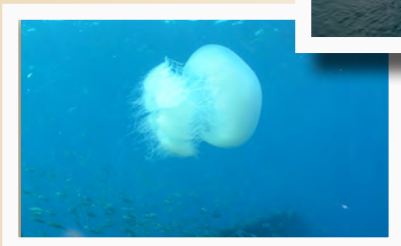
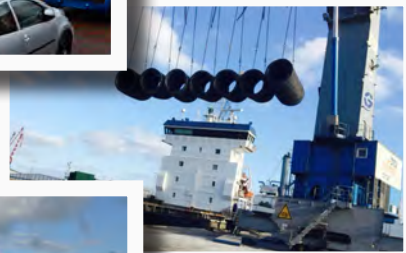


MARITIME STRATEGIC EVALUATION FOR ISRAEL 2018/19

Chief editor: Prof. Shaul Chorev

Edited and produced by: Ehud Gonen





המרכז לחקר מדיניות ואסטרטגיה ימית
Maritime Policy & Strategy Research Center

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Chief editor: **Professor Shaul Chorev**

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March 2019

Thanks and appreciations

The Maritime Policy & Strategy Research Center wishes to thank Dov (Berle) Shafir for his generous support which made possible the writing of this document.

The Maritime Strategy Evaluation report, including the insights and recommendations included in it, are based on the personal experience and professional judgment of the authors, but do not necessarily represent the official position of the Center or of the Haifa University.

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Maritime Policy & Strategy Research Center

The center is developing knowledge in maritime strategy, focusing on Israel's maritime surroundings: the Eastern Mediterranean and the Red Sea. The center does so in five core areas: (1) regional security and foreign policy, (2) the mobility of goods, people and ideas, (3) law, (4) energy (5) and the environment.

The center was established in response to the of rising significance of the maritime domain both globally and in our region: the emerging strategic maritime competition between the United State and China, the expansion of exclusive economic zones (EEZ) and the crucial role of the seas in the international economic system both as a source of economic activity as well as serving as the world's main trade route. Our immediate environment saw a similar rise in the significance of the seas including the oil discoveries in the eastern Mediterranean, the evolution of the Israeli navy into a national strategic arm, Israel's total dependence on sea trade, and the growing realization that future development of national infrastructure may have to be done in the sea as land is becoming scarce.

Content

Executive Summary	6
Global Developments in the Maritime Domain Shaul Chorev	15
Iran's Naval Strategy Eyal Pinko	80
The Naval War against the Houthis in Yemen Eyal Pinko	93
Strategic Implications of China's "Belt and Road" Initiative in the Eastern Mediterranean and the Red Sea for Israel and its Allies Eyal Hayut and Ehud Gonen	102
The Activity of the Russian Navy in 2018 the Middle East Ido Gilad	106
The Russian Northern Sea Route – Declarations and Reality Tzevy Mirkin	127
The Geopolitical Implications of the Trade War: A Theoretical Discussion Nitzan Feldman	137
Future U.S. Naval Capabilities Seth Cropsey	146
The Maritime Domain Policy: From Awareness to Reality Ram Erez	151
Developments in the Natural Gas Sector in Israel Elai Rettig	164
A Comparison of Oil and Gas Offshore Strategy between Norway and Israel Amnon Portugaly	171
An Update Regarding the Marine Areas Law, 5778-2017 Currently Under Review by the Economics Committee in Preparation for the Second and Third Reading in the Knesset Orin Shefler	185
A Defense Strategy for the Energy Facilities in the Maritime Environment: The Case of the Security Threats to the Dor Facility Nir Zarchi	204
Developments in the Construction of Artificial Islands and Floating Platforms during the Past Year Moti Kalmar and Ehud Gonen	211
The Activity in Israel's Ports Arie Gavish	217

Where to for Israeli Shipping?	233
Arie Gavish, Zeev Leshem and Arieh Rona	
The Strategic and National Implications of General Cargo and Bulk Shipping – Foreign trade as the mainstay of Israel's economy and the importance of general and dry bulk cargo	241
Yoni Essakow	
Marine Pollution: Source, Response and Prevention	256
Galia Pasternak	
The Effect of the Jellyfish Proliferation – Ramifications on the National Level	270
Tamar Lotan	
Profession Naftali Heinz Wydra / An Exhibition in his Memory	280
Ido Gilad	
Summary of the Strategic Evaluation and Policy Recommendations	285
Shaul Chorev	
The Authors (according to the order of the chapters)	296

Executive Summary

This is the fourth **Maritime Strategic Evaluation for Israel** published by the Maritime Policy & Strategy Research Center since 2016 when the Board of Haifa University approved the establishment of the Center. The Center's goal is to carry out research in regional security and foreign policy, the movement of cargo, people and ideas, law, energy and the environment, and to analyze their effect on Israel's national security.

The Center has set itself the goal of carrying out academic research as part of Haifa University's effort to take a leading role in maritime research on a national level, alongside its desire to become a knowledge center for policy makers, public leaders and the Israeli public. An additional goal is to become part of the public discourse by publishing policy papers, organizing conferences and conduct media interviews. The Center also collaborates with leading think tanks in the maritime domain worldwide, as well as being involved in the training of young researchers in the field of maritime strategy.

One of the objectives of the Center is to publish the annual **Maritime Strategic Evaluation for Israel** which focuses on the Eastern Mediterranean and the Red Sea, though it also includes a review of global developments and trends in the maritime domain that are likely to have an influence on the Eastern Mediterranean region and on Israel in particular. The Maritime Strategic Evaluation for Israel includes recommendations to various policy makers, primarily those in Israel.

In 2017, Haifa University approved the integration of the Wydra Institute for Shipping and Ports as a division within the Center, in the recognition of the importance of shipping and ports to Israel's security, in the broadest sense of the term.

In the 2018-2019 academic year, an **academic program was introduced for a graduate degree in Political Science with a minor in National Security and Maritime Strategy** in the Department for International Relations within the School for Political Science. The program adds another layer to the commitment that Haifa University has taken on itself to take a leading role in maritime studies in the framework of the Mediterranean Sea Research Center. The goal of the program is to provide its participants with knowledge, analytical tools and new research paradigms, as part of the adoption of a broad, multi-disciplinary approach that combines economic, social, environmental and technological dimensions, as derived—at least in part—from the emerging globalized world. These are closely tied to the maritime domain which is becoming an increasingly important component of Israel's resilience and security.

The importance of the maritime domain as a component within Israel's resilience has not yet gained sufficient recognition among the State's leaders or in Israeli public opinion. This is not a phenomenon that is unique to Israel and even in the US, which has a vigorous maritime tradition, it is felt that before formulating a maritime strategy it is necessary to achieve Maritime Domain Awareness.¹ In the case of Israel, the main characteristics that require the attention of leaders and the public are the following: Israel's unique geostrategic position in the Eastern Mediterranean; the high proportion of the population that lives near the Mediterranean coast; the discovery of offshore gas fields; Israel's complete dependence on seaborne trade (imports and exports); the growing share of desalinated water within Israel's water supply; and the sea as the only possible location for new infrastructures and the evacuation of existing hazardous facilities from population centers. These characteristics have essentially made Israel into a "land island" that is totally dependent on the sea. Despite its growing dependence on the sea, the lack of maritime awareness in general leads to reactive policy, as occurred in the case of the natural gas discoveries within Israel's maritime territory and the geopolitical implications of the development of Israel's ports. If there had been maritime awareness on these issues and if there had been an appropriate policy-making process, Israel's interests in these areas would have been defined ahead of time and would have been translated into a grand maritime strategy, as has occurred in many other coastal nations during the past decade.

Important support for the effort to increase the awareness of the Israeli public and in particular decision makers in the public sector has been provided by Israeli President Reuven Rivlin, who was presented with the annual report of the Maritime Policy & Strategy Research Center on June 10th 2018 by Professor Ron Rubín, the President of Haifa University; Professor Shaul Chorev, the Head of the Maritime Policy & Strategy Research Center; and General (res.) Ami Ayalon, the Center's Chairman of the Board. At the meeting, President Rivlin was presented with the report, which reviews a wide variety of topics related to Israel's maritime domain and which analyzes the developments during the past year. Professor Chorev emphasized the importance of the maritime domain to Israel's resilience and the President of the University and General (res.) Ayalon described the commitment of Haifa University to advancing academic studies related to the maritime domain. They also mentioned the establishment of the School for Marine Sciences at Haifa University and the leading role played by the Mediterranean

1 Maritime Domain Awareness (MDA): "The effective understanding of anything associated with the maritime domain, all areas and things of, on, under, relating to, adjacent to, or bordering on a sea, ocean, or other navigable waterway. MDA encompasses all maritime related activities, infrastructure, people, cargo, and vessels and other conveyances that could impact the security, safety, economy, or environment of the country".

Sea Research Center of Israel. President Rivlin said in response that he appreciates the efforts of Professor Chorev, Professor Rubin and General (res.) Ayalon to deepen awareness among the Israeli public and recognition of the importance of the maritime domain to Israel's security and resilience. He also welcomed the establishment of the Maritime Policy & Strategy Research Center and encouraged its staff to continue their research, to create a knowledge center in this sphere for the citizens of Israel and to encourage public discourse and involvement in these areas.



With respect to methodology, it was correctly decided to carry out this evaluation in relation to the existing maritime policy and strategy and indeed the Director of Planning in the Ministry of Finance recognizes the need to formulate policy in the maritime domain that takes into account the “development needs and competition among uses that is expected in Israel’s maritime domain in coming years.” The Planning Branch has recently taken a leading role in the “**Maritime Domain Policy – Israel**” project. The Ministry of Finance has mandated “the formulation of planning policy for the Mediterranean domain, the creation of a national database on environmental, technological, engineering and legal topics related to the maritime domain and the creation of tools for integrated management, coordination between all players active in

the maritime domain and cooperation between them.”² The Maritime Policy & Strategy Research Center has participated in a number of meetings held on this subject by the Planning Authority and recognizes the value of the work done so far, but wishes to again emphasize that without a definition of Israel’s interests and goals, it is not possible to progress towards a policy document. Thus, in the existing draft there are various issues that cannot be dealt with in the absence of a formal process like those which have taken place in other countries. These issues will be described in the final section of this report entitled “Recommendations to Policy Makers”.

Another government institution that the Center is in contact with regarding the importance of a maritime policy and strategy to Israel’s resilience and security is the **National Economic Council in the Prime Minister’s Office**. The Council has recently been involved in the preparation of a study whose purpose is to prepare a strategic, economic and social evaluation that will be presented to the next government of Israel (the 35th). The Maritime Policy & Strategy Research Center responded to the RFI issued by the National Economic Council in May 2017 whose purpose was to advance **a process of expert consultation** in which experts would contribute their knowledge and experience to the evaluation by means of insights into trends, main characteristics and strategic issues.³ Since it is the opinion of the Center that one of the main issues facing the next government will be the **definition of Israel’s interests and policy in the maritime domain**, staff members from the Center met with the Council’s staff to propose that they participate in the identification of these interests and in the formulation of policy on issues such as moving infrastructure facilities to artificial islands, the formulation of a security policy for offshore energy facilities, and others.⁴

The **current annual report** includes a variety of topics, some of which are new and some of which appeared in previous reports, in view of the developments during the past year. As in previous years, **the report was written** by researchers at the Maritime Policy & Strategy Research Center, research fellows of the Center and other experts—some from Haifa University—with unique knowledge on these subjects.

2 Ministry of Finance, Planning Branch, background to the preparation of the policy document, on the Ministry’s site: <http://www.iplan.gov.il/Pages/OpenTerritory/merchav-yami/allreka/reka.aspx>

3 Prime Minister’s Office, the National Economic Council, Formulation of a Strategic Socioeconomic Evaluation for the 35th Government. <http://economy.pmo.gov.il/CouncilActivity/Strategy/Pages/gibosh35.aspx>

4 The Maritime Policy & Strategy Research Center also responded to an RFI for the “Formulation of a Program for the Design, Advancement and Achievement of Regional Cooperation Goals”.

Maritime Domain Blindness is not unique to Israel. We chose to include an article that describes the phenomenon and presents possible ways of reducing it on the national level or alternatively bringing about Maritime Domain Awareness.

In 2016, **Haifa University together the Hudson Institute** in Washington established a committee of well-known Israeli and American experts in the fields of security and energy as part of the creation of a joint framework to carry out research on the Eastern Mediterranean. In August 2016, a comprehensive report was published on these two topics as part of the Center's Strategic Evaluation for 2016. In the summer of 2018, the committee met in a somewhat different format with the following goals: to examine the "The Character of Maritime Warfare" in the region in coming decades; to analyze the current strategic environment and to predict the main developments expected in it; to discuss whether the US and Israel have sufficient capabilities to deal with these developments; to examine ways in which the governments of Israel and the US can cooperate in dealing with these challenges and opportunities; and finally to recommend new policy and strategy approaches to security in the Eastern Mediterranean. The final report of the committee has not yet been published, but the discussions have emphasized the lack of government policy with regard to Chinese investments in Israel and their effect on national security in the broadest sense of the term. The committee subsequently published a position paper on the topic and parts of it were even quoted in the media.

The current annual report opens with a description of the **changes and trends in the global maritime domain**. The most important of them is the **deterioration in relations between the US and its allies on the one hand and China and Russia on the other**. The US views China and Russia as revisionist powers that are seeking to establish "a world consistent with their authoritarian models."⁵ In addition to this trend, there are signs of an increase in the number of world leaders that **reject liberal democratic values** and are seeking complete control of politics, the economy, laws and the media. These leaders are liable to create a far different future in which the globalized world, the hi-tech industries, the knowledge and enlightenment that have developed in recent decades will find themselves back in the **Age of Authoritarianism**. The trend of a gradual shift in the geopolitical, economic and geostrategic center of gravity from the West to East and Southeast Asia is continuing and is the result of the increasing importance of this region in global economic development. Alongside these developments, it is increasingly understood that this trend is accompanied by negative indicators in the

5 Mike Eckel, Pentagon Chief Calls Russia, China 'Revisionist Powers', RadioFreeEurope Radio Liberty, January 19, 2018, <https://www.rferl.org/a/pentagon-mattis-calls-russia-china-revisionist-powers/28985632.html>

ecological system, such as pollution and emissions of greenhouse gasses. A number of countries have tried to redefine their interests in the maritime domain, which can be seen in the rising power of China as a global power that is trying to expand its economic waters in the South China Sea while challenging other countries in the region; in China's increased presence in the maritime domain; and in the US reaction to this threat. The renewed race to control the Arctic Ocean and the goals Russia has set itself in this region also reflect this trend.

The report then goes on to evaluate **the changes and trends** in the Middle East during 2018. The **Persian Gulf**, which is also known as the Arab Gulf, has in recent years experienced an accelerated military buildup as part of the shift in its geopolitical status from a peripheral region to one that is central to global security. This process was driven by both the countries bordering the Persian Gulf and the superpowers which have achieved control and influence there. We chose to devote a separate chapter to this subject in the report.

Next, we decided to describe developments during the past year in areas that were reviewed comprehensively in previous reports, such as the conflict in the **South China Sea**; the maritime aspects of a **possible slowdown in globalization** due to US protectionism in trade and the possible effect of this slowdown on global shipping and national fleets; and also recent developments in the stability in the southern Red Sea and the Bab el Mandeb Strait, with reference to the maritime activity of the **Houthi rebels in Yemen**, who are supported by Iran.

The strategic aspects of exporting natural gas from Israel to other countries is a topic that is occupying the government's attention. The Tsemah Committee, which was created in 2012, recommended the export of about 50 percent of Israel's gas reserves. This led to intense public criticism which called for a larger proportion of the gas reserves to be kept for Israel's use and for examining the question of gas exports with extra caution. The export of gas from Israel is a complex issue due to the country's geostrategic location relative to potential customers and due to the high cost of transporting gas to remote markets. Accordingly, the export of gas from Israel remains a contentious topic. We present a chapter that looks at its regulatory aspects and the use of royalties.

In the chapter that discusses energy topics, we decided to include a summary version of a study carried out by one of the Center's researchers, which proposes a **multidisciplinary approach to deciding on the location of the offshore energy production facilities**. It is well-known that Israel's maritime domain serves the needs of many sectors. It also constitutes the main conduit for trade with the rest of the world

and there are those that view it as a land reserve that can be used for infrastructure facilities and perhaps even urban development. In addition, it serves as Israel's "blue lung" that includes an open landscape and a huge space for leisure activity. With the discovery of huge reserves of offshore natural gas in Israel's Exclusive Economic Zone (its "economic waters"), a new reality emerged that required an optimal balance between the exploitation of the gas reservoirs for the production of electricity and their use in transportation and industry on the one hand and export of part of the gas reserves to other countries, on the other hand, in addition to avoiding actions that would be to the detriment of public welfare and the ecological system. As mentioned, this chapter proposes an approach that tries to balance between the various components already mentioned and will serve decision makers when they are asked to approve a plan for the establishment of maritime infrastructure facilities for the production of energy from the sea.

The chapter dealing with foreign navies in the Eastern Mediterranean focuses this year on three of them: **the Russian navy, the Iranian navy and the US navy**. The Russian navy is continuing to consolidate its foothold in the Eastern Mediterranean as part of the importance attributed by the Russians to its Black Sea fleet (which is also its Mediterranean fleet). This includes the bases it is using in Syria for this purpose. The importance Russia attributes to development in the Arctic Ocean (including the Northwest Passage), whose main repercussions are ecological, has implications for the Chinese and their Maritime Silk Road and for the Egyptians, whose income is to a large extent based on revenues from the passage of ships through the Suez Canal. **The Iranian navy** continued to make clear its desire for a foothold in Syria's ports for its warships in the Eastern Mediterranean, and its continued attempt to strengthen its foothold in Syria is an important component of this approach. **The US navy** reduced its forces and presence in the Mediterranean as part of its shift to Southeast Asia (a policy called Pivot to Asia or Rebalancing). The desire of the US government to meet the demands of the navy for a buildup to 355 vessels has encountered budget problems and the constraints of the shipyards' ability to build that many ships. The chapter surveys the status of the program to increase the US navy's number of vessels and the difficulties it is encountering.

The subject of **artificial islands** for the evacuation of areas on dry land and the reduction of environmental risks from factories that handle hazardous materials has been on the public agenda for more than two decades. There have been a number of government decisions in this area but unfortunately none have been implemented as yet. Over time, the relevant technologies have developed and changed. Examples include the development of a FPOF (Floating Production Operation Facility) for the production of

natural gas; designated vessels that can serve as a floating desalinization plant; etc. This chapter will survey the developments in this area, from the perspective of both the relevant projects and the introduction of new technologies that require a “timeout” in order to examine the validity of decisions made with regard to meeting the need for artificial islands.

In the area of **shipping and ports**, we decided this year to present a number of topics: **first**, the experience gained from the operation of the Israel Shipyards Port as a private port; **second**, an examination on the strategic level of the bulk transport market (which constitutes about one-half of Israeli trade). The chapter also includes an annual review of the activity in Israel's ports and the regulatory structure of the ports. **In the area of shipping**, the report presents the position that looks at the government policy regarding the preservation of Israeli shipping capabilities. It is the Center's position that if the current situation with respect to training of manpower and the manning of essential positions in the commercial fleet continues, the State may not manage to supply essential goods to the Israeli economy in a time of crisis. In view of the current situation and the integration of the Wydra Institute within the Maritime Policy & Strategy Research Center, we decided to present a brief biography of the late **Dr. Naftali Wydra**, one of the founding fathers of Israeli shipping.

In the area of protecting the marine environment in the Eastern Mediterranean, we chose this year to review three issues: the **first** is pollution of the Eastern Mediterranean; the **second** is the multiplication of jellyfish swarms that constitute a threat to desalination plants and power plants; and the **third** is the “The Gift of the Nile – Israel's Marine Sand Resource: Sources, Uses and Quantities.” The article describes the maritime sources of sand along the coast of Israel, its physical characteristics and its main uses in the past and in the present.

The topic of **cyber warfare in the maritime domain** was evaluated and discussed in depth in the previous report. The dramatic developments in communication and information technology in recent years has affected the way in which state and non-state players operate in the marine domain. These technologies have created opportunities but also challenges in the military and commercial spheres and even in criminal activity. The previous report stated that the civilian maritime domain (shipping, ports and marine infrastructure) has not been given priority in cyber protection. The report also recommended a number of measures that can improve the situation. Accordingly, this year's report reviews the developments since the publishing of the previous report.

The conclusion of the annual Maritime Strategic Evaluation for Israel attempts to create an evaluative foundation based on a number of parameters that can be used in coming years to evaluate Israel's situation in this domain.

The report itself includes policy recommendations to decision makers in the political echelons and in the senior bureaucracy. These recommendations were considered important by the writers of this report and in their opinion can assist in dealing with the challenges outlined in the report.

Global Developments in the Maritime Domain

Shaul Chorev

General

Although this report focuses on **the Eastern Mediterranean and the Red Sea**, the events in this arena cannot be considered separately from recent global developments in general and in the maritime domain in particular and this is the result of the close links between events in the global arena and their effects on Israel's immediate environment.

It is first of all worth mentioning that the **tension in relations between the US and its allies and between the US on the one hand and China and Russia on the other** continued during 2018 and even intensified. The US views China and Russia as revisionist forces that are seeking to create "a world consistent with their authoritarian models."¹

There are scholars in Political Science who point to the growing number of leaders in the world who **scorn the values of liberal democracy** and who seek complete control of politics, the economy, the legal system and the media. These leaders are liable to lead the world toward a future in which globalization, hi-tech industries, knowledge and the enlightenment that emerged in recent decades will begin sliding back into an "Age of Authoritarianism".²

With regard to the **globalized economy**, the **gradual shift of the center of gravity** in geopolitics, the economy and geostrategy **from the West toward East Asia**, as a result of the increasing importance of the latter in global economic development (which was described in previous reports) continued this year.

This phenomenon has also made it possible for the developing countries in Southeast Asia to consume a growing share of global imports, which has led to a large rise in the volume of trade in this region. Figure 1 below presents the change in GDP in 2017, which shows the growth in GDP in the countries of East and Southeast Asia. Alongside these developments there is increasing understanding that there are also

1 Mike Eckel, Pentagon Chief Calls Russia, China 'Revisionist Powers', RadioFreeEurope Radio Liberty, January 19, 2018

<https://www.rferl.org/a/pentagon-mattis-calls-russia-china-revisionist-powers/28985632.html>

2 Der SPIEGEL Staff, Rise of the Autocrats, Liberal Democracy Is Under Attack, Spiegel Online, June 13, 2018 <http://www.spiegel.de/international/world/trump-putin-and-co-liberal-democracy-is-under-attack-a-1212691.html>

negative trends occurring in the ecological system, such as pollution and the emission of dangerous greenhouse gasses.

Following the imposition of tariffs by President Trump on Chinese goods (primarily aluminum and steel) and the lack of certainty they led to in the global economy with respect to the continuation of growth, China responded to this move by imposing tariffs on American goods—primarily agricultural products, cars and fish. Nonetheless, it is important to mention that recent indexes still do not show a retreat of the global economy and in the short run it appears that the global economy is still sufficiently flexible to absorb shocks of this sort.

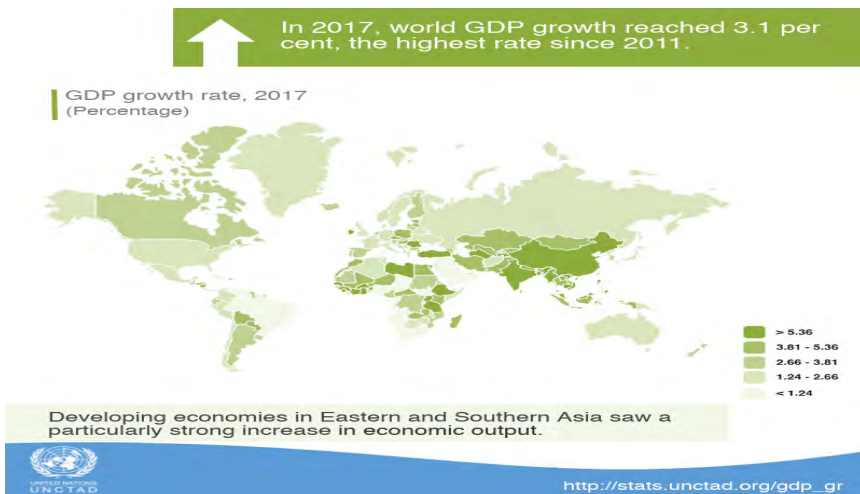


Figure 1: GDP growth rate, 2017

Despite the short-term economic volatility, it is expected that the American, Chinese and Indian economies will in the future constitute the "Big Three" (G-3). If the rate of growth of Indian GDP, which is currently 7.5 percent, continues also in 2019-20, then the Indian economy will overtake that of China. Each of these three countries will in the future be forced to deal with a spectrum of challenges, from defense and climate change to maintaining economic and industrial growth. The global events during the last decade have led experts in Political Science to the conclusion that **the international security environment** has shifted from a post-Cold-War era—in which the US was a superpower in a unipolar structure—to a new and different situation that is manifested in, among other things, the renewal of the competition for power with China and Russia. Accordingly, some scholars point out that the international system is now multi-polar. This multipolar world is an extreme substitute for the unipolar world due to the fact that it is based on the existence of several independent and sovereign centers of strategic

decision-making on the global level. Nevertheless, it should be remembered that a multipolar world does not represent a return to a bipolar system, since there is currently no single strategic or ideological force that can seriously challenge the US.

Following the settling-in period of the Trump administration, the White House published a document in December 2017 called the National Security Strategy, signed by the President.³ It led to the publishing of the National Defense Strategy by the Department of Defense in January 2018, signed by Secretary of Defense Jim Mattis. The leading motif of this document is "Sharpening the American Military's Competitive Edge."⁴ The National Defense Strategy recognizes that the global security environment has become more complex, which has been manifested in challenges to the international order and the reappearance of long-term strategic competition between countries. In the view of the Pentagon, this calls for a clear assessment of the threats facing the US and a recognition that the nature of warfare is changing and therefore the orientation of the Pentagon itself must adapt. The document states that the main threat to continued US prosperity and security is the renewal of its long-term strategic competition with the revisionist powers. The document points to the desire of China and Russia to fashion a world that is consistent with their authoritarian model, which allows them to veto the economic, diplomatic and security decisions of other nations.

The document mentions another change in the strategic environment, namely the **resilient but weakening international order**, one that has been developing since the Second World War. The document claims that China and Russia are undermining the international order from within the system and that they are exploiting the principles of that order for their own purposes, although they do not hesitate to attack those principles.

The document discusses the part of the **rogue regimes** such as North Korea and Iran in undermining the stability in various regions of the world, by means of their efforts to develop nuclear weapons and launch capabilities (ballistic missiles) and the patronage they provide to terror organizations.

The two aforementioned forces (revisionist forces and rogue regimes) are increasingly competitive on every level, though at the same they are avoiding an armed confrontation. They are doing so by means of coercion on new fronts, the violation of sovereignty and intentional obfuscation and blurring of boundaries between civilian and military goals.

3 National Security Strategy of the United States of America, The White House, December 2017 <https://www.whitehouse.gov/wp-content/uploads/2017/12/NSS-Final-12-18-2017-0905-1.pdf>

4 Department of Defense, Summary of the 2018 National Defense Strategy of the United States of America, Sharpening the American Military's Competitive Edge https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf?mod=article_inline

The document also claims that in coming years, challenges to US military superiority will develop and they will constitute another transformation in the global security situation. After years of US superiority in all domains—air, land, sea, space and cyber—it now faces competition.

In addition, the document also mentions the changes occurring in the security environment, which are influenced by, among other things, **the rapid pace of technological progress and the changing nature of war**. Among the new technologies are advanced computing, big data, artificial intelligence, automation, robotics, directed energy, hypersonics and biotechnology. Proficiency in these technologies is essential to fight and win wars in the new era.

The document also mentions that **new commercial technology** will change society and in the end also the nature of war. The fact that many technological developments will come from the commercial sector involves dangers to the US since they will be easily accessible for adversaries and non-state players, a situation that will lead to the erosion of America's conventional advantage. Based on this diagnosis, the document states that in order for the US to maintain its technological advantage, changes will be necessary in industrial culture, in the sources of investment and in the protection of what it calls the National Innovation System.

The new strategy also claims that **technologies** developed by the Department of Defense should be evaluated according to an **index of their battlefield relevance** and that the improvement in the performance of a system should be evaluated by the time until it comes into use and its relevance. The measure of success is not dependent on the question of which country develops an advanced battlefield technology first but rather which country achieves the best and fastest integration on the battlefield. According to this view, the Department of Defense has set itself the goal of exceptional performance in the development of weapons systems at the expense of putting the technology to use in a timely manner, a situation that calls for change in the Department of Defense's business culture.

The document calls for the realization that **the territory of the US** does not constitute just another region of immunity that is protected by the maritime domain, but rather as a preferred target for attack, including by terrorist elements seeking to attack its citizens, commercial targets and government infrastructures and also by means of political and social subversion. New threats arise as digital connectivity increases in all facets of life – business, government and the army – and is creating significant vulnerability.

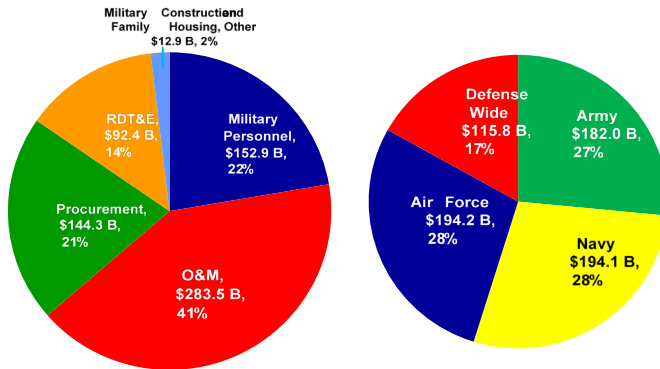
The strategy calls for the **strengthening of current alliances and the creation of new ones** on the basis of mutual respect, responsibility, orders of priority and accountability. Similarly, it calls for the expansion of regional consultation mechanisms, joint planning and deepening of interoperability. With respect to the strengthening of existing alliances and the creation of new ones, the strategy describes, among other things, the importance of expanding Indo-Pacific alliances and partnerships, the strengthening of NATO and the creation of enduring coalitions in the Middle East.

Accordingly, the document presents the highlights of the new National Security Strategy:

- More lethal force.
- Strengthening of alliances and attracting new partners.
- Reforming the Department of Defense in order to improve its performance at a reasonable cost.⁵

The administration’s request that the Congress approve a **defense budget** of \$686 billion for 2019 represents an increase of \$74 billion relative to the 2018 budget (a real increase of 10 percent; see Figure 2 below).

China and India are continuing their acquisition of advanced weapons systems with a variety of capabilities and are gaining recognition as **regional superpowers**. With respect to China, there are those who claim that it has already become a global superpower which is confronting the US and Russia in a multi-polar system.⁶



Request for fiscal year 2019 - \$686.1 billion
 Request for fiscal year 2019 – Total base and OCO funding.

Figure 2: Requested defense budget for 2019

5 Ibid., 1-10.

6 N. Janardhan, Is China Forging a New Tripolar World Order? The Diplomat, April 26, 2018 <https://thediplomat.com/2018/04/is-china-forging-a-new-tripolar-world-order>

The Chinese defense budget for 2018 was over \$1.1 trillion yuan (\$174.5 billion), which represents an increase of 8.1 percent relative to the previous year and is about one-quarter the size of the US defense budget. Although the increase in the Chinese defense budget is not significantly greater than the 7-percent increase in 2017, it reflects the highest level of defense expenditure in the last three years. It should be remembered that starting in 2016 the increase in the defense budget dropped from double-digit to single-digit. China's military buildup, alongside a policy of power projection in the maritime domain is causing concern in the region and particularly with respect to its unyielding position in maritime disagreements over sovereignty in the South China Sea region.

India's defense budget for 2018-19 stands at \$62.8 billion, an increase of about \$9 billion relative to the previous year. The Indian navy's budget accounts for about 15 percent of the total defense budget (see Figure 3).⁷

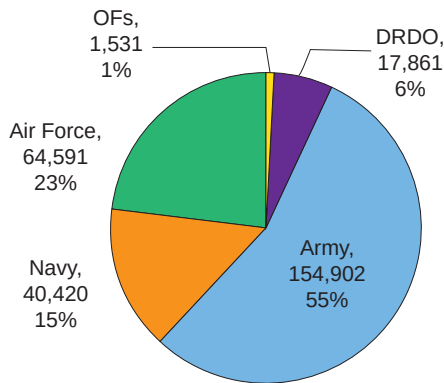


Figure 3: India's defense budget and its breakdown

The **EU** continues to constitute a major economic power and apparently the fourth largest economy in the world, even though it will grow at a low rate of about 2 percent.⁸ In May 2018, the EU revised its forecast of GNP growth downward as a result of negative external influences that originate in the trade confrontation with the US and the rise in fuel prices. The EU is still in negotiations with Britain over its withdrawal from the EU (Brexit) which are meant to conclude by March 2019. It appears that the British decision to withdraw from the EU has aroused a **broad political movement** among

7 Laxman K Behera, Defense Budget 2018-19: The Imperative of Controlling Manpower Cost, February 02, 2018

<https://idsa.in/issuebrief/defence-budget-2018-19-controlling-manpower-cost-lkbehera-020218>

8 European Commission, European Economic Forecast. Summer 2018 (Interim), Economic and Financial Affairs, https://ec.europa.eu/info/departments/economic-and-financial-affairs_en

the EU members, whose direction is still unclear, although there is a new feeling of unity emerging among the remaining 27 members.⁹ British Prime Minister Theresa May is continuing the negotiations with the EU with the intention of maintaining close economic relations. Despite the Russian pressure on NATO members, Jens Stoltenberg, the Secretary General of NATO has promised John Bolton, the US National Security Advisor, that NATO will continue the process of accepting Georgia and Ukraine as members.¹⁰ Due its lack of ability to project power, it does not appear that the EU's status in the international arena will resemble that of a G-3 power. NATO's **defense posture** is based on two principles: advanced weapons systems and platforms and forces that are trained to operate in an integrated manner. As of the writing of this report, the EU is occupied by three main challenges: in the **East**, formulating a response to the possibility of a Russian invasion of the Baltic states; in the **South**, dealing with the flow of refugees arriving on the shores of the EU countries on the Mediterranean; and in the **Eastern Mediterranean**, where there is an irresolvable crisis in Cyprus. Notwithstanding NATO Secretary General Jens Stoltenberg statement in June 2017 that the NATO countries, including Canada, have increased their defense spending by 4.3 percent and in comparison to 2014 defense spending has increased by \$46 billion, at a summit meeting held in July 2018 President Trump reiterated his demand that the NATO countries increase their defense budget (Figure 4 presents the trend in the NATO defense budget from 2006 to 2010 as a proportion of GNP).

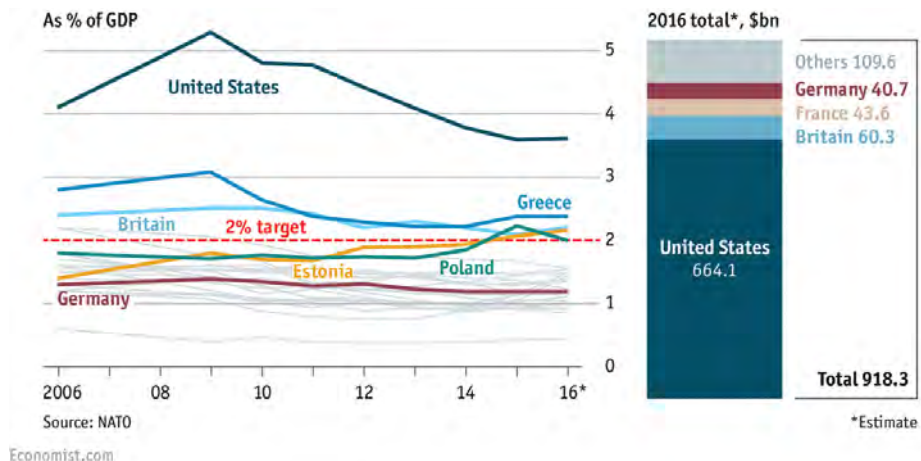


Figure 4: The trend in the NATO defense budget from 2006 to 2010 as a proportion of GNP

9 Caroline de Gruyter, There Is Life for the EU After Brexit, Carnegie Europe, March 23, 2018 <https://carnegieeurope.eu/2018/03/23/there-is-life-for-eu-after-brexite-pub-75876>

10 Stoltenberg promises that Georgia will become a NATO member, September 16, 2018 <http://uawire.org/#>

In an interview given by the President to Fox News, Trump reiterated his claim that the US does not need to defend small countries in NATO such as Montenegro based on NATO's commitment to come to the aid of every one of its members if attacked. This view was in line with the US administration's demand of the NATO countries to increase their defense expenditure and to take a more significant role in the NATO alliance (accompanied by a veiled threat that if not, he will not fulfil the American commitment to protect the NATO members in the event that Russia invades their territory).

The **Russian Federation** continues to maintain its image and standing as a global and regional power, despite its **political, economic, social and demographic** problems. The hope President Putin has placed on the election of Donald Trump as US President has not yet justified itself with respect to the cancelation of economic sanctions imposed on Russia. At the summit meeting held between the two in July 2018 in Helsinki, Russia revealed an embarrassing dimension of this relationship. First, the US President refused to support the findings of the US intelligence community that Russia had intervened in the 2016 elections, rather than expressing immediate skepticism regarding Putin's denial in this matter. Nonetheless, Russia would have preferred more official talks rather than a one-on-one conversation between the two leaders. This would have allowed Putin to ensure that the bureaucratic officials on both sides would come to agreement on a number of issues that are strategically important to the Russians.¹¹

After an uninterrupted period (starting in 2011) in which the **Russian defense budget** increased by an average of about 20 percent annually, the Russian government decided that as a result of economic difficulties it would make a permanent cut in its defense budget during the period 2017-19 (see Figure 5). The Russian defense budget for 2019, as published by the Ministry of Finance, will be \$B47.13,¹² which represents about 4.2 percent of the Russian Federation's GNP. The price of oil has a major influence on the defense budget but recently there have also been voices in the Russian establishment which point out that a wise political strategy can achieve military objectives without increasing the defense budget. The supporters of this approach point to the success—from Russia's perspective—of the British withdrawal from the EU (Brexit) which has

11 Patrick Wintour, who's wooing who in the Trump-Putin relationship? The Guardian, 21 July 2018 <https://www.theguardian.com/us-news/2018/jul/21/whos-wooing-who-in-the-trump-putin-relationship>

12 Craig Caffrey, Russian defence budget expected to be cut by 5% in 2018, Jane's Industry, 20 September 2017

weakened the EU and the election of Donald Trump as US President as landmark events, without Russia having to increase its defense budget.¹³

The **expenditure on national security** in Russia is expected to rise in 2019 by 3.7 percent, to about 2.83 trillion rubles. The new plans are in line with previous forecasts for 2018. Nevertheless, the defense allocation for 2019 is higher by about 0.5 percent than expected. This reflects the general crisis that Russian is experiencing, which is partly due to the drop in the price of oil. However, this is not preventing Russia—with the means available to it—from achieving its global status, particularly in the maritime domain.¹⁴

Russia's military doctrine, which was approved by Putin in 2014, reflects the influence of the crisis with Ukraine and the Russian response to the stance of the US and NATO on this conflict. Accordingly, it is expected that from time to time Russia will try to distance the EU countries one from the other, with the goal of weakening their unity. Russia will continue to maintain influence over the former FSU countries, through both “soft power” and “hard power”. Russia will also continue to intervene in Ukraine, in the Caucasus and in Central Asia and will oppose any attempt by NATO to extend its influence in the FSU.

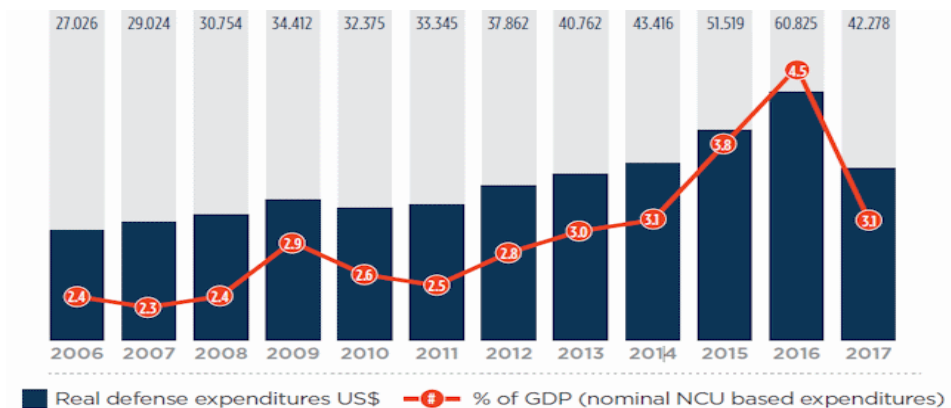


Figure 5:

<https://www.globalsecurity.org.military/world/russia/mo-budget.htm>

- 13 Russian Military Budget, Globalsecurity.org
<https://www.globalsecurity.org/military/world/russia/mo-budget.htm>;
<https://www.janes.com/article/74248/russian-defence-budget-expected-to-be-cut-by-5-in-2018>;
<http://www.janes.com/article/68766/russia-announces-deepest-defence-budget-cuts-since-1990s>
- 14 Craig Caffrey, Russia announces deepest defence budget cuts since 1990s, IHS Jane's Defence Weekly, 16 March 2017, <http://www.janes.com/article/68766/russia-announces-deepest-defence-budget-cuts-since-1990s>

Russia completed a series of **large military exercises** in September 2018 which was called Vostok. Participating in the exercises this year for the first time were Chinese aerial, naval and ground forces. The Russians claim that this is the largest exercise in modern Russian history and that more than 300,000 soldiers, more than 1000 aircraft, helicopters and drones, about 80 warships and auxiliary ships and about 36,000 tanks participated. Both Moscow and Beijing issued declarations of cooperation in the exercise and the exercise was even accompanied by meetings between Russian President Vladimir Putin with senior Chinese officials during the exercise. The main political significance of the declarations by Russia and China is the possible emergence of a strategic partnership whose goal is to deal with the threat that the two companies feel from continued US dominance in the international arena. It is not known whether the Chinese navy participated in any way in the exercise but this did not prevent it from sending a Dongdiao-class auxiliary general intelligence (AGI) ship which monitored the exercise.¹⁵

Russia is seeking to expand its control in the **Arctic region** based on the understanding that this territory is essential to its economic future and its security. Europe will remain at the focus of Russian economic activity, with emphasis on European markets for Russia's export of energy resources. The drop in the price of energy, which accounts for about 80 percent of Russia's exports, and the sanctions imposed on it by the West as a result of its invasion of Crimea have, as mentioned, contributed to the deepening economic crisis in Russia. Russia will continue to be **one of the largest exporters of weapons in the world**, and as a result of its dismal economic situation it will be prepared to offer highly advanced weapons—some of those weapons are even more advanced than those produced in the West—to anyone in the market. In 2017, **Turkey which is a NATO member** announced that it will acquire S-400 Triumpf ground-to-air missiles from Russia in place of Western air defense missiles such as the Patriot. Turkey also reported that it had made a down payment on a contract worth \$2.5 billion and it is expecting to receive the missiles in October 2019.¹⁶

In order to meet the Russian challenge in Western Europe and Scandinavia the Americans have expanded the boundaries of the Second Fleet's activity to the region

15 Sam Lagrone, China Sent Uninvited Spy Ship to Russian Vostok 2018 Exercise Alongside Troops, Tanks, US Naval Institute, September 17, 2018 [https://news.usni.org/2018/09/17/china-sent-uninvited-spy-ship-russian-vostok-2018-exercise-alongside-troops-tanks?utm_source=USNI+News&utm_campaign=ba137ef7e5-USNI_NEWS_DAILY&utm_medium=email&utm_term=0_Odd4a1450b-ba137ef7e5-233591665&ct=t\(USNI_NEWS_DAILY\)&mc_cid=ba137ef7e5&mc_eid=6495944afc](https://news.usni.org/2018/09/17/china-sent-uninvited-spy-ship-russian-vostok-2018-exercise-alongside-troops-tanks?utm_source=USNI+News&utm_campaign=ba137ef7e5-USNI_NEWS_DAILY&utm_medium=email&utm_term=0_Odd4a1450b-ba137ef7e5-233591665&ct=t(USNI_NEWS_DAILY)&mc_cid=ba137ef7e5&mc_eid=6495944afc)

16 Sebastien Roblin, America's Big Fear: Turkey Mixing F-35s and Russia's S-400 Air Defense System, The International Interest, July 7, 2017 <https://nationalinterest.org/blog/buzz/americas-big-fear-turkey-mixing-f-35s-and-russias-s-400-air-defense-system-25152>

north of Scandinavia and the Arctic Circle and announced that this reflects the new national defense strategy which is being promoted by Secretary of Defense James Mattis. This move symbolizes the return to “Great Power Competition”. According to Admiral James Richardson, the commander of the US Navy, the new Second Fleet “increases our strategic flexibility to respond — from the Eastern Seaboard to the Barents Sea – by means of expeditionary fleet operations where and when needed.”¹⁷

Defense and security will continue to be essential in both the virtual domain and the physical domain, including space and the cyber domain. The demand to protect the citizen of the various nations will increase in importance as a result of global population growth, climate change, a shortage of resources and a lack of stability in the international arena. The document National Defense Strategy 2018 describes an increasingly complex global security situation, which is characterized by open challenges to the free and open international order and the reappearance of long-term strategic competition between nations. The report itself admits that the military advantage previously enjoyed by the US is eroding, that there are more disruptions of the international order, which has been based on rules established after the Second World War and that the security situation is more complex than that faced by decision makers to date. International strategic competition, rather than terror, is now the main threat to US national security.¹⁸ This strategic assessment views China as the main strategic competitor to the US and it is using economics in order to coopt its neighbors while maintaining a process of militarization in the South China Sea. Russia has violated the sovereignty of nearby countries and has suppressed—by means of veto—the economic, diplomatic and security decisions of its neighbors. Similarly, the foreign policy of North Korea and the rhetoric of its leaders continue despite the condemnation by the US and the sanctions it has imposed. Iran continues to sow the seeds of violence and remains the biggest challenge to stability in the Middle East. Despite the defeat of ISIS, the threats to stability remain. This complex security situation is defined by rapid technological change, challenges from adversaries in every operational domain and the effect on the current readiness for an armed confrontation. Such an environment does not allow for complacency. The US strategic assessment recommends carrying out a clear evaluation of the risks facing the US,

17 Sam Lagorne, CNO: new 2nd fleet boundary will extend north to the edge of Russian waters, USNI News, August 27, 2018, https://news.usni.org/2018/08/24/cno-new-2nd-fleet-boundary-will-extend-north-edge-russian-waters?utm_source=USNI+News&utm_campaign=97450bf836-

18 US Department of Defense, Summary of the 2018 National Defense Strategy of the United States of America, Sharpening the American Military’s Competitive Edge. <https://dod.defense.gov/Portals/1/Documents/pubs/2018-National-Defense-Strategy-Summary.pdf>

recognition of the changing nature of war and a transformation of the way in which the US Department of Defense is run.

In the realm of maritime piracy, in 2018 (up until the time of writing) there had been more than 20 boardings of ships which the pirates had intended to hijack, although only three cases—all of which occurred in the region of Western Africa—were successful.¹⁹ In the region of the Gulf of Aden and the Horn of Africa, there were two incidents in which pirates opened fire on ships. In the first, in February 2018, they opened fire on a tanker east of the coast of Somalia, while in the second, in March 2018, they opened fire on a different tanker off the coast of Yemen. In both cases, the pirates did not manage to take control of the ships. The **cost** of dealing with the piracy threat in the Western Indian Ocean (East Africa) reached \$1.4 billion in 2017, a drop from \$1.7 billion in 2016 and from \$7 billion in 2010, which was the peak of attacks by Somalian gangs (see Figure 6). This improvement can be attributed to the activity of the naval forces and particularly in the north Indian Ocean and the Gulf of Aden. Nonetheless, the waters off Somalia and the Gulf of Aden, through which numerous tankers and other ships pass, is a high-risk region for piracy attacks.²⁰ Despite the international activity that was surveyed above, pirate groups have continued their illegal maritime activities, such as the smuggling of weapons and refugees.²¹

In recent years, various countries have organized to defend against the threat of piracy and in particular in the northwest Indian Ocean and in the Gulf of Aden. In November 2017, the UN Security Council renewed for another year the mandate of the international naval forces to participate in the struggle against piracy off the shores of Somalia and emphasized that this crime has intensified the instability in the country and has encouraged corruption and terror in the region. The Security Council stressed that the renewed authorization **applies only to the situation in Somalia** and does not affect the rights, obligations and responsibility of other member countries according to international law, including the Convention on the Law of the Sea.²²

The problem of piracy is being dealt with by means of both international forces that were created for this mission and independent forces (China and Russia). Since 2008,

19 MB Piracy & Armed Robbery Map 2018, <https://www.icc-ccs.org/piracy-reporting-centre/live-piracy-map>

20 The Telegraph, Piracy, 02 September 2018 <https://www.telegraph.co.uk/news/worldnews/piracy/>

21 Piracy and Armed Robbery Against Ships in East Africa 2016

22 United Nations, Meeting Coverage and Press Release, Unanimously Adopting Resolution 2383 (2017), Security Council Renews Authorization for International Naval Forces to Fight Piracy off Coast of Somalia, SC/13058, 7 November 2017, <https://www.un.org/press/en/2017/sc13058.doc.htm>

China has been deploying its naval forces (People's Liberation Army Navy – PLAN) to protect Chinese ships from pirate activity in the Gulf of Aden and Horn of Africa. The opening of a Chinese naval base in Djibouti and the operations of Chinese naval forces have led to an improvement in the operational capability of the Chinese navy far from its traditional theater of operations in East Asia and have indirectly given it blue water naval capabilities.²³ The activity has also led to a sharp drop in the number of incidents, although the economic burden of the activity remains heavy.



Figure 6: The economic price of Somali piracy during the period 2010-17. Source: The State of Maritime Piracy 2017 <http://oceansbeyondpiracy.org/reports/sop/summary>

Main Trends in Global Maritime Trade

More than 80 percent of global trade by volume and more than 70 percent by value is transported by sea and handled by the various seaports all over the world. Thus, the contribution and importance of ocean transport to global trade and its development cannot be underestimated. In 2017, total seaborne trade grew by 2.8 percent, which represents an increase in terms of volume of 10.6 billion tons. The forecasts for the intermediate term indicate continued expansion with a planned annual growth rate of 3.2 percent from 2017 to 2022. The expected growth encompasses all of the types of cargo and the highest growth is expected in containers and dry bulk commodities.²⁴ Figure 7 below presents the trends in global seaborne trade during the period 2000-2017 and its breakdown according to type of cargo.

The three largest shipping companies (Maersk Line, Denmark; MSC, Switzerland; and the CMA-CGM Group, France) account for about 30 percent of the volume of container transportation (TEU).²⁵

23 Emanuele Scimia, Anti-piracy mission helps China develop its blue-water navy, Asia Times, January 8, 2018, <http://www.atimes.com/anti-piracy-mission-helps-china-develop-blue-water-navy/>

24 Review of Maritime Transport 2017, United Nations Conference on Trade and Development UNCTAD, http://unctad.org/en/PublicationsLibrary/rmt2017_en.pdf

25 The Global Facilitation Partnership for Transportation and Trade (GFP), <http://www.gfpt.org/node/2785>

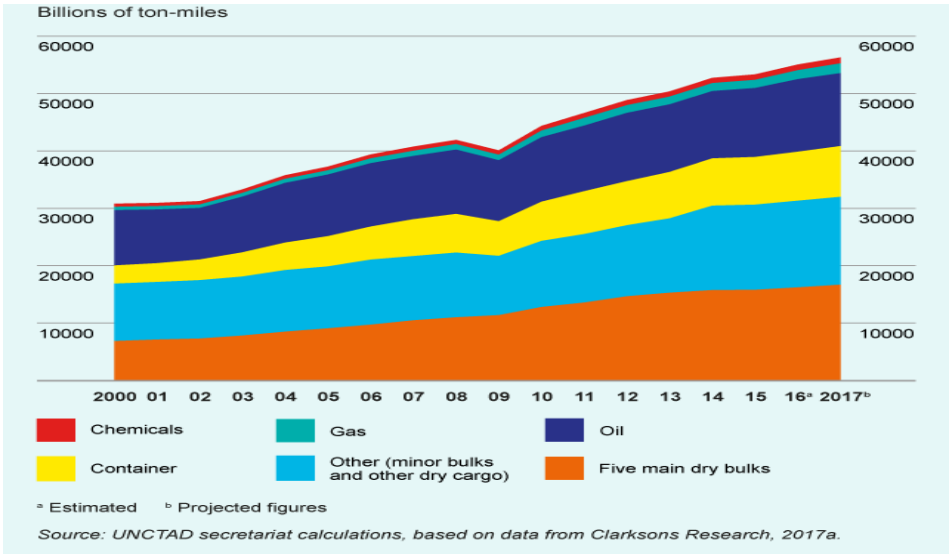


Figure 7:

With respect to container traffic, Figure 8 below presents the throughput of containers in ports during 2017 (in TEU) and also the global increase in that type of trade during 2017. The countries of Asia account for the majority of the increase (64 percent) while the European countries lag well behind them (16 percent).

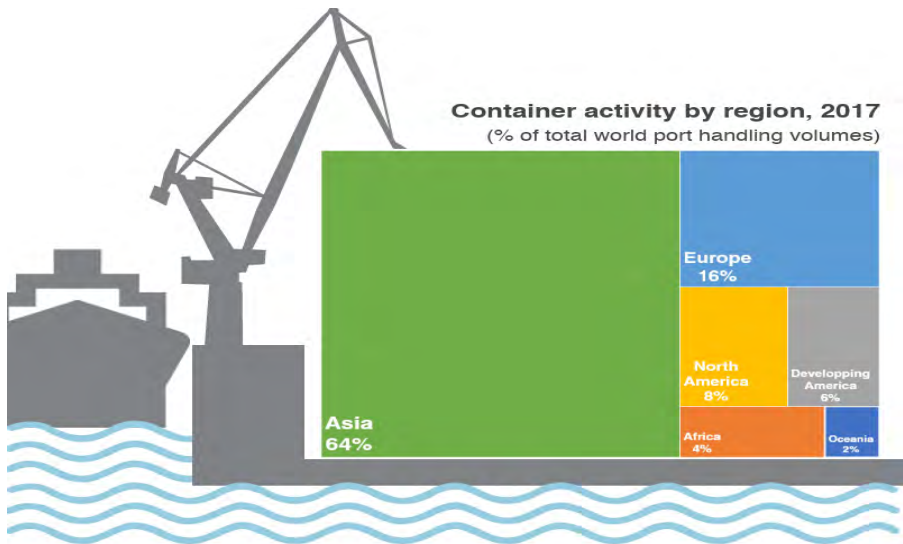


Figure 8:

Figure 9 presents the changes in the volume of transport for the fleet of oil tankers during the period 1980-2017. In 2017, the global fleet of oil tankers had a capacity of 535 million tons (deadweight tons) and it accounted for about 30 percent of global seaborne trade, which reflects the growing fuel needs of the developing economies (and particularly those in Asia).²⁶ This can also be seen in Figure 10 which presents the daily volume of oil transported by tankers through one of the main choke points in millions of barrels.

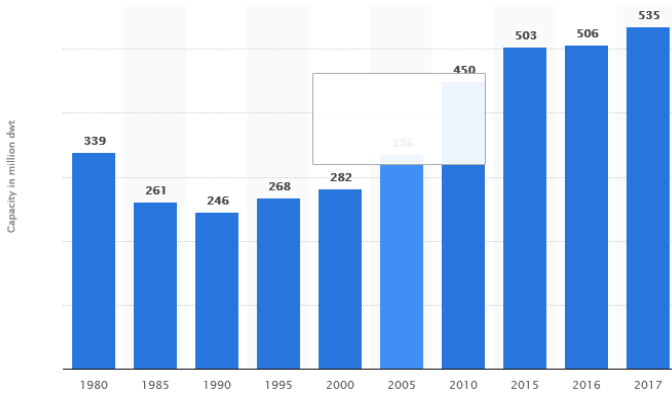


Figure 9: The changes in the volume of transport by oil tankers during the period 1980-2017 (in million DWT).

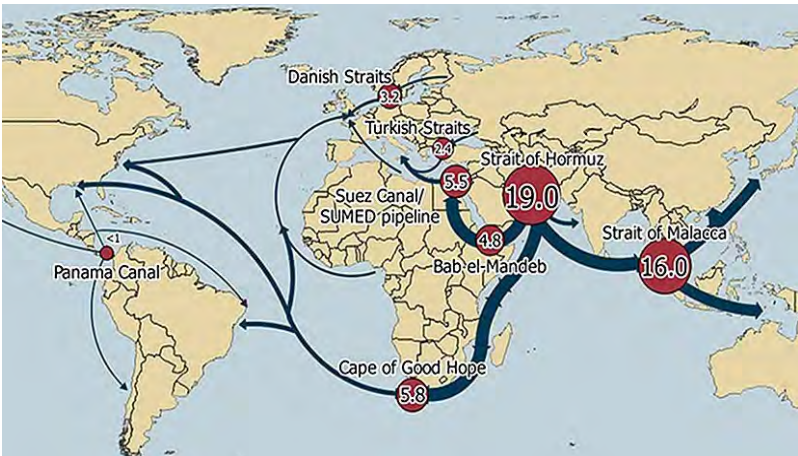


Figure 10: The daily quantity of oil transported through the main choke points and its principal destinations.

26 Statista, the statistic portal <https://www.statista.com/statistics/267605/capacity-of-oil-tankers-in-the-world-maritime-trade-since-1980/>

After having played a decisive role in the creation of the global trading network since the end of the Second World War, the US under President Trump has changed course and is no longer emphasizing a policy to seek new free trade arrangements as part of multilateral agreements. Even if the Americans view the free trade agreements positively, they have become increasingly skeptical on this issue, as a result of the situation of the US economy and the growing national debt (see Figure 7).

The discussion held at the beginning of September 2018 in Washington **between the US and China**, the two largest economies in the world, did not result in any visible progress. During the summer of 2018, the US imposed tariffs on additional Chinese goods with a value of \$16 billion. Beijing did not take long to respond, which raised the amount of trade affected by these moves to \$100 billion. In October 2018, the US, Mexico and Canada declared a new trade treaty between them. The President also placed new restrictions on investment from China. The Americans are demanding long-term structural changes in Chinese policy, such as ending industrial subsidization and the theft of intellectual property. Figure 11 presents the scope of trade between the US and China during the period 2000-2017 and the size of the annual trade deficit. Figure 12 presents the sea freight indicators for the period 2007-2017 and the adverse effect of the Trump administration following the declaration of its tariff policy.

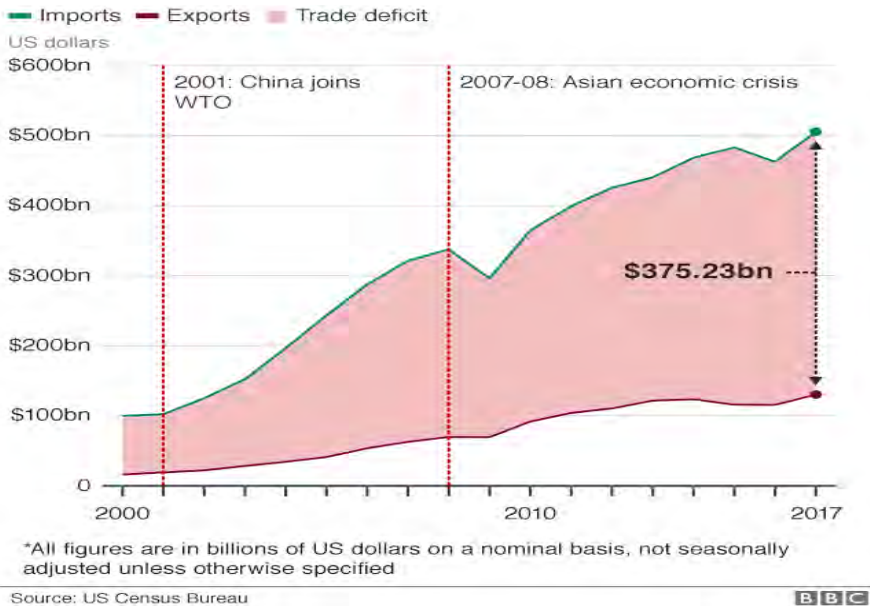


Figure 11:

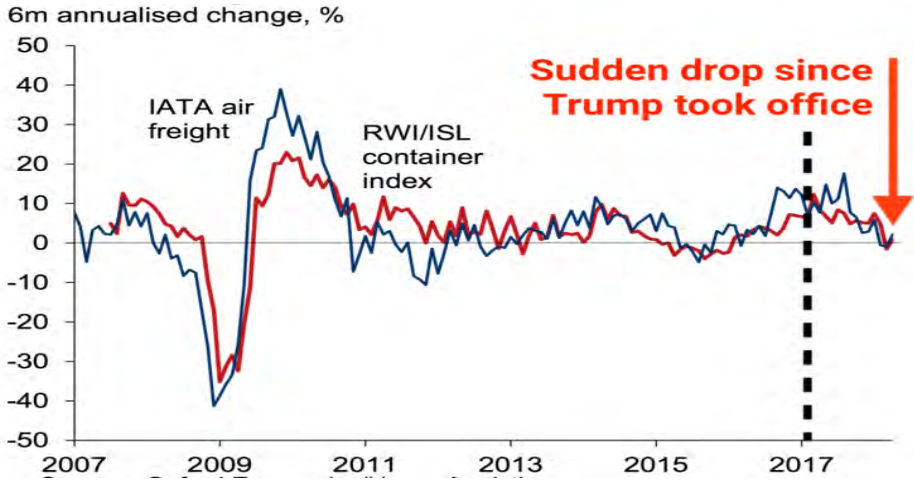


Figure 12:

Three countries dominated the shipbuilding industry in 2017: China (36 percent), South Korea (34 percent) and Japan (20 percent) (see Figure 13) and accounted for 90 percent of all merchant vessels worldwide. Figure 14 presents the commercial fleet in 2018 according to nationality (ignoring flag of convenience registration), which shows that the leading countries are Greece, Japan and China.

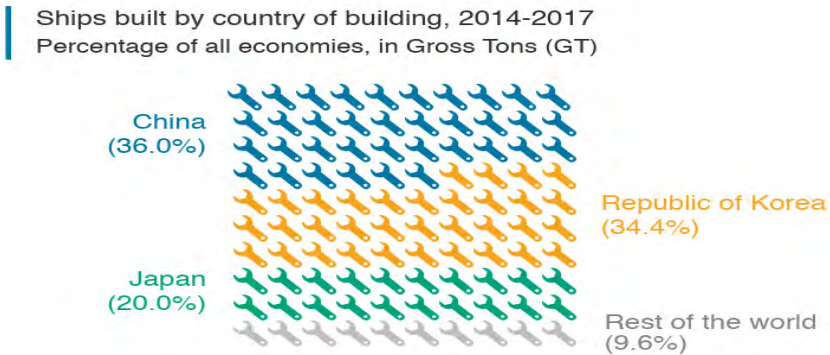


Figure 13:

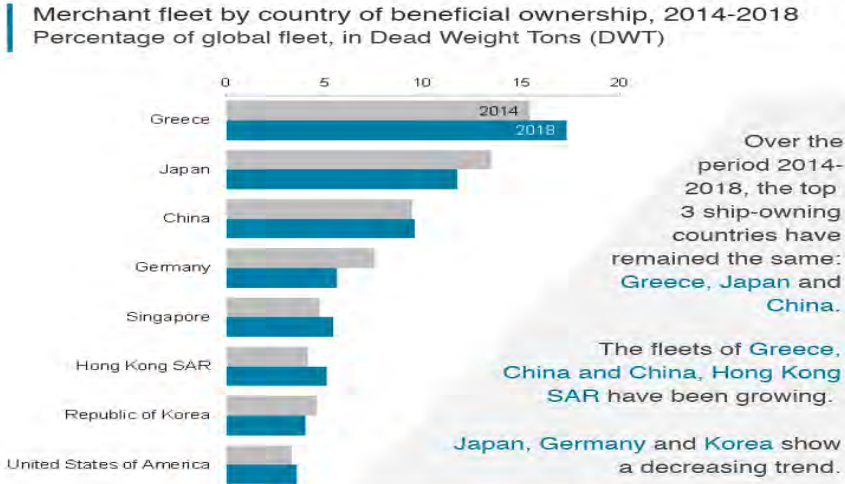


Figure 14:

New Sea Routes

The desire to circumvent the existing choke points can be seen in the ambitious plans to build and expand canals worldwide. About two years ago, the expansion of the Suez Canal was completed and the projects that are currently on the drawing boards are a canal in Nicaragua and the Kra Canal in Central Thailand.

The Nicaragua Canal is meant to compete with the Panama Canal. A contract was signed in 2014 between the Chinese billionaire Wang Jing, by means of the Hong Kong-based Nicaragua Canal Development Group, an international finance group. As a result of losses incurred by the media billionaire and the loss of a large part of his wealth, which was estimated at \$10 billion, the digging of the canal was interrupted and its future is unclear.²⁷

Notwithstanding the agreement signed in 2016 between China and Thailand regarding the long-term project to build the **Kra Canal**, which is also known as the Thailand Canal, there was no real progress in 2018. The canal is meant to cut across southern Thailand in the Kra region and will provide a new route that will shorten sailing time from the East to Europe by about 1200 kilometers, due to the circumvention of the Strait of Malacca.

²⁷ Nicaragua's US\$50b rival to Panama Canal 'going ahead slowly' as funding evaporates and Chinese investor keeps low profile, The south China Morning Post, February 22, 2018 <https://www.scmp.com/news/world/americas/article/2134250/nicaraguas-us50b-rival-panama-canal-going-ahead-slowly-funding>.



Figure 15: Possible routes for the Northwest Passage through the Arctic Ocean. Source: Geology.com/MapResources

There was an interesting development in this context with regard to the Northwest Passage through the **Arctic Ocean**. Until now, the route was not passable for regular merchant ships due to the permanent thick layer of ice (see Figure 15). Due to climate change, the ice is no longer as thick and it is predicted that if this trend continues, in another approximately two decades **it will possible to sail this route during most of the year**. As a result, the trip from Europe to East Asia will be shortened by about 2500 miles relative to the current route. In addition, the transport of oil from Alaska to the East Coast of the United States by tanker will be much quicker.

It is estimated that the savings in the cost of sea transport will be in the billions of dollar. In the meantime, Maersk Line, the largest shipping company in the world, is about to launch a new container ship line **on a different Arctic route along the northern coast of Russia**. The current layer of ice makes it possible to offer a possible future alternative to sail to the East not by way of the Suez Canal (see Figure 16).²⁸ Evidence of this was provided by the Venta Maersk container ship with a displacement of 42,000 tons and a capacity of 3600 containers, which sailed in the summer of 2018 from the port of Vladivostok on the East coast of Russia to the destination port at St. Petersburg by way of this route, while carrying containers of frozen fish. The traffic on this route

28 William Booth and Amie Ferris-Rotman, Russia's Suez Canal? Ships start plying a less-icy Arctic, thanks to climate change, The Washington Post, 8 September 2018 https://www.washingtonpost.com/world/europe/russias-suez-canal-ships-start-plying-an-ice-free-arctic-thanks-to-climate-change/2018/09/08/59d50986-ac5a-11e8-9a7d-cd30504ff902_story.html?utm_term=.0fdf923e5fb9

accumulated momentum in the summer months of 2018 and additional ships carrying oil and gas have used it. The ice layer in the Arctic Ocean reached record low levels in January 2018 and the ice thickness in the Bering Sea has reached the lowest levels ever recorded. In March 2018, temperatures in the region were higher than average by 15 degrees Celsius. There is concern about the **environmental impact** of the ships sailing on these routes because they use burn heavy fuel oil. It is feared that they will worsen the environmental situation due to their emission of harmful oxides of nitrogen and sulfur, as well as black carbon, which remain in a maritime environment for an extended period. In Antarctica, it is prohibited from using heavy fuel, but it has not yet been imposed in the Arctic region by the IMO.²⁹

The Venta Maersk will attempt to become the first large container ship to journey through the Arctic Ocean. The Northern Sea Route passes predominantly Russian territorial waters and could be as much as two weeks faster than the typical Suez Canal passage.



Figure 16: Comparison of the sea route through the Arctic Ocean and the route through the Suez Canal

29 Harry Cockburn, Maersk launches first container ship through Arctic route in alarming sign of global warming, The Independent, 21 August 2018. <https://www.independent.co.uk/environment/maersk-ship-arctic-route-launch-global-warming-climate-change-a8500966.html>

Exclusive Economic Zones (EEZ) and the disputes surrounding them

- Since the coining of the term **Exclusive Economic Zone in 1982** and the formulation of the UN Convention on the Law of the Sea, **technologies for the deep-water search for natural gas, its production and transport have developed at an impressive pace**. It is expected that by 2040, progress in underwater robotics and telepresence capabilities will result in a mature industry that will have access to oil and gas deposits and minerals below the seabed, which until now were inaccessible.³⁰
- Many countries have begun the planning process for activity in their territorial waters by means of Marine Spatial Planning, which is meant to resolve conflicts between the various uses of this domain. **In Israel**, the Planning Branch of the Ministry of Finance has completed a policy paper planning process that included a proposed work plan for the preparation of a comprehensive policy document. In October 2017, a first draft was distributed of "A Policy for Israel's Maritime Domain in the Mediterranean; Stage II Report – First Draft for Comment."³¹ In the opinion of the author, the plan (which in general is to be welcomed) has two main deficiencies: first, it does not include the Gulf of Eilat and the Red Sea as part of Israel's maritime domain; and second, it is lacking the overall targets of a maritime strategy (which are decided on by the political leadership).
- In the context of delimitation of the maritime borders between neighboring countries, there still remain a large number of **inter-state disputes** with respect to the borders of the EEZs and also fishing rights in these areas. The most prominent dispute continues to be that in Southeast Asia and it appears that despite the ruling against China in the International Court in the Hague in July 2016, China has recently been continuing in its efforts to create facts on the ground and has even recruited the support of the President of the Philippines (which submitted the claim to the International Court in the Hague in 2013).

In the **Eastern Mediterranean**, there remain **three** main unresolved disputes:

1. **The claim by northern Cyprus** (under the auspices of Turkey) to part of the EEZ around Cyprus.
2. **Turkey's claim** to part of Cyprus' EEZ.

30 2040 timeline contents, Deep ocean mining operations are widespread, Future Timeline Net, <http://futuretimeline.net/21stcentury/2040.htm#deep-ocean-mining-2040>

31 Policy Paper for Israel's Maritime Domain – Stage II Report: Policy for Israel's Maritime Domain – first draft for comment, Ministry of Finance, Planning Authority, Israel's Maritime Domain, October 2017. http://www.iplan.gov.il/Documents/Report_4.pdf [Hebrew]

3. **Lebanon's claim** that the agreement between Israel and Cyprus includes within it part of the territory that belongs to Lebanon (definition of the maritime border between Israel and Lebanon).

In 2010, Lebanon submitted a complaint to the UN that the border of Israel's claimed EEZ is located within its EEZ. Israel submitted its interpretation to the UN a year later. The US has sought to mediate between the sides in an effort to reach a compromise. The size of the disputed area is about 850 square kilometers and it is shaped like a triangle, with its vertex in Rosh Hanikra and its base on the line shared by the EEZs of Israel, Lebanon and Cyprus. The agreement signed between Israel and Cyprus in December 2010 supports the Israeli interpretation. A similar agreement between Cyprus and Lebanon was not ratified by the Lebanese Parliament. In this context, it should be mentioned that the government of Lebanon issued a call for oil and gas survey companies to submit their candidacies to carry out underwater surveys in a number of areas, some of which are within the area disputed by Israel and Lebanon. The confrontation between Israel and Lebanon over Bloc 9 has already gone on for over a decade.



Figure 17: Lebanon's version of its territorial waters

The history of the dispute is dense with declarations of ownership and threats from both sides. However, the moment of truth is nearing since Lebanon has decided to take action. At the end of January 2018, Lebanon signed the first exploration and production agreements (EPAs) with a consortium of companies composed of Total, a French company, as operator, ENI, an Italian company, and Novatek, a Russian company. The

consortium proposed two alternatives to the government of Lebanon in October 2017, which, as mentioned, approved the proposal to drill in Bloc 4 and Bloc 9 (which is in the area in dispute with Israel). After the signing, the stage of exploration will begin and the consortium is required to drill two wells in 2019—one in each bloc. The main problem to be solved is the question of the disputed maritime border between Lebanon and Israel.

Israeli Defense Minister Avigdor Lieberman made the following declaration regarding Bloc 9 at a gathering held in Tel Aviv on January 31, 2018: “Multinational companies will make a serious error if they participate in Lebanon’s exploratory drilling in territory belonging to Israel and thus violate accepted rules.”³² His words were met with anger in Lebanon and once again raised the issue of the maritime dispute between Lebanon and Israel. His speech again pointed the spotlight onto the conflict and again caught the attention of Washington. Nonetheless, a senior Lebanese official who spoke with Reuters said that Israel has conveyed messages by way of the special US envoy, according to which it is not interested in escalation. Despite the impassioned rhetoric on both sides, the quiet in the region has been maintained for over a decade. Is the US planning to renew its mediation efforts? Will the UN decide to intervene? The granting of a concession in Bloc 9, including the territory being demanded by Israel, again positions the issue as a problem that should be solved one way or another at the earliest possible opportunity.³³

The Main Naval Forces – Trends and Changes

In what follows, we will survey the changes and trends in the largest navies worldwide relative to the previous report, with emphasis on each navy’s theaters of operation, its **tactics** and its planned **buildup of force**.

The **US navy**: The US has the largest defense budget in the world and accordingly the US Navy is the most powerful in the world. **In July 2018, the US navy numbered 285 vessels.**³⁴ In 2016, the commander of the US Navy published an evaluation of the naval arm and the number of vessels needed by the Navy (355) in order to fulfill its various missions. Table 1 shows the required vessels according to type.

32 Pazit Rabina, “Stormy waters: the first gas warfare between Israel and Lebanon,” *Makor Rishon*, February 7, 2018. (Hebrew)

33 Lebanon’s oil and gas sector: A roadmap for 2018, Middle East Strategic Perspectives, 6 February 2018. <https://www.mesp.me/2018/02/06/lebanons-oil-gas-sector-roadmap-2018/>

34 Status of the US Navy as of September 18, 2018
https://www.navy.mil/navydata/nav_legacy.asp?id=146

On Trump's entry into the White House, a new National Defense Strategy was formulated and approved in January 2018, with focus on China and Russia as potential adversaries in a new era of competition for power between the superpowers. According to the guidelines of the new strategy and despite the fact that the US is still in confrontation with terror groups in Afghanistan, Iraq and Syria, the new strategy views the military buildup of China and Russia as the main threat to the United States, alongside the threat of ballistic missiles and the nuclear threat from rogue states, such as North Korea and Iran.

Following the publishing of the National Defense Strategy, the US Navy announced that notwithstanding the work done in 2016, it is carrying out a Fleet Structure Assessment (FSA), which may lead to a modification of the Navy's previous target of 355 vessels.

Table 1: Comparing the 2014 assessment of vessels needed by the US Navy and the 2016 assessment

Type / Class	2014 FSA	2016 NNN
Ballistic Missile Submarines ³⁵	12	12
Aircraft Carriers ³⁶	11	12
Attack Submarines	48	66
Guided Missile Submarines ³⁷	0	0
Large, Multi-Mission, Surface Combatants	88	104
Small, Multi-Role, Surface Combatants	52	52
Amphibious Warfare Ships	34	38
Combat Logistics Force	29	32
Command and Support	34	39
Total	308	355

Chief of Naval Operations Admiral John Richardson has stated that "We have a new National Security Strategy, a new National Defense Strategy and we'll be putting out a naval component to that National Defense Strategy out here shortly" and he added that it makes sense that the implementation of this strategy should relate to the structure

35 Replace the 14 Ohio-class SSBNs with 12 new Columbia-class SSBNs starting in the late 2020s. Operational availability will be comparable.

36 The current profile will achieve the NNN requirement of 12 ships beyond 2060; options to accelerate are under review including multi-ship procurements and reducing procurement centers.

37 The 4 SSGNs now in service retire in the mid-2020s. To meet NNN submarine payload and Special Forces requirements when the 4 SSGNs retire, Navy is inserting Virginia Payload Modules (VPM) into Block V Virginia-class attack submarines beginning in FY2019. A payload-based large diameter submarine will follow VPM late in the plan in accordance with the Tactical Submarine Evolution Plan (TSEP), which features a fast, lethal next generation attack submarine and a large-diameter, next-generation payload based submarine.

of forces that was planned in the 2016 assessment carried out by the Navy.³⁸ The commander claimed that the 2016 assessment related to the growing power of both Russia and China, such that the assessment carried out by the Navy in 2016 constitutes a suitable basis of the New Defense Strategy.

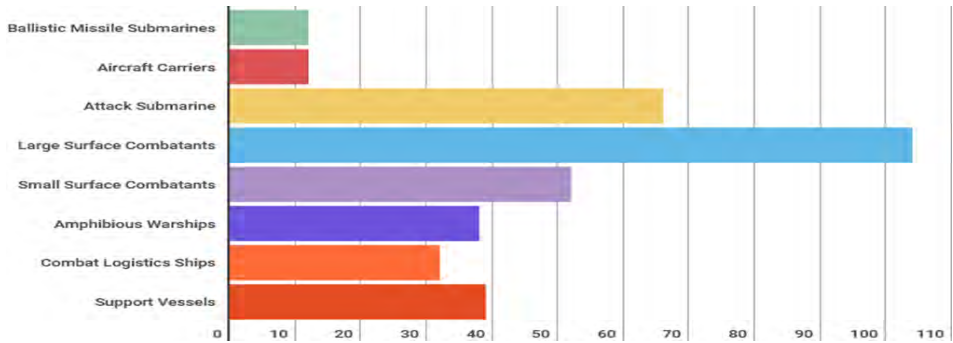


Figure 18: Composition of the 355-vessel Navy according to the 2016 assessment

Vice Admiral Bill Merz, the Deputy Chief of Naval Operations for Warfare Systems (OPNAV N9), who is responsible for carrying out the FSA stated that since 2016 "We have done multiple studies on the architecture of the Navy and the size of the Navy. Every single one of them says we have to grow, and we have to grow in these fundamental types of ships. So we don't expect much of that to change with the next FSA; maybe it changes on the margins, maybe another number we're shooting for, but it's going to be bigger than we are today."

The **2019 budget of the Naval Office** grew by about \$21 billion relative to the 2018 budget (which was \$52 billion larger than in the previous year; see Figure 19). In the presentation of the budget request to the subcommittee of the US House of Representatives, Assistant Secretary of the Navy James Geurts presented the complex challenges facing the US navy. Geurts stated that the strategic environment is becoming increasingly sophisticated, uncertain and technologically dense. This is in addition to the spread of advanced conventional and cybernetic weapons among state and non-state players and the erosion of the US Navy's competitive advantage in regions where it had long enjoyed relative superiority, a phenomenon that is expected to continue as long as rival nations try to undermine American hegemony at sea. Furthermore, in certain regions there is also violent competition over national resources and there are natural disasters, social unrest, cyber

38 Sam Lagrone, Navy Working New Fleet Size Study Following Latest Strategic Reviews, USNI News, March 7, 2018 <https://news.usni.org/2018/03/07/navy-working-new-fleet-size-study-following-latest-strategic-reviews>

attacks and regional conflicts, in addition to the proliferation of advanced weapons. All this creates a series of challenges to a force with global response capability.³⁹ The Assistant Secretary of the Navy stated that the 2019 budget will prioritize three objectives: (1) Steady, sustainable growth and establishment of minimum baseline acquisition profiles that grow the force at a stable, affordable rate. This includes the sustainment of the industrial base at a level that supports affordable acquisition, predictable and efficient maintenance and modernization, and an appropriately sized workforce for more aggressive growth if additional resources become available. (2) Aggressive growth that more rapidly attains the same warfighting requirements as increased resources and industrial capacity permit. (3) Service Life Extensions (SLEs) that evaluate the potential additional service life that can be gained through restoration and modernization based on capability improvement costs versus unit replacement criteria.

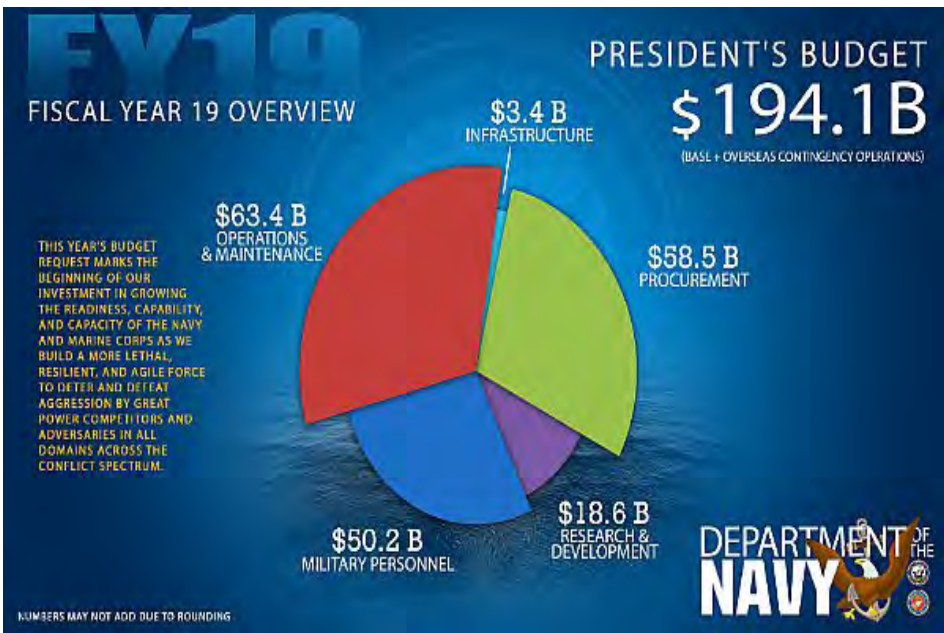


Figure 19: Proposed Office of the Navy budget and its uses for 2019

39 Statement of the honorable James F. Geurts, Assistant Secretary of the Navy for Research, Development and Acquisition, and Lieutenant General Robert S. Walsh Deputy Commandant Combat Development and Integration Commanding General Marine Corps Combat Development Command and Vice Admiral William R. Merz Deputy Chief of Naval Operations for Warfare Systems (OPNAV N9), before the Subcommittee on Sea power and Projection Forces of the House Armed Service Committee on Department of the Navy Sea power and Projection Forces Capabilities, P. 2, MARCH 6, 2018. <https://docs.house.gov/meetings/AS/AS28/20180306/106950/HHRG-115-AS28-Wstate-MerzW-20180306.pdf>

The number of vessels in the US Navy is planned to grow in 2019 from 282 to 299. The target of 355 vessels set by the US Navy will not be achieved within the framework of the multi-year budget even by the end of the next decade, at which time the total number of vessels will be 320. Table 2 presents the increase in the various types of vessels as submitted for approval to the US Congress in the proposed 2019 budget.⁴⁰ The plan increases the number of warships by 11 relative to the plan presented in 2018 and although the target of 350 vessels—which was recommended by the commander of the US navy in the assessment published at the end of 2016—is not achieved, it creates a foundation that will make it possible—starting from 2030—to accelerate shipbuilding in order to reach the target. It is worth mentioning that the plan presented by the Office of the Navy will have to cope with a more challenging budget environment and possible changes in the composition of the House of Representatives following the mid-term elections in November 2018, which may make its approval more difficult.

Table 2: Plan for construction of US naval vessels for the period 2020-2048

Year	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
Aircraft Carrier	11	11	11	12	12	12	11	11	11	11	11	11	11	11	11
Large Surface Combatant	92	95	98	99	101	104	103	101	101	100	99	97	93	92	91
Small Surface Combatant	31	34	37	35	39	32	32	33	35	37	39	41	43	45	46
Attack Submarines	52	53	52	52	51	48	46	45	44	42	44	45	47	48	50
SSGNs/Large Payload Submarines ⁴	4	4	4	4	4	4	4	2	1						
Ballistic Missile Submarines	14	14	14	14	14	14	14	14	13	13	12	11	11	11	11
Amphibious Warfare Ships	33	33	34	34	35	36	36	37	36	37	37	37	37	37	39
Combat Logistics Force	29	29	30	31	31	32	32	32	32	32	32	31	32	32	32
Support Vessels	33	35	34	37	39	39	40	40	41	41	41	41	40	41	41
Total Naval Force Inventory	299	308	314	318	326	321	318	315	314	313	315	314	314	317	321

Year	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48
Aircraft Carrier	11	11	11	11	11	11	10	11	10	10	10	11	10	10	9
Large Surface Combatant	90	88	89	90	93	95	96	96	95	94	93	92	91	91	92
Small Surface Combatant	48	51	54	55	56	58	59	58	57	54	52	51	50	51	49
Attack Submarines	52	54	56	58	58	59	59	59	61	61	62	63	64	65	66
SSGNs/Large Payload Submarines											1	1	1	2	2
Ballistic Missile Submarines	11	11	11	10	10	10	10	11	12	12	12	12	12	12	12
Amphibious Warfare Ships	37	35	36	36	36	38	37	37	36	36	36	36	37	35	35
Combat Logistics Force	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Support Vessels	41	42	42	42	40	39	38	38	38	38	38	38	38	38	38
Total Naval Force Inventory	322	324	331	334	336	342	341	342	341	338	336	336	336	336	335

40 Office of the Chief of Naval Operations, Deputy Chief of Naval Operations (Warfare Systems) (N9) Report to Congress on the Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2019, Annual Long-Range Plan for Construction of Naval Vessels for Fiscal Year 2019 February 2018.

Alongside the increase in number of vessel required by the US navy, there has been vocal criticism among government officials regarding the **operational availability of the aircraft carrier fleet**. Figure 20 below presents the operational availability of the US fleet of aircraft carriers since 1965. It can be seen that since the end of the Cold War in 1992 and since 2013 operational availability has not managed to pass the 25-percent threshold.⁴¹

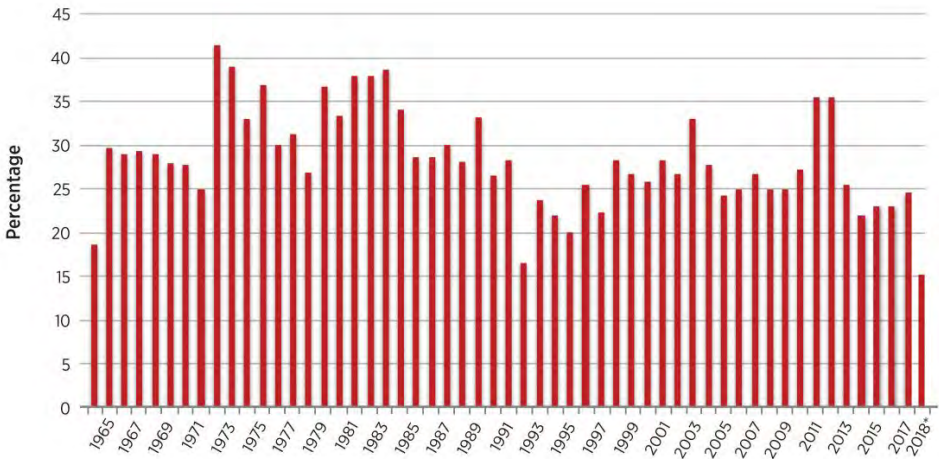


Figure 20: Operational availability of American aircraft carriers during the period 1965-2018

With respect to the **development of unmanned platforms**, the US navy has stated in an unclassified document published in 2018 that it sees huge potential in unmanned systems and the capabilities they provide and accordingly it has formulated a roadmap for their development. Nonetheless, it states that the use of unmanned autonomous systems will not bring about "fundamental changes in the way the navy operates," which constitutes somewhat of a contradiction.

The roadmap formulated three years ago was meant to be implemented by the US navy (by the Unmanned Warfare Systems Directorate - N99) was shelved in March 2018 on the instructions of Assistant Secretary of the Navy for Research, Development and Acquisitions James Geurts and it was claimed that a new roadmap had been adopted in a new organizational framework. Geurts admitted that "unmanned systems

41 Sam Lagrone, U.S. Aircraft Carrier Deployments at 25 Year Low as Navy Struggles to Reset Force, USNI, September 26, 2018 [https://news.usni.org/2018/09/26/aircraft-carrier-deployments-25-year-low?utm_source=USNI+News&utm_campaign=827217a1a4-USNI_NEWS_DAILY&utm_medium=email&utm_term=0_0dd4a1450b-827217a1a4-233591665&ct=t\(USNI_NEWS_DAILY\)&mc_cid=827217a1a4&mc_eid=6495944afc](https://news.usni.org/2018/09/26/aircraft-carrier-deployments-25-year-low?utm_source=USNI+News&utm_campaign=827217a1a4-USNI_NEWS_DAILY&utm_medium=email&utm_term=0_0dd4a1450b-827217a1a4-233591665&ct=t(USNI_NEWS_DAILY)&mc_cid=827217a1a4&mc_eid=6495944afc)

will have to overcome policy and technology barriers, but the fact that there are barriers and boundaries today does not mean that there are going to be boundaries also in the future."⁴² It is possible to say that despite the development of systems such as Knife Fish, a minesweeper for seabed mines, the large Snakehead underwater vehicle for intelligence gathering missions, the huge Orca underwater anti-mine vehicle and the unmanned Sea Hunter surface vehicle, there are numerous barriers in the US navy to the introduction of unmanned vessels for operational activities.

The approval of the new Nuclear Posture Review and its effect on the US Navy: In January 2017, President Trump instructed Defense Secretary James Mattis to carry out a Nuclear Posture Review. The President make it clear that his first priority is to protect the United States, its allies and other partners. He further emphasized that although there is a long-term goal of nuclear disarmament, in the meantime the United States must ensure that it has modern, flexible and resilient nuclear capabilities which will be safe and secure, as long as there exist nuclear weapons in the world. The directive states that the US itself remains committed to its efforts to support eventual nuclear, biological and chemical disarmament. The US has reduced its nuclear arsenal by more than 85 percent since the height of the Cold War and has not developed any new nuclear capabilities for more than two decades. Nevertheless, the various threats it faces have intensified since the publishing of the last Nuclear Posture Review in 2010. The US is currently facing a more varied and sophisticated nuclear threat than in the past, with its adversaries working are feverishly on development programs, both of nuclear warheads and the delivery systems themselves (see Figure 21).⁴³

In the context of the part played by the **US navy in the new Nuclear Posture**, the Review states that "The United States currently operates 14 OHIO-class SSBNs and will continue to take the steps needed to ensure that OHIO SSBNs remain operationally effective and survivable until replaced by the COLUMBIA-class SSBN. The COLUMBIA program will deliver a minimum of 12 SSBNs to replace the current OHIO fleet and is designed to provide required deterrence capabilities for decades." A major change in American nuclear capability will be accomplished by the development of a nuclear warhead with reduced payload, both for submarine-launched ballistic missiles (SLBM) and submarine-launched cruise missiles (SLCM). The justification for introducing this type of warhead into the US nuclear arsenal is to allow it to penetrate the enemy's

42 Richard Tuttle, The U.S. Navy sees vast potential for unmanned systems, The Association for Unmanned Vehicle Systems International (AUVSI), 7 September 2018. <https://www.auvsi.org/unmanned-systems-magazine-us-navy's-new-roadmap-sees-vast-potential-unmanned-systems>

43 Office of the Secretary of Defense, US Nuclear Posture Review, Secretary Preface, February 2018 <https://media.defense.gov/2018/Feb/02/2001872886/-1/-1/2018-NUCLEAR-POSTURE-REVIEW-FINAL-REPORT.PDF>

advanced air defense systems, as well as facilitating the options for graduate exacerbation of the nuclear response and increasing its reliability. In this context, it is worth mentioning the missile systems that have until now been deployed on American ballistic missile submarines (SSBN) included only high-payload warheads.⁴⁴

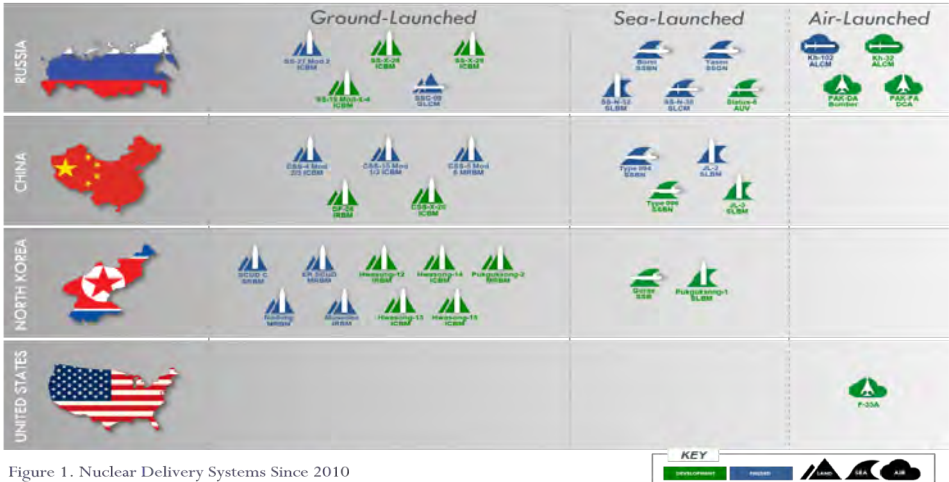


Figure 1. Nuclear Delivery Systems Since 2010
Data provided by the DoD

Figure 21: Development of new nuclear warhead delivery systems by Russia, China, North Korea and the US since 2010

Figure 22 presents the **deployment of American vessels** in the various theaters of operation in 2017 and the planning and execution during 2018. The chart shows the continuing shift of the US center of gravity toward the western Pacific Ocean and the South China Sea region, where there are about 50 vessels deployed. The shift of the center of gravity has led to a situation in which the number of warships in the Mediterranean (the Sixth Fleet) has dropped to an unprecedented low and only includes one command ship and a number of destroyers.⁴⁵

Another region of strategic importance to the US navy is the **Korean peninsula**, where North Korea—considered to be a rogue state—still constitutes a threat to the states in the region, and in particular South Korea, and especially in view of the expansion of North Korea’s nuclear program and its development of long-range ballistic missiles. In the summer of 2017, North Korea threatened to use nuclear weapons against the US and its allies in the region.

44 Ibid. P. XII

45 Highlights of the Department of the Navy FY 2016 Budget, Introduction, P. 1-3

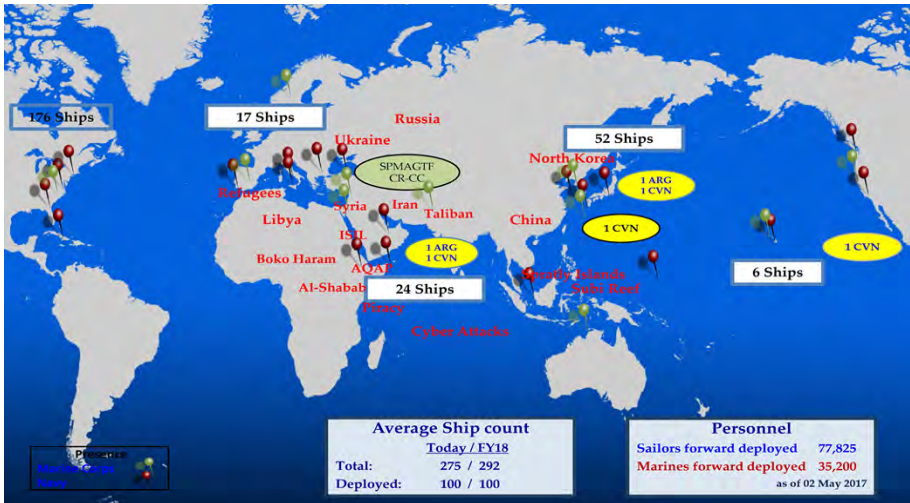


Figure 22: Deployment of US naval and marine forces in the summer of 2018

The tension between the US and North Korea has declined somewhat following the summit talks held in Singapore in June 2018 between President Trump and the North Korean leader and a 12-point document that the two leaders signed. President Trump for his part suspended the joint maneuvers of the American and South Korean armies while North Korea reciprocated in July 2018 by returning the bodies of American soldiers that had been missing since the Korean War and also dismantling a nuclear test site. Following the meeting between Trump and Kim Jong-un, North Korea is trying to appease President Trump, and at the North Korean military parade at the beginning of September 2018 to mark 70 years since the founding of North Korea, no long-range ballistic missiles with nuclear capability were displayed, unlike in previous years. US Defense Secretary Mattis stated that the “We took the step to suspend several of the largest exercises as a good-faith measure coming out of the Singapore summit; the small-scale exercises of the two armies will continue.”⁴⁶ The President himself cancelled the joint military exercise in June because it was “costly” and “provocative”. In any case, the demilitarization of the Korean peninsula is still a long way off.

The activity of the Sixth Fleet in the Mediterranean: The deployment of the fleet in the Mediterranean and its size has in the past been influenced by two main factors:

1. The Cold War.
2. A major source of oil.

⁴⁶ Amanda Macias, Pentagon has no plans to suspend more exercises with South Korea amid nuke talks with North, Mattis says, NBC Defense, August 28, 2018 <https://www.cnbc.com/2018/08/28/us-has-no-plans-to-halt-future-exercises-with-south-korea-amid-talks-with-north-mattis.html>

The conclusion of the Cold War and the drop in the price of oil and gas, including the growth of its domestic energy sources, have led the US to reduce its presence in the Mediterranean. The Sixth Fleet has shrunk in size to one command ship which is based in Italy and four Ticonderoga-class missile destroyers. In April 2017, US forces attacked targets in Syria in response to chemical attacks by the regime. A total of 59 Tomahawk cruise missiles were launched at the base from which the aircraft that had attacked the Syrian city of Idlib with chemical weapons had taken off.

Prior to the attack by Assad's forces and those of his Russian allies on Idlib in the autumn of 2018, Moscow claimed that the Jihadists controlling Idlib planned to stage a chemical attack and to blame the Assad regime for carrying it out, with the goal of involving the West in the Idlib campaign. In a typical show of strength, the Russians reinforced their naval force west of Syria, even if it was clear that they have no significant role to play in the planned attack. By reinforcing its naval forces and positioning S-400 ground to air missiles, the Russians are creating an area that is inaccessible to the US and NATO navies or in other words they have implemented an A2/AD (Anti-Access / Area Denial) strategy.⁴⁷ The incident in which an Aleutian 20 airplane was downed by Assad's anti-aircraft forces during an attack by the Israeli air force (mid-September 2018) on the Iranian infrastructure in the Latakia area further complicated the situation in the region and was followed by the delivery of Russian S-300 missile batteries to the Syrian anti-aircraft forces and the resulting constraints on air traffic along the Syrian coast.

In conclusion, the US navy is still the largest and strongest navy in the world and has the most diverse capabilities of any navy. Nevertheless, the **budget constraints and the new challenges in the various theaters** have forced it to, among other things, set priorities in the use of force, to seek out new alliances in regions such as Southeast Asia and to induce NATO to revise its strategy based on the developments in the Atlantic and in the Mediterranean.

The Chinese Navy (the People's Liberation Army Navy – PLAN)

The growing significance of Chinese naval interests, which were reported on in previous reports, has led the **Chinese navy** to continue increasing the frequency and duration of its operations and their distance from China. This activity is in line with the new **white paper** published by China in May 2015, which bore the title: "**Defense**

47 Paul Iddon, Why Is a Russian Naval Fleet Gathering Near Syria? Moscow could be hoping to deter a U.S. attack, The National Interest, September 4, 2018. <https://nationalinterest.org/blog/buzz/why-russian-naval-fleet-gathering-near-syria-30462>

on the Open Sea".⁴⁸ This major shift in Chinese strategy—which until now called for control of local waters—reflects China's growing economic and diplomatic influence throughout the world. This represents a change in the priority assigned by China in the past to its ground forces and China is essentially abandoning its traditional mentality that the land is more important than the sea. The new strategy reflects the growing importance of managing activity at sea and in the oceans and achieving effective protection of China's maritime rights and interests (see Figure 23). In order to adapt its naval capabilities to these missions, China is developing a naval force according to its national security policy. Accordingly, in 2016 China completed the construction of its first aircraft carrier—the Liaoning—which began in mid-1985 in the USSR and was completed at the Dalian naval shipyard in northern China. The second aircraft carrier (Type 001A) completed its sea trials in May 2018 and went into active service in the Chinese navy. Although this aircraft carrier is the second in China's navy, it is the first to be built entirely in China. The completion of its construction is a reflection of the plan for expansion and renewal of the Chinese navy, which is meant to transform it into a "blue-water navy". Currently, only the United States, with 11 nuclear-propelled aircraft carriers has more than one aircraft carrier. The third Chinese aircraft carrier is already under construction in a shipyard near the port of Shanghai. The Chinese navy has three geographic headquarters (North, East and South) and it can be assumed that each of them will want at least one aircraft carrier under its command. The Liaoning will be transferred also to the training command and therefore analysts believe that in the end China will build five or six aircraft carriers.⁴⁹

The aircraft carriers in general draw the most attention but the expansion of the rest of the Chinese navy has been no less impressive. In the last decade, China has constructed more than 100 battleships and submarines, more than any other navy other than the US navy.

Last year, China also presented its first model of heavy cruisers—or "super destroyers"—which, according to the US Defense Intelligence Agency, "can be compared in many respects to most of the modern Western vessels." Two heavy cruisers of this class were launched from dry dock in Dalian in July 2018.

48 Blasko j. Dennis, "The 2015 Chinese Defense White Paper on Strategy in Perspective: Maritime Missions Require a Change in the PLA Mindset. The Jamestown Foundation, May 29, 2015. http://www.jamestown.org/programs/chinabrief/single/?tx_ttnews%5Btt_news%5D=43974&cHash=d67db88687507367b668f71cd4199603#.VjH0IPkrLIW

49 Frank Lavin, The Long March of the Chinese Navy, National Review, September 26, 2018 https://www.nationalreview.com/2018/09/china-naval-power-growing-new-doctrines-new-missions/?utm_source=Sailthru&utm_medium=email&utm_campaign=NR%20Daily%20Monday%20through%20Friday%202018-09-26&utm_term=NR5PM%20Actives



Figure 23: Naval bases and balance of naval forces between the US and China/India in the Indo-Pacific theater.⁵⁰

In 2017, the Chinese navy number 317 warships and submarines in active service (as compared to 283 in the US navy). Although with respect to quality, there is no doubt that the Chinese vessels are inferior to those of the US navy; however, China's technological development is closing the gap. The Chinese defense budget is currently \$228 billion, which is second in size only to that of the US navy.⁵¹ Figure 22 presents the deployment and balance of forces between the US and China/India in the Indo-Pacific theater.

The Chinese navy is participating in joint exercises with the Russian navy, although only ground forces took part in the large Vostok exercise held by the Russian army in Siberia in September 2018.

In April 2018, the Chinese navy held a naval exercise in the South China Sea, which involved 40 warships. The exercises was meant to be a show of force opposite the

50 SAMs And Anti-Ship Missiles Are Now Guarding China's Man-Made South China Sea Islands <http://www.thedrive.com/the-war-zone/20616/sams-and-anti-ship-missiles-are-now-guarding-chinas-man-made-south-china-sea-islands>

51 Steven Lee Myers, With Ships and Missiles, China Is Ready to Challenge U.S. Navy in Pacific, The New York Times, 29 August 2018. <https://www.nytimes.com/2018/08/29/world/asia/china-navy-aircraft-carrier-pacific.html>

three American task forces sailing in the region. Also participating in the exercise for the first time was the Liaoning aircraft carrier and warships from the North, East and South China Sea. It was also the first time that the exercise involved live fire.⁵²

China is ramping up its naval and military activity and taking it farther afield, a process that began with the establishment of the naval base in Djibouti in 2017. It also intends to establish additional bases at Gwadar and Jiwani in Pakistan and at Hambantota in Sri Lanka. Additional bases will apparently be established in East Africa, in the Maldives Islands, in Myanmar and at additional locations in the Central and Western Indian Ocean.^{53,54}

Table 3: Presents the breakdown of Chinese forces according to type of vessel:

2	Aircraft carriers
6	Amphibious transport docks (LPD)
1	Mobile Landing Platform
32	Landing ship tanks (LST)
31	Landing ship medium (LSM)
8	Attack submarines (SSN)
55	Attack submarines (SSK)
5	Ballistic missile submarines (SSBN)
2	Experimental submarine
37	Destroyers
52	Frigates
42	Corvettes
109	Missile boats
94	Submarine chasers
17	Gunboats
29	Mine countermeasures vessels
12	Replenishment oilers
232	Auxiliaries (various) *

The Indian Navy

During the last two decades, the Indo-Pacific region has been attributed growing strategic importance, since it is the location of the global economic center of gravity

52 Tariq Tahir, Chinese navy carries out live-fire drills with more than 40 warships in the South China Sea as three US aircraft carrier battle groups prepare for their own exercises, 6 April 2018 <https://www.dailymail.co.uk/news/article-5587003/Chinese-navy-carries-drills-aircraft-carrier-battle-groups-prepare-exercises.html>

53 The Interpreter, David Brewster, 30 January 2018, China's new network of Indian Ocean bases. <https://www.lowyinstitute.org/the-interpreter/chinas-new-network-indian-ocean-bases>

54 The Maritime Executive, David Brewster, 2018-05-15, China's Play for Bases in the Indian Ocean. <https://www.maritime-executive.com/editorials/china-s-play-for-bases-in-the-indian-ocean>

and is characterized by processes of social mobility. The situation is the outcome of commercial maritime activity in the region and the growing need to provide maritime security to the countries and residents of the region.

The activity of the Indian navy takes place in the shadow of its large northern neighbor. While the border disputes on dry land between India and China are now less intense, the main focus of tension between the countries has moved to the Indian Ocean, where China has significantly increased its presence. One dimension of the tension is played out on the military level, with Chinese submarines moving through the area and Chinese warships periodically patrolling it. However, there is another dimension which involves development projects (primarily ports) that are being built by China in countries such as Sri Lanka, Bangladesh and the Maldives Islands, which are considered to be the "backyard" of India and its traditional sphere of influence.

Accordingly, India is adopting a pro-active naval strategy in the Indian Ocean and is taking action to maintain free movement of goods to and from India, particularly at the choke points leading into and out of the Indian Ocean. By means of this strategy and closer relations with the US (without neglecting its special relationship with Russia with regard to the buildup of India's naval forces), India hopes to neutralize the Chinese threat, which is perceived by its leaders as the main threat in the Indian Ocean. The Indians are concerned by the Chinese intention of making the Indian Ocean into a Chinese lake by constructing civilian infrastructures in the ports of other countries in the region (Seychelles and Sri Lanka), thus allowing Chinese vessels to operate from those ports. In addition, Chinese nuclear submarines routinely patrol the Indian Ocean, which is perceived by the Indians as penetration into their theater of operations.

In order to maintain its economic growth, India must import growing quantities of oil and gas, which provides it with an incentive to participate in the war on naval piracy taking place primarily in the Gulf of Aden and the Horn of Africa. India is concerned by the possibility that terrorists, especially Pakistani terrorists, will make use of the sea lanes, as they did in Mumbai in 2014.

This strategy is translated into the objectives of the Indian navy in two main areas:

1. Protection of the sea lines of communication (SLOC) used to bring oil and gas to India, and other countries, which is essential to its economic growth.
2. Expansion of its political influence in the region as a response to the growing Chinese activity in the Indian Ocean.

Nonetheless, India has often stated that its navy is not restricted to the Indian Ocean region. This is manifested in India's maritime strategy, which is viewed as having a larger global dimension than its predecessor (see Figure 24).

India's ambitions to achieve dominance in the Indian Ocean and the strategic dialog that accompanies it are discussed at the highest levels of the Indian establishment. As already mentioned in the previous report, India continues to implement the maritime strategy document published in 2015, which had two main components:

1. The link between India and the Indo-Pacific Ocean and its influence on India's maritime security.
2. The expansion of the Indian navy's spheres of influence (primary and secondary) which reflect India's desire to be a player with a greater diversity of roles in the region. For example, the Red Sea which was considered by the 2007 strategy to be of secondary importance has now been given primary importance. The Gulf of Aden, the Southwestern Indian Ocean and East Africa have also now been attributed with primary importance by the Indian navy.

The Chinese naval threat: According to Admiral Sunil Lanba, the commander of the Indian navy, there are 8 vessels of the Chinese navy (PLAN) deployed in the Indian Ocean at any given moment and if short excursions are counted then the number rises to 14. He claimed sarcastically that "it was odd for China to deploy submarines for anti-piracy operations in the Indian Ocean region."⁵⁵ He also stated that the Indian navy is prepared to take on a greater role in this region, as part of a four-sided coalition between the navies of India, the US, Australia and Japan. The US is continuing to play a major role in maintaining regional security and India, Japan and Australia are essential regional partners in that effort.

The US policy to give greater priority to the East Asia region ("Rebalance to Asia") alongside the Indian desire to project power in the region provide a geopolitical opportunity to change the configuration of power. Accordingly, the development of a new architecture for maritime security is needed, in which India will play a central role alongside the naval superpowers led by the US along with the participation of Japan and Australia.⁵⁶ Evidence of the growing importance of India from the American perspective can be seen in the mutual declarations made on the conclusion of the visit

55 Press Trust of India, Wary of China, Indian Navy kicks off process to build 6 nuclear submarines, Business Standard, December 2, 2017 https://www.business-standard.com/article/current-affairs/wary-of-china-indian-navy-kicks-off-process-to-build-6-nuclear-submarines-117120100923_1.html

56 Prakash Gopal, Maritime Security in the Indo-Pacific: The Role of the US and its Allies, Maritime Affairs: *Journal of the Maritime Foundation of India*, Volume 13, 2017 - Issue 1, 22 May 2017.

by the commander of the Indian navy to Washington in March 2018. During the visit, John Richardson, the commander of the US navy, hosted Admiral Sunil Lanba, the commander of the Indian navy, and they also met with Secretary of the Navy Richard V. Spencer to discuss the improvement of interoperability between the two navies. Admiral Richardson declared that "the relations between the US navy and the Indian navy have never been stronger," and added that "There has been meaningful progress made in strengthening the cooperation between our two great democratic and maritime nations. We are exploring every way to expand that partnership even further based on our shared interests."⁵⁷ These statements reflect the tightening of relations between the two navies as a counterweight to the Chinese navy, which is expanding its activity and influence in the Indo-Pacific region.

In June 2018, ships and aircraft of the Indian, Japanese and American navies held a joint naval expertise called Malabar 2018, during which they simulated surface and anti-submarine warfare near the Island of Guam in the Western Pacific. The exercise was the first following the change-of-name from the Pacific Ocean Command to the Indo-Pacific Command and it occurred against the background of the increasing activity of the Chinese navy in these regions, including the construction of artificial islands in the South China Sea, which will eventually become military bases.⁵⁸ Figure 24 presents the US areas of command that border on the Indo-Pacific region.

The tightening of cooperation between the two navies is also manifested in the increased acquisition of American weaponry. Thus, there have recently been large purchases of aircraft from the US, such as 24 MH-60 Romeo multi-role helicopters, as well as dozens of long-range marine patrol planes, with the intention of reinforcing the Indian ability to detect Chinese submarines patrolling the Indian Ocean.

In addition to the close cooperation between the US navy, the **French and British navies** have also begun to increase their activity in the Indian Ocean. As part of the annual Jeanne d'Arc training and patrol mission for 2018, the French task force included a helicopter carrier, the Dixmude Mistral-class helicopter assault ship, and the Surcouf La Fayette-class frigate. The force included British military personnel and a unit of Wildcat helicopters, which sailed to the Indian Ocean in the spring of 2018 (see Figure 25). In Paris and London, it was announced that his deployment, which continued for about five months, was meant to improve naval cooperation between the British and

57 Navy Leaders Host Head of Indian Navy to Expand Partnership, Story Number: NNS180321-02Release Date: 3/21/2018 https://www.navy.mil/submit/display.asp?story_id=104810

58 The Economic Times, Defence, India, US, Japan, begin war game, exercise Malabar, in Guam, June 8, 2018 <https://economictimes.indiatimes.com/news/defence/india-us-japan-begin-war-game-exercise-malabar-in-guam/articleshow/64509646.cms>

French navies. In practice, it can be viewed as a new initiative of the two countries to support the US freedom of passage in the region in order to counter the military activity of China and to ensure India's access to this region.⁵⁹



Figure 24: Areas of command of US forces that border on the Indo-Pacific region



Figure 25: The route of the Joan of Arc operation by the French navy in the Indian Ocean in the spring of 2018

59 Emanuele Scimian, New alliance could emerge in Indo-Pacific, Asia Times, March 4, 2018 <http://www.atimes.com/new-naval-alliance-emerge-indo-pacific/>

Other countries in the region with which India would like to establish naval cooperation are Thailand and Singapore. During the visit of Indian Prime Minister Modi in Thailand and Singapore, he proposed to his hosts the establishment of trilateral cooperation, part of which would involve an annual joint naval exercise. A date for the first exercise has not yet been set, but the initiative points to the importance with which India views the creation of alliances with various countries in the Indo-Pacific region as a counterweight to the Chinese navy.

India also fears the undermining of regional stability by Jihadi groups on the Maldives Islands and/or the Seychelles Islands, or those who can reach India from Pakistan by sea or those operating in the Gulf of Aden, who might attack Indian tankers bringing oil to India.⁶⁰

Buildup of power: The Indian military in general and the Indian navy in particular is the largest importer of weapons in the world and it is also focusing on the creation of the infrastructure for a defense industry. Modi's government has since 2014 also increased the share of the budget going to foreign defense industries that collaborate with local industry from 6 to 49 percent.⁶¹ In the presentation of the Modi government's last budget prior to the general elections in 2019, the defense budget was set at \$62.8 billion, which represents an increase of 7.81 percent relative to the 2017-2018 budget. Within that budget, about \$43.4 billion was allocated to India's net defense budget (after deduction pensions and other transfer payments). As in past years, the defense budget for 2018-2019 grew only somewhat and a large part of the increase was due to increasing manpower costs. In this context, it is worth mentioning that the share of the army in the 2018-2019 defense budget grew by 5 percent relative to 2010-2011, which came at the expense of the naval and aerial branches. The main reason for the growth of the army's budget is its large number of personnel, which result in salary costs that claim a large part of the defense budget.⁶² It should be remembered that the R&D budget, which has maintained its share (6 percent) of the defense budget relative to the 2017-2018 budget, includes a not insignificant expenditure on development for the Indian navy (which essentially increases the total budget allocated to India's navy).

60 Vicky Nanjappa, As Lashkar, Jaish plan sea borne attacks, how equipped is India to fight the maritime threat, One India, July 19, 2018 <https://www.oneindia.com/india/as-lashkar-jaish-plan-sea-borne-attacks-how-equipped-is-india-to-fight-the-maritime-threat-2738070.html>

61 Gady Franz-Stephen, Is India's Defense Budget Adequate? New Delhi's defense spending will rise modestly in the new fiscal year, The Diplomat, March 03, 2015. <http://thediplomat.com/2015/03/is-indias-defense-budget-adequate>

62 Laxman K Behera, Defence Budget 2018-19: The Imperative of Controlling Manpower Cost, The Institute for Defence Studies and Analyses (IDSA), February 02, 2018. <https://idsa.in/issuebrief/defence-budget-2018-19-controlling-manpower-cost-lkbehera-020218>

Figure 3 presents the division of the budget between the various branches and also the share (15 percent) of the Indian navy in the total net defense budget, while Table 4 shows the breakdown of expenditure on the Indian navy's modernization program for 2018-2019.

In order to establish its position as a regional naval superpower, the Indian navy is carrying out an ambitious buildup of power. In 2017, the Indian navy numbered about 140 vessels and 220 aircraft. The target of the buildup program is to attain a blue-water navy that operates in three dimensions (surface, air and below surface) by 2027, and which will have 212 vessels and 458 aircraft. It is likely that budget problems and the delays at the shipyards will not facilitate the meeting of those targets.

Table 4: The breakdown of the Indian navy's modernization budget

Modernization Head	2017-18 (BE) (Rs in Crore)	2017-18 (RE) (Rs in Crore)	2018-19 (BE) (Rs in Crore)	% Increase in 2018-19 (BE) over 2017-18 (BE)
Aircraft & Aero-Engine	3364	3047	1900	-44
H&MV	31	23	20	-35
Other Equipment	2299	3299	4863	112
Joint Staff	744	744	844	13
Naval Fleet	11023	9223	10300	-7
Naval Dockyard	1288	2002	2000	55
Total	18749	18338	19927	6.3

During the past years, India has upgraded its **strategic nuclear capabilities** with the entry into service of the Arihant nuclear submarine, which is armed with K-15 ballistic missiles with a range of 750 kilometers. The missile was developed for the navy by the Indian Defense Research and Development Organization (DRDO). At a later stage, the submarines will be armed with the X-K missile with a range of 3500 kilometers.⁶³ India is planning to complete the construction of 3 additional submarines of this type and to create a nuclear triad which will provide it with second-strike capability. This is an important step for India since India's nuclear strategy is "no first strike".

By the end of 2018, India is meant to absorb a second diesel-propelled Kalvari-class attack sub, which is based on the French Scorpene model and which was built at the Mazagon Dock shipyard. The submarine is part of a deal between the Indian government and the French shipyard Direction des Constructions Navales Services for the construction of 6 diesel-powered attack submarines.

63 Naval Technology.com, SSBN Arihant Class Submarine, India, Arihant armament, <http://www.naval-technology.com/projects/arihant-class>

Starting in 2013, India has operated the INS Vikramaditya **aircraft carrier** and the second INS Vikrant was launched in 2018 and is scheduled to enter active service in the coming year. The two aircrafts are identical to the Russian Kiev-class carrier. Furthermore, planning has begun for the next generation of aircraft carrier which will be built at the Cochin shipyard. India would like to plan and build the aircraft carriers on its own, a capability currently possessed by only a few naval superpowers. However, the Bhabha Atomic Research Centre has stated that the development of a reactor for an aircraft carrier of this type will require an extended period of time and therefore is not feasible for the next generation of aircraft carrier.

In order to preserve the special relationship between the Indian and Russian navies (and perhaps for other reasons as well), India has decided to construct two of the Krivak-class stealth frigates in Russia and the other two at the Goa shipyard in India.⁶⁴

The Indian navy continues to suffer from a **deficient culture of safety** and in recent years has paid a high price in lives and property. As a result, the Indian navy is creating the new position of Inspector General (safety) which will help raise safety awareness and reduce accidents, during both the construction of ships and their operation.⁶⁵ It is worth recalling the very serious accident experienced by the Indian navy in August 2013, when the INS Sindhurakshak, a Russian-built submarine, sank in the port after an internal explosion, killing 18 sailors. In 2014, a fire broke out on the INS Sinhoratna, an Indian Kilo-class submarine, and two crew members lost their lives. The accident occurred as a result of poor maintenance, rather than operational error. Also this year, there were reports of safety incidents on the INS Arihant, the new nuclear submarine, in which seawater entered the propulsion system and caused heavy damage.⁶⁶ This is the reason that military experts are skeptical of the Indian Navy's ability to safely and reliably operate a force of submarines, which is of such importance to India.⁶⁷

64 Vivek Raghuvanshi, Goa Shipyard nominated to build two stealth frigates for the Indian navy, *Getac*, Mach 15, 2017, <https://www.defensenews.com/naval/2017/03/15/goa-shipyard-nominated-to-build-two-stealth-frigates-for-the-indian-navy>

65 Rauh Singh, Indian Navy likely to appoint inspector general to ensure safety of warships, *Hindustan Times*, New Delhi, July 20, 2018 <https://www.hindustantimes.com/india-news/indian-navy-likely-to-appoint-inspector-general-to-ensure-safety-of-warships/story-UOYGHp3eZ6BHCdKEd9Sp4H.html>

66 George Allison, India's first nuclear missile submarine crippled as sailor leaves hatch open, *the UK Defence Journal*, January 10, 2018 <https://ukdefencejournal.org.uk/indias-first-nuclear-missile-submarine-crippled-sailor-leaves-hatch-open>

67 Sonia Naz, INS Arihant Accidents: Question Mark on the Sustainability of India's Naval Force, *Modern Diplomacy*, August 27, 2018 <https://modern diplomacy.eu/2018/08/27/ins-arihant-accidents-question-mark-on-the-sustainability-of-indias-naval-force>

The Shipping Corporation of India (SCI) company owns the largest **fleet of oil tankers** in India. The fleet has diverse capabilities and is composed of tankers of all sizes, which supply India's demand for imported crude oil. India, which is one of the largest oil importers in the world, has encountered problems in complying with the US sanctions on Iran, which came into effect in November 2018. India imports about 25 million tons of crude oil from Iran each year. In order to deal with the problem and not to use the SCI company, India will allow the public sector to import Iranian oil in foreign tankers.⁶⁸

The Russian Navy

Since the beginning of the last wave of reforms in Russia's armed forces in 2009, the Russian leadership has broadcast the message that the Russian navy has emerged from its crisis and is returning to its former glory and that it is capable of completing missions that are worthy of a superpower's navy. This was manifested into major events:

- **The annexation of Crimea** and the achievement of Russian control over the port city of Sevastopol, which is also the home port of the Russian navy in the Black Sea. The navy shipyard is also nearby and it plays a major role in the navy's maintenance.
- **Expansion of the navy's mission** in its six theaters of operation (the Atlantic, the Arctic, Antarctica, the Indian Ocean, the Black Sea and the Pacific), while giving priority to its permanent presence in the Mediterranean and the buildup of its power in the Arctic and Atlantic theaters.

As mentioned in previous reports, President Putin approved the **New Naval Doctrine of the Federation** on July 26, 2015. The document describes the strategy of the Russian navy, its missions and the plan for its buildup of power. This doctrine replaces the previous one which was approved in 2001.

As part of the Russian Naval Day events in July 2018, Russia held a parade of 40 war ships in the port of St. Petersburg, during which President Putin sent greetings to the crews and stated that "the Russian navy is fulfilling all of its missions to defend the State, is making a significant contribution to the war on international terror and is playing an important role in ensuring strategic equality." Putin added by saying that "during a period of more than 300 years, the Russian navy has protected the Russian Federation and its national interests." The navy's new stealth frigate (the Admiral Gorshkov) was meant to participate in the show for the first time. The ship has a displacement of 4500

68 Reuters, PSU refiners to use Iranian tankers for oil imports, the Hindu, September 4, 2018 <https://www.thehindu.com/news/national/psu-refiners-to-use-iranian-tankers-for-oil-imports/article24858669.ece#>

tons and it the first of six that are meant to become part of the Russian forces by 2025.⁶⁹ The maximum speed of the frigate is 29 knots and it is armed with Oniks and Kalibr cruise missiles, as well as Poliment-Redut surface-to-air missiles. Paul Schwartz, a researcher at the Center for Strategic and International Studies (CSIS) in the US, points out in a research study that this type of vessel, relative to its size, is well-armed and may even be preferred over Arleigh Burke-class guided-missile destroyers that serve in the US navy.⁷⁰

According to the Russian Minister of Defense, the Russian navy included **about 280 vessels** of different types in 2018, although there is a conflicting report with regard to some of these vessels. Carl Schuster, the former Director of Operations at the US Pacific Command's Joint Intelligence Center, claims that the Russians are counting vessels whose construction has been completed in the shipyard and therefore it does not accurately reflect the number of Russia's operational vessels. Schuster also claims that the Russian navy's order of priorities are as follows: construction of new vessels; operations in the various theaters of operation; training of crews; and only in fourth place – the vessel's level of maintenance.⁷¹

With regard to the **Russian navy's buildup of power**, there is currently a **turnaround in thinking**, some of whose components are economic and some of which are the result of an analysis of future warfare, which is becoming increasingly biased toward littoral warfare. The Russians are getting ready to abandon the construction of capital ships and by means of a radical shift in operational thinking are beginning to plan and build smaller ships, which are equipped with advanced weapons systems and which will create an advantage over the enemy on the strategic, systemic and tactical levels. The new program of the navy's buildup of power for the period 2018-2025 has been allocated 25 percent of the budget for acquisition, modernization and R&D, more than any other branch of the military. The navy has become the politician's preferred branch of the military, which is manifested in the text of the Russian naval strategy document (Morskaia Strategija). The Admiral Kuznetsov **aircraft carrier**, which last year completed an unsuccessful tour of the Eastern Mediterranean, returned to Russia and went into dock for refurbishing that will be complete only in 2021.

69 Russian Navy to get Admiral Gorshkov frigate on July 28, TASS, July 18, 2018
<http://tass.com/defense/1013838>

70 Paul Schwartz, Admiral Gorshkov Frigate Reveals Serious Shortcomings in Russia's Naval Modernization Program, the Center for Strategic and International Studies, March 2016,
<https://csis-prod.s3.amazonaws.com/s3fs>

71 Bred Lendon, Russia's navy parade: Big show but how much substance? CNN, July 29, 2018
<https://edition.cnn.com/2018/07/29/europe/russia-navy-parade-intl/index.html>

According to the 2015 strategy, the Russian navy is focusing on the following three objectives: nuclear strike capability by means of its fleet of nuclear-powered ballistic missile submarines (SSBN); the integration of the navy within land attack capabilities by means of cruise missiles (as was manifested in the attacking of targets in Syria) and the protection of the homeland's coasts (including territory held by Russia in the Eastern Mediterranean) by means of anti-access/area-denial (A2/AD). The two latter missions can be carried out well both by submarines and by small surface vessels the size of frigates and corvettes. Thus, according to the current Russian naval strategy, the missions of the large surface vessels mentioned above are highly limited.

In the summer of 2018 and after 13 years of development and construction, the Russians launched a second Lada-class attack submarine which is a “fourth generation” development program of Kilo-class attack submarines. The submarine is meant to be quieter and has new weapon systems and at a later stage in the program also air-independent propulsion.⁷² The long duration of the project (over 13 years) is evidence of the difficulties that arose both in terms of resources and the ability of the shipyard to finish projects on schedule. Another example of such problems can be seen in the handover of the Ivan Green landing vessel, which was built in the Kaliningrad shipyard and delivered to the Russian navy in June 2018, 14 years after the project began. The ship did not pass its sea tests and was returned to the shipyard for some major repairs.

In 2018, the **Russian navy maintained its presence in the Eastern Mediterranean** and its presence in Syria was reinforced. In 2017, the Russians renewed their lease contract in the port of Tartus for an additional 49 years and continued the construction of infrastructure in the Russian section of the port. The Russian navy in the Eastern Mediterranean is primarily based on the Black Sea fleet and its size ranges from 8-15 vessels of various types. In mid-August 2018, prior to the attack by Assad's forces on the Idlib area in northern Syria, the Russian fleet increased its forces in the Eastern Mediterranean by more than 10 warships (see Figure 26). This is essentially the largest Russian force deployed in this region since Russia declared its active support of the Assad regime in 2015. The task force includes three frigates, a destroyer, a missile cruiser, two corvettes, two Kilo-class submarines and number of supply ships. According to reports in the Russian media, the buildup is a response to warnings from the US and its allies in Europe against the use of chemical weapons in the planned attack on Idlib and the debriefing given by US National Security Advisor John Bolton to reporters, in which he expressed concern that Syria would use chemical weapons and

72 Russia's second Lada-class submarine launched 13 years after construction, Naval Today.com, September 20, 2018, <https://navaltoday.com/2018/09/20/russias-second-lada-class-submarine-launched-13-years-after-construction-start/>

that "the US will respond to any verified chemical weapons use in Idlib or elsewhere in Syria in a swift and appropriate manner."⁷³

Российские корабли в Средиземном море



Figure 26: Polygons showing the territory of the Russian navy's exercise which took place at the beginning of September 2018 in the Eastern Mediterranean. Source: Izvestia

At the beginning of September, the Russian navy carried out a naval exercise in the Eastern Mediterranean in which 25 warships and about 30 aircraft took part. During the exercise, large swaths of the ocean were closed and the units participating in it practiced warfare scenarios against threats from aircraft and from submarines and scenarios of minelaying were practiced. Leading the exercise was the Marshal Ustinov guided-missile cruiser, and there were also Tupolev 16 bombers and Sukhoi 30 and Sukhoi 33 aircraft participating. Figure 27 presents the map of the exercise published by the Russians in an open message prior to the exercise in the Eastern Mediterranean.

On the night between the 17th and 18th of September 2018, a Russian Aleutian 20 airplane was shot down by the Syrian air defense system, while Israeli planes attacked an ammunition warehouse in Latakia. As a result of the incident, 15 Russian soldiers were killed and the Kremlin expressed rage against Israel's behavior which led to an urgent conversation between Russian President Vladimir Putin and Israeli Prime Minister Benjamin Netanyahu. An IDF delegation, headed by Amikam Norkin, the commander of the Air Force, travelled to Russia to present the findings of the IDF investigation of

73 Russia deploys large task group off Syria ahead of potential new Syria attacks, Naval Today.com, August 29, 2018 <https://navaltoday.com/2018/08/29/russia-deploys-large-task-group-off-syria-ahead-of-potential-new-syria-attacks/>

the incident. However, an announcement by the Russia Ministry of Defense rejected each of the claims made in the investigation, as presented by the commander of the Air Force. The restrictions that will apparently be imposed on the activity of the Israeli Air Force in attacks of this kind and on the freedom of movement of the Israeli navy off the coast of Syria will make the Eastern Mediterranean less accessible to Israeli activity. This provides support for researchers who have long claimed that the Russian strategy is to make the Eastern Mediterranean into an **inaccessible region for the US navy and its allies** (anti-access/area-denial) in a time of crisis.⁷⁴ If indeed this is accomplished, it is liable to restrict the access of the US and its allies to the Suez Canal, the Black Sea and the Eastern Mediterranean.

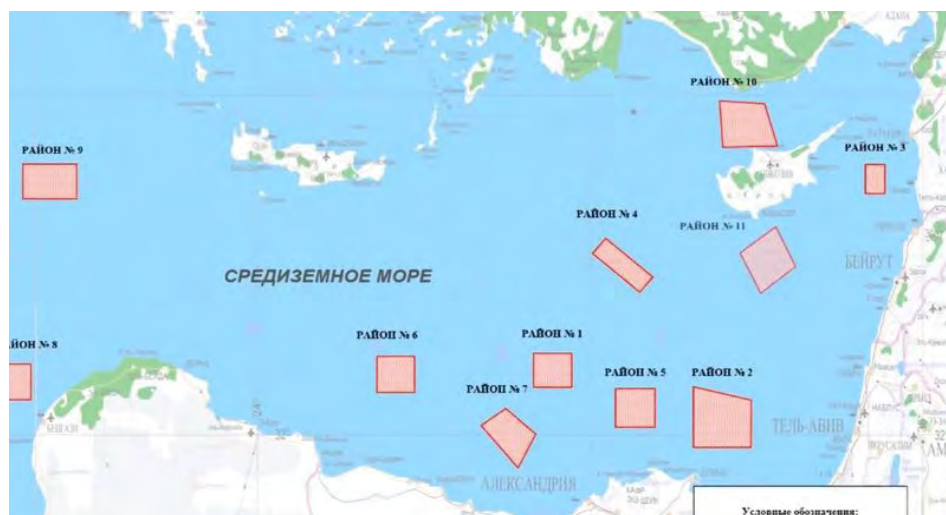


Figure 27: The forces in the Russian naval taskforce in the Eastern Mediterranean after reinforcement – September 2018

Russia has had the largest fleet of attack submarines for the last two decades. In recent years, it has been patrolling and projecting power in a number of theaters: off the coast of Scandinavia and Scotland, in the Mediterranean and in the North Atlantic. This activity is perceived as competition with the US and NATO submarine forces which until now have maintained their dominance in these regions. In the autumn of 2015, Admiral Mark Ferguson, the commander of the American forces in Europe, stated that the scope of Russian submarine patrols had risen by almost 50 percent over the

74 North Atlantic Treaty Organization, Science and Technology Organization, Analysis of Anti-Access Area Denial (A2AD), November 13, 2017
<https://www.sto.nato.int/SitePages/newsitem.aspx?ID=3546>

past year.”⁷⁵ In the context of the **littoral warfare** carried out by the Russian navy in the Eastern Mediterranean, it recently demonstrated its ability to carry out an **attack against land targets** using cruise missiles launched both from the Caspian Sea and from the Mediterranean. American commentators point out that the launch of cruise missiles from the Caspian Sea or from the Black Sea, which have the ability to “deny hostile powers access to vital areas”, creates **almost complete survivability** for these vessels.⁷⁶ In this context, US officials claim that Russia is continuing to violate the Intermediate-Range Nuclear Forces Treaty (INF) on which it is signed in view of its development program for SSC-8 cruise missiles.

Another **change in doctrine** that is taking place in the Russian submarine fleet and which represents a return to the Cold War period with regard to the use of **submersible weapons** is the introduction of a new torpedo known as the Kanyon which carries a nuclear warhead. The US Nuclear Posture Review, which was published in January 2018, mentions Russia’s aspiration to develop an “autonomous submersible torpedo”. The torpedo was first identified by the US in 2016 during launch trials of the torpedo from a Sarov-class submarine. It is believed that the torpedo is 24 meters long and has a diameter of 1.6 meters, that it has a thermonuclear warhead with a 100 megaton charge, a high speed of 185 kph, and a range of about 10,000 kilometers. It has two main purposes: to strike the enemy’s coastal/port cities and to attack and sink the American aircraft carriers.⁷⁷ One way or the other, this is an extension of nuclear weapons to the tactical battlefield, which is a throwback to the Cold War period, before there were any agreements between the US and Russia (such as START) that deal with the proliferation of this type of weapon.

In August 2018, prior to the Vostok exercise, Russia’s Pacific fleet launched seven guided cruise missiles in the Sea of Okhotsk. The missiles were of three types according to launch platform: from a surface vessel, from a submarine and from a coastal battery. The Sava-class Varyag cruiser launched the cruise missile against surface vessels; the Oscar-class Tomsk submarine launched the Granit-class cruise missile and a coastal missile battery launched a P-800 Oniks supersonic anti-ship cruise missile. Although

75 Schmitt Eric, Russia Bolsters Its Submarine Fleet, and Tensions with U.S. Rise”, The New York Times, April 20, 2016

76 Fink Andrew, Troubled Waters, Russia, Iran and Inland Seas – A bastion strategy for the second nuclear age, The American Interest, April 15, 2016

77 Russia releases first video footage of new Kanyon/Status-6 nuclear torpedo, Naval Today.com, July 19, 2018 <https://navaltoday.com/2018/07/19/russia-releases-first-video-footage-of-new-kanyon-status-6-nuclear-torpedo>

not all the data on performance were presented, the Pacific Command declared that the seven missiles hit their targets.⁷⁸

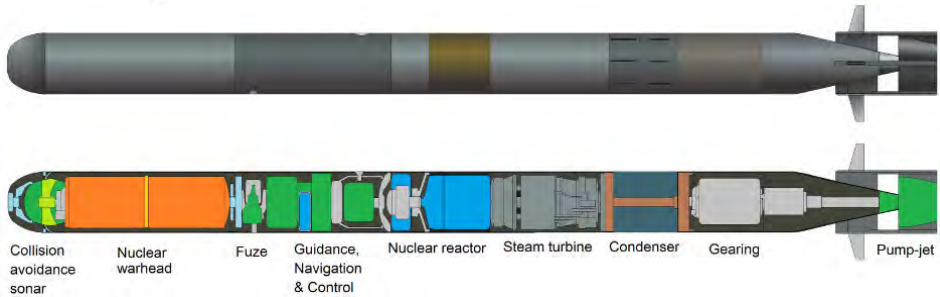


Figure 28: The Kanyon Status – 6 Russian torpedo with a nuclear warhead

In view of the growing importance of the Arctic Ocean, the Russian navy continued constructing nuclear-powered icebreakers that will be able to lead convoys in areas where there is iceberg danger. In September 2017, the Russian navy launched another icebreaker (the second in a series of three) called the Sibir, which according to the Russians can break through the thickest and strongest ice in the world. Its length is 173 meters and it is able to clear a path through ice that is 2.8 meters thick. The icebreaker was built according to the plan of the Russian nuclear agency (Rosatomflot) to operate in the Arctic Ocean and at the mouth of the Yenisei River in the Bay of Ob.⁷⁹

An original solution to the growing demand for electricity needed for the development of the Arctic was found by constructing a floating nuclear power plant in April 2018 in the Port of St. Petersburg. The Rosatom Russian nuclear agency planned and built the Akademik Lomonosov floating nuclear power plant over the last nine years in the St. Petersburg shipyard. The floating power plant, which has two nuclear reactors, will be towed from St. Petersburg and will arrive in the port of Murmansk in the autumn of 2018 and there it will be loaded with the nuclear fuel needed for its operation. The power plant will be located in the arctic port of Pevek, will be connected to the existing

78 Russia conducts cruise missile tests ahead of largest drill in three decades, Naval Today.Com, August 28, 2018 <https://navaltoday.com/2018/08/28/russia-conducts-cruise-missile-tests-ahead-of-largest-drill-in-three-decades/>

79 Russian shipbuilder Baltic Shipyard has launched the second of three Project 22220, nuclear-powered icebreakers at its shipyard in St. Petersburg, Naval Today.Com, September 25, 2017 <https://navaltoday.com/2017/09/25/video-russia-launches-second-nuclear-powered-icebreaker-sibir/>

electricity network and will replace the existing nuclear power plant which is being taken out of service.⁸⁰

In conclusion, the Russian navy has received preference over the other branches in the allocation of resources for the buildup of power and for its operations, despite Russia's difficult financial situation in recent years. The navy serves geopolitical and geostrategic goals and in some sense it is exhibiting behavior patterns with respect to the US and NATO that are reminiscent of the **Cold War period**. In recent years, **the Russian navy has tightened its relations with the Chinese navy** and has held joint exercises in various theaters. Although in 2018, Chinese naval sources did not participate in the major Vostok exercise held by the two countries, on May 7, 2018 three Russian ships of the Pacific fleet—two destroyers and a tanker—left Vladivostok for a patrol in East Asia, which included among other things an exercise with the Chinese navy. In a joint meeting of the Russian and Chinese navies held in July 2018 in Severomorsk, the main base of Russia's northern fleet, the possibilities were discussed for increased cooperation in the Barents Sea, as well as joint exercises in the Arctic Ocean, to which both navies attribute great importance.⁸¹

With respect to the export of naval weapons systems, Russia is still a major supplier of vessels and advanced weaponry to numerous navies, including the Indian navy, which in spite of its improved relations with the US navy continues to maintain a special relationship with the Russian navy. As part of the attempt to overcome its economic crisis, Russia is interested in expanding the export of naval platforms and weapons systems. In a report written for the EU in December 2017 on the Russian weapons industry, the researchers looked at the effect of the war in Syria on this industry and concluded that, "The war in Syria has had a mixed impact on the Russian armaments industry. On the one hand, the war has served as a testbed and as a showcase for new Russian military equipment. On the other hand, the high cost of the war has led to cuts in the Russian military budget and a reduction in the number of weapons acquired by the Russian Ministry of Defense."⁸² With regard to the future of this industry, researchers

80 Bill Chappell, Russia Launches Floating Nuclear Power Plant; It's Headed to The Arctic, The Two Ways, April 30, 2018 <https://www.npr.org/sections/thetwo-way/2018/04/30/607088530/russia-launches-floating-nuclear-power-plant-its-headed-to-the-arctic>

81 Thomas Nilsen, Russia's Northern Fleet works on increasing ties with Chinese Navy, Eye on the Arctic, July 31, 2018 <http://www.rcinet.ca/eye-on-the-arctic/2018/07/31/russia-china-navy-cooperation-military-defence-security-northern-fleet-severomorsk/>

82 Richard A. Bitzinger and Nicu Popescu, Defence industries in Russia and China: players and strategies, Report No.38, Published by the EU Institute for Security Studies and printed in Luxembourg by Imprimerie Centrale. Luxembourg: Publications Office of the European Union, P. 18, December 2017

do not foresee a bright future. The industry must offer a large variety of products and must shift to civilian products in order to survive. It also has to overcome the sanctions placed on it by the West in the acquisition of technologies and Western components and to adapt its programs to the budget allocated to it within the Russian defense budget for 2018-2025. Moreover, some of the leading companies in the defense industry sector in Russia are burdened with heavy debts that are liable to threaten Russian military production for years to come.

NATO's Naval Forces

A number of events during the past year had an impact on NATO in general and on its naval forces in particular:

- The continuing shift of American naval forces to the East Pacific region.
- The demand by the new American president that the NATO countries increase their investment in the defense budget to 2 percent of their GDP.⁸³
- The planned exit of Britain from the EU by May 2019.
- The deterioration in relations with Turkey which is also shifting its orientation to the East and is interested in acquiring Russian weapons.

NATO is operating according to its naval strategy, which also defines the parameters of NATO naval operations. This activity falls with the categories of collective defense, crisis management, joint security and naval security. NATO is currently holding the Sea Guardian exercise in the Mediterranean and provides assistance to refugees and migrants in the Aegean Sea. Furthermore, it collaborates with non-NATO countries and other international organizations.⁸⁴

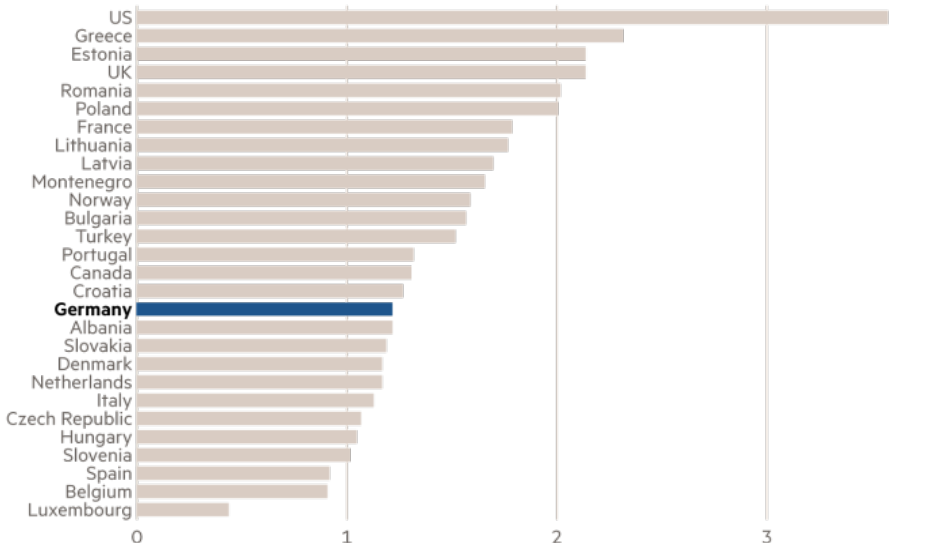
At the NATO Security Conference held in February 2018 in Munich, Jens Stoltenberg, the Secretary General of NATO, related to the US President's demand to **increase the defense budget** of the NATO members to 2 percent of GDP and claimed that indeed this is the general trend, although in 2018 only six countries met this target and by 2024 it is expected that at least 15 will do so (out of 28 NATO members). Stoltenberg added that "all NATO Allies have put forward plans to increase spending in real terms

83 Martin Bank, Defense spending increased 'significantly' among NATO allies, defenseneews.com, Europe, June 30, 2017, <https://www.defenseneews.com/global/europe/2017/06/30/defense-spending-increased-significantly-among-nato-allies>

84 North Atlantic Treaty Organization, NATO's maritime activities, June 18, 2018 https://www.nato.int/cps/ic/natohq/topics_70759.htm

but it was not possible to meet this target by the end of 2017.⁸⁵ Figure 29 presents the defense expenditures of the NATO members in 2017 as a proportion of their GDP.

With respect to the **operational readiness of the NATO forces** there have recent worrying reports that as of the end of 2017 more than one-half of the French army's aircraft were not able to fly and at the beginning of 2018 the German navy was unable to put to sea even one of its submarines and the German air force could not deploy even one of its A400M transport planes.⁸⁶



Source: Nato
© FT

* Nato member Iceland has no armed forces

Figure 29: The defense budgets of the NATO countries in 2017 as a proportion of GDP

Accordingly, NATO will have to deal with a series of **security challenges** in the near future:

- Complex challenges created by Russia, perhaps not as an enemy but as a bitter rival nonetheless.
- The complex challenges of the civil war in Syria and the Eastern Mediterranean.

85 Azita Raji, Salvaging Trump's Legacy in Europe: Fixing NATO Burden Sharing, National Security Network, University of Texas, February 26, 2018, <https://warontherocks.com/2018/02/salvaging-trumps-legacy-europe-fixing-nato-burden-sharing>

86 Lima Charlie, How The UK is Critical In NATO's Future To 'Keep The Russians Out, Force Network, July 16, 2018 <https://www.forces.net/evergreen/comment-how-uk-critical-natos-future-keep-russians-out>

- The uncertainty in the Black Sea and the vicinity in view of the possibility of additional moves by Russia.
- The increasing uncertainty on the South coast of the Mediterranean including the situation in Libya.
- In the North – the increasing importance of the North Sea and the Baltic Sea and its role in NATO security.

The challenges being created by Russia led the Pentagon to announce in May 2018 that as a result of the increasing tension with Russia it had been decided to reestablish the naval fleet in the Atlantic and to bolster US and NATO forces in the Atlantic Ocean. The fleet will be commanded from NATO's new Atlantic Command headquarters in Norfolk, Virginia. The outline of the plan was approved in a meeting of the NATO defense ministers in February 2018 as part of a broader effort to ensure the security of ship lanes between Europe and North America.

During the second half of August 2018, NATO naval forces of Naval Group One carried out a passing exercise with a Japanese task force that was sailing in the Baltic Sea. Japan is a traditional ally of NATO outside of Europe and it works with NATO in a number of areas – from security in Afghanistan to nuclear non-proliferation, naval security and cyber.⁸⁷

In the context of **NATO involvement in the civil war in Syria**, it is worth mentioning that the continual criticism by President Trump of the Obama administration during the presidential elections that it had "drawn a line in the sand" with Syria with respect to the use of chemical weapons and after the fact had allowed Syria to cross the line without an appropriate response, now puts him and the other NATO countries in the same dilemma; and so far all of his threats have remained on paper.

In the context of NATO activity in the Black Sea, two NATO naval groups participated in the Breeze 2018 exercise, which was held jointly with the Bulgarian navy during July 13-20 opposite the coast of Bulgaria in the Black Sea. The exercise was meant to improve the coordination between the participants and to strengthen cooperation by practicing various warfare techniques in a multi-dimensional scenario (aerial, ground and anti-submarine). The exercise provided an excellent opportunity for NATO forces to develop and strengthen joint operational abilities with the naval forces of allies in the Black Sea. The presence of NATO vessels in the Black Sea is part of its effort in the

87 NATO and Japan conduct exercise in the Baltic Sea, August 21, 2018
https://www.nato.int/cps/en/natohq/news_157770.htm?selectedLocale=en

region to increase the duration of NATO naval operations in the Black Sea from about 80 days in 2017 to the planned 120 days in 2018.⁸⁸

It appears that the question posed in the previous report on the effect of **Britain's planned exit from the EU**, and in view of its senior position in NATO, has become less urgent and the possibility that France would exploit the opportunity in order to take Britain's place remains only theoretical. The deterioration in relations between Britain and Russia and Prime Minister Theresa May's plan to moderate the exit processes left Britain's relations with NATO and its status basically unchanged. Furthermore, the entry into service of two new aircraft carriers—the HMS Queen Elizabeth and the HMS Prince of Wales—will constitute a force multiplier for NATO in this essential domain.

With respect to **Turkey and its relations with NATO**, it should be mentioned that although most of the attention in the Middle East is devoted to the developments in Iran, the other non-Arab force in the Middle East—namely Turkey—is often ignored. Turkey has undergone significant changes during the last decade, both internally and externally. With respect to its foreign relations, it appears that Turkey is in the midst of a strategic shift in its orientation—a **shift towards the East**. After some friction with Russia in recent years, Turkey is aligning itself with Russia at the expense of its relations with Europe and the US. President Trump's decision in August 2018 to impose economic sanctions on Turkey due to its unwillingness to free an American priest held in Turkey on charges of espionage brought the relations between the two countries to a new low. In July 2018, the Turkish President warned the United States that it is liable to lose an important ally, unless it changes its current approach. Turkey objects to the State Department's demand that NATO countries halt their imports of crude oil from Iran by November 2018. Turkey is building a military base at Doha in Qatar, a move that is bringing it closer to the Gulf States and in particular the most radical of them, namely Qatar. Qatar, which is known as a supporter of Iran and terror organizations, has committed to investing \$15 billion in Turkey with the goal of offsetting the effect of the new US sanctions. A maritime element was recently added to the longstanding dispute between Turkey on the one hand and Cyprus and Greece on the other with respect to Cyprus' EEZ, which is rich in gas deposits. Turkey is adamantly opposed to Cyprus' attempt to initiate oil and gas exploration in disputed maritime areas and the intervention of the Turkish navy in this dispute is a definite possibility.

As mentioned in the previous report, current NATO doctrine was not formulated to deal with the challenges that have developed and in particular those in the **Mediterranean**.

88 NATO Groups exercise in the Black Sea, July 17, 2018
<https://mc.nato.int/media-centre/news/2018/nato-groups-exercise-in-the-black-sea.aspx>

Accordingly, at the NATO Summit Conference held in Warsaw in July 2016, the member states' leaders decided to change NATO's operational plans and military strategy. The new operational plan (which replaced the 2001 operational plan called Operation Active Endeavour) was given the name Operation Sea Guardian and it is "aimed at working with Mediterranean stakeholders to deter and counter terrorism and to mitigate other risks to security." The missions assigned to this force include: building an accurate picture of activity in the Mediterranean in order to help identify possible security risks and the execution of three main tasks: maritime situational awareness, counter terrorism and capacity building.⁸⁹ The command center for the task force will be located at Northwood in the UK and it will maintain an up-to-date picture of the operation.

As part of the Sea Guardian exercise held in September 2018 in the Mediterranean as part of NATO's effort to involve additional nations in this mission, British and Croatian naval forces were also invited to participate. Ships from these navies joined the ITS Espero, a frigate of the Italian navy, and other participating ships and aircraft to carry out joint patrols of the Central Mediterranean.⁹⁰

During the course of 2017, the Italian navy and coast guard were intensively involved in preventing the arrival of refugees from Libya in Italy. In reality, the navy and the coast guard were forced to engage in activity to rescue thousands of refugees in distress.

Humanitarian missions of this type that have been carried out by the **Italian navy** receive public recognition for their importance and thus despite the reduction in the Italian defense budget since the end of the Cold War (from 2.3 percent to GDP in 1990 to 1.3 percent in 2015) the navy has been allocated a designated budget in the unprecedented amount of 5.4 billion euros in order to bolster its ability to carry out missions in the Mediterranean. The reason for this was mentioned by Vice Admiral Ferdinando Sanfelice di Monteforte who is also the Italian military representative to NATO: "...because security issues in Mediterranean countries have shifted from land to water – In the nineties, the focus was on land-based defense, but today it's maritime security." The new vessels include seven multi-purpose patrol boats that are particularly suited to search and rescue; a logistic support vessel and two high-speed multi-functional ships for special operations. Most of the ships will be built by the state-owned Fincantieri shipyard. The new vessels will be delivered to the Italian navy

89 Fact Sheet, Operation Sea Guardian, Allied Maritime Command Northwood UK, Media Center, <http://www.mc.nato.int/media-centre/fact-sheets.aspx>

90 Croatian and UK ships join NATO's Operation Sea Guardian, September 7, 2018 https://www.nato.int/cps/ic/natohq/news_157986.htm?selectedLocale=en

between 2021 and 2026, by which time the refugee crisis may already be over while the Italian navy will be at the peak of its refurbishment.

There are 10 Italian navy vessels that currently patrol the Mediterranean, two of which are frigates that have been assigned to search and rescue missions and the prevention of smuggling. The Italian vessels, including Italian submarines on intelligence-gathering missions, also patrol the coast of Libya.⁹¹

Naval Operations against Terror and Piracy in the Indian Ocean Region

Maritime piracy and terror present a serious challenge to shipping safety, to human lives and to economic welfare, in addition to disrupting the fabric of inter-state relations when the activity originates from the territory of a particular country. At the time of writing, it was still possible to differentiate between the activity of **maritime piracy** and **maritime terror** according to the nature of the attack, the methods used and the means used, as well as the region in which the activity is taking place. Although there is similarity between the methods of operating between them (attacking ships, stealing of sea cargo and taking of hostages), the goals of the two differ: terror activities have an ideological motive and therefore publicity is important to them in order to create psychological pressure on governments and the public, while piracy uses the property it captures and the hostages it takes for profit only.

During the course of 2017, the Combined Maritime Forces continued their activity to **counter maritime piracy and terror in the areas of the Persian Gulf**, the Indian Ocean and the Horn of Africa. The force is composed of three subforces: Force 150 which is a joint French-British force that focused in 2017 on maintaining a presence and carrying out patrols in the area of the Bab el Mandeb Strait, with the goal of securing freedom of movement in the area. This followed a number of incidents early on in the year;⁹² Force 151 whose mission is to maintain security in the area of the Red Sea, the Gulf of Aden and the Gulf of Oman; and Force 152 which operates in the Persian Gulf. It should be mentioned that apart from this force, a number of countries, including **China, Japan and India**, among others, are involved in this mission on an independent basis, with the goal of protecting the interests of their own trade, although they do not hesitate to answer distress calls from commercial ships of other countries. In August 2018, Brazil became the 33rd country in the Combined Maritime Forces.

91 Elizabeth Braw, How Migrants Rescued the Italian Navy, RUSI's Modern Deterrence program, May 31, 2016 <https://foreignpolicy.com/2016/05/31/how-migrants-rescued-the-italian-navy/>

92 Combined Maritime Forces, Warships Operating in Support of CTF – 150 Continue Presence patrols in the Western Gulf of Aden, August 10, 2017, <https://combinedmaritimeforces.com/2017/08/10/warships-operating-in-support-of-ctf150-continue-presence-patrols-in-the-western-gulf-of-aden>

From the beginning of 2018 until September 2018, the IMB Piracy Reporting Center reported only two incidents in which ships were fired on in the area east of the Somali coast, in the Gulf of Aden and in the Red Sea. Nonetheless the three forces report an increase in the capture of ships that are involved in drug smuggling in the Gulf of Aden and Horn of Africa regions. Up to September 2018, a total of 1200 kilos of heroin were sized in three separate incidents.⁹³

There has been a decline in the total economic cost of maritime counter-terror activity in the western Indian Ocean. In 2017, the cost was estimated at about \$1.4 billion (in comparison to \$1.7 billion in 2016). Figure 30 presents the total cost of the operations to counter maritime piracy in the Horn of Africa and the Gulf of Aden during the period 2010-2017 – in terms of hostages and economic price. In 2017, of 54 attempts by pirates at hijacking and armed robbery in the region, 15 ended in failure and 4 ships were hijacked by the pirates. In order to reduce the costs of security that are borne by the civilian shipping companies, they have begun to employ private companies that have provided them with trained and armed guards (3-4 per ship). The annual costs of this protection in the Western Indian Ocean reached \$292.5 million.⁹⁴ The conditions and sociopolitical environment in Somalia (including the lack of economic opportunities, the lack of governance and the lack of law enforcement) that have allowed piracy to flourish have unfortunately not changed very much.



Figure 30: The total cost of operations against maritime piracy in the Horn of Africa and the Gulf of Aden during the period 2010-2017 – hostages and economic price

The likelihood of terror attacks by organizations such as al Qaida and ISIS in this region is estimated to be high and is based on the declared intentions of these organizations to disrupt the traffic of commercial vessels in critical shipping lanes. The results of a terror attack of this kind in the region of the Gulf of Aden is liable to have

93 <https://combinedmaritimeforces.com/2018/06/20/marine-nationale-ship-nivose-seizes-illegal-heroin-in-western-indian-ocean/>

94 Oceans Beyond Piracy OBM, The State of Maritime Piracy 2017, Assessing the Economic and the Human Cost, Executive Summary, <http://oceansbeyondpiracy.org/reports/sop/summary>

a major effect on trade and the global economy. Three are three choke points in this region which are important to global trade and primarily to the transport of fuel (Figure 10 presents figures for the transport of fuel in millions of barrel per day). At the main choke points in the Indian Ocean—which include the Suez Canal, the Bab el Mandeb Strait and the Strait of Hormuz, through which about 20 percent of global oil shipments pass—it is possible to disrupt shipping with relative ease. Iran attributes great strategic importance to the Red Sea region due to its desire to take control of the main maritime route for oil and gas to the West. Iran already uses its ships in order to supply Yemen directly or by way of Somalia, thus circumventing the efforts of the coalition to intercept shipments. In January 2018, the Houthi rebel movement in Yemen threatened to block the strategic shipping lane through the Red Sea. A tanker was attacked by Houthis at the beginning of August 2018 was flying a Saudi flag and was carrying oil to Egypt. As a result of the attack, Saudi Arabia suspended the export of oil by way of the Bab el Mandeb Strait for a short time.⁹⁵

At the height of the typical Twitter exchange between US President Trump and the Iranian leadership—during which the Iranians threatened to disrupt international oil shipments if the US imposes sanctions in November 2018 that harm the Iranian oil industry—Iran carried out a naval exercise in the Persian Gulf. This was a few days before the US renewed its sanctions on Teheran with the goal of demonstrating an ability to close the main oil route. Since some of the threats have been directed towards Israel, Prime Minister Benjamin Netanyahu warned Iran that any attempt to block the Bab el Mandeb Strait in the Red Sea will encounter an international coalition that will include Israel.⁹⁶ The Americans believe that in January 2017 the Houthi rebels laid maritime mines in the coastal waters of the Gulf of Muka in Yemen. The US navy and Force 150, which is made up of French and British vessels, is currently operating to guarantee freedom of movement in the Bab el Mandeb Strait. It can be said that the region is characterizes by all of the elements of asymmetric warfare and littoral warfare.

Migration by the Sea Routes

The movement of refugees by way of the Mediterranean to Europe is not a new phenomenon and it has already claimed the lives of many thousands of them. Nonetheless, the flow of migrants has intensified during the last decade as a result of the **civil war in Syria and African refugees arriving by way of the Libyan coast**. According to the report by the UN International Organization for Migration (IOM), by the

95 KSA suspends oil shipments through Bab Al Mandab after Houthi terror attack, Arab News, July 26, 2018 <http://www.arabnews.com/node/1345626/saudi-arabia>

96 Daniel Siriuti and Lilach Shuval, "Iran will find itself facing a determined coalition," *Israel Today*, August 1, 2018. (Hebrew)

end of September 2018, 78,372 migrants and refugees managed to enter Europe by way of the sea (in contrast to 132,715 during the corresponding period in 2017). 34,238 of them arrived in Spain, 20,859 in Italy and 22,261 in Greece. 10,000 were returned to the coast of Libya by the Libyan coast guard. Figure 31 presents the situation of migration by way of the sea to the coasts of Europe up until August 2018 (including those killed and drowned).

In 2018, a downward trend could be seen in the number of refugees trying to cross the Mediterranean from Africa to Europe, although the proportion of refugees who lost their lives in these attempt rose sharply. The UN Refugee Agency announced that up to July 2018, 1095 individuals had died on the main route through the Mediterranean from Libya to Italy and the proportion of deaths is now about 1 for every 18 refugees that make it to Europe. For purposes of comparison, in 2017 2276 refugees died (a ratio of 1 to 42) on their way to Europe. Vincent Cochetel, the UN envoy to the Central Mediterranean, said that "The reason the traffic has become more deadly is that the traffickers are taking more risk, because there is more surveillance exercised by the Libyan coastguards and smugglers are taking greater risks while transporting the refugees." In addition, the UN reported that more than 300 refugees died on the sea route from North Africa to Spain, an increase of 50 percent relative to 2017.⁹⁷ Against this background, the EU is considering the idea of building an absorption and sorting center for migrants in North Africa, in an effort to deter individuals from taking the life-threatening voyage to Europe by way of the Mediterranean.

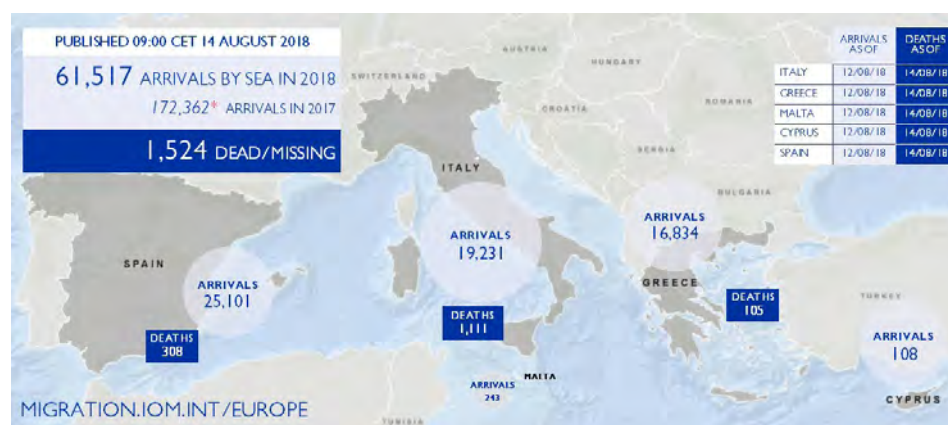


Figure 31: Arrival of refugees in Europe by way of the sea, up until August 2018 (including those who died on the way)

97 Jon Henley, Sharp rise in proportion of migrants dying in Mediterranean, says UN, The Guardian, September 3th 2018, <https://www.theguardian.com/world/2018/sep/03/sharp-rise-in-proportion-of-migrants-dying-in-mediterranean-says-un>

Warfare in the cyber domain has been on the rise in recent years on all levels: national, economic, military and operational. The intervention by Russia in the 2016 US presidential elections is still being investigated. The recognition of cyber as an additional domain (even if virtual) demands attention at all levels. Accordingly, and as part of the formulation of strategies in the various areas (such as the US Nuclear Posture), the White House published a document signed by President Trump entitled National Cyber Strategy on September 20th. The report opens with a declaration that the prosperity and security of the United States is dependent on the way in which we respond to opportunities and challenges in the cyber domain.⁹⁸

The rise of the Internet and the growing centrality of cyberspace to all facets of the modern world corresponded with the rise of the United States as the world's lone superpower. For the past quarter century, the ingenuity of the American people drove the evolution of cyberspace, and in turn, cyberspace has become fundamental to American wealth creation and innovation. Cyberspace is an inseparable component of America's financial, social, government, and political life. Meanwhile, Americans sometimes took for granted that the supremacy of the United States in the cyber domain would remain unchallenged, and that America's vision for an open, interoperable, reliable, and secure Internet would inevitably become a reality. Americans believed the growth of the Internet would carry the universal aspirations for free expression and individual liberty around the world. Americans assumed the opportunities to expand communication, commerce, and free exchange of ideas would be self-evident. Large parts of the world have embraced America's vision of a shared and open cyberspace for the mutual benefit of all. Our competitors and adversaries, however, have taken an opposite approach. They benefit from the open Internet, while constricting and controlling their own people's access to it, and actively undermine the principles of an open Internet in international forums. They hide behind notions of sovereignty while recklessly violating the laws of other states by engaging in pernicious economic espionage and malicious cyber activities, causing significant economic disruption and harm to individuals, commercial and non-commercial interests, and governments across the world. They view cyberspace as an arena where the United States' overwhelming military, economic, and political power could be neutralized and where the United States and its allies and partners are vulnerable. The role of the national strategy in this domain is to ensure the continued existence of the cyber domain in way that will reflect the values of the United States, will protect its security and will promote its prosperity.

98 National Cyber Strategy of the United States of America, Introduction P. 1, September 2018

In practice, it is worth emphasizing that the civilian maritime sector that is most vulnerable to this type of attack is the shipyards and ports sector (as pointed out in more detail in the previous report). The damage to the maritime sector has increased over time since it adapts slowly to the developing threat and it has only gradually come to the realization that ships and ports, like anything else, are now part of the cyber domain. The International Maritime Organization (IMO) is a body of the UN that is responsible for regulation of the maritime domain. It has been tardy in understanding the developments in this area and the need to establish regulatory frameworks for cyber security. Although in 2014 the IMO consulted with its member companies with regard to cyber security guidelines and in 2016 it issued the Interim Cybersecurity Risk Management Guidelines, they are not very specific and do not protect global shipping from such attacks. Experts in the field believe, not surprisingly, that in the meantime over 50,000 ships are exposed to cyber attacks.⁹⁹

Marine environmental protection and global trends in the planning of the maritime domain

Oceans, seas and coastal areas constitute an **integrated and vital component of the Earth's ecosystem** and they are essential to the continuing use of its resources. There is a need to control the ongoing exploitation of the oceans, the seas and the resources found within them, even if it appears that they can be used to eliminate poverty and to support economic growth, food security and creation of employment. Alongside controlling the use of these resources, attention must be devoted the protection of the maritime environment in all its aspects, including **preparations for the effect of climate change**.

The **Regional Seas Convention** and the triennial **Action Plans** are meant to achieve these goals by means of deepening the involvement of the signatory nations, through appropriate national legislation and the adoption of effective control and enforcement mechanisms.

The Action Plan for 2017-2020 was drawn up and approved by 143 member nations located in 13 different regions of the world. The difficulties in implementing the plan are primarily political and economic. Since this report focuses on the Eastern Mediterranean, the main environmental threat originates from **activity that pollutes the marine environment** and thus affects both human uses of the sea and the fisheries in the region.

⁹⁹ David Rider, the maritime cyber threat, why 50,000 ships are so vulnerable to cyberattacks, Maritime Security Review, June 18, 2018 <http://www.marsecreview.com/2018/06/the-maritime-cyber-threat/>

Israel is signed on the **Barcelona Convention** for the protection of environmental quality in the Mediterranean, which includes six Regional Activity Centers (RAC). **In March 2018, a report was published by the UN Environmental Programme (UNEP)** on the status of the Mediterranean. According to the Ministry of Environmental Protection this is the first report of the Integrated Monitoring and Assessment Program (IMAP). The report is based on data gathered by all of the nations signed on the Barcelona Convention as part of national monitoring programs and research.¹⁰⁰

The report contains **worrying findings** according to a number of measures, such as the number of areas with concentrations of mercury in the seabed and the steady increase in the number of invasive species that are entering the Mediterranean by way of the Red Sea and the Suez Canal. Israel is taking a leading role in the monitoring and study of this subject and indeed the only case study presented is of Israel's coasts.

Nonetheless, the report points to an improvement in some of the parameters. In Israel, for example, there has been a significant downward trend in the concentration of poisonous tin compounds, which originate from the antifouling paint on ships.

The report also points to the gaps in existing information and suggest ways of closing them. A clear example is the lack of scientific data for the North African countries. Maritime waste is an important challenge to the marine environment, but monitoring only began in recent years and in some countries has never been done. In Israel, monitoring of maritime waste began in 2017. It is important to mention that the report is only preliminary and that the monitoring program is only in its initial stages.

Conclusion

The world is in the midst of far-reaching changes that will have an impact on the maritime domain in its widest possible sense. The year 2018 is liable to be a turning point in global trade—as a result of the imposition of tariffs on Chinese goods by the US administration and the response by China, which is liable to slow international trade and the very processes of globalization.

In the international arena, the **United States** is still the leading superpower but it is increasingly being challenged by China and Russia and in the Middle East it has abandoned its role as superpower, thus allowing Russia to step in. Despite the resources invested by the Trump administration in the expansion of the US navy and

¹⁰⁰ A summary of the Barcelona Convention Report on the Status of the Mediterranean – March 2018, the Ministry of Environmental Protection website. <http://www.sviva.gov.il/subjectsEnv/SeaAndShore/MonitoringandResearch/Documents/summary-report-Barcelona-convention.docx> (Hebrew)

its ability to deal with its expected challenges in the various theaters, it does not appear that the navy will reach its target of 355 vessels that it set for itself during the coming decade.

The Trump administration adopted the term **Indo-Pacific** region which appears in the National Security Strategy (NSS) document, in order to capture the idea that the US has more critical interests beyond the Pan-Asian region. The full exploitation of this strategy's potential requires smoothing out the differences beyond the boundaries of the Indo-Pacific region and to decide what is feasible and what should be done in this huge geographic area. The NSS describes the geopolitical competition in the Indo-Pacific region between a vision of freedom and a vision of coercion in the world order, in which China is using economic incentives and sanctions, as well as military intimidation, to persuade other countries to support China's political and military agenda. The Trump administration will soon need to identify and implement specific projects for the "grand strategy" in order for it to become reality.¹⁰¹

Russia is maintaining a subversive strategy and doesn't hesitate to use covert means such as cyber warfare or chemical warfare in order to operate against Western regimes, with the goal of undermining their stability. The use of subversive politics of this sort enables it to achieve its geopolitical and geostrategic goals, despite its poor economic state.

The two rising superpowers—China and India (which are rivals)—are becoming regional superpowers, which is also manifested in the growth in the quantity and quality of their **vessels**. These two powers are also expanding their **nuclear deterrent capabilities** and in particular its submersible component. The new interests of their policies, as expressed in their military strategies, emphasize their aspiration to expand the maritime activity to the open seas beyond their coasts (or in other words to attain a blue-water navy).

In the sense of classical strategic approaches, the question that arises with respect to both China and India (between whom there has rivalry since the period of conflict in the Himalayas in 1962) is as follows: Are they choosing to **discard their continental images and envisage a maritime role** or are they remaining **loyal to the ground component which has greater geostrategic significance** despite the huge investment of resources in building navies with the abilities to deter and project power?¹⁰² The characteristics

101 Alyssa Ayres, The U.S. Indo-Pacific Strategy Needs More Indian Ocean, Foreign Affairs.com, May 25, 2018 <https://www.cfr.org/expert-brief/us-indo-pacific-strategy-needs-more-indian-ocean>

102 Zorawar Daulet Singh, India's Geostrategy and China: Mackinder versus Mahan? *Journal of Defence Studies*, Vol-7, Issue-3. pp- 137-146, 2013

of the development of these two navies, as observed in recent years and as described in this report, point to the fact that they are shifting to the maritime arena (both in terms of their conventional forces and their nuclear deterrent), at the expense of the ground forces.

The Russian navy is restoring its capabilities, increasing its number of vessels and adopting a new military doctrine. It is presenting the US and NATO navies with operational challenges in theaters such as the Black Sea and the Eastern Mediterranean, the Baltic Sea and the North Pacific. The Russians are fully exploiting geopolitical opportunities (such as in Syria and Iran) in order to deploy their naval and aerial forces and thus are also creating a situation in which they are **displacing the US navy from the region**.

In 2018, as in previous years, **relations were tightened between the Russian and Chinese navies** and they held joint exercises in various regions of the world. Apart from the media coverage of this development, this cooperation is not unlike that between the US and the NATO countries or Japan. Although Russia is selling weapons to China—more than \$10 billion since 2011—this is primarily because it is in need of hard currency. Both countries are jointly developing new drones. China wants to be able to deny access to American ships in the South China Sea region and the two navies are holding joint exercises in order to counter US influence in Asia.

Climate change in the Arctic region is creating opportunities for the exploitation of resources and the shortening of shipping routes. Resource-poor **China** has begun to collaborate with Russia in the development of oil and natural gas fields in the Arctic Ocean in order to reduce its reliance on the supply of energy from the Middle East. **Both Russia and China** are building navies for future operations in this important region.¹⁰³

In addition to China's interest in diversifying its sources of energy to include regions like the Arctic, most its economic and industrial power is concentrated along its coast, which raises concerns regarding phenomenon such as **the possible rise in sea level** as a result of the melting of the icebergs and the subsequent flooding of coastal cities.

The **United States** is also coming to understand the importance of the Arctic and in March 2018 it renewed its annual ICEX exercises in the Arctic, which involves its fleet of nuclear submarines in collaboration with the British navy. To this end, a temporary base called Ice Camp Skate (named for the first American submarine class to sail under the Arctic ice cap) was established and two American submarines and one British one

103 John Grady, China Expanding Economic Influence in Americas, Research in the Arctic, USNI News, September 14, 2018 https://news.usni.org/2018/09/14/36564?utm_source=USNI+News&utm_campaign=4393a2ebe9-USNI_NEWS_WEEKLY&utm_medium=email&utm_term=0_0dd4a1450b-4393a2ebe9-233591665&mc_cid=4393a2ebe9&mc_eid=6495944afc

arrived in the region.¹⁰⁴ In addition, the US Coast Guard is trying to obtain a budget of \$750 million in order to begin construction of a **fleet of icebreakers** that will carry out security missions in the North Pole area (an ability that does not currently exist).¹⁰⁵

The broad international effort (even if some countries, such as China and India, are not coordinating their operations with the others) to counter **maritime piracy** is having some degree of success in the Eastern Indian Ocean and the Gulf of Aden. This requires a great deal of resources and places an economic burden on the shipping companies. At the same time, there is increasing danger of **maritime terror** and in particular in the waters of nations experiencing civil war or of failed states. This situation already exists in the Bab el Mandeb Strait in which the Houthi rebels, who are supported by Iran, are fighting against Yemen and Saudi Arabia. As a result of the US withdrawal from the agreement with Iran and the imposing of sanctions on the Teheran regime, the **Revolutionary Guard navy** is continuing to operate provocatively in the Strait of Hormuz and to threaten its closure in response to the stringent US sanctions or to deter possible American action against Iran's nuclear facilities.

The protection of the marine ecosystem continues to lag behind the pace of exploitation of ocean resources and the component of human security within maritime security is threatened. Harm to any one of the system's components is liable to violate the ecological balance and to cause a collapse of the system, the destruction of fisheries, the extinction of species and damage to essential resources, whose supply is dependent on the health of the system. Ocean pollution by plastic, leakage of fuel products from drilling rigs, pollution as a result of shipping accidents, etc. are threatening the ecosystem and they call for preventative measures to preserve its internal balance.

104 US Navy kicks off ICEX 2018 in the Arctic Ocean, NavalToday.com, March 8, 2018
<https://navaltoday.com/2018/03/08/us-navy-kicks-off-icex-2018-in-the-arctic-ocean/>

105 Sam Lagrone, Coast Guard Renames New Icebreaker Program 'Polar Security Cutter, USNI News, September 27, 2018 <https://news.usni.org/2018/09/27/36846>

Iran's Naval Strategy

Eyal Pinko

Background

Iran views itself as an emerging regional power and accordingly it is exploiting the opportunity offered by the fighting in Syria in order to strengthen its position in the region, further its ambitions, gain influence and play a decisive role in the in shaping the new Middle East.

Iran's strategic ambitions include shaping a new Middle East in which it will have a significant long-term economic and military foothold and expanding its access to the Mediterranean Sea, by creating a Shiite sphere of influence stretching from Iran by way of Iraq and finally to Syria and Lebanon. Such a sphere of influence can provide Iran with freely accessible trade routes (by air and sea) in order to ship commodities, goods and weapons.¹

The maritime trade routes in general and the Strait of Hormuz in particular constitute a broad platform for Iranian activity and the realization of its strategic ambitions.

To this end, Iran maintains two navies. The first is the **Revolutionary Guard navy**, whose missions include guarding Iranian shipping, control of waterways in the Persian Gulf region, protection of the coast and confronting the enemy in this region in order to protect the regime and the State from naval aggression and to block the Strait of Hormuz.

The second is the **regular Iranian navy** which is one of the branches of the military. Its roles include protecting the oil facilities and other Iranian infrastructures at sea and the loading and unloading of cargo in the Persian Gulf, in the Gulf of Oman and in the Caspian Sea (jointly with the Revolutionary Guard navy); and supervision and monitoring of maritime traffic outside the Persian Gulf – in the Strait of Hormuz, in the Gulf of Oman and in the Caspian Sea.

In addition, the regular navy is assigned missions to prevent smuggling and illegal immigration, to project power at sea—which includes the ability to fight at long ranges, and to participate in Iranian diplomatic efforts, which are accomplished by visits to the ports of allies² and by joint naval exercises.

1 Tsimet Raz, *Iran in the post-ISIS era: goals, opportunities and challenges*, The Center for Intelligence Heritage (August 23, 2017). [Hebrew]

2 Ibid.

This article will provide a survey of Iranian naval strategy, its origins and the way it is being implemented by the two navies.

The maritime dimension of the Iranian culture

In the modern era, Iran decided to build a significant navy only in the 20th century. It sought a navy that would be able to project power in the Indian Ocean and the Arabian Sea. However, the roots of the Iranian navy go back many years and are rooted deep in history, during the peak of the Persian Empire in and around 500 BCE.

In ancient times, Persian seafarers traveled in all known seas, from Greece and the Mediterranean lands to the lands of Europe and Asia. Persian ships were involved in trade, spying and the capture of territory by means of landing forces from the sea. Xerxes, the fourth leader of Persia (465-486 BCE)³ had far-reaching political ambitions and his ships sailed the seas, taking with them soldiers who captured large amounts of territory, primarily in southern Europe. His soldiers invaded Greece by land and fought the Greeks on many occasions. The most famous of these battles are Thermopylae, Artemisium and the maritime battle at Salamis.

The various kings of Persia established large and elaborate ports and they controlled the sea routes, while establishing the status of the Persian Gulf as a bridge between the two ends of the earth, between East and West. Persia's maritime ambitions reemerged during the reign of Nader Shah, who ruled from 1736-1747. After the Western nations refused to sell ships to Persia, Nader Shah decided to develop an independent shipbuilding capability and to establish for himself a significant fleet of warships. This fleet captured Bahrein in 1736 and ruled the Arabian Sea and the Strait of Hormuz.⁴

Until the Islamic Revolution in Iran in 1979, the Imperial Iranian Navy was insignificant and had no special regional importance. This fleet was almost entirely destroyed in its ports during the Second World War, as part of a joint Russian-British invasion of Iran. After the Second World War, the Iranian navy began to rebuild itself, primarily by acquiring small ships and hovercraft from the West. This buildup of power started to gain momentum in the early 1970s, with the intention of expanding the activity of the navy into the Indian Ocean and developing a strong navy. The renewed buildup of strength was based on the acquisition of large warships (frigates and destroyers) and

3 Haghshenass Fariborz, "*Iran's Asymmetric Naval Warfare*", The Washington Institute for Near East Policy (9/2008), 4.

4 Haghshenass Fariborz, "*Iran's Asymmetric Naval Warfare*" (9/2008), 5-6.

maritime aircraft (planes and helicopters) from Britain and the US. This process was cut short by the Islamic Revolution (1979).⁵

Iranian strategy following the Islamic Revolution

The Iranian Revolution began with a series of violent protests against the regime of the Shah that broke out in 1978. During the protests, many army personnel abandoned the Shah's army and joined the grassroots uprising, which continued until Khomeini and his forces had taken over the government institutions and the army. In February 1979, the uprising succeeded in toppling the regime of the Shah and it was replaced by the regime that, until the time of writing, has ruled Iran.⁶

The Iranian strategy, as formulated by the Iranian regime after the Revolution, rests on three main elements:⁷

1. The desire to transform Iran into a regional power, with the ability to project power throughout the Middle East and even beyond. The Iranian leadership feels that Iran must have global influence in every facet of life and in particular over all Muslims in the world. From the viewpoint of the regime, Iran is a regional superpower, both geographically and demographically, and controls the natural resources in the Gulf region. The projection of Iran's power beyond its borders is based primarily on "proxies", i.e. armed organizations under Iranian patronage which operate outside of Iran (such as Hezbollah, the Houthis and Hamas) and which enable Iran to project power beyond its borders in areas of strategic interest.
2. The ability to overcome and neutralize threats from inside and outside Iran: Iran has placed emphasis on upgrading its naval capabilities, its non-conventional capabilities and its long-term missile capabilities, based on the understanding that they will allow it to protect its economic resources (primarily oil and gas) and to deter its adversaries, and in particular the US and Saudi Arabia, and to persevere against them if deterrence fails. The implementation of this strategic element—namely the neutralization of threats from inside and outside Iran—rests on a number of basic principles which have been formulated by the Iranian leader:
 - **The people's war:** The fear of an armed invasion by its adversaries and the capture of its territory led to the principle of using the people as a force for resistance and guarding the homeland (later to be called the Basij force).

5 Stewart Richard A., "*Sunrise at Abadan: The British and Soviet invasion of Iran, 1941*", New York: Praeger.

6 Kirsch Ephraim, "Iran: Anatomy of a Revolution", *Maarachot*, vol. 268 (4/1979): 20-22. [Hebrew]

7 Eisensatdt Michael, "*The Strategic Culture of the Islamic Republic of Iran: Operational and Policy Implications*", **Middle East Studies MES Monographs No. 1**, Marine Corps University (8/2011): 3-6.

- A navy that operates using **guerilla warfare**: The buildup of the navy, which uses asymmetric tactics in the Persian Gulf and operates near the coast, as a complementary force to the regular navy which operates farther out to sea.
 - **“Soft” power**: Use of “non-kinetic” elements, such as deception, psychological warfare, etc., in order to increase Iran’s military power.
3. The desire for **independence in all facets of life** in Iran (economic, industrial, technological, etc.). This desire is based on the Iranian understanding that it is alone in the global battle and that it has no real partners or a superpower that will assist it.

The Revolutionary Guard

In the context of Iran’s strategic approach, the leader of the Revolution, Ayatollah Khomeini, issued a directive in May 1979 to establish a body whose goal is to preserve the ideological purity of the Revolution, to maintain internal security in the State and to prevent an uprising.

The body was named the Revolutionary Guard or ‘Pasdaran’ (or ‘Sepah’). Another of its functions, and a not insignificant one, is to act as a counterweight to the standing army, which was a remnant of the Shah’s regime and which the Islamic regime did not trust.⁸ In addition, the Iranian regime sought to create new military and civilian capabilities in order to deal with the transition processes in establishing the new order.⁹ The Revolution Guard was also given the responsibility to export the Iranian revolutionary ideology to the rest of the world.¹⁰

At the beginning, the Revolutionary Guard consisted of irregular infantry units, which totaled about 10,000 men. They had a relatively low level of training and were armed with only outdated light weapons.¹¹ The initial members were young, religious and mostly from the lower class. They were inspired by Khomeini’s ideology and his message, which they viewed as divine, and by the possibility of religious redemption from the new way, in which the end justifies the means, whether or not this involves violence.¹²

8 The period of the Shah’s regime in Iran is the period of the Pahlavi dynasty, during the years 1921-1979, which ended with the revolution and the establishment of the Islamic regime.

9 Takeyh Ray, “How Powerful is Iran’s Revolutionary Guard Corps”, Council on Foreign Relations, (6/2016), Retrieved from: www.cfr.org/iran/powerful-iran-revolutionary-guard-corps/p38009

10 For the text of the law establishing the Revolutionary Guard, see: Islamic Parliament Research Center, “Statue of the Iranian Revolutionary Guards Islamic Revolution” (9/1982) Retrieved from: rc.majlis.ir/fa/law/show/90595

11 Kam Ephraim, “From Terror to Nuclear”, *Maarhot*, 2004: 93. [Hebrew]

12 Takeyh R., “How Powerful is Iran’s Revolutionary Guard Corps”, 2.

The Revolutionary Guard navy

In 1984, the Revolutionary Guard navy was established. Its first operations involved amphibious missions on the coast of southern Iraq, in which landing craft delivered infantry forces and supplies.

In September 1985, the Revolutionary Guard navy was declared to be an independent fighting branch and it began to operate more aggressively and to carry out attacks using Chinese 'Stix' missiles on Iraqi vessels and even to operate against Iraqi commercial ships using missiles and rockets fired from launchers installed on the islands in the Persian Gulf and on oil rigs at sea.¹³

Despite the many attacks it carried out, the Revolutionary Guard navy was not a powerful force, due to its lack of weapons and vessels. Nonetheless, it managed in October 1987 to successfully execute a coordinated swarm attack against Saudi Arabia's gas fields. The attack was carried out as revenge for the murder of Iranian pilgrims in Mecca by the Saudi security forces (in July 1987), as well as the sinking of a minelayer by the US navy in September of that same year.

The Revolutionary Guard navy was in that year involved in numerous attacks on Kuwaiti and American oil tankers (including the use of mines), the most famous of which was the Bridgerton affair (in July 1987), in which an American tanker was damaged by an Iranian sea mine.¹⁴

At the end of the Iran-Iraq War, the Iranian leader had been convinced that the Revolutionary Guard navy had the power to carry out its missions, including the protection of Iranian shipping, control of the waterways in the Persian Gulf and confronting the enemy in that region.

This approach was first manifested in 1988 with a massive buildup of the Iranian navies, which was carried out on the instructions of the Iranian leader. This buildup included the acquisition of numerous defensive systems which facilitated defense and control in the Persian Gulf, including the closing and control of the Strait of Hormuz and including the passage of oil through it (which enabled it to achieve control and leverage over other Arab countries).¹⁵

13 Aryan Hossein, "Aggrandizement of Iran's Naval Threat on the Persian Gulf", CIRA Bulletin, Volume 13 No. 1, <http://www.cira-jira.com>, (3/1997): 30.

14 Haghshenass, "Iran's Asymmetric Naval Warfare", 4-11.

15 Aryan Hossein, "Aggrandizement of Iran's Naval Threat on the Persian Gulf", 28-31.

In order to achieve these goals, the Iranian ruler understood that Iran's two navies have a major role in this strategy. This buildup also included the creation of a radar network, which covers the length of the Iranian coast and whose goal is the detection of targets and the building of a uniform and integrative maritime picture for use by the two navies. Over the years, the use of unmanned vessels was added to the coastal control system. They are operated in coordination with the command and control centers along the coast, thus enabling detection at far distances and the confirmation of targets that are detected by the radar system.¹⁶

An example of the importance of the Revolutionary Guard navy's activities within the overall Iranian strategy can be seen a statement by an Iranian admiral in May 1988: **"Only non-conventional operations can compensate for our shortage in equipment and conventional weapons."**¹⁷

The Iranian admiral, like the rulers of Iran and the commanders of the navies, understood that this method of warfare, which was developed, exploited and upgraded during the Iran-Iraq War, is the only one that will allow Iran in a future conflict to confront the massive US navy in the Persian Gulf and the large Saudi navy, which possess naval and aerial superiority.

Another parameter taken into account by the Iranians in the development of asymmetric fighting capabilities was economic. The Iran economy, which was in poor shape, particularly following the Iran-Iran War, did not allow for the maintenance of the ships, aircraft and weapons of a conventional navy and didn't even allow for a significant naval buildup of power. The acquisition of fast and simple vessels that are cheap to acquire and to maintain allowed the Revolutionary Guard navy to build a significant force that could carry out its missions with high availability.

In order to fulfil the Iranian operational demands for control of the Persian Gulf in general and the Strait of Hormuz in particular, the Iranian ruler defined what is required from the Revolutionary Guard navy:¹⁸

- The ability to carry out quick and massive attacks on the enemy and quickly return to their place of concealment.
- A large number of anti-ship missiles of different types and on multiple platforms.
- Small high-speed boats, armed with rockets and/or missiles.
- High-speed platforms for the laying of mines.

16 Miller John, *"Iranian Maritime Improvements: Challenges and Opportunities"*, The International Institute for Strategic Studies, retrieved from: www.iiss.org.

17 Aryan Hossein, *"Aggrandizement of Iran's Naval Threat on the Persian Gulf"*, 33.

18 Haghshenass, *"Iran's Asymmetric Naval Warfare"*, 4-11.

- Submersible fighting capabilities using various types of submarines.
- Small and hard-to-detect semisubmersibles and unmanned vessels.
- Communication and coordination between all of the forces.
- Deception.
- Intelligence.
- High-level capability to disrupt the enemy's communication, command and control abilities.
- Offensive initiative.
- Avoiding direct contact between the Iranian naval forces and those of the US navy.
- The need to protect vessels from aerial attack, with emphasis on the US navy.¹⁹

In the analysis of the operational demands on the Revolutionary Guard navy, account was taken of a number of factors that influence the character of asymmetric activity in the Persian Gulf:²⁰

- **Geography:** the width, density and depth of the Strait of Hormuz, which restricts the maneuvering of vessels and facilitates the closing of the strait from the coast by means of land-to-sea missiles. The geographic dimension of the Iranian coast, namely its many inlets and islands, make it possible to conceal and construct small and hard-to-detect military bases.
- **Sea routes** that pass through the Gulf. More than 90 percent of the oil being shipped by tanker from the Gulf to the rest of the world passes through the straits. The blockage of these sea routes has serious global ramifications for the energy sector and the price of oil.²¹
- Along the coast of the Persian Gulf there are **three large naval bases** (of the regular navy); another three bases located on islands; and more than sixty seaports and small inlets, all of which require protection (see Figure 1).²²
- **Chokepoints** along the Gulf which make it possible to carry out attacks on the adversary's naval forces while he is restricted in his ability to maneuver and avoid attack.
- **Meteorological and hydrographic parameters** (high temperature and humidity) have an effect on the adversary's fighting systems (with emphasis on detection capabilities) which were not intended for use under such conditions.
- **Economic** effects and primarily the conveyance of oil from the Gulf to the rest of the world.

19 Cordesman A., "Iran's Military Forces in Transition", Praeger Westport London (1999): 207-208.

20 Haghshenass, "Iran's Asymmetric Naval Warfare", 4-11.

21 Nader Alierza, "Will Iran Close the Straits of Hormuz?", retrieved from: <http://www.rand.org/blog/2012/10/will-iran-close-the-straits-of-hormuz.html>

22 Kaplan Robert D., "Asymmetry at Sea - What War with Iran in the Gulf Could be Like", 10/2008, retrieved from: www.theatlantic.com/magazine/archive/2008/10/asymmetry-at-sea/307093.



Figure 1: Main seaports in the Persian Gulf²³

The Revolutionary Guard Navy has about 20,000 men, including a unit of about 5000 marines whose role it is to attack the enemy's ports and its oil and energy facilities.

The Revolutionary Guard navy has five command centers and is distributed among about eight permanent bases and at other temporary sites along the coast and the Strait of Hormuz, in which are located missile and torpedo launchers that are intended to block the sea routes when desired.²⁴



Figure 2: The naval command posts of the Revolutionary Guard²⁵

23 Office of Naval Intelligence, "Iran's Naval Forces", Retrieved from: www.oni.navy.mil/Intelligence_Community/docs/iran_navy_forces.pdf. Accessed August 10th, 2016. These seaports are for both civilian and military use.

24 Cordesman A., Kleiber M. "Iran's Military Forces and Warfighting Capabilities", 74-75.

25 <http://thearkenstone.blogspot.in/2014/07/irgc-n-naval-regions.html>. These seaports are for both civilian and military use.

The Revolutionary Guard navy operates hundreds of high-speed craft, which are equipped with a variety of weapons, some of which are very sophisticated (such as sea missiles of various types and torpedoes), including sea mines, rockets of various diameters and relatively simple weapons. In addition, it has missile launching vehicles that can fire land-to-sea missiles and which are camouflaged as innocent civilian vehicles and are highly mobile. This makes it possible to deploy them near the coast and to fire large quantities of missiles at targets at sea.²⁶

The regular Iranian navy

In parallel to the activity of the Revolutionary Guard navy, Iran also has a regular navy, which is under the command of the Iranian General Staff. The navy's operations are similar to those of a traditional navy.

Iran views its naval force as a main element in dealing with its adversaries. The regular navy plays a central role in Iran's ability to project power, particularly in the Indian Ocean and in the Arabian Sea, with emphasis on confronting enemy navies at long distances from Iran.²⁷

The role of the regular navy is conventional protection of Iran. On Khomeini's instructions, the regular army was preserved and its main function at that time was to defend against the invasion of the Iraqi army in 1980.

Following are the tasks of the regular Iranian navy:²⁸

- Protection of the Iranian coast, the oil facilities and infrastructures that are dispersed in the sea, cargo being loaded/unloaded in the Persian Gulf, in the Gulf of Oman and in the Caspian Sea, together with the Revolutionary Guard navy.
- Supervision and monitoring of maritime traffic in the Persian Gulf, in the Strait of Hormuz, in the northern Gulf of Oman and in the Caspian Sea, as well as protection and recapture if necessary of the islands in the Persian Gulf.
- In the case of defense, the achievement of control of the Strait of Hormuz, together with the Revolutionary Guard.

26 Nader Alierza, "Will Iran Close the Straits of Hormuz?", retrieved from: <http://www.rand.org/blog/2012/10/will-iran-close-the-straits-of-hormuz.html>. Accessed 30th April 2016

27 Cordesman A. H., "Iran's Military Forces in Transition", Praeger Westport London (1999): 186-187.

28 Harmer Christopher, "Iranian Naval and Maritime Strategy", Institute for the Study of War, **Middle East Security Report 12** (6/2013).

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- Coastal control tasks: prevention of smuggling and illegal immigration in Iran's territorial waters and in the forward sections of the Persian Gulf and the Gulf of Oman.
 - Projection of naval power, including the ability to fight at long ranges.
 - Diplomatic tasks accomplished by visits to the ports of allied countries.

The Iranian regular navy has about 20,000 men of which about 5,000 are crewmembers. Furthermore, it includes two brigades of marines (about 2,600 men) and an aerial force (including about 2,000 men).²⁹

The navy includes two main flotillas: the first constitutes the navy's main force and is located at Bandar Abbas where Iran's main warships anchor.

The Iranian intention in setting up their main base at this location was on the one hand the large distance from Iraq (to prevent aerial attacks) and on the other hand the relatively close proximity of the base to the Strait of Hormuz³⁰ which facilitates a relatively rapid response against threats from Saudi Arabia and from the Arabian Sea.

The regular Iranian navy has three Kilo-877 submarines (which were acquired from Russia in the late 1970s), three frigates, six corvettes, 11 missile boats, minesweepers, 13 amphibious ships (for landing the brigades of marines), six aerial patrol boats and 11 armed helicopters.

Most of the ships in the regular Iranian navy went into service during the late 1960s and early 1970s, prior to the Iran-Iraq War and as a result they are in poor condition.³¹

Although the Iranian regular navy has a large number of vessels, it is Iran's understanding that relative to its adversaries, the navy is inferior both quantitatively and qualitatively. This inferiority is a result of the fact that since the end of the Iran-Iraq War the focus has been on the buildup of the Revolutionary Guard, rather than the regular navy, and therefore its vessels, as well as its weaponry, are old and in poor condition.³²

29 Cordesman A. H., Kleiber M. "*Iran's Military Forces and Warfighting Capabilities*", Praeger Security International (2007): 120.

30 Cordesman A. H., "*Iran's Military Forces in Transition*", 191.

31 Cordesman A. H., Lin Aaron, "*The Iranian Sea-Air-Missile Threat to Gulf Shipping*", CSIS Center for Strategic & International Studies (2/2015): 19-32.

32 Cordesman A. H., Lin Aaron, "*The Iranian Sea-Air-Missile Threat to Gulf Shipping*", 13.

Only in recent years, and after decades of neglect, has the regular navy been given a budget that allows it to build up its force and to acquire new vessels (including submarines and aerial defense systems).³³



Figure 3: Firing of an Iranian 'Noor' missile from a Tir-2 missile boat (produced in Iran)³⁴

The relations between the Iranian navy and the Revolutionary Guard navy

At the beginning of 1987, the regular Iranian navy tried to establish a joint command with the Revolutionary Guard navy, with the intention of controlling its activities; however, the ambitious Revolutionary Guard navy refused and continued to operate independently, with the support of the regime which understand that the activities of the Revolutionary Guard navy serve its goals while the regular navy does not have the ability to carry out operations in the Persian Gulf at the regime's request.

Such joint command did come into being in January 1992 and its goal was coordination of Iran's naval defense efforts. Due to political infighting between the groups, the joint command was redivided in September 1997.

In 2000, a joint command between the regular navy and the Revolutionary Guard navy was again established at a base near the Strait of Hormuz. The consolidation of the commands was carried out on the instructions of the regime in order to facilitate coordinated operations of the two navies. The Revolutionary Guard navy continued its activities in the Gulf, while accumulating operational experience; meanwhile the regular navy, which is building up its strength for a future war, was hardly active and

33 Iran Submarine Capability", retrieved from: <http://www.nti.org/analysis/articles/iran-submarine-capabilities> (8/2015).

34 From: <http://spioenkop.blogspot.co.il/2016/08/photo-report-syrian-arab-navy.html>

accumulated experience only in exercises. The peak of the regime's desire to unify the commands was reached in a joint exercise in November 2008, in which more than 35 ships and submarines from the two navies practiced warfare scenarios

Thus, the regular navy has been forced to compete (both politically and organizationally) with the Revolutionary Guard navy—and with its prestige, its power and its activity in the Persian Gulf region.

Until today, there is major tension between the two navies and despite the competition over limited resources, the waste in the acquisition of their equipment and in their operations, the two forces operate separately and without any significant coordination at any command level. The two navies and in particular the Revolutionary Guard, are adamantly opposed to the merging of headquarters and forces.³⁵

The competition between the navies, the separate acquisitions and buildup of power and the operation of the forces without coordination limits the ability of Iran to improve its military performance and cohesion and perhaps even its ability to realize its regional ambitions. Nonetheless, the regular navy is benefiting from the development of weaponry by the Revolutionary Guard, which it is installing on its vessels



Figure 4: Attack boat of the Revolutionary Guard navy³⁶

Conclusion

Iran views the waterways in the Strait of Hormuz and the Persian Gulf as important assets that enable it to realize its ambitions as a regional superpower. The Iranian naval strategy includes the asymmetric component of naval warfare, which is carried

35 Himes Joshua, "Iran's Two Navies - A Maturing Maritime Strategy", Middle East Security Report, 10/2011, 6-8.

36 Source: Iranian News Agency: ERA <http://en.alalam.ir/news/1866312>

out by the Revolutionary Guard navy. Each of the organizations has different roles and missions, which combine together into an overall strategy that provides defense of the Iranian coast, the Strait of Hormuz and Iran's essential infrastructures by means of the Revolutionary Guard, on the one hand, and the projection of power and activity far from Iran's shores, on the other hand.

As part of the grand strategy and the naval strategy, according to the declarations by the commander of the Iranian navy in 2016, Iran has an ambition to build permanent seaports in the Gulf of Aden and in Syria. To date, it has not realized these ambitions and a number of months later the intention to build a permanent seaport in Syria was denied by the deputy commander of the Revolutionary Guard.

The regular Iranian navy would very much like to increase its influence and its operational range, not only in order to realize Iranian strategy but also in order to achieve prestige in the eyes of the regime as its long arm that is able to realize its vision, even though today it is for the most part inferior to the Revolutionary Guard navy.

The increasing influence of Iran in the naval domain has a number of implications for the State of Israel:

1. The ability of Iran to control the Strait of Hormuz and to close it any time it wishes constitutes a major threat to the global economy and the supply of oil. This ability is used as a bargaining chip in the nuclear agreement, and especially with respect to Europe.
2. The increased Iranian presence in the Red Sea and in the Mediterranean, including Syria, which has a number of ramifications:
 - On the economic level, this presence supports Iran's maritime trade (despite the embargo placed by President Trump on Iran) and even more so if the nuclear agreement with Iran is renewed.
 - On the military level, Iran can assist in the rehabilitation and reinforcement of the Syrian navy and the reinforcement of the naval forces of Hezbollah and Hamas, through the unconstrained supply of weapons, infrastructure and training.
 - On the intelligence level, more intensive gathering of intelligence on the State of Israel from the sea and the carrying out of commando operations and the gathering of intelligence, whether on a routine basis or during battle (by means of, for example, the landing of soldiers from cargo ships or other vessels off the coast of Israel).

The Naval War against the Houthis in Yemen

Eyal Pinko

Background

The Shiite uprising in Yemen against the Sunni regime under President Ali Abdullah Saleh began in July 2004 and was led by the Houthi organization, a militant group that was created by Hussain badar din al Houthi, the leader of the Shiite-Zaidi faction. This Shiite faction accounts for about one-third of the population in Yemen.

The Houthi rebels claim that the goal of the rebellion is to protect the Shiite Zaidi population from discrimination and the aggression of the current regime in Yemen, while the Sunni regime, which is aligned with Saudi Arabia, claims that the Houthi organization is essentially trying, under the patronage of Iran, to overthrow the government and to establish an Islamic Shiite state.

The fighting has continued since June 2004 and is taking place in all regions of the country. Up until the time of writing, the fighting had exacted a high price in lives, with thousands of civilians and soldiers killed on both sides.

The Houthi rebel organization, which is characterized by an extremist Shiite ideology and has close connections to the Iranian regime and even with Hezbollah, views the Sunni countries, including Egypt and Saudi Arabia, as enemies, as it does the Western countries, and in particular the US and Israel.

The Houthis are equipped with Iranian weapons and they are also trained by Iran. They are fighting against the Sunni regime in Yemen, against Saudi Arabia and against US forces in the region, in a number of contexts and at various ranges. This is manifested in ground attacks and battles, suicide attacks in crowded locations and mosques, the operation of unmanned vessels and even the use of ground-to-ground and ground-to-air missiles, which have been fired multiple times at cities and targets in Saudi Arabia and at aircraft of the Saudis and the Americans.

The Houthi organization has a naval force that is equipped with weaponry supplied by the Iranians and utilizes tactics similar to those of the Revolutionary Guard navy against the US and Saudi vessels in the vicinity of the Bab el Mandeb Strait.

The naval arm of the Houthi organization constitutes a means of creating pressure and power projecting (as in the case of the Iranian navy in the Hormuz Straits) with the goal of closing the Bab el Mandeb Strait, a choke point and a critical passage for world trade and the transport of goods and petroleum from Asia and Africa to Europe.

As a counterweight to the Houthi activity at sea, the navies of Egypt, Saudi Arabia and the United Arab Emirates and a coalition of vessels from the US, France and Australia are working in collaboration in the Bab el Mandeb Strait with the goal of creating a naval blockade on the Houthi rebels. The blockade is intended to prevent the supply of weapons and other goods from Iran.

This chapter will try to shed light on the naval activity of the Houthi rebel group in Yemen and naval warfare taking place in the area, as well as their implications for Israel.

The Naval Domain

Naval operations constitute an important component in the Houthi rebels' strategy in its war against the Yemenite government and its allies, i.e. the Saudis and the Egyptians. The Houthis' fighting doctrine at sea is based on Iranian asymmetric tactics, which emphasize the importance of naval operations as a means of achieving international pressure and the ability to affect trade and the global economy. This is accomplished by means of a naval blockade that blocks the passage of ships, goods and oil, at locations that constitute choke points on international trade routes.

Yemen lies on the Bab el Mandeb Strait, which is a global chokepoint, one of nine worldwide, through which numerous vessels from Asia and Africa pass on their way to the Mediterranean by way of the Suez Canal.

The Houthis, who are utilizing Iranian tactics, are operating at sea to essentially impose a naval blockade, which is confronted by a broad coalition of countries, including Egypt, Saudi Arabia, the United Arab Emirates, the US, France and Australia. Under the authority of UN resolutions, they are, on the one hand, using offensive tactics to prevent a naval blockade of the Bab el Mandeb Strait by the Houthi naval force and, on the other hand, are seeking to create their own naval blockade in order to prevent the supply of arms from Iran to the rebels.

The efforts by the Houthi rebels to create a naval blockade include the laying of naval mines near the Bab el Mandeb Strait, the use of naval commando tactics, the firing of land-to-sea missiles and the use of unmanned vessels which are remotely controlled and which are used to attack ships operating in the region.

As mentioned, Iran's supply of weapons to the rebels is transported by sea. In December 2017, US naval forces stopped an "innocent" Iranian fishing vessel near the coast of Yemen, which was carrying a large quantity of weapons destined for the Houthi rebels, including about 1500 Kalashnikov assault rifles, about 200 RPG launchers, about 20 heavy machine guns and more.

In February of that same year, the Australian navy stopped a similar vessel that was carrying an even larger quantity of weapons and in March 2017, the French navy also stopped a shipment of weapons that included anti-tank weapons and other advanced weaponry.¹

With respect to the use of weapons at sea, in late September 2018 the Saudi navy detected an unmanned vessel about 45 km off the coast of Yemen.² The vessel, which belonged to the Houthi rebels, was guided by remote control by means of satellite navigation; it was driven by a powerful engine and carried a number of wooden boxes on its deck which contained hundreds of kilos of explosives.

This is not the first time that the use of an unmanned vessel by the Houthi rebels has been documented. In January 2017, the Houthis carried out a coordinated attack on a Saudi warship using three remotely controlled unmanned vessels.³ One of the unmanned vessels rammed the hull of the Saudi ship, blew up and caused the deaths of two Saudi crew members and the injuring of three more.



Figure 1: The unmanned vessel captured in September 2018⁴

In October 2016, a naval force of Houthi rebels attacked a Saudi ship by means of Iranian Noor missiles (the Iranian name for the Chinese C-802 missiles which are produced in Iran), which were fired from a land-based launcher. The attack disabled the ship.

- 1 Denis Simon. Proof of Iranian Missiles Launched by Houthis in Yemen (14/12/2017), retrieved from: <https://founderscode.com/proof-iranian-missiles-launched-houthis-yemen/>
- 2 Jeremy Binnie, New unmanned bomb boat found off Yemen (14/9/2018), retrieved from: <https://www.janes.com/article/82987/new-unmanned-bomb-boat-found-off-yemen>
- 3 Reuters, Yemen Houthi Rebels Attacked Saudi Warship (30/1/2017), retrieved from: <https://www.tesfanews.net/yemen-houthi-rebels-saudi-warship-attack>
- 4 <https://www.janes.com/article/82987/new-unmanned-bomb-boat-found-off-yemen>



Figure 2: The Saudi ship that was damaged by a missile fired by the Houthi rebels⁵

Two days after the attack on the Saudi warship, at the beginning of October 2016, the Houthi naval force attacked the USS Mason with a coordinated attack utilizing two missiles, apparently of the same type.⁶ The defensive systems on the American warship successfully disrupted and intercepted the missiles while in flight and prevented any damage to the ship. The American ship apparently used ESSM anti-missile missiles and SM2 missiles and advanced Nulka decoy rockets.⁷

The American naval force identified the coastal radar which had apparently detected the target at sea and had conveyed the data to the rebel missile launcher. It was attacked by missiles from the American ship and destroyed.⁸

About a year after the series of attacks on the Saudi and American ships, the Houthis unveiled Iranian Mandib-1 missiles (the Iranian export version of the Noor missiles which take their name from the Bab el Mandeb Strait) in their possession.

It is not known how many missiles the Houthi organization possesses.

- 5 <https://defence-blog.com/news/uae-media-releases-photo-of-hsv-2-swift-it-was-attacked-by-a-c-802-missile.html>
- 6 Tesfanews, Houthi rebels fire missiles at US warship in Red-sea: navy (10/8/16), retrieved from: <https://www.tesfanews.net/houthi-rebels-fire-missiles-us-warship-red-sea>
- 7 BIMCO, Intelligence Report: Update on Houthi missile attacks off Yemen, and US strikes against Houthi radar sites (13/10/2016), retrieved from: http://www.mast-security.com/i/Downloads/MAST_Intrep_attack_on_USSMASON_Update1.pdf
- 8 Tesfanews, A New Danger Rises in the Red Sea (8/10/2016), retrieved from: <https://www.tesfanews.net/houthi-new-red-sea-danger>



Figure 3: The Iranian Mandib-1 missile⁹

The Houthi rebels are not operating only by means of coastal missiles but are also using naval commando forces, which have two main missions. The first is to carry out attacks on vessels from high-speed boats and to utilize light weapons, such as anti-tank missiles (against ships), RPG rockets and machine guns (as in the case of Iranian tactics).

Another mission assigned to the naval commando force is to lay naval mines in the Bab el Mandeb Strait and near the coast. The mines discovered in late 2017 were similar to the Sadaf floating mines which are in use by the Iranian Revolutionary Guard and are presented during the annual exercises of the Revolutionary Guard naval forces. These naval mines can be used individually (like the one in the picture below) or as a network of mines, which are connected one to the other and which are detonated one by the other in a chain explosion when they come in contact with a ship.



Figure 4: A naval mine discovered on the Saudi coast¹⁰

9 <https://twitter.com/WithinSyriaBlog/status/927549276049330176>

10 <https://www.thebaghdadpost.com/en/Story/17086/Underwater-mines-planted-by-Houthis-off-Yemeni-coast-dismantled>

Building of a maritime picture for the detection of ships operating in the region

According to various American assessments, the Houthi rebels are using advanced measures to build a maritime picture, including a combination of mobile and fixed naval radar, which are also apparently supplied by Iran, and identification data from the Automatic Identification System (AIS)¹¹ which makes it possible to differentiate between civilian and military vessels (the latter do not usually operate AIS).¹² In addition, the Houthi rebels operate seemingly innocent fishing vessels that report targets at sea to the coast.

Implications

The naval war against the Houthi rebels, though it is being waged far from Israel's shores, has wide-ranging implications for trade to and from Israel and in gaining insight into the use of naval forces by Iran and by the organizations that they support, train and equip, such as Hamas and Hezbollah.

With regard to the former, maritime trade between Israel and Asia is an important component in Israeli foreign trade and accounts for about one-quarter of its total imports and exports.¹³ This trade travels by way the of Red Sea, with only a small proportion carried by ships flying an Israeli flag. Land-to-sea missiles and naval mines used by the Houthi rebels constitute a threat to the freedom of passage in the Red Sea in general and to Israeli ships in particular, as can be seen from the map showing the range of C-802 missiles, particularly when Israeli ships use identification means (the AIS) which enable their identification as Israeli ships or as having Israeli ownership.

In this context, it is worth quoting the words of Prime Minister Benjamin Netanyahu that "Israel will be part of a coalition to prevent Iran from blocking the shipping lanes through the Red Sea."¹⁴

11 The system is operated automatically and enables the identification of a ship at sea by means of a unique identification number for every vessel, as well as additional information about it. The system is operated according to global guidelines and standards. The system makes it possible to observe any ship (displacement of over 300 tons) at sea at any given moment and all of its details (nationality, location at sea, etc.) by means of Internet sites or even using an app on a cellular phone.

12 BIMCO, Intelligence Report: Update on Houthi missile attacks off Yemen, and US strikes against Houthi radar sites.

13 Central Bureau of Statistics, Foreign Trade – Goods, 2017 http://www.cbs.gov.il/www/presentations/16_18_008maznis.pdf

14 <https://www.haaretz.co.il/news/politics/1.6338303>



Figure 5: Range of the C-802 missile possessed by the Houthi organization¹⁵

Second, by observing the equipment, weapons and tactics of the Houthi rebels at sea Israel will gain insight into the tactics and weapons of the Hamas and Hezbollah naval forces, which are similar in nature to the Houthi force in that they rely on Iranian asymmetric tactics and Iranian weapons.

By observing the operations of the Houthi naval forces, it is possible to identify a number of elements:

1. The Iranian supply of weapons (including ground force weapons) by sea by means of seemingly innocent vessels. This Iranian method of operation was also revealed in the seizure of weapons-carrying vessels such as the *Karin A*, the *Francop* and *Victoria*, among others during the last decade.
2. The building of a maritime picture, which is based on a number of capabilities, including mobile and fixed coastal radar, seemingly innocent fishing vessels that report on targets in their vicinity and use of AIS data, as means of detecting targets but also of determining whether they are civilian or military. What this means is that civilian ships flying the Israeli flag, as well as ships that are listed in publicly available international registries as Israeli-owned (by means of subsidiaries in other countries), are liable to be targets for missiles if they are identified. Military

15 <https://www.tesfanews.net/houthi-new-red-sea-danger>

vessels, which do not operate AIS, will be identified as such even they are not explicitly identified as Israeli military vessels.

3. The use of land-to-sea missiles of various types and of various ranges enables the hermetic closure of the Bab el Mandeb Strait.
4. Rapid and coordinated attacks ("sting") by means of high-speed boats using light weapons. Defending against such attacks is complicated even if the target vessel has advanced defensive systems (since, for example, it is difficult to defend against a barrage of RPG rockets from different directions).
5. Use of naval mines, whether they are dispersed or in a network (in which one can detonate the rest). This enables the coverage of a large area and the ability to harm not only vessels that hit a mine but also vessels in its vicinity, if there are any.
6. Intensive use of unmanned vessels that are remotely controlled and navigated by means of satellite and which carry on board explosive material. A number of unmanned vessels have been used in coordinated attacks. It is possible that in the future, unmanned vessels will be used against a maritime target simultaneously with the firing of land-to-sea missiles.

Conclusions and Recommendations

The fighting in Yemen against the Houthi rebels, which began in 2004, appears to be far from over. And since this is the Middle East, it is impossible to foresee how it will end.

Not only is the military confrontation continuing but Iran views this theater as a platform from which to attack its Sunni adversaries—Egypt, the United Arab Emirates and Saudi Arabia—and even the US forces that are deployed in the region. Iran, which supports the rebels, is continuing to fan the flames by means of the Kuds force of the Revolutionary Guard and by means of the supply of weapons, advice, infrastructure, funding and training (which is carried out in Iran).

Since Hezbollah is occupied by the fighting in Syria and its deployment in Lebanon, Iran is finding it difficult to test new weapons and tactics, particularly at sea. Therefore, it appears that Yemen is being used for testing Iranian weapons, particularly naval weapons, with emphasis on unmanned vessels and their operation.

Following are a number of recommendations that are based on the above and on the implications of what has been presented:

1. First priority should be given to building and maintaining an up-to-date intelligence picture of what is happening in the region: Iranian involvement, the weapons and infrastructure being supplied by Iran and also the Iranian-Houthi tactics which are

being developed and applied in the region. The urgent need for intelligence is a result of a number of needs:

- To understand the developments in the region and the level of the threat to Israeli freedom of passage (civilian and military), as part of the identification of trends and the intentions of the Yemenite organization to act against Israel or to assist Iran or Hamas and Hezbollah.
 - To Identify Iranian development of technologies and weapons in order to construct a response.
 - To understand the asymmetric tactics which are likely to be employed by Hamas and Hezbollah against the navies of Israel and other Western countries who are operating in the relevant theaters.
2. To examine the capability of the Israeli navy in the detection, identification and disruption of unmanned vessels and their operation.
 3. Examining the ability of the Israel navy to detect and neutralize a network of mines, whether floating, submerged or on the seabed.
 4. Refraining to whatever extent possible (and according to the decision of the International Maritime Organization (IMO)) from the use of Israeli identification in the AIS of ships operating in this region.
 5. Examining the feasibility of installing means of mine detection and neutralization and means of disrupting missiles on civilian Israeli ships operating in the region.

Strategic Implications of China's "Belt and Road" Initiative in the Eastern Mediterranean and the Red Sea for Israel and its Allies

Eyal Hayut and Ehud Gonen

Summary of a discussion with the participation of a joint team of experts from Israel and the US

A joint US-Israeli team of experts convened at the University of Haifa on August 22-23, 2018 with the goal of discussing maritime security in the Eastern Mediterranean. The team's work is part of the activity of a consortium established in 2016 between the Maritime Policy & Strategy Research Center at the University of Haifa and the Hudson Institute which is located in the US. This was a follow-up to the discussions of a joint team of experts on security and energy issues which took place in 2016 and which produced a joint report published in September 2016 on security and energy in the Eastern Mediterranean.

Heading the team was Professor Shaul Chorev, the head of the Maritime Policy & Strategy Research Center, and Douglas Feith, a researcher at the Hudson Institute and former Undersecretary of Defense for Policy. In addition, the team included General (res.) Ami Ayalon, former commander of the Israeli navy; Admiral (ret.) Gary Roughead, former commander of the US Navy and currently a research fellow with the Hoover Institute at Stanford University; Dr. Seth Cropsey, a researcher at the Hudson Institute and former Deputy Undersecretary of the Navy; and Vice Admiral (ret.) Jack Dorsett, former Director of Naval Intelligence.

Among other topics, the Chinese government's "Belt and Road" Initiative¹ was discussed at the meeting from a global perspective and in particular with respect to its implications in the region of the Eastern Mediterranean and the Red Sea. The main findings and highlights of the discussion are presented below.

The joint team of experts emphasized that China is operating with the goal of becoming a global military power and has shown its willingness to **challenge American control of the open seas**. This can be seen in its massive shipbuilding effort, the inclusion of an aircraft carrier and a fleet of submarines in its navy, the development of missile capabilities, carrying out operations far from Chinese waters, and the establishment

1 The Belt and Road Initiative (BRI) is a large-scale Chinese geopolitical and economic initiative which encompasses more than 60 countries, with financing on the scale of about one trillion dollars. The initiative includes a land component ("a belt for economic cooperation") and a maritime component ("a 21st century maritime silk route"). For further details, see the relevant chapter in the Maritime Strategic Evaluation for Israel 2017-2018.

of its first military base outside its borders – in Djibouti. The Chinese Navy has shown determination in challenging the US in the East China Sea and in the South China Sea.

China's global maritime strategy is closely linked to the "Belt and Road" Initiative and in particular its maritime element – the Maritime Silk Route. Its influence on the ports in Israel is part of this global strategy, which includes the achievement of influence in major port facilities – from the east coast of China, by way of the ports in Southeast Asia (such as Malaysia and Myanmar), South Asia (such as Sri Lanka, Bangladesh and Pakistan), East Africa (such as Tanzania, Sudan and Ethiopia) and finally the ports of Southern Europe in the Mediterranean – with the goal of pursuing China's national interests.

These Chinese investments are to be viewed as a political-economic initiative that is managed personally by President Xi himself and apparently as part of a national strategy that includes military-civilian integration, i.e. double use (military/civilian) of national infrastructures. In this context, it is worth quoting President Xi: "The ideas, decisions and plans of military and civilian **integration must be fully implemented in all fields** of national economic development and defense building."²

- The Chinese government uses commercial companies under government control (such as COSCO Shipping Lines and China Merchant Port Holdings) in order to acquire and operate commercial ports. According to rough estimates, about one-tenth of the port infrastructures in Europe are already under Chinese influence. In addition to a port in Israel (Haifa), China is acquiring and operating terminals and ports throughout the Mediterranean, including in Egypt, Algeria, Turkey, Italy, France and Spain.
- In a report published by the US Department of Defense in 2018 on China's military power, it was stated that "**[China's] military modernization program has become more focused on investment and infrastructure** whose goal is to support a range of missions beyond the Chinese periphery."

In the Eastern Mediterranean, the Sixth Fleet has significantly cut back its forces and operations since the end of the Cold War. The Sixth Fleet is only a shadow of what it was in the past and this fact is providing an incentive for the entry of superpowers and countries from outside the region. Thus, Russia has expanded its naval and aerial bases in Syria, while Iran and China are also seeking to gain influence in the region and are building up their capabilities accordingly.

2 Xi calls for deepened military-civilian integration (March 12, 2018).
http://www.xinhuanet.com/english/2018-03/12/c_137034168.htm

Given the limited resources of the US Navy in the region, maritime cooperation with Israel is becoming increasingly necessary and valuable. Such cooperation can include the pooling of resources, the use of the port of Haifa as a home port by American ships, cooperation between the defense industries and other activities.

It is worth mentioning the words of Admiral (ret.) Gary Roughead, former commander of the US Navy, who stated at the meeting that in principle he supports cooperation and joint projects between the US and Israel in the maritime domain to a much greater extent than in the past. However he also added that:

Israel is working itself out of such cooperation because of the Chinese significant presence and role in Israel's ports and the infrastructure that will be in place there. If asked whether the U.S. should forward deploy U.S. Navy ships in Haifa port, which will be operated by the Chinese, I would recommend against that. The Chinese port operators will be able to monitor closely U.S. ship movements, be aware of maintenance activity and could have access to equipment moving to and from repair sites and interact freely with our crews over protracted periods. Significantly, the information systems and new infrastructure integral to the ports and the likelihood of information and electronic surveillance systems jeopardize U.S. information and cyber security. These factors might not preclude brief port visits, but it would preclude homeporting and other protracted projects and initiatives.

The Shanghai International Port Group, a Chinese company, is expected to begin operation of the new port—the Hamifratz port—in Haifa in 2021 for a period of 25 years. Another Chinese company, the China Harbor Engineering Company, is building the Hadarom port in Ashdod. At least in the case of the port of Haifa, there is still time for the government of Israel to carry out a reevaluation of the national security impact of the Chinese presence in the port. Such an evaluation may lead the government to decide that changes are needed in the current arrangements. Such an evaluation is urgently needed and should also take into account the viewpoint of the US administration.

At the same time, it would not be correct to think of China only in terms of an adversary. Despite its pro-Arab stance, China is also a major trading partner of the US and Israel and makes significant investments in the Israeli economy, including in the hi-tech sector, which is in addition to its large-scale activity in the domain of infrastructure.

The US is currently amending the Exon-Florio Law, which established the Committee on Foreign Investment in the United States (CFIUS), whose goal is to determine whether planned foreign investment in the US is liable to constitute an unreasonable risk to US national interests. The Committee includes representatives of the White House, the State Department, the Department of Defense, the Department of Commerce and the

Department of Justice, as well as the intelligence community and other authorities. There is no analogous committee in Israel and it appears that the circumstances call for one to be created. It is important that this be a government body or an inter-ministerial committee which will take into account all national security aspects of direct foreign investment and in this case the fact that Chinese operation of the Hamifratz port in Haifa is liable to reduce American willingness to cooperate with Israel in the maritime domain.

Recommendations

1. While the Chinese policy of building and operating ports all over the world has an economic motive, it also has political and military aspects and is part of the Chinese approach of integrating military and civilian infrastructures. This should be taken into account when awarding tenders to Chinese companies.
2. Israel should define the desirable extent of Chinese involvement in the Israeli economy, while maintaining Israel's security interests.
3. There is currently no formal inter-ministerial process in Israel that examines the national security aspects of foreign investment in the Israeli economy, in addition to its commercial aspects. It is recommended that investments of a certain size and in certain sectors be examined as part of an inter-ministerial process, which will be managed by the National Security Council.
4. The strategic developments in the Eastern Mediterranean are making cooperation with Israel more necessary and more valuable for the US Navy, although the operation of the Hamifratz port (next to the port of Haifa) by SIPG, a Chinese company, starting in 2021, will hinder or even prevent such cooperation.
5. Israel needs to reevaluate the contract for operating of the Hamifratz port in Haifa from a national security perspective and to make any necessary changes. This will avoid or at least mitigate the risks that will likely be an outcome of the contract.

The Activity of the Russian Navy in 2018 the Middle East

Ido Gilad

Background

During 2018, the Russian navy reinforced its presence in the Eastern Mediterranean and the Black Sea. This can be seen primarily in the buildup on the Syrian coast in the area of the Port of Tartus. The acceleration of activity in the Eastern Mediterranean in parallel to the continued fighting in Syria reached a peak in September 2018, particularly following the downing of a Russian spy plane over the Mediterranean. In the Black Sea, Russia continued to strengthen its hold on the Crimean Peninsula. The inauguration of the Crimea Bridge by Putin (in May 2018) reintroduced the maritime front into the conflict between Russia and Ukraine. This is after Russia reneged on previous agreements reached in 2003 with regard to the freedom of passage through the Kerch Strait under the completed Crimea Bridge – the entrancement to the Sea of Azov. This tension has the potential for escalation and the creation of an active front between Russia and Ukraine, particularly since the latter has recently received the support of Western and NATO nations. On November 25, 2018, Russia stopped a tug accompanied by two gunships of the Ukrainian navy, claiming that it was a provocation as they refused to stop and pass an inspection. The Russians fired on the vessels, injuring two seamen, and rammed the tug. The Vessels are being held at the Russian naval base in Kerch and their crews were imprisoned for two months in Russia. The Russian move is part of its occupation of Crimea since 2014 and evolved a Ukrainian declaration of an emergency alert for 30 days. Russia was condemned worldwide, and it appears that the situation will raise the level of escalation. The advantages of Russian control at two points of 'forward deployment'—the ports of Tartus and Sevastopol—will allow Russia to strengthen the maritime connection between them and will reduce constraints on vessels under the Russian flag while passing through the Kerch, Bosphorus and Dardanelles straits (Figure 1).

Another global focus of attention for the Russians is the Northern Passage along the northern coast of Russia. The Russians expect that global warming will facilitate the exploitation of natural resources in this region. The possibility is also being considered of using the Northern Passage—once the ice has melted in the future, or already at present, as ice has become thinner—which will make it possible for Russian icebreakers to create a passage for shipping. This route has been called the “Russian Suez Canal” and its key advantage shortens thus reduces the cost of shipping from East Asia to north Europe. The realization of this initiative will have implications for our region as well. First, the affection on China to decide whether this move which they call the

'Ice Silk Road' competes or complements with their current initiative named 'Belt and Road initiative', that President Xi launched in 2013 and intends to connect China to Europe (see following section: on the potential developing of the Northern Passage). Furthermore, in the longer run, it is possible that a reduction in the usage of the Suez Canal will have an effect on the Egyptian economy. It should be mentioned that the strategic alliance between Russia and China has been strengthened this year. Process is still being developed and should be observed.



Figure 1: Three straits in the Black Sea – the Dardanelles, the Bosphorus and the Kerch.

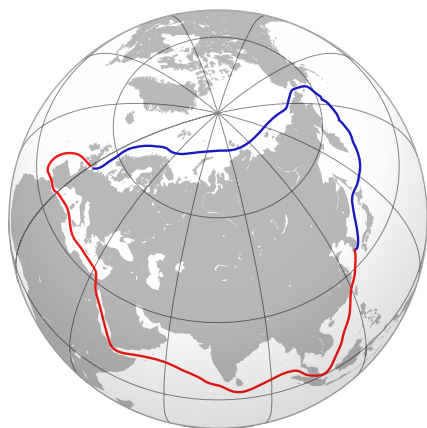


Figure 2: The northern route: The northern route (blue) and the traditional southern route through the Suez Canal (in red), source: Wikipedia

The Eastern Mediterranean

Russia's foothold in the Eastern Mediterranean was reinforced in 2018. This trend was expressed by the Commander of the Russian Navy (already in February). In his description of the naval part in the fighting in Syria up to that point (about six months before it demonstrated a massive presence during September 2018; see below). Admiral Vladimir Korolov stated that "the navy has been involved in the fighting since the beginning of Russian activity against terror in Syria (September 2015). The Navy has acquired its experience since then, mainly by launching long-range cruise missiles from ships and submarines. The Admiral added that during the operations in Syria, his navy carried out more than ten attacks using more than 100 long-range cruise missiles fired by surface ships and submarines. These attacks destroyed more than 80 operating sites of "illegal armed groups."¹ Putin himself (Sochi, May 16, 2018) instructed the Ministry of Defense to maintain a permanent presence of attack vessels that carry 'Caliber' missiles in the Mediterranean,² in order to deal with the "continuing threat of international terror attacks in Syria." The activity in Syria challenged the navy – as it increased the scope of its missions, thus contributed significantly the operational and technical sense and experience.³



Figure 3: The Commander of the Russian Navy – Admiral Vladimir Korolov speaking at a conference at the Naval Museum in St. Petersburg (February 9, 2018), Source: from the Russian Ministry of Defense site

- 1 Russian Ministry of Defense site, February 9, 2018; Sputnik site, February 8, 2018.
- 2 Путин: корабли ВМФ с ракетами "Калибр" будут нести постоянную вахту в Средиземном море <https://tass.ru/armiya-i-opk/5205614>
- 3 Корабли с «Калибрами» отправятся на постоянную вахту в Средиземное море <https://iz.ru/744028/2018-05-16/korabli-s-kalibrami-otpraviatsia-na-postoiannuiu-vakhtu-v-sredizemnoe-more>

The permanent presence in the Port of Tartus and the Khmeimim Airport (defined by the Commander of the Navy⁴ as a “Naval airport”) received the status of a Presidential Directive from the Kremlin in December 2017 following a year-long ratification process by Russia and Syria. President Putin even visited Syria (his first visit since Russia became involved in the fighting there- about two years earlier).⁵ According to the Kremlin, a directive signed by President Putin provides Russia’s activity with legitimacy according to international law, since Russia (and also Iran) were invited by the local sovereign, namely President Assad, to operate on Syrian soil.⁶ Assad and members of his government also reiterated on several occasions along the year about their invitation to Russia and Iran.

Russia and Iran helped this year, too to tilt the balance in favor of Assad, in restoring most of the territory he lost in Syria, apart from the Idlib enclave (located on Syria’s border with Turkey about 100 km inland). In his aforementioned visit to Syria (late 2017) Putin related to the success in destroying the Islamic State. In his view, this advantage would allow Russia to withdraw some of its forces, as of other countries, too. The issue was mentioned in some occasions during the year (for example, in June⁷ and on October 3, 2018⁸). It is worth emphasizing that by declaring a potential withdrawal of some Russian forces, there was no mentioning of the Russian naval units among them ! It is believed that naval units are part of the forces to remain in Syria, also to assist the Syrian regime in fighting the regels? (primarily in the Idlib region).

A permanent Russian military presence will preserve its influence over the Syrian regime in the future and similarly will ensure Russia’s regional and global interests in view of the complex reality emerging in Syria.⁹

4 See footnote 1.

5 Valdimir Putin visited Khmeimim Air Base in Syria.
<http://en.kremlin.ru/events/president/news/56351>

6 From the Kremlin site <http://en.kremlin.ru/acts/news/56562>. The President has signed the Federal Law On Ratifying the Agreement between the Russian Federation and the Syrian Arab Republic on Extending the Area of the Russian Navy’s Inventory and Logistics Support Centre in the Port of Tartus and the Entering by Russian Federation Military vessels into the Territorial Sea, Inland Waters and Ports of the Syrian Arab Republic, December 29, 2017

7 <http://tass.com/defense/1008504> From Tass, June 7, 2018. In relating to the withdrawal from Syria, Putin stated that “there are two sites where our forces are deployed – the Port of Tartus and the Khmeimim base. At this stage, we have no plans to withdraw these forces.”

8 From Tass, October 3, 2018 <http://tass.com/politics/1024196>.

9 From the site of the Intelligence Heritage Center, <http://www.terrorism-info.org.il/he>

The aforementioned assessment is manifested in the continued presence of naval units, however, since October 2018 also on the deployment of S-300 ground-to-air missile batteries, were brought to Syria following the downing of the 'Ilyushin- 38' Russian spy plane (see below).¹⁰ Russian Minister of Defense,¹¹stated that these batteries were brought to Syria to be delivered furtherly to the Syrian army.



Figure 4: The Port of Tartus

In conclusion, Russian naval units will apparently not be withdrawn from Syria. In contrary, they will build up their forces along the Syrian coast, primarily in the Port of Tartus. Such measures should provide Russia with maritime potential to act in the Eastern Mediterranean, to gain a geostrategic achievement with implications on the naval presence in the Mediterranean and the Black Sea, both referred among the Theater arenas of the Russian navy.¹²

10 <http://tass.com/world/1024058>. A report that the missiles were unloaded early on the morning of October 3rd at Khmeimim airport.

11 From Tass, October 3, 2018 <http://tass.com/world/1024146>.

12 Mirkin, Zvi "Guideline of Russia's Naval Policy as a Continuation of the Soviet and Russian Bureaucratic-Military Tradition", *Maritime Strategic Evaluation for Israel 2017-18*, Shaul Chorev (ed.). Haifa University Publications, Haifa Center for Maritime Policy and Strategy.

The Black Sea fleet by its forces, marked 235 years (June 2018) since its foundation. An event that symbolizes the historical activities in the region.¹³

The effect of the Idlib events

The Idlib enclave was a potential area for attack (late August 2018) also by the US, British and French fleets. The goal was to deter Assad's army from carrying out further chemical attacks in that region and in general. Recall to these navies launches (in mid-2017) of cruise missiles by its surface and submarine platforms against targets in Syria occurred as a response due to Assad Army continuing chemical attacks, which contradicts the international law. Western navies last attacked from sea in April 2018, after a chemical attack by Assad's army in Duma, near Damascus, a week earlier.¹⁴

As a step meant to prevent Western navies from carrying out further missile attacks (referred by the Russians as "provocation") on the Idlib area against Assad's army, the Russian navy declared, on August 29, 2018, the closure of a maritime area in the eastern Mediterranean, for the holding of an exercises by Russian air and naval forces. Although number of closures held during the year, this time played a larger scale compared to previous instances - since the collapse of the USSR. The maneuver was held from September 1-8, 2018, and included about 25-30 vessels, of which ten carried missiles, including two Kilo submarines. The vessels were under the Black Sea fleet, the Northern Sea fleet and the Caspian Sea flotilla.¹⁵ Also included in the exercise were 34 naval aircraft, according to the Russian Minister of Defense in a later comment (on November 2, 2018). He also referred to as a pioneer maneuver of its scope in the Mediterranean, and that further exercises should be held on a permanent basis..." The maneuver in September (as apparently the future ones, too- I.G.) was managed both from "the headquarters in St. Petersburg and the 'support facility' in Syria's Tartus". The need for this maneuver was to "independently cope with a wide range of missions in a changing situation."¹⁶ The repeated statements by the Minister of Defense, highlighted once more the importance which Moscow attributes to the Russia's foothold in this naval/aerial theater.

13 <http://tass.com/defense/721411>

14 Site of the US Department of Defense, April 14.

15 <https://iz.ru/782349/aleksei-ramm-aleksei-kozachenko-kirill-gulov-elmar-bainazarov/morskoj-shchit-dlia-sirii>

16 <http://tass.com/defense/1029078>

The downing of the Russian 'Ilyushin-20' spy plane

During the second half of September 2018, the Russians (for a second time that month) closed off the maritime zone west of the Syrian coast. This time it was in response to the downing of the 'Ilyushin-20' spy plane west of Banias. The plane was hit by the fire of a Syrian ground-to-air SA-5 missile battery, which carried out a massive and a complete inefficient fire, following an earlier Israeli air force attack on targets in the Dakiya district. Closing the maritime zone originally intended to allow Russian naval forces of 8 vessels, to conduct search and rescue operations for the remains of the plane, its systems and its 15 crew members.¹⁷ Naval vessels added to the searches a deterrence from foreign forces to operate in Syria and disturb neither the Russians nor their allies. Even though the downing of the plane was an error by the Syrian ground-to-air batteries and a lack of communication with the Russian command, several formal authorities in Moscow as the army, Ministry of Defense, and Foreign Ministry - blamed Israel for the outcome, claiming for its overall responsibility that caused the incident. These authorities also criticized Israel for other series of recent attacks in Syria, mainly against military targets and in particular those of Iran and Hezbollah. As the aircraft was downing "fog of war" that followed it, it made Russians blame also the involvement of a French frigate which was operating at the time east of Cyprus.¹⁸ It should be mentioned that President Putin personally took a more moderate stance than blaming solely Israel for its responsibility, and demanded also from Russians and Syrian forces to draw conclusions from the incident.¹⁹ Nonetheless, during most of the period since then, and in response to Russian voices that are demanding hegemonic control in Syria, it seems that his position towards Israel was hardening.

The operations of the Russian navy as manifested in the aforementioned events of September 2018, were made possible regarding to the Russian control of the Port of Tartus and of the Syrian coast in general. These activities furtherly confirm the arguments that support the need for Russia to maintain its presence and influence in Syria. This is in line with Russian interests, that include Tartus as a permanent base for the Russian navy, and the adoption of Syria as a permanent Russian 'forward base' in the region. Also, as a territorial foothold in the Mediterranean and the international arena. Following are levels which represent this approach:

The strategic perspective: The incident of the downing of the aircraft demonstrated Russian superpower status and its involvement in the Mediterranean theater as a

17 <http://tass.com/emergencies/1022043>.

18 <http://tass.com/defense/1022076>.

19 <https://www.israelhayom.co.il/article/591639>.

dominant player; the exploitation of the event in order to make a claim for the need to limit Israeli and perhaps even American activity in the Syrian domain; an opportunity to express solidarity (even if only in theory) with their Syrian and Iranian allies on the one hand as Turks on the other (see below for further details on Turkey); presenting the response dictated from “above” in order to generate an atmosphere of crisis (perhaps even a prolonged one) with respect to Israel. Notwithstanding the limited freedom of action that Russia allowed Israel prior to the downing of the airplane - in order to balance the Iranian equation in Syria, have limited Israel to operate, since the downing of the airplane (in mid-September). Nonetheless, the coordination between Russia and Israel apparently remains in place, see below.

The operational perspective: An opportunity to enable Russia to further entrench its Syrian bases, upgrading the military systems and their deployment along the Syrian coast. The fundamental claim is for the necessity to protect Russian forces. Although the 'S-300' batteries were provided to Syria, it appears that the immediate concern was for Russian forces use, rather than the concern to their Syrian ally (who showed low level of skills, responsibility and even reliability while downing the airplane). In addition to the 'S-300' batteries, Russia has deployed electronic warfare systems along the Syrian coast which purpose is to locate and disrupt the electronic warfare of foreign navies and air forces operating in the air, sea or any Syrian soil. Coastal intelligence gathering and defense systems like the 'Bastion' followed its deployment and increase the advantage of the Russia even more. Thus, a lesson to emphasize is the coordination and communication measures Israel should strengthen and extended with the Russians, although it may reduce Israel's naval freedom to operate in the Eastern Mediterranean. The various weapon systems - deployment in the Syrian theater, provide the Russians with an additional advantage, i.e. the ability to test their weapons systems on the battlefield. Furthermore, the Russians gain the opportunity to study the Western operational and technological responses to their own systems.

The tactical perspective: The 'Il-20' downing also demonstrated essential need for a control on the Port of Tartus and Khmeimim airport, in order to facilitate a permanent deployment of Russian's air units and naval units. This may provide a possibility for an immediate response or necessary intervene (as was shown in September 2018) on an ad-hoc basis. Either for search and rescue purposes on sea, or for the closure of maritime zones, to ensure Russian's control in the theater. This includes defensive patrols, ability to attack quality targets on land from surface /under-surface vessels, transportation and delivery of supplies, as well as weapons, ammunition, etc. Developments on the seashore will supply with infrastructures to be used and provide economical profits.

A Conclusion for the foothold in Syria

The major presence in the Port of Tartus and the Khmeimim airport provides Russia with an opportunity for a permanent control on the territory for another 49 years (with almost an automatic extension for additional 25 more years), by the lease agreement. The agreement also allows a Russian defensive deployment for its own protection purposes – from sea and air. These foreign bases, which have been established along the Syrian coast, provide a comprehensive framework for a full spectrum of maritime interests shared both by the hosted as the host countries. These among others include search and rescue, maintenance, transport, security or any other operational, civilian or hybrid activity, as can be carried out far from Russia's shores. The Syrian case is unique and since the Soviet era Russia has never abandoned its coastal foothold in the Port of Tartus. The port had been served as Russia's only platform outside its territory, in view of the fact that various countries in the Middle East have not always provided Russia with full operational freedom in using their ports. Moreover, Turkish control of the Bosphorus and Dardanelles straits could make passage of Russian vessels difficult, even impossible at extreme, particularly in a military confrontation. Therefore, the buildup in the Port of Tartus, which is relatively close to Russia but is beyond the Black Sea and the Turkish- straits, preforms an historical importance.²⁰ The current mission in the foreign port is listed on the site of the Russian Ministry of Defense as the fourth task (out of five) for the Russian navy. This task relates to "the Russian need to ensure its naval presence in the oceans and seas, to show the flag and military forces, also by visits of the navy's ships in foreign countries."²¹ The explicit mention of the Mediterranean as a part of the Russian activity in the Black Sea represents its continues strategic focus and importance. The activity in the region, as expressed during the past year and described above, is with full accordance to the official document of "Fundamentals of the State Policy of the Russian Federation in the Field of Naval Operations for the Period until 2030", which was formulated and approved by Putin on July 20, 2017.²² The Russian Navy is described in that document as "one of the effective deterrent efforts that protect the Russian strategy."²³ In addition, the war in Syria is mentioned primarily as one of the international points that threaten potentially Russian strategic interests.²⁴ Viewing the Navy's perspective of activity during the past year, lead to the assumption that region will continue to serve as a key focus for Russian's efforts.

20 Berkovski, A. (2018), "Foreign bases in the Mediterranean," University of Haifa Publication, Chaiken Chair of Geostrategy, p. 6, 9 [Hebrew].

21 Site of the Ministry of Defense of the Russian Federation, Navy page.

22 The site of the Kremlin: document 555127 signed by President Putin – "Foundations of the State Policy of the Russian Federation in the Field of Naval Operations for the Period until 2030".

23 Ibid., Chapter 4, paragraph 32 and 38.

24 Ibid., chapter 2, paragraph 27.

In where those principles aforementioned policy with accordance to the document - are being implemented in practice.

The Black Sea and the Crimean Peninsula

Another area of interest in where the Russian navy reinforced its status during the past year (and since 2014) is the Crimean Peninsula. Nevertheless, the claim that Russia “annexed the peninsula, or recovered ownership”²⁵, 60 years after Khrushchev handed it over to Ukraine. Recall that both countries were once part of the USSR, and the city of Sebastopol, exclusively kept its status as the Hub port for the Russian navy in the Black Sea, thus in practice remained under Moscow’s authority by a special arrangement. The majority of the population considered itself Russians in the city and in Crimea as a whole. The Russian language remained the dominant one. Russia is currently in a final stage for building the Crimea bridge (name was decided upon a referendum in December 2017, and the bridge was inaugurated in May 2018 by President Putin). This massive project crosses over the Kerch Bay and Strait has 19 kilometers in length and facilitates various land transportation from the mainland, the city of Novosibirsk towards the Crimean Peninsula, over the direction to the cities of Sevastopol and Simferopol.²⁶ Among limitations of the bridge emphasized its height of only 33 meters. While the strait itself is narrow and shallow, thus limit the passage for large ships. Although the sides in conflict: Russia and Ukraine came to an agreement on the free use of the strait already in 2003— with accordance to the international definition of ‘innocent passage’—the building of the bridge was the final step in the Russian annexation of the Crimea after 2014, and by de facto left for the Russians the control on maritime passage. By these circumstances, Kerch strait renewed a maritime dispute between Moscow and Kiev, that increased during the recent months and cast a shadow over the passage of ships into the Azov Sea.

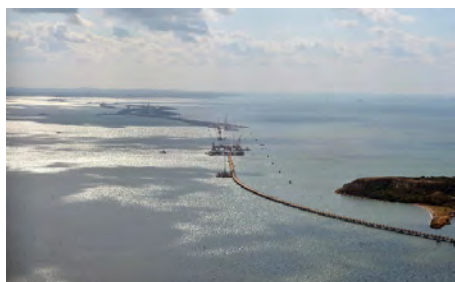


Figure 5: Construction of the bridge over the Kerch Strait



Figure 4: The Crimea Bridge under construction

25 Borshchetskaya, A. (2016). *Russia in the Middle East*, Washington Institute for Near East Policy P. 18.

26 <https://tass.ru/ekonomika/5203942> Tass Agency in Russian.

The dispute reached its peak on November 25, 2018 when a tug boat accompanied by two patrol boats of the Ukrainian navy were requested by Russian vessels of the Federal Security Forces (FSB) to halt before passing through the strait. As the Ukrainians refused, Russian's vessels set a warning fire, which wounded two sailors, and the tugboat was rammed. Russia accused Ukraine of provocative behavior and claimed they had violated the International Convention Law of the Sea. The Ukrainian crew of 24 was interrogated and imprisoned in Russia, being accused of violating Russian sovereignty and causing damage to Russian property (November 27) according to Russia's law they could be sentenced up to 6 years in prison.²⁷ Vessels are still in hold at Russian naval base in Kerch.

The dispute had been examined in the international arena, including the UN Security Council, while Ukraine declared (on November 26) an emergency situation in the country for a period of 30 days. At this stage, it is not clear whether this flare-up between Russia, Ukraine and its partners in NATO and the West, will lead to ?or how would it end.²⁸ It should be mentioned that on September 23, 2018 two vessels of the Ukrainian navy passed under the bridge on their one way northbound to Mariupol in the Azov sea. These vessels were accompanied by the Russian coast guard and there was no incident.²⁹ It appears that Kiev is seeking to demonstrate an Ukrainian maritime presence in the Azov Sea and its ports, namely Mariupol and Berdiansk.³⁰ In October 2018, the possibility arose that Ukraine would invite NATO warships for a maneuver in the Azov Sea, which was perceived by the Russian Foreign Minister as a threat to Russia's borders. Minister Lavrov referred on this event also to the agreement reached with Ukraine, regarding the passage of warships in the Kerch Strait (below the Crimea Bridge).³¹ Russia views the passage to be under its sovereignty, even though in practice this policy has so far been demonstrated towards Ukrainian warships solely. President

27 The Russians accused the Ukrainian flotilla of violating the International Convention on the Law of the Sea and creating a provocation according to paragraphs 19 and 21 of the UN International Convention, Chapter 3 with respect to the passage of all types of vessels; from http://www.un.org/depts/los/convention_agreements/texts/unclos/unclos_e.pdf (by the generosity of Dr. Benny Shepiner). For a description of the incident, see the Red Star in Russian: <http://redstar.ru/vlasti-ukrainy-organizovali-provokatsiyu> and Putin's comments on November 27, in for example: Tass <http://tass.com/politics/1032781>.

28 www.ecfr.eu/article/commentary_strait_to_war_russia_and_ukraine_clash_in_the_sea_of_azov from October 2, 2018.

29 <http://tass.com/world/1022782>

30 <https://nevnov.ru/598592-nikakogo-boya-i-byt-ne-moglo-voennyi-ekspert-prokomentiroval>.

31 <http://tass.com/defense/1026652>

Trump has referred to the Russian action as an act of “aggression”,³² while Russian Foreign Minister Lavrov described it as a response to a “provocation”, or in the words of Prime Minister Medvedev “an unfriendly act [by Ukraine] that will create problems later on.”³³ It appears that the Sea of Azov has the potential to become a front line in the dispute between Russia and the West.



Figure 7: The Sea of Azov and the Strait of Kerch that separates it from the Black Sea
Source: see footnote 30.

In conclusion, already in 2014 Putin drew a connection between Ukraine and the Middle East.³⁴ The buildup of the Russian maritime strongholds in the Crimea and Tartus are connected one to the other and provide Russia with the possibility to project its power and to expand its territorial hold beyond its borders. Measures as such may include also a deployments of various weapons as other abilities with accordance. These strongholds provide the Russian navy with the advantage of forward deployment. Deploying of vessels there, could allow various missions, as well as a demonstration of its power towards other players. The situation can allow Russia to mitigate the constraints imposed by foreign players, particularly Ukraine and Turkey, as Russia needs of free passage through the Kerch, Dardanelles and Bosphorus straits.

Such a forward deployment but for the facilitation of transporting and supplies by sea, provides also a backup for land and air transports. The forward geographic deployment

32 Washington Post <https://www.washingtonpost.com/politics/i-dont-like-that-aggression-trump-threatens-to-cancel-putin-meeting-over-clash-with-ukraine>. Quote in Tass: <http://tass.com/world/1033008>

33 Novosti, November 27, 2018 <https://riafan.ru/1125729-na-zaderzhannom-katere-vmsu-nikopol-nashli-dokument-s-osoboi-zadachei-kieva>.

34 See footnote 26.

provides another additional advantage, whose implementations suits with Russia's strategy, and is no less important than the one which vessels forward deployment do play. i.e. the possibility to deploy also various weaponries on the forward coasts and its nearby areas. This also raises the possibility to create deterrence of the enemy, by restricting his freedom of action (A2AD). Among all relevant means to accomplish this, a focus should be put on the possibilities to integrate unmanned vessels and aircrafts in various missions, either already existed platforms, or others to be developed in the future, according to the needs.

Turkey

The important maritime space between Ukraine and Syria is within the territory of another influential player in the region – Erdogan, the ruler of Turkey. Not only Turkey's geostrategic location is important but also its relations with Russia, that apparently have tightened during the past year. Also, as Turkey's growing economic which is more depended on Russia and especially Russian natural gas. Turkey, as Iran, has joined the partnership dealing with the crisis in Syria, with Russia that took the leading role. The Russian-Turkish cooperation increased during the second half of the year, as part of the events in the Irbil enclave and later on, with the absorption of refugees from Syria on Turkish territory (an agreement signed with the EU already in 2016). Putin has presented himself as a potential, if not actual, alternative to the West under U.S. leadership, particularly in view of the deterioration in the West's relations with Erdogan. It appears that the memory of the incident in which a Russian 'Sukhoy 24' aircraft was downed by Turkey (in November 2015) has faded. The maritime implication relates on the acquisition of Russian weaponry by Turkey. Russian economic involvement in the production of natural gas and its transport (by land/sea) through Turkey's territory will constitute a continual challenge for Russia. This challenge will affect Russia's presence and that of Russian companies, such as Gazprom, in the region and the overall Russian tendency is to prevent the creation of alternatives that might harm Russian hegemony over the supply of gas to Europe.³⁵ This hegemony has been reinforced by the inauguration (on November 20, 2018) of the maritime segment of the "Turkish" gas pipeline at which Putin and Erdogan were present (by videoconference). The pipeline crosses the Black Sea from the Russian coast (the Krasnodar area) to the Turkish coast and is expected to carry 15.75 billion cubic meters of gas to Turkey starting from 2019.³⁶ In conclusion, it is worth mentioning the statement of the Turkish Prime

35 Rettig, Elay. "Russian's Interests in Israel's Natural Gas discoveries". Conference held in June 2018 at The University of Haifa, HMS – Haifa Research Center for Maritime Policy and Strategy.

36 The Sputnik site in Russian, from November 20, 2018. <https://sputnik-georgia.ru/columnists/20181120/243048839/Gaz-na-raspute-kuda-poydet-rossiyskoe-goluboe-toplivo.htm>.

Minister (in November 2018) that Russia is today one of its most important partners and Turkey will do all it can in order to develop the cooperation between the two countries on several levels. Nonetheless, the leading issue is the need to stabilize the situation in Syria and particularly in the Idlib enclave. At the Sochi Conference (in September 2018), Putin gave Erdogan an opportunity to find a solution, in the meantime without committing to a timetable.³⁷ A senior official in the Russian Foreign Ministry stated (in November 2018) that Russia views the partnership and the cooperation with Turkey very positively.³⁸

The Russian navy – China

The Russians view the Chinese as a strategic partner in maintaining global stability (at least in theory).³⁹ The interface between Russia and China continued to develop during the past year, including the Chinese navy. There were several visits,⁴⁰ exercises and maneuvers, the most prominent of which was “Vostok (East) 2018” that was held in the Far East in mid-September. It was claimed to be the largest ever carried out and included a force from the Chinese army.⁴¹ The maritime element consisted of dozens of Russian vessels, of which about 20 carried missiles. The maneuver took place in the Sea of Okhotsk (a coast in where the first Russian settlement in the Far East was established).⁴² It is worth mentioning that the two countries have an interest in common, i.e. promoting their status as maritime superpowers. One result refers to the devoting efforts for the development of their navies. For Russia, this is a part of the aforementioned maritime strategy for 2030, while for China, the formulation appears in the 18th and 19th Chinese National Congress of the Communist Party, President Xi declared his intention that China shall become a “strong maritime nation.”⁴³ The maritime interests for both these countries can serve as a common denominator and one of the main expressions of their Russian-Chinese strategic partnership, as both are seeking to develop.

37 tass.com/world/1029351 from November 6, 2018.

38 <http://tass.com/politics/1029920> from November 8, 2018.

39 Thomas, T.L. (2017) *Kremlin Control, Russia's Political Military Reality*. Kansas, Fort Leavenworth Foreign Military Studies Office. p. 66.

40 The most recent included the flagship of the Pacific fleet, a destroyer and an auxiliary ship in the Chinese Port of Qingdao during October 23-25 2018 <http://tass.com/defense/1027291>.

41 <https://iz.ru/782349/aleksei-ramm-aleksei-kozachenko-kirill-gulov-elmar-bainazarov/morskoi-shchit-dlia-sirii>:

42 <http://tass.com/defense/1021559>

43 https://www.ecfr.eu/page/-/Blue_China_Navigating_the_Maritime_Silk_Road_to_Europe.pdf

One of the main symbolic implications of this strategic partnership is the Chinese presence in the two most recent Russian annual exercises: Zapad 2017 in the Baltic Sea, which included the presence of Chinese vessels and can be attributed to a Chinese expression of solidarity and loyalty to Russia,⁴⁴ and the Vostok 2018 maneuver which took place in the Far East in September and in which the Chinese army took part for the first time, apparently without a clear enough share of its naval units. A participation that expresses Russian-Chinese operational strategic cooperation, as was declared by the Chinese defense minister.⁴⁵ Russian Minister of Defense Shoigu stated in late October 2018 that “the close relations between the two nations are at their historical peak.”⁴⁶ The Chinese participation in Vostok 2018 strengthened even further the military dimension of Russian-Chinese cooperation. The Chinese took the opportunity to view from closeup the revised Russian combat approach which was implemented during the maneuver. These warfare lessons were learned by Russia as a result of the participation in recent fighting in the Crimea and primarily in Syria. The revised approach mainly provides field officers with greater freedom of action, combined with exposition towards new air and sea offensive tactics, which emphasize speed and surprise of the enemy, synchronized with a variety of weapons systems.⁴⁷

Other Commercial/civilian dimension continued to develop during the past year, some of them with regard to the Northern Passage, also referred by the Russians - as the “Russian Suez Canal” (see following section).⁴⁸ The Chinese have called this project the “Ice Silk Road”, although this initiative still is in early stages of assessment by China.⁴⁹ Project's aim is to create a passage for ships north of the Asian continent, in the Arctic Ocean, and is expected to become feasible as a result of global warming and the partial melting of the northern ice cap. Experts believe that in coming years a month will be added to the current summer of 3 months season, and in the longer run—around the year 2040—a major melting of the ice on the route would free most of this path.⁵⁰ Already now the Russians are looking at the possibility to establish a passage

44 Ibid. pp. 30-31.

45 <https://russianmilitaryanalysis.wordpress.com> Analysis by Michael Kofman September 25, 2018.

46 <http://tass.com/defense/1026819>

47 https://www.ecfr.eu/article/commentary_russian_manoeuvres_with_chinese_characteristics September 25, 2018.

48 https://russian.rt.com/world/news/552945-rossiya-sueckii-kanal?utm_source=smi2

49 See footnote 43, p. 3.

50 <https://newstrend24.ru/v-mire/2171-cepnaya-reakciya-iz-za-sevmorputi-rf-v-ssha-ozabocheny-rekordami-v-arjolly> | <http://tass.com/economy/1030485> November 12, 2018.

for ships on this route, which will involve the use of icebreakers.⁵¹ The main implication of this project could allow a potential saving of about 35 percent of the current costs, compared to the use of the traditional route from China to Europe through the traditional Suez Canal. The trip through the Northern Passage from China to Europe would take only about two weeks and will avoid also passage fees to the Suez Canal and Egyptian authorities (a grossly passage per one bound for a large ship size is estimated at about a half million dollars). There will also be a saving of fuel which price is expected to rise by the end of 2019 (due to IMO regulation to prohibit the use of highly polluting fuel⁵²). Russia would like to claim sovereignty in the northern region and over the passage, primarily in view of the profits it can produce. Russia has also included the potential exploitation of the Northern Passage as one of its natural resources. This area (as Atlantic Ocean region that includes Black Sea fleet which operates in Mediterranean) has been declared by Putin in the document which defines the Russian navy's missions up to 2030 as an area of preference among the naval priority activities.⁵³

Global and regional implications for such implementations of using the "Russian Suez Canal" in the Middle East are still been assessed, as by Russia, too. The Chinese who are expected to be main beneficiaries of the initiative, are also assessed as key investment partners of it. They will have to consider and decide whether they indeed support this initiative as it requires coordination with Russia as a *modus operandi* between both countries. Thus, the Chinese will need to decide on the equation: how much to develop this new project, even as a side-lobe of the "Belt and Road Initiative" (BRI), or how much to rely on the existing BRI see – connection between China Sea – Indian Ocean, the Red Sea, and finally via Suez Canal into the Mediterranean and Europe). China has highly invested in the current BRI initiative, which considered as one of the key national infrastructure projects. This initiative and other possible investments concerned the northern sea resources are likely to be discussed in the First Russian-Chinese Business Energy Forum (held on November 29, 2018 in Beijing by China's President). President Xi stated that energy is a one component among the joint bilateral projects are being developed and has reflections on the strategic interaction between them.⁵⁴

51 <https://newstrend24.ru/v-mire/1147-strahi-finnov-po-sevmorputi-zapadu-grozit-ne-tolko-rossiya.htm>

52 PORT2PORT November 2018, Volume 925. Tel Aviv, p. 14.

53 The site of the Kremlin: document 55127 signed by President Putin – "Fundamental of the State Policy of the Russian Federation in the Field of Naval Operations Until 2030", paragraph 24, subparagraph a and f, and paragraph 27c and 27a.

54 <https://nation-news.ru/416075-si-czinpın-zayavil-o>

The Russian Navy – NATO

The reduced presence of the US and western navies has contributed to the growing Russian hegemony in the Eastern Mediterranean. The Russians have closed large areas of the Eastern Mediterranean in number of occasions during last year and particularly in September. It appears it has to do with the presence of the western allies: either its thinness, or the opposite, namely the continued Russian fear of the West's intervention along Russia's borders and in Russian waters. This fear has been manifested at sea by the activities taken place west off the Syrian coast and in the region of Kerch strait to the Azov Sea, as described above. Russian fear is based also on the Western development of options that could be employed in the region in a time of a crisis or a need. A such was the deployment of the task force in the region as the Truman aircraft carrier returned to the region in late November 2018 (for an undetermined period), the launch of missiles from sea platforms; and the deployment of stealth aircraft (F-35 or unmanned aircraft). It appears that the Russians and their allies are being careful not to violate this equation. Although the French frigate was claimed by Russia to become involved in the downing of the 'Ilyushin 20' in September. it appears that nonetheless the value of the coordination mechanism between Russia and the West—including Israel—will continue to be needed - maintained, and perhaps even upgraded. Israel may even have a key role to play in it. This may become clear following the renewal of the conflict in the Crimea in late November 2018, which President Trump viewed as an act of aggression. The Congressional Committee that examined the US National Defense Strategy for 2018 concluded that "Russia and China are challenging the U.S., its allies and its partners on a far greater scale than has any adversary since the Cold War's end." The Crimea incident is liable to provide China with inspiration on how it should proceed in the South China Sea and illustrates the Congressional Committee's conclusion.⁵⁵

Conclusion

Russia's control of the Eastern Mediterranean theater and in particular its maritime components has tightened during the past year and particularly after the downing of the 'Ilyushin 20' airplane in Syria in September 2018. Recall that maritime presence in the region has historically been a Russian interest. Also, today, maritime presence continues to constitute a fundamental Russian interest in the region. Evidence to this is the intention to maintain this situation for decades to come, as part of the leasing agreement between Russia and Syria. Although the buildup is still taking shape, the

55 From an article generously provided by Dr. Seth Cropsey of the Hudson Institute in Washington. www.axios.com/authors/SethCropsey

process is aligned with the policy adopted by Russian in recent years (the annexation of the Crimea in 2014 and the participation in the fighting in Syria since 2015). This can be viewed as part of an intentional Russian strategy, which is seeking to position Russia as the number two naval power in the world (after the US). Russia is seeking to increase its presence and influence globally and not just in our region.

The implications of this process for our region are not yet fully clear, primarily in view of the continued fighting in Syria. The Russians themselves are still studying these implications, as are other players in the region. The timing, conditions and characteristics of an end state to the fighting in Syria are still unclear.⁵⁶ It appears that also the renewal of the conflict in the Crimea between Russia and Ukraine in late November 2018 following the confrontation between vessels of the two countries indicates that the dispute will continue into 2019 and beyond. It focuses on the dispute about the control of a free international passage of ships through the Strait of Kerch and the traffic in the Sea of Azov and its ports. The implications of the conflict for Ukraine and the rest of the countries involved are still unclear, since the crisis is still in its early days.

The Russian side will have to examine the economic implications of all these involvements, due to the cost of such efforts. Furthermore, the movement of forces, including ships and other naval units, to our region from other naval theaters of operation will require the investment of resources. Aside the price of these activities, there is also a potential economic, operational and political benefit to Russia, particularly from its involvement in Syria. The political profit stems primarily from its renewed superpower status. The expansion of Russia's global influence also influences Putin's domestic status. From an operational-maritime perspective, Russia's activity makes it possible for naval personnel to acquire operational experience, including the use of various weapons system, improvement and developments - as products that can be exported.

It is possible to conclude that the wider maritime implications in the areas of shipping, the economy and commerce will be exploited by Russia, in view of the potential profit that can be gained. This dimension is also attributed to the northern sea and its natural resources, including the exploitation of the Northern Passage within the near future, by means of icebreakers exclusively produced by Russia. However, this initiative will apparently also be influenced by the Chinese willingness to become involved in it.

56 The time allotted to Turkey at the Sochi Conference (on September 17, 2018) for the demilitarization of the Idlib region ended on October 15th, but was extended indefinitely in the meanwhile. <http://tass.com/politics/1026509>

Recommendations for the East Med Arena

In view of Russia's continued buildup of power in the region, Israel must consider how it can produce benefits from the situation. In the first stage and as a lesson from the events of September 2018 and their ramifications, it is important to rehabilitate relations with Russia with respect to Israel's activity in Syria and Lebanon. In addition, Russia's overall strategy with regard to strengthening its hold in the Eastern Mediterranean is also based on the relations and alliances that Russia establishes. (At the same time, there are relationships with most of the players and simultaneously the relations with each player has a few interfaces) It is recommended that Israel consider taking advantage of these mutual relations—on the military, economic or civilian aspects—and to integrate within them. Advantage is to exploit its influential geographic location, internal demographic diversity and the juncture of connections that enable the possibility to influence also the -foreign policy domain. This provides Israeli with the potential to serve as a significant counterweight against Russia in view of the equation of alliances and interests that Russia is currently establishing in the region and at least against key players like Iran, as well as Turkey, Egypt, Syria, also even Lebanon. As a first step, it is important to attempt to rehabilitate relations as possible to the level they were at prior to last September, before the lost of Russian 'Ilyushin 20' airplane.

Russia's expansionary strategy, which includes control of the Syrian coast at the Port of Tartus and the Khmeimim airport, will allow the Russian navy to implement its current operating doctrine with greater momentum in the Middle East. Its goal is primarily to achieve dominance of power and control in a given cell of territory in order to prevent the counter-part from operating in the air or at sea within it, namely the maritime operating doctrine known as A2/Ad (Anti-Access / Anti-Denial). Region's Russian buildup is not yet completed, as still is needed to divide Russian efforts in the maritime domain - between their focus of activity in the Crimean Peninsula as well as the deployment on the Syrian coast. Syria has become even more important in recent months, since the events of September 2018 in Irbil and the downing of the Russian plane within its crew over the Mediterranean. These events have provided additional proof of the necessity for a forward position in the naval base at Tartus and a permanent deployment of vessels and aircrafts there and at Khmeimim, first for the purpose of search and rescue missions, then participation in other naval and ground missions, or for some foreign policy or military tasks. In addition to the reinforcement of naval and aerial platforms, the incident in which a Russian plane was downed led to the decision to also reinforce the coastal presence, as deployment of systems for detection, defense, hybrid warfare, intelligence-gathering and cyber. The same goes for the Russian S-300 air defense

systems which were apparently delivered to the Syrians, aside to those designated for the exclusive use by the Russians.

Moreover, in view of the cooperation and information sharing between the Russians and most of the players in the arena, it is worthwhile that account be taken of the exchange of information between them and the formalization of military and civilian cooperation (e.g. maritime domain, gas and oil rigs). The implications for Iran, Hezbollah and perhaps even Hamas (even if indirectly) will be attributed primarily to the Syrian front which has until now been the main area of operations. Things could spread over additional areas such as Lebanon and even Gaza, either as a response to UN and EU initiatives there, as Russian aspiration to have influence there – too. Another expected regional influence in the maritime domain involves Turkey, Egypt and also the neighboring countries, as well as more distant countries on the North African coast. With regard to the superpowers, consideration should be given to the partnership with China and perhaps even the sharing of information with it. The development of the Russian arsenal may also involve cooperation with China and will provide additional reinforcement to the Russian buildup in the region. In any case, maintaining the maritime status quo, including this use of detection and intelligence-gathering systems, will continue and will be expanded, including that based on non-military sources.

The buildup of the Russian navy in the domain, including tighter cooperation between Russia and its partners, will apparently also affect the joint effort to prevent access to the Western navies, and particularly the USN and Israeli navy in the East Med. This is also based upon the improvement in Russia's military arsenal and in particular its maritime arsenal. It appears that the territory that will be restricted to the Israeli navy, even if only partially, in order to hinder its operations, will be the maritime zone west of the Syrian coast. This will affect the Israeli naval variety operational possibilities, with emphasis on clandestine and low signature activity. The Israeli navy will have to integrate systems and methods to overcome the aforementioned constraints on its operational activities.

On the other hand, it is worthwhile considering the strengthening of the Israeli navy's explicit presence and the demarcation of its boundaries of operations accordingly, as part of missions to "show the flag" and to maintain sovereignty and influence. It is worthwhile developing a variety of activities, some on the civilian and international levels, within this context. This is related to an additional component, namely the US navy and in particular its reduced presence in the arena, in shaping the configuration of forces and the rules of the game in this region.

It is recommended that the Israeli navy also maintain the mechanism for cooperation with Russia. However, this will require extra caution in order to avoid an error that would threaten Russian sovereignty, as occurred in the downing of the 'Ilyushin 20' airplane in September 2018.

Another element that may emerge as a result of the mutual coordination and the focus on the common concerns involves threats from Iran and Hezbollah which have the ability to utilize naval weaponry. Although these are primarily directed toward Israel, the nature of the threat and in particular its asymmetric components—which are meant to disrupt advanced weapons systems—will require Russians to take an interest and to monitor the situation, also because of the limited ability to control these systems at every given moment. Although the risk of the realization of these threats against Russia, or assets under its sovereignty in the maritime domain has a low likelihood. The possibility exists of this threat being realized indirectly against Russia, whether due to a loss of control or negligence or even unintentionally, as occurred in the 'Ilyushin 20' event.. The risk to Russia of such an extreme scenario will require it to adopt extra caution and to monitor the situation. Here again there is an opportunity for Israel to establish cooperation. Russia will in the future apparently be more careful about maintaining control over the operation of Russian-made weapons systems, such as the S-300, including those that various players in the arena may wish to deploy.

In addition, it is recommended to invest in considerations and in mapping the potential opportunities for Israel, which are likely to arise as a result of the implementation of Russia's maritime strategy, as well as the presence of the Russian navy in the arena. These developments will be in addition to the expected benefits from Russia's relations with the abovementioned "third parties" and are likely to be beneficial in the various dimensions: political, economic-commercial, military, etc.

In conclusion, the presence of the Russian navy in the Syrian domain will only get stronger and is not expected to diminish (unlike the expectation for other arms of the Russian military). Also, within the context of civilian shipping, the activity of the shipping lines between the two countries, with emphasis on the ports of Sebastopol and Tartus, will also open up as part of the rehabilitation process in Syria. On the basis of Russian cooperation with other regional players, as mentioned, it can be assumed that there will be an increase in the presence of the Russian navy also in other areas within the maritime domain of the Eastern Mediterranean.

The Russian Northern Sea Route – Declarations and Reality

Tzevy Mirkin

Due to global warming and the change in the global climate, it is becoming increasingly feasible for the Northern Sea Route to serve as a route for commercial shipping between East Asia and Europe. The result will be a shortening of the trip by thousands of kilometers, which will lead to huge economic savings.

The opening of the Northern Sea Route is highly beneficial for Russia and will allow it to build a maritime services industry along this route, as well as providing it with greater access to shipping (and lower costs of trade). Thus, Russia's activity in this region is growing, both from a technical point of view (building of a fleet of icebreakers) and an international / legal point of view, which involves its claim of ownership over this route. If the use of the Northern Sea Route reaches a significant level from the perspective of global trade, then it will have a potentially adverse effect on Egypt.

Background

The Northern Sea Route traverses the northern coast of Russia. It is part of the Northeast Passage, which connects the Atlantic Ocean to the Pacific Ocean by way of the Northern Sea.

The term Northern Sea Route first appeared when the Soviet Union tried to use this route for maritime transport in the 1930s. In this context, the fundamental question relates to the boundaries of Russian control in the Arctic region. Since the Russian Federation is the only republic of the USSR that had access to the Arctic region, it inherited all of the USSR's assets in the region in 1991. Questions then arise as to the demarcation of Russian control in the region. In 1926, the Soviet leadership approved a law which defined the boundaries of Soviet control in the Arctic Region as the lines rising from the eastern-most point (Chukotka Peninsula) and the western-most point (the Kola Peninsula) up to the North Pole. A special name was even invented for the Soviet part of the Arctic region: "the polar possessions of the USSR." In contrast, in 1982 the USSR signed the United Nations Convention on the Law of the Sea (UNCLOS) and as a result it also accepts the decision regarding the widths of territorial waters and of the Exclusive Economic Zone. Nonetheless, Russia is currently trying to expand its control in the Arctic Region, based on the claim to the two underwater ridges that are to be found in the Northern Sea and which range up to the North Pole. These ridges are part of the Russian continental shelf and therefore Russia claims that they are part of its Exclusive Economic Zone.

Russian law defines the route as the “exclusive national transportation route of Russia in the Arctic, which came into being historically.”¹ The route runs through the Kara Strait, which connects the Barents Sea and the Kara Sea, and through the Bering Strait, which connects the Northern Sea and the Pacific Ocean. The length of the route is about 5600 km. From an administrative perspective, the route has two segments: “the Western Zone” (from Murmansk to Dudinka, the port at the mouth of the Yenisei River) and the Eastern Zone (between Dudinka and the Bering Strait).

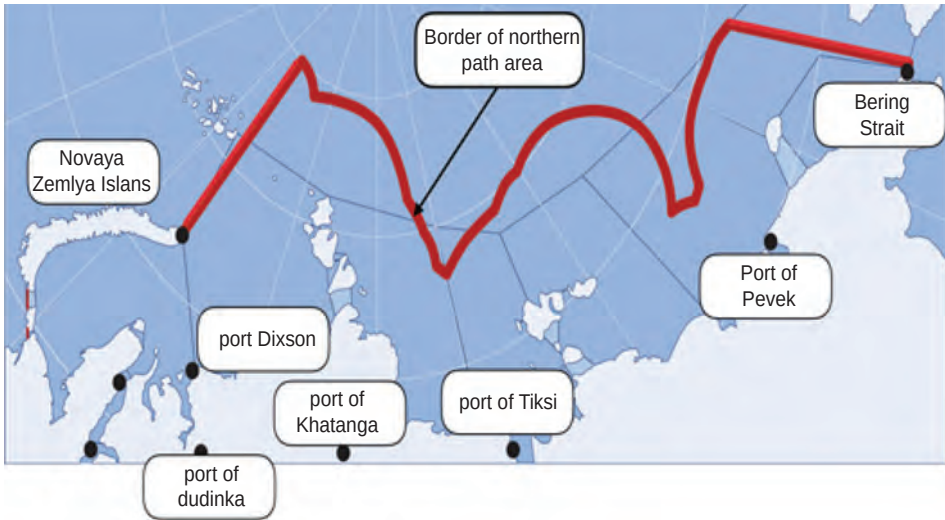


Figure 1: A diagram of the northern route and the main port cities along it

The historical place of the Northern Sea Route within Russian maritime strategy

The Russian leadership has expressed interest in the Northern Sea Route for a very long time and there were attempts to utilize the route already at the end of the 19th century. Nonetheless, only in 1932 was it proven to be practical for ships accompanied by an icebreaker to travel the route within one shipping season.² Since then, there have been changes in the strategy in this region, until things coalesced during the Cold War, when the Soviet Northern Fleet became one of the two main components of the maritime arm and was officially defined (together with the Pacific Fleet) as a “strategic fleet”.

- 1 The Federal Law of the Northern Sea Route, paragraph 14.
http://www.nsra.ru/ru/ofitsialnaya_informatsiya/zakon_o_smp.html
- 2 The shipping season is the part of the year when conditions allow ships to travel the route. In general, this is the period of the summer during which the water is ice-free.

Since the current strategy and operating doctrine of the Northern Fleet are based on those that prevailed during the Cold War, an understanding of the place of the Northern Sea Route in the thinking of the Soviet leadership is particularly important in understanding the mindset of the architects of current Russian strategy.

The development of the route

The idea of a direct connection between the western part of Russia and its territory in East Asia by way of the Northern Sea Route may have existed already when the Russian Empire reached the shores of the Pacific Ocean. Nonetheless, the undertaking was not feasible due to technical limitations of ships which could not withstand the difficult conditions in the Arctic Ocean. Similarly, there were huge difficulties in building the necessary infrastructure along the route, such as anchoring ports for refueling, supplies and repairs, in addition to the fact that these areas were poorly connected by land transportation to the central regions of the country, if at all. An exception was the port city of Arkhangelsk, which was established in the 16th century at the mouth of the Northern Dvina River and for more than a hundred years served as the only port through which Russia had direct access to commercial shipping lanes. The port became much less important after Russia captured the eastern shore of the Baltic Sea in the early 18th century, thus gaining the use of the Riga and Tallinn ports which did not freeze in the winter,³ and also when it built Petersburg at the mouth of the Neva River.

Up to the beginning of the 20th century, the Russian government hardly invested in the development of northern Russia and in particular in its maritime infrastructure. The situation changed with World War I, when the “traditional” maritime routes in the Baltic and the Black Sea were cut off by the navies of the Central Powers, and Russia began looking for alternatives in order to maintain contact with its allies. In 1915, the city of Murmansk was established on the shore of the Barents Sea, although its development was delayed by the Bolshevik Revolution and the civil war in Russia.

At the beginning of the 1930s, the Soviets made their first attempts to exploit the natural resources of the Far North. At the same time, military leaders realized the importance of the maritime routes in the North and began working toward their development. In 1933, the Northern Military Flotilla was established (which became the Northern Fleet in 1937) and the entire Northern Sea Route was put under its operational command. Murmansk and a number of smaller cities became the centers of activity in the region.

3 In this context, Russia also expanded southward toward the Black Sea in a process that was completed in 1791 with the annexation of the Crimean Peninsula; however, the ports in the Baltic Sea were always far more important than those in the Black Sea.

At the end of the 1930s, the Soviet leadership came to the conclusion that the importance of the Arctic region in general and of the Northern Fleet in particular is based on control of two routes: that connecting Murmansk with the Atlantic Ocean and the Northern Sea Route. They were also aware of the role played by the northern ports in maintaining contact with Russia's allies during World War I.⁴ In this context, there were also attempts to check the possibility of using the Northern Sea Route to connect the western part of Russia to the Far East. This was particularly important in view of the fact that the only way to reach the eastern part of Russia was the Trans-Siberian railway, whose route passed close to the border with China and was particularly vulnerable. Thus, the first attempt to sail the Northern Sea Route in one season was made in 1932 and, following that, construction of ports began along the route.⁵

In 1936, the route was used for the first time for a “purely” military purpose when warships of the Baltic Fleet traversed it on their way to the Pacific Ocean, in order to reinforce the Pacific Fleet as a result of the tension with Japan. During World War II, movement was in the opposite direction, such that ships from the Pacific Fleet were transferred to the Northern Fleet. In addition, resources, and in particular coal and metals, produced in Siberia were shipped on this route.⁶

Overall, World War II served as an additional catalyst for the development of Russia's northern coast. During the first months after the German invasion, the USSR lost access to its natural resources in the western part of the country and was forced to quickly replace them with natural resources from Siberia and the Far North. The critical role of Murmansk and Arkhangelsk in maintaining contact with the US and Britain and the need to protect the Arctic convoys⁷ increased the importance of the Northern Fleet. In fact, after the Soviet fleets in the Black Sea and the Baltic Sea were neutralized by the Germans, the Northern Fleet remained the USSR's only active maritime force.

4 Golovko, A. *Together with the Navy*, Moscow, 1984. Admiral Areseni Golovko served as the commander of the Soviet Northern Fleet during the period 1940–1946.

5 The Great Russian Encyclopedia; entry for the Northern Sea Route. <https://bigenc.ru/geography/text/3543982>

6 The Great Russian Encyclopedia; entry for the Northern Sea Route. <https://bigenc.ru/geography/text/3543982>

7 The maritime convoys bought aid from the US and Britain to the USSR during World War II. Between August 1941 and May 1945, 78 convoys arrived in Murmansk and Arkhangelsk. This accounted for about one-half of the total volume of assistance which Russia received from the Allied powers during the war.

The Cold War

After the end of World War II, the new Soviet leadership reexamined the “Northern Policy”. Based on the experience during the war, senior navy officials came to the conclusion that the “internal maritime routes in the North” are of great importance. In addition, the Naval Command claimed that decision makers had underestimated the importance of these routes before the war and as a result the navy had not been ready for battle in the northern zone.⁸

In addition to the experience from World War II, the northern region also grew in importance from the perspective of the Soviet naval command, since it was the only theater in which the USSR has direct access to the open seas without having to pass through straits controlled by unfriendly or even hostile nations. It also provides almost direct access to the Atlantic Ocean, which was particularly important in confronting the US.

The acquisition of offensive nuclear weapons and the development of a nuclear strategy also contributed to the importance of the Arctic region. During the Soviet period, the region became particularly important as part of the USSR's nuclear strategy. Located there was one of the two test sites for nuclear weapons and it served as one of the main theaters for patrols by strategic submarines (for which a method had been developed to fire ballistic missiles in ice-covered areas) and by nuclear bombers. Some of the planned trajectories for intercontinental missiles on their way to the US also passed through this region.⁹ At the same time, the Soviets feared that the Americans would use the Arctic region as a jumping-off point to attack them.

Almost simultaneously with the upgrade of the Northern Fleet, a similar process was instituted for the Pacific Fleet. This raised the importance of the Northern Sea Route even further, as a result of the possibility of using it to move naval forces between theaters, and primarily it facilitated the delivery of new submarines produced in the city of Severodvinsk on the White Sea to the Pacific Fleet.

Although the importance of the Northern Sea Route at that time was mainly military, its use for civilian purposes also began to develop. The production of metals in the Far North began during World War II and continued after it. The center for this activity was the city of Norilsk, located near a large number of metal mines. The port of Dudinka was built near Norilsk at the mouth of the Yenisei River. The activity at Norilsk expanded to

8 Platonov, V., *Admiral's Notes*, Moscow, 1991, p. 295. Admiral Vasili Platonov served as the commander of the Northern Fleet during 1946–1952.

9 Trenin, D. and P. Bayev, *The Arctic: The View from Moscow*, Moscow, Carnegie Center, 2010, p. 7.

a great extent during the second half of the 1960s, and the production and transport of the mines' output to industrial centers in the western USSR required increased usage of the Northern Sea Route. To accommodate this growth, the USSR began expanding its fleet of icebreakers and in particular nuclear-powered ones.

The first ship of this kind was the Lenin, which was launched in 1957 and went into practical use in 1960. The Lenin was an experimental ship. In 1975, the Arktika nuclear icebreaker was launched and another seven ships of this type were built up until the breakup of the Soviet Union.

The post-Soviet period and the current situation

The economic crisis in the USSR during the second half of the 1980s also affected the activity in the Northern Sea Route. In 1987, the amount of cargo transported on the route reached a peak of 6.5 million tons, and subsequently declined. In 1991, 4.8 million tons of cargo was shipped on the route and in 1996, only 1.8 million tons.¹⁰ In 1991, during the final days of the USSR, the route was opened to international shipping.¹¹

Interest in the Arctic region was renewed in the early 2000s and was primarily the result not of Russian government policy but rather the aspiration of Gazprom, the Russian energy company, to begin developing gas sources in the far north. Due to the lack of infrastructure in the regions of the main gas reserves, their development required first and foremost a huge investment in the development of infrastructure. According to various estimates, the investment required reached about \$20 billion over a number of years. It is possible that from the perspective of Gazprom it would have been preferable to involve the government in the development of the northern region so that part of the expenditure could be financed from the federal budget.

It is unclear whether this idea was appropriately packaged for foreign policy makers or whether they came to the same realization simultaneously. Whatever the case, the federal government also began to show interest in the Arctic region at approximately the same time. Only in this case, the interest was not only of an economic nature, but also aligned with the strategic vision of the Russian government.

After the terror attack in Beslan in 2004, Putin made the following statement: "We no longer devote enough attention to matters of defense and security. Furthermore, our country, which once had the strongest border defense, all of a sudden found itself to

10 The Northern Sea Passage vs. The Suez Channel, Nezavisimaya gazeta, June 19, 2018.
http://www.ng.ru/energy/2018-06-19/11_7247_nord.html

11 The Great Russian Encyclopedia; entry for the Northern Sea Route.
<https://bigenc.ru/geography/text/3543982>

be unprotected, whether in the East or the West...We showed weakness and the weak are beaten. There are those that want to take something fat from us and others who are helping them.”¹²

The overall view of the subject was based on the idea of “global competition”, which has been adopted by Putin and his administration. Essentially, it was another version of “the war of each against all” (“bellum omnium contra omnes”), an idea suggested by Thomas Hobbes. In this view, Russia’s defense policy architects are convinced that as a result of the diminishing natural resources worldwide there is increasing competition over what is left and under these conditions the Arctic region—which has huge reserves of various natural resources—is starting to attract the attention of many countries. As a consequence, there is a developing threat against Russia which controls a large part of the region. This situation is forcing Russia to strengthen the defenses of this region. An additional view of the Kremlin’s philosophy on the “Arctic matter” can be seen from a statement by Nikolai Patrushev, the Secretary of the Russian National Security Council, according to which “the US, Norway, Denmark and Canada are implementing a coordinated policy to deny Russia access to the resources of the Continental Shelf.”¹³

Following a number of declarations, Russia’s policy guidelines in the Arctic were formalized in a government document called “On the Foundations of Russia’s Policy in the Arctic up to 2020 and beyond,”¹⁴ which was approved in September 2008. In its first part, entitled “Russia’s Fundamental National Interests in the Arctic Region”, it is stated, among other things, that Russia must strive to exploit the Arctic as a “strategic source of resources that will ensure the achievement of the socioeconomic development of the country” and Russia needs “to use the Northern Sea Route as Russia’s exclusive national transportation route in the Arctic.” Among the objectives derived from these interests, it mentions the expanded exploitation of natural resources in the Arctic region and ensuring the operational capabilities of the forces protecting the Arctic region.

The Arctic domain, from the perspective of both transportation and the military, is also mentioned in “The Military Doctrine of the Russian Federation.” The most recent version of the doctrine was approved in 2017 and lists the following four main points:¹⁵

1. Ensuring free access of the Russian navy to the Atlantic Ocean and the Pacific Ocean.

12 The official site of the Kremlin:

http://www.kremlin.ru/appears/2004/09/04/1752_type63374type82634_76320.shtml

13 Trenin, D. and P. Bayev, *The Arctic: The View from Moscow*, Moscow, Carnegie Center, 2010, p. 15.

14 The official site of the Russian government: <http://government.ru/info18359>

15 Collection of the Russian Federation’s laws:

<http://legalacts.ru/doc/morskaja-doktrina-rossiiskoi-federatsii-utv-prezidentom-rf-26072015/>

2. The unique natural resources in Russia's Exclusive Economic Zone and in the Continental Shelf of the Northern Sea.
3. The growing importance of the Northern Sea Route to ensure Russia's stable development.
4. The decisive role of the Northern Fleet in the protection of Russia from the sea.

Following the statement of the Northern Sea Route's importance, Russian senior officials have expressed the idea of transforming it into one of the main maritime trade routes—one that even competes with the Suez Canal—for the transport of goods from East Asia to Europe.¹⁶ In a speech to the Parliament on March 1, 2018, President Putin even declared that the goal is to increase the volume of cargo transported by the Northern Sea Route to 80 million tons by 2025 and to transform it into a "global trade route."¹⁷ This goal does not appear to be particularly realistic. Thus, although during the 2000s the movement of cargo on the route began to rise following the low levels reached during the 1990s, only in 2016 did it reach about 7 million tons—the peak reached during the Soviet period—and in 2017 it reached about 9.9 million tons.¹⁸ For purposes of comparison, the traffic through the Suez Canal totals several million tons every day. Thus, during one of the days in August 2017, which was a record day in the history of the Suez Canal, 74 ships passed through it carrying 5.2 million tons of cargo.¹⁹

Although, according to Russian officials, the use of the Northern Sea Route significantly shortens the distance between the ports of East Asia and those of Europe, there still remain numerous obstacles to shipping (the season during which it is possible to traverse the Northern Sea Route without icebreakers is only about four months long during the summer, and traffic accompanied by icebreakers during the winter is fairly slow), and there is a very low level of necessary infrastructure. It is possible that the Russian government expected that the Gazprom and Rosneft companies, which are interested in the North's resources, would invest in the region's infrastructure but they apparently never intended to do so and the economic crisis prevailing in Russia in recent years has made this even less likely.

The development of the route by means of foreign investment also appears to be problematic. It is possible that Western nations and companies will not participate in

16 For example, a news bulletin on the "official" television channel:

http://www.ng.ru/energy/2018-06-19/11_7247_nord.html

17 http://www.ng.ru/energy/2018-06-19/11_7247_nord.html

18 The site of the Federal Russian Bureau of Statistics <https://fedstat.ru/indicator/51479>

19 <https://worldmaritimeneeds.com/archives/239818/suez-canal-bags-usd-5-3-bn-in-revenue-in-2017/>

this initiative, both because of the economic sanctions imposed on Russia²⁰ and in light of previous experience (such as that of BP in the development of the Sakhalin-2 project from which it was expelled and its share transferred to Russian companies after it had provided most of funding in the development stage). The participation of China in the project also appears to be problematic, both because the Belt and Road Initiative (“the maritime Silk Road and belt for economic cooperation”) answers its needs and because participating in the project essentially means helping Russia create infrastructure that can be used for military purposes, including the movement of naval forces from the Northern theater to the Pacific theater.

Another problem that is hindering trade activity on the Northern Sea Route is the rivalry between bodies over the exclusive right to operate in the Northern Sea Route—the Northern Sea Route Authority which is under Russia’s Ministry of Transportation and is responsible for the operation of the route, including all of the infrastructure for the support of shipping and the 35 diesel-powered icebreakers, and Rosatomflot, a subsidiary of Rosatom, a government corporation that operates Russia’s six nuclear-powered icebreakers, another three of which are under construction and another which is in the planning stages.²¹

In the meanwhile, Russia’s activity in the North is limited to declarations and attempts to build a military infrastructure and the deployment of land-based forces, including a division on the Chukotka Peninsula. In this context, one of the officer schools of the land forces has even established a special track for the training of infantry forces operating in the Arctic.²² Nonetheless, it is unclear what part of the plan for force buildup will actually be implemented and which will remain on paper.

The plans for the civilian development of the Arctic region and in particular that of the Northern Sea Route are in a similar situation. Despite a number of declarations, there is a lack of budgets for investing in infrastructure and without those budgets the implementation of the aforementioned plans does not appear to be realistic.

20 The sanctions prohibit, among other things, the transfer of advanced technology that might contribute directly or indirectly to Russia’s military capabilities. Furthermore, the sanctions impose tight restrictions on cooperation with a number of Russian companies and banks.

21 Northern Thorny Pass, *Kommersant*, June 18, 2018.

22 The official site of the Russian Ministry of Defense:
https://function.mil.ru/news_page/country/more.htm?id=12072218@egNews#txt

Conclusion

Whether there is a full melting of the ice along the Northern Sea Route or whether icebreakers will be used to assist ships in traversing the route, it appears that a growing volume of cargo will be shipped via the route in coming years.

It appears that for the foreseeable future the Northern Sea Route will not present a genuine threat to the current route through the Suez Canal, although it is possible that in the intermediate term it will see growing traffic and perhaps significant volumes of cargo.

It appears that the issue does not have any immediate implications for Israel or for our region, although in the intermediate and long term it should be remembered that the revenues from the Suez Canal are a major component of the Egyptian government's revenues and of the country's economy²³ and therefore it may be that the emergence of competition to the canal and a potential drop in its revenues will have major ramifications for Egypt's future. This is even more the case in view of the fact that the Suez Canal was widened (and even doubled in size in some spots) in recent years, as part of a massive national project that includes the establishment of new industrial parks along its route.

Clearly, the economic situation in Egypt will affect other countries in the region, including Israel.

23 <https://www.reuters.com/article/egypt-canal-minister-idUSL5N0W74WT20150305>

The Geopolitical Implications of the Trade War: A Theoretical Discussion

Nitzan Feldman

In 2018, the "trade war"—which had previously been limited to a number of declarations by the Trump administration that the US is being treated unfairly in its trade with other countries—escalated to the stage of major policy measures, which have already left their mark on the global economy.

The opening shot of the trade war was fired in March 2018 when the US imposed a tariff of 25 percent on the import of steel and 10 percent on the import of aluminum.¹ At first, the US exempted close allies, such as the EU, Canada and Mexico, from the tariffs. Its decision three months later to cancel those exemptions was a sign that the trade war is not limited to an economic-political struggle between the US and China and other strategic rivals and it is possible that the US administration is indeed determined to change the rules of the game, which had been put in place by the international institutions that it itself created following the Second World War.

During the last few months of 2018, there were indications that some of the tension between the US and a number of its major trading partners had dissipated, such as the joint declaration at the beginning of October of a renewed trade agreement between the US, Canada and Mexico. The tensest front in the trade war was the confrontation between the US and China. As of late 2018, there was as yet no hint that either of the two superpowers intends to deviate from a tit-for-tat strategy, which began to emerge after the US imposed tariffs on Chinese goods worth \$34 billion in July and the immediate response by China, which imposed tariffs on goods with a similar value. A similar phenomenon was observed in August when the US imposed tariffs on Chinese goods worth \$16 billion, which was met by an identical Chinese reaction. In September, a decision to raise the tariffs on Chinese goods worth \$200 billion by a rate of 10 percent went into effect and it is likely to go up to 25 percent by the end of the year. In response, China announced that it would raise the tariffs on American goods worth about \$60 billion.² President Trump threatened that China's response would lead to a

1 Even before this, tariffs on the import of washing machines with a value of \$1.8 billion and on solar panels with a value of \$8.5 billion went into effect in January 2018. For a detailed schedule of all of the American tariffs and the responses of the various countries, see: Chad P. Bown and Melina Kolb, "Trump's Trade War Timeline: An Up-to-Date Guide," Peterson Institute for International Economics, September 24, 2018, <https://piie.com/blogs/trade-investment-policy-watch/trump-trade-war-china-date-guide>

2 Ibid.

hike in the tariffs on Chinese goods worth \$267 billion, such that there is the possibility that within a few months almost all of the bilateral trade between the two countries will be subject to tariffs.

The research departments of most of the international economic institutions have, in their annual forecasts for 2019, ranked the increase in international tension surrounding trade issues as being the leading cause of growing uncertainty in the international economic system.³ Despite the differences in methodology and scenarios used by the various international bodies to estimate the damage to economic growth, almost all of the economic publications agree that this is a negative process which will harm global growth to one extent or another. Since about 80 percent of the volume of international trade is by sea, a major reduction in the volume of world trade will have major implications for commercial fleets all over the world and is liable to intensify the problems of many shipping companies, which in any case have been suffering in recent years from only moderate growth in the demand for ocean transport.⁴

In addition to the attempts to assess the economic damage from the trade war, the exchange of economic blows between the superpowers has been accompanied by a wave of forecasts which predict that a slide into protectionism will undermine the stability of the international system and will even increase the likelihood of violent confrontations worldwide. While the fear that a protectionist policy will harm economic growth is backed up by solid theoretical and empirical research, which enjoys a consensus among the economic establishment, many studies that have attempted to determine whether international trade contributes to peace do not present a clear picture. Thus, it is difficult to present unambiguous empirical evidence in support of the concern that the trade war necessarily constitutes a destabilizing factor which increases the likelihood of violent conflicts worldwide. Nonetheless, research on the subject can certainly help to identify the important variables that should be the focus when analyzing the strategic implications of a major retreat from globalization processes. This brief article

3 At the end of September, the IMF, the World Trade Organization and the World Bank made a joint announcement that expressed concern regarding the adverse economic implication of the increase in tariffs. A description of the expected damage and the ways to moderate it can be found in the speech given by the Chairman of the IMF, Christian Lagarde. See Christine Lagarde, "Steer, Don't Drift: Managing Rising Risks to Keep the Global Economy on Course," Speech in Washington, DC ahead of the IMF-World Bank Annual Meeting, October 1, 2018, <https://www.imf.org/en/News/Articles/2018/09/27/sp100118-steer-dont-drift>

4 For a description of the implications of the trade war on the commercial fleets and on maritime trade, see United Nation Conference on Trade and Development (UNCTAD), Review of Maritime Transport, October, 2017, <https://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=2245>

will consider the importance of these variables with respect to the potential geopolitical implications of the trade war escalation.

Is the trade war necessarily a destabilizing factor?

The direct and most important question that arises from the aforementioned processes is whether the raising of tariffs and the reduction in the volume of trade are increasing the likelihood of violent conflicts between countries worldwide and are leading to the creation of a “cold war” between China and the US which might even escalate into a violent confrontation. Many of the op-ed articles that have commented on the trade war mention the fact that the protectionism which prevailed during the Great Depression in the 1930s contributed to the various processes that in turn led to the international tension prior the Second World War. Considering the historic context can indeed assist in the analysis, but must be carried out carefully and while controlling for variables that differentiate between the different circumstances and periods. Indeed, most of the contemporary research does not rely only on the investigation of historic processes, but also on quantitative analysis that utilizes sophisticated statistical techniques whose goal is to examine how trade affects the likelihood of conflicts between nations.

Starting from the 1990s, dozens of studies have reported a negative and statistically significant relationship between bilateral trade and the probability that two countries will go to war. This finding supports the well-established liberal logic according to which countries do not go to war against their main trading partners in order not to sacrifice the fruits of trade. In other words, the greater the volume of trade between a pair of countries, the higher will be the cost of war and therefore the likelihood of war will diminish. In recent years, the research on this topic has presented empirical findings showing that the more open countries are to trade in general and to additional globalization processes, the more restrained their behavior will be in the international arena. This is because they concern that war will harm their trade and investments with third parties which are not directly involved in the war.⁵

According to the logic underlying this research, one of the major dangers of a trade war is that the retreat from globalization will indeed lead to a significant drop in the volume of trade between countries and therefore to a drop in the opportunity cost of a conflict between potential adversaries. Although this logic is likely to be relevant for various pairs of countries, it apparently does not hold in the case of China and the US in the short term. Even after all the planned tariffs have gone into effect, the mutual economic

5 There is a vast literature on the topic and it is difficult to review it all in an article of this type. For a good review of the articles which show that trade reduces the likelihood of conflicts, see: Gerald Schneider, “Peace through Globalization and Capitalism? Prospect of Two Liberal Propositions,” *Journal of Peace Research*, Vol. 51, no.2 (2014), pp. 173–183.

dependence between the superpowers will remain and the potential decoupling will have disastrous effects on the economy of the two superpowers and on the entire global economy. In other words, if the fear of economic damage is indeed a factor that can prevent conflict, then the trade war—at its current level—will not reduce the superpowers' fear of the economic consequences of a violent conflict between them.

The research which supports the theory that trade contributes to peace will claim that despite the recent increase in tension on the surface, the acceptance of China into the World Trade Organization in 2001 and its opening up to additional globalization processes have contributed to international stability, since they have created a mechanism of "mutually assured economic destruction" between China and the US, which reduces the likelihood of a violent confrontation between them. The US is the largest export destination for Chinese goods and China is the largest source of goods imported into the US and is the third largest destination for US exports. The trade relationship is, however, characterized by a chronic US trade deficit that stood at more than \$375 billion in 2017.⁶ The American claim that the trade deficit does not only reflect fundamental economic factors and is primarily the result of unfair Chinese policy (such as a fixed exchange rate between the dollar and yuan) was voiced by the economic establishment in the US long before the Trump administration declared the deficit to be the main factor behind the change in trade policy. Even bodies that totally oppose the Trump administration's recent moves justify some of its main claims against China's trade and investment policy. However, and despite US complaints against unfair Chinese policy and notwithstanding the determination to change China's policy, it does not appear that the sides can allow themselves to make moves that will lead to a cutoff of economic relations between them.

China's trade surplus with the US is one of the main factors that has led to the return of capital to the US by way of the purchase of US bonds. China holds a total of \$1.18 trillion in US treasury bonds,⁷ which makes it the largest creditor of the US government. The escalation of the trade war raised the possibility that China would respond to the American tariffs by selling off US bonds, with the goal of lowering their value. Although China may gradually reduce its holdings of American assets, it is clear that a rapid selloff of US bonds would hurt China's asset portfolio. Thus, a situation exists that prevents the sides from suddenly cutting off economic relations.⁸

6 United State Census Bureau, <https://www.census.gov/foreign-trade/balance/c5700.html>

7 US Department of the Treasury, <http://ticdata.treasury.gov/Publish/mfh.txt>

8 For a theoretical analysis of the difficulty China faces in using its US bonds as geopolitical leverage, see: Dan Drezner, "Bad debts: Assessing China's financial influence in great power politics," *International Security*, Vol .34, No.2 (2009), pp. 7–45.

Another important point raised in the literature relates to the complexity of the trade networks in the global era, which reduces the possibility of one large economy being able to harm another, without it also harming the supply and production chains that benefit other members of the network.⁹ A major share of Chinese exports to the US is composed of electronic products that include components imported by China from US allies, such as Japan and South Korea. A rapid drop in US imports from China would have far-reaching implications for the global production and supply chains and would likely cause economic damage to strategic US allies and other countries, who account for a significant portion of the demand for imports and investment from the US.

In conclusion, and according to the logic of the literature which holds that globalization is a stabilizing factor, the depth of the mutual dependency that currently exists in the global economy has significantly raised the cost of cutting off economic relations between China and the US, and therefore the possibility has been reduced that an exchange of economic blows between them will soon escalate into a violent conflict or other moves that will lead to a rapid drop in trade between them. The fear expressed in the research relates to the possibility that the trade war will gradually undermine the stabilizing mechanisms that have led the globalization of the entire world economy.

It is believed that the lion's share of trade between China and the US, as well as between the US and its allies, is not expected to be adversely affected in the near future. However, the recognition that the trade war is providing indications of a possible shift in global trade and the weakening of US commitment to existing institutions could lead various countries to look for ways of formalizing their trade in bilateral and multilateral agreements that do not include the US.

The expectation of barriers to free trade may motivate countries to consider the development of commercial and even military solutions that will ensure their access to future trade. It is worth mentioning in this context studies which claim that the expectations among European countries of the continuation of the trend toward protectionism in the early 20th century and their desire to ensure access to economic resources contributed to the maritime arms race that preceded the First World War.¹⁰ Clearly there are huge differences between that period and the current international situation; nonetheless, the possibility of a slide toward protectionism that may cause countries to increase their efforts to ensure their trade cannot be ruled out. Paradoxically, the trade war—which may in the short run harm the demand for ocean transport—may lead countries to

9 Han Dorussen and Hugh Ward, "Trade networks and the Kantian peace," *Journal of Peace Research*, Vol 47, No.1 (2010), pp. 29–42.

10 Dale C. Copeland, "Economic Interdependence and War: A Theory of Trade Expectations," *International Security*, Vol. 20, No. 4 (1996), pp. 5–41.

reinforce their economic security through greater dependence on their own commercial fleets. Thus, an escalation in the trade war may actually increase the size of national commercial fleets and encourage acquisitions for their navies.

The trade war as strategic competition

Although the aforementioned studies are the ones that have attracted the attention of the economic establishment, which has promoted the globalization process in recent decades, there are many other studies that challenge this logic and the empirical findings presented in the surveyed studies. These studies have claimed that the empirical findings which allegedly show that trade promotes peace do not take into consideration the fact that it is friendly nations that trade with one another in the first place, such that the finding is the result of a methodological problem. And indeed, a number of studies have shown that the relationship between trade and peace becomes statistically insignificant if the order of events is correctly controlled for.¹¹

Other studies have demonstrated that the inclusion of countries within globalization processes increases the likelihood that they will be attacked by strategic rivals who fear that their inclusion in the global economy will strengthen them.¹² According to this logic, the trade war is essentially an American attempt to prevent China from growing too strong and the US will be willing to risk economic harm if its actions cause even greater harm to China, which will prevent it from achieving strategic advantages. Specifically, the US is willing to absorb price increases and to risk a certain reduction in its exports in order to impede the economic and political expansion that China is trying to promote by means of its "One belt, one road" initiative and in order to prevent the potential growth that the vision of "Made in China 2025" can provide it. Made in China 2025 is an ambitious program that is aimed at changing the economic model and transforming China into a competitive industrial superpower that stands at the forefront of technological knowledge in various domains, such as aerospace, robotics and maritime technology. It is clear that apart from the fear of economic competition from China, Chinese dominance in the aforementioned sectors will have far-reaching implications for security.¹³ The US tariffs are liable to harm sectors that were meant to advance the plan, but it is in fact possible that increased pressure on Chinese exports

11 Omar M. G. Keshk, Rafael Reuveny and Brian M. Pollins, "Trade and Conflict: Proximity, Country Size, and Measures," *Conflict Management and Peace Science*, Vol. 27, No.1 (2010), pp. 3–27.

12 Timothy M. Peterson, "Third-party Trade, Political Similarity, and Dyadic Conflict," *Journal of Peace Research*, Vol. 48, no.2 (2011), PP. 185–200.

13 Paul Mozur and Jane Perlez, "China Tech Investment Flying Under the Radar, Pentagon Warns," *The New York Times*, April 7, 2017, <https://www.nytimes.com/2017/04/07/business/china-defense-start-ups-pentagon-technology.html>

will increase China's motivation to more rapidly reduce its dependence on the export of labor-intensive goods and to increase the budgets allocated to the 2025 vision.



Fig 1: US President Donald Trump and Chinese President Xi Jinping at their meeting in July 2017. Source: Chinese Foreign Ministry website

It would appear that the same asymmetry in trade between the two countries, which is presented in the US as the reason for changing the rules of the game, provides the US with more tools in the trade war relative to China, since the quantity of Chinese goods that are sold in the US and on which tariffs can be placed is much larger than the quantity of American goods sold in China, as well as being due to the difference in dependence on exports and imports between the US and China.

Total Chinese exports stand at \$2.27 trillion and constitute 20 percent of Chinese GDP. Of this, 19 percent goes to the US. China's imports total \$1.23 trillion and 9.9 percent of that originates in the US.

Total American exports total \$1.32 trillion and constitute 7.1 percent of US GDP. Of that, 9.2 percent goes to China. Total American imports total \$2.12 trillion and 21 percent of that comes from China.¹⁴

14 The Observatory of Economic Complexity; MIT Media Lab.

In addition, the increasing difficulty in exporting from China to the US may even reduce the attractiveness of investment in China for multinational companies and thus reduce total investment in China. However, the trade war does not have to be limited only to tariffs and China can respond to American moves by impeding the operations of American companies in China in various ways or by reducing the value of the currency, which will offset the effect of the tariffs on trade relations between the countries. These potential measures, like the sale of US bonds mentioned above, will impose significant costs on both sides.

The effect on the system of alliances

As can be seen, it is difficult to find unambiguous assessments of the expected contraction in trade and it is even more difficult to find unambiguous findings which conclude that the trade war and the possible drop in the volume of trade will indeed raise the likelihood of violent confrontations. However, and notwithstanding the disagreements between the studies, research on this issue has produced a consistent finding that can help in understanding one of the most important expected implications of increased tension in trade relations. Almost all statistical studies of the issue report a positive and statistically significant connection between trade on the one hand and the existence and strength of alliances on the other.¹⁵ This is apparently a two-way connection, whereby allies trade a lot with each other and trade is a way for countries to express their commitment to an alliance.

These consistent findings can provide an indication that the escalation of the trade war and a major contraction of US trade with its friends in Europe, Asia and the Americas will be added to other factors that increase the concern that the US is not fully committed to its allies. The fear of losing faith in US commitments to its allies has various results, such as attempts by some of the countries to improve relations with China and greater willingness to take part in the new international institutions that it is trying to promote, including the Asiatic Infrastructure Investment Bank (AIIB) and others. It would be premature therefore to conclude that the American steps herald the fragmentation of the trade system and constitute a threat to world peace. However, an escalation of the trade war will likely lead to a slow disintegration of the global trade system that is also likely to herald changes in the network of US alliances, which it nurtured during the years when it was the leader and initiator in international trade.

15 Nizan Feldman and Tal Sadeh, "War and Third-party Trade," *Journal of Conflict Resolution*, Vol. 62, no.1 (2018), pp. 119–142.

Table 1: Comparison of trade between the US and China

China	US\$	USA	US\$
China GDP	12,014,610	US GDP	19,390,600
GDP per capita	8,309	GDP per capita	57,831
Trade of GDP	19.10%	Trade of GDP	13.40%
Trade per capita	1,586	Trade per capita	7,756
China Export	2,263,329	US Export	1,546,725
China Export out of GDP	18.84%	US export out of GDP	7.98%
China Export to US (*)	430,033	US Export to China	182,347
China Export to US out of GDP	3.58%	US Export to China out of GDP	0.94%
China Export to US out of all export	19%	US Export to China out of all export	11.79%
China Import	1,841,889	US Import	2,409,495
China Import out of GDP	15.33%	US Import out of GDP	12.43%
China Import from US	182,347	US Import from China	430,033
China Import from US out of GDP	1.52%	US Import from China out of GDP	2.22%
China Import to US out of all import	9.90%	US import from China out of all import	17.85%

(*) direct export

https://www.wto.org/english/res_e/statis_e/statis_e.htm

<https://atlas.media.mit.edu>

Israel is not currently involved in the trade war, but of course a reduction in the volume of international trade and a change in the institutional arrangements can be expected to affect the Israeli economy, which is export-biased. Increased tension between the superpowers on economic issues is likely to increase the interest of the US in the amount and character of China's investments in Israel and may even lead to pressure on Israel to refrain from accepting Chinese investments in strategic domains.

Future U.S. Naval Capabilities

Seth Cropsey

Capabilities and Strategy

There is little to be gained by looking at future naval—or any—capabilities absent consideration of what kind of challenges are likely. Before the 9/11 Attacks, Donald Rumsfeld’s writing as Secretary of Defense focused on “capabilities-based planning.” Although the term now carries a set of bureaucratic connotations, the phrase’s original intent was simply to remind American policymakers that, in an uncertain world, the best safeguard against failure is a long-term vision. By better foreseeing threats and challenges, the US could adapt to a variety of crises while still securing its long-term objectives. Such thinking is particularly important for the armed services. If done correctly, it offers insight about the future of military and political confrontation, and a greater understanding of how best to dominate their enemies. If done incorrectly, or not done at all, it leaves them woefully underprepared. This is particularly true of the sea services. Airplanes, tanks, battle rifles, missiles, artillery are all expensive. But naval ships both typically require more resources overall to produce and will remain in service much longer than other military assets. Clear strategic thinking that in turn guides procurement and force structure, therefore, is critical for naval superiority and success.

Such strategic thinking has sometimes eluded policymakers from the Cold War’s end until today. Of greater concern, some of the attempts at strategic thinking yielded the wrong conclusions and identified the wrong policies. The US will find increasing difficulty in attempting to stay “ahead of the curve.” It must instead catch up to the current international system, with its new mix of threats and challenges.

Specifically, the threats that Russia, China, and Iran pose to American and allied interests and values are all heavily maritime in nature, indicating that great power competition in the 21st century will involve a distinct naval component. Two major force structure questions exist for the US Navy. First, what will the role of the carrier be? Will the Navy move away from its current Carrier Strike Group format, and if so, what will replace it? Second, how will unmanned platforms in the air, on the sea, and below it change the Navy’s capabilities and structure?

Hanging over these questions, however, is the central issue of funding. If the Navy is unable to secure proper funding, all the above questions are functionally irrelevant. For example, as U.S. national debt passes \$20 trillion dollars on its upwards curve, the portion of the annual budget that must be spent to service the debt is projected to

rise to more than 25 percent. Combine this with the spending required by law on social welfare programs and the amount left over for defense shrinks. Substantially.

Maritime Competition and New Threats

The current strategic environment is defined by three actors that are hostile to American and Western interests – China, Russia, and Iran. Although the three are not formally allied, and possess differing, and potentially contradictory, long-term interests, for the foreseeable future these three states will actively and passively cooperate against the United States and its allies.

China poses the greatest threat. After decades of economic development, China is finally prepared to increase its international assertiveness. The word in Beijing nowadays is that since China's former public declarations of intent about "peaceful rise" have not borne out, other means must be sought. China's strategy has two long-term objectives. First, it aspires to become the leading power in Asia, in part, by ejecting the US from the region. In the short-term, this involves applying pressure to America's alliance networks, building a naval force that can challenge the US and its allies for maritime superiority in the East and South China Seas, and subjugating Taiwan.

In the long-term, China will expand its naval footprint even further, operating around the globe and fielding a true blue-water navy with advanced capital ships that can challenge the US in a direct confrontation. Second, China desires to gain control of the Eurasian heartland and other resource-rich regions, to leverage their material wealth and in turn expand its own economic and military power. Chinese investment in Latin America, Africa, the Middle East, and the One Belt One Road project in Central and South Asia and the Near East facilitate this objective. Chinese naval power clearly has a major role to play in this project. China is constructing a fleet that is capable of launching amphibious assaults against Pacific island strongholds, supported by a missile and naval aviation force that can blunt or turn back an American response.

Russia, despite its decreased relative power, is also a significant adversary. Putin retains the Soviet and Imperial dream of dominating Europe to ensure Russian security from invasion and cement its status as a great power once again. This strategy requires that Russia pressure NATO, which can be done most effectively at its weakest points – its maritime flanks. Hence, Russia has consolidated its control over the Black Sea, conquering most of the Georgian coastline and annexing Crimea. It has now progressed to the next phase of its strategy, increasing its presence in the Near East to gain control over the Eastern Mediterranean. An advanced submarine force, supported

by small but lethal surface combatants and naval aviation, allows Russia to achieve these goals at sea.

Iran underscores the geographic link between Russia and China. Iranian imperial ambition stems from its ancient history and contemporary religious fervor. Its theocratic government seeks to dominate the Islamic world. Now that Iran has consolidated its grip on Iraq and Syria, it is freer to project power at sea, particularly in the Red Sea and Eastern Mediterranean, where its proxy Hezbollah dominates Lebanon. Iran lacks the resources and basing capabilities of Russia and China but is mastering the use of long-range missiles and irregular forces to wield its hard power.

Long-term friction exists between these three partners. China's goal of Eurasian hegemony will eventually trigger a negative Russian reaction, as military and political effects follow Beijing's economic expansion into Central Asia (and potentially the Eastern Mediterranean). Russia has no desire for physical control of the Near East, and fears the enmity of the Islamic world, whereas Iran's expansionist policies could make vulnerable Russia's foothold in Syria. But for the near future, China, Russia, and Iran will remain a tacit illiberal entente, designed to challenge America's position and its allies in nearly every region, and particularly at sea.

Fleet Structure – the CSG, Distributed Lethality, and Unmanned Systems

With the return of great power competition, and increased potential for maritime confrontation, the US Navy's role in safeguarding American interests and allies is once again paramount. The Navy's focus has returned to sea control, rather than the power projection missions that dominated the 1990s and 2000s. Controlling specific geographical chokepoints and maritime spaces – namely the Baltic, Eastern Mediterranean, Strait of Hormuz and of Bab al-Mandab, Strait of Malacca, Strait of Lombok, South China Sea, and East China Sea demands a fleet better optimized to fight at sea and for the sea, rather than one intended to strike shore targets. However, two structural-technological issues must be confronted before projecting the US Navy's future structure and capabilities: the persistence and role of the Carrier Strike Group (CSG), and the prevalence of unmanned systems in the fleet.

The CSG has defined the US Navy's structure since the Second World War. The Pearl Harbor attack thrust the carrier into its current role as a full-fledged capital ship – American admirals, drawing off two decades of tactical, operational, and strategic testing and refinement – employed aircraft carriers in coordinated offensives against their Japanese counterparts. The Carrier Air Wing, known as the “Sunday Punch,” was the US Navy's greatest offensive weapon. Comprised of air superiority, strike, and

anti-submarine platforms, the Carrier Air Wing was flexible enough to respond to nearly any threat at sea and support amphibious assaults. Each fleet carrier group, known as a Fast Carrier Task Force, included escorting ships to keep the flat-top itself out of harm's way by surrounding it with a shield of anti-aircraft fire, and checking any surface or undersea movements against the capital ships.

Technology has advanced, but today's CSGs closely resemble their Fast Carrier Task Force antecedents. Largely defensive surface combatants carry air defense systems that can intercept enemy missiles, while the air wing provides the CSG's offensive punch. Today's air wing has decreased in diversity, while modern surface combatants lack—in relative terms—the naval offensive capabilities of their predecessors, but the basic operational concept remains unchanged.

Still, modern advances in networking and weapon and sensor range have called this CSG structure into question. Counter to oft-repeated assertions, the missile has not eliminated the need for naval power. In fact, the missile arguably amplified the efficacy of naval forces, increasing their range, and diversifying their potential missions. However, centralizing combat power on a small set of capital ships may not be the most efficient or effective method to structure naval forces today. This is not to say that the need for aircraft carriers has vanished. American naval operations in the 1980s, beginning with *Ocean Venture '81*, demonstrated the ways in which communications technology enabled fleets to reorganize their tactical deployments. Considering advances in unmanned technology, it may be time to take the next evolutionary step, and reconsider how weapons and systems are distributed throughout the fleet, alongside developing new tactical deployment structures.

Unmanned technologies concurrently drive the potential move away from the CSG structure. Historically, the decisive concentration of firepower in any form of warfare has required physical colocation. From the hoplite phalanx and Roman legion to the French cavalry lance or Prussian line regiment, this has remained true throughout the 20th century, even as airpower, rail movement, and motorized and mechanized vehicles became common in modernized militaries. This explains the need to create large, heavily armed surface warships (and submarines), organized into battle squadrons, a staple of naval operations since Themistocles led his triremes against the Persian fleet.

Unmanned technology and increasingly effective networking capabilities, alongside long-range missiles, could allow military forces to modify this staple of conflict. Today, a central authority can coordinate and control geographically dispersed forces, bringing their firepower to bear on any number of targets without moving these platforms as an organized battle squadron. Smaller warships have always been more flexible than

their capital ship counterparts. But that advantage in flexibility has never offset the advantage the capital ship holds in firepower. Such broad-scale coordination would threaten to overturn this formulation, allowing smaller manned and unmanned surface combatants and submarines working in conjunction to deliver the same amount of firepower as a CSG. Moreover, this dispersed force is much less vulnerable to enemy strikes, scattered as it would be over many miles of ocean. Additionally, an enemy would encounter far greater difficulty in identifying this network's Clausewitzian center of gravity – the elimination of one node in the network would not threaten the entire squadron.

Finally, I cannot overstate the questions about the U.S.' willingness to pay for a modern, appropriately-sized fleet. The current administration wants to build a 355-ship fleet and reach this goal in 30 years. Achieving this requires a commitment from every president and Congress between now and the middle of the 21st century. And even at current, increased defense spending levels, the fleet will not meet President Trump's goal. To do so would require a sustained increase of about 25 percent over the average spent on shipbuilding over the past three decades. As with other enterprises, fleet modernization and expansion demand steady and sustained funding over many years. In the current U.S. political climate, it would be a mistake to assume such funding.

Finally, statements from senior Trump administration officials about future defense budgets as well as the Republicans' loss of a majority in the House of Representatives point to reduced resources for building a larger US naval fleet. Decreased resources for defense will hurt efforts to grow the fleet as they introduce uncertainty into the industrial base required to build up US naval forces.

The Maritime Domain Policy: From Awareness to Reality

Ram Erez

Introduction

The subject of the maritime domain has recently been in the headlines in Israel, primarily due to the discoveries of natural gas in Israel's economic waters and the efforts to exploit them, and due to their potential effect on the environment, on the Israeli economy and on the navy, which is deployed to protect the maritime domain. At the same time, and in contrast to the importance of the maritime domain to the State of Israel, the issue has for years suffered from lack of an overall policy, and only now is a policy emerging.

In order to advance the discourse on policy in the maritime domain in Israel, this chapter borrows a term from the international discourse – Maritime Domain Awareness. The term will be examined and used to study the Israeli case and its degree of Maritime Domain Awareness. In order to do so, the chapter focuses on an analysis of the concept and the potential for its use. To this end, the analysis begins with a definition of the term, the identification of its sources and its development, in view of the growing need for a conceptual framework in the discussion of the maritime domain. From there, the analysis moves on to conceptual and practical challenges in the application of the term and discusses the need to expand the realms in which it is applied. Israel will serve as an interesting and relevant case study, with emphasis on Israel's efforts to formulate a national policy in the maritime domain.

The concept of Maritime Domain Awareness and its sources

The traumatic event of the 9/11 attack on American soil constituted a catalyst for the coining of the term Maritime Domain Awareness.¹ The Bush administration's concern was, among other things, that the next terror attack would originate from the sea. The maritime front was identified as exposed and vulnerable, with limited control and broad freedom to operate for elements hostile to the United States.² In December 2004,

1 Essentially, President Bush coined the term Maritime Domain Awareness in January 2002 in a speech about 4 months after the 9/11 attack.

2 "The Maritime Domain facilitates a unique freedom of movement and flow of goods while allowing people, cargo, and conveyances to transit with anonymity not generally available by movement over land or by air. Individuals and organizations hostile to the United States have demonstrated a continuing desire to exploit such vulnerabilities". **National Security Presidential Directive NSPD-41**. December 21, 2004. <https://www.hsdl.org/?abstract&did=776173>

President Bush issued a Presidential Directive on the subject in which he broadly defined the maritime domain as follows:³

...all areas and things of, on, under, relating to, adjacent to, or bordering on a sea, ocean, or other navigable waterway, including all maritime-related activities, infrastructure, people, cargo, and vessels and other conveyances. Due to its complex nature and immense size, the Maritime Domain is particularly susceptible to exploitation and disruption by individuals, organizations, and States. The Maritime Domain facilitates a unique freedom of movement and flow of goods while allowing people, cargo, and conveyances to transit with anonymity not generally available by movement over land or by air.

And the term Maritime Domain Awareness as:⁴

...the effective understanding of anything associated with the global Maritime Domain that could impact the security, safety, economy, or environment of the United States.

In the context of the 9/11 attack, the Presidential Decree emphasized that it is essential for the US to create a basket of tools for the identification of threats to the American maritime domain **as early as possible and as far away as possible**, in order to create a unified picture of the situation that will be available to all entities in the US government.⁵

In this context, the US has been a pioneer in defining the subject and the concept has been accepted and fixed in international discourse. Thus, the International Maritime Organization (IMO), which functions within the framework of the UN, has adopted the definition and works to apply it throughout the world,⁶ as the NATO members⁷ and other countries as well.⁸

3 Ibid.

4 Ibid.

5 Ibid.

6 The term appears in the organization's definitions. See, for example: IMO (2010). **Amendments To The International Aeronautical And Maritime Search And Rescue (IAMSAR) Manual**. http://www.imo.org/blast/blastDataHelper.asp?data_id=29093&filename=1367.pdf. The organization holds international seminars to promote the concept and its application. See, for example: IMO (2017). **Strengthening Maritime Security In West And Central Africa**. http://www.imo.org/en/OurWork/Security/Guide_to_Maritime_Security/Documents/WEB_version_v1-01.09.17.pdf

7 Andrew Metrick, Kathleen H. Hicks. **Contested Seas: Maritime Domain Awareness in Northern Europe**. Center for Strategic and International Studies. March 2018.

8 See, for example, the Indian application, as it appears in its 2015 naval strategy document: Indian Navy (2015). **Ensuring Secure Seas: Indian Maritime Security Strategy**, New Delhi. http://indiannavy.nic.in/sites/default/files/Indian_Maritime_Security_Strategy_Document_25Jan16.pdf

The 2004 Presidential Decree defined six overall goals for the achievement of security in the maritime domain:⁹

1. Preventing terrorist attacks or criminal acts or hostile acts in, or the unlawful exploitation of, the Maritime Domain, and reducing the vulnerability of the Maritime Domain to such acts and exploitation;
2. Enhancing U.S. national security and homeland security by protecting U.S. population centers, critical infrastructure, borders, harbors, ports, and coastal approaches in the Maritime Domain;
3. Expediting recovery and response from attacks within the Maritime Domain;
4. Maximizing awareness of security issues in the Maritime Domain in order to support U.S. forces and improve United States Government actions in response to identified threats;
5. Enhancing international relationships and promoting the integration of U.S. allies and international and private sector partners into an improved global maritime security framework to advance common security interests in the Maritime Domain; and
6. Ensuring seamless, coordinated implementation of authorities and responsibilities relating to the security of the Maritime Domain by and among Federal departments and agencies.

In order to achieve these goals, the Department of Homeland Security, which was created following the 9/11 attack, issued a document on achieving Maritime Domain Awareness, as part of eight documents for the achievement of Maritime Security.¹⁰ This is part of an effort to achieve the **"accurate and timely decision-making ability that will enable effective action to neutralize threats"**.¹¹

Measures to achieve Maritime Domain Awareness

The American approach, which has also been adopted by other countries, focuses the discussion of maritime awareness on the response to threats in the field, primarily by means of situational awareness. To this end, the US Navy (like other navies which

9 Ibid.

10 DHS (2005). **US National Plan to Achieve Maritime Domain Awareness**. https://www.dhs.gov/sites/default/files/publications/HSPD_MDAPlan_0.pdf

11 Ibid.

followed in its footsteps) established the ability of sensor fusion,¹² which can form a broad and accurate maritime picture over time,¹³ that monitors ships, people, sites and infrastructures, cargo, trade routes and threats (maritime surveillance).

It is possible to summarize and characterize the trend and the solutions that the navies have put in place using the following three characteristics:

1. **Gathering of information from numerous sources simultaneously**, with emphasis on existing and accessible information, including, among others, satellites, maritime, aerial and coastal sensors, as well databases. These include radar, communication with ships, AIS information which ships of more than 300 tons displacement are required to operate, reports from ships and aircraft and information from the Internet, as well as from classified networks.
2. **Increasing use of unmanned systems** that can provide continuous and reliable capability at low cost.¹⁴
3. **Automation of sensor fusion**, based on artificial intelligence.

The result is an effective, close to real-time tool that multiplies and improves the situational awareness capabilities, by any measure, including greater range of the situational picture, the ability to deal with a wide variety of threats simultaneously and the ability to monitor a large number of events and processes **and in particular the ability to identify anomalies in the maritime domain**. The continuity of the information also enhances retrieval ability in order to find and investigate previously gathered information. These measures provide a deeper and more precise understanding of the theater and as a result it is possible to implement measures more accurately, with greater certainty and in a timely manner.

While In the early days of the concept the main American concern was the attainment of means to deal with maritime terror due to, among other reasons, the fear of nuclear terror,¹⁵ over the years and with the spread of the piracy problem the needs and

12 Sensor fusion relates to the combining of a number of sources of information of different types and different levels (data, information and knowledge), in a way that creates new information that is hopefully reliable and accurate.

13 US Navy (2007). **Navy Maritime Domain Awareness Concept**. https://www.navy.mil/navydata/cno/Navy_Maritime_Domain_Awareness_Concept_FINAL_2007.pdf

14 Including unmanned aircraft, vessels and submersibles that can be at sea for long periods and can broadcast in real time to the information center. They are less sensitive to weather conditions than manned systems. In this context, see, for example, Eyal Pinko, "Unmanned Vehicles in the Maritime Domain: Missions, Capabilities, Technologies and Challenges," in the Maritime Strategic Evaluation for Israel 2017, Maritime Policy & Strategy Research Center.

15 DHS (2005). **US National Plan to Achieve Maritime Domain Awareness**. P. 15

applications for Maritime Domain Awareness have expanded. Evidence of this can be found in a variety of companies that offer services and products in this domain, as well as the large number of countries and navies that are investing resources in it.

Conceptual and practical challenges in the implementation of Maritime Domain Awareness

The implementation of Maritime Domain Awareness has managed to gain a foothold, but not without challenges. In this context, three main difficulties are encountered: dealing with the scope of information and the level of technological complexity, information sharing and the challenge of expanding the concept of Maritime Domain Awareness.¹⁶

The difficulty in dealing with the scope of information and the required level of technological complexity – This problem is intensified to the extent that the relevant area is larger and has greater traffic within it.¹⁷ India, for example, protects a coast that is 7500 km long and along which there are 4 million fisherman operating from about 250 thousand fishing boats, some of which do not have electricity nor the ability to broadcast by radio. In this context, technology is not always the correct solution.¹⁸ Furthermore, the ability of the developing countries to use advanced technological measures is highly limited and therefore it is necessary to also achieve low-tech solutions in this context.¹⁹

The difficulty in sharing information – A major challenge arose in the United States in view of the multiplicity of agencies, the organizational rivalries between them and the characteristics of the organizational culture that has been embedded in them for so

16 For an analysis of the challenges to Maritime Domain Awareness from a somewhat different angle, see: Christian Bueger and Amaha Senu "Knowing the Sea: The Prospects and Perils of Maritime Domain Awareness," **PIRACY-STUDIES.ORG**, Cardiff University, July 8, 2016. <http://piracy-studies.org/knowning-the-sea-the-prospects-and-perils-of-maritime-domain-awareness/>

17 The technological challenges in this context are numerous, with emphasis on sensor fusion and the ability to analyze numerous moving objects. For further details, see: Christophe Claramunt et al. "Maritime Data Integration and Analysis: Recent Progress and Research Challenges," in Proc. 20th International Conference on Extending Database Technology (EDBT), March 21-24, Venice, Italy, 2017 https://www.researchgate.net/profile/Elena_Camossi2/publication/312601728_Maritime_data_integration_and_analysis_recent_progress_and_research_challenges/links/58b0453892851cf7ae8ba1f9/Maritime-data-integration-and-analysis-recent-progress-and-research-challenges.pdf

18 Dialog between the Maritime Policy & Strategy Research Center (HMS) and the Indian National Maritime Foundation (NMF), May 14-15, 2018.

19 Christian Bueger (2017), Effective maritime domain awareness in the Western Indian Ocean: Policy Brief, Institute for Security Studies (ISS). <https://issafrica.s3.amazonaws.com/site/uploads/policy-brief104.pdf>

long. Recall that one of the main conclusions of the investigation of the 9/11 attack was the lack of information sharing between the agencies and between levels in the same agency. This problem also exists between states, particularly when an attempt is made to move from a country perspective to a regional perspective.

Perhaps the greatest challenge to the concept of Maritime Domain Awareness lies in the fact that the official American process to achieve it has focused on security threats, whether traditional or non-traditional, but as a result only part of the story is being told. The next section will examine this point.

The need to expand the concept of Maritime Domain Awareness beyond the security/military domain

The importance of the maritime domain is clear, as is the understanding of the need to possess a clear picture that extends far beyond a country's territorial waters or even its economic waters, in order to protect its borders, its residents and its capabilities. There is also a recognition of the growing importance of the maritime domain from a long-term perspective. In this section, we will identify the need to expand the attention given to Maritime Domain Awareness to beyond the discussion of concrete security/military threats and the implication of this extension for the discourse on the subject.

The growing importance of the maritime domain, from the long-term perspective, is manifested in a number of important trends:

1. The maritime domain has become increasingly important in global and domestic trade – Since the 1970s, total maritime trade has grown by an average annual rate of about 3 percent. According to the forecasts, this trend will continue in coming years.²⁰ It is believed that by 2030, the scope of maritime trade will be double its 2010 level.²¹
2. The share of the blue economy²² has grown as a result of, among other things, the shortage of land and the problem of sustainability, alongside technological developments that facilitate the production of food and energy at competitive

20 http://unctad.org/en/PublicationsLibrary/rmt2017_en.pdf

21 <http://www.futurenavitics.com/wp-content/uploads/2013/10/GlobalMarineTrends2030Report.pdf>

22 European Commission (2012). **Blue Growth Opportunities for Marine and Maritime Sustainable Growth**. http://publications.europa.eu/resource/cellar/c9cb968d-9e9e-4426-b9ca-3728c6ff49ba.0003.02/DOC_1

prices. This includes shipping, fishing, desalination, aquaculture and tourism, and additional spheres of influence that create a long value chain also on dry land.²³

3. The growing importance of the maritime domain as a source of energy – The involves the growing use of non-renewable energy (oil and gas) and renewable energy (wind).
4. The maritime domain is taking on an increasing role in socially detrimental phenomena, such as illegal trade in people and goods, illegal immigration and piracy.
5. It is becoming increasingly important to deal with ecological issues in the maritime domain – The ecosystem is affected by the aforementioned processes, as well as other horizontal processes that increase the pressure on the maritime environment. As a result of this trend, the response to environmental challenges in the maritime domain is becoming even more critical and is vital in order to ensure long-term sustainability.

The conclusion is therefore that a transition is needed from a discourse exclusively focused on national security in the maritime domain to a broader discourse that gives expression to three additional dimensions: society, the economy and the environment. Maritime Domain Awareness is necessary in order to provide a solution to the built-in tension between uses, as well as between users, and the tension between the desire for economic development in the maritime domain and the desire to preserve the environment (fisheries, wildlife and beaches) and historic sites. In other words, **an integrative approach is needed that does not separate between the security, economic, social and environmental dimensions**. The result will be a conceptual framework with greater meaning that requires the resolution of inherent conflicts between the various components and therefore calls for the formulation of a comprehensive and integrative policy based on a broad and long-term systemic perspective.

In order to develop and expand the discussion, the concept of “securitization”, which was developed by Waever and others, will be useful. As part of the Copenhagen

23 From the building of means and capabilities for surface and below-the-surface projects and the development and production of available technologies to the provision of services to the emerging maritime economy.

school,²⁴ which was active in expanding the securitization concept during the 1990s, in recent years this approach has also entered the discussion of *expanding the concept of maritime securitization*.²⁵ As can be seen in Figure 1,²⁶ the concept of maritime security is broader than just its military dimension and includes economic, social and environment components. In the context of the discussion in this chapter, this approach underlies the desire to expand the discussion of Maritime Domain Awareness to issues that are not exclusively related to national security. The rest of the chapter will examine the expansion of Maritime Domain Awareness in the Israeli case.

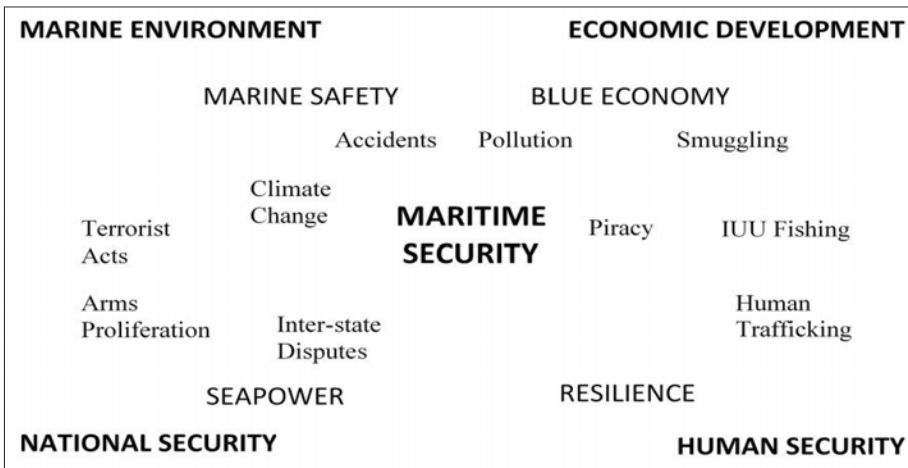


Figure 1: Maritime Security Matrix of Christian Bueger

The Israeli case – toward Maritime Domain Awareness

Notwithstanding the centrality of the maritime domain for Israel, the national approach has been characterized—starting already from the period of illegal immigration and until recently—by a *lack of awareness*, and therefore the lack of a national policy for the

24 Barry Buzan, Ole Waever and Jaap de Wilde (1998). **Security: A New Framework of Analysis**. Boulder: Lynne Rynner; Ole Waever (1995). "Securitization and Desecuritization," in Ronnie D. Lipschutz, ed. **On Security**. New York: Columbia University Press, pp. 46-86. This school emphasizes that the success in defining a particular subject as a security issue means that it will receive greater public and government attention and also greater allocation of resources. Defining an issue as security-related gives it greater power and therefore the very definition as such changes the perspective on the issue and its implications for other issues.

25 Christian Bueger (2015), "What is Maritime Security?" **Maritime Policy** 53: 159-164. https://ac.els-cdn.com/S0308597X14003327/1-s2.0-S0308597X14003327-main.pdf?_tid=921823c7-16ac-4576-99fc-5030cc60dacf&acdnat=1543665220_0a0529119de700c72ba6e69f8375238e

26 Ibid., p. 161.

maritime domain.²⁷ During the past two decades, the gap and the contrast between the crucial importance of the marine domain to the State of Israel and the lack of an overall national maritime policy have become more acute. Based on the analysis up to this point, this section will briefly describe the change and the developments in Maritime Domain Awareness and the latest trends in Israel – from a lack of awareness to steps toward Maritime Domain Awareness.

The sea and its routes were central in the Israeli experience already from the days of the Mandate, when the sea was the main channel for illegal immigration. Furthermore, the Arab pressure and the fear of an embargo were among the motives for the creation of a merchant navy under an Israeli flag, including passenger ships, which reached its peak in the 1970s. Since then and as a result of global processes, Israel has come to depend on international shipping for its trade, and there has been a decline in Israeli shipping.²⁸

Israel's maritime domain has changed dramatically in recent decades, due both the changes in its characteristics and the change in national awareness of it. The characteristics of Israel's maritime domain reflect to a large extent the characteristics of the maritime domains of other Mediterranean countries, namely the tension between the desire to economically develop the maritime domain and the effect of this development on the environment and the growing ecological threats that are liable to transform the domain into a "marine desert" (pollution, warming of the sea, excess salinity, change in the acidity of the sea, the destruction of fisheries and overfishing).

In the Israeli case, the issue is particularly acute in view of the importance of the maritime domain from a security/military viewpoint. The Israeli navy has—within its limited resources—developed an ability to maintain "situational awareness" in the maritime domain; however, from a national perspective, there was still no full solution to the issue. The State of Israel did not have a national policy for the maritime domain,

27 The gap between the importance of the maritime domain and the lack of a maritime policy raises a fundamental question that is beyond the scope of this chapter, namely: Why didn't Israel develop Maritime Domain Awareness and a national maritime policy?

28 In this context, it is worth mentioning the emergence of the container as the main means of maritime trade, which is based on transshipment ports and feeder routes which have taken the punch out of the Arab embargo on ships visiting Israeli ports and has reduced the need to rely on ships under an Israeli flag, along with the globalization of many systems in the national markets and the collapse of the Communist (and pro-Arab) bloc.

nor a grand maritime strategy.²⁹ The perspective was primarily coastal, as were the legal jurisdiction and the planning tools.³⁰

The discoveries of natural gas and the development of the fields in Israel's Exclusive Economic Zone (EEZ) have intensified the need for a spatial planning policy, especially the need for a national policy, and they have acted as a catalyst for activity. Starting from 2012 and picking up momentum in 2014, the Planning Authority (today part of the Ministry of Finance) initiated a national process in cooperation with the EU to formulate Israel's policy in the maritime domain. As part of the process, a draft policy paper was published in October 2017³¹ for public review and public seminars were held to present the program and in order to get the public involved.³² As of December 2018, the program is still awaiting the approval of the Planning Authority.³³

One of the most important achievements of the process so far is the ability to bring together all of the stakeholders in the maritime domain – the government ministries (Energy, Defense, Agriculture, Transportation, Environmental Protection, Science, Communication, Industry, the Foreign Ministry, Health, Justice, Education and Tourism), as well as national authorities, local authorities, companies, NGOs and academics – for an integrative discussion of the needs, conflicts and regulation of the maritime domain, including recommendations for the definition of powers and responsibility, planning tools and necessary steps for implementation.

29 Oded Gur-Lavi (2017). "A Grand Maritime Strategy for Israel," **The Maritime Strategic Evaluation for Israel**, the Maritime Policy & Strategy Research Center. https://poli.hevra.haifa.ac.il/~hms/images/publications/Report_2016/4.pdf; And also the Technion (2015), **The Israel Marine Plan**. <http://msp-israel.net.technion.ac.il/files/2015/11/Israel-Marine-Plan-.pdf>

30 **The proposed "Maritime Zones" legislation** has been on the table of the Knesset since July 2014. It is meant to anchor the rights and powers of the State of Israel in the coastal waters, the internal waters, the contiguous waters and the Exclusive Economic Zone. As of the time of writing, the proposed law had passed First Reading and was awaiting approval in Second and Third Reading. http://fs.knesset.gov.il/20/law/20_Is1_392707.pdf

31 The Planning Authority (2017). **Policy paper for Israel's Maritime Domain – Stage II of the Maritime Domain Policy Report – First Draft for Comments**. http://www.iplan.gov.il/Documents/Report_4.pdf [Hebrew]

32 As part of the public process, the Maritime Policy & Strategy Research Center prepared a response to the draft report and submitted it the Planning Authority [Hebrew]. <http://hms.haifa.ac.il/index.php/he/component/content/article/14-publications-heb/98-2018-10-18-11-45-53?Itemid=108>

33 Leor Guttman, "For the first time: The State establishes an authority that will regulate the development of the Maritime Domain", **Calcalist**, April 24, 2018 [Hebrew]. <https://www.calcalist.co.il/local/articles/0,7340,L-3736598,00.htm>

The document defined the vision for the maritime domain (in Stage I) as "the management and planning of Israel's maritime domain as a dynamic and balanced environment, in a way that will ensure effective coordination of the various uses and the exploitation of the socioeconomic potential in the domain, alongside the preservation of nature, landscape and heritage".³⁴ The document also emphasizes that "the main principle underlying the proposed policy is the creation of spatial balance and a correct balance of interests between the various uses of the sea in a way that will facilitate optimal functioning along with the preservation of ecological values in the marine environment. To this end, the policy should be based on interdisciplinary planning that combines various fields of knowledge, along with the identification of the connections between them".³⁵

The policy paper suggests—for the first time—an integrative approach that includes a maritime strategy for Israel (combined with appropriate legislation), a framework for the management, the preservation and planning of all uses and activities in the maritime domain, and a policy tool for the management and regulation of the maritime domain in a manner that will create an infrastructure for the development of a blue economy, which will relate to all of the considerations, including but not restricted to security factors.

In this context, the document emphasizes that "shipping, maritime security and hydrocarbons (oil and gas) are components that are highly important to man in relation to the sea and constitute a dominant component of the maritime domain policy". Similarly, the document emphasizes that "from a geopolitical perspective, Israel is an island nation," and therefore "Israel's dependence on shipping as its only gateway for the import and export of goods and fuels, together with the dependence on natural gas as a primary source of energy emphasize the importance of security and maritime protection".³⁶

Accordingly, the document defines the following overall goals for the maritime domain policy:

- Encouragement of sustainable economic development in the maritime domain.

34 Planning Authority (2018). **Policy Paper for Israel's Maritime Domain** – a slide presentation for the expanded editors committee on April 23, 2018. The difference with the aforementioned document is basically the addition of the word "landscape" as part of the preservation of values. For comparison, see **Policy Paper for Israel's Maritime Domain – Stage II**, p. 10.

35 Ibid., p. 21.

36 Ibid., p. 19.

- Mediation of conflicts between the various uses of the domain (in the present and the future).
- Creation of mechanisms for the management of the domain under conditions of certainty and a changing environment.
- The definition of interfaces between the various uses.
- Viewing the sea and the land from an overall planning and managerial perspective.
- Ensuring that the maritime system remains healthy and functional.
- Preserving Israel's internal and external security interests.
- Closer international relations and collaborations in the maritime domain in order to ensure regional stability and the promotion of shared regional interests.

In order to implement the policy, the document recommends the "**creation of a new statutory authority – the Maritime Authority**" as a government body that will promote management and coordination in the sea and will be committed to a balanced long-term viewpoint.³⁷ The responsibility for security, maritime trade and hydrocarbons, the preservation of nature and the maritime environment will remain with the existing bodies.

The proposed "Maritime Zones" law, which relates to the outcomes of the process, mandates that "the government will approve, according to the proposal of the Ministry of Finance and within two years of the application of this law, a long-term policy document for the regulation of all activities and uses in the maritime zones".³⁸

Summary of the insights and directions for the future

The maritime domain is highly important to the State of Israel and is expected to become even more so in view of the economic trends described here. Similarly and against the background of the process in Israel, which is gradually and for the first time making progress toward a national policy for the maritime domain, the concept of Maritime Domain Awareness has been identified as making a potential contribution to the discourse.

The conclusion from the analysis is that the term Maritime Domain Awareness is relevant to the discourse in Israel. Furthermore, its meaning should be expanded and its development should continue to receive attention. In a situation where there is tension between needs and uses—between economic development, the environment, security and social welfare—as in the Israeli maritime domain, the discussion of the

37 Ibid., p. 29.

38 The proposed "Maritime Zones" law, paragraph 16(a).

concept of Maritime Domain Awareness, which is currently focused exclusively on concrete military elements, should be expanded to become an integrative concept based on a tetrad structure: maritime security, environmental protection, social welfare and economic development. In this sense, the chapter has focused on the "expansion" of awareness of the maritime domain.

However and as in the case of other countries which have implemented the concept of maritime awareness, the process is not free of problems. Israel is also expected to face problems in achieving inter-agency cooperation and sharing of information between the various authorities that are likely to be involved in the process. This is particularly true in view of the expected difficulties in the implementation of policy in the maritime domain, once it is approved.

The potential contribution of the concept is the ability to translate it into an effective policy tool, as in the case of the concept's original use, which will be accomplished by creating an up-to-date picture for decision makers, based on fusion of information from a multiplicity of sources and the identification of trends and outliers. These steps will create a wise national decision-making ability that weights all of the factors—which often compete and even conflict—using a long-term perspective that ensures a sustainable environment.

Therefore, development of the concept of Maritime Domain Awareness should continue in two main directions – conceptual and practical.

1. **From the conceptual viewpoint**, the concept should continue to be developed and refined, by means of, among other things, a comparative study of implementation in other countries, which will include the identification of differences and similarities between them and an analysis of the factors explaining them. In addition, the regional implications of developing the concept should continue to be examined.
2. **From the practical viewpoint**, the degree to which the idea can be used as a decision-making tool should be examined, for example, in the context of the Maritime Authority, if it is created. Similarly, in view of the nature of the maritime domain, the process calls for regional cooperation and is likely to be appropriate for the promotion of cooperation in the Eastern Mediterranean.

Developments in the Natural Gas Sector in Israel

Elai Rettig

During the past two years there have been important achievements in Israel's natural gas sector. These include the completion of important trade agreements with Jordan and Egypt, and the success of boosting domestic demand for natural gas. Nonetheless, the failure of the offshore exploration tender in 2017, coupled with the deterioration in relations with Turkey, have lowered public expectations for discovering more natural gas fields in Israel or for finding additional export destinations for Israel's gas. These developments are not necessarily negative, since they force Israel to focus on developing its domestic and regional natural gas market rather than search for distant markets where the political advantage of export is doubtful. These developments also force the State to collaborate with state and non-state entities in its vicinity, including Lebanon and Gaza, if it wishes to create a developed regional energy market that will attract investors and maximize economic benefit to the State of Israel.

The local natural gas sector: Growing demand alongside lower expectations of new discoveries

In June 2018, the Adiri Committee, headed by the Director General of the Ministry of Energy, submitted draft recommendations for the reexamination of Israel's export quota for natural gas, as the State is required to do every five years. The Committee concluded that the export quota established in 2013 will largely remain intact: Of the 878 billion cubic meters (BCM) of proven gas reserves in Israel's waters, 500 BCM will be saved for the local economy until 2042 (about 57 percent).¹ The decision not to change the export quota is the result of two main factors that point to a growing trend in Israel's energy sector: (1) The failure of the recent licensing tender issued by the Ministry of Energy for new gas exploration in Israel's waters has increased the concern that additional major natural gas deposits may not be discovered and therefore the State must be prudent with what it already has; (2) the actual domestic demand for natural gas has grown beyond the original expectation of the Tsemach Committee in 2013. Both these factors, together with the increasing sensitivity of the Israeli public to the sale of Israeli natural gas at the expense of domestic needs, are encouraging the Ministry of Energy to focus primarily on the local and regional markets (Egypt, Jordan and the Palestinian Authority).

1 Note that the Adiri Committee's recommendations can still change and be revised, and the government can choose not to accept them and to change the quota established according to its discretion, as it did with the Tsemach Committee recommendations submitted in 2013.

The future of gas exploration

The failure of the oil and gas exploration tender in 2017 was a signal to many that Israel will potentially have to make do with the gas it already discovered, at least in the near future. Despite the efforts of the Ministry of Energy to attract new investors, only two players responded. The first was Energean, a Cypriot/Greek company that already operates the Karish and Tanin licenses in Israel, and has no intention of investing in new exploration before it finishes developing its existing fields. The second company is an Indian consortium that apparently did not intend to explore in Israel and did not even bother to publicize a timetable for activity. The consortium likely participated in the tender as a personal political gesture made by the Indian Prime Minister Narendra Modi to Israeli Prime Minister Benjamin Netanyahu as part of the warming relations between the two countries. Although this is an impressive political achievement on its own, it is of no benefit to Israel's energy sector. The failure of the tender is the result of a combination of political, geopolitical and primarily economic factors, only some of which can be overcome. Apart from the fact that it is unclear to whom additional gas will be sold if it is discovered (since the local market is saturated and Israel's export destinations are diminishing in number, as will be described below), and apart from the reluctance on the part of international energy companies to invest in Israel (and thus arouse the ire of large energy-producing countries in the Middle East), the threshold conditions for participating in the tender were high and prevented local exploration companies from participating.² Despite the previous negative experience, the Ministry of Energy issued an additional tender for exploration licenses in November 2018 (which is expected to end in July 2019), and left the high threshold conditions in place. In addition, it specified that the owners of the Tamar and Leviathan fields, Delek and Nobel Energy, could not participate in the tender despite their proven success in finding gas in Israel's waters.³ While the Ministry of Energy has an understandable interest in encouraging the entry of new investors to create greater competition in the domestic market, it appears that in this case the effort to "break the monopoly" has created more harm than good, since the local companies are among the only ones that agree to seriously get involved in exploration in Israel given the current conditions. If the State is seriously interested in finding additional reserves of natural gas, it must allow the energy companies that are already in the market to participate in new tenders, even at the price of strengthening the monopoly.

2 The main requirement was equity of at least \$400 million and a minimal holding of 25 percent in the drilling license.

3 Ministry of Energy, "Minister Steinitz announces the issuing of the second tender for offshore oil and gas exploration," November 2018 <https://www.gov.il/he/Departments/news/bidround2>.

Growing local demand for natural gas

In parallel to the diminishing prospects of finding new gas deposits, local demand for natural gas is growing rapidly. The consumption of natural gas in Israel in 2018 is expected to total about 11 BCM in comparison to about 9.2 BCM in 2016 (an increase of 19.5 percent in only two years).⁴ This increase is manifested primarily in the electricity sector and comes at the expense of coal consumption, which is part of the Ministry of Energy's effort to close coal-fired plants and thus reduce the emissions of greenhouse gases in Israel.⁵ The high rate of growth in the demand for natural gas exceeds the original expectations of the Tsemach Committee in 2013, even though some of the predicted uses for natural gas have not materialized as expected. As of 2018, less than 10 percent of the factories in Israel that can potentially connect to natural gas have indeed done so. Although most of the largest factories in Israel have already connected to the gas (among them: Bazan, Haifa Chemicals, ICL, Machteshim, Hadera Paper, etc.), the pace at which additional factories are connecting is still very slow. This is partly due to the burdensome regulation and the slow progress in creating the transmission infrastructure.

In addition, the original expectation of the Ministry of Energy that vehicles in Israel would convert their engines to run on compressed natural gas (CNG) was not realized, due to, among other things, the global trend towards electric cars. The Ministry of Energy even announced its intention to prohibit the import of gasoline-powered vehicles starting from 2028 to encourage the import of electric vehicles.⁶ Although these cars will replace the previously preferred CNG option, this trend is still expected to significantly increase the demand for natural gas in Israel since electricity for charging these vehicles will largely be produced from natural gas anyway. According to the Ministry of Energy's forecast, by 2040 Israel's population will grow to 13 million and the number of personal vehicles will double (to about six million), resulting in a need to double the current quantity of electricity production.⁷

4 Figures on energy consumption in Israel relative to previous years is taken from the 2018 BP Statistical Review of World Energy which is available at <https://www.bp.com/content/dam/bp/en/corporate/pdf/energy-economics/statistical-review/bp-stats-review-2018-full-report.pdf>.

5 On the other hand, the emissions of greenhouse gasses in Israel jumped by 2.3 percent in the last year (in contrast to an average rise of 0.4 percent only during the last decade). The rise is the result of the increased import of oil, apparently to be refined and exported to other countries.

6 Ministry of Energy, "Targets for the energy sector for 2030," October 2018. Accessible at https://www.gov.il/BlobFolder/news/plan_2030/he/2030summary.pdf.

7 Ibid.

In addition to a larger-than-expected use of natural gas, the Ministry of Energy also predicted that by now there will be significant use of renewable energy for electricity production (about 10 percent of total production by 2020). However, Israel is far off from that goal (only 3 percent, as of 2018), and it does not appear to be making serious efforts to reach it. It is woefully behind in terms of preparing the necessary grid infrastructure to withstand the intermittent nature of solar and wind power generation, and it is somewhat reluctant to approve subsidies for new renewable projects. One argument is that the State is waiting for more efficient technologies to come to light, specifically those that utilize electricity storage technologies, before it seriously invests any further. Thus, this plan remains largely on paper and promises that gas will be the almost exclusive source of electricity in the foreseeable future, leading to more growth in demand for it.

While the plan to make Israel almost completely dependent on natural gas has implicit economic and environmental advantages, it also contains security risks. Energy security is based on energy diversity (in both the type of fuel that is burned and the source from which the fuel comes from) rather than from energy independence. In the case that Israel is totally dependent on a small number of natural gas deposits for all its electricity production, any serious technical malfunction or sabotage to these fields or to the pipeline can create prolonged electricity outages, even if these deposits are located within Israeli waters. Therefore, coal will continue to play an important role on the margins of the Israeli energy sector as an alternative fuel in an emergency, and the coal-burning electricity plants in Israel will likely not shut down completely.

More importantly, if Israel intends to depend on the accessibility of natural gas in such a complete way then the motivation to export gas to destinations beyond its close regional surroundings needs to be lowered accordingly. Export to Europe or to Asia will perhaps produce temporary profits but in the long run the State is liable to regret the move, especially if the technologies that are predicted to replace natural gas do not arrive as quickly as predicted.

The regional natural gas sector: Diminishing export alternatives for Israel's natural gas

During the last two years, the owners of the Tamar and Leviathan fields made two significant achievements: in 2016 they signed a deal for the export of 45 BCM from the Leviathan field to Jordan for a period of 15 years (the laying of the pipelines will be completed in 2019) and in 2018 they signed a deal to export 64 BCM from the Tamar and Leviathan fields to the Dolphinus Holdings Company in Egypt for a period of 10 years (which will begin from Tamar in 2019, on the condition that proper infrastructure

for transmission will be available). Therefore, if all goes as planned, in 2019 Israel will become a major exporter of natural gas.⁸

Despite the media attention that has focused primarily on the importance of the Egyptian deal, the more important of the two deals is with Jordan. The Jordanian deal provides the Leviathan owners with the economic anchor they needed to develop the field, and the deal's economic logic is far more stable than that of the Egyptian deal, which increases the chance of contractual stability over the years. In contrast to Egypt, the Jordanians need Israeli gas and this need will only increase in coming years, despite the popular opposition to the deal coming from the Jordanian street. In contrast, Egypt no longer needs Israeli gas following a number of major discoveries of natural gas in its waters and additional discoveries that are expected in coming years. The Egyptian interest in Israeli gas is primarily based on broader political and strategic considerations. These include the Egyptian desire to become a regional gas hub, to strengthen security relations with Israel, and also to avoid the embarrassment of 2015 when Egypt was forced to import expensive liquified natural gas (LNG) from Qatar due to a rapid increase in local demand for gas.⁹ While the new gas deposits in Egypt are expected to mostly meet the demand of the local economy, there is still a window of time that must be bridged until these fields are ready to produce. There is also some likelihood that the Egyptian demand for natural gas will exceed expectations, especially if it decides to connect additional industries to its gas infrastructure. Furthermore, it is possible that Egypt will designate the Israeli natural gas for its gas liquefaction plants in Idku or Damietta for the purpose of exporting to Europe and other markets, rather than for domestic consumption.¹⁰ Therefore, there is still economic logic for Egypt to import natural gas from Israel, although it is not particularly solid and there is a danger that the deal will either not be implemented, will be partially implemented, or will be altogether cancelled a few short years after it begins. The government in Egypt also has a long history of not paying its debts to foreign oil and gas suppliers, which may eventually lead to the cancellation of the deal by the Israeli side.

8 Apart from the negligible quantities that Israel already exports to Jordan at the Dead Sea.

9 The assumption that the natural gas deal with Israel is intended primarily for strategic, rather than economic purposes, is strengthened by a local reporter's investigation in "Mada Masr" which claimed that the Egyptian intelligence service is behind the Dolphinus company. <https://madamasr.com/en/2018/10/23/feature/politics/whos-buying-israeli-gas-a-company-owned-by-the-general-intelligence-service/>

10 It is possible that the deal for bringing Israeli natural gas to the liquefaction plants in Egypt will be implemented separately, as part of a plan to establish an underwater pipeline from Egypt to the Aphrodite deposit in Cyprus, to which the Leviathan field can then connect.

There is major political benefit for Israel from the deals with Jordan and Egypt. The deals create an additional channel for strengthening the strategic and economic relations between Israel and its neighbors. They also transform the gas deposits from simply an “Israeli” asset into a “regional” asset that several countries have an interest in securing. Thus, for example, a terrorist attack on the Leviathan deposit will lead to electricity outages in Jordan and the Palestinian Authority and will harm the Egyptian economy, which will create an incentive for them to cooperate with Israel in preventing incidents of that type. Nonetheless, the limits of the power of natural gas should be kept in mind. Israel is not able to “turn off” supply to Egypt, which does not need gas from Israel, nor does it have an interest in doing so in the case of Jordan if it wants to create the image of a reliable natural gas supplier in the region. There are few countries that cut off the supply of natural gas for political reasons and they in general cause economic and political harm to themselves in the long run. Furthermore, the sale of natural gas does not guarantee political stability between countries and is also not expected to induce Jordan or Egypt to weaken their criticism of Israeli policy or change their voting against Israel in the UN.

Apart from Israel's close neighbors, the options for exporting Israeli gas are few and hold little promise. As of now, the owners of Leviathan and Tamar have obtained foreign commitments to purchase only 115 BCM of natural gas, out of about 400 BCM that was approved by the State for export (about 30 percent). Several political and economic constraints are preventing them from finding additional large markets for their gas. The export of gas to Turkey by way of an underwater pipeline is the most logical economically in view of Turkey's growing demand for natural gas, but politically it is not feasible. The victory of Erdogan in the last Turkish elections and his success in consolidating political power after the failed military coup has made it possible for him to be more confrontational towards Israel. It appears that most of the benefits that were expected from a “normalization” of the relations between Israel and Turkey in 2016 were misplaced.

In view of the deterioration of relations with Turkey, Israel is making efforts to solidify an “Aegean alliance” with Cyprus and Greece. To this end, Israel is using natural gas as a way of attracting interest and creating collaboration by promoting an ambitious project to lay an underwater pipeline from Israel all the way to Italy and Greece (nicknamed the “East Med Pipeline”). Israel has also been promoting the connection of an electricity and fiber optic infrastructure with Cyprus. But while there is plenty of political goodwill between the sides to build a gas pipeline, there is almost no economic logic behind it. The creation of a pipeline along such a long and complex route involves major engineering and economic obstacles and will not facilitate the sale of gas to Europe

at a competitive price. Furthermore, the growing dispute between Cyprus and Turkey regarding energy exploration in the island's economic waters is preventing progress in this channel. Turkey has even sent warships to the area to signal that it does not intend to back down from its demands. Therefore, it is more likely that the planned natural gas pipeline serves as a potent "excuse" for Israel to deepen relations with Cyprus and Greece. In case the ambitious pipeline project does not happen, Turkey can be blamed, and in the meantime the Aegean alliance will only grow stronger through other channels.

The third option of finding new markets is to liquefy the gas. However, in current market conditions international corporations have little interest in building new liquefaction plants in the region. Therefore, it is reasonable to assume that the liquefaction of Israeli gas will be limited to small quantities in the existing liquefaction plants in Egypt.¹¹ Israel will gain little political benefit from this option since it will not have any control over the destination of the export of liquefied gas. The customers for liquefied gas in Europe or Asia will not care if the gas is originally produced in Israel since their connection is only to the private company operating the facility in Egypt.

Conclusion

Given the growing demand for natural gas in the Israeli market in coming years, combined with the Ministry of Energy's ambitious domestic plans for its electricity and transportation sectors, it may be that the lack of export options for Israeli gas is not a bad turn of events. The economic and political conditions in the region are forcing Israel and the owners of the gas fields to focus on increasing domestic demand and developing a regional market rather than searching out distant markets for which the political gain is unclear. This reality will also promote the realization that Israel must cooperate over exploration and pipeline projects with the State entities in its vicinity, including Lebanon and Gaza, if it wants to encourage additional investment in its waters and to promote its economic interests.

11 On the situation of the liquefied gas markets in Israel's vicinity, see: Elai Rettig, "Economic challenges to natural gas exports from Israel's maritime gas fields", in Shaul Chorev (ed.), *Maritime Strategic Evaluation for Israel 2017/18*, January 2018, pp. 227-236.

A Comparison of Oil and Gas Offshore Strategy between Norway and Israel

Amnon Portugaly

Introduction

The discovery of oil and gas fields—like the discovery of other minerals—often achieves energy independence and economic growth, but is sometimes more of a curse—known as “the Resource Curse”—than a blessing. For many countries, it has led to increased inequality, massive corruption and often intervention and the dictation of rules from the outside, whether officially or unofficially.¹

Norway, in contrast, is often perceived as one of the more positive examples of oil and gas resource management for the benefit of society as a whole and as an example of the protection and realization of the interests of society as opposed to those of narrow interest groups. It serves as a model from which other countries can learn.

The Norwegian model is relevant for Israel, in whose economic waters oil and gas fields have been discovered and which is facing major economic problems, such as the housing crisis among the middle class, the downsizing of the welfare state and the increase in inequality. Israel, which is dependent on multinational energy companies, can and must learn from the Norwegian case. How did Norway find oil and gas in large quantities and at the same time remain an egalitarian welfare state? How did Norway develop a local industry that can handle the complex challenges in producing oil and gas in the difficult conditions of the North Sea?²

Norway entered the world of oil and gas during the 1970s with no previous experience. Nonetheless, during the last 50 years, it has managed to develop one of the leading oil and gas industries worldwide and to create one of the largest sovereign wealth funds in the world based on oil and gas revenues. It has progressed from its initial tendency to allow the energy companies to determine the rules of the game to a challenging process of insisting on the ownership of its natural resources and ensuring the transfer of knowledge and technology and the development of national expertise in oil and gas. Today, the Norwegian company Equinor, (formerly Statoil) is—47 years after its

1 Steiner Holden, Avoiding the Resource Curse: The Case of Norway, June 2011. <http://folk.uio.no/sholden/wp/oil-ghana-norway.pdf> accessed on October 3, 2018

2 Helge Ryggvik, The Norwegian Oil Experience: A toolbox for managing resources <https://www.sv.uio.no/tik/forskning/publikasjoner/tik-rapportserie/Ryggvik.pdf> accessed on October 3, 2018.

founding—one of the largest multinational companies and the Norwegian Oil Fund is apparently the largest of its type in the world.

Unlike Norway, Israel has for the last 45 years accumulated national knowledge, technology and expertise on land and in the sea; however, in contrast to Norway where the dependence on multinational companies was the catalyst for the development of independent national abilities in oil and gas, in Israel the process was reversed. The argument of dependence on multinational companies gave Israel a reason to privatize the government oil and gas companies that had accumulated knowledge and expertise, thus eliminating their economic and strategic advantages for the State and Israeli society.

Norway is the only developed country that has succeeded in keeping the windfall profits from oil and gas for itself. About 80-90 percent of the cash flow from the production of oil and gas currently goes to the Norwegian government and only Norway has established trustworthy institutions that are managing this wealth for generations to come. It cannot be said that Israel has implemented good governance and a long-term strategy for the development of its offshore natural gas resources. Israel does not currently have any ownership share in the production of its oil and gas. Israel is apparently the only country, apart from the US and Canada, among the oil and gas-producing countries without a state-owned oil and gas company. About 20 years after gas was first found in Israel, Israelis are more open to ownership of Israeli companies by Chinese companies than ownership from Jerusalem.

If there is one lesson to learn from the Norwegian oil and gas experience, it is the presence and impact of the conflict between the gas companies and society and the importance of determination on the part of the government and civil society in ensuring the State's independence and its position relative to the large oil companies. The Norwegian experience in offshore oil and gas is the result of active democracy, which expresses itself by means of both formal representation of its citizens and, to the same extent, direct citizen involvement.

It can be concluded that to the extent that openness and transparency are adopted in Israel, as well as public monitoring and control of the political agenda and of fateful technological decisions, so Israeli society will be able to better manage its strategic energy resources and to produce benefit for all of society, rather than just the top thousandth of the population.

Norway

At the end of 1950, very few people believed that Norway's continental shelf might be a major source of oil and gas. The discovery of gas in Groningen in Holland in 1959 led to a change in thinking as to the oil potential in the North Sea. This discovery, in a region where energy consumption was based to a great extent on coal and imported oil, focused attention on the North Sea, and in particular the coasts of Britain, Denmark and Norway.

Norway at the time did not have any expertise in oil and gas exploration or exploitation; it did not have any expectation that oil and gas would be found in its territory; it did not have any regulatory framework that could grant oil concessions; and it did not have an agreed-on and fixed maritime border with its neighbors. Furthermore, the Norwegians were facing powerful multinational energy companies that were used to dictating the rules, whether officially or unofficially. Nonetheless, the Norwegians had a powerful advantage – Norwegian senior bureaucrats and politicians, both socialists and conservatives, had designated the good of the country as their paramount interest.

Norway advanced along two axes: first, **it established maritime boundaries almost immediately** and second, **it formulated an oil and gas exploration policy in its maritime territory**. In 1971, 12 years after the discovery of natural gas in Holland (and the effect of that discovery on additional exploration and discoveries in the Norwegian continental shelf (NCS) as well), Norway published an offshore oil and gas policy document, which is also known as the "Ten Commandments of Oil Policy".³

Norwegian politicians who realized the importance of a national oil and gas policy and the Stortinget, the Norwegian legislature, unanimously adopted the following basic guidelines in June 1972:

1. National supervision and control must be ensured for all operations on the NCS.
2. Petroleum discoveries must be exploited in a way which makes Norway as independent as possible of others for its supplies of crude oil.
3. New industry will be developed on the basis of petroleum.
4. The development of an oil industry must take necessary account of existing industrial activities and the protection of nature and the environment.
5. Flaring of exploitable gas on the NCS must not be accepted except during brief periods of testing.

3 Norwegian Petroleum Directorate, 10 commanding achievements <http://www.npd.no/en/Publications/Norwegian-Continental-Shelf/No2-2010/10-commanding-achievements> accessed on October 3, 2018.

6. Petroleum from the NCS must as a general rule be landed in Norway, except in those cases where socio-political considerations dictate a different solution.
7. The state must become involved at all appropriate levels and contribute to a coordination of Norwegian interests in Norway's petroleum industry as well as the creation of an integrated oil community which sets its sights both nationally and internationally.
8. A state oil company will be established which can look after the government's commercial interests and pursue appropriate collaboration with domestic and foreign oil interests.
9. A pattern of activities must be selected north of the 62nd parallel which reflects the special socio-political conditions prevailing in that part of the country.
10. Large Norwegian petroleum discoveries could present new tasks for Norway's foreign policy.

One of the first steps taken in 1972 was the establishment of Statoil, the state-owned oil company, based on a law passed unanimously by the Norwegian Parliament that year. Statoil received preference in a large proportion of the new concessions in the most promising areas of the Norwegian continental shelf and was exempt from participating in exploration costs, which were covered by its foreign business partners. The foreign oil and gas companies were also required to establish subsidiaries in Norway, to operate according to Norwegian labor and safety regulations and to train Norwegians in order to ensure that the State would not be dependent on external technological knowledge in the development of its resources. The foreign companies were also required to use Norwegian subcontractors and local shipyards, even if their price quotes were higher.

Environment and climate

An important part of Norway's oil policy and an integral component of its offshore oil and gas policy involves environmental and climatic considerations. Norway's environmental and climatic standards in offshore oil and gas are very high relative to those of other countries.⁴ This is why the fifth commandment of Norway's oil and gas policy prohibits flaring—the burning of gas produced as a byproduct of oil—except during short periods of testing.

The responsibility for pollution is defined in Section 7 of the Norwegian Oil Law. Holders of a license for oil and gas exploration and exploitation are responsible for the pollution

4 Acute Pollution and Oil Spill Preparedness And Response <https://www.norskpetroleum.no/en/environment-and-technology/oil-spill-preparedness-and-response> accessed on October 4, 2018.

they cause, regardless of who is at fault (without having to prove negligence or error) or in legal language – strict or absolute liability:

Section 3-7: The liable party and the extent of liability

The licensee is liable for pollution damage without regard to fault. The provisions relating to the liability of licensees apply correspondingly to an operator who is not a licensee when the Ministry has so decided in connection with the approval of operator status.⁵

The strict liability provision provides a major incentive for the prevention of accidents and in particular environmental pollution accidents. The provision places liability on the responsible party for damage caused without having to prove negligence. The rationale behind strict liability transfers the burden of proof from the affected innocents to the responsible party.^{6,7,8}

The development of Norway's offshore oil and gas policy

Norway's oil and gas era began with the discovery of the giant Ecofisk oil field at the end of 1969. Production from the field began in June 1971 and during the five subsequent years the oil companies discovered two more giant oil fields and also a number of smaller fields within Norway's waters in the North Sea. During this period, the Norwegian continental shelf was gradually opened up to exploration, although in each round of licensing only a limited number of blocs were approved for exploration.

At this stage, the foreign companies controlled the exploration of Norway's coastal waters and were responsible for developing the country's first oil and gas fields. In the next stage, Statoil, (Statoil changed its name to Equinor in 2018) the national Norwegian oil and gas company, was established (in 1972) and the principle of 50-percent State ownership in every production license was established. This rule was changed later

5 Norwegian Petroleum Directorate Act 29 November 1996 No. 72 relating to petroleum activities. Last amended by Act 19 June 2015 No 65. <http://www.npd.no/en/Regulations/Acts/Petroleum-activities-act/#Section%207-1> accessed on October 4, 2018.

6 Aili Zong, Liability Regime Concerning The Oil Pollution Rising From Offshore Facilities <https://www.duo.uio.no/bitstream/handle/10852/38222/MT.pdf?sequence=1> accessed on October 4, 2018.

7 Shane Bosma, The Regulation Of Marine Pollution Arising From Offshore Oil And Gas Facilities <http://ssl.law.uq.edu.au/journals/index.php/maritimejournal/article/viewFile/179/221> accessed on October 4, 2018.

8 Legal Dictionary – Strict Liability <https://legaldictionary.net/strict-liability> accessed on October 4, 2018.

on, such that the Norwegian Parliament could raise or lower the level of participation, according to the circumstances.

In 1973, OPEC cut oil production quotas, which led to a fourfold increase in the price of oil. A year later, the oil companies reported a sharp increase in profits. Norway's senior bureaucrats and economists understood immediately that the tax regime imposed a few years earlier was not appropriate in the new era of high prices and was costing the State tens of billions of dollars in lost revenue. The new situation made clear the need to change the tax laws and for a wise but tough stance on Norway's natural resources, which would achieve these changes.

During the five years following the discovery of oil in 1969, Norway learned a great deal about the powerful oil industry and was now ready to achieve a maximal share of revenues for itself. It established a national oil company and assigned it the task of creating ownership and direct profits for the State and to create Norwegian involvement in the development of the industry. It instituted a policy that enabled the State to acquire a direct share in the oil fields, without investing in the cost of exploration. However, in the existing tax regime all of the windfall profits from oil and gas would remain with the oil and gas companies, rather than being shared with the Norwegian government.

Norway benefited from a skilled civil service with a long tradition of dealing with powerful foreign interests and in particular companies that had developed Norway's hydroelectric potential at the beginning of the 20th century. The bureaucrats in the Norwegian civil service convinced the government to act quickly and with determination and to take possession of the windfall profits that, in their opinion, belonged to the State while ensuring that the foreign oil rigs would remain in place and continue to operate. Norwegian Ministry of Finance officials were very pragmatic in achieving maximal taxation though at the same time they did not want the foreign oil companies to pick up and leave. In 1974, officials invited representatives of the multinational oil and gas companies and other companies to a meeting in which they announced the new oil law, which would raise the overall tax rate to about 90 percent, a significant increase from the previous level of 50 percent. The representatives of the most powerful industry in the world were not pleased but not one of the companies that were present at the meeting gave up their oil concessions.

The oil companies, who were furious at the new tax law, began a large-scale media campaign. They declared that they would leave Norway, claiming that it is impossible to operate in a socialist country that does not understand the rules of multinational capitalism. Officials in the Norwegian government feared legal challenges, trade sanctions by the US and the exit of the foreign oil companies. But these fears were in

the end unfounded. The oil companies did not leave Norway, despite the higher rate of taxation, and their profits actually increased beyond original expectations due to the rise in global oil prices.

Even more revolutionary and daring than the special tax rate was the approach on which it was based, namely that the government of Norway will be the one to determine the selling prices and basic cost of projects. This approach was in direct contrast to the conventional practice of minimizing taxation, which is still the norm among multinational companies.⁹

The new oil law introduced in 1974 not only raised the tax rate, it also established that the tax would be calculated on the basis of numbers provided by the Norwegian government, rather than those provided by the oil companies themselves. The State would define the value of oil produced and would tax the companies according to it. Norway would not accept what the companies present as taxable income, since these figures are easily manipulated.

Despite the aggressive measures taken by Norway, the large oil companies kept their drilling and production rigs operating on the Norwegian continental shelf since the region remained attractive for investment and primarily **because they could not obtain the support of Norway's conservative party**. Although conservatives were traditionally strong supporters of low taxes, in Norway they supported the higher tax rate and abstained from political opportunism.

It is worth mentioning that in the negotiations with the multinational oil companies the Norwegian political parties presented a united front. There was no argument between the sides on this issue and no one politically supported the business interests of the oil companies. There was a general consensus that Norway needs the technical capabilities and the advantages of scale enjoyed by the foreign companies in order to develop the not easily accessible oil and gas fields and all were in favor of the oil companies remaining in Norway, but Norwegian politics was never coopted by the business interests of the oil and gas industry (unlike in the case of Israel). In Norway, it was taken for granted that the interests of the oil sector would not be introduced into the political discourse by spokesmen and lobbyists trying to influence the various parties. Everyone was in favor of a flourishing society in Norway and the idea that Norway should obtain maximal benefit from its oil and gas resources. There was no public discussion of the pros and cons of the oil companies' operations, but rather only the way in which the government would obtain the maximal share of revenues.

9 Paul Cleary – Trillion Dollar Baby. How Tiny Norway Beat the Oil Giants and Won a Lasting Fortune. August 2016

The situation described above is in contrast to that in Israel and in many other countries, where the oil companies managed to gain support by means of a “divide and conquer” policy in the political arena. Until today, both sides in Norwegian politics are in favor of the tax regime imposed on the oil and gas companies.

Norway’s policy has remained unchanged since 1970. It has collected 70 to 80 percent of the revenues produced from its oil industry, by means of a corporate income tax rate that is twice as high as that in Israel and a designated tax on oil profits. In Israel, the royalties collected on the production of gas from Tamar during the period 2013–2017 were about 11 percent of revenues, on top of about 25 percent in corporate income tax (if it was paid).

Unlike other resource-rich countries, Norway realized that it could maintain control and not end up serving the interests of the multinational oil companies. The meeting in November 1974 was a decisive step toward achieving maximal national benefit from the country’s natural resources. The result is that Norway has managed to obtain a maximal share of the windfall profits from its oil and gas and as a result about 80 - 90 percent of the cash flow currently ends up in the State’s coffers.

Israel

Since the beginning of 1990, major natural gas fields have been discovered in the Nile Delta and in the sea nearby. The discovery of natural gas in Egyptian waters attracted the interest of a number of geologists in Israel with regard to the potential for finding oil and gas in the Eastern Mediterranean along Israel’s coasts. But unlike in the case of Norway, Israel has never fixed the boundaries of its economic waters; it has not managed to formulate an offshore oil and gas policy; it has not passed a law to determine whose responsibility it is to prevent accidents, including environmental accidents, nor has it determined who is responsible for cleaning up the damage from such accidents.

In May 2008, the government prepared legislation that relates to Israel’s economic waters. The proposed legislation was meant to declare Israel’s economic waters and to replace the law passed in 1953. The introduction to the proposed law states as follows: “The geological structures [the potential gas reservoirs in the Mediterranean], which are likely to spread over a number of square kilometers, have a potentially high value to the country, which makes the declaration of the Exclusive Economic Zone so important.”¹⁰

10 <https://www.calcalist.co.il/local/articles/0.7340.L-3407514.00.html>

Israel's offshore oil and gas policy

In October 2011, the Prime Minister and the Minister of National Infrastructures (today the Minister of Energy and Water) appointed the Interministerial Committee to Examine the Government Policy on the Natural Gas Sector, which became known as the Tsemach Committee.¹¹ Essentially, it focused on the export of gas and on the policy to maintain reserves for domestic consumption. Following is a summary of the Committee's recommendations:

- An obligation to supply domestic needs.
- Ensuring energy independence and giving priority to supplying domestic needs.
- Defining the government involvement in the planning and establishment of infrastructure within the natural gas sector.
- Encouragement of competition in the natural gas sector.
- Ensuring that the needs of the natural gas sector are met in the short run.
- Encouragement of the development of small and mid-size fields.
- Licensing of the sale of natural gas outside the Israeli economy.

The document closest to providing an oil and gas strategy is the work plan of the Ministry of Energy for 2018, which was published on February 25, 2018.¹² The highlights of the Ministry of Energy policy according to the document are as follows:

1. An energy sector based on natural gas and renewable energy.
2. The formulation of long-term policy and appropriate regulation of the electricity sector and implementation of the reform of the Israel Electricity Company.
3. Increasing the reserves in the energy sector and energy independence, by means of backing up the supply of fuels in an emergency, creating infrastructures for storage, diversification of energy sources and ensuring reliability of supply, including during an emergency.
4. Reduction of air pollution from electricity production and promoting the use of alternative energy sources in the transportation sector.
5. Creation of an optimal mix of energy sources.
6. Diversification of energy sources and ensuring the reliability of supply, also during an emergency.
7. Encouragement of initiatives, research, innovation and increased efficiency in the energy sector.

11 <http://archive.energy.gov.il/Subjects/NG/Documents/NGSummaryAug12.pdf>

12 https://www.gov.il/BlobFolder/reports/work_plans_2018/he/work_plans2018.pdf

8. Development of an effective and competent natural gas sector by maximizing the use of natural gas.

The comparison between this policy document and the Ten Commandments of the Oil and Gas Policy in Norway illustrates the problems and lacunae in the Israeli approach, and the ramifications are clearly visible.

In 1999, the Noa natural gas field was discovered by the Yam Thetis partnership, followed in 2000 by the discovery of the nearby Mari B field, which contained about 32 billion cubic meters (BCM) of natural gas. The need to amend the archaic 1952 law was clear to senior government officials and the ministers accepted this view. Thus, Government Decision 2377 was approved by the government in July 2002: "It is decided to amend the Oil Law, 5712-1952...with respect to the following points, among others...3. To determine a levy or additional tax at the rate of 10-60 percent of profits from the sale of oil or natural gas, which will be imposed on oil or natural gas producers according to the rules that will be determined in law..."¹³ However, the proposed law did not pass due the fierce opposition of the oil companies and the lack of effective political support.^{14,15}

On April 12, 2010, then Minister of Finance Yuval Steinitz established the Committee for Examining Fiscal Policy Regarding Israel's Oil and Gas Resources, which became known as the Sheshinski Committee. The committee's objective was to determine the optimal tax rate on the production of oil and natural gas in Israel (including in its economic waters), such that the State would benefit from the recent discoveries, and primarily the Leviathan field. The Sheshinski Committee came under heavy pressure from the natural gas companies, which included a media campaign similar to that in Norway in 1974 and a divisive campaign by a dummy organization called the Forum on

13 Government decision database, amendment to the Oil Law <http://www.sviva.gov.il/InfoServices/ReservoirInfo/DecisionStockpileGovernment/Pages/2002/Decision2377.aspx> [Hebrew]

14 The Proposed Arrangements Law for the National Economy (amendments to the law for achieving the budget and economic policy objectives for the 2003 fiscal year), Section VII (page 61) https://www.nevo.co.il/law_word/Law15/memshala-04.pdf [Hebrew]

15 Discussion of the proposed Oil Law (Amendment no.), 5703-2002 from the proposed Arrangement Law for the National Economy...Section VII: Oil http://www.knessetnow.co.il//15279/ועדות_פרוטוקול/15279-ג-מס-התשסג--2002-מתור-הצ-ח-ההסדרים-במשק-המדינה-פרק-ז-נפט-דיון-בהצעת-חוק-הנפט-תיקון-מס-התשסג--2002-מתור-הצ-ח-ההסדרים-במשק-המדינה-פרק-ז-נפט-33-12-סעיף [Hebrew]

Behalf of the Land of Israel.^{16,17} In contrast, the Committee had the active backing of a civil organization called the Forum for Civil Action.¹⁸

The committee recommended the cancelation of the “depletion deduction” and raising the tax rate on the production of oil and gas. In order to implement the recommendations, the Oil Profit Levy Law, 5771-2011 was passed (whose name was later changed to the Natural Resources Profit Taxation Law).¹⁹

It appears that in contrast to Norway, the committee members and the Members of Knesset could not withstand the pressure from the natural gas companies. There is a huge gap between the committee's interim and final conclusions and between the latter and the final version of the law passed by the Knesset.²⁰

During 2015, discussions of the new Natural Gas Framework were held in a working group headed by Professor Eugene Kendal, after the Commissioner of the Anti-Trust Authority notified the gas companies that he is renegeing on the previous understandings and that he plans to break up the gas monopoly. The discussions were attended by senior officials from the Anti-Trust Authority and representatives of Delek and Nobel Energy, the main players in the natural gas sector. The minutes of these meetings give an indication of the intensity of the pressure and the threats from the gas companies and of Israel's capitulation.^{21,22}

The representatives of the gas companies claimed that, among other things:

All of the small factories need gas and they will be closed if they don't get it. Israel's credit rating will drop immediately; there will be mass unemployment; State revenues will drop significantly; the agreements to sell gas to Jordan and Egypt will be cancelled; it will even harm Israel's relations in the region...if someone thinks that we will accept the cartel decision as if nothing happened – then he is making a mistake...This decision is an economic and political terror attack. The implication of

16 Yuval Steinitz reveals: “I was afraid they would kill me” <https://www.makorrishon.co.il/nrg/online/1/ART2/457/784.html>

17 <https://www.ynet.co.il/articles/0,7340,L-3932657,00.html> [Hebrew]

18 <http://www.tashtiot.co.il/tag/%D7%A4%D7%95%D7%A8%D7%95%D7%9D-%D7%A4%D7%A2%D7%95%D7%9C%D7%94-%D7%90%D7%96%D7%A8%D7%97%D7%99%D7%AA> [Hebrew]

19 Conclusions of the Committee to Examine Fiscal Policy Regarding Israel's Oil and Gas Resources https://mof.gov.il/BudgetSite/reform/Documents/shashinskiFullReport_n.pdf [Hebrew]

20 Israeli Gas and the History of it being Swallowed up by the Jaws of the Capital-Government-Defense Establishment <https://idanlandau.com/2012/09/24/how-israeli-gas-was-swallowed-up> [Hebrew]

21 <https://storage.googleapis.com/ch2news-attach/2016/04/%D7%92%D7%96.pdf>

22 https://www.mako.co.il/news-money/economy-q2_2016/Article-3029f4231c93451004.htm

what has been stated [by David Gilo, the Commissioner of the Anti-Trust Authority] is the end of the natural gas market...We reserve all its rights under multinational law.

As in the case of the Sheshinski Committee and unlike in Norway, Israel was not able to withstand the pressure from the gas companies.

Environment and Climate

An examination of the situation in Israel with respect to offshore oil and gas disasters, such as that in the Gulf of Mexico, and Israel's preparedness for a similar event paints a worrisome picture. The Tsalul non-profit association carried out an examination of the issue in comparison to the EU Directive that went into effect in July 2013.²³ The EU Directive was written in order to reduce the risks of an offshore oil and gas disaster such as those in recent years and particularly in the Gulf of Mexico. The Directive, which went into effect at the beginning of July 2013, created uniform and binding rules for oil and gas exploration and exploitation, up to the stage of abandoning the well.

In contrast to the European directive, Israel lags far behind in the following areas, among others:

- Legislation in Israel is lacking and most of it applies only to its sovereign waters.
- There is no real separation of power between the bodies responsible for environmental safety and protection and those responsible for the economic development of the sea, including licensing and collection of royalties.
- Specific approval is needed for drilling activity instead of clear and stringent criteria.
- There is no connection between the drilling activity and the national preparedness for a marine pollution event. Preparedness is lacking.
- The responsibility of the company to prevent a disaster and to repair damage is limited to a small guarantee and specific insurance coverage, instead of full and binding responsibility.
- There is no supervision by an independent third party at each stage of the planning and activity.
- There is little transparency of information or public participation.

Fred Arzoin, the Assistant Director of the Sea and Shore Branch in the Ministry of the Environment, provided firsthand evidence of Israel's lack of preparedness for an

23 Offshore Oil and Gas Drilling: A Comparison Between the New EU Directive and Israeli Law http://www.zalul.org.il/wp-content/uploads/2013/11/%D7%94%D7%93%D7%99%D7%A8%D7%A7%D7%98%D7%99%D7%91_%D7%94-%D7%94%D7%90%D7%99%D7%A8%D7%95%D7%A4%D7%99%D7%AA-5.12.13-%D7%A1%D7%95%D7%A4%D7%99.pdf [Hebrew]

offshore oil and gas disaster during his speech as part of a panel led by the journalist Aviv Lavi in June 2018 at the Conference on the Future of Israel's Maritime Domain. Lavi asked: "Is Israel ready for a major mishap like the Gulf of Mexico at one of the offshore energy production sites?" He answered as follows: "There is finally a budget for spokesmen and advanced equipment, but there are no positions for professional manpower to operate them, and as long as there is no one to operate them, the Ministry of the Environment has no motivation to acquire the ships and the technologies." Lavi then asked: "Then essentially you are saying that what we are doing to protect against the possibility of a giant offshore spill that is liable to destroy the shores of Israel is essentially to pray." Arzoin: "We are continuing to pray."²⁴

What is possible and what is feasible for Israel – Conclusion²⁵

Israel needs to advance the legislative process for two proposed laws which has dragged on for over a decade: the Maritime Zones Law whose goal is to apply Israeli law to the economic waters and the National Plan for Preparedness and Response to Offshore Oil Pollution, which is meant to create preparedness in terms of equipment and manpower for an oil and gas disaster and to limit its scope. Despite their importance, these two laws have not yet been passed, a situation that exposes Israel and its waters to major dangers.

In addition to this proposed legislation, Israeli law should determine who is responsible for damage caused by offshore drilling, which will impose full and binding responsibility on those responsible for the damage, both to the natural resources and to the environment; it should define national resource trustees who will file a claim for damage to the environment; and it should require proof of the ability of potential polluters to pay for any damage they may cause, as a condition to begin drilling activity.

A professional public committee should be established that will work toward the definition of intermediate and long-term energy policy, the development and exploitation of offshore natural resources and the regulation of the offshore and onshore natural gas sector, based on the Norwegian and Dutch model, including taxation, with the goal of applying the environmental principles set out in the EU Directive in Israel.²⁶

24 <https://www.facebook.com/photo.php?fbid=1830539623677946&set=a.572323132832941&type=3&theater>

25 <http://energynews.co.il/?p=14862>

26 DIRECTIVE 2013/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 12 June 2013 on safety of offshore oil and gas operations and amending Directive 2004/35/EC <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:178:0066:0106:EN:PDF>

The functions of the committee should include the following:

- Declaration and implementation of Israel's sovereignty accordance to its rights as a coastal nation and a declaration of Israeli ownership over the natural resources within its economic waters.
- Amendment of the Oil Law, 5712-1952²⁷ and of the Taxation of Natural Resources Profits Law, 5771-2011 (the Sheshinski Law).²⁸
- The formalization of Israeli law that applies in its economic waters, as part of the Maritime Zones Law, without exemptions or exceptions.
- Dealing with issues related to the environment, drilling safety and pollution, by advancing the National Plan for Preparedness and Response to Offshore Oil Pollution Law. In addition, emphasis should be put on requiring effective insurance coverage against an ecological disaster and also imposing strict liability for damage caused by companies that have received a license, concession or lease from the State.
- Checking the feasibility for the State to acquire maritime transmission infrastructures for natural gas from the wellhead to dry land, by means of an Israeli government subsidiary (Israel Natural Gas Lines?).
- Checking the possibility of supervision over natural gas prices in Israel.
- Regulating the export of natural gas and determining the price of gas for export for tax purposes. This includes imposing a conceptual export levy such that the price of gas for tax purposes will not be lower than that of gas for the domestic market.
- Advancing plans for alternative energy, such as solar and wind, combined with electricity storage.

27 https://www.nevo.co.il/law_html/Law01/315_001.htm

28 https://www.nevo.co.il/law_html/Law01/500_479.htm

An Update Regarding the Marine Areas Law, 5778-2017 Currently Under Review by the Economics Committee in Preparation for the Second and Third Reading in the Knesset¹

Orin Shefler

1. What is the Status of the Proposed Law?

This chapter will survey the legislative progress of the proposed **Marine Areas Law, 5778-2017** (herein: the “Proposed Law”). The Proposed Law was drafted by the Government of Israel, approved by the Ministerial Committee for Regulatory Matters and the Ministerial Committee for Legislative Matters and passed a *First Reading* in the Knesset. Subsequently, it was submitted for review to the Economics Committee, chaired by MK Eitan Cabel, in preparation for the Second and Third Reading at a future date that has not yet been determined.

There have so far been three discussions held by the Economic Committee on this matter, each attended by relevant professionals. Most of the Committee members² attend the discussions and represent the full political spectrum. The current draft of the Proposed Law was approved after several government interventions regarding substantive matters that were a source of disagreement between various government ministries (these decisions will be described below). In the past, various other drafts of the Proposed Law were submitted as private legislative initiatives (these drafts differ from the current proposal), including a draft co-submitted by the Committee's Chairman, MK Eitan Cabel and others who are familiar with the issues in dispute. Representatives of various stakeholders attend the committee meetings as well, including environmental organizations, social activists, oil and gas companies, lobbyists, attorneys, defense organizations, academia, etc.

The Proposed Law sections are read out in public during the meetings of the Economics Committee and then discussed by the members and participants. So far, Sections 1 to 17 have been read (with a short discussion regarding section 16 out of a total 48 section in the Proposed Law).

1 The chapter relates to the proposed Marine Areas Law, 5778-2017, dated November 6, 2017, p. 48 which has passed First Reading in the Knesset.

2 Members of the Economic Committee in the 20th Knesset.

2. What are the Key Points of Disagreement, and Possible Solutions, Raised During the Economic Committee Discussions?

2.1 First Meeting (May 7, 2018)³

The first meeting focused on the goals of the Proposed Law with general statements. The meeting highlighted the rights and obligations of the State of Israel in the Exclusive Economic Zone (EEZ) according to local and international law. One of the Proposed Law's goals is to provide certainty to investors operating in the marine areas and to encourage them to make investments. The Proposed Law is based on similar laws in other countries and is consistent with the principles of international law. The Proposed Law will also enable the State of Israel to map out and delimitate its Marine Areas, including the State's maritime borders. Similarly, the Proposed Law will provide certainty with respect to the application of Israeli law in the Marine Areas.⁴



Figure 1: Map of the Marine Areas and the Maritime Borders
(Unofficial, as of today)

³ See the press release of the Economic Committee on May 7, 2018.

⁴ See the video broadcast of the first meeting of the Economic Committee on May 7, 2018.

The current version of the Proposed Law was drafted in 2017 by the government and constitutes a continuation of two previous drafts dated 2009 and 2013, and of a legal opinion issue by Advocate Avi Licht, the former Assistant to the Attorney General (Economy) on the subject of the Marine Areas. Prior to issuing the current version, the Ministry of Justice and the Ministry of Energy held consultations with the relevant government ministries, including the Foreign Ministry, the Ministry of Defense, the Ministry of Energy, the Ministry of Environmental Protection, the Ministry of Transportation, the Ministry of the Economy, the Ministry of Finance, the Ministry of Communication, the Ministry of Health, the Ministry of Homeland Security, the Ministry of Labor and the Ministry of Welfare, as well as additional entities such as municipalities, environmental organizations, and representatives of industry and academia.

The Proposed Law resolves various issues that have been in contest between the Ministry of Energy and the Ministry of Environmental Protection concerning authority to approve *Petroleum Activities* (a defined term) and also, concerning major environmental aspects related to the Marine Areas, and in this way it differs from the previous versions.

Discussion, Disagreements, Alternatives and Decisions⁵

One of the main arguments against the Proposed Law is that it does not create a mechanism for the overall administration of Israel's EEZ. According to this view, the Proposed Law emphasizes the process of exploration, development and production of offshore oil and gas but does not pay enough attention to the variety of additional activities in the EEZ. Proponents of this claim suggest introducing a mechanism that would coordinate between all of the activities, rather than concentrating the authority with the Director of Petroleum Affairs within the Ministry of Energy. To implement an effective governing authority over the Marine Areas, the Proposed Law introduces a *Policy Document* (defined hereafter).

The following are highlights of the issues discussed during the first Committee meeting:

- **Overall Administration of Israel's Maritime Domain.** A representative of the Planning Authority was asked to present the status of the *Policy Document*.⁶ The *Policy Document* is being drafted with the support and guidance of the EU and is expected to be completed by 2023. The team has been working on the *Policy Document* for about two years in two parallel committees: the first is a small group that includes representatives of all the relevant government ministries; the second group is larger and also includes relevant representatives of the public,

⁵ See the minutes of the discussion of the Economic Committee on May 7, 2018.

⁶ See the Proposed Law, Chapter 6, Section 16.

NGOs, academia, etc. In parallel to these group activities, the public is also being involved.⁷ The representative stated that the work is progressing and that they have already created maps of all the infrastructure in Israel's maritime domain. In addition, Israel is a member of the Union for the Mediterranean (UFM) initiative of the EU and in this context has accepted the EU's principles for wise exploitation of the sea's economic potential (development of a blue economy).⁸ It appears that holistic work is being done with some of the Mediterranean countries with respect to all of the issues combined, which is manifested in the *Policy Document*.

At this point, the *Policy Document* presents three options for managing Israel's maritime domain: **the first option** includes the creation of a "maritime authority" within the Prime Minister's Office and/or as a designated committee within the Planning Authority in the Ministry of Finance.⁹ The new authority would be responsible for all aspects of managing Israel's maritime domain (other than exploration, development and production). The authority would be made up of committees, which would include a Committee for Maritime Affairs, and would formulate policy guidelines. **The second option** would also include the creation of a "maritime authority" within the Prime Minister's Office or under the National Security Council within the Prime Ministers Office, but with the goal of managing and coordinating all of the various elements of the maritime domain, but not as a single stand-alone authority with actual regulatory power. Essentially, this proposal does not involve the creation of a new regulatory body but rather leaves all of the powers with existing bodies and attempts to coordinate and manage those bodies with greater efficiency. The responsibility of the new authority according to this option would include matters common to all the stakeholders, such as security, sharing of databases, etc. The guiding principle of this option is to avoid the creation of another mechanism that might detract from efficiency and effective management.¹⁰ The Maritime Policy & Strategy Research Center supports this option. **The third option** has not been finalized and will be presented by the Ministry

7 See the Policy Document for Israel's Maritime Domain, expanded formulation committee, April 23, 2018.

8 See the minutes (page 19).

9 See the article in *Globes*, July 3, 2018.

10 See the proposal of the Maritime Policy & Strategy Research Center which was submitted to the Planning Authority as part of the request for public comments regarding the management of the maritime domain issued on April 24, 2018. The position paper emphasizes the importance of concentrating all responsibilities related to the management of the maritime domain under one roof within the Prime Minister's Office, but would leave in place the powers of the government ministries in the maritime domain and simply reorganize them. The Maritime Authority should be responsible for national and strategic maritime goals and the coordination of the government

of Environmental Protection and therefore has not yet come up for discussion. The process of preparing the *Policy Document* is identical to that of preparing a National Zoning Plan according to the Planning and Building Law,¹¹ including discussions with the local committees and the approval of the National Council and up to the government level approval. The critics of the Proposed Law claim that the *Policy Document* is lacking and creates a “quasi-planning” framework that circumvents the Planning and Building Law, which does not apply in Israel’s EEZ.

- **Protected Maritime Zones.**¹² At this stage, the *Policy Document* defines about **18 percent** of Israel’s **territorial waters** as a Protected Maritime Zones. It has not yet been determined what **percentage** of the EEZ will be declared as a Protected Maritime Zones. It should be noted that this is an issue of dispute between the government and the environmental organizations. Opponents claim that further differentiation and clarification is needed to distinguish between a Protected Maritime Zone (under the Proposed Law) and a Nature Reserve, and that the primary concern is that during the time that passes between the approval of the Proposed Law in the Knesset and until the subsequent approval of the *Policy Document*, the Ministry of Energy will have absolute and unconstrained authority to authorize oil and gas exploration and development activities in the EEZ, without Protected Maritime Zones being effectively declared. This situation will permit activity up until the declaration of the Protected Maritime Zones in the EEZ. Some claim that in some cases the interests of the Ministry of Energy and of the oil and gas companies are far from being aligned with those of the public and therefore they should be constrained immediately rather than gradually over time. In this context, the Ministry of Energy representative pointed to the strategic environmental survey carried out in 2016, which is an important benchmark for determining the Protected Maritime Zones and which is guiding its actions.
- **Separation of Powers.** The question was raised if the entity responsible for resource exploration and development of natural resources in the maritime domain should be the same body that oversees and supervises this activity? In order to explain the issue, the representative of the Ministry of Justice described certain changes in the US following the Gulf of Mexico offshore disaster (The Macondo incident). The US decided to separate some of the government authority between various different entities, however the authority was divided between divisions in the same department (in the US, the Department of the Interior – Bureau of Land and

ministries accordingly. It should be mentioned that the more detailed position paper has practical implications and is implementable in the relevant circumstances.

11 See the Planning and Building Law, 5725-1965.

12 See the Proposed Law, Chapter 8, Section 29.

Minerals Management) with the goal of preserving the power for decision-making on disputed issues. Similarly, the Ministry of Energy in Israel has established a new body for environmental matters, which is separate from the Director of Petroleum Affairs. According to the Ministry of Justice's position, the separation itself is more important than the final identity of the entity that is authorized to approve oil and gas activity in the EEZ, since it is difficult to create complete separation between entities that have similar areas of responsibility. The separation in practice exists and therefore is balanced and preserves the principle of separation of powers. The Director for Petroleum Affairs gave the example of Australia, where two government ministries were acting without synchronization between them and therefore decided to consolidate their powers.

2.2 Second Meeting (July 12, 2018)

In this meeting, the slow process of reading out the sections of the Proposed Law began, starting from Section 1.¹³ The goal of reading each section is not to generate discussion and/or an argument over every section but rather to concentrate only on the most substantive issues, along with minimal text modification, without delaying the entire process. During the meeting, it was decided to approve some small changes, however discussions on some important issues was delayed to a later date. It was noted, that the government has already made key determinations on the main issues in dispute and there is expectation that the meetings will not drag-on more than is reasonably necessary. Following are the highlights of the Meeting:

Discussion, Disputes, Alternatives and Decisions¹⁴

- **National Assets and Cross-Border Hydrocarbon Deposits.** With regard to Section 1 (3) of the Proposed Law (The Goal of the Law), the point was raised that the text does not establish the need to protect cross-border hydrocarbon deposits.¹⁵ In other words, the Proposed Law does not include a mechanism that protects from depletion of State Assets through exploitation of an oil and gas reservoir from the other side of the border, without obtaining the consent and/or a diplomatic agreement between countries. The need for said protection is exemplified in light of the slow mediation process taking place in the case of the Aphrodite-Yishai deposits. The concern is that parties on one side will develop the joint-reservoir without reaching

13 See the video of the Second Meeting of the Economic Committee, June 12, 2018.

14 See the minutes of the meeting in the Economic Committee, June 12, 2018.

15 A cross-border gas deposit is one whose geological structure straddles the border between two countries and the countries share it according to percentages. The quantitative measurement of the deposit is sometimes difficult and requires international mediation in order to reach a resolution.

an agreement with the other. This type of cross-border hydrocarbon dispute could potentially arise with respect to other deposits in the future.

A proposal was made to amend the text of the section so as to adopt a principle stated in section 77 (2) of the Convention of the Law of the Sea¹⁶ (UNCLOS) which requires **Express Consent** to be given by a Coastal State for the exploitation of natural resources on its continental shelf (the seabed). One interpretation relates the mechanism of **Express Consent** in UNCLOS as a form of protective measure for cross-border hydrocarbon deposits which encourages negotiations, dialog and prior agreement between countries.

A Question that Arises from Comments Made During the Meeting (O.S):

May one side develop and/or exploit a hydrocarbon reservoir located within its Exclusive Economic Zone, which crosses into the border of a neighboring country, without securing the neighboring countries consent?

The simple answer is that there are certainly worldwide precedents and examples of cases and scenarios similar to this, as cross-border disputes are quite common around the world. But in the specific case of Aphrodite -Yishai, one must recall that Israel and Cyprus have voluntarily submitted the issue to international mediation/arbitration with the intent on agreeing on the best course of action for this cross border reservoir or otherwise to consolidate the Aphrodite and Yishai fields. The two States have undertaken to act according to the outcome of said voluntary process, in accordance with the principles of international law. This is of course a very complex legal question that must be studied thoroughly in order to achieve protection and/or make valid claims.

Due to the economic and diplomatic ramifications of the depletion of an oil and gas deposit without consent, a far-more reaching proposal was raised to include the possibility of imposing economic sanctions on countries and/or commercial companies involved in the depletion of the country's natural resources without obtaining consent from the other side.

On this, the Ministry of Justice noted that the Proposed Law is not intended to provide a solution to every single issue connected to oil and gas reserves development in the EEZ. The Ministry of Justice cites the Petroleum Law, 5712-1952 as the governing legislation over offshore oil and gas fields and as such should offer solutions for such situations. Similarly, this sensitive matter has for many years now been a focus of the Foreign Ministry. The Director for Petroleum

16 UNCLOS, Article 77 (2) "The rights referred to in Section 1 are exclusive in the sense that if the coastal State does not explore the continental shelf or exploit its natural resources, no one may undertake these activities without the express consent of the coastal State".

Affairs asked that this matter not be given excessive attention in public. Following a short discussion in the Committee, it was agreed to add the following onto Section 11 of the Proposed Law (which deals with the status of the gas deposits as a national asset and the law that applies to them): "...unless a different arrangement is agreed in this context."



Figure 2: Map of the EEZ and Maritime Border between Israel and Cyprus
Source: An article in Calcalist titled "Nerve Gas", October 16, 2018.

- International Tribunal for Maritime Affairs.** Advocate Moshe Shahal, the former Minister of Energy who was present at the meeting referenced a legal opinion that he had published in the past on a previous draft of the law. Advocate Shahal stated for the protocol that he does not represent any commercial body and that he is appearing before the committee without being compensated due to the importance of the issue at hand. According to his opinion, the Proposed Law is a threat to the security of the State of Israel and should not be approved at this time, in view of the fact that Israel is not a signatory of the UNCLOS and because the Proposed Law is in conflict with Israel's national security interests. From his perspective, liability could be imposed on the State in disputes concerning maritime borders as a result of the provisions of UNCLOS and without an arrangement between Israel and its maritime neighbors, the issue of borders could be submitted to the International Tribunal, where Israel has traditionally incurred an inferior position.

Thus, for example, he presented the issue of the maritime border dispute with Lebanon and with Gaza and the Palestinian Authority. From his perspective the contribution of the Proposed Law is limited at this point in time, since the legal opinion of Advocate Avi Licht still provides the desired certainty without exposing the State to international law. The Ministry of Justice responded that the Proposed Law is essential to the State of Israel, both for fiscal reasons and because it is not sufficient to rely on the legal opinion of Advocate Avi Licht. Furthermore, since Israel is not a signatory of UNCLOS, but has only adopted some of its principles by way of common law, and the fact that Israel has not accepted the compulsory conflict resolutions provisions in the convention, the state will not be exposed to a compulsory proceeding of the Tribunal of the International Court of Justice without its consent.

On this matter, the issue of the maritime border dispute between Israel and Lebanon was surveyed in detail by Advocate Nadia Zimmerman as part of the Maritime Strategic Evaluation for 2017-18 published by the Maritime Policy & Strategy Research Center¹⁷ and it provides support for the position of the Ministry of Justice that as long as Israel does not become a signatory of UNCLSO it cannot be forced into the conflict resolution mechanism mentioned in Section 15 of the Convention to which Advocate Shahal refers.

- **Protected Maritime Zones.**¹⁸ The Committee considered the definition of the term “Protected Maritime Zones” in relation to the term “Nature Reserve” which appears in the National Parks Law.¹⁹ The Ministry of Energy stressed the importance of preserving nature in the sea and referred to the strategic environmental survey it carried out in 2016,²⁰ which found that there were sensitive spawning grounds of rare corals within Israel's EEZ. These spawning grounds were defined as having major environmental importance and in the future are to be declared as Protected Maritime Zones according to the *Policy Document*. In addition, the Planning Authority stated that the future *Policy Document* will refer in detail to the maritime zones that will be closed to activity for environmental reasons and as natural heritage areas, as has been done in zones that are sensitive from a security viewpoint. It was agreed that the relevant Section that deals with this subject in the Proposed

17 “The Dispute over the Maritime Border between Israel and Lebanon – Legal Elements,” Maritime Strategic Evaluation for Israel 2017-18, p. 148.
<http://hms.haifa.ac.il/images/reports/report-2018.pdf>

18 See the Proposed Law, Chapter 8, Section 29.

19 National Parks, Nature Preserves, National Sites and Memorial Sites Law, 5758-1998.

20 See the Proposed Law, Section 16 (8) and also the Strategic Environmental Survey for the Exploration and Production of Offshore Oil and Gas, October 2016. [Hebrew]

Law is Section 29, which has not yet been considered by the Committee and since this involves a substantive issue, an amendment of the definition of a “Protected Maritime Zone” should be considered following the discussion of this important section. The Chairman of the Committee defined this as a core issue and stated that it should be examined in depth.

- **Distinction between an “Offshore Facility”²¹ and a “Permanent Offshore Facility”²².** Questions were raised as to the need for a *Pro-Active Declaration* by the appointed Minister on the legal status of a Permanent Offshore Facility in the EEZ, and why the actual activity of the facility is not itself sufficient, de facto. The Ministry of Justice is of the opinion that a *Pro-Active Declaration* made by a Minister is intended to create absolute certainty and to avoid the need for interpretation – the legal status of an offshore facility has far-reaching economic implications on the cost of operating such facilities. The concern here is that the Minister will not declare the status of a facility due to political or other considerations at the time, which will create a kind of exemption, deferral and/or circumvention of the intent of the law. The Ministry of Justice mentioned that there is full intention to apply all labor laws to a Permanent Offshore Facility as if it were a factory located within Israel, although there is no intention to do so for a regular Offshore Facilities that will operate for a limited amount of time in Israel’s marine areas and then leave. In light of these questions, the Chairman of the Committee requested a precise definition of the “extended period” that would be determined according to the nature of the facilities operations and an amendment will be inserted into the law.

There is a possible scenario in which the legal status of a Floating Production Storage and Offloading (FPSO) unit would change over the lifetime of the project, such that it will shift from being an “Offshore Facility” to a “Permanent Offshore Facility”, which would automatically induce upon it the **Fourth Addendum to the**

21 See the Proposed Law, Section 2 (Definitions). “An Offshore Facility is a structure or facility including a rig or platform in the Exclusive Economic Zone, whether or not it is attached to the seabed, that is required for one of the activities in the Exclusive Economic Zone including if it is a vessel as defined in the Shipping Law (Vessels), 5720-1960, listed below:

1. Exploration, Production, Exploitation, Conservation, or Management of Natural Resources.
2. Laying cables or pipelines
3. Conducting research in marine sciences
4. Construction or Abandonment of infrastructure or other facility including a rig or platform, intended for use on items 1 to 3 above”.

22 See the Proposed Law, Chapter 2 (Definitions). “A Permanent Offshore Facility is an offshore facility that is planned to be in place permanently or for an extended period of time, which the Minister of Justice has declared in an announcement in *Reshumot* and which is necessary for conducting the activity stated in paragraph (1) of the definition of a “Offshore Facility” – that the Minister of Justice has declared following consultation with the Minister of Energy.”

Law²³ (and all that that implies with it). This would happen over time and according to the function of the facility, at the time of the declaration if intended by the Minister of Justice, following consultation with the Minister of Energy.

- **Adoption of the Straight Baselines Method for Delineating the Marine Areas.**²⁴ A representative of the Israel Mapping Center described the designated use of the straight baselines method in order to determine Israel's Marine Areas. The points and the baselines will constitute the boundaries for determining the marine areas from the coastline. These points touch and/or are tangent to the coastline. Following the approval of the Proposed Law, the government intends to declare the points from which the marine areas are measured and to publish their coordinates. According to the representative of the Israel Mapping Center, the proposed points (still unofficial) are as follows:
 - The Rosh Hanikra point.
 - The "techelet" point.
 - The Rosh Carmel point.
 - The end of the Orot Rabin coal jetty (2 km out to sea).
 - The wave barrier point in Ashdod.
 - The border with Gaza point.
- **The Extension of the Antiquities Law to the Contiguous Zone.**²⁵ The Ministry of Justice stated that accumulated experience indicates that antiquities are sometimes discovered in the Continuous Zone during infrastructure construction in the maritime domain and therefore there is a need to regulate the issues of ownership, obligations, rights and rules in order to preserve antiquities that are part of Israel's heritage. Accordingly, the Antiquities Law should be extended to the Contiguous Zone, which will include the policing powers with regard to antiquities according to the Penal Code. The only reservation is that an exemption should be granted from the obligation to register a comment in the Land Registry with respect to antiquities and that no comment will be recorded with the District Committee since it is not relevant to the Contiguous Zone.

23 "The List of Laws that Apply to Permanent Offshore Facilities that are located in the Exclusive Economic Zone."

24 See the Proposed Law, Section 3, Definitions in the explanation. "The definition of a "baseline". As mentioned in the General section, the Proposed Law changes the method adopted by Israel for measuring the various Marine Areas adjacent to its coastline. According to the proposed method, the Marine Areas will be measured from straight lines that extend between the geographic points on the coast or nearby that are determined according to the accepted cartographic practice. Those straight lines that will serve as a point of reference for measuring the various marine areas from the baselines."

25 See the Proposed Law, the Contiguous Zone, Section 7.

- **Payment of Municipal Tax for Facilities, Pipelines and Infrastructures in the Territorial Waters and Shore Approach.** This is an issue with important economic implications for stakeholders in the Marine Areas [O.S.]. The question of the obligation to pay municipal tax to a municipality/coastal authority for facilities and infrastructure near the coast has been considered on a number of occasions in legal proceedings and by the Supreme Court over the years. Thus, for example, the municipalities of Haifa, Ashdod and Hadera have tried in the past to clarify this issue. So far, the courts in Israel have tended to rule against the obligation to pay municipal tax in the Territorial Waters. So was in the case of, for example, the waters enclosed by the piers and wave barriers in the Port of Ashdod²⁶ and also in the case of the coal unloading facility in Hadera.²⁷ In some of the cases, the legal proceedings have not yet come to a conclusion. At the Meeting, the Chairman, who raised the subject, instructed to determine whether the obligation to pay municipal tax on Offshore Facilities in the Territorial Waters can be included within the law. The Planning Authority Representative responded that this is under the authority of the Ministry of the Interior and their position on the matter should be ascertained. It was agreed that the issue would be dealt with in the *Policy Document* and therefore there is no need to include it as a separate section in the Proposed Law.
- **Approval of the List of Laws in the First, Second, Third and Fourth Addendums.** The Ministry of Justice reported that it has drawn up the list of laws on the Addendums over the past three years based on discussions with the relevant government ministries, and according to international law (UNCLOS and others). The goal was to identify which local laws can be applied in the EEZ. During this activity, it was decided not to include the Planning and Building Law in the Addendums and therefore not to apply said law to Israel's EEZ. Instead, an alternative regulatory "quasi-planning" mechanism was proposed through a policy tool called a "*Policy Document*" under the responsibility of the Planning Authority. Said policy tool would introduce a process similar to a National Zoning Plan [O.S.]. On this, it is worth mentioning that the Second Addendum to the Proposed Law extends the Natural Gas Sector Law²⁸ to the Marine Areas, which will allow for, among other things, the construction of natural gas transmission systems beyond the territorial waters. This extension is likely to pave the way for a new international gas transmission network

26 Land Ownership Appeal 86/329 Israel Ports Company Development and Assets Ltd. versus the Municipality of Ashdod.

27 Land Ownership Appeal 99-80-86361 Israel Electricity Company Ltd. versus the Municipality of Hadera.

28 The Natural Gas Sector Law, 5762-2002.

to Europe or beyond, outside the scope of the government leases granted to the offshore oil & gas companies.

The Chairman of the Committee concluded that the question of the application of the Planning and Building Law - yes or no - in the EEZ is in his opinion a substantive matter and it will be necessary to discuss it again later. Towards the end of the meeting, the question was also raised on how the State is planning to budget the enforcement of the laws in the EEZ.

- **The Policy Document.** The Planning Authority presented a detailed update on the progress of the preparation of the *Policy Document*, which includes both the territorial waters and the EEZ. International experts are also involved in the preparation of the *Policy Document*, through government ministries involved in the matter. The main problem in determining future-oriented policy is the lack of knowledge about the existing maritime situation and therefore there is need to enrich the sources of knowledge beforehand. Currently, there are bathymetric maps available for shallow water (a system for mapping objects on the seabed and their shape) for most of the Marine Areas. At greater water depths it is more difficult to obtain accurate information. The Planning Authority has created an information center that is bringing together all of the existing information. Similarly, the Planning Authority is interested in obtaining a decision as to which single entity will manage Israel's Marine Areas. International experience indicates that there should be a **single body** that manages the maritime domain. Upon completion, the *Policy Document* will have the status of a government decision and all the government bodies will operate according to it. The Chairman of the Committee emphasized that the *Policy Document* should be flexible so that it can be revised when the gaps in knowledge are narrowed in the future. The Ministry of Justice listed the tools used for maintaining such flexibility. The status of the *Policy Document* was presented to the public at a conference held by the Planning Authority in April 2018.²⁹

Before the discussion ended, Sections 1 to 15 — with minor changes — were approved by a vote by the members of the Committee. Similarly, the first to fourth Addendums were approved. Section 16 passed only an initial reading and there was a short discussion of it; it was not brought for approval and will be discussed again at a later stage.

²⁹ See the *Policy Document for Israel's Maritime Domain*, expanded editorial committee, April 23, 2018.

2.3 Third Meeting (November 5, 2018)³⁰

At the beginning of the third meeting, a reservation was submitted by a number of MKs regarding cross-border hydrocarbon deposits. The Chairman of the Committee instructed the Ministry of Justice to convene a meeting with these MKs, with the goal of finding an agreed-upon resolution to this substantive issue.

Similarly, and in spite of the issue's importance, it was decided not to resume the discussion on Section 16 (the Policy Document) since the Chairman of the Committee requested additional time to hold an interministerial discussion before presenting the section for additional reading in the Committee and its approval.

The meeting centered on Section 17, which also identifies the **Authorized Entity** (as defined) that will have the authority to approve Petroleum Activities (as defined) in the EEZ.³¹ The Section grants the responsibility and powers to officials from the Ministry of Energy.³² This substantive issue was previously determined by the government before the Proposed Law was issued for First Reading in the Knesset.

Section 17 – The “Authorized Entity” – The Director for Petroleum Affairs who was appointed according to the Petroleum Law, and with respect to Petroleum Activity to which the Natural Gas Sector Law applies – the Minister or the Director of the National Gas Authority who was appointed according to the Natural Gas Sector Law, according to the circumstances.

According to the Ministry of Justice and the Ministry of Energy, the current text of the law provides the balance point necessary for approving offshore Petroleum Activities and also in light of the Petroleum Law, 5712-1952 (herein the “Petroleum Law”).

Discussion, Disputes, Alternatives and Decisions

- **Responsibility for Approving “Petroleum Activity” in the EEZ.** Opponents to the definition in Section 17 argue that it grants almost complete control of the approval of offshore Petroleum Activity to the Ministry of Energy. This control / authority circumvents the Planning Authority, the Ministry of Environmental Protection and

30 See the minutes of the third meeting held on November 5, 2018.

31 The Proposed Law, Section 17, Definitions. “Petroleum Activity – drilling for Petroleum during the exploration for Petroleum or during the production of Petroleum, the laying of infrastructure and pipelines to transport Petroleum or the creation of a Permanent Offshore facilitates for Petroleum drilling or to handle the products of drilling or their storage, and the dismantling of said Offshore Facilities; even if the facility is not recorded in the *Reshumot* as stated in the definition of a Permanent Offshore facility”.

32 See the video broadcast of meeting number three of the Economic Committee, November 5, 2018.

other regulators while taking on a major environmental risk without supervision. The opponents argue that it is not consistent with the planning and building principles that are in place on-land, the coast and the territorial waters. It is important to remember that the Planning and Building Law does not apply beyond the territorial waters, even according to the text of the Proposed Law, and therefore the government is assembling a “quasi-planning” mechanism that includes only some of the planning and building principles for the EEZ.

In contrast, environmentalists are proposing that decisions regarding the EEZ be made by a special Committee for Maritime Affairs that will be operated under the Planning Authority of the Ministry of Finance. The Planning Authority and all the other relevant government entities will operate according to the *Policy Document* that will receive the status of an obligatory zoning plan, **after** the approval of Petroleum Activity by the Ministry of Energy. The claim here is that this alternative proposed model is similar to the existing one. For example, this is the method of operating of the Committee for Coastal Matters and the Committee for National Infrastructures. These committees have been found to operate very efficiently. Environmentalists claim that the Committee for Maritime Affairs should be comprised of representatives from a number of government ministries and headed by the Ministry of Finance. Furthermore, an additional variation of this alternative is to establish a Maritime Authority that will report to the Prime Minister's Office and will also be involved in areas that the Proposed Law does not touch on, such as the management of the national sand resources and/or the creation of other maritime infrastructure like communication lines, natural gas transmission systems, vocational training, etc.³³

The discussion on this issue did not lead to agreement with respect to the entity authorized to approve Petroleum Activity. It should be mentioned that the attempts to find a creative solution to the problem are ongoing, and meanwhile the government decision, as expressed in the text of the Proposed Law, remains valid.

- **The Licensing Process for the Approval of “Petroleum Activity”.** At the request of the Chairman of the Committee, the Ministry of Justice and the Ministry of Energy prepared **slides** in order to explain the division of responsibility between the different ministries in the procedure for issuing permits, licenses and leases for offshore Petroleum Activity according to the mechanism specified in the Proposed Law.

33 See the *Globes* website article. “A sea of potential: who will manage Israel's prestigious maritime domain?” July 7, 2018 [Hebrew]

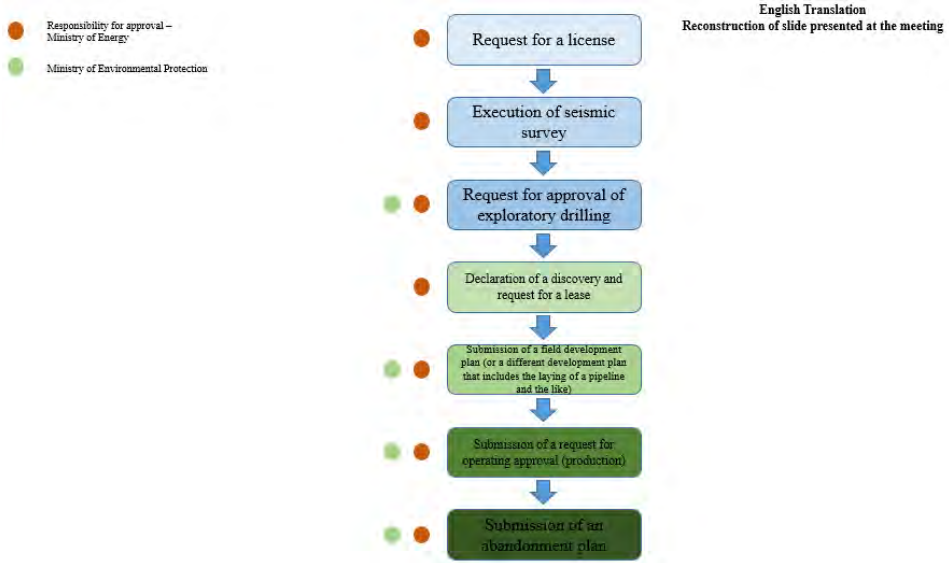


Figure 3: Responsibility of the Ministry of Energy in consultation with the Ministry of Environmental Protection

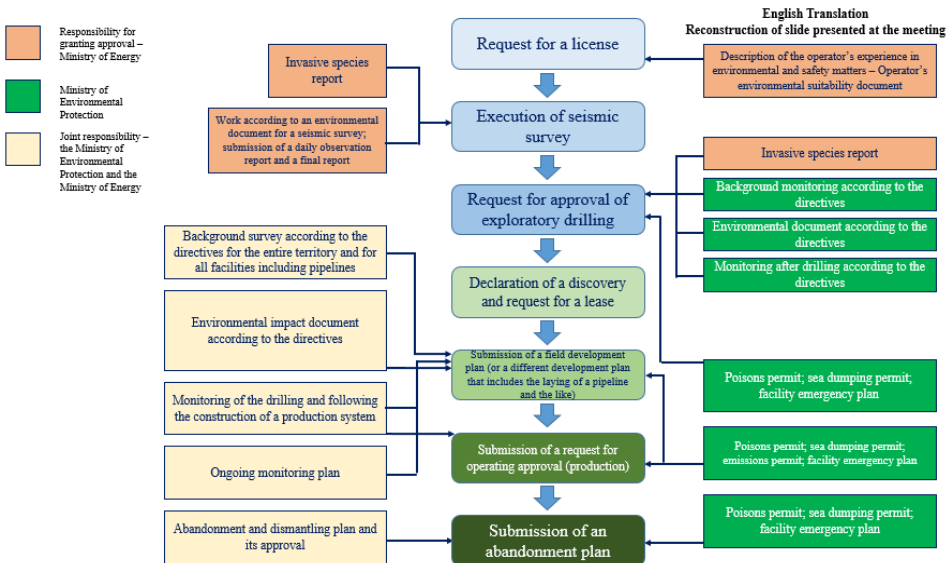


Figure 4: Presentation of the Licensing Process and the Environmental Requirements

Under the emerging arrangement, the Ministry of Energy will be responsible for managing the procedure for licensing Petroleum Activity, including approval of development plans for hydrocarbon deposits in the EEZ. The approval process

will take into account a number of environmental factors that are presented above and which are under the responsibility of the Ministry of Energy and in consultation with the Ministry of Environmental Protection. Any deviation from the position of the Ministry of Environmental Protection requires written justification.

In this context, the opponents of the arrangement expressed their dissatisfaction that the body that approves Petroleum Activities is the same one that supervises and monitors the activity. They claim that this violates the principle of separation of powers (as was discussed at length in previous meetings). A member of the committee even quoted an official American report that investigated the disaster in the Gulf of Mexico. He claims that according to the findings of the report one of the reasons that the disaster was not prevented was that the body which approves Petroleum Activity also supervised and monitored that activity. He claims that the report reinforces the idea that the licensing of Petroleum Activity should be transferred to a body separate from the Ministry of Energy, such as the proposed Committee for Maritime Affairs and/or a separate regulatory authority. Here again, agreement was not reached and therefore the government determination remains valid.

- **Involvement of the General Public in the Planning Process.** During the meeting, a number of MKs and other representatives expressed their dissatisfaction that according to the proposal the public will not be involved in the licensing process of Petroleum Activity and particularly in the approval of the development plans of offshore hydrocarbon deposits. This debate is related to the opposition of some residents of the coastal area to the construction of the Leviathan platform in the territorial waters according to National Zoning Plan 37h and their attempts to move the treatment facility farther from the shore, perhaps to the EEZ. As a result, the Chairman of the Committee urged that without an efficient process to involve the public in the approval of Petroleum Activity, the Proposed Law would not pass in his view. The Director of Petroleum Affairs stated at the end of the discussion that he understands the demand of the Chairman and that in upcoming discussions representatives of the ministries will provide an improved proposal that also includes the involvement of the public in the process.

3. Conclusions and Recommendations

The Proposed Law should be promoted while attempting to achieve a broad consensus among all professional entities, up to final enactment by the Knesset as early as possible. The focus should be on the following issues:

- 3.1 Completion of the *Section-by-Section* analysis in the Economic Committee and approval without delay.
- 3.2 Advancement and/or completion of diplomatic activities concerning Israel's maritime borders, including:
 - 3.2.1 Trying to reach agreement with Lebanon (either publicly or quietly) or by mediation if necessary, with regard to the overlap points of Israel's EEZ.
 - 3.2.2 Completion of voluntary international arbitration proceedings with **Cyprus**³⁴ to determine the separation and/or unification of the Aphrodite and Yishai hydrocarbon deposits located on the maritime border between the countries. The two sides should refrain from any activity involving these deposits until the end of the arbitration process.
 - 3.2.3 Preparation of a comprehensive study and legal arguments with regard to international law for future cases of lack of agreement regarding maritime borders and/or cross-border hydrocarbon deposits, including *among other things* an examination of the Express Consent mechanism introduced in Section 77 of UNCLOS as a pre-condition for the development of cross-border hydrocarbon deposits and/or, examination of models for the prevention and/or creation of deterrence against the depletion of national assets without consent.
- 3.3 Agreement and/or Determination on issues that have so far been raised during the Economic Committee Meetings, as follows: (a) Declaration of the Protected Maritime Areas in the EEZ according to Israel's international obligations; (b) Specifying the entity responsible for the management of the Marine Areas; **it is recommended to adopt the position presented by the Maritime Policy & Strategy Research Center**³⁵ regarding the creation of a Maritime Authority that will coordinate the activity of the government ministries and the regulators in this domain; (c) Formalizing the approval process for Petroleum Activity, with effective integration of the Ministry of Environmental Protection and the inclusion of the public in the process; and finally (d) Determining a budget policy for the enforcement of laws in the Marine Areas; in the absence of consensus, the position of the government should be adopted in order not to delay the legislative process.

34 See the article in *Globes* on May 1, 2018.

35 See the position paper "Comments of the Maritime Policy & Strategy Research Center on the draft maritime policy document of the Planning Branch of the Ministry of Finance," April 24, 2018.

- 3.4 Completion of the Policy Document. An effort should be made to approve the Policy Document by the government at approximately the same time, or in sync with the approval of the Proposed Law by the Knesset.
- 3.5 Advance the exploration and development of the new hydrocarbon deposits in Israel and establish international collaborations, such as constructing an international natural gas pipeline, creating joint infrastructure and development of cross-border deposits.
- 3.6 Completion of the Second Offshore Licensing Round (“Opening of the Sea #2”) without delays; attracting operators and investors to Israel. Ensure that the operators and investors that come to Israel are aligned with the countries national interests by their character, quality and capabilities, and that their geopolitical alignment is consistent with Israel’s existence, independence and continuing development; Develop ways to reduce regulation and push for “fast-track” approval of projects.
- 3.7 Train professional manpower that can effectively represent the interests of the State of Israel in areas of maritime law in international organizations.
- 3.8 Adopt methods and practices used in the applicable western countries with the goal of (a) Developing offshore energy infrastructures; (b) Finding the correct balance between exploitation of energy resources and environmental values; (c) Use of profits and revenues from natural resources in order to strengthen Israel’s economy and education system; and (d) Protect Israel’s heritage and maritime ecology.

A Defense Strategy for the Energy Facilities in the Maritime Environment: The Case of the Security Threats to the Dor Facility

Nir Zarchi

Introduction

The maritime domain of the State of Israel¹ answers many of the country's social, economic and environmental needs. It has a huge potential for providing energy resources, it is the main source of input for the production of water for household consumption and it contributes to the country's heritage and endowment of nature. The maritime domain also constitutes the main conduit for trade to the rest of the world and there are those who view it as a land reserve that can be used for infrastructure facilities and perhaps even urban development. Furthermore it is the "blue lung" of Israel which includes open landscape and a huge expanse for recreation and leisure (Technion, 2015).

During the years 2009-2010, large reserves of natural gas were discovered opposite the coast of the State of Israel in its Exclusive Economic Zone (EEZ or economic waters). These reserves serve as the major source of energy for the production of electricity in Israel and they are expected in the future to constitute one of the main sources of energy for transportation and local industry. Furthermore, it is planned that in the future, part of the gas reserves will be exported and it is estimated that the royalties to be received will constitute a significant source of income for Israel (State of Israel, 2013). In addition, it is expected that these energy sources will also answer any future growth in the regional needs for electricity and water (Shaffer, 2011).²

Accordingly, in recent years, there has been accelerated development of these discoveries in Israel's economic waters and on the coast. Thus, for example, the Leviathan field, which is the largest one³ and is located about 125 km west of Haifa, is expected to begin production in 2020. Its development is based on a designated underwater production system that will be connected to a network of pipes to a fixed production rig, which will be located 10 km from the coast in the western portion of the northern maritime territory, near Dor Beach. In addition, there is the Karish-Tanin

- 1 The maritime area is estimated at 26,000 cubic meters, which is larger than the dry land area.
- 2 Israel is implementing a national plan for the desalinization of water which includes the construction of desalinization plants that are among the largest in the world. The method of desalinization chosen for these facilities is reverse osmosis and the source of energy for their operations is natural gas.
- 3 The total conditional amount of natural gas is estimated to be 621 BCM and close to 40 million barrels of condensate (the Leviathan Project, 2019).

project whose fields are located from 75 to 120 km west of Israel's northern coast. Its development will be based on a designated underwater production system that will be connected to an FPSO ship which will be anchored near the Karish field and will be used for the treatment and separation of the raw material. The resulting natural gas will be pumped to the coast while the oil will be stored on the FPSO ship and will be exported by tanker at a rate of 7 shipments per year (Mekorot).

However, the State of Israel does yet have an overall policy for managing the maritime domain and all of the conflicts that arise within it. Israel's maritime policy is primarily sectoral, which leads to regulatory chaos in which a large number of different (and sometimes conflicting) regulatory authorities relate to the same maritime environment, each with a narrow perspective and without any clear order of priorities (Zimmerman, 2017). Moreover, since the State has only recently had to deal with the maritime domain, a maritime culture has not yet emerged and a base of knowledge on the subject has yet to develop. Essentially, the authorities that regulate Israel's maritime environment lack expertise and the appropriate tools to carry out their task.⁴ In this situation, a reality is emerging that will determine the future of Israel's maritime domain for years to come and will have an increasing effect on the State's national interests, assets and resources. All this is happening in the absence of an overall strategic perspective.

Against this background and in light of the explicit threats to attack the gas rigs, a public discourse has recently developed which has expressed the need to examine the possible solutions for the development of the State's maritime energy infrastructures, including from a security perspective.

Accordingly, this essay discusses the formulation of a security policy for the energy facilities in the marine environment, including the examination of alternatives for the cases of the Leviathan, Karish and Tanin discoveries and for the Dor maritime complex.

Method

The formulation of policy rests on three main components: (1) the goals of the policy – primary and secondary; (2) the scope of the policy – the areas to which it relates; (3) the period of the policy – the period during which the policy will remain valid.

Accordingly, during the formulation of security policy for the maritime energy facilities the following components will be present:

⁴ Or policy makers rely on bodies that have different interests or outlooks to theirs and in addition they lack the ability for effective control.

1. Primary policy objectives which usually include maintenance of public health and human lives, maintaining sustainability and preserving the environment, ensuring energy independence,⁵ and economic efficiency. Alongside these can be secondary objectives such as operational or legal elements;
2. The scope of the policy which essentially delimits the content of the policy and is characterized by three layers: (a) prevention or mitigation of risk; (b) minimization of the scope of damage in the event that the risk is realized; (c) ability to return to a minimal level of functioning as quickly as possible (achievement of robustness);
3. Period of the policy – in the case of critical infrastructures in general and maritime energy infrastructures in particular it is the practice to consider a period of 30 years.

In light of these fundamental components, an analysis was carried out with the goal of generating possible solutions (hereafter: also alternatives) and the comparison of one to the other. To this end, the principal alternatives are first set out; then, each of the alternatives is examined in depth, including an analysis of vulnerability and risk assessment.⁶ Following that, a range of tools and methods for mitigating the scope of possible damage is considered and the solutions required for a return to functionality are analyzed. As mentioned, once the alternatives have been described, a multidimensional comparison is made and the result is a collection of the preferred solutions (which will serve as the foundation for decision making).⁷ A basic model of this method is presented in Figure 1.

Case study of security threats to the Dor facilities

Analysis

As part of the research study (Zarhi, 2018) to examine the vulnerability of the maritime energy infrastructures to security threats and as a basis for creating a framework for policy formulation, the main maritime energy projects that are currently being developed

5 This factor can be replaced with “maintaining functionality”.

6 A designated method to accomplish this was developed at the Sandia Institute (Sandia, 2010) and includes, among other things, the characterization of the infrastructure, an identification of undesirable events and the critical assets it includes; an assessment of the expected results in the case of a realization of the undesirable events; a definition of the possible threats, including an assessment of the likelihood of their occurrence, alongside defensive capability; and finally an analysis of the level of risk reflected in the threats to the infrastructure.

7 Usually problems of this type are characterized by a multiplicity of variables and do not have a unique optimal solution. Accordingly, the method generates a “Pareto frontier”, which is a collection of possible solutions which are preferable, even if only partially so, over other possible solutions, and from which the optimal solution will be chosen by decision makers.

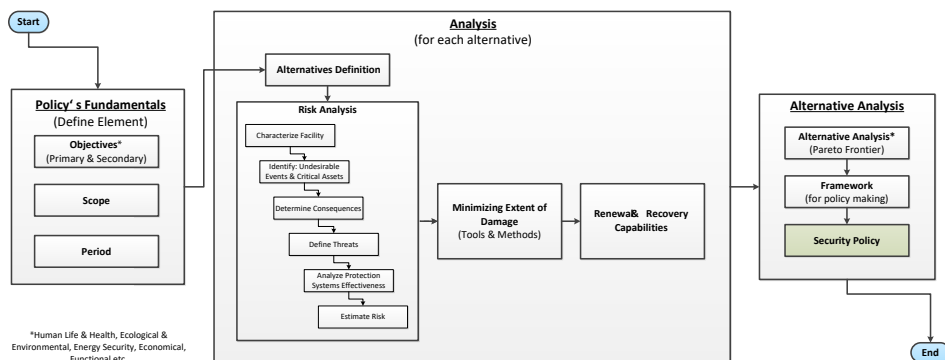


Figure 1: Model for security policy formulation

and are intended to serve Israel's energy sector in coming decades – the Leviathan start and Karish-Tanin projects and the Dor maritime facilities – were considered.

Accordingly, four alternatives were defined for consideration: (a) the current situation, which includes a marine handling platform near the coast and a floating production, storage and offloading (FPSO) unit; (b) an alternative identical to the existing situation except with the addition of FSO near the rig that will be used for the storage of oil;⁸ (c) an alternative based on handling by means of an FPSO unit in the contiguous waters; and (d) an alternative based on handling by means of an FPSO unit in the economic waters near the gas rigs. Figure 2 presents the various alternatives.

Findings of the analysis

The main conclusion of the analysis is that **production by means of an FPSO unit in the contiguous waters has a relative advantage in comparison to the other alternatives**. Thus, the alternative provides an optimal solution from the perspective of overall risk level and extent of damage in a security event. Furthermore, the alternative also provides a balanced solution from the perspective of national resilience, operations, law and consistency with a grand strategy.

Moreover, an analysis of the damage components (intensity of the events) indicates **the possibility of the development of outcomes with high to very high levels of damage intensity in the case of an undesirable event involving assets near the coast**. In this context, it was found that the alternative of using an FSO unit near the rig is inferior to the other alternatives.

8 According to what is possible as part of National Zoning Plan 37h.

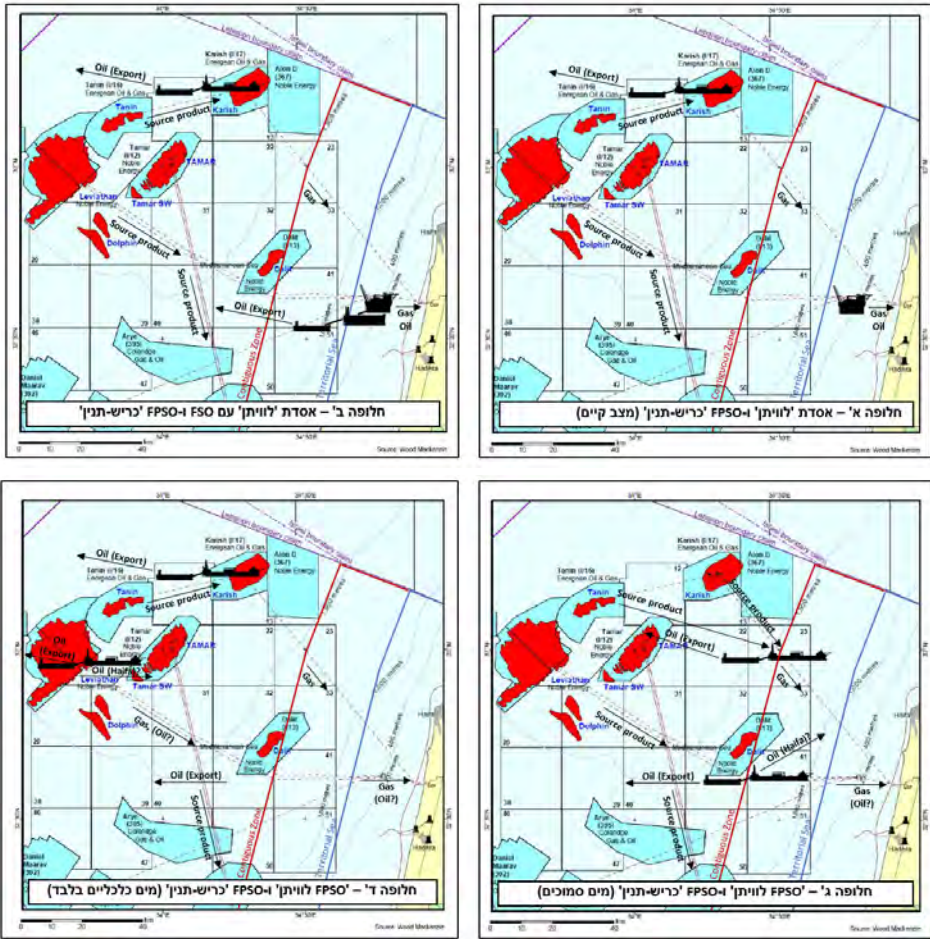


Figure 2: The various alternatives.

In addition, the findings indicate that a “mixed alternative”, which is composed of assets near the coast and assets distant from the coast, inherently includes significant risk factors and is also characterized by high variance. Thus, essentially, **these alternatives, including the current situation alternative, generate a reality that makes it difficult to formulate a comprehensive, efficient and effective multidisciplinary approach.**

Furthermore, it was found that **the State's defenses provide an appropriate response to most of the threats to the assets near the coast, except against long-range precision land-to-sea missiles, ramming by a ship or an explosives-rigged civilian aircraft (particularly during periods of calm); and that closely defense provides an appropriate response to most of the threats to assets remote from the coast, apart**

from ramming by a ship or an explosives-rigged civilian aircraft and to some extent underwater threats (particularly in the economic waters).

The analysis also found that a major layer in the defense capability, particularly in times of conflict, is the **use of soft means of defense that significantly reduce and even eliminate the overall risk**. In particular, it was found that the **use of mobile platforms has a significant advantage over the use of fixed platforms in eliminating risk and in dealing with a situation of failure**. Similarly, the ability to cool off the handling and production facilities in an emergency situation is likely to reduce the risk to a very low level. In addition, the determination of total storage capacity and the definition of design requirements and the operational configuration—which are derived from the various threats and the characteristics of the environment—constitute one of the main layers in the effort to limit potential damage in the case of an event occurring.

Main recommendations for policy formulation

In view of the findings of the analysis, it is recommended that **the energy facilities, and in particular the handling and production facilities, be based on mobile platforms (i.e. FPSO) at the remote edge of the contiguous waters**.^{9,10}

In addition, it is proposed that **a comprehensive and multidisciplinary national strategic doctrine be formulated for the management of Israel's maritime domain** including the critical assets located within it and the manner in which they should be protected.

It is also recommended that **the soft defense components be integrated as a primarily tool in the protection of the energy infrastructure**. In particular, it is proposed that an ability be created to detach and sail the mobile platforms in a time of emergency; to build in backup in the form of an alternative FPSO unit in the event of failure; to assimilate capabilities to “cool” the handling and production facilities; and to ensure control over the potential damage, by means of limiting the amount of oil and hazardous materials¹¹ that are likely to be released in the occurrence of an event. In addition, it

9 At about 45 km from the coast.

10 From the viewpoint of dispersion of an oil spill, the longitudinal location (the longitudinal current flows along the coast from South to North and exists for most of the days of the year), alongside the element of depth, has critical significance. In this context, a specific analysis should be carried out of every possible location, taking into consideration the localized effects.

11 To this end, a number of tools are available including, among others, the limitation of the overall storage capacity, the use of a unique engineering design (such as division into cells, each of limited capacity; protected location; use of physical fortification elements; etc.) and mode of operation (MOO). All of these are to be based on an analysis of the threat to security and safety.

is also suggested that greater use be made of geopolitical pressure and in particular against major players in the region who are likely to suffer damage in the event of a successful attack on distant energy infrastructure. These players are likely to include, among others, Lebanon, Syria, Turkey and even Russia.

In addition, it is recommended that **the components of hard protection against precision long-range land-to-sea missiles be strengthened and also that the mechanisms to deal with ramming by a ship or suicide aircraft be formalized**, especially in the case of the contiguous waters.

Similarly, it is recommended that **the national preparations to deal with a major oil spill be completed**, starting with the updating of the reference scenario based on the proposed doctrine,¹² that efforts continue to lay the legal, regulatory and budget groundwork and that gaps in equipment and manpower be filled, including the raising of skill levels.

In addition, it is recommended that **the judicial and legal status of Israel's maritime zone be formalized, in a manner consistent with the overall doctrine for the management of the maritime domain** (which was recommended previously). In this context, **emphasis should be placed on the regulation of the contiguous waters**, in a way that will make it possible to provide a suitable level of security for critical assets found within it, including an appropriate solution for the spectrum of needs in the region.

In conclusion, it is recommended that **a centralized and professional mechanism be established that will bring together the existing knowledge on the subject**. It is proposed that this body carry out a periodic examination of the various issues in a systematic and multidisciplinary manner, with the goal of optimally adapting the overall doctrine for managing the maritime domain to the changes occurring within it.

12 Accordingly, an ability is needed to provide an effective response within a few days (about 4).

Developments in the Construction of Artificial Islands and Floating Platforms during the Past Year

Moti Kalmar and Ehud Gonen

The goal of this chapter is to briefly describe the recent developments in artificial islands in Israel and the innovations in floating platforms.

Government decisions and processes

During the past two decades, the government of Israel has discussed the subject of artificial islands off the coast of Israel a number of times. The discussions have led to a number of important decisions:

- The decision of the Ministerial Committee for Socioeconomic Matters no. 86 from December 18, 2000 regarding the “Advancement of efforts to build artificial islands”.
- Government Decision 4776 from June 17, 2012 regarding the “Feasibility of constructing artificial islands for infrastructure complexes”.

In addition, the government has published a number of documents:¹

- The conclusions of the Planning Authority within the Ministry of the Interior, which appear in the “Policy Paper on Artificial Islands, Final Report prior to the Discussion in the Committee for the Coastal Environment”, July 2007.
- Interim conclusions of the Committee to Examine the Construction of Artificial Islands off the Coast of Israel, within the Ministry of Science and Technology from November 6, 2012.
- Policy Paper on the Maritime Domain in Israel: Mediterranean, Stage II Report, Maritime Domain Policy, first draft for comments October 2017 (including specifically the subject of artificial islands).

In January 2018, the government approved an additional decision to create a working group led by the head of the National Economic Council within the Prime Minister’s Office with the participation of the director generals of most of the government ministries, which will “...recommend existing facilities or those to be constructed during the next 20 years, for which there is a potential to be moved or established on an artificial island or islands off the coast of Israel and will recommend technological alternatives for the

1 Over the years, many documents on the subject have been published, including academic ones. This chapter will present only those published by the government.

creation of the island or islands and the possible geographic locations for the island or islands, according to the facilities that are selected.”²

At the same time and in addition to the recent government decisions, there are two additional and parallel processes taking place:

1. A process to plan Israel's maritime domain (Spatial Planning) that is being led by the Planning Branch in the Ministry of Finance. As part of this process, a draft has been published of a policy document for Israel's maritime domain. The draft does not discuss any allocation of maritime territory for artificial islands.³ It should be mentioned that this is a complicated planning process that has lasted a number of years and has included hundreds of stakeholders.
2. The process to examine the feasibility of creating an artificial island for an airport and other uses, which is being led by the Ministry of Transportation and Road Safety. In July 2017, the Ministry of Transportation published a multi-stage tender, which includes an initial filtering stage and an advanced tender stage (Tender 11/17).⁴ In the first stage, a request was published for proposals to study the feasibility of establishing an artificial island for the purpose of building an international airport and other uses. The second stage of the tender was carried out during 2017. In July 2018, there took place a workshop at the University of Haifa on artificial islands off the coast of Israel, at which researchers from the Maritime Policy & Strategy Research Center presented their position, according to which there is a preference for floating platforms for 'infrastructure complexes' over the technology of reclaiming the sea with sand. This was based on a variety of factors, including the unavailability of fill in the required quantities; disruption of the movement of sand along Israel's coast; harm to the coast close to the island due to the change in the wave regime and the movement of sand regime (damage to the coastal cliff).

Assessment of the preferred technology (floating platforms or sea reclamation) in the tenders recently published by the government

Tender 11/17 issued by the Ministry of Transportation did not include any specification of the type of island to be proposed. The possibility of a floating platform was one of the options, although it appeared that the intention of the tender was a dry land island

2 Working Group to Advance the Creation of Artificial Islands off the Coast of Israel, from the site of the Prime Minister's Office https://www.gov.il/he/Departments/policies/dec3344_2018

3 Policy Document for Israel's Maritime Domain: Mediterranean, at the site of the Planning Authority http://www.iplan.gov.il/Documents/Report_4.pdf

4 Assessment of the Feasibility of Creating an Artificial Island for an Airport and Other Uses – Initial Filtering Stage, at the site of the Ministry of Transportation <https://www.mr.gov.il/officestenders/Pages/officetender.aspx?PID=597559>

(draining or fill from the sea). The financial requirements that apply to the participating companies and the requirement of extensive experience in large-scale infrastructure projects limited the type of participant and their number from the start. A number of team-ups were organized between Israeli and foreign companies which submitted proposals together. In the summer of 2018, a Dutch-Israeli group won the tender.

In January 2018, as mentioned, the government approved a decision to renew the activity to assess the feasibility of artificial islands for national energy infrastructures. The implementation of the decision was the responsibility of an interministerial working group led by the Prime Minister's Advisor for Socioeconomic Matters, which was called the "Interministerial Working Group for the Advancement of Artificial Islands in Israel."

The working group published a call for proposals in this matter. The proposals were examined and if the proposal appeared to be feasible or innovative then the proposer was invited to present it to the members of the group. The group was assisted by a civil engineering company that provided consultation in assessing the proposals that had passed the initial sort. The company chosen has extensive experience in the infrastructure construction and even projects involving sea reclamation, although it has little experience in maritime construction and particularly in maritime architecture (building of ships – floating metal structures). It is possible that the lack of experience in the maritime construction (Metals) will have implications for the decisions arrived at by the group. For example, the assessment of the price of "dry" construction (sea reclamation) relative to the price of "maritime construction" (building the same dry surface area by using floating metal/cement structures).

The working group's conclusions and recommendations have not yet been published.

Innovation abroad

An emerging worldwide trend, led by Russia and China, is that of floating sea platforms for energy infrastructure. More and more countries are adopting maritime construction as the preferred solution in cases where there is a shortage of space for these infrastructures along the coast, where solutions with regard to safety and cost are attained with a relatively small investment.

Russia

In St. Petersburg, a floating platform named the Akademik Lomonosov has been launched. The platform is not self-propelled and carries two nuclear reactors with a

capacity to produce 35 MWe of electricity each. The platform will provide energy in the Northern Sea.^{5,6}

As the ice cap melts due to global warming, shipping lanes have been opened between Northern Russia and the West which were previously not traversable. The platform will serve as a source of energy for developing Russia's northern coast, which so far is uninhabited. Five similar units are planned.



The platform is relative small in size – 10 X 30 X 145 meters with a draft of about 5 meters. According to its planners, its can withstand the local conditions.

According to the platform's planners and builders, there is interest in the product also in South America and specifically Argentina. Any potential buyer that is not interested in purchasing the Russian nuclear reactor can install a different one on the platform.

China

China has launched a floating platform that carries a nuclear reactor with a capacity to produce 60-70 MWe of electricity. The platform will be used to supply energy for the construction / completion of islands in the South China Sea. The platform is also

5 The Nuclear Power Plant of the Future May Be Floating Near Russia <https://www.nytimes.com/2018/08/26/business/energy-environment/russia-floating-nuclear-power.html>

6 Russia's Floating Nuclear Power Plant Has Hit the Sea <https://gizmodo.com/russias-floating-nuclear-power-plant-has-hit-the-sea-1825650002>

intended to provide energy in emergency situations to the coastal cities in the case of a natural disaster, such as a typhoon or tsunami resulting from an earthquake.

The platform was planned in Russia. It is identical in its dimensions to the Akademik Lomonosov platform, although the installed upper structure is somewhat different.

A number of similar structures are under construction. At the same time, the Chinese are planning even larger platforms with double or triple the electrical capacity and with larger structures, which are expected to go into service during the 2020s.⁷



Recommendations

According to the draft of the Policy Document for the Maritime Domain: “Due to the shortage of marine sand and the environmental impact of mining it, artificial islands will be built using other technologies, which do not use sand, or using floating marine structures.”⁸ The recommendations of the environmental organizations are represented by the position of the Tsalul NGO,⁹ which points to the many environmental risks in building an artificial island by sea reclamation, as well as the global trend toward the use of advanced technologies in the area of giant ships and offshore rigs. These organizations recommend the transfer of civilian infrastructure using technologies that have been developed in recent years, such as the FPSO,¹⁰ which does not require the

7 Plans for China’s floating nuclear reactors can be found at <https://www.popsoci.com/china-floating-nuclear-reactors>

8 Policy Paper on the Maritime Domain in Israel, Mediterranean, Stage II Report, Maritime Domain Policy, first draft for comments http://www.iplan.gov.il/Documents/Report_4.pdf

9 As presented at a conference at University of Haifa on July 1, 2018 and in the document: “Artificial Maritime Islands and Structures in the Mediterranean off the coast of Israel” <http://www.zalul.org.il/wp-content/uploads/2018/06/%D7%93%D7%A3-%D7%A2%D7%9E%D7%93%D7%94-%D7%9E%D7%A9%D7%95%D7%AA%D7%A3-%D7%90%D7%99%D7%99%D7%9D-%D7%9E%D7%9C%D7%90%D7%9B%D7%95%D7%AA%D7%99%D7%99%D7%9D.pdf>

10 Floating Production Storage and Offloading.

use of sand for draining or a structure on pillars that is restricted to the continent shelf, and which can be moved at the end of its life or in an emergency.

In addition, it appears that the Policy Document for the Maritime Domain being advanced by the Planning Branch in the Ministry of Finance, which has involved the investment of significant resources over an extended period, does not include nor seriously take into account the option of building an international airport on an artificial island off the coast of the Center. On the other hand, the Ministry of Transportation is in fact headed in this direction and has already issued the relevant tenders. We recommend that the final Policy Document for Israel's Maritime Domain should relate to the building of an international airport on an artificial island off the coast of Israel, including the allocation of maritime territory.

This example of unsynchronized activity among the government ministries emphasizes the need to formulate a maritime strategy for Israel.

The Activity in Israel's Ports

Arie Gavish¹

General

This chapter summarizes the activity in Israel's ports in 2017² and is based on data from the Ports and Shipping Authority (ASP) Annual Statistical Abstract for 2017. The chapter also includes issues and trends in the ports during 2018 and primarily with regard to the strategic preparations of the Haifa and Ashdod port companies prior to the commencement of operations of the Hamifratz and Hadarom ports, which is expected in 2021.

The ASP's Statistical Abstract is divided according to four types of loading/unloading of cargo:

1. Containers
2. General cargo (metal, wood, paper and vehicles).
3. Bulk
4. Automated facilities, such as for grain, fuel, acids, export of phosphates and potash, cement, etc.

This chapter includes the following sections:

- Analysis of the activity in the ports in 2017 based on data from the ASP Statistical publication.
- The status of the construction of the Hamifratz and Hadarom ports.
- The preparations of the Haifa Port Company and the Ashdod Port Company for the commencement of operations of the new terminals.

Port activity in 2017

The number of ships that visited Israel's commercial ports (Haifa, Ashdod, Eilat and Israel Shipyards) was 6383 in 2017, which represents a 2.1 percent decrease relative to 2016.

1 The writer wishes to thank Moshe Cohen of the Ports and Shipping Authority who helped in processing and organizing the data from the Authority's Annual Statistical Abstract and provided additional data that does not appear there.

2 This chapter will not examine Israeli shipping or the number of Israeli seamen since there have not been any major developments recently. This situation is not encouraging and we would draw the reader's attention to the chapter on Israeli shipping in this Strategic Evaluation published by the Maritime Policy & Strategy Research Center, University of Haifa. The chapter calls on decision makers and the Israeli government to urgently discuss the future of Israeli shipping and the number of Israeli seamen.

The maritime departments of the Haifa and Ashdod ports dealt with all aspects of the service provided to these ships (routing, towing, mooring, anchoring, safety within the boundary of the ports and port control).

Negotiations are currently taking place between the unions in the maritime departments of the Haifa and Ashdod port companies, the Israel Ports Company (IPC) and the Ministry of Transportation with regard to transferring the maritime departments from the port companies to the IPC. This is a complex and controversial issue which involves the format of the maritime departments within the IPC.

There are a number of possibilities:

1. The maritime departments will become part of the IPC (The port landlords).
2. The maritime departments will become subsidiaries of the IPC.
3. The status quo will be maintained, such that the maritime departments will remain within the Haifa and Ashdod port companies and will provide maritime services to all companies operating in the port.
4. A different configuration (there are a number of possibilities, such as privatizing the maritime departments or parts of them).

Whatever decision is made, the existing maritime departments will serve as a professional infrastructure for the provision of maritime services to the ships being handled by all of the companies in each port, including the new terminals (the Hamifratz port and the Hadarom port). In discussions among stakeholders, the possibility is periodically discussed that the IPC will establish maritime departments that will provide maritime services to the new companies (the Hamifratz port that will be operated by SIPG, a Chinese company, and the Hadarom port which will be operated by the TIL company). This solution is not economically feasible and it is possible that these discussions are simply a tactic.

One of the challenges to the maritime departments in both ports is the maneuvering of large ships on entering and exiting the ports' piers, and particularly the giant container ships, which account for a growing share of global traffic. The upward trend in the orders of these giant container ships requires that the world's ports make modifications to allow these ships to maneuver and of course to enable them to load and unload.

In parallel to the decision regarding the structure of the maritime departments, a decision is needed as to the fate of the Haifa and Ashdod administrations which are currently part of the ASP.

Reminder

The Haifa and Ashdod port administrations were created in 2007 as part of an agreement between the Ministry of Transportation (ASP) and the IPC. It was agreed that the port administrations would constitute the administrative infrastructure that would allow the IPC to operate in all of the shared domains as a “landlord”, including security, maritime department services, environmental protection, etc. It was also decided that the port administrations would be transferred in the future from the ASP to the IPC once it was transformed into the ports’ landlord. One of the possibilities is to execute the agreement between the IPC and the ASP as written, namely to transfer the port authorities to the IPC and that they will report to the maritime departments (to be transferred to the IPC), as will the appropriate framework in the IPC that will serve as its executive arm in the ports in all the shared domains (maritime departments, security, environmental protection, etc.).

In most ports around the world, the landlord system is used to operate the port. The municipality is the landlord of the port and it is responsible for issues that are common to all the companies (development, transportation, marketing, security, maritime services and other activities). The reform of the ports in 2005 did not deal with all aspects of this situation. According to the reform, it was decided that the IPC would be the landlord with respect to the land and the development of the ports. It should be mentioned that the IPC serves as landlord for the existing ports in many realms (port development, land, infrastructure, etc.). In order for the IPC to become a full landlord of the ports, a number of steps are necessary, and in particular transferring the maritime departments from the port companies to the IPC; making the IPC fully responsible for security in the ports; and of course updating the Shipping and Ports Authority Law, 5774–2014, accordingly.

The Haifa and Ashdod port administrations have operating in this format since 2007 as a temporary solution until the necessary modifications are made. The original intention was to operate the authorities in this format only temporarily until they are transferred to the IPC and the IPC’s establishment as a landlord with respect to all shared domains, as well as the creation of an appropriate organizational framework for what is known worldwide as a “port authority”.

It is recommended that a decision be made on this issue in parallel to the decision that is currently under discussion regarding the maritime departments.

Containers

There is a long-term upward trend in global container traffic of about 4-6 percent annually. The trend in Israel is similar.

In 2017, total container traffic was 2.9 million TEU's in the Haifa and Ashdod ports, which represents an increase of 5.8 percent relative to 2016. Since 2000, there has been an annual increase of 4.6 percent in container traffic. Container traffic in units (number of containers) totaled 1.843 million this year, which represents an increase of 4.8 percent relative to 2016.

According to the Annual Statistical Abstract of the ASP for 2018, the data for the first three quarters show that this trend has continued. In other words, container traffic continued to grow by 4–6 percent in annual terms.

In the Ashdod port, container traffic totaled 1.525 million TEUs, which represents an increase of 5.7 percent relative to 2016.

In the Haifa port, container traffic totaled 1.343 million TEUs, which represents an increase of 5.9 percent relative to 2016.

The share of the Ashdod port in total container traffic is 53.2 percent and that of the Haifa port is 46.8 percent. This is in contrast to the past when the Haifa port accounted for about two-thirds of container traffic and the Ashdod port for only one-third. The Ashdod Port Company succeeded in changing this ratio in its favor since the Eitan (Hayovel) port went into operation in 2006. This ratio is a function of various factors, including the competition between the Haifa and Ashdod port companies.

Competition within each port and between the ports (Haifa and Ashdod) will intensify once the Hamifratz and Hadarom terminals go into operation in 2021.

During the first three quarters of 2018, there were indications of a change in favor of the Haifa port, with its share increasing to 50.7 percent relative to Ashdod's share of 49.3 percent.

Transshipment

The total containers that were transshipped in Israel's ports during 2017 was 154,645 TEU's. Of that the Haifa port accounted for 145,134 (94 percent) and the Ashdod port accounted for 9512 (6 percent).

In the near future, with the opening of the new terminals, the shipping companies will consider transforming one or both of the terminals into a regional hub, which will have

an effect on the regional competition between the ports in the Eastern Mediterranean. The ability of the new terminals to handle giant container ships together with their container storage capacity can transform them into a regional hub for the Eastern Mediterranean.

During the first three quarters of 2018, this trend remained unchanged. Transshipment was divided between the two ports as in 2017.

The major question of whether the large shipping companies will locate their regional hub for the Eastern and Central Mediterranean and the Black Sea in one of Israel's ports will remain open until the new terminals begin operations. The answer to this question will have a number of effects (efficiency, reliability, level of service, productivity, costs, the regional situation, etc.).

This year, there was a growing trend for the Haifa and Ashdod port companies to direct large ships (around 14,000 TEUs) to their deep piers (the Carmel pier in the Haifa port and Pier 23 in the Ashdod port). The shipping companies that operate these large ships are welcoming the efforts being made in the ports to improve routing, mooring and maneuvering ability in the aforementioned piers. The efforts of the port companies are meant to improve their ability to compete in providing direct call services to the large container ships (14,000 TEUs).

The new terminals that are being built in the Haifa and Ashdod ports are able to handle the large ships. The depth of the water at these terminals is meant to be 17.3 meters, the turning radius will be about 600 meters and the length of the piers will be 750-800 meters.

The "threat" of these terminals is meant to shift a not insignificant share of the container traffic away from the Haifa and Ashdod port companies. The administrations of these port companies are concerned, and rightly so, and each of them is strategizing as the day approaches when the new terminals will go into operation.

It can be assumed that once the new terminals go into operation, the container traffic of the Ashdod and Haifa port companies will be reduced, in view of the better conditions at the new terminals (depth, size of ships, etc.) and the fact that the terminals are closely connected to the shipping companies. It can also be assumed that the level of service / reliability / efficiency will be superior to that of the government port companies. This is essentially the main challenge facing the Ashdod and Haifa port companies.

The company that most successfully reorganizes in preparation for the new era of competition will be the one that survives and flourishes.

General cargo

In 2017, 3.9 million tons of commodities passed through the commercial ports, which represents a decline of 9.4 percent relative to 2016. It is difficult to draw any conclusions with respect to the trend in general cargo over the years. This is illustrated by the fact that in 2000, 3.8 million tons of general cargo passed through Israel's ports, which is similar to the volume in 2017.

In 2017, general cargo was divided between the ports as follows:

Haifa Port Company – 615 thousand tons, an increase of 6.9 percent relative to 2016.

Israel Shipyards Port Company – 1183 thousand tons, a decline of 19 percent relative to 2016.

Ashdod Port Company – 1877 thousand tons, a decline of 6.4 percent relative to 2016.

Eilat Port Company – 182 thousand tons, a decline of 17.4 percent relative to 2016.

General cargo can be characterized as follows:

- The entry of the Israel Shipyards Port Company (a private port) into the sector led to a significant quantity of cargo being shifted to it from the Haifa and Ashdod ports.³
- There is genuine competition between Israel's Mediterranean ports, such that general cargo has been shifted to the Israeli Shipyards Port from the Haifa and Ashdod port companies.
- The administrations of the port companies are devoting attention to general cargo and in particular the improvement of productivity and environmental protection.
- Despite the trend toward containerizations of many types of cargo (starting from the standardized stacking of general cargo and ending with container transport), general cargo will continue to "demand" efficient solutions for loading/unloading, storage, distribution, etc.

According to the strategic plans of the Ashdod and Haifa port companies, there is an intention to develop this domain as a major component in port revenues. The activity in the Israel Shipyards port proves that if activity is organized appropriately general cargo can be profitable and can constitute a major component in the mix of cargo dealt with by the port companies.

During the first three quarters of 2018, there was an increase of 2 percent in the quantity of general cargo relative to the first three quarters of 2017.

³ See the chapter on the national element of operating the Israel Shipyards Port in this document.

Automated facilities

The exports of Israel Chemicals Limited (phosphates and potash) from the Ashdod port totaled 1.444 million tons, a decline of 20.1 percent relative to 2016. The exports of Israel Chemicals Limited (phosphates and potash) from the Eilat port totaled 1.988 million tons. The import of cement through the Israel Shipyards port was 942 thousand tons and was handled using an automated facility and modern storage and distribution capabilities. Import of cement through the Eilat port – 997 thousand tons. Import of seeds by way of the Dagon facility in the Haifa port – 3.281 million tons. Import of raw fuel through the SPL connection in the Haifa port – 3.300 million tons. Export of fuel by Petroleum and Energy Infrastructures Ltd. through the Haifa port – 742 thousand tons. Export of chemicals through the Haifa port – 417 thousand tons.

Bulk cargo:

- The Haifa Port Company – 2.041 million tons, an increase of 32 percent relative to 2016.
- The Ashdod Port Company – 3.385 million tons, a decline of 1 percent relative to 2016.
- The Israel Shipyards Company – 803 thousand tons, a decline of 22 percent relative to 2016.

Main characteristics:

1. Part of the cargo moving through the automated facilities in the ports consists of captive cargo and the volume of their activity is affected by competition in the international markets. For example: the export of phosphates and potash from the Ashdod and Eilat ports or the export of fuel products from the Haifa port.
2. There is a certain level of competition in cement. The Ashdod port and the new project to import cement through the Israel Shipyards port is challenging the Israeli cement monopoly.
3. The import of bulk cargo is important in the use of facilities that minimize air pollution (bulk, pneumatic buckets, etc.).

Import of vehicles

Israel does not manufacture any vehicles and therefore all new vehicles must pass through the seaports.

The total number of vehicles imported into Israel in 2017 was 311,344, a decline of 15.2 percent relative to 2016.

The Haifa Port Company – 55,932 vehicles, a decline of 24.8 percent relative to 2016. This constitutes 18 percent of Israel's total vehicle imports.

The Ashdod Port Company – 161,184 vehicles, a decline of 0.6 percent relative to 2016. This constitutes about 52 percent of Israel's total vehicle imports.

The Eilat Port Company – 94,228 vehicles, a decline of 23 percent relative to 2016. This constitutes about 30 percent of Israel's total vehicle imports.

There is still a shortage of storage space for imported vehicles. Again this year, use was made of all available space in the ports for the storage of vehicles, to the point that it interfered with the activity of the operational piers that are intended for the loading and unloading of other types of cargo.

During the first three quarters of 2018, there was an increase of 1.3 percent relative to the same period in 2017.

Passenger traffic

In 2017, Israel's ports were not visited by a large number of cruise ships, despite the variety of historical sites in Israel and the increase in incoming tourism. Total passenger traffic through Israel's ports in 2017 was 176,346, a decline of 7 percent relative to 2016.

The Haifa port – 140,054 passengers which constitutes 79.5 percent of the total. This represents a decline of 11.6 percent relative to 2016 and constitutes 79.4 percent of total passenger traffic to Israel.

The Ashdod port – 26,757 passengers, an increase of 24.3 percent relative to 2016. This represents 15 percent of the total passenger traffic to Israel.

The Eilat port – 9536 passengers, a decrease of 1.5 percent relative to 2016. This represents 5.4 percent of total passenger traffic to Israel.

There is competition among the port companies to attract cruise ships to the Haifa and Ashdod ports. The cruise ship sector could provide a significant amount of revenue for the port companies in an era of increased competition for container traffic.

The factors that affect this sector:

- The political situation (the rounds of fighting in the North and the South).
- The overall tourism situation in Israel and worldwide.
- The level of service provided to cruise ships.
- The attractiveness of the holy sites (Nazareth, Jerusalem, the Dead Sea, etc.).

The status of the projects⁴

The Hamifratz and Hadarom ports

A Dutch company called Haskoning won the international tender issued by the IPC for the strategic planning of Israel's ports. It will be responsible for preparing a master plan for Israel's seaports. The target years for the characterization of Israel's ports is 2048 (Israel's centennial year). The company will analyze the needs, the alternatives and other important factors and will present a possible scenario for the development of new ports/terminals.

In addition, the IPC issued a request to the public to express its opinions and ideas with regard to a masterplan for Israel's seaports in the country's centennial year (2048).

The IPC did wisely by consulting with the Haskoning Company from Holland in order to decide how the map of Israel's future ports would look. The construction of a new port is not a simple matter and will be a lengthy process (15-20 years from the conceptual stage until the port/terminal begins operations) and therefore it is important to examine needs and capabilities at the earliest stage possible.

It is recommended that use be made of the local knowledge that has accumulated in Israel among the planners / engineers / operators of the new and existing ports in the planning of the future ports.

Status of the Hamifratz Port

The construction of the Hamifratz Port was begun in 2005 by Ashtrom-Shafir, which is the main contractor. It is expected to go into operation in 2021—in about 3 years. The expected cost of construction is about NIS 4 billion which will come from the IPC's budget. The construction is being carried out under the responsibility of the IPC, which is also responsible for choosing the operator. SIPG, a Chinese company (a subsidiary of the Shanghai Port), won the international tender issued by the IPC.

There will be one pier in the port/terminal of 800 meters length for container activity and a secondary pier of about 720 meters in length. The planned depth of the water will be 17.3 meters.

The construction is proceeding at a good pace. The port is being created between the secondary wave barriers and the walls of the pier, which are composed of thousands of tenons. Sea sand is being constantly injected by means of advanced

4 The writer would like to thank Noa Oren, the head of the New Port Development Administration within the IPC for assistance in gathering the data on these topics.

digger ships. Along the line of the pier, over one thousand concrete piles have been drilled to a maximum depth of about 45 meters. At the same time, the construction of the massive sea wall in front of the piers is continuing. Similarly, connecting walls are being poured and finally the crane walls are being built on which will be placed the giant cranes that will be purchased by SIPG in order to operate the pier for containers. On the secondary wave barrier in the area that connects to the strip of caissons—giant concrete structures that were sunk into the water—work has begun building the “perimeter wall” from cast concrete, an additional weight added to the wave barrier that will protect the port against heavy seas. A high voltage electrical substation is being built to supply electricity to the port. The work to prepare and secure the large territory of the port is continuing at full speed. The lengthening of the main wave barrier has been completed along an 882 meter route. Currently, a final upper reinforcement layer is being laid which is composed of thousands of concrete blocks, each weighing up to 30 tons. This huge structure, which rises from the seabed to a height of 25 meters will protect the port from heavy seas.

SIPG is working energetically at the moment and will continue to formulate the strategy for the terminal, including the port’s operating configuration. Yoav Zuckerman, the company’s representative in Israel, explained that the company is in the advanced stages of characterization, acquisition and installation of equipment and is getting organized for the start of operations. However, at this stage, he could not provide details in view of the competition that is expected between the Hamifratz terminal and the Port of Haifa.

Given the unavailability of details from SIPG, we are unable to describe the components that are planned for the Hamifratz terminal.

Status of the Hadarom port

The construction of the Hadarom port was begun in 2014 by PMEC, a Chinese company which is the main contractor. It is expected to begin operations in 2021. The cost of construction is expected to be NIS 3.3 billion which will come from the IPC budget. IPC is responsible for the construction, as well as the choice of operator. The operator of the terminal is TIL (a subsidiary of the MSC shipping company) which won the international tender issued by the IPC.

The port/terminal will have a main pier for containers that is about 800 meters long and a secondary pier of about 500 meters. The water depth is expected to be 17.3 meters.

Sea sand is being injected into the area of the future port which is delineated by a wave barrier from the North and by the pier wall from the South. The work is being carried out by advanced digger ships until the fill is completed.

In order to create the main pier so that it can bear the incredible weight of the cranes and cargo which the port will be handling, hundreds of concrete piles are being drilled to a maximum depth of 36 meters.

Along the line of the main pier, the construction of the rear pier wall is being completed. It is being created by the penetration of steel tenons into the seabed using powerful penetration hammers. Between the tenon walls, hundreds of steel anchorage rods are being laid. At the same time, the construction of the massive sea wall in front of the piers is continuing, along their entire length.

In the next stage, the connecting walls will be poured, followed by the crane walls which will bear the weight of the huge cranes. In the rear of the port, a high-voltage substation is being built which will provide electricity to the new port. The preparation and securing of the large port territory is continuing.

The work in the open sea is challenging due to the forces of nature. A perimeter wall—a massive concrete structure—is being built along the 1500-meter secondary wave barrier. It will serve as additional weight for the wave barrier and will strengthen the defense line of the port against heavy seas.

Work is continuing on the reinforcement of the wave barrier walls.

Western pier – The foundation of this unique pier is composed of a structure of 600 steel pipes.

Alongside them, there is a strip of huge concrete structures called caissons,⁵ which were placed on the sea bed.

In parallel, the lengthening of the main 600-meter wave barrier is continuing.

The massive wave barrier structure that rises like a wall from the seabed to a height of 32 meters will protect the port from heavy seas.

The pouring of a perimeter wall is being carried out on the wave barrier, as an additional weight element and which will also serve as a roadway.

A giant platform is inserting gravel columns into the seabed in order to reinforce it along the length of the wave barrier.

Preparations by the Haifa and Ashdod port companies for increased competition from the Hamifratz and Hadarom terminals

General

The operation of the new terminals in the Port of Haifa—the Hamifratz terminal—and in the Port of Ashdod—the Hadarom terminal—which will begin in 2021, is a major concern to the Haifa and Ashdod port companies (and rightly so). A significant share

⁵ Caissons: empty concrete structures built on land, which are floated to the marine construction site, then filled with sand and sunk in order to create marine infrastructures.

of the containers that are currently handled by the port companies will shift to the new terminals. It can be assumed that when the new ports are fully operational, 50 to 70 percent of the containers will be handled by the new ports.

The advantages of the new ports:

1. A deep-water pier (17.3 meters) about 850 meters in length with a turning radius of 600 meters. This will allow the entry of large containers ships (about 400 meters in length which is the size of the giant container ships currently being built).
2. Modern up-to-date equipment and systems. We do not have details of the type of systems since the representative of SIPG (in the Hamifratz port) and of TIL (in the Hadarom port) are not prepared to provide any information at this stage. It can be assumed that the professional expertise of the new operators and their experience in operating other terminals around the world will come into play at the Hamifratz and Hadarom terminals.
3. The new terminals will have a business/commercial connection with large shipping companies that are involved in the transport of containers worldwide. It is likely that these terminals will be preferred by these shipping companies.
4. The new operators will have lower costs than those of the existing port companies (manpower, automation, computer systems, etc.). The trend toward manpower savings can be relevant in almost every element of a container terminal's activity (operation, maintenance, information systems, etc.).
5. It is planned that the terminals will include the construction of railway tracks and a railway terminal in each of the container terminals.
6. There is a growing global trend toward building giant container ships with a capacity of 18,000 to 22,000 TEUs or more. Some of these container ships will be able to enter the new terminals.

The Haifa and Ashdod port companies have been working energetically in recent months on reorganizing and making preparations for the new era, which will begin when the Hamifratz and Hadarom terminals begin operations. This will increase competition within each port, between the ports and perhaps even between the new terminals and hub ports in the Eastern Mediterranean.

Naturally, some of the decisions by the port companies are confidential and include competitive elements. Therefore, the information in this article is based on various media sources, conferences and the insights of the writer. Many of the issues are in the process of negotiation with the workers and therefore there is more hidden than revealed. The large scale of investments by the port companies have still not

been approved by their boards; however, it can be assumed that the managements of the port companies will do whatever they can to prepare for the approaching era of competition and to put the ports (the Haifa and Ashdod port companies) in a better position to compete for containers and cargo arriving in their areas.

The main topics being discussed by the port companies, the IPC and the Ministry of Transportation are as follows:

1. The deepening of the existing piers of the Haifa and Ashdod port companies and reorganization in order to receive large container ships of around 18,000 TEUs.
2. Upgrading of existing container capabilities (retooling of piers, larger cranes and improved services).
3. Manpower – a drastic reduction of manpower is needed in various domains in order to reduce costs (reduction in work stations, work methods, wages, etc.).
4. General cargo – Expanding the capability to handle general cargo (piers, storage, work methods, logistic center, etc.).
5. Development of other cargo (seeds, passengers, vehicles, etc.).
6. Additional uses, whether port-related or otherwise.
7. Recruitment of a strategic investor – examination of feasibility, advantages and disadvantages.
8. Transfer of the maritime departments to the IPC and the completion of creating landlord status for the Haifa, Ashdod and Eilat ports.

The Haifa Port Company

During 2018, the Haifa Port Company was energetically working to formulate a strategic plan that would map out the company's future path. As mentioned, it was not possible to obtain confirmation from the port management of the information appearing in this document. Following are the highlights as I understand them, based on statements by senior port executives at conferences and in the local media.

As mentioned, what is written in this section is according to my understanding and does not obligate the Haifa Port Company.

The general direction of the port's management and the Board of Directors is to transform the Port of Haifa into a small and effective port by improving its ability to compete, its operational flexibility, its ability to respond to customers, the availability of piers and its level of service.

1. The east container pier will not be deepened at this stage. The Haifa Port Company will focus on attracting container ships of only 14,000 TEUs to the Carmel pier

where cranes will be added and heightened and the crane arms will be widened. The Haifa Port Company has arrived at the conclusion that deepening the eastern pier at this stage will not contribute significantly to its ability to compete with the Hamifratz port. In the future, it is possible that the eastern Carmel pier (which is not currently in use) will be upgraded so as to attract large container ships of 18,000 TEUs.

2. The work pier (Kishon Mizrach) of the Hamifratz port will be transferred to the Haifa Port Company at the conclusion of the construction of the Hamifratz port and will become a pier for general cargo and seeds (the target: 6 arm cranes at Kishon Maarav and 3 Gottwald arm cranes at Kishon Mizrach).
3. Agreements with the workers to increase efficiency (voluntary retirement, reduction in number of work stations, etc.). There are intensive discussions in order to sign an agreement in principle, which will be followed by detailed agreements.
4. Connecting Kishon Maarav and Mizrach by means of an operational bridge that will be built above the port. The flow of operational vehicles on the bridge between Kishon Maarav and Kishon Mizrah will streamline the handling of cargo.
5. The creation of one cargo gate for the Kishon Maarav and Kishon Mizrah piers.
6. The deepening of the Kishon Port and providing operational capability to handle Panamax ships.
7. Upgrading railway capability.
8. Upgrading of capabilities for other types of cargo (seeds, vehicles, iron, etc.).
9. Integration within various projects, such as the Western Sea Front in partnership with the Haifa Municipality, collaboration with gas exploration companies in the Mediterranean, etc.

The Ashdod Port Company

The Ashdod Port Company approved a strategic plan in principle which is meant to improve its competitiveness prior to the completion of the Hadarom terminal, which is planned for 2021. As mentioned, the port management would not confirm the information presented in this document. Following are the highlights of the plan as I understand them, based on statements by the port management at conferences and in the local press.

As mentioned, what is written in this section is according to my understanding and does not obligate the Ashdod Port Company.

1. Deepening of Pier 21 (in the eastern section) to a depth of 17.3 meters in order to enable the loading and unloading of container ships with a capacity of 18,000 TEUs.
2. The aforementioned includes all of the changes required for the deepening including the reinforcement of piers in order to bear the weight of the appropriate cranes, the acquisition of new cranes and the preparation of a container storage area with Rubber Tired Gantry (RTG) cranes.
3. The western section of Pier 21 is designated to handle seeds by means of 2 existing pneumatic buckets, each with a capacity of 600 tons per hour. Another pneumatic bucket with a capacity of 1200 tons per hour will be acquired in the future. Recently the seed conveyor project was approved. It will carry the cargo unloaded by the pneumatic buckets to storage in the rear of the port, which will save the double handling that exists today. The project will be completed in 2020/1.
4. The container storage area beside Pier 7 will become a general cargo storage area with a Rail Mounted Gantry (RMG) which currently exists for containers.
5. Pier 7 will no longer be used as a container pier; Piers 7 and 9 will become general cargo piers. Pier 9 (which in the past was used to unload coal ships) has a depth of about 13 meters which will make it possible to handle large general cargo ships.

Transportation of containers by Israel Railways in 2017

The movement of containers by rail accounted for about 7.4 percent of total container traffic in 2017. The expanded use of the freight trains of Israel Railways for the transport of containers will reduce the truck traffic on Israel's roads and therefore it is recommended that the existing and new companies make maximal use of railway terminals for this purpose.

A third railway track was added to the existing railway terminal at the Port of Haifa, which improved the output of the terminal.

The new railway station in the Ashdod port, which was meant to serve the Hayovel port and Pier 7, is not being used.

As part of the plan for the Hamifratz and Hadarom ports, a railway track will be built to these terminals, which will be completed in 2021 when the ports go into operation.

Following are figures generously provided by Israel Railways:

From the Haifa port: to Ashdod – 56,592 TEUs; to other destinations – 8,741 TEUs.

From the rear terminals in Haifa: to Ashdod – 10,605 TEUs; to other destinations 7,620 TEUs.

From Ashdod port to Haifa – 18,774 TEUs; to other destinations – 11,189 TEUs.
 From the rear terminals in Ashdod to Haifa – 75,739 TEUs; to other destinations – 27,498 TEUs.

Recommendations

1. Taking on a strategic partner in the existing ports (Haifa/Ashdod): In view of the discussions regarding the Chinese presence in the domain of Israel's infrastructure and the ports' intention to take on a foreign strategic partner, it is recommended that the decision on a potential partner for the ports will take into account elements of national security, in addition to economic and operational considerations. In this context, we would draw the reader's attention to the chapter on the Chinese ports in Israel in this Strategic Evaluation.
2. Encouraging the specialization of the existing ports in areas other than containers, such as general cargo, passengers, etc, since most of the container traffic is expected to shift to the new terminals.



The giant ships ELBA Maersk carries out maneuvers using tugs in the Port of Haifa, Courtesy of the spokesmen of the Port of Haifa



Cars unloaded on the platform at Port of Haifa, Courtesy of the spokesmen of the Port of Haifa

Where to for Israeli Shipping?

Arie Gavish, Zeev Leshem and Arie Rona¹

This chapter presents the problematic situation of Israeli national port and shipping situation—including the lack of Israeli maritime manpower—to stakeholders and decision makers in the State of Israel. We recommend an urgent discussion by the government of the future of Israeli shipping, including the economic, strategic and national security needs of the State.

The authors believe that there is an urgent need to reexamine the question of whether and how to revive Israeli shipping. We recommend that the government and decision makers establish a policy that will guarantee the existence of Israeli shipping on a profitable and competitive basis and which will achieve the maximal strategic contribution to Israel's resilience and national power (economic, military, commercial, etc.).

Background

Shipping is a term that refers to anything related to vessels that carry goods of various types in the maritime domain (containers, general cargo, chemicals and fuel, passengers, etc.), including maritime facilities (rigs for the drilling and production of maritime resources, oil, gas and quarries).

Since the dawn of human history, shipping has been a significant component of relations between nations, whether commercial, economic, military or otherwise, and it has been an integral part of human development. Shipping continues to be the most important channel for relations between nations and will continue to advance together with mankind. Shipping will continue to serve as an important component in the national resilience of countries around the world and an important element in national strength. Shipping encompasses a large variety of activities: planning and building of ships, including equipment and systems; operation of ships; training of maritime manpower; commerce; seaports; etc.

1 Arie Rona – Director of the Shipping and Ports Authority during the period 1995-2009.
Zeev Leshem – Senior Branch Director for Economic Planning and Foreign Relations – Shipping and Port Authority from 1973-2013.
Arie Gavish – Director of the Port of Ashdod prior to the reform from 1997-2002 and Director of the Port of Haifa within the Shipping and Ports Authority following the ports reform from 2007-2017.

International shipping is regulated by the UN by means of the International Maritime Organization (IMO). The Shipping and Ports Authority (SPA) within the Ministry of Transportation is the body that oversees shipping and port activity in Israel.

About 99 percent of Israel's goods, cargo, raw material and foreign trade (in terms of weight) is transported by ships, primarily by global shipping companies, i.e. ships that are not registered in Israel and are not under Israeli control.²

For hundreds of years, the guiding principle of international maritime commerce, which is anchored in international covenants, has been freedom of navigation. This principle enables a ship under any flag to enter an Israeli port for the purpose of transporting cargo for import or export (apart from ships flying the flag of a country at war with Israel). As a result, Israeli shipping is dealing with fierce competition from many countries even in Israeli ports.

Israeli shipping is in continual competition with shipping companies based in countries with a long maritime tradition and allow shipping under flags of convenience, in addition to countries with extensive domestic trade, which provides them with significant economic advantages. Ships flying the Israeli flag are limited in their access to some ports of the world for political reasons, a fact that makes it difficult for Israeli shipping companies to create associations and alliances with other shipping companies, as is common today in international shipping.

Israeli shipping's ability to compete with international shipping companies must be preserved, based on a proper balance between maintaining the safety of ships and life at sea according to international standards, maintaining the quality of the maritime environment and the employment of professional and skilled maritime manpower.

Every maritime nation maintains a policy to preserve its national shipping sector, for both economic and strategic reasons. This policy is manifested in a system of exemptions and preferential tax treatment, financial supports and assistance, preference in the transport of government and public cargo, assistance to shipyards and ship owners, training of maritime manpower, etc. Furthermore, most countries work to advance bilateral and multilateral shipping agreements with the goal of improving the terms of trade between countries and to prevent economic discrimination. Some of this data can be found in "Maritime Subsidies" which was summarized in a shipping policy booklet published by the SPA.

2 Israeli shipping in this context is commerce that is carried out either by ships under an Israeli flag according to the Shipping Law (Vessels), 5720-1960 or ships under foreign flags but under Israeli control according to the Shipping Law (foreign vessels under the control of an Israeli entity), 5765-2005.

The importance of a shipping sector to a country's economy, national resilience and ability to maintain operational continuity in emergency and in wartime is well-known and agreed upon. However, this importance is not translated into real assistance from the government that would advance shipping, based on the thinking that the international shipping will provide a solution in any future scenario. The approach that advocates globalization and a free economy, and which opposes intervention by the State, leads to a situation in which shipping in Israel does not get the attention it deserves from the government. The need for a healthy Israeli shipping sector is also a result of the fact that the State of Israel, which is a coastal nation, has huge potential in the maritime domain and in the resources that are located in its EEZ, and the fact that it is interested in producing the maximum from this situation and in a manner that is independent of external agents to whatever extent possible.

Current government support for the industry is on a relatively low scale and amounts to only about NIS 20 million and is intended for the support of Israeli ships (under the Israeli flag or Israeli ownership) and to support the employment of Israeli seamen.³

David Ben Gurion's Vision

The need for Israeli shipping was already recognized in 1950 by then Prime Minister Ben Gurion, in words he spoke at the graduation ceremony of the Naval officers course on February 5, 1950:

The security of the State is also dependent on the sea. Our equipment, our commerce is carried on the sea waves and without maritime control and power, we will not have the strongest land and sea forces.

However, the importance of the sea is not only political and military: Our economy's future is dependent to a large degree on the sea and the sea contains unlimited possibilities of settlement. This is not a paradox. The sea is not a water-desert, as it is perceived by many. The sea is full of treasure and lacks nothing.

Just as we must make the Negev bloom – so we must conquer the maritime domain. Our small country will flourish and expand if we understand that the coast is not a divider and a border but rather a bridge and a doorway...⁴

During the early years of the State, the shipping sector grew to an impressive size as a result of the support from reparations, and because the government of Israel emphasized its importance. Later on, this was manifested in active legislative efforts,

3 Government decisions, the Airport Authority and improvement of Israeli shipping's ability to compete, Government Decision 3373 from January 11, 2018.

4 Speech by the Prime Minister taken from *David Ben Gurion, Yihud veYeud, The Navy – Speech at the officers Graduation Ceremony*, February 5, 1950, Givatayim, 1972, pp. 100-107. [Hebrew]

various government decisions and the government's "gold share" in the Zim company⁵ which was privatized in 2004. At a later stage, the developments were manifested in the Authority for Training of Seamen and in a subsidization policy to reduce the cost gap between Israeli and foreign marine officers.

General statistics – Israeli shipping

Following are figures for the Israeli commercial fleet:⁶ As of March 1, 2018, the fleet of ships under Israeli ownership and control consisted of 34 ships with DWT⁷ of 1,960,295 tons. Total GRT⁸ was 1,349,256 tons and the NRT⁹ was 813,022 tons. The average age of the ships in the commercial fleet is 10.9 years. Only seven ships fly the flag of Israel, which in terms of DWT constitute about 15.9 percent and in terms of GRT about 18.6 percent of the total commercial fleet.

Table 1: Breakdown of the age of ships owned and controlled by Israeli shipping companies

Age of ship	Up to 2000		2001-5		2006-10		2011-16		Total Ships	
Type of ship	# ships	% of DWT	# ships	% of DWT	# ships	% of DWT	# ships	% of DWT	# ships	% of DWT
Container			5	28.4%	9	40.4%	3	31.2%	17	100%
General cargo	2	23.6%			4	65%	1	11.4%	7	100%
Bulk+coal			1	25.1%	3	50.6%	1	24.3%	5	100%
Tanker			2	29.9%	3	70.1%			5	100%
Total	2	0.5%	8	26.5%	19	46.3%	5	26.7%	34	100%

The Israeli shipping companies

The Israeli commercial fleet, as of March 2018, included:

Zim Integrated Shipping Services: 8 ships with a total DWT of 434 thousand tons and GRT of 348 thousand tons which are owned/controlled by the Zim Company. All of the ships under the exclusive ownership/control of Zim are container ships. Three ships fly the flag of Israel.

Zim also operates ships under leasing for various terms. In addition, it provides its customers with logistic services related to maritime transport. XT Shipping Company:

- 5 <https://he.wikipedia.org/wiki/%D7%A6%D7%99%D7%9D> Zim Combined Shipping Services Ltd., which was established in 1945 and upgraded in 1953 as a result of the reparations agreement.
- 6 The Statistical Abstract of the Shipping and Ports Authority (SPA) for 2017 and the Ports pp. 100-104. <http://asp.mot.gov.il/he/abstract>
- 7 Deadweight Tonnage.
- 8 Gross Register Tonnage.
- 9 Net Register Tonnage.

12 ships with total DWT of 1.05 million tons and GRT of 1740 thousand tons. 9 container ships, 2 bulk coal ships and one tanker. Two ships fly the Israeli flag. Other companies: 7 general cargo ships, 4 tankers and 3 bulk carriers with total DWT of 468 thousand tons and GRT of 260 thousand tons. Two ships fly the Israeli flag.

Table 2: The commercial fleet under Israeli ownership and control

Company	December 13, 2016				March 1, 2018			
	DWT of ships owned/ controlled			% of the company in total DWT	DWT of ships owned/ controlled			% of the company in total DWT
	Total (000s of tons)	Of that under an Israeli flag 000s of tons	%		Total (000s of tons)	Of that under an Israeli flag 000s of tons	%	
Zim	434	200.1	46.1%	22.3%	434	200.1	46.1%	22.2%
XT Shipping	1055	100.1	9.5%	54.3%	1049	100.0	9.5%	53,5%
Other companies	455	19.7	4.3%	23.4%	477	10.7	2.2%	24,3%
Total	1944	320	16.4%	100.00%	1960	311	15.9%	100.00%

Number of active seamen in the commercial fleet

Based on the active seamen in the commercial fleet (as of March 2018):¹⁰

- Total active seamen in the commercial fleet – 456 of which 128 are Israeli (28.1 percent).
- Number of active officers in the commercial fleet – 216 of which 119 are Israeli (55.1 percent).
- Number of active cadets in the commercial fleet – 5 all of whom are Israeli.
- Number of active enlisted seamen in the commercial fleet – 234 of which 3 are Israelis.

Table 3: Number of active seamen in the commercial fleet according to shipping company

Name of company	Total seamen	Israeli seamen	% Israeli seamen
ZIM	187	67	35.8%
XT Shipping	155	24	15.5%
Inter Global Shipping	42	18	42.9%
Others	72	19	26.4%
Total	456	128	28.1%

Due to the particularly acute shortage of Israeli officers, only about 50 percent of the quota of Israeli positions are manned by Israeli officers. A policy should be adopted as soon as possible in order to encourage the training of cadets.

¹⁰ Active seaman – one who has sailed for at least 30 days during the past year. The report presents the last shipping company with which the seaman sailed where each seaman is counted once.

The contribution of a strong Israeli shipping sector to the resilience of the State of Israel

The contribution of Israel's commercial fleet to its economy/commerce, security and foreign policy is reflected in the following elements:

1. The ensuring of the country's supply chain in an emergency (as part of the "Economy in a Time of Emergency" framework), with respect to both the import of essential goods such as energy, food, etc. and the export of goods produced in Israel, such as agricultural produce, bulk cargo (potash and phosphates), etc., in order to maintain the continuity of economic activity.
2. Shipping provides skilled workers in "dry land" occupations that require a maritime and shipping background, such as pilots and captains in Israeli ports, maritime supervisors in the SPA, positions related to protection of the coastal environment, maritime education and training, positions in the shipping companies and shipping agents, etc. Without Israeli workers in shipping there will be no source of skilled workers for these positions in Israel.
3. The added value of an Israeli ship to the Israeli economy is estimated to be about 25 percent.
4. Total revenue of Israeli shipping companies is about NIS 14 billion annually,
5. The savings due to the existence of an Israeli shipping sector in times of emergency: In an emergency, a war risk insurance fee is imposed by the international insurance companies (Lloyds) on ships entering a dangerous region and the insurance coverage is paid by the State.
6. The development of a maritime industry (development and production of systems and services in the maritime sector whose target markets are both in Israel and abroad).

In order to produce an assessment of the Israeli shipping sector that is needed by the Israeli economy, the economic and defense establishment in Israel must define their needs for sea transport in times of emergency, in terms of volume of cargo and type of ship (primarily general cargo ships). It can be assumed that in times of emergency there will be limitations on the entry of foreign ships into Israel's ports and coastal waters and that ships will refrain from sailing in areas declared as war zones (as was the case in 2006 during the Second Lebanon War). Problems may also arise with regard to the high insurance premiums that will be imposed on carriers under a foreign flag and under foreign ownership.

In the next stage, and in an effort to arrive at the optimal size of the Israeli shipping sector, the necessary steps should be considered that will help entrepreneurs build up Israeli shipping. As of now, there are businessmen who are involved in international shipping and a government policy is needed that encourages them to return to Israel or transfer part of their activity to Israel.

Among the means for expanding Israeli shipping is the passage of legislation for a "tonnage tax" which has been delayed for many years and which is likely to encourage the expansion of Israeli shipping. Similarly, an assessment should be made of the extra cost to an Israeli company to operate a ship under Israeli control, with respect to the added cost of employing Israeli officers as the core of the skilled manpower that the State requires. Furthermore, an effort should be made by means of subsidization or some other economic measure to arrive at "economic indifference" among ship-owners when weighing the employment of an Israeli or foreign officer, to whatever extent that is possible (in other words, a difference in cost between an Israeli and foreign officer such that a ship-owner will prefer employing the Israeli even if he is somewhat more expensive than a foreigner). It should be mentioned that if costs were similar between an Israeli officer and a foreign one, it is certain that ship-owners would prefer employing an Israeli officer.

Furthermore, there is a need for encouragement, upgrading and development of maritime training as a source of manpower for shipping companies and obligating them to subsidize this activity in exchange for switching to a tonnage tax, as has been done in more than a few European countries. Another measure is the earmarking of a portion of government/public sea freight for Israeli shipping (in the US, 50 percent of foreign aid shipments by sea must be shipped under the US flag). This includes defense sector cargo; energy cargo; cargo for emergency stores; government and public sector tenders; recognition of sea transport by Israeli shipping as a reciprocal purchase of Israeli goods for companies that win tenders in Israel; etc.

Conclusion

Israeli shipping is in a particularly bleak situation and is on the brink of disappearing altogether, from the perspective of both the number of Israeli ships and the infrastructure of maritime manpower (machine and deck officers, including captains and chief engineers).

The situation of Israeli shipping may lead to a problematic dependence on foreign commercial fleets (foreign shipping companies) and foreign seamen filling critical national tasks. This is in parallel to the loss of revenue to the State and the hindering of

development of maritime industry that relies on a flourishing national shipping industry. The need for an independent shipping sector in an emergency is self-evident and is the responsibility of leaders in the defense sector and those charged with maintaining the economy in an emergency; it is their job to define the need and how to meet it.

The dismal reality with respect to the number of ships and the level of maritime manpower does not facilitate the guarding of interests that the governments of Israel have in the past sought to protect, through legislation, government decisions and Zim's "gold share".

The era of globalization and pure economic considerations, which is driving Israeli companies out of shipping, does not constitute an excuse for the government not to take action to revive Israeli shipping. Advanced nations worldwide assist their national shipping sector if it experiences difficulties. There is no reason why the State of Israel cannot make a significant contribution to reviving Israeli shipping and expanding Israeli maritime manpower.

The vision of Ben Gurion is still valid and the government decision and declarations regarding the need for a strong Israeli shipping sector are as well. Therefore, the issue of Israeli shipping should be put higher on the agenda and greater attention should be given by policy makers to this issue within the context of maritime resource development (natural gas, fisheries, artificial islands for seaports and airports, etc.). The Ministry of Transportation should present the government with up-to-date information on the dismal situation of the shipping sector and on the forecast for coming years.

A decision should be made as soon as possible to adopt a long-term policy that will significantly improve the situation (of both ships and maritime manpower) and ensure the existence of Israeli shipping.



Figure 1: Port Of Haifa (Port of haifa spokesman)

The Strategic and National Implications of General Cargo and Bulk Shipping – Foreign trade as the mainstay of Israel's economy and the importance of general and dry bulk cargo¹

Yoni Essakow

Introduction

Non-containerized cargo accounted for 53 percent of the cargo (in terms of weight) that passed through the ports of Israel in 2017. In other words, more than one-half of the trade that passes through Israel's port is not in containers. On the other hand, the two new ports being built in Haifa and Ashdod (Hamifratz and Hadarom, respectively)² are container terminals and are not planned to handle the loading and unloading of general and bulk cargo.

Therefore, about one-half of Israel's trade will not be exposed to the competition that has been promoted by the government of Israel for more than a decade and which has been achieved at the high cost of constructing the new ports.

It would appear that general and bulk cargo have not received the attention they deserve, in view of their importance to the Israeli economy, and clearly there is a need to modify the unloading infrastructure, the planning and the investment in the ports in order to take this type of cargo into account.

The importance of general cargo

For centuries and perhaps millennia, shipping involved general and bulk cargo. During most of the history of commercial shipping, cargo was transported by ship in bundles, on pallets, in barrels or in sacks, and sometimes the cargo was simply “dumped” into the holds of the ships.

The first container ships came into service in the 1960s and since then they have accounted for a major share of sea transport. Container ships are composed of special compartments for the containers, which are essentially huge packages (30 or 60 cubic meters) that are designed for transport by sea or on land. However, despite the dramatic

1 This article relates primarily to the ports of Haifa and Ashdod and not to the port of Eilat.

2 The two private international companies that were chosen by international tender to operate the ports are SIPG, a Chinese company that belongs to the Port of Shanghai, which will operate the Hamifratz port, and TIL, a company located in Switzerland that operates 29 container terminals worldwide, which will operate the Hadarom port. The Mifratz and Hadarom ports are leased for a period of 25 years.

switch to container ships, there remains a large amount of cargo that is transported in bulk carriers and general cargo ships. Moreover, the figures for Israel that are published by the Shipping and Ports Authority and the Israel Ports Company consistently show that the ratio of the percentage of containerized cargo to the percentage of general and bulk cargo remains relatively constant. Thus, it is reasonable to assume that in the foreseeable future, we will continue to see significant trade using general cargo ships and bulk carriers.

Bulk cargo is unpackaged cargo that is transported on a ship in large quantities. Bulk cargo can be either liquid or dry. Examples include grain, clinker,³ cement, coal, sulphur, etc. Examples of liquid bulk cargo include fuels, oil and various chemicals. Currently, a supplier or importer of goods can choose to transport his cargo on a container ship or a bulk carrier and the vast majority these types of cargo will be transported on a bulk carrier. There are rare instances in which large amounts of coal, for example, are transported by container ships.

General cargo is transported on ships as units/individual packages (i.e. not in bulk or in containers). Examples of general cargo include iron rods, bundles of wood, sacks of cellulose and steel coils. As in the case of bulk cargo and even though some of these goods are transported in container ships, the majority of general cargo is transported on general cargo ships. This phenomenon has a number of explanations, including the capabilities of suppliers and importers for loading and unloading, the need to transport very large quantities of cargo in one shipment, the means of transport within the ports, etc.

About 99 percent (in terms of weight) of all cargo traffic to and from Israel passes through the seaports.⁴ Therefore, Israel's economy is critically dependent on the optimal functioning of its ports. Israel's foreign trade constitutes about two-thirds of its GDP, one of the highest ratios in the world. Israel's manufacturing plants and commercial centers are modern and efficient and their output is exported to all parts of the world. Israel's imports consist of numerous types of raw material and consumption goods, as appropriate to the high standard of living of its inhabitants. It is no surprise therefore that the income of Israel's citizens is dependent on foreign trade.

Furthermore, those involved in foreign trade have no real alternative to sea transport, even in the long run, since the alternatives of air and land transport are far from attractive economically (even under conditions of peace with our neighbors).⁵

3 Raw material for cement.

4 See the Committee for Socioeconomic Change, p. 170. (Hebrew)

5 Israel Ports Company – Strategic Masterplan for the Development of the Mediterranean Ports, p. 8.

The Israeli economy is essentially an “island economy” in the Eastern Mediterranean. There is almost no passage of cargo through the border crossings, although in view of its close proximity to the northern exit of the Suez Canal Israel is definitely located on the main international trade routes—from the Far East in the direction of Europe and North America, from North America and Europe in the direction of the Far East—and of course it is close to the various routes between the Northern and Southern hemispheres, such as to the countries of Africa, to the Oceania, etc.

Therefore, in view of its land isolation, the distances to remote markets and the absolute dependence of the Israeli economy on its seaports, it is essential that the State’s leaders ensure that this primary and important link in the chain of supply be available and efficiently run throughout the year.

In a lecture given at the graduation ceremony of a Maritime Cadet’s course in 1950, David Ben Gurion stated that “...the conquering of the maritime domain is even more important for a small country like Israel, which will expand and develop in the future. If we understand that the coast is not a barrier and a border, but rather a bridge and a doorway to a huge empire that stretches out almost to infinity...” There is no doubt that his prophecy has been fulfilled.

An examination of the general and bulk cargo passing through Israel’s ports shows that the vast majority is used as raw material by Israeli manufacturing, both as part of the production processes for our own consumption and also in order to produce export goods:

- Grain transported in bulk is used by the food industry. Considered as a single product, it accounts for the highest proportion of imports (9 percent).
- Cement and clinker are used as raw material by the building industry.
- Shipments of iron are used as raw material by the building industry and in many civil infrastructures.
- Shipments of sulphur are used as raw material for the manufacturing of phosphates (designated for export).
- Shipments of fuel are used as raw material for manufacturing, transportation and energy in the private and public domains.

Development of the ports

The government of Israel decided on December 18, 2011 “to instruct the Director General of the Ministry of Transportation and Road Safety to work to accelerate the

implementation of National Zoning Plan 1/1/b/13 for the Hamifratz port in Haifa and National Zoning Plan a/2/1/b/13 for the Hadarom port in Ashdod..."⁶

This government decision followed the submission of the Strategic Masterplan for the Development of Israel's Mediterranean Ports by the Israel Ports Company in 2007.⁷ As part of this plan, it is worth mentioning a number of interesting insights:

"A comparison of the shares of the various types of transport in foreign trade shows that Israel's foreign trade is particularly dependent on its ports relative to other countries and it does not appear that in the near future there will be a realistic alternative to Israel's ports as the almost exclusive channel for foreign trade."⁸

Professor Trajtenberg, who headed the Committee for Socioeconomic Change (which was established following the "grassroots protests" in the summer of 2011), also related to the issue of the seaports. The Committee's report stated: "An examination by professionals in the Ministry of Transportation and the Ministry of Finance shows that the output in term of containers per work team in Israel's ports is lower than other ports in the world; it is 15-25 percent lower than for other ports in the Middle East and by an even greater percentage in the case of the world's most advanced ports. The cost to the economy is estimated in the hundreds of millions of shekels each year."

The report continues: "The existing port companies constitute a regional monopoly each in its domain and together constitute a national duopoly. Although the reform in 2005 created some degree of competition, it did not affect a large proportion of the cargo." In addition: "The Committee feels that efforts should be made to achieve a more optimal balance between the interests of the general public and the behavior of the monopolistic bodies that are controlled by the State and which directly influence the cost of living."⁹ Although the remarks referred to container traffic, there are even more applicable to general and bulk cargo traffic, as we will see below.

Following the government decision and the report of the Committee for Socioeconomic Change, construction began of two new container terminals in Israel at a cost of NIS 7 billion, one in Haifa, to be operated by SIPG, a Chinese company, and one in Ashdod, to be operated by TIL, a Dutch company. These two international operators specialize in the operation of container terminals around the world. The terminals currently being built are meant to, among other things, encourage competition among the ports and

6 Government Decision no. 3986.

7 Israel Ports Company – Strategic Masterplan for the Mediterranean Ports.

8 Ibid., p. 3.

9 The report of the Committee for Socioeconomic Change (the Trajtenberg Committee).

primarily within each port. The declared intent of the government was to build new piers with semi-automatic operation that would compete with the existing ports, which are meant to undergo an appropriate upgrade.

According to Member of Knesset Yisrael Katz, the Minister of Transportation and Road Safety, "Today there is no doubt about the need for the two new ports; it is absolutely clear that new ports must be built that have deep-water piers that can accommodate larger ships. Furthermore, there is currently no doubt that greater competition is needed and this can happen only between one port and another. There is competition between Haifa and Ashdod but it is limited because customers are a "captive audience."¹⁰ It is worth mentioning that research carried out by the Israeli Shipping Bureau clearly showed that the competition between Ashdod and Haifa is highly limited and 70 percent of the demand is determined by proximity to one port or the other, mainly due to the high cost of land transportation.

There is no doubt that the government of Israel did indeed act and it acted quickly, following, among other things, the Strategic Masterplan for the Development of the Mediterranean Ports submitted by the Israel Ports Company, the report of the Committee for Socioeconomic Change, the Government Decision and publications by the Bank of Israel, the Ministry of Finance and others. There was no doubt regarding the need to build additional infrastructure and the construction of the Hamifratz port in Haifa (by the Shafir-Ashtrom partnership) and the Hadarom port in Ashdod (by the China Harbor Corporation) is in their final stages. Unfortunately, general and bulk cargo did find a place in the new terminal plans. At best, there is an intention to upgrade the existing ports (the Haifa Port Company, the Israel Shipyards Port and the Ashdod Port Company) in order for them to handle container traffic more efficiently.

The question of how the existing ports will deal with a situation in which they are expected, on the one hand, to lose a significant share of the container ship market and on the other hand to carry out investments in order to deal with the general and bulk cargo market is critical and has major consequences for the entire Israeli economy.

The question then arises of whether the State's leaders have paid sufficient attention to bulk and general cargo, which as mentioned constitute about one-half (by weight) of the total cargo passing through Israel's ports (not including energy cargo), from the point of view of resource allocation, construction of infrastructure, investment, operation and the like.

¹⁰ The Marker, June 6, 2013.

The operational parameters of general and bulk cargo

There are many parameters that can be used to analyze the handling of general and bulk cargo in Israel's ports. This discussion will focus on a few main parameters, such as ports and cargo piers, the volume of general cargo and other issues, including the operational queue or the allocation of "hands" in the ports:

Where is general and bulk cargo unloaded in Israel's ports?

Port of Haifa: western pier, eastern pier, fuel terminal, Kishon pier, East Kishon pier, Gadot, chemicals terminal.



Figure 1: A crane for conveying bulk cargo (Haifa Port spokesperson)



Figure 2: Unloading of general cargo on the western pier at the Haifa port (Haifa Port Spokesman)

With respect to the loading/unloading piers in the Port of Haifa, it is worth mentioning the following: As part of the new reform agreement with the Haifa Port Company, it was decided not to upgrade the container piers but rather to focus on upgrading the ability to handle general and bulk cargo. This is a dramatic decision with many ramifications and may herald a change in perception and approach in the Haifa Port Company.

Western pier: National Zoning Plan approval a/3/13 for the development of an urban seafront in Haifa means that the territory of the Western pier in the Port of Haifa is to be used for the development of an urban seafront that will include activity such as tourism, leisure, commerce and holiday recreation. The pier is currently used for the unloading of general and bulk cargo and the change in its use to an urban seafront means the "loss" of a major pier.

Eastern pier: This pier is currently used for the unloading of containers. The order of priority in the operational queue allows for an “exemption” for bulk carriers at this pier; however, in practice, there is hardly any unloading of bulk cargo on this pier.

Kishon East: This pier is currently used by the Shafir-Ashtrom partnership for the construction of the new Hamifratz port. According to the plan, in 2021, this pier will return to operating as part of the Haifa Port Company. The return of the pier will constitute a major addition to the infrastructure for unloading of general and bulk cargo.

Deepening of the approach channel and the piers: There is no doubt as to the need to deepen the entry channel to the Kishon port (and the Israel Shipyards Port) in order to allow the unloading of the Panamax-class ships¹¹ (about 60,000 tons).

Dagon granaries: Most of the grain cargo arriving in Israel is unloaded at this granary in Haifa. The National Zoning Plan 13 (a), which includes the plan for a seafront to replace the Western pier and the Dagon granaries, forces all of those involved to find a suitable alternative for the location of the granary. At the time of writing, there was still no approved alternative plan. This is a national strategic resource of the first order and there is no doubt that a suitable alternative must be found as soon as possible.

Carmel 5 pier: This pier does not currently have cranes or other cargo handling means. The positioning of a number of suitable mobile cranes (such as those currently on Kishon pier) will enable the unloading of large bulk carriers and the efficient exploitation of a useful port infrastructure.

Port of Ashdod: Piers 1, 3, 5, 21 and the ICL pier.

With regard to the unloading/loading piers in the Port of Ashdod, it is worth mentioning the following:

Pier 21: This is an important pier for the unloading of general and bulk cargo in the Port of Ashdod. There is an intention to convert the eastern part of the pier to container unloading. This conversion, in addition to the construction of a seed conveyer belt, without a suitable alternative location, is liable to hinder the unloading of large bulk carriers and will cause harm to the port and its customers.

Seed conveyer belt: There is a plan (which is currently in the tender stage) to build a conveyer belt for grain cargo from the western section of Pier 21 to the granary located about 2 kilometers from the port. This conveyer belt will enable the substantial expansion of the amount of grain that can be unloaded at the Port of Ashdod. Nonetheless, there is a need for an overall plan for the expansion of the granaries and the construction of a

11 Panamex – the maximal size of a ship that can pass through the Panama Canal.

warehouse for grain products in order for the unloading to be efficient and economically worthwhile.

Pier 24: This pier currently serves as a work platform for the building of the Hadarom port. There are discussions as to whether this pier will serve the Ashdod Port Company or will be transferred to a private operator, whether by means of privatization or a long-term operating tender.



Figures 3-4: Unloading general cargo of iron rollers by bulk loading system, Israel Shipyards Port

Israel Shipyards Port

With respect to the piers of the Israel Shipyards Port: The Israel Shipyards Port, based on its authorization document, is limited to 5 percent of the total cargo handled by Israel's ports. As of the end of 2018, the port had reached this limit and currently there is negotiation underway (whether by way of the courts or by direct negotiations) to remove it, particularly in view of the start of operations of the new container terminals in the near future. In view of the policy to encourage competition between the ports and within them (including the building of new terminals and the expected upgrading of the Haifa and Ashdod ports), it is desirable that the Israel Shipyards Port participate without any constraints placed on it. The western part of Pier A is devoted to the drilling and production of natural gas.

Total cargo handled in Israel and the relative share of general and bulk cargo (by weight)

In 2017, total cargo handled in all of Israel's ports (Haifa Port Company, Ashdod Port Company, Israel Shipyards Port, and the Port of Eilat) stood at 51.42 million tons.¹²

¹² The Shipping and Ports Authority – Branch for Economics and Foreign Relations.

Almost half (46.7 percent) was general and bulk cargo, which is a significant share of Israel's foreign trade. A similar ratio has been observed during each the last seven years.

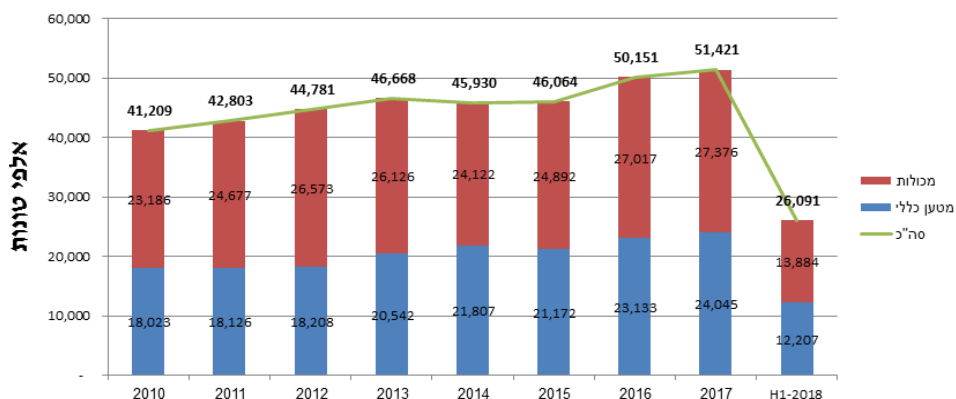


Figure 5: The breakdown between container cargo and general cargo in Israel's ports
Source: The Shipping and Ports Authority – Branch for Economics and Foreign Relations

The operational queue

A ship arriving at an Israeli port is subject to the “operational queue” which determines the order of entry and exit from/to that port.¹³

The operational queue is decided on by the Shipping and Ports Authority and essentially it decides whether a ship which arrived first is dealt with first (first come, first served). “The order of entry into the port and the allocation of a pier to the ship will be according to the ship’s date of arrival in the port and the order of exit from the port will be according to the date on which the ship is ready to sail...”¹⁴ In addition, the operational queue gives priority to certain vessels according to the bylaws, such as priority for passenger ships, for essential cargo in an emergency, for container ships over general cargo ships, etc. The result is that a general cargo ship and a bulk carrier have almost last priority in entering and leaving a port.

There is an ongoing debate between the various shipping authorities in Israel on the question of whether an operational queue is necessary when there are so many exemptions. There are those who claim that having an operational queue is justified in order to allow container ships to meet their schedules, while there are others who claim that the operational queue discriminates against general cargo ships and bulk

13 The Rules of the Operational Queue in the Ports of Haifa, Ashdod and Eilat, 5768 – 2008.

14 Ibid.

carriers and that priority should only be given according to “first come, first served”. In practice, a result of the situation in which container ships (and others) receive priority over general cargo ships and bulk carriers is that the waiting time outside the port for general cargo ships and bulk carriers is longer and this involves higher costs, which are in the end passed on the customer.

Another problem that developed over the years and which is related to the operational queue is that the ports have chosen to “use” the rules of the operational queue to allocate manpower (“hands”) for the unloading and loading of ships. The implication of allocating “hands” according to the operational queue is that general cargo ships and bulk carriers suffer twice: first, when waiting outside the port and second, because of their low preference in the allocation of “hands” in each shift.

Ships waiting outside the port (service indexes)

When a ship arrives at an Israeli port it waits outside the port until a pier is available. When the pier become available, the ships is tied up to it using tugboats and a Pilot from the port’s Sea Department. The entry of the ship into the port is a complex maneuver that requires skill and a great deal of experience. The waiting time outside the port is dependent on the availability of a pier for unloading/loading and the time spent at the pier itself is a function of the availability of an appropriate team of dockworkers.

An accepted rule in ports all over the world is that “the pier waits for a ship rather than a ship waits for a pier”. As shown in the graph below, there is a large difference between container ships and general cargo and bulk carriers in the time they must wait for an available pier and/or an appropriate team of dockworkers. The gap in waiting time between the types of ships can reach hundreds of percent. The immediate ramification of these gaps is relatively simple:

Longer waiting time = less productivity = less efficiency = additional cost to the economy

Claims are sometimes made with respect to the waiting time of ships and the difference between container ships on the one hand and general cargo ships and bulk carriers on the other hand that the random arrival of general cargo and bulk carriers does not allow for the efficient allocation of infrastructure and work teams. And indeed the arrival of general cargo ships and bulk carriers is influenced by volatility in the commodity markets (grain, iron, etc.), the weather conditions, kashrut demands, accessibility of ships in the various ports of origin and the directives of the Antitrust Authority.



Figure 6: Average waiting time of ships (in hours) with a breakdown between container ships and general cargo ships. Source: The Shipping and Ports Authority – Branch for Economics and Foreign Relations

Container ships are characterized by a specific and pre-determined allocation of lines and ports and the arrival of a ship at a port is according to a known and predetermined timetable. This is not the case with general cargo ships and bulk carriers. Despite the upward trend in the amount of general and bulk cargo arriving in Israel every year (see Section b), these ships do not arrive according to a predetermined timetable; however, on a monthly and annual basis, there is little variation in the total cargo arriving in the ports. The situation in Israel is no different than in other countries. The same parameters listed above affect the patterns in the transport of commodities (raw material) all over the world.

Allocation of work teams (“hands”)

The Haifa Port Company and the Ashdod Port Company suffer from a shortage of manpower. There are those that claim that it is serious. There is currently a consensus in the industry that the shortage in manpower is causing damage to all the parties involved – customers, ship owners and the ports. Without getting into the political questions and issues related to the reform being implemented in the ports and the reason for the manpower shortage, it is clear to all that this is currently one of the leading problems in the ports of Israel and one which demands an immediate solution.

Moreover, the fact that the ports allocate manpower on the basis of the operational queue means that general cargo ships and bulk carriers receive fewer teams than container ships (Section d above). Using the data of the Shipping and Ports Authority, an analysis of the response of the ports to the demand for hands in the ports of Haifa and Ashdod shows that container ships receive significantly larger allocations of hands relative to general cargo ships and bulk carriers, with a gap that sometimes reaches tens of percent.

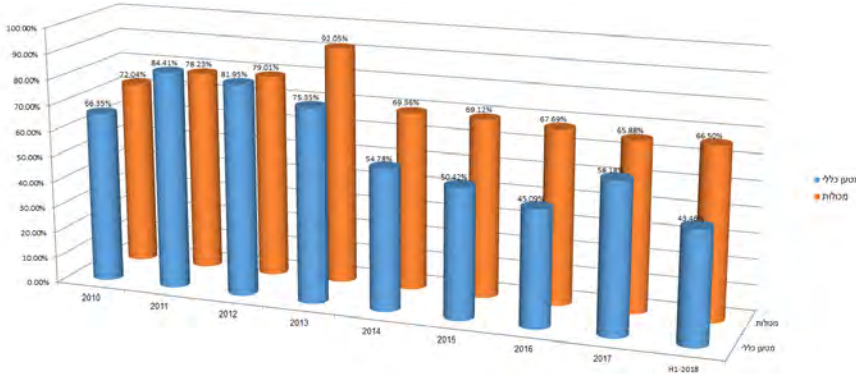


Figure 7: Response to the demand for hands in the Haifa and Ashdod ports according to container cargo and general cargo

As mentioned earlier, the report of the Committee for Socioeconomic Change stated that “An examination by professionals in the Ministry of Transportation and the Ministry of Finance shows that the output in term of containers per work team in Israel’s ports is lower than for other ports in the world; it is 15-25 percent lower than for ports in the Middle East, and by an even greater percentage in the case of the world’s most advanced ports.”¹⁵

Since according to the data of the Shipping and Ports Authority with regard to the response to demand for hands in the Haifa and Ashdod ports as depicted in the graph, container ships receive a significantly larger allocation of hands relative to general cargo ships and bulk carriers—with a gap that sometimes reaches tens of percent—a simple equation is obtained:

Less hands = less productivity = less efficiency = higher cost to the economy.

Investment in infrastructure and equipment

If we analyze the investment in port infrastructure during the past ten years, there is a significant gap between investment in infrastructure for containers and that in infrastructure for general and bulk cargo.

According to the data of the Israel Ports Company, over NIS 7 billion has been invested in the two new terminals currently being built – Hamifratz port in Haifa and Hadarom port in Ashdod. This is in contrast to the relatively small investment in general and bulk cargo infrastructure in all of the ports. Although there are discussions concerning the construction of a grain conveyer belt in Ashdod, it should be mentioned that this plan

15 The report of the Committee for Socioeconomic Change (the Trajtenberg Committee).

was approved already in 2008 but has not yet been implemented. In any case, this project involves an investment of NIS 200 million, which is not negligible but is small relative to the investment in container infrastructure.

Member of Knesset Yisrael Katz, who is the Minister of Transportation and Road Safety, has stated that “the existing ports should be upgraded for the sake of fair competition.”¹⁶ There is no doubt that there is an immediate need to upgrade the handling systems for general and bulk cargo, whether it be piers, handling equipment (cranes, unloaders, etc.), forklifts, loaders or manpower. Moreover, it can be said that this small amount of investment is many fold smaller than the huge investment in the new container ports.

Environmental quality

The need for protecting the quality of the environment also exists in the case of Israel's ports. The ports operate according to comprehensive regulations in numerous domains, including permits for emissions into the sea, the Clean Air Law,¹⁷ the Prevention of Ocean Pollution Law¹⁸ and others.

The handling process for bulk cargo constitutes a challenge for all the related parties (ports, users, ship owners, etc.). The loading and unloading of certain commodities, and primarily grains or powders, can involve small-scale emissions into the air if not carried out properly. The handling of such cargo requires special and precise preparations in order to meet the demands of the various authorities and in parallel investment in suitable equipment is necessary. From the ports' perspective, this involves training and instruction of workers, acquisition of the proper equipment and the correct and efficient operation of handling systems. From the perspective of the customer, there is a need for appropriate trucks, appropriate ships and optimal planning of loading and unloading. From the authorities' point of view, there is a need to set rules that the customers are able to comply with, while still fulfilling the demands of the law.

There is a delicate balance between protecting the environment on the one hand and the handling systems and the needs of the economy on the other.

For example, in view of the fact that most of the grain cargo is unloaded at the Dagon granaries in Haifa, about one million tons of grain are transported by truck. Thus, on the one hand, the cargo is unloaded according to the accepted standards but on the

16 Port2Port May 22, 2018.

17 The Clear Air Law, 5768 – 2008.

18 The Prevention of Ocean Pollution from Land Sources, 5768 – 1988.

other hand this creates indirect environmental damage on the roads (congestion, air pollution, etc.).

Conclusion

1. The Israeli economy is almost totally dependent on the ports and on their availability and efficiency.
2. General and bulk cargo constitute about one-half of the cargo passing through Israel's ports.
3. An analysis of the various operational parameters and a comparison to container ships leads to the following insights:
4. General cargo ships and bulk carriers have low priority in the operational queue.
5. General cargo ships and bulk carriers wait much longer outside the ports (relative to container ships).
6. General cargo ships and bulk carriers are allocated less "hands" than container ships.
7. There is a huge gap between the national investment being made in container infrastructure and that in general and bulk cargo infrastructure.
8. The "High cost of living" starts here: Since most of the general and bulk cargo is used for raw material in manufacturing, the more expensive is loading and unloading of this cargo, the more the Israeli consumer will pay.
9. There is an immediate need to upgrade the existing ports with respect to the unloading of general and bulk cargo.

Recommendations

1. In order to achieve an optimal level of investment in the existing ports and to facilitate long-term planning with respect to general and bulk cargo, there is a need to prepare a national strategic plan for general and bulk cargo, similar to the master strategic plan of the Israel Ports Company of 2007.¹⁹
2. From the perspective of environmental protection (an important issue for these types of cargo), there is a need for continuous dialogue between the various users, with the goal of ensuring that the various interests—of the ports, of the customers and of the public by way of the regulator—are considered and primarily that there be transparency and clear and quantifiable rules for all the parties.
3. In order to increase the efficiency of work in the ports and to reduce costs, there is a need to establish indexes of service that are binding on the ports (using the carrot and stick method) as in other sectors of the economy.

¹⁹ Israel Ports Company – Strategic Master Plan for the Development of the Mediterranean Ports.

Marine Pollution: Source, Response and Prevention

Galia Pasternak

Introduction

This chapter looks at marine pollution in Israel and surveys the legal situation with respect to the conventions for the prevention of marine pollution that apply to the Mediterranean, as well as the risks, the prevention and mitigation factors, and the legal situation in Israel in this regard.

Background: The conventions for prevention of marine pollution

A **marine environment** is a body of salty water that contains complex systems of life with which it interacts.¹ The oceans and the seas cover 72 percent of the earth's surface and serve as a fertile substrate for rich and varied ecological systems. The oceans produce about 50 percent of the oxygen we breathe² and influence the earth's weather and climate.³ The coastal sea (the sea between the shore and the edge of the continental shelf, of up to 100 meters in depth, and which accounts for only 8 percent of the oceans' area) is particularly important to mankind, since 60 percent of the world's population lives near it and about 90 percent of global fishing takes place within it.⁴

Marine pollution is defined by the Barcelona Convention for Protection of the Mediterranean Sea against Pollution (1976) as "the introduction by man, directly or indirectly, of substances or energy into the marine environment resulting in such deleterious effects as harm to living resources, hazards to human health, hindrance to marine activities including fishing, impairment of quality for use of sea water and reduction of amenities." Pollutants are categorized into seven main groups according to their chemical nature: nitrates (fertilizers) which can cause overstimulation of seaweed and changes in the populations of phytoplankton; heavy metals such as mercury, cadmium, lead and bromine, which can accumulate in the seabed and in the food chain;

- 1 Adler, A. (2000) "Marine environmental quality – is there such a thing?" *Sea and Shore 2000*, Ministry of the Environment, Sea and Shore Branch, pp. 3-7 [Hebrew].
- 2 Grof, Y. (2016). "The real lungs of the Earth," the Davidson Institute, the Weizmann Institute. <https://davidson.weizmann.ac.il/online/%D7%9E%D7%93%D7%A2-%D7%91%D7%9E%D7%91%D7%98-%D7%A2%D7%9C/%D7%94%D7%A8%D7%99%D7%90%D7%95%D7%AA-%D7%94%D7%90%D7%9E%D7%99%D7%AA%D7%99%D7%95%D7%AA-%D7%A9%D7%9C-%D7%9B%D7%93%D7%95%D7%A8-%D7%94%D7%90%D7%A8%D7%A5> [Hebrew].
- 3 Baum, D. (2000), "The oceans and the weather," *Sea and Shore 2000*, Ministry of the Environment, Sea and Shore Branch, pp. 38-41 [Hebrew].
- 4 Adler, 2000.

oil and its byproducts, which are poisonous to marine plants and animals and are liable to cause changes in the environment; synthetic organic materials, such as pesticides, that are liable to accumulate in the environment and the food chain; radioactive material that is likely to cause mutations and cancer; bacteria that are liable to infect humans and cause infectious diseases; and finally solid waste and in particular plastic, which is liable to kill large animals that get caught up in it or swallow it, and micro plastic (plastic particles that are smaller than five millimeters) that may contain hormones, among other things, and are liable to attach to organic and synthetic material that enters the food chain. The sources of these types of pollution are coastal factories, shipping, municipal waste and drainage of aboveground runoff in the cities and vacation spots.⁵

The area of the **Mediterranean** accounts for only about 0.7 percent of the oceans' total area and it is a closed sea that connects to the oceans by way of the Strait of Gibraltar (which is only about 14 km wide and about 300 meters deep). Its coasts have a dense population, to which are added tourists and vacationers each summer, who double the population. In addition, there is heavy traffic of ships in the Mediterranean and numerous marine infrastructures (in 2017 it was estimated that about 15 percent of global sea trade and about 10 percent of oil shipments by sea pass through the Mediterranean). Due to the low turnover of water and the widespread shipping and energy activity, the Mediterranean is highly exposed to the pollution that accumulates within it. Moreover, the dense traffic of oil tankers in the vicinity of the northern entrance to the Suez Canal and in the area of Port Said, as well as the discovery of oil and gas along the coast of Israel in recent decades and the accompanying production rigs and pipelines that bring the oil and gas products to the shore, have moved the risk loci closer to Israel's coast.

As awareness of the environment grew during the second half of the 20th century, there was increasing concern about the situation of the Mediterranean and there are those that even described it as a dying sea. However, many years of research have shown that although the situation of the Mediterranean is indeed worrying, there is a chance to save it if environmental measures are taken to protect the quality of its water and shores.⁶

As a result of the establishment of the United Nations Environmental Program (UNEP) in 1972, the Mediterranean countries began organizing to reduce pollution in the Mediterranean. Thus, in 1975, 16 Mediterranean countries and the European

5 Kress, N. (2000) "Marine pollution – sources, types and impact," *Sea and Shore 2000*, Ministry of the Environment, Sea and Shore Branch, pp. 95-98 [Hebrew].

6 Adler, A. (2000) "Work plan for the Mediterranean," *Sea and Shore 2000*, Ministry of the Environment, Sea and Shore Branch, pp. 55-67 [Hebrew].

community adopted the **Mediterranean Action Plan (MAP)** which led to the creation of marine environment protection programs in additional regions under the umbrella of the UNEP. The foundation of these programs includes: preparation of protocols that are to be signed by the Mediterranean countries; creation of a Mediterranean monitoring system and study of the marine environment; and formulation of a socioeconomic program that combines socioeconomic development with a healthy environment. In 1995, the partners adopted a work plan for the protection of the marine environment and the sustainable development of the coastal regions of the Mediterranean (MAP II), which replaced the original plan.⁷

Following the writing of the initial protocols, the **Convention for the Protection of the Mediterranean Sea against Pollution** was adopted in Barcelona in 1976 (referred to as the **Barcelona Convention**). It went into effect in 1978 and has a number of protocols, each of which deals with a specific element of environmental protection in the Mediterranean:

1. Dumping Protocol (from ships and planes) – ratified by Israel in 1984.
2. Prevention and Emergency Protocol (pollution from ships and emergency situations) – ratified by Israel in 1978 although the revision in 2002 has not yet been ratified.
3. The Land-based Sources and Activities Protocol which was ratified in 1991 and an amendment to the protocol which was ratified in 2009.
4. Specially Protected Areas and Biological Diversity Protocol which was ratified in 1987.
5. The Offshore Protocol (prevention of pollution from exploration and exploitation) which was signed by Israel in 1994 but has not yet been ratified.
6. The Hazardous Waste Protocol with regard to the prevention of cross-border hazardous waste pollution, which has not yet been ratified by Israel.
7. The Protocol on Integrated Coastal Zone Management (ICZM) which was ratified by Israel in 2014.^{8,9}

The international **MARPOL 73/78 Convention** for the prevention of pollution from ships was adopted at a conference of the International Maritime Organizations (IMO) in 1973

7 European Commission (2016) Our Oceans, Seas and Coasts – The Barcelona Convention. http://ec.europa.eu/environment/marine/international-cooperation/regional-sea-conventions/barcelona-convention/index_en.htm

8 European Commission (2016).

9 The Ministry of the Environment (2012). The Barcelona Covenant Protocols. http://www.sviva.gov.il/subjectsEnv/InternationalRelations/international-Conventions/Marine_coast/BarcelonaConvention/Pages/BarcelonaProtocols.aspx [Hebrew].

and was amended in 1978 by means of a protocol (and therefore its name: 73/78). The goals of the convention are to completely halt marine pollution originating from ships and to reduce as much as possible pollution as a result of maritime accidents, which is accomplished by precise regulations that ships must comply with. The regulations relate to all types of pollution and are divided into six appendixes: fuel, chemicals, packaged cargo, sewage, garbage and smokestack emissions. The flag states¹⁰ bear the primary responsibility for enforcement. MARPOL 73/78 imposes building standards on ships, such as double hulls in fuel tankers, and additional standards for maritime equipment that reduce the marine pollution from fuel. In addition, ports are required to provide services to remove and handle oils and sludge.^{11,12} Israel ratified the Convention in 1983.¹³

In July 1989, the IMO was asked to develop additional means for preventing pollution from ships and a year later it presented the **International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC) 1990** whose goal is to provide a global framework for cooperation in dealing with large-scale marine pollution events or threats of marine pollution. The parties to the Convention are required to prepare plans for handling oil pollution and to equip themselves with the means to deal with pollution events, both on the national level and in cooperation with other countries. The Convention also requires ships, offshore facilities and factories and local authorities along the coast to prepare local emergency plans to deal with oil spills, which will be integrated within the national plans.¹⁴ The Convention was signed by Israel in 1990 and then ratified and went into effect in June 1999.¹⁵

10 Flag state: the state whose flag is flown by the ship and in which it is registered.

11 Andel, H. (2000). "MARPOL Convention 73/78," *Sea and Shore 2000*, Ministry of the Environment, Sea and Shore Branch, pp. 80-91. [Hebrew]

12 The International Maritime Organization. 1973. International Convention for the Prevention of Pollution from Ships (MARPOL). www.tinyurl.com/MARPOL-IMO.

13 The Ministry of the Environment (2012), Convention for the Prevention of Pollution from Ships (MARPOL). http://www.sviva.gov.il/subjectsEnv/InternationalRelations/international-Conventions/Marine_coast/Pages/MARPOLConvention.aspx [Hebrew]

14 The International Maritime Organization. 2000. International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC). [http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-on-Oil-Pollution-Preparedness,-Response-and-Co-operation-\(OPRC\).aspx](http://www.imo.org/en/About/Conventions/ListOfConventions/Pages/International-Convention-on-Oil-Pollution-Preparedness,-Response-and-Co-operation-(OPRC).aspx)

15 The Ministry of the Environment (2012), "International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC)," http://www.sviva.gov.il/subjectsEnv/InternationalRelations/international-Conventions/Marine_coast/Pages/OPRC_Convention.aspx [Hebrew]

The **Anti-Fouling Systems (AFS) Convention** prohibits the use of toxic organotin compounds (TBT), an additive to the paints used for antifouling the hulls of ships. This material is slowly and continually released into the water. The material is highly toxic and accumulates in the food chain on the seabed, particularly in enclosed areas such as ports. It has a slow rate of breakdown and therefore the damage is particularly serious.¹⁶ Israel is working to reduce the use of paints containing TBT even though it never ratified the convention and nonetheless enjoys its benefits since modern ships are no longer painted with this material.¹⁷

The **Ballast Water Management Convention**¹⁸ is a global convention that Israel has not yet signed, though it is complying with its instructions through the activity of the Shipping and Ports Authority in Israel. The convention was written with the goal of minimizing the transferal of marine creatures in ballast water, which is liable to violate the balance of the marine ecology in the location where they are discharged. Therefore, the convention specifies ways of dealing with the problem using methods for replacing the ballast water in mid-ocean or through ballast water treatment or disinfecting before discharge. It should be mentioned that in the absence of appropriate legislation in most countries, these types of systems have not been installed on most ships.¹⁹

Prevention of marine pollution in Israel

The body responsible for the prevention of marine pollution in Israel is the **National Unit for Protection of the Marine Environment** (previously, the Sea and Coasts Branch) within the Ministry of the Environment. Its function is to apply and enforce environmental laws in the marine environment. The polluters bear responsibility for the pollution they produce according to the principle of "the polluter pays". This principle is manifested in fees, levies and fines as specified in the law. Additional bodies with authority to protect the marine environment include the Israel Police, the Ministry of Transportation (the Shipping and Ports Authority), the Green Police in the Ministry of the Environment, the inspectors of the Nature and Parks Authority and the local Municipalities (which have enforcement authority according to the Anti-Littering Law and other environmental laws).

16 The International Maritime Organization. 2001. International Convention on the Control of Harmful Anti-fouling Systems on Ships. www.tinyurl.com/anti-fouling

17 Levinsky, N., R. Amir (2014). "Reduction in the environmental damage from sea transportation – a look at what is happening in Israel," *Ecology and Environment* 5(1), pp. 40-42. [Hebrew]

18 Ballast water is held in the ballast tanks of a ship in order to maintain its stability and thus ensure the safety of its crew and cargo.

19 Levinsky and Amir (2014).

The **Fund for the Prevention of Marine Pollution** was established in 1979 in accordance with the Directive for Prevention of Oil Pollution in the Sea [new version], 5760-1980. The goals of the fund are to centralize the financial resources for fighting marine pollution, prevent the pollution of the sea and coasts, clean them up and supervise them. The Fund's financial sources are fines imposed on polluters in Israel's territorial waters; fees charged to ship owners and coastal oil terminals; reimbursement of cleaning expenses according to court verdicts or collected in some other way; financial sanctions and levies on polluting factories (since the middle of the previous decade); funds and allocations from individuals; and the State budget. For these reasons, the Fund's budget varies and it is difficult to plan or predict its activities and policy.²⁰

Marine pollution from land-based sources includes any pollution from activity on land. The Land-based Sources and Activities Protocol of the Barcelona Convention is implemented by the Law for the Prevention of Marine Pollution from Land-based Sources, 5768-1988 and its 1990 amendments, as well as the Law for the Prevention of Marine Pollution (dumping of waste), 5763-1983 and additional regulations. According to these laws, it is prohibited to discharge waste into the sea, unless a permit is obtained from the Interministerial Committee that provides dumping and discharge permits. Any individual or factory that discharges directly or indirectly into the sea or is interested in dumping waste at sea from a ship or a plane must obtain a permit for discharging or dumping of waste into the sea from the Committee, which includes representatives of seven government ministries: the Environment – the Chairman (and also the National Unit for Protecting the Marine Environment which manages the committee), Defense, Health, the Economy and Industry, Agriculture, Tourism and Transportation, as well as a representative of the public according to the Law for Representation in Public Bodies Involved in the Protection of the Environment. The committee has the right to grant a permit for discharge into the sea only in the absence of any land-based solution, namely connection to the municipal sewage system, the possibility of recycling, the possibility of treatment at the source, etc. Furthermore, the holder of a discharge permit must install means for treating the discharge before dumping it at sea using the Best Available Technology Economically Achievable (BATEA). In accordance with the 2005 amendment to the Law for the Prevention of Marine Pollution from Land-based Sources 5768-1988, anyone that discharges into the sea will receive a fine calculated

20 Annual Report 64a (2013). "Ministry of the Environment – Preparedness for the environmental impact of offshore oil and gas drilling," State Comptroller and the Commissioner for Public Complaints, pp. 463-498. [Hebrew]

on the basis of the amount of pollutant that he discharged and the severity of its impact on the environment, according to the principle of “the polluter pays”.²¹

About 120 factories in various sectors possess permits to discharge into the sea: ocean discharge terminals that intake brine²² from various factories, such as slaughterhouses, food factories and factories that use ion exchange to purify water; industrial factories, such as refineries, petrochemicals, chemicals, fertilizers and power plants, which discharge wastewater or water that is too salty to be recycled for agricultural irrigation directly into the sea; desalination plants that intake seawater and discharge water with a concentration of salt that is higher than that of seawater; waste treatment plants that discharge treated water (the treatment plant in Herzliya), sludge (the reclamation plant in Rishon Letsion) and Ein Bokek at the Dead Sea; coastal power plants of the Israel Electricity Company which discharge cooling water at temperatures higher than that of the sea; and from time to time permits are granted for discharging ground water in order to construct a buildings. The companies that are involved in exploration and production of oil and gas require a permit in order to discharge cuttings that are created by digging into the seabed and which is mixed with mud from the drilling; formation water which is separated from natural gas in a drying process; and byproducts of the activity of offshore facilities that include desalination brine discharge, bilge, cooling water and treated wastewater.²³

The inspectors of the National Unit for Protection of the Marine Environment carry out periodic inspections in all of the factories that discharge into the sea; they carry out independent sampling in order to examine the quality of the discharge; and they check the compliance of the factory with the quantities specified in the discharge permit, including the installation of treatment equipment as required by the permit.²⁴

Nonetheless, there are uncontrolled discharges into the sea (primarily sewage) as the result of malfunctions of the municipal sewage systems or heavy rain that causes flooding in the factories or in the sewage system and as a result sewage flows into the sea by way of the drainage system. Individuals that discharge wastewater or dump waste into the sea illegally are investigated and charged according to law, which

21 The Ministry of the Environment (2018), “Preventing marine pollution from land-based sources,” <http://www.sviva.gov.il/subjectsEnv/SeaAndShore/MarinePollutionLand/Pages/default.aspx> [Hebrew]

22 Salty water than cannot be discharged into the sewage system.

23 The Ministry of the Environment (2018). “Exploration and exploitation of offshore oil and natural gas,” <http://www.sviva.gov.il/subjectsEnv/SeaAndShore/GassOilSea/Pages/default.aspx> [Hebrew].

24 The Ministry of the Environment (2018).

provides for punishment of up to one year imprisonment or a fine. In addition, according to amendments passed in 2008, financial sanctions can be imposed on a polluter.

Solid marine waste, which is defined in the Barcelona Convention as “solid, persistent, produced or processed material that was disposed of, dumped or abandoned in the marine or coastal environment,” has been recognized as an international problem that transcends national boundaries. The waste that piles up on the shores and accumulates on the seabed or at “ocean garbage patches” located at ocean gyres harms marine creatures, fisheries and the biological diversity of the marine environment. Even after an extended period in the sea, marine waste (and primarily plastic) does not simply disappear, but rather breaks down and penetrates into the food chain and may even end up on our plates and thus may also harm human health. Marine waste is a growing threat to the safety of shipping and to sustainable livelihood and extracts a high price from various business sectors that depend on the sea, such as tourism and leisure, shipping and fishing, coastal power plants, desalination plants and coastal local authorities.²⁵

Scientists generally believe that if things continue on their present course, by 2050 there will be more plastic (in terms of weight) in the sea than fish.

In order to reduce marine waste, in 2005 the National Unit for Protection of the Marine Environment within the Ministry of the Environment initiated the **Clean Shores program** whose goal is to minimize the phenomenon of marine waste in Israel and to clear up the coast and the sea in fulfillment of our international obligations and for the benefit of the environment and the public. The program was launched with a budget of NIS 3 million in the 2017 fiscal year and operates along six interconnected axes, where the program's dominant vision is to achieve awareness of the importance of the sea and the coast and that citizens will take personal responsibility for cleaning up the environment:

1. Anti-littering – Cleaning up of the coast line by the coastal local authorities and the Nature and Parks Authority which supports the program and continual monitoring of the level of cleanliness on the coast.
2. Education – The integration of educational programs within the formal and informal education systems for various target audiences.
3. Publicity and public relations – To increase public awareness of the importance of preserving the coast line.

25 Pasternak, G., A. Shafnir, D. Tzvieli, A. Ariel, and R. Amir (2014). “Marine waste on the coast of the Mediterranean,” *Ecology and Environment* 5(1), pp. 25-31. [Hebrew].

4. Enforcement – Among the users of the coast line and the local authorities that are not fulfilling their obligations according to the Anti-Littering Law, 5764-1984. This enforcement is easier in the case of the local authorities which do not clean up the coast line in their jurisdiction, but is problematic with respect to private individuals, since this usually involves single individuals on a crowded beach, and enforcement would require a large amount of manpower.

During the past year, two components were added to the program, although they have not been fully implemented:

5. Monitoring of marine waste – Monitoring of waste along the coast, on the seabed and in the sea by means of a national monitoring staff and researchers from academia, and in coordination with the regional program that is part of the Barcelona Convention for the reduction of marine waste.
6. Reduction at the source – Obligating the business sector to reduce the use of disposable plastic goods on the beaches.²⁶ This follows the results of a study carried out of Israel's beaches in 2012 by the Department for Maritime Civilizations in the University of Haifa, which indicated that 90 percent of the waste on Israel's beaches is made of plastic, 55 percent of which is left by bathers; 75 percent are items produced or marketed in Israel; and 35 percent are disposable items and packaging.²⁷

In addition, the Ministry of the Environment has intensified its efforts to deal with solid waste. The Ministry's policy is to transform garbage from a nuisance into a resource and to reduce the amount of garbage brought to landfills by means of an integrated and sustainable solution, which involves a hierarchy of waste disposal. The policy is based on a number of laws: Collection and Evacuation of Garbage for Recycling, 5753-1993; the Bottle Deposit Law, 5759-1999; the Removal and Recycling of Tires Law, 5777-2007; the Anti-Littering Law, 5754-1984; Anti-Littering Regulations (anti-littering levy), 5747-1987; the Disposal of Packaging Law, 5771-2011²⁸; and the Plastic Bags Law, 5777-2017.

Marine pollution from ocean sources involves marine pollution from ships and offshore facilities (such as drilling rigs, power plants and coal and oil terminals) and is primarily

26 Ministry of the Environment (2018). The Clean Beach Program. <http://www.sviva.gov.il/subjectsEnv/SeaAndShore/IsraelCoast/cleancoastprogram/Pages/default.aspx> [Hebrew].

27 Pasternak, G., D. Zviely, C.A. Ribic, A. Ariel, E. Spanier (2017). Sources, composition and spatial distribution of marine debris along the Mediterranean coast of Israel. *Mar. Pollut. Bull.* 114, 1036-1045. <https://doi.org/10.1016/j.marpolbul.2016.11.023>.

28 Pasternak et al. (2014)

the result of discharge of oil products due to a malfunction or accident, the discharge of polluted ballast water, byproducts of offshore drilling, pollution from hull paint that contains TBT, sewage and solid waste.

The enforcement and supervision powers are derived from the laws and regulations related to the marine environment:

1. Directive for the Prevention of Marine Oil Pollution [new version], 5740-1980.
2. Regulations for the Prevention of Marine Oil Pollution (implementation of the Convention), 5747-1987.
3. The Prevention of Marine Pollution Law (dumping of waste), 5743-1983 and also its regulations from 1984.
4. Port Regulations (loading and unloading of oil), 5736-1975.
5. The Port Regulations (dumping of garbage from ships), 5770-2010.
6. The Anti-Littering Law, 5744-1984.

The National Unit for Protecting the Marine Environment, with the assistance of ship inspectors from the Shipping and Ports Authority, are carrying out regular and systematic inspections of ships, during which they check the ships' compliance with international standards for the prevention of marine pollution. Additional activities to reduce marine oil pollution include licensing and inspections of ports and wharves, aerial patrols of the sea and along the coast and maritime patrols by inspection ships at problematic locations, diving inspections and taking laboratory samples from problematic locations in order to check compliance with regulations and the law. Israel has permission to use the long-distance sensing surveillance systems of EU satellites, which make it possible to identify polluters and pollution in almost real time.²⁹

Although Israel has not signed the **AFS Covenant**, the Ministry of the Environment led an initiative during the previous decade to end the use of paints containing TBT. This policy includes prohibiting the sale and use of these paints as part of the business licenses of wharves and shipyards, the addition of paints containing TBT to the list of prohibited substances for import, according to an import-export directive and according to the tariff regulations, and the prohibition of possessing more than 1 kilogram of paint containing TBT or in a concentration of 3 percent or more, which went into effect during 2009.³⁰

29 Levinsky and Amir (2014).

30 Ministry of the Environment (2017). "Preventing pollution from ship hull paint – paint that contains TBT." http://www.sviva.gov.il/subjectsEnv/SeaAndShore/Sea_Pollution_sea/MarinePollutionVessels/Pages/MarinePollotionTBT.aspx [Hebrew]

Handling of marine oil spills is required following a serious oil spill in the sea or on the coast. A large oil spill is liable to cause serious damage to the environment and the economy.

As part of the **International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC) 1990**, an agreement was signed in May 2018 for an emergency sub-regional trilateral emergency plan between Israel, Greece and Cyprus (as part of the emergency protocol of the Barcelona Convention and the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC)). Each country that is a party to the agreement is committed to establish response centers for dealing with oil spills that are roughly estimated to be between 4000 and 6000 tons, to outfit them with appropriate equipment, to train response teams and to prepare a national emergency plan. In situations where the affected country is not able to handle the oil spill on its own or if the spill may affect the coasts of more than one country, the affected country can request assistance from its neighbors, in which case the cleanup will be carried out based on a combined effort and cooperation in the field. In such cases, the maritime command and the responsibility for the efforts will be in the hands of the country where the cleanup is taking place.³¹

The Regional Cooperation Plan for Oil Spills in the Gulf of Eilat (Aqaba) between Israel, Jordan and Egypt is based on the assumption that due to the close geographical proximity between the countries in this region, oil spills will quickly spread from the source to the territorial waters and coasts of the neighboring countries. As an appendix to the peace treaty with Jordan in 1995, a regional cooperation agreement was signed for preparedness, response and cooperation in oil spill events, which includes Egypt, Jordan and Israel. Unfortunately, Egypt is not currently cooperating in the implementation of this agreement. The level of equipment and preparedness in each country was defined so as to provide an efficient response to oil spills of up to about 200 tons of oil. As part of the agreement, two special boats (Sviva 2) for fighting oil spills were acquired, in parallel to their Jordanian sister ship "Hamza1", and they operate as part of an emergency framework that encompasses both sides of the gulf.³²

31 Ministry of the Environment (2018). "A trilateral Israel-Greece-Cyprus agreement has been signed for preparedness and response to oil spills." <http://www.sviva.gov.il/InfoServices/NewsAndEvents/MessageDoverAndNews/Pages/2018/may2018/Israel-Greece-Cyprus-signed-sea-pollution-Tripartite-Agreement.aspx> <http://www.sviva.gov.il/subjectsEnv/SeaAndShore/OilPollution/RegionalCooperation/Pages/Default.aspx> [Hebrew].

32 Ministry of the Environment (2012). "International cooperation in the Gulf of Eilat." <http://www.sviva.gov.il/subjectsEnv/SeaAndShore/OilPollution/RegionalCooperation/Pages/RegionalCooperationEilat.aspx> [Hebrew].

In 1998, the government decided to establish an interministerial steering committee chaired by the Ministry of the Environment, which is responsible for preparing the **National Plan for Dealing with Oil Pollution**, and to anchor it in law.³³ After about ten years, in 2008, the government approved the principles of the National Plan for the Prevention of Marine Oil Pollution, which is an organizational framework that brings together the various organizations that respond to an oil spill event that is liable to cause marine pollution along Israel's coasts in the Mediterranean and the Gulf of Eilat. The National Unit for Protection of the Marine Environment developed and wrote the plan, which is based on preparedness in terms of equipment, manpower and continual readiness of the bodies involved in marine oil pollution, which share the responsibility. The Ministry of the Environment is the national body that guides, assists and supervises an event at every stage of the plan. The goals of the plan are to coordinate the actions of the entire network, including readiness and response to oil pollution events, mapping of areas sensitive to marine pollution along the coast and foci of risk, establishing policy to handle a marine pollution event, and specifying the methods and means for dealing with a serious marine pollution event while coordinating between the relevant bodies. The National Unit for the Protection of the Marine Environment brings together the means for dealing with marine oil pollution events, which provide the ability to block, pump and concentrate the oil until its evacuation to a designated site for treatment.³⁴

Offshore facilities and coastal local authorities were required to prepare local plans for readiness and response to pollution events in their jurisdiction. The formulation of these plans was paid for by the Fund for the Prevention of Marine Pollution. Marine pollution exercises are held each year on the national level by the Ministry of the Environment with the participation of all the relevant bodies and on the local level in factories and local authorities. During a marine pollution event, the inspectors of the National Unit for the Protection of the Marine Environment provide professional guidance to those responsible at the site, with the goal of restoring the situation to what it was previously and minimizing the damage to the environment. If there is a suspicion of negligence, a criminal investigation is initiated in order to decide whether reasonable precautions were taken to prevent the event.

According to the government decision that approved the National Plan for the Prevention of Marine Pollution, the Ministry of the Environment was to verify that by January 2014 the owners of the fuel conveyance infrastructures and the Ministry of Defense had completed their acquisitions for the handling of marine oil pollution, with

33 Decision of the Ministerial Committee on behalf of the government (decision 6 on March 2, 1998).

34 Ministry of the Environment (2015). "The National Plan for the Handling of Marine Oil Pollution." <http://www.sviva.gov.il/subjectsEnv/SeaAndShore/OilPollution/Pages/NationalPlan.aspx> [Hebrew].

a total cost of about NIS 18 million and a total investment of about NIS 15 million from the budget of the Fund for the Prevention of Marine Pollution to finance maintenance costs.³⁵ Petroleum Energy and Infrastructures Ltd., the Israel Electricity Company and the Trans-Israel Pipeline Company have acquired most of the required equipment and the Israeli navy has announced that it has also completed its acquisitions. In contrast, not all the local councils have acquired the equipment to deal with marine pollution, despite the RFQ of the Fund for the Prevention of Marine Pollution for the acquisition of equipment to handle marine oil pollution events.

Furthermore, the Ministry of the Environment is meant to acquire two designated ships for fighting pollution and an inspection ship in order to complete the acquisition of equipment to fight marine oil pollution, to build stations for the prevention of marine pollution and to add 10 employees for dealing with marine pollution events and supervision. About NIS 15 million from the budget of the Fund for the Prevention of Marine Pollution and an additional budget from the Ministry of the Environment (if the Fund's budget is insufficient) were allocated to finance the acquisition program. As a result of the offshore oil and gas activity, the Ministry of the Environment has since the end of 2010 requested a one-time allocation from the Ministry of Finance in the amount of NIS 22 million, an allocation of 11 employees and an annual budget of NIS 7 million to finance maintenance activities and additional manpower positions.³⁶ In actuality, only now has the Ministry of the Environment began acquiring equipment according to the plan while the additional budget and employees requested in 2010 have not yet been received.

Conclusion and recommendations

Marine pollution is a cross-border problem that needs to be dealt with through, among other means, regional cooperation. During the past four decades, Israel has adopted most of the international conventions for reducing marine pollution and has passed laws and regulations accordingly. Two of the main causes of pollution in recent years have been marine waste (and primarily disposable plastic products) and the potential for oil spills as a result of oil and gas drilling or an accident / malfunction in the shipping and ports sector.

Since a significant part of the problem of marine waste is the result of overuse of disposable products (on land), their use should be limited (reduction at the source) through appropriate legislation, as well as by increasing the scope of recycling. The success of the bottle deposit and plastic bags laws is an indication that such legislation would be effective.

35 Ministry of the Environment (2013).

36 Ministry of the Environment (2013).

As of the end of 2018 and 20 years after the relevant government decision (no. 6 from March 2, 1998), the National Plan for Dealing with Marine Oil Pollution has not yet been approved, nor has it been updated as a result of the oil and gas discoveries during the past decade. Furthermore, the preparations for handling an oil spill are not yet complete, despite the increased risk. The National Plan for Dealing with Marine Oil Pollution should be made into law and it should be updated to take into account the additional risk created by the natural gas discoveries. Similarly, additional budget should be immediately approved for the relevant organizations to acquire the necessary equipment for an appropriate response to a potential oil spill off the coast of Israel.



Figure 1: Plastic waste on the shores of Israel (Ministry of Environmental Protection)

The Effect of the Jellyfish Proliferation – Ramifications on the National Level

Tamar Lotan

Background

Jellyfish developed more than 500 million years ago and the earliest evidence of their existence consists of fossils that have been dated to the Cambrian period. The term jellyfish includes three main groups: the true jellyfish which have a large bell that can be up to 3 meters in diameter in some species; the box jellyfish whose bell is square-shaped and which include the most poisonous species in the world; and the hydra jellyfish which includes thousands of species that live as individuals or in colonies. The jellyfish have a complex life cycle which varies from one species to the next and in general includes a sessile stage attached to the seabed, when it is called a polyp, and a flagellate stage when it swims and is essentially a medusa (Figure 1).

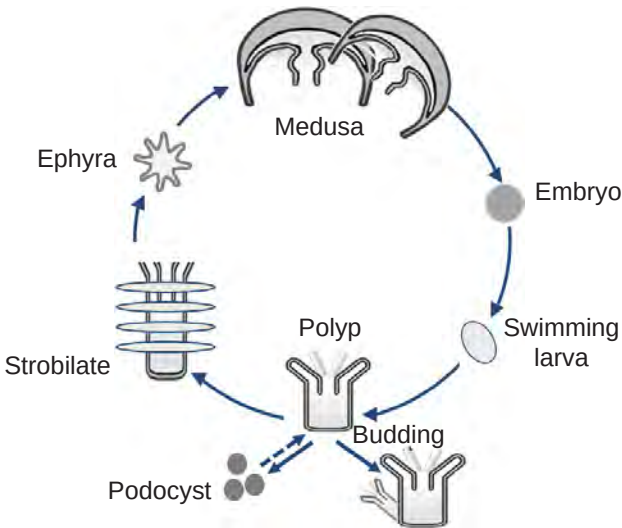


Figure 1: The lifecycle of the medusa. The embryo is created in sexual reproduction by the medusas and develops into a larva that undergoes a metamorphosis to create the polyp. In asexual reproduction additional polyps are created or a strobilate releases ephyra to create medusas

The signal for the creation of the medusas is seasonal and as a result the polyp changes its form and starts to manufacture ephyra, the initial stage in the development of the medusas. The ephyra released from the polyp are a few millimeters in size and within a short time they develop into medusas, which are what we usually observe in

the sea. Depending on the species of jellyfish, the polyp can produce between one and dozens of medusas in a season. The jellyfish carry sex cells and after external fertilization, a larva develops which undergoes metamorphosis into a polyp. The polyp is the permanent stage throughout the year and after the release of the ephyra, the polyp continues to grow and multiply by budding or a lateral process in order to create dozens of additional polyps. In addition, the polyp produces dormant podocysts that can develop back into the polyp stage under the right environmental conditions. Essentially, the lifecycle of the jellyfish is resistant to difficult environmental conditions, such as pollution, saltiness, lack of oxygen or lack of food. These factors are likely to produce years in which there are large blooms and years with small or non-existent blooms. The factors that influence the blooms of the jellyfish are complex and there is currently no general model for predicting blooms. In addition, in recent decades, there have been changes in the global jellyfish map and species that were previously unique to certain areas have now spread to new ones.

The population explosion of the jellyfish is a global phenomenon that is not only causing damage to ecological niches but also economic damage by blocking intake pipes of electricity plants and desalination plants and damage to marine agriculture, fishing and the resort industry, as well as being a threat to the health of vacationers and bathers. Although this kind of damage also occurs in Israel, there is no planning on the national level to prevent possible damage to electricity plants and desalination plants, which draw water from the sea for their operational needs, or the possibility of the arrival of deadly jellyfish to Israel's coast. In this review, I will survey the most vulnerable sectors in Israel and the means that currently exist to deal with the various types of damage.

Jellyfish in the Mediterranean with emphasis on the coast of Israel

There are about 20 species of the Scyphozoa jellyfish in the Mediterranean (Mariottini & Pane 2010), less than half of which can be found off the coast of Israel. Up until the 1980s, the barrel jellyfish (*Rhizostoma pulmo*) was the most commonly observed species found off the coast of Israel. In 1976, the nomad jellyfish (*Rhopilema nomadica*) was first observed (Galil et al. 1990) and about ten years later there began reoccurring seasonal blooms of the nomadic jellyfish along Israel's coast (Figure 2). These blooms were measured to be about 2.1×10^5 individuals per square kilometer in a total area of about 15 square kilometers (Lotan et al. 1994; Spanier & Galil 1991). Over the years, the jellyfish have spread to the entire Mediterranean, from Turkey to Tunisia and Malta (Avian et al. 1995; Öztürk & Isinibilir 2010; Deidun et al. 2011; Gülşahin & Tarken 2011; Yahia et al. 2013), an area with a population of about 200 million people. Additional jellyfish that are appearing in large blooms in the Mediterranean (Fuentes et al. 2011) are the pelagia (*Pelagia noctiluca*), the cotoylorhiza (*Cotylorhiza tuberculata*) and the aurelia

(*Aurelai aurita*). These jellyfish usually first arrive on the coast of Israel as individuals, although in March 2014 a large swarm of pelagia arrived on the southern coast and bathers were stung. A globally invasive species of jellyfish named phyllorihiza arrived from the Western Pacific Ocean to the coast of Israel and at the end of the 2000s adult individuals with reproductive ability were observed. Currently, there are still relatively low numbers of phyllorihiza off the coast of Israel, as opposed to other locations in the world where this type of jellyfish creates huge blooms that damage fishing and a variety of marine species (Boero et al. 2009; Verity et al. 2011; Galil et. al. 2009).



Figure 2: A bloom of nomad jellyfish – a beach in Haifa is covered with jellyfish that have been washed up from the sea

The deaths from jellyfish stings mainly occur in the Indian Ocean on the coasts of Thailand, the Philippines and Australia. The deaths are mainly caused by the box jellyfish found near the equator. One representative (*Carybdes marsupialis*) of the box jellyfish is found in the northwestern Mediterranean, in the region of Spain, but its sting is not lethal. Among the hydra medusa, I would mention here only the jellyfish known as the Portuguese man o' war (*Physalia physalis*), which constitutes a threat to public health. This jellyfish's locomotion is by wind by means of a gas bladder about 20 centimeters long, which is similar to the sail of the 15th century Portuguese Caravella warship after which it is named. This jellyfish is common along the eastern and western coasts of Spain and from time to time is observed in the Strait of Gibraltar. In 2010, the hydra jellyfish was observed on the coast of Corsica and Italy and there was a report of

one death, apparently from a jellyfish sting. Research that has examined the advance of the hydra jellyfish in the Mediterranean in 2010 suggested that its arrival in the Strait of Sicily was the result of unique meteorological and oceanographic conditions and not as the result of a natural expansion of range due to climate change (Peliz & Ruiz 2015).

Power plants and desalination plants

Steam-driven and nuclear power plants and also desalination plants intake seawater in large quantities for their operations and in the process jellyfish are also drawn in. Power plants pump in large quantities of water for cooling and desalination plants pump in large quantities of seawater to create freshwater. The continual pumping from the sea requires constant filtering of the water in order to prevent the intake of animals, plants and waste. The jellyfish blooms and the arrival of swarms on the coast of Japan already in the 1960s have caused the blockage of filtering systems and the closing of a power plant (Purcell et al. 2007). In recent years, dozens of power plants have reported slowdowns in the production of electricity and damage to their operating systems as the result of pumping in swarms of jellyfish. Furthermore, in various places around the world, such as India, the Philippines, Japan, the US, Sweden and Scotland, the jellyfish proliferation has caused outages of plant operations for various lengths of time (Purcell et al. 2007; Graham et al. 2014; Uye 2014). For example, in 2008 the PG&E company reported the closing for two days of one of two reactors at the Diablo Canyon nuclear power plant, which supplies electricity to about three million people in California (U.S. Nuclear Regulatory Commission Operations Center). In 2011, it was reported that the St. Lucie power plant in Florida was closed for two days and in that same year the Tomes nuclear power plant in Scotland was closed for about a week. In 2013, the Oskarshamn power plant in Sweden, which supplies about 10 percent of the country's electricity consumption, was closed for two days. Israel is defined as an "electricity island" and must produce all of its own electricity without any backup from its neighbors. About 32 percent of Israel's electricity is still produced by coal-fired power plants, which are located along the coast of Israel (Electricity Authority 2017). Each year the power plants have to evacuate dozens of tons of jellyfish that are caught in their filtering systems (Figure 3), which causes a slowdown in the production of electricity. In 2011, as a result of the arrival of a large swarm of jellyfish, the Orot Rabin power station was forced to close due to the blockage of its pumping system. In addition, the large blooms of nomadic jellyfish arrive in the summer when the temperature of the ocean is relatively high and the cooling pumps must be operated more intensively than in the winter months. Together with the increased demand for electricity in the summer, a slowdown in the coastal power plants' operations is liable to adversely affect the production of electricity.



Figure 3: Jellyfish discharged from the filter of the Orot Rabin power station

Desalination plants all over the world that pump in water from the sea are forced to deal with jellyfish blooms (Purcell et al. 2007; Peliz & Ruiz 2015). The intake pipe is usually protected by one of a number of systems against the intake of animals or other objects, but these systems do not provide protection against a massive bloom of jellyfish. As a result, the systems become clogged and the desalination process comes to a halt (Azis et al. 2000; Miller et al. 2015; Ghermandi et al. 2015). In Israel, more than 80 percent of the fresh water for household and industrial consumption is provided by five desalination plants located along the coast. This trend will only grow in view of global climate change, the drying up of natural sources and population growth. In addition, the use of desalination plants requires energy which is currently supplied by power plants located along the coast. Thus, the damage from a jellyfish bloom is liable to damage both the production of electricity and that of drinking water.

Fishing and marine agriculture

In recent decades, a connection has been found between overfishing and jellyfish proliferation (Richardson et al. 2009; Uye 2011). In Israel most of the fishing is done from trawlers and although there is damage to certain species of fish, no connection to the proliferation of the nomadic jellyfish has been found (Angel et al. 2016). Essentially, local fishing is on a limited scale and contributes less than 5 percent of the locally consumed fish. Jellyfish proliferation causes large losses to the global fish industry and attempts to limit the damage have primarily involved early warning of a bloom. In Japan, a model was developed based on accumulated knowledge which can produce a warning of blooms. In a joint effort by Japan and China, facilities have been removed from the sea that constitute a platform for the early stages in the lifecycle of jellyfish that arrive in Japan (Uye 2014). Currently, we do not possess the data needed to produce a similar model in Israel and investment is needed in research to understand the proliferation and the oceanographic conditions that facilitate the spread of the

nomadic jellyfish. In addition to fishing, jellyfish proliferation causes damage to the fish cages of marine agriculture. A swarm of jellyfish that encounters fish cages on its journey will cause a massive die-off of the fish as result of stings and the blockage of gills (Graham et al. 2014; Purcell et al. 2007; Uye 2014). In Israel, marine agriculture is still in its early stages of development and it is recommended that the location of the cages be carefully planned in order to reduce the damage from jellyfish swarms.

Public health and tourism

Jellyfish constitute a nuisance on beaches all over the world. On the beaches of Florida, hundreds of thousands of bathers are stung, while in Maryland and Virginia, more than half a million bathers are stung every year in Chesapeake Bay. In a survey of lifeguards carried out at 760 beach stations in Spain, it was found that 60 percent of the injuries (a total of 116,000 instances) are caused by jellyfish stings. The survey indicates that the jellyfish in Spain are the main nuisance for bathers (Bordehore et al. 2016). In Thailand, the Philippines, Malaysia and Australia, tourists and natives are killed by deadly jellyfish and dozens of people are hospitalized every year. The prevention and care for jellyfish stings is a global public health problem. Jellyfish have stinging cells that contain a sophisticated microscopic needle structure for the injection of poison into prey and for protection. These needles work under 150 atmospheres of pressure and penetrate the body of their target within microseconds (Beckmann & Özbek 2012; Park et al. 2017). The severity of a jellyfish sting varies according to the type of jellyfish since the stinging cells of different species contain poisons from different groups (Rachamim et al. 2015). As a result, the means of protection against jellyfish stings varies according to the geographic area and the species of jellyfish found in the sea (Kingsford et al. 2018). In Australia, long stretches of beach are closed to bathers in certain seasons in order to prevent stinging deaths. In addition, thin Lycra suits that cover a bather from head to toe are used on Australian beaches to protect against stings. The level of awareness of the jellyfish danger among residents of Australia is high as a result of education and public information programs over the years. As a result, the number of deaths from stings is low relative to the Philippines, where many children die every year from jellyfish stings. In the early 2000s, a number of sites were created for the public all over the world with the goal of informing and warning of the presence of jellyfish. A site has also been created in Israel (<http://www.meduzot.co.il>) which is based on reports from bathers. In Spain, France and other countries, there is now an app that updates the user on the presence of jellyfish on the beaches (such as <http://medjelly.com>). In addition, lifeguards in Spain take active part in reporting the presence of jellyfish and also cases of stinging. A purple flag flying on a beach today is an international signal of the presence of jellyfish or other dangerous

animals in the water. Recently, this flag has also come into use in Israel on beaches where there is a danger of stinging, but lifeguards are still not part of the reporting and public awareness system. On some of the beaches in Europe, there is use of nets to prevent the penetration of jellyfish, although their effectiveness is not clear. In Spain, on beaches where there is a danger from the Portuguese man o' war jellyfish, the sea is combed and poisonous jellyfish are removed. For personal protection, lycra suits that are used in Australia are now available and there is protective cream against the sun and jellyfish, whose effectiveness in preventing stings has been proven in clinical trials carried out in Israel, the US, Japan and Europe (Kimball et al. 2004; Boulware 2006). The nomadic jellyfish are not deadly, but their sting is very painful and can cause a serious wound and even a systemic reaction in sensitive individuals (Mariottini & Pane 2010; Uri et al. 2005; Friedel et al. 2016; Silfen 2003). Nonetheless, the scope of the problem and the number of people being stung every year is unknown and there is no monitoring of the situation. In addition, and despite the low probability that individual Portuguese man o' war jellyfish will arrive in Israel, lifeguards and the lifeguard organizations should be informed.

The reality of jellyfish on the beaches does not necessarily damage tourism in the long term (Tomlinson et al. 2018). A few studies have been done on the economic damage done by jellyfish to tourism. In Australia, the reality of deadly jellyfish does not discourage tourism, but a temporary dip in tourism results from a severe sting or death among bathers (Graham et al. 2014). In Israel, the effect of jellyfish on tourism was examined in a survey of about 160 people and its results showed that a reduction of 3-10.5 percent is expected in the number of bathers as a result of a jellyfish bloom (Ghermandi et al. 2015). There is need for further research in order to determine whether the proliferation of jellyfish is a major factor when a tourists decides on his destination.

Conclusion and recommendations

The proliferation of jellyfish in Israel is an annually recurring phenomenon, although its intensity varies. Currently, we do not possess the knowledge to understand, analyze and predict the pattern of a bloom or its intensity. It is recommended that early warning systems for the fishing and recreational sectors according to the European model be created and upgraded. Lifeguards, as well as the maritime police, should report observations of jellyfish on beaches each morning to a center that will report the data to bathers by means of an app. In 2018, the Ministry of Health changed its recommendation for treating a jellyfish sting and it is important to instruct lifeguards in Israel on how to provide first aid for stings and to update the public on the new procedures. There is currently a lack of information on the number of sting cases, the severity of the stings

and the side effects, if they exist, of a return sting. It is recommended that an integrated system be created for the gathering of this data, which will include the lifeguards and first aid providers on the beaches. Monitoring the reaction to a sting and understanding the scope of the threat to children and adults will make it possible to provide the most optimal care.

The Ministry of Agriculture and the Planning Authority within the Ministry of Finance are currently in the planning stage for thousands of dunam in the Mediterranean Sea to be used for fish cages and it is recommended that the locations should be chosen so as to avoid the path of jellyfish swarms.

The large swarms of nomadic jellyfish lead each year to the slowdown of operations in the power plants and disrupt the desalinization process. Based on the little data there is, it appears that these disruptions do not at the moment cause serious economic damage. Nonetheless, since Israel is dependent on full production of electricity in its coastal power plants and on desalinization for the production of drinking water, it is recommended that consideration be given on a national level to finding an engineering-biological solution to preventing the intake of jellyfish. The protection of power plants and desalinization plants has strategic importance. The solution must assume that an increase in magnitude (x10) in the density of jellyfish in the Mediterranean is not impossible. Such a situation is liable to cause major disruptions in the electricity and water sectors of Israel, the Palestinian Authority and Jordan. Israel is known for its ability to find innovative solutions and progress in this area can produce a solution that protects basic systems which are essential to the economy and the welfare of the State. In addition, since the problem of the blockage of intakes systems by jellyfish is global, a solution will also have high commercial value.

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Profession Naftali Heinz Wydra / An Exhibition in his Memory

Ido Gilad

Professor Naftali Wydra was one of the fathers of Israeli shipping and the founder of the Wydra Institute of Shipping and Aviation Research. He was born in Leipzig, Germany in October 1909 and in 1933 made aliyah to Israel, after completing his doctorate in Law, Justice and Economics. Since then, he lived and worked in Haifa until his death in 1987.



During the years 1936–1947, he was the head of the Maritime Department of the Jewish Agency, where he developed the research of fishing in Israel, along with the establishment of fishing-based settlements along the coast of the Mediterranean and Lake Kinneret. These settlements were also connected to the activity of the Palyam¹ and the Aliyah B Mossad.² Wydra saw to the introduction of Jewish labor in the ports of Israel. At the same time, he worked to organize the training for 'maritime enterprises and occupations' in Israel as part of the Maritime School that was established near the Technion in Haifa (in 1938). At the request of Dr. Reuven Hecht, an old friend from his youth in Leipzig, Wydra was among the founders of the Dagon Group already in 1948 and served as a member of the Board of Directors and the Managing Committee of the Company until his death.

For two decades (1947–1966), he headed the Kedem Company, the first partnership company of Zim, and the owner of the first ship—the Kedma, and primarily as part of the Executive of Zim, as co-CEO and as CEO. Under his management, Zim grew to a fleet of about 150 ships, including passenger ships, tankers, cargo ships, and bulk ships. Of those, 70 were owned by the Company. In addition, during his tenure, 17 fixed shipping routes were established, as well as shipping services between foreign ports, which were also used by partnership companies from developing states.

1 The military maritime branch of the Palmach.

2 A branch of the Haganah that served as the organizing body of the Yishuv leadership for clandestine immigration.

During the period 1969-1981, Wydra served as the Chairman of the Board of Directors of the Israel Ports Authority. This was a period in which there was significant development of the ports and in particular they were prepared for the handling of containers. In 1969, he established the Israeli Institute for the Research of Shipping, which later was renamed the Wydra Institute of Shipping and Aviation Research. Its goal was to study shipping in the State of Israel from an academic and independent perspective, while creating a high-quality database that would support decision making in maritime transportation, port planning and development, port-city relations, sea/coast interfaces, maritime history, exploitation of maritime resources, territorial rights and maritime law, ecology, international collaborations, etc.

Wydra was a member of the founding generation of the State and focused on "capturing the sea", which according to his view was intended to meet Israel's need to build an important maritime link to the world (in the absence of a safe land connection). His work was based on a Zionist vision but he was also influenced by German culture (a "yekke" in the classic and positive sense of the word, as a person who is precise, fair and level-headed and who is constantly aspiring to rationality and perfection). He viewed the integration of the Jewish people in general and the members of the Jewish 'Yishuv' in the Land of Israel in particular, among "seafarers " who are involved in fishing, seamanship and shipping, while at the same time coping with the forces of nature, as an important value. In his endeavors, he showed a spirit of perseverance which led to the development of the Hebrew fleet and Hebrew shipping despite the huge challenges.

His vision encompassed a variety of domains: the connection between the coast, the port and the sea; between the sailors and their ships; between Israel and other nations of the world; between the maritime reality which is a given and that which will develop in the future; and between thinking and doing. All these came together in the broad maritime domain – the "wide open sea"³, in the context of defense, economics, trade, the creation of a shipping and fishing infrastructure in Israel, modern technological development, education and occupational training, creation of standards and research. All these are part of providing a long-term solution in a changing reality.

Following is an excerpt from his writings from 1943:

At the end of the first decade of our sea endeavors, since the 'Yishuv' in Israel began to systematically develop its maritime projects, the foundations have been laid that

3 Maximal development of the sea space, which means "to develop the maritime domain in all its aspects, with a broad and long-term perspective" from Gur Lavi (ed.) (2017), "A Model and Methodology for a Maritime Strategy for Israel," Haifa: University of Haifa Press, Maritime Policy & Strategy Research Center, p. 6.

will facilitate development on a much greater scale in the future. The development of Jewish maritime endeavor in Israel is conditional on the combination of three factors: Jewish-owned ships under an Israeli flag, Jewish workers and a Jewish-Israeli organizational framework that knows how to manage a maritime business. Wydra, N. (1943).⁴

As a result of his leadership role in the “capture of the sea”, his talent and his achievements, Wydra became a well-known figure also among maritime circles worldwide. For this and more, University of Haifa had the honor of granting Naftali Wydra the degree of Associate Expert Professor and the Haifa Municipality named him as one of the “city’s notables” and named a square after him at the suburb of Kiryat Eliezer, which is near the Maritime Museum and the Museum of Clandestine; Immigration and the Navy. The commemoration of his legacy continues today—the staff of the Maritime Policy & Strategy Research Center has created a modest exhibition in the library of University of Haifa in honor of Naftali Heinz Wydra z”l and his work, in cooperation with the daughters of the Wydra family.

The Professor Naftali Wydra Research Institute at University of Haifa

Professor Wydra founded the Chair for the Study of Shipping, Ports and the Sea at University of Haifa. He was a trustee and chairman of the University’s managerial board. In 1987, the last year of his life, he had the Institute for Shipping Research, which he founded in 1969, transferred to the University. According to his vision, he foresaw the added research value and academic spirit of the Institute under the auspices of the University. Thus, members of the University’s faculty, led by Professor Yehuda Hayut and Ms. Leah Romi, were closely involved in the work of the Institute throughout its years of activity. Other researchers from various academic disciplines also provided backing and support to the Institute. They provided a professional envelope to meet the Institute’s research and publishing needs. They included researchers from the departments of geography, economics and maritime civilization, as well as from other faculties that had some connection to maritime subjects.

The Institute library has become a unique and comprehensive center of information for those in the maritime domain. The Institute has provided professional assessments and consultation, as well as mediation services in economic matters connected to shipping, in collaboration and coordination with the Chair for the Study of Shipping, Ports and the Sea.

The growing importance of the sea as part of Israel’s strategic resilience has provided leverage for the development and deepened academic involvement in this domain. The

4 “Achievements and Prospects” in “Ofek” a magazine published by the Hahovel Hayami Leyisrael, Haifa.

relevance of the sea led in 2017 to a decision by the Executive of the University to include the Institute as a division of the Maritime Policy & Strategy Research Center under the leadership of Professor Shaul Chorev. The Center is part of University of Haifa's leading role in the activity of the Inter-Institutional Mediterranean Sea Research Center of Israel (MERC I),⁵ whose goal is to deal with a diversity of scientific, technological, economic, security and environmental challenges that affect the development of Israel's maritime domain.

The Exhibition in Memory of Professor Wydra at the University of Haifa Library

To mark 70 years since the founding of the State and to honor the establishment of the productive and educational infrastructure for the domain of shipping and ports, led by Professor Wydra, a modest exhibition in his honor has been put together at University of Haifa. The exhibition includes three generations of endeavor: the first and founding generation which produced the legacy of Professor Wydra and the second and third generations—the daughter and granddaughter of Professor Wydra—who have added an artistic dimension to the exhibit by including their works. The theme of the artwork is the legacy of their father/grandfather and includes motifs that were significant in his life and his work, namely the sea, water and the coast.

We would like to thank the artists: Yael-Lala Wydra-Yanur – daughter and Li Yanur – granddaughter

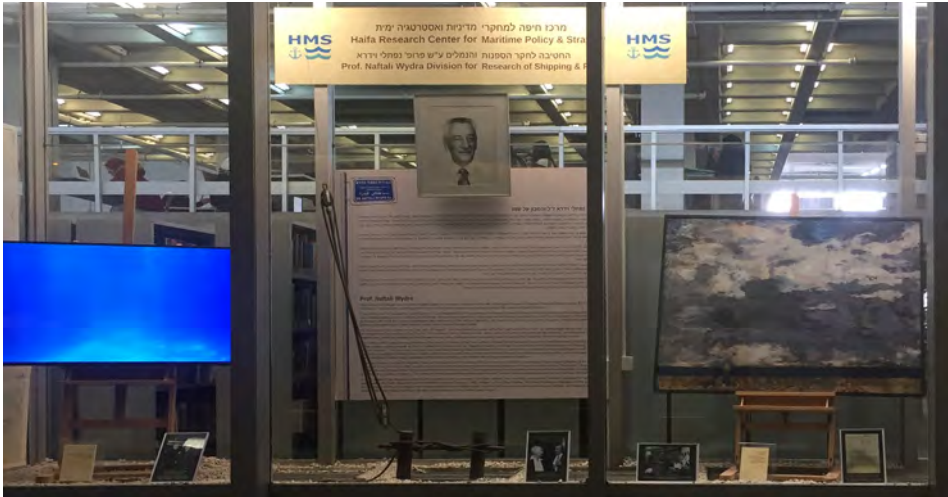


Naftali Wydra with David Ben Gurion



Wydra Square, Haifa

5 MERC I – Mediterranean Sea Research Center of Israel <http://merci.haifa.ac.il>



Wydra Presentation at the library of the university of Haifa

Summary of the Strategic Evaluation and Policy Recommendations

Shaul Chorev

General Background

During the past year, the **contribution of the maritime domain** to Israel's resilience and security continued to grow. Due to the lack of an approved maritime policy and strategy, and despite the completion of the study carried out by the Planning Branch of the Ministry of Finance with respect to a maritime plan for Israel, a number of events during the past year have emphasized the need for an overall policy and strategy for the maritime domain:

- The public debate over the location of the production facility rig for the Leviathan gas field.
- The delay in completion of the Economic Waters legislation.
- The lack of a clear policy on Chinese investment in Israeli ports and the control over the operation.
- The acquisition process for navy vessels in order to protect the offshore gas infrastructure.
- The dispute over the demarcation of the maritime boundary between Israel and Lebanon against the background of the Lebanese government's intention to begin developing gas fields in its territory.
- The situation of Israeli shipping (commercial vessels and the manpower to operate them).

In the geopolitical realm, the **Eastern Mediterranean** and nearby areas continued to exhibit turbulence and instability. In the civil war in Syria, the regime continues to have the advantage as the situation approaches a conclusion and President Assad continues to maintain control. However the geopolitical outcomes of this war have created a new and more complex reality in the Middle East.

The **Iranians** continued their attempts to consolidate their presence and geopolitical influence in an area stretching from the Persian Gulf to the shores of the Mediterranean. Iran supports the Assad regime in Syria; it participated in the civil war on Russia's side; and it has exploited the situation in order to upgrade its status in the region almost to that of a regional superpower. This has been a long-time goal of the Iranians, which includes dividing the Muslim world between Sunnis and Shiites, and it is close to arriving at the shores of the Mediterranean.

In May 2018, US President Donald Trump announced his decision to cancel US participation in the nuclear agreement with Iran and to reinstate the **sanctions** that were imposed on Iran in the past. According to Trump, the nuclear agreement signed in 2015 between Iran on the one hand and the US, the EU, France, Britain, China, Russia and Germany on the other was violated by Iran, which led to the US withdrawal from the agreement. The first stage of the sanctions went into effect in May 2018 and the second in November 2018 and the US has announced that it expects Iran to return to the negotiating table.

At the summit between Erdogan, Putin and Rouhani which took place in April 2018 in Ankara, the three leaders discussed the commitment of Turkey, Russia and Iran to ensure the territorial integrity of Syria and to continue the local ceasefire. The three also discussed the issues of border security, the distribution of humanitarian aid and the formulation of a new constitution for Syria.

At the Helsinki summit which took place in July 2018 between Russian President Putin and US President Trump, Putin said that he and Trump had agreed to guarantee Israel's border with Syria according to the 1974 ceasefire agreement. The US President later added that Russia and the US are working together to ensure Israel's security. Nonetheless, this did not change the US policy to reduce its presence in the region as part of the increased priority it is giving to other regions and particularly in east Asia.

The existence of a pro-Western **Sunni coalition** led by Saudi Arabia, which is meant to check the spread of Iran and to counter Islamic terror, is being undermined by complex internal Arab relations. It does not appear that such a coalition is able to meet its objectives, not only because of the disputes among the Arab countries or because some of them are cooperating with Iran, but primarily because of the lack of confidence in American policy in the Middle East.

During the past year, there has been continuing deterioration in the relations between **Israel and Turkey**. The Turkish instruction to the Israeli ambassador to leave Turkey in May 2018, as well as the return of the Turkish ambassador to Israel back to Turkey for consultations, and against the background of protests on the border with Gaza, symbolize a new stage in the crisis between the two sides, even if economic relations remain reasonably strong. Hope had been pinned on an agreement to export gas from Israel to Turkey, which appeared to be the most logical and easiest to execute; however, it does not appear that this vision will be realized in the near future.

In **Lebanon**, Israel's northern neighbor, general elections were held in May 2018. Saudi Arabia injected a large amount of money in order to support the El Hariri camp while

Iran sent funds and weapons to strengthen Hezbollah, as part of its view of Lebanon as a frontline base against Israel in a future war. According to the results of the election, the Hezbollah camp has gained in strength. Nonetheless, up until the time of writing, the efforts to form a government in Lebanon have not been successful. When a government is formed, two issues will become critical for Israel on the maritime front: Lebanon's desire to begin gas exploration in its maritime territory and the disputes regarding the demarcation of the maritime boundary between it and Israel.

Recently there were events in three **Persian Gulf states** which reflected a move toward normalization with Israel. The main event was the visit by Israeli Prime Minister Netanyahu in Oman at the end of October 2018. The Omani Foreign Minister even declared on several occasions that Israel is a Middle East country and should be accepted as such. The involvement of Qatar in the attempt to resolve the crisis in Gaza also pointed to the importance of these countries in regional diplomacy in general and in diplomatic matters related to Israel in particular.

The Southern Red Sea region and the Bab el Mandeb Strait, through which about one-third of Israel's maritime trade passes, are becoming increasingly important strategically. The region has in recent years become a dangerous area for shipping due to the increasing intensity of the civil war in Yemen and the fighting between Houthi rebels, who are supported by Iran, and Saudi forces. The conflict has led to a number of incidents in which the Houthis were involved and to the declaration by Iran, which supports the Houthis, of its possible strategic exploitation of the blockage of the straits to shipping.

In Israel's maritime domain, the Russian navy continued to maintain a presence and its foothold in Syrian ports has been consolidated. In 2017, the Russians renewed their leasing contract for the Tartus port for an additional 49 years, and they continued building infrastructures in the Russian section of the port. The Russian navy in the Eastern Mediterranean is based primarily on the Black Sea fleet and in mid-August 2018, prior to the attack of Assad's forces on the area of Idlib in northern Syrian, the Russian navy reinforced its deployment in the Eastern Mediterranean. This is essentially the largest Russian deployment in the region since Russia declared its active support for the Assad regime in 2015.

At the same time, there is a continuing reduction in **US maritime involvement in the region**, due to the preference being given to naval forces in other theaters and in particular east Asia (as part of the Pivot to Asia policy), which has led to the weakening of its status in the Mediterranean region. The deep structural crisis in the EU is influencing its global status, including in the Eastern Mediterranean.

Some of the strategic changes that are taking place in the region involve **risks to Israel** and in particular the strengthening of the Iran-Syria axis. This is leading to fear that Iranian forces will be deployed in the area of the Golan Heights, although other changes are creating **opportunities** that did not previously exist. The relations that are developing with Egypt, Saudi Arabia and the Gulf States constitute one of those opportunities, even if these countries condition the tightening of relations on finding a solution to the Palestinian problem.¹ Nonetheless, it worth mentioning that Israel's military situation in the region remains strong and there does not appear to be any major military existential threat to it, including in the maritime domain.

This strategic evaluation is a **policy-oriented document**, rather than an academic one and accordingly we decided to summarize it in nine recommendations, most of which are directed at the political echelons and the various government ministries. All of the recommendations are on the level of the government's maritime policy.

First recommendation – Formulation of a maritime policy and strategy for Israel

A formal process should be initiated to identify the State of Israel's maritime interests and to establish a policy in all aspects of the maritime domain. It will then be possible to create a grand maritime strategy according to that policy, which will include defined objectives and ways of achieving them.

In order to strengthen awareness of the maritime domain, we presented the Center's previous annual report to Israeli President Reuven Rivlin on June 10th 2018. He welcomed the activities of the Center in deepening awareness among the Israeli public and the recognition of how important the maritime domain is to Israel's security and resilience. The President welcomed the establishment of the Maritime Policy & Strategy Research Center and encouraged its staff to continue studying the maritime domain, to serve as a center of knowledge on the subject and to encourage the public discourse on these issues.

One of the positive developments during this past year was the completion of the **Policy Paper for Israel's Mediterranean Maritime Domain²** by the Planning Authority of the Ministry of Finance. It is written in the spirit of similar processes in other Western

- 1 In a speech given in Assiut, Egyptian President Abdel Fatah al Sisi said that "if we can solve the Palestinian issues, peace would be much warmer... I would ask that Israeli leaders allow the broadcast of this speech since this is a genuine opportunity." Walla News, May 17, 2016. <http://news.walla.co.il/item/2962078>.
- 2 Policy Paper for Israel's Maritime Domain in the Mediterranean – in the Stage II report, first draft for comments, October, 2017.

countries and therefore the document relates more to maritime spatial planning rather than maritime policy and strategy. For example, the document does not relate to the Gulf of Eilat and the Red Sea, through which about one-third of Israeli commerce passes; there is no discussion of protecting essential marine infrastructures; there is no priority given to infrastructures that will be built on artificial islands; it does not mention the strategic need for Israeli shipping capability; there is no discussion of the demarcation of Israeli maritime boundaries; and no goals or vision were formulated for the export of natural gas that can provide guidance to the next Israeli government (the 35th). The work being carried out by the National Economic Council and the staff of the Prime Minister's Office should include the formulation of a maritime policy and strategy for Israel as one of the subjects to be discussed by the next government.

Second recommendation – Securing shipping to and from Israel

Israel's geopolitical situation requires an infrastructure of commercial and military vessels to fulfill both civilian and military needs. The Israeli shipping industry is in continual economic competition with, on the one hand, the commercial fleets of countries with a long maritime tradition and on the other hand countries that allow shipping under flags of convenience. This competition has led to a deterioration in the state of Israeli shipping, from the perspective of both the number of Israeli ships and shipping manpower. Therefore, it is important to establish a minimal number of vessels (a "critical mass") for the Israeli commercial fleet that will ensure essential shipping during wartime both to and from Israel and to establish a policy for operating an essential commercial fleet and the ports during an emergency. The capabilities that are required to accomplish this should be determined and an operating plan should be formulated.

The existing infrastructure in Israel's ports for **general cargo**, which constitutes about one-half of Israel's trade, is in need of an upgrade (as was carried out for container traffic) and a designated plan should be drawn up to deal with this issue.

In order to support Israeli shipping, effort should be invested in advancing legislation regarding the tonnage tax, which includes a clause that will require shipping companies to invest in the training of an Israeli officer corps.

In view of the growing cyber threat in general and the threat to Israeli shipping and ports in particular, a plan is needed for the protection of the Israeli commercial fleet and ports against cyber attack.

There is a need for long-term planning of where and when to build **future ports** which are intended to serve the State in its centennial year (2048). The Maritime Policy &

Strategy Research Center considers itself to be a partner in this strategic process, which is being led by the Israel Ports Company.

Third recommendation – Examination by the defense sector of the naval buildup of power and acquisition processes

The naval buildup of power that was approved in recent years by the government is meant to compensate for the lack of Israel's strategic depth by means of a fleet of submarines and the protection of Israel's economic waters, in particular the gas facilities, by means of, among other things, the Saar 6 ships.

During the past decade, flaws and deficiencies have been found in a number of areas:

- Inefficient and unsystematic acquisition processes in the navy and the Ministry of Defense.
- Changes in the defensive envelope of the gas facilities in the Leviathan field which will move them closer to shore, which brings into question the need for ships that have are able to provide solutions far from Israel's shores.

The defense sector and the navy need to draw the relevant conclusions and to create mechanisms and processes that will prevent these situations in the future.

Fourth recommendation – Development and exploitation of offshore energy resources and protection of the environment

Under the geopolitical and market conditions that are expected to prevail in coming years, the government and the gas companies should focus effort on **developing the local and regional gas sector** rather than on searching for distant export markets.

The government should encourage the use of gas in additional sectors of the economy (agriculture, industry, transportation and residential) by means of incentives and primarily by making it easier for users to hook up to the gas system through a scaling back of regulation.

The disappointingly small number of companies that participated in the tender for maritime exploration in 2017 is an indication that foreign companies are not particularly enthusiastic about operating in Israel in the absence of special incentives and that the exclusion of local companies from the tender significantly reduces the chances of its success.

A policy should be established that will incentivize local and foreign investors to invest in the development of gas fields and will reduce the economic risk to which the State is

exposed. The guidelines of this policy should be transparent to the public. In addition, a clear policy should be taken with FDI into Israel.

The decision to move Leviathan's production facility closer to the shore and the ensuing public protest illustrated the lack of a national authority that can take into account a variety of considerations in a decision of this type. It would be worthwhile designating such a body which will facilitate a balanced analysis of the various factors that affect the development of the gas fields and the vulnerability of the infrastructure.

The Maritime Policy & Strategy Research Center carried out a study during the past year that looked at the vulnerability of the various alternatives for the maritime natural gas handling and storage facilities as a result of security threats.

In this context, the rapid technological progress in all aspects of natural gas production facilities (such as FPSO ships as a substitute for the production facility) should be monitored and the new methods should be adopted if they promise greater balance between economic, strategic and environmental considerations.

The policy should be transparent to the public and should take into account the protection of the environment both on land and at sea, including heritage and archaeological sites.

It would also be worthwhile formulating an environmental policy that will protect the ecological system. This should be accomplished by means of a program that will identify the environmental factors related to offshore natural gas that need to be taken into account, including readiness for incidents and accidents that might be caused by the development and production of offshore gas.

Fifth recommendation – Development of professional manpower to deal with Israel's new maritime challenges

A program should be established for the necessary investment of public resources in the education system in order to build a professional infrastructure that can deal with the challenges and opportunities arising from the maritime domain. This program will include the areas of energy production, energy development, protection of the ecological system, including the industries that must deal with these issues, and also the establishment of a "maritime cluster for Israel" that will constitute a platform for discourse among stakeholders. These steps will contribute to, among other things, Maritime Domain Awareness, which is almost non-existent today.

Maritime education and training in Israel on various levels (high schools, training of officers for the commercial fleet and academic programs) have declined in scope and

cannot meet the needs of the State of Israel as a nation that is totally dependent on seaborne trade. A program should be established to rehabilitate these capabilities.

As a first step in this direction, University of Haifa opened a graduate degree program in the 2018-19 academic year, which included a minor in national security and maritime strategy studies, within the School for Maritime Sciences. The program is intended for the naval officers, government officials and gifted students who have completed an undergraduate degree in Political Science or International Relations. The program needs to be marketed among those who would benefit from it, so that the number of participants in the program will grow in the 2019-2020 academic year and will include representatives of all the institutions it is meant to serve.

Israel is recognized worldwide as the startup nation in many areas of technology. Nonetheless, entrepreneurship in maritime technology has not yet found its place and ways should be found to encourage entrepreneurship also in this domain.

Sixth recommendation – Formulation of a foreign policy in the Eastern Mediterranean and preservation of essential security interests in the region

During 2018, **Russian presence and activity** increased in the Eastern Mediterranean. Its maritime presence continued to constitute a fundamental component in Russia's efforts to consolidate its influence in the arena. The Russian presence creates new rules of the game in the entire Middle East and these have a major influence on Israel's ability to freely operate in the region.

The relations with Russia deteriorated following the downing of an IL-20 plane by Syrian anti-aircraft fire during an attack by the Israeli air force in the area of Latakia in September 2018.

The increasing Iranian influence in Syria and South Yemen, which also includes the activity of Iranian forces in the region, is a threat to Israel. The possible activity of the Iranian navy from Syrian ports or in the Southern Red Sea would constitute an even greater threat.

Israel must maintain its freedom to operate in order to counter the Iranian intention to strengthen its foothold in the region and in particular its interest in creating a maritime stronghold in Syria.

To this end, Israel must try to solidify this relationship, with the assistance of the US and Russia, which will include the use of coordination mechanisms that have been created together with Russia, with the goal of maintaining Israel's freedom to operate.

It is mentioned that the response by the Israeli Prime Minister to the Iranian threat to restrict freedom of passage in the Southern Red Sea, which was made in the summer of 2018, be backed up by an overall naval strategy, in order to deal with the issue by way of a maritime coalition of Western forces in the region or independently.

As part of the Israeli effort to achieve a long-term ceasefire with Hamas and as part of the plan for the development of Gaza and the improvement of Gaza's economic situation, a commercial port that will serve Gaza and the expansion of the fishing zone for Gazan fishermen can serve as important components. A solution of this type must of course be accompanied by appropriate security arrangements that will prevent the smuggling of weapons to the terrorist organizations in Gaza.

The Maritime Policy & Strategy Research Center feels that it is important that the port be built in Gaza itself and that one of the more attractive alternatives is an artificial island that is connected to the shore and which will meet the need for security inspections of cargo.

Seventh recommendation – Establishment of a body and a process that will examine the involvement and activity of foreign companies in Israel's ports and their effect on Israel's security

In August 2018, the Strategic Evaluation carried out by a joint working group of the Hudson Institute and the Maritime Policy & Strategy Research Center examined the **Chinese interests** in the Mediterranean and the Red Sea. The insights reached included the following:

- The Chinese initiative to build and operate ports all over the world has an economic motive but also political and military aspects that are related to the Chinese strategy of combining military and civilian infrastructures.
- Israel must define the desirable extent of China's involvement in the Israeli economy, while preserving Israel's security interests.
- There is currently no formal interministerial process for examining the national security aspects of foreign investment in the Israeli economy, beyond purely commercial interests. It is recommended that investments over a certain size and in certain sectors be examined in the aforementioned framework, which will be under the auspices of the National Security Council.

It is recommended that Israel reexamine the contract for operation of the Hamifratz Port in Haifa by a Chinese company from a national security perspective and that changes be carried out if necessary, with the goal of preventing or at least reducing the accompanying risks.

Eighth recommendation – Advancement and consolidation of the Israeli maritime law

Since the previous report, there has been progress in the advancement of the proposed Economic Waters Law, 5777 – 2017, according to the version that was approved by the Ministerial Committee for Regulation, and it was approved on First Reading by the Knesset on November 13, 2017.

At this point in time, the proposed legislation is being prepared for Second and Third Reading in the Finance Committee. There have been three professional discussions of the law's various clauses.

It is important to formalize the application of Israeli law in the coastal zones at this point in time since not passing the proposed legislation is liable to expose the country to legal claims, which will require that the Planning and Building Law, 5725 – 1965, be applied to the development of the gas fields that are outside the territorial waters. In its present form, this law is not appropriate to the character of offshore activity.

The examination of the law's clauses in the Finance Committee and their approval should be completed without delay.

An attempt should be made to reach agreement on the disputed areas of overlap with the Exclusive Economic Zones of neighboring countries (and in particular Lebanon), including referral to arbitration processes involving a third party, according to the rules of international law.

In the absence of agreement on maritime boundaries and extra-territorial resources, the employment of mechanisms that are consistent with international law should be considered. This includes, among other things, a mechanism of express consent as a condition for the development of extraterritorial reservoirs and/or the consideration of models for prevention and/or deterrence of the theft of State resources.

The preparation of the policy document by the Planning Authority of the Ministry of Finance should be completed in the near future. It is important that the policy document be approved by the government prior to and/or in synchronization with the approval of the proposed law by the Knesset.

Professional manpower should be trained in order to deal with matters related to maritime law within international organizations.

Practices and methods that are used in the development of offshore energy infrastructures in the Western world should be adopted. This will make it possible for

a democratic country to find the right balance between the exploitation of its energy resources and to use energy profits correctly in order to strengthen the economy, the education system and the protection of the ecological system.

Ninth recommendation – Integration of the Maritime Policy & Strategy Research Center within national research studies

The examination of strategic and foreign policy issues in the maritime domain requires special multidisciplinary knowledge that is not currently available in Israel.

The Maritime Policy & Strategy Research Center is, among other things, an independent multidisciplinary knowledge center for maritime strategy, in the broadest sense of the term, with emphasis on Israel and its maritime environment in the Eastern Mediterranean and the Red Sea.

Over the years, the Center has developed extensive relationships that can contribute to the international maritime strategic discourse that Israel is a part of.

This situation presents the State of Israel with the possibility of exploiting the professional and scientific knowledge that already exists at the Center and investing the resources required in order to allow its researchers to carry out high-quality applied research in relevant topics and in this way to strengthen Israel's maritime status.

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The Maritime Policy & Strategy Research Center is engaged in research on maritime strategy as part of Haifa University's effort to lead the Israeli national research in maritime and sea science. The Center conducts academic research in the areas of regional security and foreign policy, the movement of goods, people and ideas, law, energy and the environment – all while examining their impact on the national security of the State of Israel.

The 'Maritime Strategic Evaluation for Israel, 2018-2019', reviewed the main changes in the maritime domain globally as well as regionally (East Mediterranean) The 'Maritime Strategic Evaluation for Israel' included action plans and policy recommendations for decision makers which, in the opinion of the authors, can help Israel strengthen the sea component of Israel's national security and promote the sea-related economy as a growth engine (blue growth) for the Israeli economy.

The report was written by researcher fellows from Maritime Policy & Strategy Research Center at the University of Haifa, and researchers from the University of Haifa who have a unique knowledge of these subjects.



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