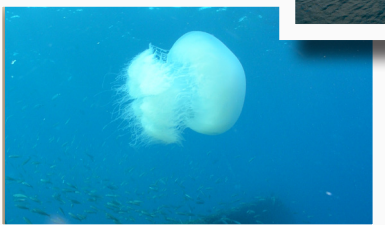
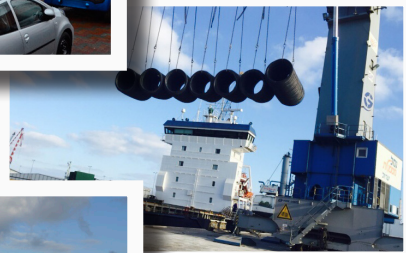
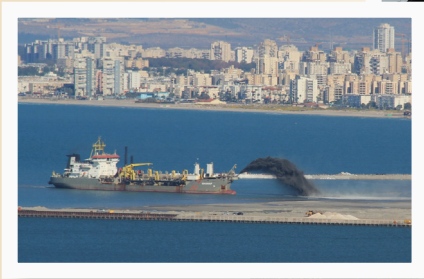


MARITIME STRATEGIC EVALUATION FOR ISRAEL 2018/19

Chief editor: Prof. Shaul Chorev

Edited and produced by: Ehud Gonen



Developments in the Construction of Artificial Islands and Floating Platforms during the Past Year

Moti Kalmar, 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

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.

alternatives for the 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 Haifa Center for Maritime Policy and Strategy 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

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?plD=597559>

of the options, although it appeared that the intention of the tender was a dry land island (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.

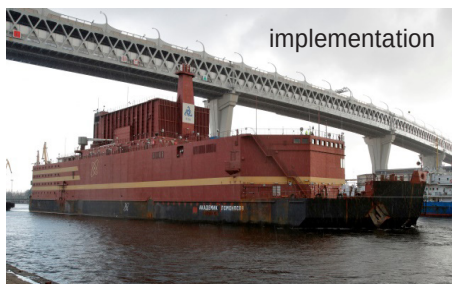
Innovation abroad

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.

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>

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 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

7 Plans for China’s floating nuclear reactors can be found at <https://www.popsci.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 Haifa University 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>

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 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.

10 Floating Production Storage and Offloading.