



New Prospects Open Up for Deep-Sea Mining

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Despite the non-adoption of the Mining Code by the International Seabed Authority (ISA), the possibility of obtaining permits from the ISA to extract metals from the seabed in international waters has opened up since July this year to companies and countries, including Poland. The challenge will mainly be to ensure an adequate level of environmental protection, so it is advisable to accelerate research to develop more environmentally friendly extraction technologies.

Deposit Characteristics. There are three forms of marine metal deposits considered to be the most attractive for mining. The first are polymetallic nodules, which are usually a few to a dozen centimetres in diameter, formed by the precipitation of metals from water and littering up to 70% of the sea and ocean floor at depths of about 3-6 km. They are mainly composed of manganese, nickel, copper, and cobalt, but also lithium, gallium, and rare-earth elements (REE). The second form is massive polymetallic sulphides—hydrothermal vents that rise from the seafloor to a height of tens of metres, typically formed between 800 m and 3 km below sea level. They contain mainly iron, copper, zinc, and lead, as well as silver and gold. The third type is ferromanganese crusts, which are layers that form on bedrock at depths of 400 m to 7 km. They consist mainly of iron, manganese, and cobalt, but also include, for example, nickel, platinum, and REEs. In addition to composition and depth, these deposits also require different mining techniques. At present, it is assumed that special harvesters moving along the seabed can be used to suck up the nodules, while more intrusive mining operations would be necessary for sulphides (in an area limited by the size of the vents) and crusts (a larger scale via surface mining).

The scale of the seabed metal resources is evidenced, for example, by geologists' estimate that the amount of cobalt ore in the Clarion-Clipperton Zone alone (an area of about 6 million km² in the northeastern Pacific Ocean) is about 50 million tonnes, when nearly half of the world's onshore deposits in the Democratic Republic of Congo amounts to about 3.5 million tonnes. Interest in these resources has

therefore been growing strongly in recent years, with advances in technology and robotisation increasing the potential for deep-sea mining operations. It has also been closely linked to the increasing demand for REEs, often crucial for the energy, defence, automotive, and telecommunications sectors. This interest is also influenced by the acceleration of the energy transition in the EU and around the world, increasing demand and the desire to diversify the sources of metals used in, for example, the production of cables and electronic devices (e.g., copper) or batteries and accumulators (especially cobalt, lithium, manganese, nickel).

However, environmental issues are a significant challenge. In particular, sceptics of mining point to disturbance of ocean flora during the works (especially in the case of surface mining). They are also concerned about dust clouds with high concentrations of heavy metals floating in the water, which could adversely affect living organisms, especially filter feeders such as sponges and mussels. Technology development may be the answer to that, such as EU-funded research into minimising ground disturbance and particle emissions when harvesting nodules with marine harvesters under the Blue Nodules and Blue Harvesting projects.

Management of Offshore Mining. According to the 1982 United Nations Convention on the Law of the Sea (UNCLOS), the legal regime of offshore mining activities depends on the location of the deposits. For those within an Exclusive Economic Zone (up to 200 nautical miles from the boundary of the territorial sea) or continental shelf (generally up to 350 nautical miles), the state has full

sovereign rights to exploit the natural resources and therefore sets the rules itself. Deposits in the high seas, which make up about two-thirds of the Earth's water areas, are, according to UNCLOS, the common heritage of mankind and their exploitation is supervised by the ISA, which issues permits for exploration and extraction. The ISA members (169) are the EU and all parties to UNCLOS, which is most countries, with the exception of Iran, Turkey, the U.S., Venezuela, and some others. So far, ISA has granted a total of 31 exploration permits to governments and companies from, among others, China, France, India, Japan, South Korea, Germany, Russia, Jamaica, Nauru, and Tonga. Poland has two: one for exploration for nodules in the Clarion-Clipperton Zone in the Pacific within the Interoceanmetal organisation, of which it is a member, and an individual one for sulphide exploration on the Mid-Atlantic Ridge in the Atlantic.

However, ISA has so far not licensed the exploitation of the deposits, mainly because it has not adopted the rules for such activities required by UNCLOS (the so-called Mining Code) concerning, among others, safety, environmental protection, insurance, and profit-sharing from mining. Work on these rules, which started in 2014, has been slow due to conflicting interests, although a draft version of the Code was adopted in 2018. In July 2021, frustrated with the lack of progress, Nauru, which has in the meantime contracted with Canadian company TMC to mine deposits in part of the Clarion-Clipperton Zone, triggered a legal mechanism requiring the ISA to finalise the Code within two years or issue mining permits on a provisional basis. This deadline expired in July 2023, meaning ISA can start issuing permits despite the absence of a finalised Code. Concerned about the environmental impacts, Fiji, Palau and Samoa, backed by NGOs, have called for a moratorium on seabed mining activities. Their initiative has so far been supported by 21 countries, including Chile, France, Canada, Germany, and Portugal. However, the moratorium proposal submitted to the ISA Assembly in August 2023 did not receive the necessary majority to be included on the agenda and will only be able to be brought up again at next year's Assembly meeting.

Further Prospects. The first companies, such as TMC, have already announced that they will submit mining applications to ISA in 2024 at the latest. They are likely to be in a hurry, especially as the Convention on the Conservation of Marine Biodiversity, which will impose additional restrictions on deep-sea mining, is expected to come into force in 2025. It can also be assumed that some countries with an interest in this activity will not ratify the convention.

At the same time, the ISA declares its willingness to continue work on the Mining Code with a working deadline of 2025. The chances of its adoption remain modest. The main issue

in contention is the distribution of revenues from deposits extracted in international waters, part of which should go to all members of the organisation, in line with the principle that the resources of the high seas are the common heritage of mankind. The current arrangements for calculating royalties are questioned particularly by African states, as not sufficiently reflecting this requirement.

The chances of ISA agreeing to the first extraction works, on the other hand, are quite high. This is due to the organisation's governance rules. Although permits are issued by the ISA Council, composed of 36 countries (Poland, among others, sits on it until the end of 2024), the key role is played by the 30-member expert Legal and Technical Commission, which, in accordance with UNCLOS, gives its opinion on applications and (at least in the case of applications for exploration) is usually in favour of them. A positive recommendation by the commission is decisive unless the Council rejects it by a two-thirds majority of each of its five voting groups. Meanwhile, for example, until the end of 2024 there will be three countries strongly interested in seabed mining among the four countries in Group A (the largest consumers of minerals), namely China, Japan and Russia, and two in Group B (the largest investors), India and South Korea. Thus, support for an application from two countries in any of these groups would be sufficient to obtain a permit if the Commission approves it. It is also potentially possible for the proposal not to be referred to the Commission and to be considered by the Council alone, making it more difficult to approve (needing a two-thirds majority, including a simple majority in each voting group). However, this is less likely, as applications for exploration have been referred to the Commission in the past, so it is reasonable the same treatment would be given to those for mining.

Conclusions. The issue of offshore mining is gaining importance and there is a chance that the first mining works will start in the next few years. From Poland's perspective, it would therefore be advisable to pursue the exploration of its allocated areas efficiently and to consider submitting applications for the allocation of new zones that are geographically close (e.g., for sulphides in the South Atlantic). It also seems reasonable to follow the progress of companies applying for mining permits and, if they are successful, to consider submitting own applications. At the same time, it seems necessary to engage more strongly in scientific research into technologies that would allow the exploitation of deposits with minimal environmental impact. At the same time, the mining applications announced by some entities will require Poland, as a member of the ISA Council, to take a position on the admissibility of offshore mining activities as early as 2024.