

## **New Developments in Deep Seabed Mining**

### **Speech by Michael Lodge, Secretary-General, International Seabed Authority to the Hamburg Business Club**

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It's a real pleasure and honour for the International Seabed Authority to be here this evening and I wish to thank the Hamburg Business Club for inviting me to speak.

I have been asked to speak about the status and prospects for deep sea mining, which I am very happy to do because I do believe we are at a very exciting stage of development in this new emerging industry. Over the next few years I believe there will be significant opportunities for public and private industrial cooperation in many diverse fields, including exploration geology, environmental management, subsea technology, project development and financing.

But we are not there yet.

It has been a long and arduous road to turn the promise of seabed mining into commercial reality. At various times, and in various combinations, these have included technical, financial, legal and political challenges.

Even now, no commercial exploitation is taking place and deep sea mining remains a frontier industry. But the pace of activity has increased dramatically over the past several years and we are seeing rapid development in all sectors of the industry.

So, where are we up to? And why are we even considering this expensive, uncertain and risky venture into the deep unknown?

This evening I will briefly talk about the current state of affairs.

After that, I will say a few words about the overall context in which this industry is developing and explain why I think that deep seabed mining is an essential component of the global vision for a sustainable world.

Let me begin by giving you a little bit of background about the International Seabed Authority.

We are a truly unique organization. Our jurisdiction covers the entire seabed and subsoil of the earth beyond the national maritime jurisdiction of States. That is about 54% of the ocean floor. Under the United Nations Convention on the Law of the Sea, this is known as the Area.

This Area and its mineral resources are designated by the Convention as the common heritage of mankind, which means, first, that no country or entity can operate in that area without the consent of the International Seabed Authority, and, second, that we are mandated to collect royalties on minerals

recovered from the seabed and share those royalties among the developing countries that lack the ability to exploit those minerals for themselves.

This is a unique experiment in international relations. We are the only example of an international organization that is mandated to operate in this way and eventually to produce profits for mankind. As with any new idea, this has taken some time to bring into reality.

This slide shows the timeline of the Authority since the Law of the Sea Convention was adopted in 1982. After a slow start, things started to pick up at the turn of the century, and you can see that in the past few years, we have seen a significant increase in activity, with several new exploration projects coming on line.

We also now have 168 member States – the vast majority of the member States of the United Nations – indicating that there is widespread acceptance of the underlying legal regime.

The Authority has authorized 29 different exploration projects involving 22 different countries.

When I say ‘authorized’ it is important to understand that we operate exclusively through a contract-based system.

There are two fundamentals for any State or entity wishing to carry out seabed exploration. They must obtain a contract from the Authority; and they must be sponsored by a State that it is a party to the Law of the Sea Convention. There are three points of significance from the slide. First, the majority of projects have been launched after 2011. Second, compared to the earlier pioneer investments, which were made by State-owned research organizations, most of the post 2011 investments have come from the private sector. Third, sponsoring States include not only the developed economies like Japan, Germany and the UK, but also small developing countries like Nauru, Tonga and Cook Islands, looking to diversify and develop what is referred to as the Blue Economy.

The next slide shows the general location of current exploration activity in the Pacific, Atlantic and Indian Oceans. This does not include a number of projects within national waters, which are not regulated by the International Seabed Authority. For now, let me just focus in on the Clarion Clipperton Zone in the Pacific Ocean, which is by far the area of greatest interest for us in terms of activity.

In this one region – albeit a vast region covering more than 5 million square kilometres – the Authority has issued 15 exploration contracts. Taking account of work done before the Authority came into existence, exploration work has been carried out more or less constantly in this region for more than 30 years. As a result, we have an amazing amount of data and knowledge about the ocean floor in this region and a high degree of confidence in the resource base.

So where are we now in terms of moving towards exploitation?

It is not enough just to have a resource. In order to promote investment, we also need technology and regulation.

Technology in my view should no longer be regarded as a limiting factor. In the last year, we have already seen successful trial mining for seafloor massive sulphides take place at 1,600 metres water

depth in Japanese waters, as well as tests of a nodule collector, Patania I, at 5,000 metres in the Clarion Clipperton Zone.

Last week I attended the unveiling of Patania II which will be used to carry out collection tests in April 2019 in the German and Belgian contract areas. The environmental impacts of these tests will also be closely monitored by the JPIO programme, with full collaboration of ISA and international teams of scientists.

These are just examples. Other contractors are also increasing their exploration programmes and partnerships and many of the companies involved, such as Lockheed Martin, Deme, China Minmetals Corporation, Maersk and Fugro, are important industry players. It seems important to me to emphasize that collaboration will be key. This project of raising nodules from the seafloor is too big and too complex for one player to solve by itself. There will be many opportunities for industrial collaboration in designing technology, including technology for reducing and monitoring environmental impacts.

The third element is regulation, including the financial terms for mining.

Whilst the general principles of the legal regime are laid down in the Law of the Sea Convention, the Authority has to develop appropriately detailed regulations to govern the process of applying for exploitation rights, financial terms of contracts, environmental monitoring and inspection systems and reporting obligations.

A draft of the regulations is presently open for comment by member States and stakeholders, including industry and civil society. At the same time, a financial model of a deep sea mining operation has been prepared to assist countries to negotiate the appropriate financial terms. The Council of the Authority has reiterated its commitment to adopt the regulations by 2020, whilst recognizing that additional work will be required on Standards and Guidelines to support the implementation of the regulations, and that many of these will evolve over time.

### ***Enabling global economic and social development through sustainable deep seabed mining***

At this point I want to say a few words about the overall context in which this discussion is taking place and deep seabed mining as an essential component of a vision for a sustainable world. This is important, for one reason because it is evident that there is a vociferous and growing environmental lobby in some countries that has existential concerns about deep seabed mining.

In saying this I want to make it clear that I do not in any way want to understate the importance of environmental protection. This is something that we take very seriously. The Convention makes it clear that, as a regulator, the Authority has the responsibility to protect the marine environment from the harmful impacts of mining and must develop environmental regulations that ensure that exploration and exploitation take place in a manner that prevents serious harm to the marine environment, both on the ocean floor and in the water column. At the same time, contractors must reduce, mitigate and, as far as possible, prevent harmful impacts and pollution that can affect wider ecosystems and habitats. These are very high environmental standards, and certainly not less than any other ocean-based industry, including offshore oil and gas and wind energy.

It is also worth putting some context and perspective around deep seabed mining.

First, the nature of the operation. The environmental management techniques that will be used by the Authority, contractors and sponsoring States are tried and tested. They include environmental impact assessment, based on collection of baseline data during exploration; long-term monitoring both during and after impact; use of best available technology to minimize impacts and risk mitigation measures. Many guidelines and standards for this new industry can easily be adapted from existing offshore industries.

Second, the scale of operations. The 29 exploration contracts currently issued by the Authority cover about 1.1 million square kilometres of seafloor, with about 800,000 square kilometres under exploration in areas under national jurisdiction. But that is a minuscule portion of the ocean floor – less than 0.5% according to GEOMAR. The part of this area that might eventually be mined is even less, since exploration areas are typically much larger than mineable areas. In the case of polymetallic nodules, for example, we would expect a typical 20-year mining operation to impact an area of around 8,500 square kilometres, or about 1% of the original exploration area. For other mineral resources, the geographic footprint is even smaller.

In these circumstances I am disturbed by the fact that popular perception of deep seabed mining is increasingly subject to wildly inaccurate and distorted scenarios portrayed by some sections of the media and interest groups. This is irresponsible. Suggestions that deep seabed mining will inevitably cause large-scale irreversible damage and ecosystem collapse appear to be grossly exaggerated and lack any basis in fact.

Furthermore, the ocean conservation lobby appears reluctant to address the real and uncomfortable issue for them, which is the environmental trade-off between land-based mineral production and seabed mineral production.

It is essential that deep seabed mining must be considered in a broader context.

Whilst the industry shares many of the characteristics of the offshore sector, fundamentally it is about mining and metals. Mining and metals are essential to global economic and social development and an integral part of any foreseeable economy and society. The prospects for deep seabed mining are thus intrinsically linked to the prospects and challenges facing the mining and metals sector in sustainably meeting global demand for minerals over the next 50 years.

All indications are that, notwithstanding reductions in demand owing to more effective recycling, substitution of materials and innovation in processing technologies, increases in demand for minerals are inevitable for the next 50 years or so.

Estimates vary, but if mineral demand were to increase at a 1 per cent annual rate, as predicted by the U.S. Geological Survey, it will be about 60 per cent higher than today by 2050. For specific commodities, the increase may be much higher. For example, the European Commission estimates that demand for copper – one of the key minerals of interest for deep seabed mining – could increase by up to 341 per cent by 2050 compared to 2010.

The key driving factors behind this long-term trend are population growth and increases in the standard of living.

Between now and 2050 it is estimated that the world's population will grow from just over 7 billion to 9.6 billion. The bulk of that growth will take place in Africa and Asia, where the demand for an improved quality of life will drive the need to access goods and services. Africa, for example, now has the fastest-growing middle class in the world.

Against these long-term trends, economic cycles, recycling, materials substitution and other factors are likely to be only second-order controls on overall demand for new minerals, although they will be important locally and for shorter periods.

How to accommodate those demands and needs within planetary boundaries is one of the great challenges facing decision-makers in all regions and industrial sectors. For the minerals sector, the challenge is even more acute since, according to the World Bank, 'mineral resourcing and climate change are inextricably linked, not only because mining requires a large amount of energy, but also because the world cannot tackle climate change without adequate supply of raw materials to manufacture clean technologies.'

Let us not forget that mining on land is not traditionally considered to be a clean industry, even though the industry has recognized the need to transform the sector and enormous progress is being made. But there are obstacles to progress, not least the fact that an increase in mineral demand also means an increase in consumption of key enabling resources, such as water and energy. Mining is extremely energy intensive and one of the biggest contributors to global carbon emissions. For example, the European Commission study I mentioned earlier found that the energy required for copper production could be as high as 2.4 per cent of global energy demand in 2050, compared to 0.3 per cent today.

There is a strong argument that, compared to terrestrial mining, deep seabed mining requires less fixed infrastructure and has the potential for securing resources with a lower carbon footprint, reduced waste and lower energy consumption. There are also issues around human rights abuses in the mining industry, as well as environmental damage to rivers, waterways and human settlements.

Furthermore, for several developing States, which I have hardly had time to touch on tonight, seabed mining has the potential to become an integral part of a transition to a sustainable blue economy. In the case of the deep seabed beyond national jurisdiction, which is managed through the Authority, there is a mechanism in place to ensure equitable distribution of benefits and social equity.

### ***Concluding remarks***

Achieving sustainable consumption means that we will all need to adapt to a circular economy, accelerate technological innovation to reduce waste and energy consumption, minimize the carbon footprint, and ensure fair and equitable participation.

In my view, seabed mining offers substantial potential for developing high-grade, abundant, mineral resources over the long term and in this context, the contribution of deep seabed mining towards increased long-term demand for minerals must be part of the overall vision for a sustainable world.

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