

AT A CROSSROADS:  
**EUROPE'S**  
ROLE IN  
DEEP-SEA  
MINING





## At a crossroads: Europe's role in deep-sea mining

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*“Just stop. Think about the opportunity that now is before us. We have the choice to embrace nature with care, restore the damage insofar as we can, and respect what remains intact. Doesn't mean we are not using the deep sea. We're breathing. We're living. So, let's take that option. Let's choose life over destruction.”*

Oceanographer Sylvia Earle on the dangers of deep-sea mining.<sup>1</sup>

## Summary

The transition to renewable energy, the shift to electric cars, the acceleration of digitalisation, and our ever-growing cities all require vast amounts of metals and minerals. Already this is leading to a mining boom in the Global South, causing irreparable environmental and social damage. The mining industry is also more and more venturing into new frontiers. Now it is targeting one of the most biodiverse, fragile and life-sustaining ecosystems on Earth: the deep sea, the least explored area on Earth, covering more than half of the planet. Europe (in this paper including the EU and its Member States, Norway and the UK) is a major player in this 'race the bottom'. But it can also choose to champion deep-sea protection – in its own seas and globally.

The projected soaring raw-materials demand and geo-political concerns about “security of supply” has triggered the “biggest landgrab in the history of humankind”, as marine biologist and explorer Sylvia Earle calls it. Areas approved for deep-sea mining (DSM) exploration now cover over 1.3 million square kilometres in the Pacific, Indian and Atlantic Oceans. The coveted prize: metals such as cobalt, nickel, copper, manganese and rare-earth elements that have accumulated over millions of years in the ocean's depths. Sites of DSM interest often include highly vulnerable marine ecosystems and biodiversity hotspots. Scientists have warned repeatedly of large-scale, irreversible biodiversity loss.

Europe has a substantial share of responsibility for growing global metal demand, using up 20% of global mineral production for less than 10% of the world's population. It is therefore not surprising to find European countries and companies at the forefront of DSM developments. Several European countries have high stakes in DSM. Of the 30 exploration contracts the International Seabed Authority (ISA) has established so far, European contractors hold a total of nine. Countries sponsoring or holding contracts include Belgium, Bulgaria, Czech Republic, Slovakia, Poland, France, Germany and the UK.

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<sup>1</sup> YouTube (2021). “Oceanographer Sylvia Earle on the Dangers of Deep-Sea Mining”.  
At: <https://www.youtube.com/watch?v=PanBRbX76xM>



Some EU countries, such as Spain and Portugal, have previously signalled interest in exploring for marine minerals on their continental shelves. Norway has announced it could start permitting DSM exploration on its continental shelf as early as 2023. Other countries, e.g. the Netherlands and Italy, have companies that are significantly involved in DSM technology development. Some countries show more caution, e.g. Sweden stated its support for a moratorium in a response to the EU Biodiversity Strategy.

The EU and European countries can have a strong influence on the global future of the sector, since all are member of the ISA. For a long time, however, the EU's position on DSM has been ambiguous. The 2012 Blue Growth Strategy promoted DSM into the EU's top five priority maritime sectors. Millions of euros of EU research money have been used to study the potential impacts of DSM, and even more millions to develop DSM technologies. Following a narrative that "European companies will do it better than others" and "it will happen anyway, so we better make sure it is done to high standards", the Commission failed to investigate the actual need for DSM.

The many recent scientific warnings and the tidal wave of calls for a ban or moratorium nevertheless seem to have shifted the EU's position. The 2020 adoption of the EU Biodiversity Strategy – implicitly calling for a moratorium on DSM, as the European Parliament already did explicitly in 2018 – seems to have led the Commission to shift gears. After more than a decade of silent presence at ISA negotiations, the Commission seems set to take a joint EU position at negotiations on ISA environmental exploitation regulations.

At the request of President von der Leyen, the Blue Growth strategy will this year be re-invented as a Sustainable Blue Economy strategy more in line with the Green Deal, hopefully moving away from its earlier explicit support for DSM. Ironically, however, it is the Green Deal, with its decarbonisation and digitisation objectives, that risks triggering a mining boom. Profiled as the EU's new 'growth strategy', the Green Deal sees 'security of supply' of raw materials as a key-priority to underpin its decarbonisation and digitalisation policies.

This has been concretised in the EU Raw Materials Action Plan, which includes plans to expand mining in both the Global South and in European countries like Portugal and Spain. And although the Action Plan does not mention DSM by name, it also encourages exploring new frontiers and innovative methods for mining. The Action Plan does acknowledge the EU's 'enormous appetite for resources' and notes that 'the underlying problem ... needs to be addressed by reducing and reusing materials before recycling them'. However, it fails to set binding targets for reducing the EU's material footprint. Other Green Deal strategies, such as the circular economy, decarbonisation, mobility and digitisation strategies, also lack such targets.

All of the above underscores the need for a much more transformative European Green Deal, one which is able to downscale economic consumption, shifting its priority from destructive growth to meeting people's needs without overshooting Earth's ecological ceiling. **Transformative change means doing things differently— not just a little more or less of something we're already doing.**<sup>2</sup>

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<sup>2</sup> IPBES, "What Is Transformative Change, and How Do We Achieve It?". At: <https://ipbes.net/news/what-transformative-change-how-do-we-achieve-it>



DSM is not happening yet, but 2021 will likely be an important year for its potential development and the seabed's future. The ISA, which has as a mandate the regulation of mineral exploration and extraction in the deep seabed – as well as the protection of the deep seabed – is expected to push forward the negotiation of exploitation regulations. This would allow the start of commercial extraction of deep-sea minerals within a few years. As this is being written, the Belgian company GSR is conducting the very first equipment tests in the Clarion-Clipperton Zone, while Norway has announced it could possibly issue exploration licences for DSM on its continental shelf as of 2023.

## The way ahead: ten steps for Europe to champion deep-sea protection

1. Transition to a resource-efficient Green Deal and Blue Economy that focusses on wellbeing of planet and people, i.e. aims for “growth without economic growth”, following EEA, IPCC, IPBES and IRP recommendations.<sup>3</sup>
2. Set binding EU and national material-footprint reduction targets for 2030, 2040 and 2050 – including for mining and metals supplies – and mainstream those into all related EU and national policies e.g. those dealing with circular economy, industry, energy, mobility, climate, renewable energy and digitalisation and urbanisation.
3. Protect the deep sea in line with the nature recovery and protection commitments of the EU Biodiversity Strategy and the Leaders' Pledge for Nature.
4. Prohibit DSM in European waters/continental shelves following the example of the 2021 DSM ban by Australia's Northern Territory or set conditions such as established for by the DSCC's moratorium call.<sup>4</sup> Ensure this is embedded in the EU's new Blue Economy and International Ocean Governance strategies.
5. As members of the International Seabed Authority: advocate a conditional prohibition in international waters along the lines of the European Parliament's 2018 call for an international moratorium and of the DSCC's call for a moratorium. Cease sponsoring and permitting DSM exploration contracts and refrain from sponsoring or permitting exploitation contracts.
6. Following examples such as the Conflict Minerals Regulation,<sup>5</sup> adopt specific trade and sectoral (e.g. batteries) regulations banning import and use of raw materials or manufactured goods that have been obtained from or produced with deep-sea minerals.

<sup>3</sup> EEA (2021). “Sustainability: What are the alternatives to economic growth?”. Copenhagen: European Environment Agency. At: <https://www.eea.europa.eu/highlights/sustainability-what-are-the-alternatives>

<sup>4</sup> DSCC (2019). “DSCC Position Statement on Deep Seabed Mining”. Amsterdam: Deep Sea Conservation Coalition. At [http://www.savethehighseas.org/wp-content/uploads/2019/08/DSCC-Position-Statement-on-Deep-Seabed-Mining\\_July2019.pdf](http://www.savethehighseas.org/wp-content/uploads/2019/08/DSCC-Position-Statement-on-Deep-Seabed-Mining_July2019.pdf)

<sup>5</sup> EU (2017) “Official Journal of the European Union”. Brussels: European Union. At:<http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2017:130:TOC>

7. Stop funding DSM technology, and instead support fundamental research into the role and functioning of deep-sea ecosystems, their contribution to carbon storage and the regulation of planetary processes, as well as into pathways to drastic reduction of resource-use (e.g. post-growth, transition economies and sustainable consumption and production).
8. Ensure institutional reform of the ISA by establishing environmental and scientific committees, enhancing environmental competence and transparency, amending the voting and decision-making and the 'use it or lose it' and two-year trigger clauses, ensuring accountability and full involvement of civil society and stakeholders and enshrining judicially binding human-rights due diligence for companies<sup>6</sup>.
9. Ensure overarching ocean governance through the global Ocean Treaty (on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction) that includes the conservation of the deep seabed and redefines the role of the ISA, integrating it into other existing bodies and treaty organisations.
10. Involve environmental ministries, scientific bodies and stakeholders in the adoption of relevant decisions regarding DSM in national and international waters, raise awareness and establish processes for public participation.

## Objectives and scope of this paper

This paper provides an analysis of the existing policies and positions of the European Union and its Member States as well as of Norway and the UK in relation to DSM and connected Green Deal and raw-materials strategies. Besides introducing basic facts about DSM and its potential impacts, it also presents individual factsheets summarising national involvement of EU member states, Norway and the UK and a list of EU-funded research projects related to DSM.

The paper proposes ten steps for Europe to champion deep-sea protection. It aims to contribute to the shaping of strong EU and country commitments to protect the deep sea, including policies and actions to avert the threat of deep-sea mining.

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<sup>6</sup> See "Deep Sea Mining: is the International Seabed Authority fit for purpose?" [http://www.savethehighseas.org/wp-content/uploads/2020/10/DSCC\\_FactSheet7\\_DSM\\_ISA\\_4pp\\_web.pdf](http://www.savethehighseas.org/wp-content/uploads/2020/10/DSCC_FactSheet7_DSM_ISA_4pp_web.pdf)



*“It is a curious situation that the sea, from which life first arose, should now be threatened by the activities of one form of that life. But the sea, though changed in a sinister way, will continue to exist; the threat is rather to life itself.”*

Rachel Carson, *The Sea Around Us*.

## 1. Deep-sea mining: what's at stake?

### What is deep-sea mining?

Deep-sea mining (DSM) refers to the extraction of minerals from the deep sea, i.e., the area of the ocean below 200 metres in depth. DSM mostly targets metal deposits in seamounts and abyssal areas, where polymetallic nodules, ferromanganese crusts and massive sulphide deposits are most often found:<sup>7</sup>

- **polymetallic nodules** are spherical concretions of up to 20 centimetres found mainly in abyssal plains at depths of 6km and are mostly made up of manganese, nickel and copper, as well as significant concentrations of cobalt;
- **ferromanganese crusts** are formed by precipitation over hard substrates and may include cobalt, nickel, copper, zinc, vanadium, molybdenum, strontium, barium and rare-earth and platinum-group elements. They form “scabs” covering the rocks of seamounts and continental margins; and
- **massive sulphide deposits** are the result of volcanic and magmatic action in hydrothermal vents and, like their land equivalents, frequently present significant concentrations of copper, zinc, silver, gold and lead.

Other types of marine mineral deposits of known commercial interest include phosphorite deposits – made up of organic and other deposits in sedimentary rocks and marine placers, formed by the accumulation of minerals in sedimentary processes, although these are usually not far from the coast.

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<sup>7</sup> Ecologistas en Acción (2020). “Out of sight... Deep-sea mining in Spain”. Madrid: Ecologistas en Acción. At: <https://www.ecologistasenaccion.org/148756/>

Figure 1: Types of marine mineral deposits



polymetallic nodules



ferromanganese crusts



massive sulphide deposits

Source: Jessica Aldred (2019), "The future of deep seabed mining", China Dialogue.

At: <https://chinadialogueocean.net/6682-future-deep-seabed-mining/>

Globally, DSM is still in the exploration phase. Commercial deep-seabed mining is not yet active. In 2017, Japan carried out excavation trials on its continental shelf.<sup>8</sup> The Belgian company Global Sea Mineral Resources NV (GSR) is planning equipment tests in the Clarion-Clipperton Zone in the South Pacific for spring 2021 after a first attempt failed in 2019. India has also announced the intention to carry out DSM trials in the Central Indian Basin in 2021.<sup>9</sup>

The types of deposits and their depths, geomorphology and distances from the coastline determine hypothetical extraction methods, as well as the impacts and their extent. Extraction from the seabed is expected to occur by remote-controlled collector vehicles. In the case of nodules, they would scoop up not only the nodules, but also the first 10 cm of seabed sediment – where most bacterial life is found. Mining machines would be used to excavate and crush ferromanganese crusts from seamounts or massive sulphide deposits from hydrothermal vents.<sup>10</sup>

Delivery of the extracted material to transport ships will be primarily by hydraulic suction systems, through which the extracted material is pressurised and pumped up to ships or platforms on the surface through risers (tubes) up to several thousand metres in length.

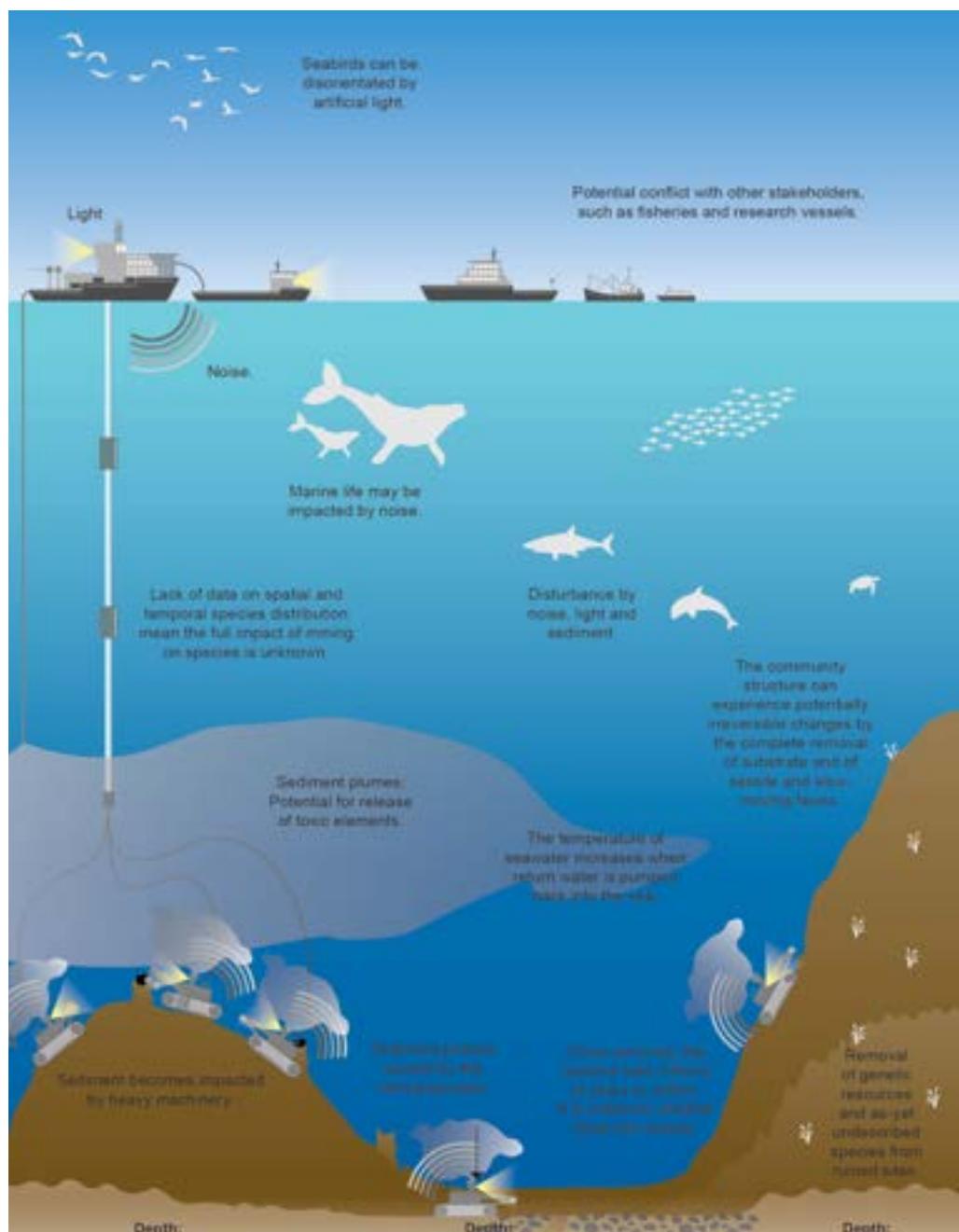
<sup>8</sup> Carver R., et al. (2020) "A critical social perspective on deep sea mining: Lessons from the emergent industry in Japan". *Ocean & Coastal Management* vol. 193. At: <https://www.sciencedirect.com/science/article/pii/S0964569120301526>; BBC (2018) "Japan's Grand Plans To Mine Deep Sea Vents". London: British Broadcasting Corporation. At: <https://www.bbc.com/future/article/20181221-japans-grand-plans-to-mine-deap-sea-vents> ; Mining Magazine (2020). "Japan extracts cobalt, nickel from seabed". London. At: <https://www.miningmagazine.com/exploration/news/1393673/japan-extracts-cobalt-nickel-from-seabed>

<sup>9</sup> MoES (2020) "Deep Sea Mining Systems Trials by MoES". New Delhi: Ministry of Earth Sciences. At: <https://moes.gov.in/content/deep-sea-mining-system-trials-moes>

<sup>10</sup> Cuyvers, Luc, et al. (2018). "Deep seabed mining: a rising environmental challenge". Gland: IUCN; Gallifrey Foundation, pp. 23-27.

Extracted materials would then be pre-processed on ships or platforms, separating ore-bearing materials from sediments. Only a small fraction of the extracted seabed materials would have enough commercial value to justify the logistical costs of their transfer to shore. Most of the extracted seabed material would be discarded to the sea as sediment combined with waste-water. This can happen at different depths – e.g. back to the deep sea or into the mid-water, such as beneath the mesopelagic zone, which is at around 1,000 metres in depth. Both the reinjection of mining waste into the sea and the extraction process itself can generate plumes – clouds of suspended particles – which can have considerable amounts of toxic heavy metals in the case of discarded tailings.

Figure 2: DSM methods

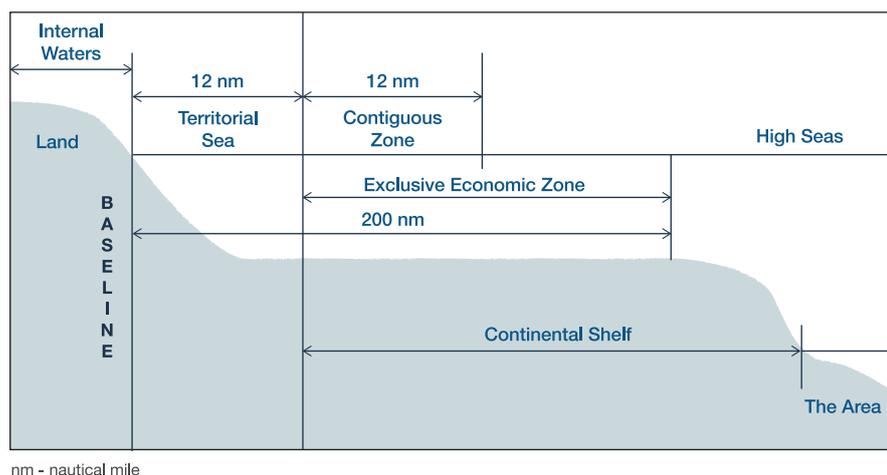


Source: Miller, K.A. et al. (2018). "An Overview of Seabed Mining Including the Current State of Development, Environmental Impacts, and Knowledge Gaps". *Front. Mar. Sci.*, 4: 418. At: <https://doi.org/10.3389/fmars.2017.00418>

## Where could it happen

Potential deposits are located both on countries' continental shelves (jurisdictional waters) or in "the Area", meaning the seabed and ocean floor and its subsoil beyond the limits of national jurisdiction. Although international attention has mostly focused on the Area, deposits of commercial interest are also present within national jurisdictional waters, including those of several European countries.

Figure 3: Maritime zones



Jurisdiction over international waters (the high seas) and the seabed is defined by the 1982 United Nations Convention on the Law of the Sea (UNCLOS). The exploration and exploitation of mineral resources in the Area is under the governance of the International Seabed Authority (ISA). Deposits in the Area include those from the Pacific's Clarion-Clipperton Zone, the Mid-Atlantic Ridge, the South Atlantic Ocean and the Indian Ocean, where polymetallic nodules, ferromanganese crusts and massive sulphides can be found stretching along large portions of the seabed.

The rush to mine in the face of slow regulatory processes in the Area has been accompanied by growing interest in deposits located in areas over which European states have direct authority. Exploration projects are under consideration in Norwegian waters, while certain areas, particularly around the Azores and Canary Islands, are being studied. On continental shelves, national governments are responsible for regulation of most maritime activities, including DSM.

Such national jurisdiction over continental shelves extends up to 200 nautical miles (or, when specifically claimed and approved, up to 350 nautical miles) from the coastal baseline. States have special rights to exploit marine resources, including minerals, on their continental shelves. Above the continental shelf, up to 200 nautical miles from the baselines, lies the exclusive economic zone.

**Interest in DSM is one of the main reasons for states to pursue extended limits beyond 200 nautical miles from baselines, often leading to overlapping claims – e.g. mineral-rich Mount Tropic, south of the Canary Islands, is being claimed by both Spain and Morocco.**

### Box 1: The deep sea: rich in unique life, extremely vulnerable, largely unexplored

The deep sea is the entire ocean below 200 metres in depth. It makes up 95% of Earth's living space. But only in recent decades have scientists been able to explore it and understand its importance.

Scientists believe that as many as 10 million species may inhabit the deep sea – a biodiversity potentially as rich as tropical rainforests. The majority of species are yet to be discovered.

All life on Earth – including human life – depends on the deep sea because it keeps the planet's systems functioning. It drives the global currents that regulate temperatures and weather. It regenerates nutrients. And it absorbs and stores the carbon dioxide emitted by human activity.

Humans benefit from the deep sea in other ways. Deep-sea coral and sponge communities are largely untapped sources of natural products which can be used in medicines, cosmetics and other commercial products. A test to diagnose COVID-19 was developed using an enzyme isolated from a microbe found in deep-sea hydrothermal vents.

The deep sea is the most difficult area on Earth to access: so far, fewer humans have explored its deepest regions than have walked on the moon. But it is also extremely vulnerable.

Most deep-sea species are slow to grow and reproduce, and highly adapted to a largely unchanging environment. This makes them extremely vulnerable to overfishing and other human disturbance. This was recognised by the United Nations General Assembly, which committed nations to protecting the deep sea from harmful fishing activities, "recognizing the immense importance and value of deep-sea ecosystems and the biodiversity they contain."

The deep sea is home to remarkably rich coral systems. Corals were once thought to inhabit only the warm waters of tropical and subtropical regions, but they have actually been thriving in deep, dark and cold waters across the world for millions of years. In fact, over half of all known coral species are found in the deep sea. Cold-water reefs are bustling with life, providing essential sanctuaries and nursing grounds for countless other species.

Adapted from: <http://www.savethehighseas.org/about-the-deep-sea/>

## Prospective areas in European waters

All three types of mineral deposits of commercial interest are present in European waters:

- **Polymetallic nodules** have been found in the gulfs of Riga, Finland and Bothnia, in seamounts south of the Canary Islands and southeast of Svalbard and in the proximities of the Gulf of Cádiz and the Galicia Bank off the western Iberian coast.

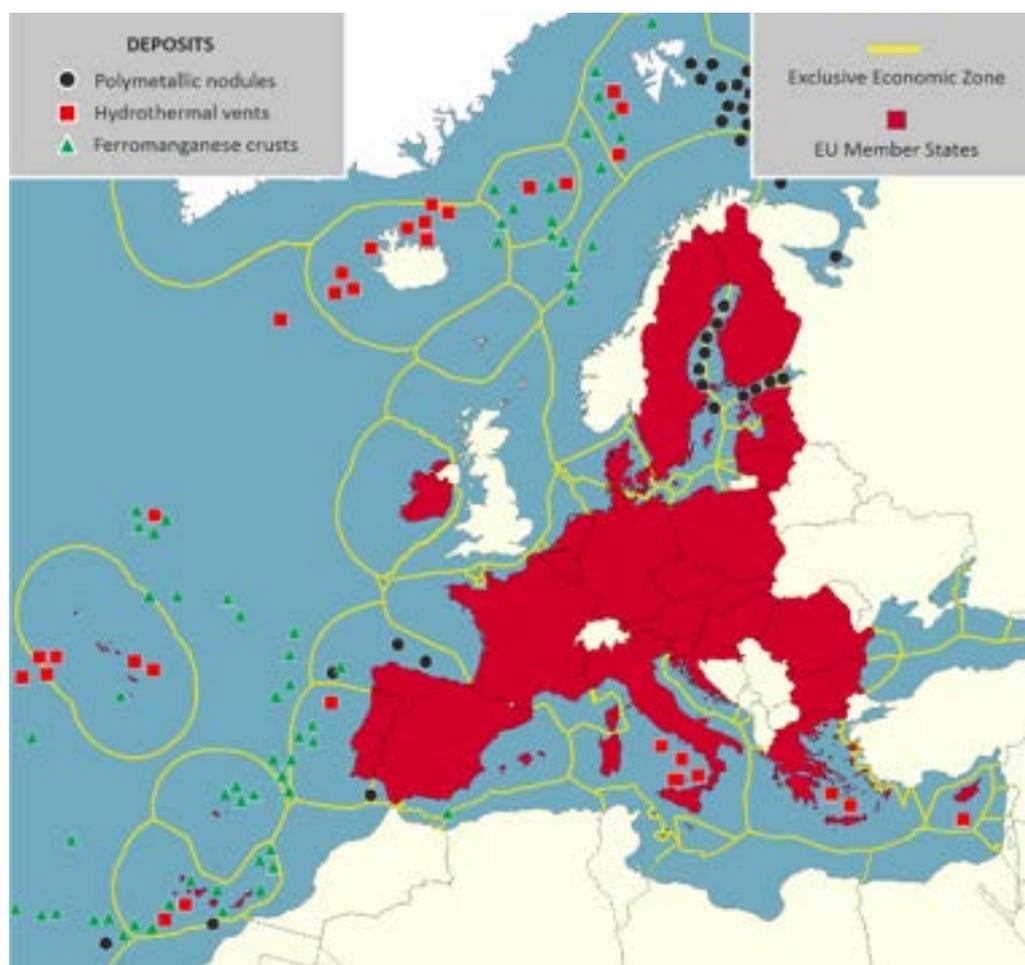
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#### Europe's role in deep-sea mining

- **Cobalt-rich ferromanganese** crusts have been located to the northwest of Norway, to the west of Portugal and north from Madeira, and around the Canary and Azores archipelagos.
- **Sulphide hydrothermal deposits** are present mainly in the Mid-Atlantic Ridge areas, particularly in the proximities of the Azores, Iceland, Jan Mayen Island and the Canary Islands.
- **Sulphide deposits** have also been identified in the Tyrrhenian Sea, off the southwestern coast of Italy.

Several countries are engaging in exploration of their continental shelves and proposed extended continental shelves.

Figure 4: Mineral occurrences in European marine regions



Source: The EU Blue Economy Report 2020. At: [https://blueindicators.ec.europa.eu/sites/default/files/2020\\_06\\_BlueEconomy-2020-LD\\_FINAL-corrected-web-acrobat-pro.pdf](https://blueindicators.ec.europa.eu/sites/default/files/2020_06_BlueEconomy-2020-LD_FINAL-corrected-web-acrobat-pro.pdf)

**At a crossroads:**

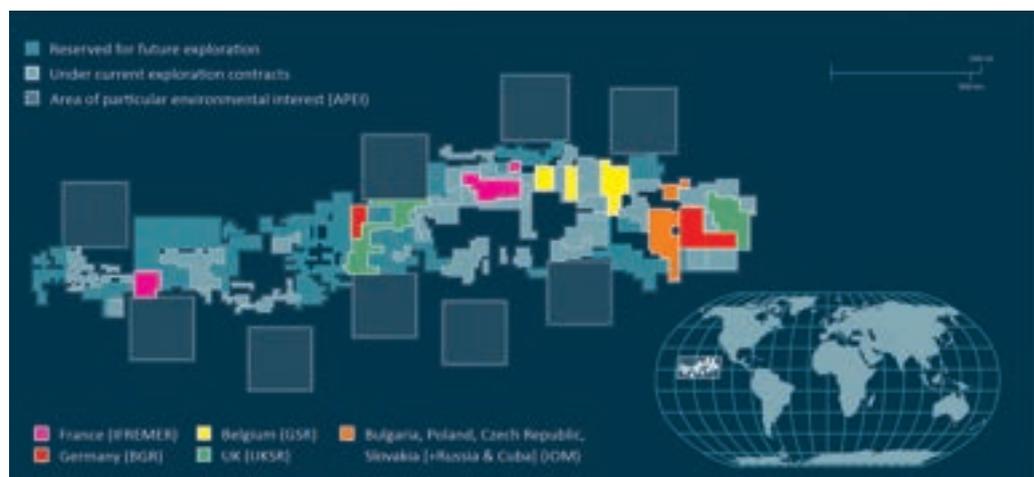
Europe's role in deep-sea mining

The most extensive exploration zones in areas beyond national jurisdiction are within the Clarion-Clipperton Zone, between Hawaii and Mexico in the Pacific, where the ISA has allocated over a million square kilometres of exploration contracts, mainly for nodules. Other areas where claims for deposits of different types have been granted include the Rio Grande Rise, in the South Atlantic; the Mid-Atlantic Ridge to the south of the Azores; the Mid-Indian Basin and Mid-Indian Ridge in the Indian Ocean between India and Mauritius; and in an additional zone in the Pacific between Japan and the Marshal Islands.

Since the first six “pioneer claims” for minerals exploration were issued in 1984, the ISA has established 30 exploration contracts with 21 contractors for polymetallic nodules, polymetallic sulphides and cobalt-rich ferromanganese crusts in the deep seabed. Contracts are signed by governments at their own initiative or in state-sponsorship arrangements with other entities (private companies, public agencies, consortiums, etc.).

**European contractors holding a total of nine exploration licences include two private companies – GSR and UK Seabed Resources Ltd., sponsored by Belgium and the UK respectively; two public agencies – the French Research Institute for Exploitation of the Sea (IFREMER) and the German Federal Institute for Geosciences and Natural Resources (BGR); the Government of Poland; and an intergovernmental consortium, the Interoceanmetal Joint Organization (IOM), a remnant of the Eastern Bloc comprising Bulgaria, Poland, the Czech Republic and Slovakia in addition to Cuba and Russia.**

**Figure 5:** Polymetallic nodule exploration areas in the Clarion-Clipperton Zone



Source: Adapted from the Pew Charitable Trust

**Table 1:** Exploration contracts in the Area sponsored by European states.

Sponsoring state(s)	Nodules	Crusts	Sulphide deposits	Type of contractor
France	1	—	1	Public agency
Germany	1	—	1	Public agency
Poland	—	—	1	Government
Belgium	1	—	—	Private company
United Kingdom	2	—	—	Private company
Bulgaria, Poland, Czech R. and Slovakia	1	—	—	Public consortium

Source: International Seabed Authority

## The risks: large-scale and irreversible biodiversity loss

While the deep sea was thought as recently as the 1970s to be largely void of life, research has since shown that it is in fact home to a vast biodiversity of species and habitats. Only a tiny fraction of the deep sea has been explored to date, meaning that science still faces many unknowns.

But growing scientific evidence stresses how DSM would entail the large-scale and irreversible loss of biodiversity in the deep seas through destruction of species, habitats and ecosystems. This also includes concern about impacts on fish populations, including those of commercial interest, and the potential release of sequestered greenhouse gases from the ocean floor and other impacts on climate change.

Several scientific studies, including multi-year EU-funded research like the MIDAS and MiningImpact 1 and 2 projects, have documented and warned about the known or probable impacts of DSM. Scientific warnings have led numerous bodies and organisations to urge application of the precautionary principle and call for a moratorium, ban or strong precaution on DSM (see subsection ‘Growing calls for a ban or moratorium’ in this report).

<sup>11</sup> Watson, A. J. et al. (2020). “Revised estimates of ocean-atmosphere CO2 flux are consistent with ocean carbon inventory,” *Nature Communications*, 11: 4422. At: <https://www.nature.com/articles/s41467-020-18203-3>

### Box 2: Known or probable impacts of DSM

- The oceans are the planet's main carbon sink, capturing a quarter of CO<sub>2</sub> emitted by human activity (some 2 billion tonnes per year)<sup>11</sup> and also locking away methane. The disturbance of the seabed could contribute to the release of carbon sequestered for millions of years, and interfere with the carbon pump, thus contributing to climate change while suppressing or limiting the capacity of carbon-fixing organisms – such as phytoplankton – and compromising existing absorption capacity.<sup>12</sup>
- Underwater hydrothermal vents associated with massive sulphide deposits play a key role in regulating climate and ocean geochemistry. Their disturbance could affect the amount of nutrients available,<sup>13</sup> with potential effects for the marine food chain.
- Sediment disturbance would create underwater plumes or columns of suspended particles that would adversely affect filter feeders not only in contiguous areas but even at great distances.<sup>14</sup>
- The physical destruction of the seabed over enormous areas – a nodules claim can exploit 9,000 km<sup>2</sup> in 30 years<sup>15</sup> – can cause the fragmentation and loss of structure and ecosystem functions of marine habitats, while habitat-dependent life forms – such as those in nodule fields that take millions of years to form – would never recover outside geological timeframes.<sup>16</sup>
- The returned and likely toxic waste sediment and wastewater would also create large plumes that could move hundreds or thousands of kilometres from the extraction site and affect different depths, smothering plankton and other species in the affected area.<sup>17</sup>
- The potential toxicity of these plumes due to heavy-metal concentrations could affect the entire food chain through bioaccumulation and biomagnification processes, possibly affecting seafood.<sup>18</sup>

<sup>12</sup> Levin, L.A. et al. (2016). "Hydrothermal Vents and Methane Seeps: Rethinking the Sphere of Influence," *Front. Mar. Sci.*, 3: 72. At: <https://doi.org/10.3389/fmars.2016.00072> Also see: <http://www.rfi.fr/es/economia/20200601-la-explotaci%C3%B3n-minera-amenazar%C3%ADa-los-fondos-oc%C3%A1nicos-y-su-biodiversidad>

<sup>13</sup> Howard, P.; Parker, G.; Jenner, N.; Holland, T. (2020). An assessment...

<sup>14</sup> Drazen, J.C., et al. (2019). "Report of the workshop Evaluating the nature of midwater mining plumes and their potential effects on midwater ecosystems," *Research Ideas and Outcomes*, 5: e33527. At: <https://doi.org/10.3897/rio.5.e33527>

<sup>15</sup> Lodge, M. (2018). "New Developments in Deep Seabed Mining". Available at: <https://ran-s3.s3.amazonaws.com/isa.org/jm/s3fs-public/documents/EN/SG-Stats/dsm-hamburg.pdf>

<sup>16</sup> Kaiser, S.; Smith, C.R.; Arbizu, P.M. (2017). "Editorial: Biodiversity of the Clarion Clipperton Fracture Zone," *Mar Biodiv* 47: 259-264. At: <https://doi.org/10.1007/s12526-017-0733-0>

<sup>17</sup> Drazen, J. C., et al. (2020). "Midwater ecosystems must be considered when evaluating environmental risks of deep-sea mining," *PNAS*, 117(30): 17455-17460. At: <https://doi.org/10.1073/pnas.2011914117>

<sup>18</sup> Hauton, C. et al. (2017). "Identifying Toxic Impacts of Metals Potentially Released during Deep-Sea Mining—A Synthesis of the Challenges to Quantifying Risk," *Front. Mar. Sci.*, 4: 368. At: <https://doi.org/10.3389/fmars.2017.00368>

## At a crossroads:

### Europe's role in deep-sea mining

- Seamount ecosystems such as sponge fields and deep corals formed over thousands of years could be damaged or destroyed, ceasing to serve as habitat and pantry for millions of species, many of which are still unknown. Disturbance of these areas could affect migratory species – fish, whales and seabirds – with unpredictable consequences.<sup>19</sup>
- Mining operations would be carried out non-stop, 24 hours a day, year round, for decades, causing noise and light pollution along thousands of metres separating the seabed from the surface,<sup>20</sup> affecting whales and other animals that are dependent on echolocation systems.
- The seabed is home to numerous endangered species, such as the scaly-foot snail (*Chrysomallon squamiferum*) that was included in the IUCN's Red List because of the threat posed by DSM.<sup>21</sup>
- The destruction or extinction of species could prevent the discovery of new medicines associated with life forms present only in the deep ocean. The test for COVID-19 was developed using an enzyme isolated from a microbe found in deep-water hydrothermal vents now targeted by DSM.<sup>22</sup>

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<sup>19</sup> Miller, K.A. et al. (2018). "An Overview of Seabed Mining Including the Current State of Development, Environmental Impacts, and Knowledge Gaps," *Front. Mar. Sci.*, 4: 418. At: <https://doi.org/10.3389/fmars.2017.00418> ; Watling, L.; Auster P.J. (2017). "Seamounts on the High Seas Should Be Managed as Vulnerable Marine Ecosystems," *Front. Mar. Sci.*, 4: 14. At: <https://doi.org/10.3389/fmars.2017.00014>

<sup>20</sup> Miller, K.A. et al. (2018). An Overview of Seabed Mining Including the Current State of Development, Environmental Impacts, and Knowledge Gaps. *Front. Mar. Sci.* 4:418. doi: 10.3389/fmars.2017.00418

<sup>21</sup> Nature (2019). Ocean snail is first animal to be officially endangered by deep-sea mining. London: Springer Nature. At: <https://www.nature.com/articles/d41586-019-02231-1>

<sup>22</sup> Guardian (2019) Scientists fear impact of deep-sea mining on search for new medicines. London: The Guardian. At: <https://www.theguardian.com/environment/2019/may/20/scientists-fear-impact-of-deep-sea-mining-on-search-for-new-medicines> ; Unesco (2020). COVID-19: the ocean, an ally against the virus. Paris: UNESCO. At: <https://en.unesco.org/news/covid-19-ocean-ally-against-virus>

## Deep-sea mining: is it really needed?

Proponents of DSM point to expected growing demand for primary metals and minerals as a result of growing population, increased use of e-devices such as mobile phones and tablets, the transition to renewable energy and electric cars, and accelerating urbanisation, among others. And indeed, business-as-usual scenarios generated by, e.g. the OECD,<sup>23</sup> the World Bank<sup>24</sup> and the IRP<sup>25</sup> project more than a doubling of demand by 2050–60. All warn of the severe climate and biodiversity impacts of mining activities.

Future outlooks for the demand of metals are highly uncertain, however, and often differ largely in growth outlooks. The World Bank study, for instance, concludes that with the battery sector changing rapidly, it was nearly impossible to forecast which technologies will be the most used in 2050. End-of-life recycling, would, according to this study, reduce the amount of primary copper, nickel and cobalt used by that date. The need for DSM is thus still questioned by civil-society organisations and scientists,<sup>26</sup> especially in light of drastic reductions that can be achieved when states deliver on UN Sustainable Development Goal 12 for sustainable production and consumption, and when societies transition to, e.g. sustainable mobility, energy and urban systems. An IRP report, *The Weight of Cities*, shows for instance that compact, resource-efficient cities could see cuts of 36–54% in GHG emissions and in metals, land, energy and water use.<sup>27</sup> An OECD study on future mobility shows that a combination of car sharing and public transport can reduce urban car fleets by 90%.<sup>28</sup>

Furthermore, under its “Towards sustainability” scenario for 2060, the IRP shows that the extraction of metals would increase by only 12% by 2060, compared to doubling under a business-as-usual scenario. The report highlights numerous opportunities for governments, businesses and society together to create and implement policies that will ultimately lead to sustainable resource management. These include better planning, technological innovation and strategic incentives and investments. The IRP report issues an urgent call for transformative change, cautioning that it is not a lack of resources that will limit our economy, but rather the environmental impacts of extractivism. It thus echoes calls for transformative change made by the IPCC and IPBES in their reports.

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<sup>23</sup> OECD (2019). *Global Material Resources Outlook to 2060*. Paris: Organisation for Economic Co-operation and Development. At: [HYPERLINK “https://www.oecd.org/environment/global-material-resources-outlook-to-2060-9789264307452-en.htm”](https://www.oecd.org/environment/global-material-resources-outlook-to-2060-9789264307452-en.htm) <https://www.oecd.org/environment/global-material-resources-outlook-to-2060-9789264307452-en.htm>

<sup>24</sup> WBG (2020). *Minerals for Climate Action*. Washington D.C.: World Bank Group. At: <https://www.worldbank.org/en/topic/extractiveindustries/brief/climate-smart-mining-minerals-for-climate-action>

<sup>25</sup> UN (2019). *Global Resources Outlook: 2019: Natural Resources for the Future We Want*. Paris: International Resource Panel. At: [“https://www.resourcepanel.org/reports/global-resources-outlook”](https://www.resourcepanel.org/reports/global-resources-outlook) <https://www.resourcepanel.org/reports/global-resources-outlook>

<sup>26</sup> Rakhyun E. Kim (2017). *Should deep sea mining be allowed?*. Elsevier: *Marine Policy*, Volume 82, August 2017, Pages 134-137. <sup>27</sup> UN (2019). *The Weight of Cities: Resource Requirements of Future Urbanization*. Paris: International Resource Panel. At: <https://www.resourcepanel.org/reports/weight-cities>

<sup>28</sup> OECD (2021). *ITF work on Shared Mobility*. Paris: International Transport Forum. At: [“https://www.itf-oecd.org/itf-work-shared-mobility”](https://www.itf-oecd.org/itf-work-shared-mobility) <https://www.itf-oecd.org/itf-work-shared-mobility>

## Terrestrial versus deep-sea mining: a false dilemma

Estimates of the potential annual output of cobalt by DSM is in the range of 8% of global production by 2050, and much less for other metals.<sup>29</sup> **A significant reduction in the demand for metals would therefore make DSM obsolete and allow the ISA to focus on its core mission of protecting the deep seabed from irreversible harm.** It would also safeguard many vulnerable terrestrial sites from the mining industry's expansionist dreams.

It is debatable whether or not DSM will be needed to supplement demand unmet by terrestrial mining. Estimates show that despite steadily increasing demand, onshore deposits will in most cases continue to satisfy our growing appetite for metals and minerals for a few decades.<sup>30</sup> Metal prices will need to rise substantially before DSM is commercially viable.

Geopolitical concerns about security of land-based minerals supply seem to be another major driver behind the move to the deep sea. More than 60% of cobalt comes from land-based mines in the Democratic Republic of Congo, and China is currently producing more than 90% of the world's supply of rare-earth materials. DSM, proponents say, would make global supply less prone to national monopolies and avoid the risks of unstable regimes.

In a business-as-usual scenario, in which demand for metals could more than double by 2060, there is also the question of whether the environmental and social impact of deep-sea mining is greater or less than that of land-based mining. At present, there is insufficient scientific information to determine this. The impacts of DSM will also depend on approach.

An indicative comparison of footprints shows that nodule DSM would require an 80 km<sup>2</sup> area to source 1 million tonnes of ores, versus only 0.52 km<sup>2</sup> on land.<sup>31</sup> The comparison between land-based mining and DSM is a false choice, however. It is highly unlikely that DSM will replace terrestrial mining. Rather it would exist in addition to terrestrial mining, which is also set for a boom. Moreover, if DSM were to go ahead, it would be in addition to terrestrial mining, potentially doubling or tripling the area or nature of impact from mining on the globe<sup>32</sup>.

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<sup>29</sup> Rozemeijer, M.J.C., et al. (2018). "Seabed mining," in Johnson, K.; Dalton, G., and Masters, I., Eds., *Building Industries at Sea: 'Blue Growth' and the New Maritime Economy*. Gistrup: River Publishers. At: <https://seas-at-risk.org/27-deep-sea-mining/976-deep-sea-mining-not-needed-for-the-future-we-want-2.html>

<sup>30</sup> Ali, S. H., et al. (2017). "Mineral supply for sustainable development requires resource governance," *Nature*, 543: 367-372. At: <https://www.nature.com/articles/nature21359>

<sup>31</sup> Weaver P. (2017). "Key environmental issues related to deep sea mining". Presentation at Seas At Risk-Oceano Livre conference, 'Deep-sea Mining – A sustainable choice for Portugal?', Lisbon 27th October, 2017

<sup>32</sup> Smith (2020). University of Oxford, "Grand challenges in science seminar series: Deep sea mining". At: Oxford NERC DTP Grand Challenges 2020 Deep Sea Mining - YouTube

Even though a lot of progress has been made, much still needs to be done in several countries to make land mining socially and environmentally responsible. A paper in the Harvard Environmental Law Review warned that DSM threatens the same pitfalls as previous resource scrambles, in which environmental and social impacts were ignored and the rights of Indigenous people marginalised.<sup>33</sup>

### **Box 3: The missing link: an international governance mechanism for the conservation and sustainable use of all mineral resources**

In its 2020 report, *Mining Resource Governance in the 21st Century*, the IRP points to an important missing link in global governance, namely the lack of an international body mandated to oversee the conservation and sustainable use of mineral resources.

The IRP concludes that: “Effective governance of mineral resources fundamentally requires better signalling between demand for particular emerging technologies that require minerals and the extractive enterprises that will supply them, in place of the ad hoc arrangements and contracts between particular firms and suppliers, which are often economically and ecologically inefficient.” It calls for the establishment of an international coordination mechanism facilitated through an international mineral agency or an international agreement.

Until this missing link is addressed, it is impossible for the ISA to effectively govern the use of marine resources, let alone ensure they are being managed in a sustainable manner.

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<sup>33</sup> Hunter J. et al (2018). “Broadening Common Heritage: Addressing Gaps in the Deep-Sea Mining Regulatory Regime,” *Harvard Environmental Law Review*, April 16. At: <https://harvardelr.com/2018/04/16/broadening-common-heritage/>

## 2. Deep-sea mining governance

### International Seabed Authority: governing half of the planet for “the benefit of mankind”

The ISA regulates all mineral-related activities in the seabed of the Area. The ISA was established in 1982 under UNCLOS “to regulate seabed mining activities in the international seabed area beyond limits of national jurisdiction”. It was also mandated to ensure the effective protection of the marine environment from harmful effects that may arise from deep-seabed related activities (Article 145 UNCLOS) and to guarantee that any mining activities in the Area are carried out for the “benefit of [hu]mankind” (Article 140, UNCLOS).

The ISA has 167 member states, with the European Union a member in its own right. It is governed by an assembly that includes the full membership and a 36-member council, which is an executive organ periodically elected by the assembly.

All 27 EU countries are members of the ISA, as are the UK and Norway, though not all regularly attend the ISA's annual sessions. Italy, France, Germany, Belgium and Spain have permanent diplomatic missions to the ISA – a task usually performed by their ambassadors in Kingston, Jamaica, where the ISA is headquartered. The European Union also has permanent representation, a task performed since January 2021 by Marianne Van Steen.<sup>34</sup> All other European states that are parties to UNCLOS are automatically members of the ISA assembly, including several candidates and potential candidates for membership of the European Union (Bosnia and Herzegovina, North Macedonia, Montenegro, Albania and Serbia).

European membership on the council during the 2017–2022 period included Italy, France, Germany, the Czech Republic, the Netherlands, Norway, Poland, Spain and the United Kingdom. For the 2021–2024 period, Poland and the Czech Republic will serve as permanent members, while the Netherlands, Spain, the United Kingdom and Norway will be present under various rotation arrangements.<sup>35</sup> Of these countries, only Italy, Spain, Norway and the Netherlands have not sponsored any exploration claims before the ISA.

In addition to the assembly and the council, the ISA structure also includes a legal and technical commission (LTC, currently chaired by a Norwegian) consisting of 30 members, and a finance committee made up of 15 members (currently chaired by Poland). LTC members are experts nominated by states but who serve in their individual capacity. The LTC is the body responsible for advising the council on a broad range of critical issues and is as such a de-facto decision-making body within the ISA.

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<sup>34</sup> ISA (2021) New European Union Permanent Representative Marianne Van Steen presents her credentials to ISA Secretary-General. Kingston: International Seabed Authority. At: <https://www.isa.org.jm/news/new-european-union-permanent-representative-marianne-van-steen-presents-her-credentials-isa>

<sup>35</sup> ISA (2021). ISA Assembly elects new Council members for the period 2021-2024. Kingston: International Seabed Authority. At: <https://www.isa.org.jm/news/isa-assembly-elects-new-council-members-period-2021-2024>

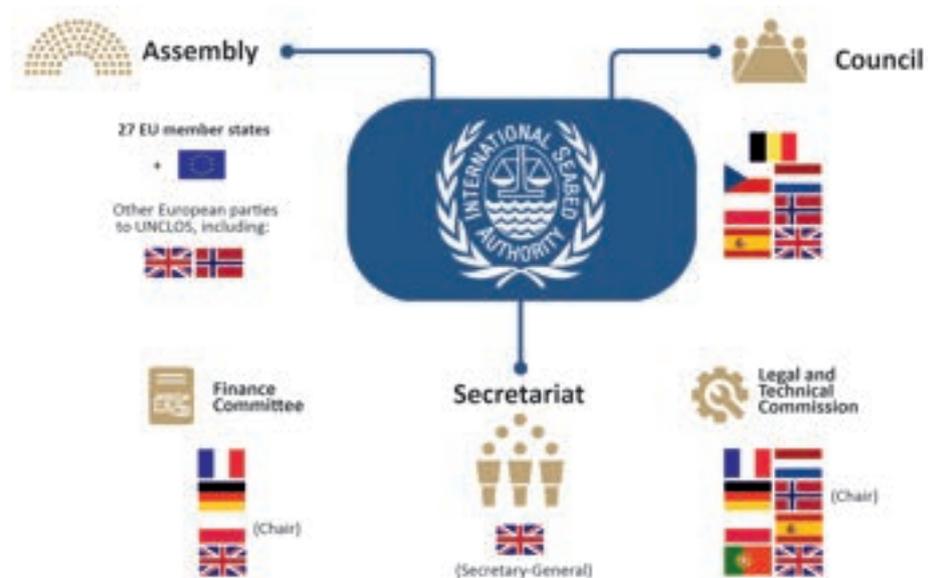
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For the 2017–2021 period the LTC included members from Spain, Germany, France, the UK, Norway, Portugal, Poland and the Netherlands. The LTC meets behind closed doors and is currently chaired by Harald Brekke, senior geologist at the Norwegian Petroleum Directorate (NPD).

The ISA is responsible for establishing exploration and exploitation regulations and procedures and approving and governing exploration and exploitation contracts. Regulations have been adopted for exploration of nodules (in 2000; updated in 2013), sulphides (2010) and crusts (2012). Regulations for exploitation are currently under negotiation. Current drafts include exploitation regulations, guidelines for approval of a plan of work for exploitation, standard and guidelines for the development and application of environmental-management systems and on the form and calculation of an environmental-performance guarantee.<sup>36</sup>

**Figure 6:** Organs of the International Seabed Authority



Source: Adapted from ISA

<sup>36</sup>ISA (2021). Draft Exploitation Regulations. Kingston: International Seabed Authority. At: <https://isa.org.jm/mining-code/ongoing-development-regulations-exploitation-mineral-resources-area>

#### Box 4: ISA, fit for purpose?

While the ISA has environmental protection among its mandates, it lacks enforcement capacity, which has generated serious doubts about how compliance with regulations – particularly those addressing environmental issues – will be secured in inaccessible areas beyond public scrutiny. Lack of transparency, openness and environmental expertise have also been identified as issues of concern, particularly as the LTC is not open to observers, in sharp contrast with other UN agencies that encourage civil-society participation. It does not release adequate record-keeping of its meetings, either.<sup>37</sup>

Open public support for DSM and potential conflicts of interests among some LTC members together with lack of transparency in certain countries' nomination procedures have invited criticism and questions concerning possible biases regarding the assessment of environmental impacts.<sup>38</sup> In the event exploitation is ever allowed, the ISA will have the tasks of authorising DSM operations and enforcing liabilities in the event of misconduct or environmental harm, but will also have an interest in financial benefits that are to sustain its own budget, potentially a conflict of interests and basis for an already evident pro-mining stance.

**Other structural issues within the ISA include rules such as the “two-year trigger rule”. This rule implies that if a sponsoring state applies for an exploitation contract on behalf of a contractor, necessary regulations must be adopted within two years. Otherwise, a provisional contract to mine must be granted in absence of such regulations.** This severely undermines the ISA's environmental protection mandate and the integrity of the seabed.

## DSM stakes of EU Member States, Norway and the UK

Several European countries either hold or are sponsoring DSM exploration contracts with the ISA. These include Belgium, Bulgaria, Czech Republic, Slovakia, Poland (the previous four as part of the IOM), France, Germany and the UK. Factsheets for each of these countries are annexed to this report.

A number of other countries have also signalled potential interest in pushing for DSM on their continental shelves or have companies that are significantly involved in DSM-technology development. These include Italy, Norway, Portugal, Spain and the Netherlands. Factsheets for these countries are also in the annex.

<sup>37</sup> DSCC (2020). Deep Sea Mining: is the International Seabed Authority fit for purpose?. Amsterdam: Deep Sea Conservation Coalition. At: [http://www.savethehighseas.org/wp-content/uploads/2020/10/DSCC\\_FactSheet7\\_DSM\\_ISA\\_4pp\\_web.pdf](http://www.savethehighseas.org/wp-content/uploads/2020/10/DSCC_FactSheet7_DSM_ISA_4pp_web.pdf)

<sup>38</sup> Ecologistas en Acción (2020). Out of sight... Deep-sea mining in Spain. Madrid: Ecologistas en Acción. At: <https://www.ecologistasenaccion.org/148756/>

## At a crossroads:

### Europe's role in deep-sea mining

These factsheets are intended to help navigate the complex web of -often diverging - interests across EU Member States (plus Norway and the UK) at a critical moment in which a strong common position is needed. Each country file provides an overview of DSM activities, indicating the roles played at the ISA (sponsorship of exploration contracts, membership of the council, members appointed in the LTC) and existing national seabed-mining regulations (in force or in development). Where applicable, the sheet presents data on potential mineral deposits in the country's continental shelf.

**Table 2:** European participation at the ISA at a glance

Country	Contracts	Type of contractor	ISA council	ISA LTC	DSM law	EEZ deposits
Belgium	1	Private company	YES	—	Yes	—
Bulgaria (IOM)*	1	Public consortium	—	—	Yes	—
Czechia (IOM)*	1	Public consortium	YES	—	Yes	—
France	2	Public agency	—	YES	Yes	Yes
Germany	2	Public agency	—	YES	Yes	—
Italy	—	—	—	—	—	Yes
Norway	—	—	YES	YES	Yes	Yes
Poland + IOM*	2	Gov. & Consortium	YES	YES	Yes	Yes
Portugal	—	—	—	YES	Yes	Yes
Spain	—	—	YES	YES	Yes	Yes
Slovakia (IOM)*	1	Public consortium	—	—	—	—
The Netherlands	—	—	YES	YES	—	—
United Kingdom	2	Public consortium	YES	YES	Yes	—

\*Bulgaria, Czechia, Slovakia and Poland have a joint exploration contract as part of the IOM international public consortium, while Poland has an additional exploration contract with the government as the sole contractor.

A number of additional countries have industrial interests in DSM without being formally engaged in DSM directly, i.e., by developing exploration and extraction technologies or providing logistical support. Annex 2 on DSM-related funding presents links where some of these engagements (particularly within the Horizon 2020 framework) can be explored. Other EU countries were involved with DSM in the past, but are not currently engaged in any known capacity.<sup>39</sup>

European countries not listed above have no known involvement with DSM, apart from formal ISA membership. Some have publicly stated their position in favour of a moratorium. Sweden, for instance, stated in a June 2020 memo on the EU Biodiversity Strategy its support for “a moratorium on DSM in areas beyond national jurisdiction until the environmental impacts have been sufficiently assessed”.<sup>40</sup>

As the factsheets illustrate, a number of countries have shifted over the years from being open to DSM to harbouring growing reservations; Portugal is one such case. From a broader perspective, it must be noted that only a small group of EU countries has been actively involved in DSM activities. Among these countries, some commonalities and differences can be pointed out:

- Some countries/companies active in DSM have a history of offshore and shipping industries (including Belgium, the Netherlands, Norway and the UK) and thus have a consolidated industrial lobby seeking alternative business opportunities in the face of diminishing oil and gas profits. Recent Italian interest in DSM seems to follow this pattern.
- In countries such as France and Spain, interest in DSM has also been driven by geopolitical considerations and is connected to their claims to an extended continental shelf. This demonstrates the weight and unwarranted influence that pro-mining marine geology experts from public bodies engaged in both the ISA and extended continental-shelf projects have in these countries (Spain's Geological Survey-IGME and IFREMER in France).
- The involvement of Poland, Bulgaria, Slovakia and the Czech Republic is a direct consequence of the continuity of the IOM, an intergovernmental institution formed among Eastern Bloc countries that survived the collapse of the USSR. It also includes Russia and Cuba. Poland has a pivotal role in the IOM as its host country and, like France and Spain, it brings a strong pro-mining bias to the ISA.

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<sup>39</sup> Finland had been particularly interested in DSM in the 1980s, when companies such as Rauma-Repola Oy or Hollming Oy sought to diversify their stakes beyond offshore drilling and a joint Finno-Soviet project to develop a nodule mining system was being conducted. More recently, the shipping company Bore participated in Nautilus' DSM exploration by providing its vessel MV Norsky.

<sup>40</sup> Regeringskansliet (2020). EU:s strategi för biologisk mångfald för 2030. Sweden: Government Office. At: “<https://data.riksdagen.se/fil/36E23634-418C-4D6F-A735-84756E8C71FF>”<https://data.riksdagen.se/fil/36E23634-418C-4D6F-A735-84756E8C71FF>

In most countries the general public, and sometimes even the ministry of environment, is hardly informed about the country's DSM plans or the position it takes at ISA negotiations. In recent years some countries have become more open and participatory; Belgium, Germany and Portugal have allowed for broader participation processes, involving several inter-ministerial discussions (including the environmental departments) and civil-society participation. Belgium, the Netherlands and Germany are also pushing in the ISA for strong environmental regulation, with, for instance, a Dutch-German proposal for mandatory regional environmental management plans.<sup>41</sup>

### Box 5: Lost City under threat

The government of Poland decided to request its own exploration contract for sulphide deposits in the Mid-Atlantic Ridge. This was granted in 2018 and is valid through 2033. This step was criticised by international and Polish ENGOs, including the MARE Foundation,<sup>42</sup> particularly given the apparent absence of environmental considerations. Poland's contract extends over a Convention on Biological Diversity (CBD)<sup>43</sup>-designated ecologically or biologically sensitive area (EBSA) which features the "Lost City", a unique hydrothermal vent field discovered in 2000 where simple hydrocarbons are created abiotically in conditions similar to when life started on earth.<sup>44</sup>

The ISA publicly stated that the area's status as an EBSAA was "of no relevance".<sup>45</sup> In a clear conflict of interest, ISA LTC recommendations on the potential environmental impact of this 2018 contract were made with Mr. Piotr Nowak, Poland's Director of the Department of Geology and Geological Concessions of the Polish Ministry of Climate and Environment, serving on the body. Mr. Nowak previously served as country manager of Celtique Energie Petroleum LTD – a now-defunct UK shale-oil and gas company with documented disregard for the environment.<sup>46</sup>

<sup>41</sup> Umwelt Bundesamt (2019). Towards a standardised approach to Regional Environmental Management Plans in the Area. Dessau-Roßlau: German Environment Agency. At: <https://www.umweltbundesamt.de/sites/default/files/medien/2875/dokumente/rem.pdf>

<sup>42</sup> SAR (2017). The MARE Foundation calls on Polish government to cease its support for deep sea mining. Brussels: Seas At Risk. At: <https://seas-at-risk.org/publications-and-videos-2/members-news/785-the-mare-foundation-calls-on-polish-government-to-cease-its-support-for-deep-sea-mining.html>

<sup>43</sup> Boetius, A. (2005). "Lost city life", Science, 307: 1420-1422. Also see: <https://www.greenpeace.org/international/press-release/23390/scientists-sound-alarm-about-destructive-deep-sea-mining-as-greenpeace-demands-government-action/>

<sup>44</sup> Johnson, D. E. (2019). "Protecting the lost city hydrothermal vent system: All is not lost, or is it?" Marine Policy, 107: 103593. At: <https://doi.org/10.1016/j.marpol.2019.103593>

<sup>45</sup> Oxygen Project (2020). How Special Interests Are About To Ravage The Ocean's Last Sanctuary. Atlanta: The Oxygen Project. At: <https://www.theoxygenproject.com/post/when-conservation-gives-way-to-greedy-interests/>

<sup>46</sup> Power Base (2019). Celtique Energy. Public Interest Investigations and Spinwatch. At: [https://powerbase.info/index.php/Celtique\\_Energy](https://powerbase.info/index.php/Celtique_Energy)

## Obligations and liability of sponsoring states

Countries sponsoring or holding ISA exploration/exploitation contracts need to adopt national DSM legislation that at the minimum complies with ISA regulations. UNCLOS requires sponsoring states to adopt “laws and regulations” and to take “administrative measures which are, within the framework of its legal system, reasonably appropriate for securing compliance by persons under its jurisdiction”. Such national laws have been passed by several EU member states, including Germany, Belgium and the Czech Republic.

Becoming a sponsor of seabed mining brings a state multiple obligations and responsibilities. The wide range of potential impacts seabed mining could have on the marine environment, on resources such as fisheries and minerals and even on people and property, the need for proactive monitoring of the mining activities of contractors and the high level of scientific uncertainty about the extent of harm that could occur mean there is significant risk that sponsoring states could be held liable for substantial costs for damage caused by the activities of their mining contractors.

### Box 6: Liability of the sponsoring state

Each seabed-mining operation would be governed by a set of terms and conditions incorporated in a contract with the ISA, thereby determining the extent to which any impacts are authorised. In the event of damage beyond the scope and severity allowed in the contract, the contractor could be liable for the costs of reparation or compensation for harm. Liability would be determined by the actual amount of damage, while the type of reparation would depend on both the damage itself and the technical feasibility of restoration.

In the event of damage, an injured state might make a claim for economic or environmental loss. For example, a flag state, a coastal state or other might make a claim for losses associated with fisheries, minerals, or marine genetic resources damaged, displaced or disrupted by mining activity. Compensation might also be claimed for purely environmental loss. Moreover, because the seafloor beyond national jurisdiction is designated the “common heritage of [hu]mankind” under UNCLOS, a state might also make a claim for losses on behalf of humankind if valuable minerals located in the Area are impacted by mining – whether the minerals are in an area of another contractor or an area not under contract.

Considering the wide range of potential impacts seabed mining could have on the marine environment, on resources such as fisheries and minerals, and even on people and property, the need for proactive monitoring of the mining activities of the contractor and the high level of scientific uncertainty about the extent of harm that could occur, there is significant risk that sponsoring states could be held liable for substantial costs for damage caused by the activities of their mining contractor.

**Adapted from: D. Currie (2020) “Seabed Mining: Legal Risks, Responsibilities and Liabilities for Sponsoring States”. Deep Sea Conservation Coalition.**

## EU marine governance: strong on paper, weak in implementation

The ISA's mandate does not apply to national continental shelves, and some of the (formerly) most advanced projects – such as Solwara 1, pushed by Nautilus in Papua New Guinea – were planned in waters under national jurisdiction. **Although UNCLOS article 208.3 states that laws, regulations and measures applicable to continental shelves “shall be no less effective than international rules, standards and recommended practices and procedures”, such international rules do not exist.**

While the collapse of Solwara and the huge debt left to Papua New Guinea<sup>47</sup> further support calls for a ban on DSM, other countries intend to allow DSM on their own continental shelves. Norway has announced it could issue permits as early as 2023,<sup>48</sup> and will propose legislation on DSM.<sup>49</sup> It is currently conducting a public consultation which will inform decision-making on the matter. Australia's Northern Territory has recently adopted a ban on seabed mining.<sup>50</sup>

On the continental shelves of EU Member States, Union legislation applies, including:

- The Marine Strategy Framework Directive (Directive 2008/56/EC; MSFD)<sup>51</sup> aims more effectively to protect the marine environment across Europe and to restore European seas to good environmental status. It requires countries to put in place targets and measures to reduce environmental impacts. Relevant to DSM are the objectives on biodiversity, contaminants, seafloor integrity, foodweb, energy and noise. The MSFD provides the framework for the ecosystem-based management of human activities at sea, while enabling a sustainable use of marine goods and services.
- The Marine Spatial Planning (MSP) Directive (Directive 2014/89/EU)<sup>52</sup> is aimed at “promoting the sustainable growth of maritime economies, the sustainable development of marine areas and the sustainable use of marine resources”. It requires Member States to establish MSPs by March 2021 (so far only six have done so). MSP can potentially be used by countries to identify areas of marine minerals and assign zones for DSM.

<sup>47</sup> Mining (2019). Nautilus Minerals' plans to mine the seafloor sink deeper. Vancouver: Glacier Media Group. At: <https://www.mining.com/nautilus-minerals-plans-to-mine-the-seafloor-sink-deeper/>

<sup>48</sup> Reuter (2021). Norway eyes sea change in deep dive for metals instead of oil. London: Reuters. At: <https://www.reuters.com/article/us-norway-deepseamining-insight-idUSKBN29H1YT> <https://www.reuters.com/article/us-norway-deepseamining-insight-idUSKBN29H1YT>

<sup>49</sup> Schjodt (2019). Mineral extraction activities in Norway – status – environmental impact assessment for seabed mineral extraction. Oslo: Advokatfirmaet Schjodt AS. At: <https://www.schjodt.no/en/news-events/newsletters/mineral-extraction-activities-in-norway--status--environmental-impact-assessment-for-seabed-mineral-extraction/>

<sup>50</sup> Guardian (2021). Northern Territory to permanently ban seabed mining. London: The Guardian. At: <https://www.theguardian.com/australia-news/2021/feb/05/northern-territory-to-permanently-ban-seabed-mining> <https://www.theguardian.com/australia-news/2021/feb/05/northern-territory-to-permanently-ban-seabed-mining>

<sup>51</sup> EU (2008). DIRECTIVE 2008/56/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL. Brussels: The European Union.

At: <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32008L0056&from=EN>

<sup>52</sup> EU (2014). DIRECTIVE 2014/89/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL. Brussels: The European Union.

At: <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32014L0089&from=EN>

- The Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA) directives (Directive 2001/42/EC and Directive 2011/92/EU)<sup>53</sup> regulate impact assessment procedures for plans and programmes (SEA) and for projects (EIA). This includes provisions for stakeholder and public participation and environmental impact statements. It requires Member States to address cumulative effects and propose mitigation measures.
- The Fauna and Flora Habitats Directive (Directive 92/43/EEC), aims to promote the maintenance of biodiversity and establishes the EU-wide Natura 2000 ecological network of protected areas, to be safeguarded against potentially damaging developments. This includes the Natura 2000 network of marine protected areas.

While the EU provides a comprehensive governance system for marine protection and management, implementation by countries is very weak. **Evaluations by the Commission and the European Court of Auditors<sup>54</sup> of the MSFD's first cycle concluded that Member States had failed to achieve good environmental management by 2020. The Biodiversity Strategy requires transforming 30% of Europe's sea into effectively managed protected areas, with one-third strictly protected, by 2030. Today, only 12.4% of the EU marine area is designated for protection, with only 1.8% of the seas covered by Marine Protected Areas (MPAs) with concrete management plans.<sup>55</sup>**

In addition, marine protection in European seas is largely focused on coastal areas, with few offshore areas protected. Although the MSP Directive calls for ecosystem-based, cross-sectoral planning to keep cumulative impacts within ecological limits, in practice planning is often done on a sector-by-sector basis, with nature protection considered a “user” like any other – one often sacrificed to make space for others.

The European Environment Agency's Marine Messages 2<sup>56</sup> shows a continuing trend of overexploitation and degradation of Europe's seas. It is clear that adding a harmful activity like DSM to this setting would be unsustainable and counter to the EU's objective to restore its seas to good health.

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<sup>53</sup> While DSM is not specifically mentioned among listed activities, ECJ interpretation of the EIAD gives direct effect to its relevant provisions on the requirement of EIA “whether the projects concerned are likely to have significant effects on the environment and, if so, that an assessment of those effects is then undertaken” (Judgment of the Court of Justice of the EU (Fifth Chamber) of 21 March 2013 in Case C-244/12).

<sup>54</sup> SAR (2020). Marine environment: European Court of Auditors' analysis is urgent call to action. Brussels: Seas At Risk. At: <https://seas-at-risk.org/29-ocean-governance/1117-marine-environment-european-court-of-auditors-analysis-is-urgent-call-to-action.html>

<sup>55</sup> WWF (2019). Protecting Our Ocean: Europe's Challenges To Meet The 2020 Deadlines. Gland: World Wide Fund For Nature. At: [https://wwfeu.awsassets.panda.org/downloads/protecting\\_our\\_ocean.pdf](https://wwfeu.awsassets.panda.org/downloads/protecting_our_ocean.pdf)

<sup>56</sup> EEA (2019). Navigating the course towards clean, healthy and productive seas through implementation of an ecosystem-based approach. Copenhagen: European Environment Agency. At: <https://www.eea.europa.eu/publications/marine-messages-2>

### 3. EU's shift to precaution and growing calls for a moratorium

#### Blue Growth and international ocean governance

In 2012, the Commission released its “Blue Growth opportunities for marine and maritime sustainable growth” communication. It outlined initiatives to “harness the untapped potential of Europe’s oceans, seas and coasts for jobs and growth.” The European Commission identified “marine mineral resources” as one of five Blue Growth focus areas, stating that “By 2020, 5% of the world’s minerals, including cobalt, copper and zinc could come from the ocean floors. This could rise to 10% by 2030.”<sup>57</sup>

The Blue Growth strategy foresees “measures to ensure that European companies are not squeezed out of the value chain for marine minerals by state-supported competitors. This might include a pilot action within the framework of the proposed European Innovation Partnership on Raw Materials, supported by a structured EU research effort addressing main technology challenges. EU engagement would help to ensure that high environmental, legal and security standards are upheld.”

Subsequently, major EU funding – including European Maritime and Fisheries Fund (EMFF) funds from DG Mare for the 2014–2020 period – was provided to, among others, the European Marine Observation and Data Network (EMODnet) Geology to support “marine minerals” mapping across European waters.<sup>58</sup> Many similar projects were funded through the FP7 and Horizon 2020 frameworks. Such funding supports predominantly DSM-technology development, and only to a lesser extent the underdeveloped area of environmental impacts. The Commission also funded DSM-related legal support and capacity-building in Pacific states and co-financed the development of a regional environmental management plan for the Mid-Atlantic Ridge area (in cooperation with the ISA).<sup>59</sup>

Initial EU enthusiasm for DSM has meanwhile evolved towards a much more precautionary approach (at least in writing), given the environmental risks combined with huge knowledge gaps and the questions surrounding the very need for DSM in global supply.<sup>60</sup> This shift is evident in the EU Biodiversity Strategy’s precautionary statement and the European Parliament’s call for a moratorium.

<sup>57</sup> EEA (2012). Blue Growth opportunities for marine and maritime sustainable growth. Copenhagen: European Environment Agency. At: <https://www.eea.europa.eu/policy-documents/com-2012-494-final-blue>

<sup>58</sup> EMODNET (2021). At: <https://www.emodnet-geology.eu/>

<sup>59</sup> DSCC (2020). Workshop on the Development of a REMP for the Area of the Northern Mid-Atlantic Ridge with a Focus on Polymetallic Sulphides Deposits. Amsterdam: Deep Sea Conservation Coalition. At: <https://www.isa.org.jm/event/workshop-remp-area-northern-mid-atlantic-ridge>

<sup>60</sup> SAR (2018). European Commission and Azores question need for deep-sea mining. Brussels: Seas At Risk. At: “<https://seas-at-risk.org/27-deep-sea-mining/836-european-commission-and-azores-question-need-for-deep-sea-mining.html>”<https://seas-at-risk.org/27-deep-sea-mining/836-european-commission-and-azores-question-need-for-deep-sea-mining.html>

The 2016 communication entitled “International ocean governance: an agenda for the future of our oceans”<sup>61</sup> acknowledged that “the current framework does not ensure the sustainable management of the oceans”, specifically referring to the ISA.

The communication nevertheless also established a mandate for the Commission to “produce guidance on the exploration and exploitation of natural resources on the seabed in areas under national jurisdiction, to assist coastal Member States respect their duty under UNCLOS to protect and preserve the marine environment” by 2018. So far this has not been achieved, but it confirmed that the EU and some countries had the intention of DSM exploration in European waters.

## The European Parliament's call for a moratorium

In response to the 2016 communication on international ocean governance, the European Parliament adopted a resolution on 16 January 2018 on “International ocean governance: an agenda for the future of our oceans”.<sup>62</sup> Passed by a large majority – 558 votes in favour, 25 against and 83 abstentions<sup>63</sup> – the resolution urged the European Commission and its Member States to “stop sponsoring deep-sea mining exploration and exploitation licenses in Areas Beyond National Jurisdiction and on and not to issue permits for deep-sea mining on Member States’ continental shelf” and, for the first time, called on the EU **to support an international moratorium on commercial deep-sea mining exploitation licences until such time as the effects of deep-sea mining on the marine environment, biodiversity and human activities at sea have been studied and researched sufficiently and all possible risks are understood.**

The resolution also pinpointed “existing governance shortcomings” regarding the public accountability of country representatives to international bodies, with direct reference to the ISA. Instead of further promoting the DSM sector, the European Parliament called on the EU to invest in sustainable alternatives, specifically a transition to sustainable consumption and production, as outlined in Sustainable Development Goal 12 under Agenda 2030.

The resolution built on previous parliamentary work related to DSM, including joint resolutions, research reports and a number of parliamentary questions. For example, a 2014 “Resolution on mining for oil and minerals on the seabed in the context of sustainable development”<sup>64</sup> by the African, Caribbean and Pacific (ACP) Group of States-EU Joint Parliamentary Assembly was unanimously adopted, warning about how in “the absence of strong governments to regulate and control the seabed

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<sup>61</sup> EU (2016). JOINT COMMUNICATION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS International ocean governance: an agenda for the future of our oceans. Brussels: The European Union. At: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=JOIN:2016:49:FIN>

<sup>62</sup> EU (2018). International ocean governance: an agenda for the future of our oceans in the context of the 2030 Sustainable Development Goals. Brussels: The European Union. At: [https://www.europarl.europa.eu/doceo/document/TA-8-2018-0004\\_EN.html](https://www.europarl.europa.eu/doceo/document/TA-8-2018-0004_EN.html)

<sup>63</sup> EP (2017). International ocean governance: an agenda for the future of our oceans in the context of the 2030 SDGs. Brussels: The European Parliament. At: [https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?lang=en&reference=2017/2055\(INI\)](https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?lang=en&reference=2017/2055(INI))

<sup>64</sup> EP (2014). ACP-EU JOINT PARLIAMENTARY ASSEMBLY. Brussels: The European Parliament. At: [https://www.europarl.europa.eu/intcoop/acp/92\\_01/pdf/ap101546en.pdf](https://www.europarl.europa.eu/intcoop/acp/92_01/pdf/ap101546en.pdf)

mining sector, the activities of seabed mining companies may lead to significant long-term local environmental and health damage". And the next year, a report on "Deep-seabed exploitation"<sup>65</sup> by the European Parliamentary Research Service indicated how difficult it was "to fully estimate the real environmental impact of deep-sea mining exploration and exploitation activities due to the fragility of these ecosystems, the unknown resilience of this system and as well as the effectiveness of the anticipated efforts to assist natural recovery."

In response to written questions by MEPs,<sup>66</sup> Commissioner for the Environment, Maritime Affairs and Fisheries Karmenu Vella stated in 2015 that further consultations with the wider public were needed "Before the Commission considers a more defined policy stance on deep sea mining".<sup>67</sup> In 2016 Commissioner for Industry Elżbieta Bieńkowska revealed that the Commission was "not planning to develop a separate regulation on deep sea mining"<sup>68</sup> and did not "intend to draw up a roadmap at this stage as the deep-sea mining sector is not yet sufficiently developed."<sup>69</sup> However, a 2018 response by Commissioner Bieńkowska stated that €47 million had been provided to DSM-related research in the 2013–2020 period.<sup>70</sup>

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<sup>65</sup> EP (2015). Deep-seabed exploitation: Tackling economic, environmental and societal challenges. Brussels: The European Parliament. At: "[https://www.europarl.europa.eu/RegData/etudes/STUD/2015/547401/EPRS\\_STU\(2015\)547401\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2015/547401/EPRS_STU(2015)547401_EN.pdf)"[https://www.europarl.europa.eu/RegData/etudes/STUD/2015/547401/EPRS\\_STU\(2015\)547401\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2015/547401/EPRS_STU(2015)547401_EN.pdf)

<sup>66</sup> E-0014/09, E-010961-13, E-004201-15, E-004267-16, E-005435-16 and E-003641-18

<sup>67</sup> EP (2015). Parliamentary Questions: Answer given by Mr Vella on behalf of the Commission. Brussels: The European Parliament. At: [https://www.europarl.europa.eu/doceo/document/E-8-2015-004201-ASW\\_EN.html](https://www.europarl.europa.eu/doceo/document/E-8-2015-004201-ASW_EN.html)

<sup>68</sup> EP (2016). Parliamentary Questions: Answer given by Ms Bieńkowska on behalf of the Commission. Brussels: The European Parliament. At: "[https://www.europarl.europa.eu/doceo/document/E-8-2016-005435-ASW\\_EN.html](https://www.europarl.europa.eu/doceo/document/E-8-2016-005435-ASW_EN.html)"[https://www.europarl.europa.eu/doceo/document/E-8-2016-005435-ASW\\_EN.html](https://www.europarl.europa.eu/doceo/document/E-8-2016-005435-ASW_EN.html)

<sup>69</sup> EP (2016). Parliamentary Questions: Answer given by Ms Bieńkowska on behalf of the Commission. Brussels: The European Parliament. At: [https://www.europarl.europa.eu/doceo/document/E-8-2016-004267-ASW\\_EN.html](https://www.europarl.europa.eu/doceo/document/E-8-2016-004267-ASW_EN.html)

<sup>70</sup> EP (2018). Parliamentary Questions: Answer given by Ms Bieńkowska on behalf of the Commission. Brussels: The European Parliament. At: [https://www.europarl.europa.eu/doceo/document/E-8-2018-003641-ASW\\_EN.html](https://www.europarl.europa.eu/doceo/document/E-8-2018-003641-ASW_EN.html)

## Biodiversity Strategy 2030

The adoption of the EU Biodiversity Strategy<sup>71</sup> in 2020, with specific commitments and actions to be met by 2030, represents a first step by the Commission towards establishing an EU moratorium on DSM. Even if not explicitly named as such, the statement clearly echoes the earlier 2018 resolution by the European Parliament supporting an international moratorium:

**In international negotiations, the EU should advocate that marine minerals in the international seabed area cannot be exploited before the effects of deep-sea mining on the marine environment, biodiversity and human activities have been sufficiently researched, the risks are understood and the technologies and operational practices are able to demonstrate no serious harm to the environment, in line with the precautionary principle and taking into account the call of the European Parliament. In parallel, the EU will continue to fund research on the impact of deep-sea mining activities and on environmentally-friendly technologies. The EU should also advocate for more transparency in international bodies such as the International Seabed Authority.**

The Council's "Conclusions on Biodiversity" of October 2020 reinforced this and requested **"that EU and its Member States endorse this position in relevant fora"**.<sup>72</sup> At the same time, a European Parliament own-initiative report on the Biodiversity Strategy is being developed to formally set out the Committee on the Environment's position with respect to the Biodiversity Strategy.<sup>73</sup>

On the basis of the EU's competence on international regulations dealing with the protection of the marine environment, its involvement together with Member States in the legally binding agreement on marine biological diversity of areas beyond national jurisdiction as well as in the Regional Sea Conventions (for the North-East Atlantic, Baltic, Mediterranean and Black Sea) open additional possibilities for securing the protection of vulnerable areas in the high seas. Concern for "the potential impacts of deep-seabed mining on marine biodiversity" has surfaced in decisions of the Conference of the Parties to the Convention on Biological Diversity<sup>74</sup> – and will likely reappear in the 2021 CBD COP-15. OSPAR (Convention for the Protection of the Marine Environment of the North-East Atlantic) and HELCOM (the Baltic Marine Environment Protection Commission), are studying implications and possible measures to take.

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<sup>71</sup> EC (2020). Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions. Brussels: The European Commission. At: "<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020DC0380&from=EN>"<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020DC0380&from=EN>

<sup>72</sup> COE (2020). Conclusions on Biodiversity - the need for urgent action. Strasbourg: Council of The European Union. At: "<https://data.consilium.europa.eu/doc/document/ST-11829-2020-INIT/en/pdf>"<https://data.consilium.europa.eu/doc/document/ST-11829-2020-INIT/en/pdf>

<sup>73</sup> EP (2020). EU Biodiversity Strategy for 2030. Brussels: The European Parliament. At: "<https://www.europarl.europa.eu/committees/en/eu-biodiversity-strategy-for-2030-/product-details/20201026CDT04342>"<https://www.europarl.europa.eu/committees/en/eu-biodiversity-strategy-for-2030-/product-details/20201026CDT04342>

<sup>74</sup> CBD (2018). DECISION ADOPTED BY THE CONFERENCE OF THE PARTIES TO THE CONVENTION ON BIOLOGICAL DIVERSITY. Sharm El-Sheikh: Convention on Biological Biodiversity. At: <https://www.cbd.int/doc/decisions/cop-14/cop-14-dec-10-en.pdf>

## EU fisheries advisory councils

Finally, in the runup to the United Nations Summit on Biodiversity in September 2020, the EU has also endorsed the Leaders' Pledge for Nature, committing to reverse Biodiversity Loss by 2030<sup>75</sup>. It is difficult to imagine that the large-scale loss of deep-sea biodiversity could be reconciled with such a commitment.

Calls for a moratorium on DSM have also been issued by several fisheries advisory councils (ACs), the stakeholder bodies established by the Common Fisheries Policy, which provide the European Commission and Member States with advice on fisheries management. In May 2019 the Long Distance Fleet Advisory Council (LDAC) was the first to adopt an opinion on DSM,<sup>76</sup> stating inter alia:

1. A moratorium on mining in the deep sea needs to be in place in international waters without exemptions until the risks are fully assessed and understood;
2. No deep-seabed mining should be permitted in the international areas of the world's seabed under the jurisdiction of the ISA unless a very clear case can be made that society must mine the deep sea for the benefit of humankind as a whole and not simply because it may be economically viable and profitable to an individual company or country;
3. The case for DSM needs to be evaluated in light of commitments to conserve and sustainably use the oceans, through strengthening resilience and acting for the restoration of marine ecosystems concurrently with initiatives to transition to circular economies, sustainable methods of consumption and production and related efforts as called for in the UN 2030 Agenda on SDGs;
4. That the European Commission and Member States should stop funding, facilitating or promoting the development of deep-sea mining and deep-sea mining technology and support the above-mentioned objectives.

DG MARE Director-General João Aguiar Machado responded to LDAC's opinion in July 2019 indicating that the Commission's "emphasis has been put on activities to ensure that deep-sea mining, **if it is carried out at all**, will be fully in line with EU's commitment to sustainability, in line with the precautionary and ecosystems based approaches." (emphasis added)<sup>77</sup>

LDAC's opinion was followed in the same month by a Notice from the South West Waters Advisory Council (SWWAC) endorsing the European Parliament's 2018 Resolution<sup>78</sup> and, in June 2020, by a "Recommendation on deep-sea mining activities"<sup>79</sup> issued by the Pelagic Advisory Council. This also called for an international

<sup>75</sup> Leaders Pledge for Nature (2021). At: <https://www.leaderspledgefornature.org/>

<sup>76</sup> Long Distance Advisory Council (2019). LDAC Opinion on Deep-sea Mining. At: [https://ldac.eu/images/EN\\_LDAC\\_Advice\\_on\\_Deepsea\\_Mining\\_R.04.19.WG5\\_May2019.pdf](https://ldac.eu/images/EN_LDAC_Advice_on_Deepsea_Mining_R.04.19.WG5_May2019.pdf)

<sup>77</sup> EC (2019). LDAC Opinion on Deep-sea Mining. Brussels: The European Commission. At: [https://ldac.eu/images/Commission\\_reply\\_Deep\\_sea\\_mining\\_R.04.19.WG5.pdf](https://ldac.eu/images/Commission_reply_Deep_sea_mining_R.04.19.WG5.pdf)

<sup>78</sup> CCS (2019). Avis 129 sur l'exploitation du gaz et des ressources pétrolières et minières dans les Eaux Occidentales Sud. Lorient: Conseil Consultatif Sud. At: <http://cc-sud.eu/images/img-ccs/avis/Avis-2019-2020/Avis129-Petrole/Avis129-Petrole-FR.pdf>

<sup>79</sup> Pelagic AC (2020). Pelagic AC recommendation on deep-sea mining activities. Zoetermeer: Pelagic Advisory Council. At: <https://www.pelagic-ac.org/media/pdf/1920PAC81%20to%20COM%20PELAC%20opinion%20Deep-sea%20mining.pdf>

moratorium. The recommendation noted that a number of foreseen effects, “such as chemical and sediment plumes generated by mining, as well as noise and light pollution, may also impact the widely distributed pelagic species and fisheries in the North Atlantic, resulting from the mining of polymetallic sulphides on the Mid-Atlantic Ridge and Arctic Mid-Ocean Ridge”. DG MARE’s Director-General Charlina Vitcheva<sup>80</sup> reiterated the EU Biodiversity Strategy’s call for caution, and stated that long-term studies are still needed to gauge the full range of mining’s impacts on benthic and deep-ocean biodiversity.

In December 2020, 10 of the 11 ACs<sup>81</sup> submitted a “Multi-AC advice on the ‘Maritime sector – a green post-COVID future’”<sup>82</sup> which included a number of recommendations for a sustainable Blue Economy, stating, “Certain activities, such as deep-sea mining, oil and gas extraction or similar, are incompatible with the objectives of a sustainable Blue Economy and will need to be stopped altogether.”

## Proposal for a common EU position at the ISA

The EU has for decades been a silent member of the ISA, having no mandate to take an EU position on behalf of its Member States. While the EU, as a party to UNCLOS, has voting rights at the ISA assembly, it has only been present as an observer at the ISA council.

In January 2021 the European Commission broke their silence by formally issuing a proposal for a “Council Decision on the position to be taken on behalf of the European Union at the meetings of the ISA Council and Assembly”.<sup>83</sup> The proposed EU position is framed in Annex I of the suggested Council decision, emphasising the principle that:

**The EU should advocate that marine minerals in the international seabed area cannot be exploited before the effects of deep-sea mining on the marine environment, biodiversity and human activities have been sufficiently researched, the risks are understood and the technologies and operational practices are able to demonstrate no serious harm to the environment, in line with the precautionary principle.**

This is the same position as that taken in the 2020 Biodiversity Strategy and is based on Article 191 of the Treaty on the Functioning of the European Union (TFEU), which states that EU policy must be based on the precautionary principle. The overarching

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<sup>80</sup> EC (2020). Reply to PELAC letter - Opinion paper on deep-sea mining activities. Brussels: The European Commission. At: <https://www.pelagic-ac.org/media/pdf/1920ref20%20Response%20COM%20on%20deep-sea%20mining%20activities.pdf>

<sup>81</sup> Long Distance Advisory Council (LDAC), Market Advisory Council (MAC), Mediterranean Advisory Council (MEDAC), North Sea Advisory Council (NSAC), North Western Waters Advisory Council (NWWAC), Pelagic Advisory Council (PELAC), Baltic Sea Advisory Council (BSAC), Black Sea Advisory Council (BISAC), South Western Waters Advisory Council (SWWAC) and the Outermost Regions Advisory Council (CCRUP). The only AC not to join the advice was the Aquaculture Advisory Council.

<sup>82</sup> Multi Advisory Councils (2021). Multi-AC advice on the “Maritime sector – a green post-COVID future” Roadmap. At: [http://en.med-ac.eu/files/documentazione\\_pareri\\_lettere/2020/12/351\\_multi-ac\\_advice\\_blue\\_economy\\_09dec2020.pdf](http://en.med-ac.eu/files/documentazione_pareri_lettere/2020/12/351_multi-ac_advice_blue_economy_09dec2020.pdf)

<sup>83</sup> EC (2021). COUNCIL DECISION on the position to be taken on behalf of the European Union at the meetings of the International Seabed Authority Council and Assembly. Brussels: The European Commission. At: <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52021PC0001>

“obligation to protect and preserve the marine environment” established by UNCLOS is also referred to as a guiding principle in the proposed Council Decision, encompassing the “responsibilities to prevent, reduce and control pollution of the marine environment from any source, to monitor the risks or effects of pollution and to assess the potential effects of activities under States parties’ jurisdiction and control that may cause substantial pollution of or significant and harmful changes to the marine environment”.

The proposed position states that:

**Given the limited scientific knowledge and the concerns about the inevitable, and likely irreversible, impacts on biodiversity and climate, it is crucial to ensure that the Union’s position on deep seabed mining is fully in line with the European Union’s commitment to sustainability and based on the best available science, the application of the precautionary principle and the ecosystem-based approach.**

This proposal triggers simultaneous “readings” by the Council and the European Parliament. The Council’s Working Party on the Law of the Sea (COMAR) will have a particularly important role to play in handling potential frictions and diverging interest among EU Member States. The approval of the proposed decision, which is expected by July 2021, in time for the ISA’s 27<sup>th</sup> session, would mean a new role for the EU at the ISA, a role critical not only in securing the highest environmental standards but also in assuring that DSM does not occur until a full understanding of its potential impacts and implications is attained.

The possibility that a lower common denominator across EU Member States could lead to the weakening of environmental protection demands and standards put forward by particular countries nevertheless remains a matter of concern. Should the Commission be mandated with negotiating a joint EU position, it should be ensured that this does not impede EU Member States from taking a stronger position, such as calling for a moratorium.

In 2019, President von der Leyen of the European Commission wrote a mission letter to Commissioner Sinkevičius<sup>84</sup>, Commissioner for Environment, Oceans and Fisheries. The letter urged the Commissioner “to ensure that our environment, blue economy and fisheries sector form an integral part of the European Green Deal, helping to deliver on our climate ambitions while creating jobs and sustainable growth.”

In addition, the president stated that:

Europe must also lead the way on international ocean governance and play a prominent role in discussions in the United Nations, notably at the UN Ocean Conference in Lisbon in 2020 [now postponed], as well as in other regional and international forums.

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<sup>84</sup> EC (2019). Mission Letter. Brussels: The European Commission. At: [https://ec.europa.eu/commission/commissioners/sites/comm-cwt2019/files/commissioner\\_mission\\_letters/mission-letter-sinkevicius-2019-2024\\_en.pdf](https://ec.europa.eu/commission/commissioners/sites/comm-cwt2019/files/commissioner_mission_letters/mission-letter-sinkevicius-2019-2024_en.pdf)

Europe's blue economy plays a crucial role in supporting coastal communities and in decarbonising our economy. To harness its full potential, I want you to develop a new approach for a sustainable blue economy. This should bring together everything from marine knowledge and research to maritime spatial planning, marine renewable energy, blue investment and regional maritime cooperation.

DSM is conspicuously missing from this mission letter and subsequent communications from the Commission.

In October 2020 the Commission undertook a consultation on the road map for a communication "on a new approach for a sustainable blue economy in the EU".<sup>85</sup>

This road map made no mention of DSM. Instead, it acknowledges that "Climate change and biodiversity loss have serious impacts on oceans and ultimately on the resilience of the blue economy" and warns that "For economic activities at sea to carry on, actors must urgently integrate sustainability principles and reduce pressure on marine ecosystems".

This is consistent with the conclusions drawn by the High Level Panel for a Sustainable Ocean Economy (led by fourteen heads of State, including Norway and Portugal, who committed to 100% sustainable ocean management): that "Until the need for, and potential consequences of, deep-sea mining are better understood, **the concept is conceptually difficult to align with the definition of a sustainable ocean economy and raises various environmental, legal and governance challenges, as well as possible conflicts with the UN Sustainable Development Goals.** It is thus not discussed further in this report."<sup>86</sup>

The same conclusion was reached in the 2021 guide Turning the Tide: How to Finance a Sustainable Ocean Recovery published by the UN Environment Programme with the support of the European Commission. DMS is explicitly excluded from its "sustainable Blue Economy" concept.<sup>87</sup>

Public consultations on the new Blue Economy are scheduled for May 2021. The aim is to have European Parliament and Council conclusions before the end of the Portuguese presidency (June 2021). It is hoped that the new strategy will coherently complement the Biodiversity Strategy, the European Parliament's resolution on international ocean governance and the proposed ISA position. It is also hoped it will include a moratorium on DSM in EU waters and a commitment by the Commission to push for a global moratorium through the ISA.

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<sup>85</sup> EU (2020). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a new approach for a sustainable blue economy in the EU. Brussels: The European Union. At: [https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=PI\\_COM:Ares\(2020\)5477619](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=PI_COM:Ares(2020)5477619)

<sup>86</sup> Stuchtey, M. R. et al. (2020). Ocean Solutions That Benefit People, Nature and the Economy. Washington: World Resources Institute. At: <https://www.oceanpanel.org/ocean-action/people-nature-economy-report.html>

<sup>87</sup> UN (2021). Turning The Tide: How To Finance A Sustainable Ocean Recovery. Geneva: United Nations Environment Programme. At: <https://www.unepfi.org/publications/turning-the-tide/>

The European Commission is also currently reviewing its approach to oceans management through initiatives such as the International Ocean Governance (IOG) Forum. IOG is also part of other global processes, including the Post-2020 Global Biodiversity Targets, the UN Climate Change Convention, the Biodiversity Beyond National Jurisdiction Agreement and the SDGs.

**The role of the EU in all these negotiation fora – as well as in the ISA – will be key to determining the future of ocean governance, and whether or not DSM can have a place in it.**

## Growing calls for a ban or moratorium

The growing scientific evidence of irreversible large-scale biodiversity loss has led many scientists, civil society and other organisations to conclude that a strong application of the precautionary principle is in order. In recent years, voices calling for a ban or moratorium on DSM have grown exponentially after early appeals from affected frontline communities in the Pacific.

### Box 7: Recent calls for ban or moratorium on deep-sea mining<sup>88</sup>

- In 2018, 50 NGOs, led by Seas at Risk and Greenpeace International, called on the ISA to “Protect the marine environment from harm!” by imposing a moratorium on exploration and exploitation contracts.<sup>89</sup>
- In 2019 the Papua New Guinea Council of Churches, Voice of Milne Bay, Alliance of Solwara Warriors, Bismarck Ramu Group and the Center for Environmental Law and Community Rights published an open letter to the Prime Minister of Papua New Guinea, calling on the government to protect the marine environment by “Not issuing any more exploration licences or mining leases for deep sea mining”.<sup>90</sup> The Prime Ministers of Fiji, Vanuatu and Papua New Guinea subsequently made a similar call for a moratorium until the conclusion of the UN Decade of Ocean Science in 2030.<sup>91</sup>

<sup>88</sup> Deep Sea Mining Campaign (2013) The Pacific Conference of Churches calls for a moratorium on seabed mining. Washington D.C.: The Ocean Foundation. At: <http://www.deepseaminingoutofourdepth.org/the-pacific-conference-of-churches-has-called-for-a-moratorium-on-seabed-mining/>; WCC (2013). Pacific Conference of Churches resolutions welcomed by WCC. Le Grand-Saconnex: World Council of Churches. At: <https://www.oikoumene.org/news/pacific-conference-of-churches-resolutions-welcomed-by-wcc>

<sup>89</sup> SAR (2018). Joint NGO call on the International Seabed Authority: Protect the marine environment from harm!. Brussels: Seas At Risk. At: [https://seas-at-risk.org/images/pdf/publications/2018\\_04\\_27\\_NGO\\_submission\\_to\\_ISA\\_9\\_07.pdf](https://seas-at-risk.org/images/pdf/publications/2018_04_27_NGO_submission_to_ISA_9_07.pdf) [https://seas-at-risk.org/images/pdf/publications/2018\\_04\\_27\\_NGO\\_submission\\_to\\_ISA\\_9\\_07.pdf](https://seas-at-risk.org/images/pdf/publications/2018_04_27_NGO_submission_to_ISA_9_07.pdf)

<sup>90</sup> Deep Sea Mining Campaign (2013) Joint Letter calling for the PNG Government to cancel all Nautilus Minerals deep sea mining licences. Washington D.C.: The Ocean Foundation. At: <http://www.deepseaminingoutofourdepth.org/joint-letter-calling-for-the-papua-new-guinea-government-to-cancel-all-nautilus-minerals-deep-sea-mining-licences-and-to-ban-seabed-mining-in-png/> <http://www.deepseaminingoutofourdepth.org/joint-letter-calling-for-the-papua-new-guinea-government-to-cancel-all-nautilus-minerals-deep-sea-mining-licences-and-to-ban-seabed-mining-in-png/>

<sup>91</sup> Doherty, B. (2019). Collapse of PNG deep-sea mining venture sparks calls for moratorium. London: The Guardian. At: <https://www.theguardian.com/world/2019/sep/16/collapse-of-png-deep-sea-mining-venture-sparks-calls-for-moratorium>

## At a crossroads:

### Europe's role in deep-sea mining

- That same year, the DSCC issued the “DSCC Position Statement on Deep Seabed Mining” calling for a moratorium on “deep seabed mining; the adoption of seabed mining regulations for exploitation”.<sup>92</sup>
- Also in 2019, Greenpeace launched its “In Deep Water: The Emerging Threat of Deep Sea Mining” report calling “for an immediate moratorium on deep sea mining”.<sup>93</sup>
- In January 2020 more than 100 civil-society organisations, led by Seas at Risk, BirdLife Europe, ClientEarth, Oceana, Surfrider Foundation Europe and WWF launched the “Blue Manifesto”,<sup>94</sup> which called on the EU to establish a moratorium on deep-seabed mining, stop financial support for research into DSM technology and push for the adoption of a global moratorium in the ISA.
- In February 2020, 26 organisations representing civil society, fishers, Indigenous people and philanthropic organisations issued “RISE UP: A Blue Call to Action” demanding to “stop any further development of new activities which harm ocean health, such as seabed mining.”<sup>95</sup>
- In March 2020 the Sustainable Ocean Alliance issued a call to “support a moratorium on deep-seabed mining for at least 10 years in line with the UN Decade of Ocean Science”,<sup>96</sup> while Fauna & Flora International and Sir David Attenborough<sup>97</sup> strongly advised a moratorium.
- In May 2020 WWF adopted its “Policy Position on Deep Seabed Mining”, stating that “a moratorium on deep seabed mining activities is urgently needed”.<sup>98</sup>

<sup>91</sup> Doherty, B. (2019). Collapse of PNG deep-sea mining venture sparks calls for moratorium. London: The Guardian. At: <https://www.theguardian.com/world/2019/sep/16/collapse-of-png-deep-sea-mining-venture-sparks-calls-for-moratorium>

<sup>92</sup> DSCC (2019). DSCC Position Statement on Deep Seabed Mining. Amsterdam: Deep Sea Conservation Coalition. At: [http://www.savethehighseas.org/wp-content/uploads/2019/08/DSCC-Position-Statement-on-Deep-Seabed-Mining\\_July2019.pdf](http://www.savethehighseas.org/wp-content/uploads/2019/08/DSCC-Position-Statement-on-Deep-Seabed-Mining_July2019.pdf)

<sup>93</sup> Greenpeace (2019). In Deep Water. Amsterdam: Greenpeace International. At: <https://www.greenpeace.org/international/publication/22578/deep-sea-mining-in-deep-water/>

<sup>94</sup> SAR (2020). Blue Manifesto - The Roadmap to a Healthy Ocean in 2030. Brussels: Seas At Risk. At: <https://seas-at-risk.org/24-publications/1020-blue-manifesto-the-roadmap-to-a-healthy-ocean-in-2030.html> <https://seas-at-risk.org/24-publications/1020-blue-manifesto-the-roadmap-to-a-healthy-ocean-in-2030.html>

<sup>95</sup> RISE UP (2020). RISE UP: a blue call to action. At: [https://www.riseupfortheocean.org/wp-content/uploads/2020/01/BCA\\_RISE-UP\\_EN\\_A4-3.pdf](https://www.riseupfortheocean.org/wp-content/uploads/2020/01/BCA_RISE-UP_EN_A4-3.pdf) [https://www.riseupfortheocean.org/wp-content/uploads/2020/01/BCA\\_RISE-UP\\_EN\\_A4-3.pdf](https://www.riseupfortheocean.org/wp-content/uploads/2020/01/BCA_RISE-UP_EN_A4-3.pdf)

<sup>96</sup> SOA (2020). Campaign Against Deep-Seabed Mining. San Francisco: Sustainable Ocean Alliance. At: <https://www.soalliance.org/soa-campaign-against-seabed-mining> <https://www.soalliance.org/soa-campaign-against-seabed-mining>

<sup>97</sup> FFI (2020). Sir David Attenborough urges halt to deep sea mining plans in wake of alarming new scientific report. Cambridge: Fauna & Flora International. At: <https://www.fauna-flora.org/news/sir-david-attenborough-urges-halt-deep-sea-mining-plans-wake-alarming-new-scientific-report> <https://www.fauna-flora.org/news/sir-david-attenborough-urges-halt-deep-sea-mining-plans-wake-alarming-new-scientific-report>

<sup>98</sup> WWF (2020). Policy Position: Deep Seabed Mining. Gland: World Wide Fund for Nature. At: <https://wwf.be/nl/publicatie/policy-position-deep-seabed-mining>

In July 2020 Ecologistas en Acción, a federation of 300 Spanish environmental groups, published its “Out of sight...Deep-sea mining in Spain”, calling for an international moratorium.<sup>99</sup>

- In September 2020, over 230 European civil-society organisations issued an open letter<sup>100</sup> to European Commission Vice-President Maroš Šefčovič and commissioners Thierry Breton and Virginijus Sinkevičius in response to the European Commission’s Critical Raw Material Action Plan. The letter called for “clarification on actions the Commission will take towards establishing an international moratorium”.
- In February 2021 the Pacific Conferences of Churches, Pacific Islands Association of NGOs, Development Alternatives with Women for a New Era and PANG issued a joint “call for a total ban on DSM within our territorial waters and in areas beyond national jurisdiction”.<sup>101</sup> This was supported by 80 organisations.
- In April 2021, six environmental organisations, including the World Wildlife Fund and Greenpeace, called on Norway to stop plans to open ocean areas for deep-sea mining.<sup>102</sup>

Private companies are also starting to express reservations concerning DSM. On 31 March 2021, Google, BMW, AB Volvo Group and Samsung SDI were the first global companies to sign up to a World Wildlife Fund call for a moratorium on deep-sea mining, likely shrinking the potential market for deep-sea minerals harvested for our cars and smartphones.<sup>103</sup> This led to GSR vowing not to produce ocean-mined minerals before the environmental risks were comprehensively understood.<sup>104</sup> GSR did not, however, specify how or by whom that criterion would be assessed.

Calls have in some cases been superseded by pioneering government action. For example, in 2012 Australia’s Northern Territory Government passed the first moratorium on seabed mining, extending it in 2015 and again in 2018, before deciding in 2021 to declare an outright ban on seabed mining in its territory.<sup>105</sup>

<sup>99</sup> Ecologistas en Accion (2020). Ojos que no ven... La minería submarina en España. Spain.

At: <https://www.ecologistasenaccion.org/148756/> <https://www.ecologistasenaccion.org/148756/>

<sup>100</sup> EC (2020). Civil society concerns on EU critical raw materials plans. Brussels: The European Commission. At: [https://seas-at-risk.org/images/pdf/Letters/EC\\_letter.pdf](https://seas-at-risk.org/images/pdf/Letters/EC_letter.pdf)

<sup>101</sup> CWM (2021). Deep Sea Mining is Not Needed, Not Wanted, Not Consented!. Singapore: Council for World Mission. At: <https://www.cwmission.org/wp-content/uploads/2021/03/Pacific-joint-statement-against-Deep-Sea-Mining-DSM.pdf>

<sup>102</sup> Reuters (2021). Environmentalists call on Norway to stop plans for deep-sea mining. London: Reuters. At: <https://www.reuters.com/world/europe/environmentalists-call-norway-stop-plans-deep-sea-mining-2021-04-12/>

<sup>103</sup> Reuters (2021). Google, BMW, AB Volvo, Samsung back environmental call for pause on deep-sea mining. London: Reuters. At: <https://www.reuters.com/article/mining-deepsea-idUSL1N2LT0W5>

<sup>104</sup> GSR (2021). GSR vows not to produce ocean-mined minerals before the environmental risks are comprehensively understood. Zwijndrecht: Deme Group. At: <https://www.deme-gsr.com/news/article/gsr-vows-not-to-produce-ocean-mined-minerals-before-the-environmental-risks-are-comprehensively-understood/>

<sup>105</sup> NT Newsroom (2021). Protecting our Environment: Government to Ban Seabed Mining. Australia: Northern Territory Government. At: <https://newsroom.nt.gov.au/mediaRelease/34139>

Other voices around the world are also calling for permanent bans on similar terms to the existing 50-year prohibition of “any activity relating to mineral resources”<sup>106</sup> in the Antarctic, agreed by the international community in the 1998 Protocol on Environmental Protection to the Antarctic Treaty.

### **Box 8: Deep Sea Conservation Coalition call for a conditional moratorium**

The DSCC has a membership of 80 non-government organisations, fishers' organisations and law and policy institutes worldwide working together to protect vulnerable deep-sea ecosystems. In 2019, the DSCC published the following position on a conditional moratorium for deep-sea mining:

The DSCC holds that there should be a moratorium on: deep-seabed mining; the adoption of seabed-mining regulations for exploitation (including the “International Seabed Authority Exploitation Regulations”); and the issuing of exploitation and new exploration contracts, unless and until

1. The environmental, social and economic risks are comprehensively understood;
2. It can be clearly demonstrated that deep-seabed mining can be managed in such a way that ensures the effective protection of the marine environment and prevents loss of biodiversity;
3. Where relevant, there is a framework in place to respect the free, prior, informed consent of Indigenous peoples and to ensure consent from potentially affected communities;
4. Alternative sources for the responsible production and use of metals also found in the deep sea have been fully explored and applied, such as reduction of demand for primary metals, a transformation to a resource-efficient, closed-loop circular materials economy and responsible terrestrial mining practices;
5. Public consultation mechanisms have been established and there is broad and informed public support for deep-seabed mining, and that any deep-seabed mining permitted by the ISA fulfils their obligation to “benefit [hu] mankind as a whole” and respects the common heritage of mankind;
6. Member States reform the structure and functioning of the ISA to ensure a transparent, accountable, inclusive and environmentally responsible decision-making and regulatory process to achieve the above.

Source: [http://www.savethehighseas.org/wp-content/uploads/2019/08/DSCC-Position-Statement-on-Deep-Seabed-Mining\\_July2019.pdf](http://www.savethehighseas.org/wp-content/uploads/2019/08/DSCC-Position-Statement-on-Deep-Seabed-Mining_July2019.pdf)

<sup>106</sup> Potočnik, J. (2019). Are we really ready to risk our own future? Bled Strategic Forum, September 3. At: <https://medium.com/bled-strategic-forum/are-we-really-ready-to-risk-our-own-future-5450c375a8fe>

## EU-funded research for DSM

Growing scientific evidence supporting the need for a global moratorium on DSM has been building over the last ten years in spite of a chronic deficit of fundamental research to understand deep-sea environments. Paradoxically, the EU and Member States have not adequately addressed this critical knowledge gap, supporting instead the development of DSM technologies even before the scientific community has reached solid conclusions about the consequences of deploying such technologies.

Annex 2 illustrates the dynamics of financial flows of EU funds towards DSM-related research programmes over the past decade and a half. These have been divided in two types: (1) fundamental research to understand and protect the deep-sea environment and (2) applied research to support technology development for DSM. DSM-related funding from national research programmes has not been included, but is particularly substantial in some countries, including Norway's current commitment to provide €13 million to DSM research (following the earlier MarMine project at the Norwegian University of Science and Technology) or the UK's multi-million-pound MarineE-tech project.

Most EU funding has been channelled through the Framework Programmes for Research and Technological Development (FP1 to FP7, with FP8 being named Horizon 2020, succeeded by Horizon Europe in the 2021–2027 period). Specific objectives and actions vary between funding periods. While FP6 and FP7 focused on technological research, Horizon 2020 has focussed on innovation, aiming at “delivering economic growth faster” and providing solutions to end-users that are often governmental agencies.

Other funding has been provided directly by DG GROW's Raw Materials Initiative (aimed at securing access to raw materials) and by DG MARE, which has engaged in a variety of studies and projects to shed light on the benefits, drawbacks and knowledge gaps associated with DSM. During 2014–2020 DG MARE and DG GROW provided significant funds (including European Maritime and Fisheries funds) to EMODnet Geology for mapping “marine minerals” across European waters.<sup>107</sup> DG RELEX has also provided DSM-governance-related support to small island states in the Pacific. Other research projects on DSM have been funded and conducted through other mechanisms, including the European Research Council, JPI Oceans and Census of Marine Life.

Based on the information gathered, it is estimated that the EU invested over €100 million in projects related to DSM. There are two distinct project types: DSM-technology projects and environmental projects. Technology projects are those that aim at researching and developing potential technical solutions for exploration and exploitation activities. Environmental projects include research into the functioning of deep-sea ecosystem, environmental issues related to the exploitation of deep-sea minerals and the different management approaches to reduce or mitigate potential DSM impacts on marine ecosystems.

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<sup>107</sup> EMODnet (2021). At: <https://www.emodnet-geology.eu/>

**Table 3:** EU funding going to fundamental research on deep-sea environment versus funding for applied research to support the development of DSM technologies.

Programme	Technology	Environment	Total €
FP6 (2002-6)	0	15,500,000	15,500,000
FP7 (2007-13)	16,428,774	26,567,132	42,995,906
Horizon 2020	84,028,292	38,787,157	122,815,449
DG GROW	2,920,418	0	2,920,418
DG MARE	1,300,000	1,749,814	3,049,814
DG RELEX	0	4,400,000	4,400,000
Others	0	1,051,500	1,051,500
Total €	104,677,484	88,055,603	192,733,087

Source: Seas at Risk and DSCC (2016). EU funded deep-seaminingrelated research, updated 2020 by Éliisa Martínez.

Despite the huge knowledge gap regarding deep-sea ecosystems, most funding went to the development of DSM technologies: 54% of the €192 million spent on deep-sea research have been allocated for DSM technology projects, and over the years there has been an observable shift towards DSM technological development. Currently, projects developing technologies to facilitate DSM now amount to 73% of the €32.9 million allocated to ongoing DSM-related research.

While the 2020 EU Biodiversity Strategy explicitly states that “the EU will continue to fund research on the impact of deep-sea mining activities and on environmentally-friendly technologies”, the continuing imbalance and resulting deficit in basic research into deep-sea ecosystems needs to be addressed. A more detailed explanation of the different projects including (1) budget, (2) partners, (3) time-frame, (4) summaries and (5) website details, can be found in Annex 2.

*What could be achieved in terms of human progress if the European Green Deal is implemented with the specific purpose of inspiring European citizens, communities and enterprises to create innovative social practices that have little or no environmental impacts yet still aim for societal and personal growth?*

European Environment Agency (2021), "Growth without economic growth".

## 4. Green Deal: the climate, biodiversity and mining nexus

### The Green Deal and the decoupling illusion

The Commission's proposed position for the EU on DSM is intended to support "the objectives of the European Green Deal and the green oath 'to do no harm' and the European Union's ambition to lead globally on the conservation and protection of our environment, including seas and oceans".

The raw-material demands associated to the European Green Deal – and its decarbonisation and digitisation ambitions – puts the EU on a tightrope between security of supply for meeting demand for metals and "responsible supply":

**Access to resources is also a strategic security question for Europe's ambition to deliver the Green Deal. Ensuring the supply of sustainable raw materials, in particular of critical raw materials necessary for clean technologies, digital, space and defence applications, by diversifying supply from both primary and secondary sources, is therefore one of the pre-requisites to make this transition happen.<sup>108</sup>**

Europe's drive for metals is nevertheless also based on the ideology of perpetual growth and on an unwavering faith in the possibilities of "green growth". As a senior geologist at the Geological Survey of Finland put it in 2020, most policy-makers have been led to believe that, through mining, they can simply replace an industrial civilisation built upon cheap oil with a green version of the same model.<sup>109</sup>

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<sup>108</sup> EC (2019). The European Green Deal. Brussels: The European Commission. At: "[https://ec.europa.eu/info/sites/info/files/european-green-deal-communication\\_en.pdf](https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf)"[https://ec.europa.eu/info/sites/info/files/european-green-deal-communication\\_en.pdf](https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf)

<sup>109</sup> Michaux, S. (2020). The Raw Material Challenges Facing the Energy Transition from Oil to Minerals [presentation]. At: <https://www.gtk.fi/en/presentation-the-raw-material-challenges-facing-the-energy-transition-from-oil-to-minerals/>

This is implicitly incorporated into the European Green Deal, which is profiled as the EU's new growth strategy. This is very reminiscent of the "green growth" ambitions of the 1990s, which over-relied on technological efficiency and innovation to reconcile economic growth with environmental targets. In reality, growth often offsets efficiency gains and improved efficiency usually also leads to more consumption (as the Jevons paradox<sup>110</sup> illustrates) unless strong interventions to reduce demand are implemented (for example, resource caps).

The EEA's briefing "Growth without economic growth", showed that decoupling growth and environmental footprints (e.g. water, materials, energy and greenhouse gases) associated with EU consumption patterns is often relative and varies between countries.<sup>111</sup> It concludes that

**an absolute reduction of environmental pressures and impacts would require fundamental transformations to a different type of economy and society – instead of incremental efficiency gains within established production and consumption systems.**

An earlier report by the European Environmental Bureau concluded the same: **the green-growth decoupling strategy is set "to fail with irreversible consequences on the environment"**.<sup>112</sup>

The growth paradigm that underpins the Green Deal – and other high-level strategies such as the SDGs<sup>113</sup> – risks pushing the demand for raw materials and mining many times beyond planetary limits. **If everyone on Earth were to consume the way an average European citizen does, 2.6 planets would be needed to feed the resulting over-consumption and absorb the ensuing waste.** Even at what is currently considered a moderate GDP growth rate of 3%, mining production would have to double every 25 years<sup>114</sup> to meet increasing material consumption demand.

**Current on-surface stock of copper represents 50% of all known ore reserves still underground – in the case of silver and gold, on-surface stock is 70%<sup>115</sup> – while projections contemplate mining the remaining 50% in the following 30 years – i.e., extracting more copper in three decades than during the whole of human history.<sup>116</sup>**

<sup>110</sup> The Jevons paradox explains how technological progress or policies that increase resource use efficiency can lead to the rise of the rate of resource consumption due to increasing demand.

<sup>111</sup> EEA (2021). Growth without economic growth. Copenhagen: European Environment Agency At: <https://www.eea.europa.eu/publications/growth-without-economic-growth>

<sup>112</sup> Parrique, T. et al. (2019). Decoupling debunked: Evidence and arguments against green growth as a sole strategy for sustainability. Brussels: European Environmental Bureau. At: <https://eeb.org/library/decoupling-debunked/>; Vadén, T. et al. (2020). Raising the bar: on the type, size and timeline of a 'successful' decoupling. Environmental Politics. At: <https://doi.org/10.1080/09644016.2020.1783951>

<sup>113</sup> See Sustainable Development Goal 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

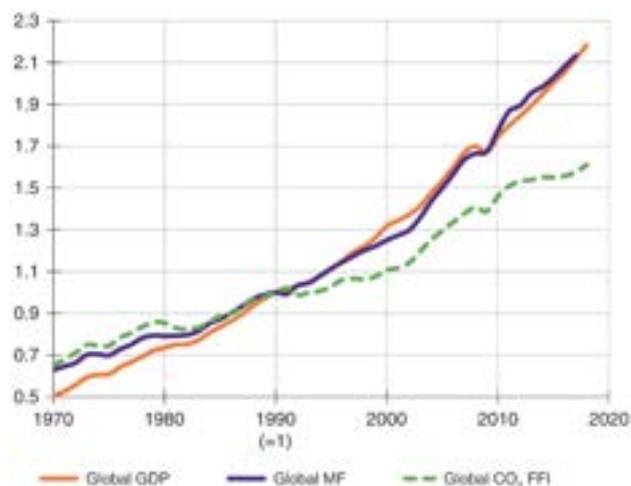
<sup>114</sup> Exter, Pieter van, et al. (2018). Metal demand for renewable electricity generation in The Netherlands. Amsterdam: Metabolic. At: <https://www.metabolic.nl/publications/metal-demand-for-renewable-electricity-generation-in-the-netherlands-pdf/>

<sup>115</sup> Galos, K.; Szamałek, K. (2016). "Metals in Spent Mobile Phones (SMP) – a new challenge for mineral resources management," Mineral Resources Management, 32(4):45-48. At: <http://journals.pan.pl/dlibra/publication/121561/edition/105936/>

<sup>116</sup> Pitron, G.; Pérez, J.-L. (2019). Le vert n'est pas vert! [film]. Paris: Arte France.

These predictions occur at the same time when metals, instead of being reused or recycled, are being wasted on a colossal scale – reburied in landfills, or dumped in the Global South and in the seas – thus fuelling a destructive spiral.

**Figure 7:** Relative change in main global economic and environmental indicators from 1970 to 2018



Source: Wiedmann et al. (2020). “Scientists’ warning on affluence,” Nature Communications, 11: 3107. At: <https://www.nature.com/articles/s41467-020-16941-y>

NOTE: Shown is how the global material footprint (MF, equal to global raw material extraction) and global CO<sub>2</sub> emissions from fossil-fuel combustion and industrial processes (CO<sub>2</sub> FFI) changed compared with global GDP (constant 2010 USD). Indexed to 1 in 1990. Data sources: <https://www.resourcepanel.org/global-material-flows-database>, <http://www.globalcarbonatlas.org> and <https://data.worldbank.org>.

**Although concentration-wise a mobile phone has 100 times more gold and 10 times more tungsten than a high-grade mineral deposit,<sup>117</sup> nine out of 10 discarded phones – with an average lifespan of little more than 2 years in 2020 – are being incinerated or buried<sup>118</sup> even if over 80% of their total metal value can be recycled.<sup>119</sup> In the EU alone, there are more than 500 million shelved phones, worth €1.3 billion in recoverable gold, silver, platinum, palladium and copper.<sup>120</sup>**

These facts not only illustrate the shortcomings of EU circular-economy policies but also the short-sightedness of raw-material policies which encourage more and more mining, and in the *wrong places*. Urban and landfill mining remain out of the picture, outcompeted by devastating “low-cost” mining that forces others to pay for its social and environmental impacts.

By opening up a new exploitation frontier such as the deep sea, more and more mining will only exacerbate excessive and irresponsible use of resources. It furthermore risks diverting funds and attention from much-needed investments in a circular and transformational economy.

<sup>117</sup> Galos, K.; Szamalek, K. (2016). See previous reference.

<sup>118</sup> Gornall, J. (2016). Here’s the fix: planned obsolescence and the rise of a global repair movement. The National, October 10. At: <https://www.thenationalnews.com/arts-culture/here-s-the-fix-planned-obsolescence-and-the-rise-of-a-global-repair-movement-1.161013>

<sup>119</sup> Bookhagenab, B., et al. (2020). Metallic resources in smartphones. Resources Policy, 68: 101750. At: <https://doi.org/10.1016/j.resourpol.2020.101750>

<sup>120</sup> reBuy (2020). 2020 Mobile Phone E-Waste Index. At: <https://www.rebuy.de/s/mobile-ewaste-index-en>

## Raw Materials Action Plan and security of supply

The Critical Raw Materials Action Plan, launched in September 2020, looks at the current and future challenges and supply risks, and proposes actions to reduce Europe's dependency on other countries, diversifying supply from both primary and secondary sources and improving resource efficiency and circularity while promoting responsible sourcing worldwide.<sup>121</sup>

The aim of the action plan is to promote “diversified and undistorted access to global markets for raw materials”. The action plan acknowledges the EU's “enormous appetite for resources” and notes that “the underlying problem (...) needs to be addressed by reducing and reusing materials before recycling them”. However, the plan does not include any commitment to reduction targets on overall resource consumption.

With “security of supply” as an underpinning argument, the action plan includes expanding mining in both the Global South and in European countries with “critical minerals” reserves. While DSM is not explicitly mentioned, the “security of supply” argument has been repeatedly used to justify the need to exploit the seabed. This is often expressed in terms of antagonism or conflict with or within third countries that are currently important providers – i.e., China, Bolivia, Congo, etc. – as a recent letter from MEPs to the Commission illustrated.<sup>122</sup>

While it is true that China banned foreign investors from extracting metals such as tungsten, tin, molybdenum or rare earths – infuriating the European mining lobby – the fact that the EU is shipping millions of tons of used batteries and other discarded devices bearing “critical metals” back to China for recycling and later repurchase<sup>123</sup> does not seem to cause similar concern.

**One single recycling company in China has been producing more cobalt than all the country's mines together<sup>124</sup> mainly thanks to constant e-waste shipments from the EU and other countries.**

The lack of political will to establish security of supply through enhanced and enforced metal recovery within Europe seems not to be considered a problem. It naturally does not bother mining lobbies either, considering millions of euros of public subsidies are being poured into DSM research and onshore mining development on EU sites to address the same supply issues.

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<sup>121</sup> EC (2020). Commission announces actions to make Europe's raw materials supply more secure and sustainable. Brussels: The European Commission. At: [https://ec.europa.eu/commission/presscorner/detail/en/ip\\_20\\_1542](https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1542)

<sup>122</sup> EP (2020). Open strategic autonomy': A vision for Europe's raw materials future. Brussels: The European Parliament. At: [https://g8fip1kplyr33r3krz5b97d1-wpengine.netdna-ssl.com/wp-content/uploads/2020/06/Letter-to-EC-on-'Open-strategic-autonomy'-A-vision-for-Europe's-raw-materials-future\\_final.pdf](https://g8fip1kplyr33r3krz5b97d1-wpengine.netdna-ssl.com/wp-content/uploads/2020/06/Letter-to-EC-on-'Open-strategic-autonomy'-A-vision-for-Europe's-raw-materials-future_final.pdf)

<sup>123</sup> Melin, H. (2019). State-of-the-art in reuse and recycling of lithium-ion batteries– A research review. Stockholm: The Swedish Energy Agency. At: <http://www.energimyndigheten.se/globalassets/forskning--innovation/overgripande/state-of-the-art-in-reuse-and-recycling-of-lithium-ion-batteries-2019.pdf>

<sup>124</sup> WEF (2019). A New Circular Vision for Electronics. Geneva: World Economic Forum. At: [http://www3.weforum.org/docs/WEF\\_A\\_New\\_Circular\\_Vision\\_for\\_Electronics.pdf](http://www3.weforum.org/docs/WEF_A_New_Circular_Vision_for_Electronics.pdf)

## EU trade policies in support of raw materials and DSM

The EU's security-of-supply concerns influenced EU trade deals and international development aid through chapters on "Raw Materials and Energy".<sup>125</sup> Recent negotiations with Chile, Australia and Mercosur, for instance, state that agreements "should include provisions aimed at ensuring an unrestricted and sustainable access to raw materials".<sup>126</sup> The Pacific Regional Indicative Program (2014–2020)<sup>127</sup> included "support towards development of policies, and legislative and revenue frameworks for deep-sea mining have highlighted the importance of building capacity to support sound institutional and policy processes that will ensure increased returns from the exploitation of marine mineral resources, from the outset."

The EU also funded the Secretariat of the Pacific Community's (SPC) Deep Seas Minerals Project, begun in 2011 with a budget of €4.4 million. It aimed to help Pacific Island countries improve governance and management of their deep-sea minerals resources in accordance with international law, with particular attention paid to the protection of the marine environment and securing equitable financial arrangements for Pacific Island countries and their people.

A leaked draft<sup>128</sup> of a follow-up agreement to the Cotonou Agreement between the EU and the African, Caribbean and Pacific Group of States also included references to DSM. The intention was to open the way for European mining companies explore and extract minerals from waters under Pacific states' jurisdictions.

## EU circular economy strategy: potential and limitations

A 2017 EU Joint Research Centre Report on Critical Raw Materials and the Circular Economy<sup>129</sup> pointed out that the use of critical raw materials in the EU economy is far from being circular, and concluded that "not only recycling has to be looked at, but also re-use, product lifetime extension, new business models, etc."

Previous EU circular-economy policies – such as the 2011 Roadmap to Resource Efficient Europe<sup>130</sup> and 2015 Circular Economy Action Plan – mostly focussed on recycling. The 2020 Circular Economy Action Plan (CEAP)<sup>131</sup> is more ambitious in that it also takes on board such things as eco-design, repair and re-use.

<sup>125</sup> Power-shift (2020). Alternatives for the 'Energy and Raw Materials Chapters' in EU trade agreements. Berlin: Verein für eine ökologisch-solidarische Energie- & Weltwirtschaft e. V. At: <https://power-shift.de/wp-content/uploads/2020/05/Alternatives-for-the-'Raw-materials-and-Energy-Chapters'-in-EU-trade-agreements-web.pdf>

<sup>126</sup> EC (2018). Council Directives for the negotiation of a Modernised Association Agreement with Chile. Brussels: The European Commission. At: [http://trade.ec.europa.eu/doclib/docs/2018/january/tradoc\\_156550.pdf](http://trade.ec.europa.eu/doclib/docs/2018/january/tradoc_156550.pdf) [accessed 11 March 2020].

<sup>127</sup> EU (2015). European Union - The Pacific Islands Forum Secretariat Pacific Regional Indicative Programme for the period 2014-2020. Brussels: The European Union. At: [https://eeas.europa.eu/sites/eeas/files/pacific\\_regional\\_indicative\\_programme.pdf](https://eeas.europa.eu/sites/eeas/files/pacific_regional_indicative_programme.pdf)

<sup>128</sup> ACP (2020). Evolving Draft Of The New Acp-Eu Partnership Agreement. Brussels: Organisation Of African, Caribbean And Pacific States. At: [https://www.bilaterals.org/IMG/pdf/draft\\_acp-eu\\_partnership\\_agreement\\_\(mar\\_2020\).pdf](https://www.bilaterals.org/IMG/pdf/draft_acp-eu_partnership_agreement_(mar_2020).pdf)

<sup>129</sup> EC (2017). Critical Raw Materials and the Circular Economy – Background report. Brussels: The European Commission. At: <https://ec.europa.eu/jrc/en/publication/eur-scientific-and-technical-research-reports/critical-raw-materials-and-circular-economy-background-report>

<sup>130</sup> EU (2011). Roadmap to a Resource Efficient Europe. Brussels: The European Union. At: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0571>

<sup>131</sup> EC (2020). Circular economy action plan. Brussels: The European Commission. At: [https://ec.europa.eu/environment/circular-economy/index\\_en.htm](https://ec.europa.eu/environment/circular-economy/index_en.htm)

The CEAP focuses on sectors that are important drivers of demand for minerals, i.e., electronics, digitalisation and batteries and vehicles. It fails, however, to address the renewable technologies sector, among other things. It also fails to meet the European Parliament's expectations for establishing legally-binding targets to reduce raw-material use. A February 2021 report adopted by the European Parliament<sup>132</sup> included a motion for a resolution on the new CEAP calling "on the Commission to propose binding EU targets for 2030 to significantly reduce the EU material and consumption footprints and bring them within planetary boundaries by 2050".

As such, CEAP lags behind policies adopted elsewhere that have established minimum recycled-material content,<sup>133</sup> effectively making metal recovery and reuse mandatory (with defined recovery thresholds) and requiring and enforcing recycled-content targets in manufacture.<sup>134</sup> Reduction must connect to enhancing previous EU ecodesign regulations passed in October 2019 following an earlier 2017 European Parliament resolution for "A longer lifetime for products" that called for policies ensuring the availability of replacement parts, establishing an independent system to test and detect built-in obsolescence in products and changing design norms to force manufacturers to ensure ease of repairs and replacement of materials – for example, using screws rather than welding parts together.<sup>135</sup>

**One of the reasons for the failure of circularity policies is that none has seriously considered the need to leave minerals in the ground and in the seabed.** Only decisive political will to curb extraction will force real progress towards circularity, as the status quo – which feeds relatively cheap metals into the market at huge environmental cost – is evidently not serving as an incentive to stop or reverse the colossal waste of metals in the Global North.

**Rather than supporting the false narrative that DSM or more terrestrial mining can "save the planet", it is a moratorium or permanent ban on DSM as well as strict limits on onshore mining that will provide the catalyst forcing Europe towards circularity.**

The shift away from the throwaway, take-make-waste consumer society also requires adding Rs to the earlier Reduce-Reuse-Recycle triad, boosting Repair, Remanufacture and Recovery. The end of wasteful practices requires drastically curbing obsolescence – technological, psychological and planned – guaranteeing reparability, long-life product cycles and built-in circular design for easy and economical disassembly of components for reuse and recycling.<sup>136</sup>

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<sup>132</sup> EP (2020). Report On The New Circular Economy Action Plan. Brussels: The European Parliament. At: [https://www.europarl.europa.eu/doceo/document/A-9-2021-0008\\_EN.html](https://www.europarl.europa.eu/doceo/document/A-9-2021-0008_EN.html)

<sup>133</sup> Responsabilitas (2018). China's Extended Producer Responsibility Regulations Take Shape. Paris. At: <http://www.responsabilitas.com/blog/china-epr-regulation/>

<sup>134</sup> Söderholm, P. (2020). Metal markets and recycling policies: impacts and challenges. *Mineral Economics*, 33:257-272. At: <https://link.springer.com/article/10.1007/s13563-019-00184-5>

<sup>135</sup> EP (2017). MEPs call for measures to ensure products last longer. Brussels: The European Parliament. At: <https://www.europarl.europa.eu/news/en/headlines/economy/20170629STO78621/meps-call-for-measures-to-ensure-products-last-longer>

<sup>136</sup> Bachér, J. et al. (2020). Electronic products and obsolescence in a circular economy. Boeretang: European Topic Centre on Waste and Materials. At: <https://www.eionet.europa.eu/etcs/etc-wmge/products/electronics-and-obsolescence-in-a-circular-economy>

A number of EU and Member State policies have shown potential for progress when political will is mobilised. Some examples include the 2020 European Parliament report demanding Europe “clamp down” on planned obsolescence<sup>137</sup> and establish compulsory long-life guarantees and producer liability for repair, remanufacture and recovery, encouraging companies to reengineer designs into compliance.

Other pioneering policies including France's 2015 inclusion of planned obsolescence as a punishable offence – with subsequent enforcement<sup>138</sup> – and 2021 introduction of product-lifetime index labels based on built quality, reparability and durability.<sup>139</sup> In Sweden, VAT was lowered for repair services in 2017 – for everything from bikes, and shoes to phones and washing machines – and new laws allowed citizens to claim part of the labour cost of appliance repair on their income taxes.<sup>140</sup> Most of these policies and many other had already been recommended in a 2017 UN report<sup>141</sup> which also called for minimum durability criteria and extended guarantees, planned-obsolescence and right-to-repair legislation, product-lifetime labelling and extended producer responsibility.

### Box 9: Europe's consumption in a circular economy: the benefits of longer-lasting electronics

The DSCC's membership of 80 non-governmental organisations, fishers' organisations and law and policy institutes worldwide are working together to protect vulnerable deep-sea ecosystems. In 2019, the DSCC published the following position on a conditional moratorium for deep-sea mining:

Extending the lifetime and delaying obsolescence of electronics can significantly reduce their environmental and climate impacts and contribute to meeting the EU's environment, climate and circular-economy objectives. According to the EEA, however, smartphones, televisions, washing machines and vacuum cleaners all are used on average for shorter periods than both their designed and desired lifetimes. The main reasons are consumers' desire for the latest model, marketing-induced obsolescence, lack of repair services, operating-system problems, and hardware that does not match new software.

<sup>137</sup> EP (2020). Towards a more sustainable single market for business and consumers. Brussels: The European Parliament. At: [https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?reference=2020/2021\(INI\)](https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?reference=2020/2021(INI))

<sup>138</sup> Kayali, L. (2020). Apple fined €25M in France for misleading consumers about slowed-down iPhones. Politico. At: <https://www.politico.eu/article/apple-fined-e25m-in-france-for-misleading-consumers-about-slowed-down-iphones/>

<sup>139</sup> The Local (2018). France to toughen stance on planned obsolescence of goods. Paris. At: <https://www.thelocal.fr/20180216/france-muses-whether-to-expose-the-true-lifespan-of-goods-and-appliances>

<sup>140</sup> Venard, L. (2017). Get Paid To Fix Your Broken Things — New Swedish Tax Breaks Support Repair. Medium. At: <https://medium.com/@greenxeurope/getting-paid-to-fix-your-broken-things-new-swedish-tax-breaks-support-repair-ff67c016c211>

<sup>141</sup> Bakker, C. A.; Schuit, C. S. C. (2017). The Long View: Exploring Product Lifetime Extension. Nairobi: UNEP. At: <https://www.oneplanetnetwork.org/resource/long-view-exploring-product-lifetime-extension>

## At a crossroads:

Europe's role in deep-sea mining

Extending the lifetime and delaying obsolescence of electronics can significantly reduce impacts and contribute to meeting EU environment, climate and circularity objectives. The enabling and scaling-up of circular business models supported by the development and implementation of effective measures – eco-design, energy labelling, green public procurement and extended producer responsibility – can support this.

Finally, circularity is only one part of an economy that keeps its use of raw materials within planetary boundaries. Like the Green Deal, the CEAP remains very much a “growth economy”, and a growing circle – even when optimally efficient in resource use – is bound to require increasing material inputs. The EEA's “Growth without economic growth” briefing<sup>142</sup> is crystal clear: economic growth cannot be decoupled from resource use and 100% circularity is not possible. In fact, the world economy is only 9% circular and declining. In the EU, only 24% of metals are recycled.

**Source: European Environment Agency (2020), Europe's consumption in a circular economy: the benefits of longer-lasting electronics. At: <https://www.eea.europa.eu/publications/europe2019s-consumption-in-a-circular/benefits-of-longer-lasting-electronics>**

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<sup>142</sup> EEA (2021). Growth without economic growth. Copenhagen: European Environment Agency At: <https://www.eea.europa.eu/publications/growth-without-economic-growth>

## The need for binding EU material footprint reduction targets

Several sectoral EU strategies and policies developed under the Green Deal umbrella have a significant impact on future demand for minerals in the EU. These include, among others, the policy areas of climate and clean energy, sustainable industry, digitisation and sustainable mobility. While all these strategies involve developing mineral-intensive infrastructure and technologies to address pressing carbon-reduction targets (to meet the Paris Agreement), they do not adequately address the impacts associated with the massive increase of mining that would be required. Most only mention circularity principles and consumption reduction in a cursory manner, and targets for reducing the overall material footprint are lacking.

### Examples include:

- The new Sustainable and Smart Mobility Strategy<sup>143</sup> aims to deliver a 90% reduction in the transport sector's emissions by 2050, and envisages that by 2030, 30 million zero-emission vehicles will be in operation on European roads and by 2050 nearly all cars, vans and buses as well as new heavy-duty vehicles will be zero-emission. It notes that sustainability and end-of-life cycle requirements, including related to carbon footprint and ethical and sustainable sourcing of raw materials, are essential to reduce the environmental footprint of electric vehicles. While the strategy also states that it aims for the increase of shared and collaborative mobility services, it fails to set targets for significantly reducing the EU car fleet.
- The 2018 Renewable Energy Directive (under revision) sets a new binding renewable-energy target for the EU for 2030 of at least 32% (to be increased to 65% or more under the new target of the Climate Target Plan for 55% emission reduction by 2030)<sup>144</sup> but makes no concrete reference to the inevitable increase in mineral demand, other than generic references to circular-economy principles. The associated EU strategy on energy-system integration emphasises that to "meet our emissions reduction goals we need to generate more electricity from renewables" (emphasis added), while virtually ignoring the need to reduce energy consumption.
- The Offshore Renewable Energy Strategy, which targets a twenty-five-fold increase in offshore wind by 2050, calls for "critical raw material substitution and to systematically integrate the principle of 'circularity by design' into renewables research & innovation."<sup>145</sup>

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<sup>143</sup> EC (2020). Sustainable and Smart Mobility Strategy – putting European transport on track for the future. Brussels: The European Commission. At: <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020DC0789&from=EN>

<sup>144</sup> EU (2020). Stepping up Europe's 2030 climate ambition Investing in a climate-neutral future for the benefit of our people. Brussels: The European Union. At: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0562>

<sup>145</sup> EC (2020). An EU Strategy to harness the potential of offshore renewable energy for a climate neutral future. Brussels: The European Commission. At: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0741&from=EN>

- The proposed draft regulation concerning batteries and waste batteries<sup>146</sup> sets extremely modest minimum recycled-content targets for decades ahead (only 4% for lithium and nickel and 12% for cobalt by 2030), which hardly disincentivises primary-metal extraction and DSM. It is worth noting that such a low target for the recycled-materials content used in new batteries put on the market in the EU is at odds with the 2020 Circular Economy Action Plan's<sup>147</sup> objectives of boosting this measure to promote a sustainable and competitive battery industry in Europe. References to recovery targets in other pieces of legislation, such as Article 11 in the Waste Electrical and Electronic Equipment Directive<sup>148</sup> remain purely declarative.
- The Industry Strategy<sup>149</sup> acknowledges that “with the transition of Europe's industry to climate-neutrality, the reliance on available fossil fuels **could be replaced with reliance on non-energy raw materials**, many of which we source from abroad and for which global competition is becoming more intense.” Assuming that the “demand for raw materials is projected to double by 2050, making diversified sourcing essential to increase Europe's security of supply”, the Commission launched its Action Plan on Critical Raw Materials. While both the strategy and the action plan recognise that recycling and the use of secondary raw materials are important to reduce dependency, they include no concrete targets or measures to disincentivise primary-metal extraction in favour of increased metal recovery and recycling.
- The European Digital Strategy<sup>150</sup> and its associated policies (2021 Digital Compass, Action Plan on 5G and 6G, revised Broadband Cost Reduction Directive, etc.) do not acknowledge the massive energy costs of ICT (some estimates consider ICT networks could be using up to 50% of world electric production by 2030). While the “Shaping Europe's digital future” communication states that “ICT equipment must become fully circular – designed to last longer, to be properly maintained, to contain recycled material and to be easily dismantled and recycled”, targets and concrete measures are again missing.

## Towards growth without economic growth

All of the above underscores the need for a much more transformative European Green Deal, one which is able to downscale economic consumption, shifting its priority from destructive growth to meeting people's needs without overshooting Earth's ecological ceiling. The Intergovernmental Panel on Climate Change (IPCC) 2018 Global Warming of 1.5°C special report warned that the only viable way

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<sup>146</sup> EC (2020). Regulation Of The European Parliament And Of The Council concerning batteries and waste batteries, repealing Directive 2006/66/EC and amending Regulation (EU) No 2019/1020. Brussels: The European Commission. At: [https://ec.europa.eu/environment/pdf/waste/batteries/Proposal\\_for\\_a\\_Regulation\\_on\\_batteries\\_and\\_waste\\_batteries.pdf](https://ec.europa.eu/environment/pdf/waste/batteries/Proposal_for_a_Regulation_on_batteries_and_waste_batteries.pdf)

<sup>147</sup> EC (2020). Circular economy action plan. Brussels: The European Commission. At: [https://ec.europa.eu/environment/circular-economy/index\\_en.htm](https://ec.europa.eu/environment/circular-economy/index_en.htm)

<sup>148</sup> EU (2012). Directive 2012/19/EU Of The European Parliament And Of The Council of 4 July 2012 on waste electrical and electronic equipment. Brussels: The European Union. At: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02012L0019-20180704>

<sup>149</sup> EC (2020). Communication From The Commission A New Industrial Strategy For Europe. Brussels: The European Commission.

At: <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52020DC0102&from=EN>

<sup>150</sup> EU (2020). Shaping Europe's digital future. Brussels: The European Union. At: <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=COM%3A2020%3A0067%3AFIN>

ahead was for rich countries to decisively cut their rates of material production and consumption; the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the International Resource Panel (IRP) reached similar conclusions. Transformative change means doing things differently—not just a little more or less of something we're already doing.<sup>151</sup>

As the European Environment Agency stated in its “Growth without economic growth” briefing: “It is unlikely that a long-lasting, absolute decoupling of economic growth from environmental pressures and impacts can be achieved at the global scale; therefore, societies need to rethink what is meant by growth and progress and their meaning for global sustainability.”<sup>152</sup>

**It concludes that “The European Green Deal and other political initiatives for a sustainable future require not only technological change but also changes in consumption and social practices.”**

Setting out alternative schools of thought (e.g. the degrowth, post-growth and doughnut economy), the EEA concludes that the challenge in coming years will be to bring these insights into mainstream policy processes and consider how they can be operationalised effectively in support of Europe's sustainability objectives.

Recalling Kenneth Boulding's 1966 landmark essay “The Economics of the Coming Spaceship Earth,”<sup>153</sup> a true green deal must break away from the “cowboy economy” – the “cowboy” being symbolic of the unlimited plains, but also associated with reckless, exploitative, romantic and violent behaviour – shifting to what Boulding called a new “spaceman economy”, considering Earth as “a single spaceship, without unlimited reservoirs of anything, either for extraction or for pollution, and in which, therefore, man must find his place in a cyclical ecological system”.

**On that spaceship, there is no space for DSM.**

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<sup>151</sup> IPBES (2019). What Is Transformative Change, and How Do We Achieve It?. Bonn: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services. At: <https://ipbes.net/news/what-transformative-change-how-do-we-achieve-it>

<sup>152</sup> EEA (2021). Growth without economic growth. Copenhagen: European Environment Agency At: <https://www.eea.europa.eu/publications/growth-without-economic-growth>

<sup>153</sup> Boulding, Kenneth E. (1966). The Economics of the Coming Spaceship Earth. In H. Jarrett (ed.) Environmental Quality in a Growing Economy. Baltimore: Resources for the Future/Johns Hopkins University Press, pp. 3-14.

## 5. The way ahead: ten steps for Europe to champion deep-sea protection

Portugal and Norway are members of the High Level Panel for a Sustainable Ocean Economy, a group of leaders of 14 countries that has put forward new action proposals aimed at sustainably managing 100% of national waters. Belgium heads the Blue Leaders group of countries, including Denmark, Finland, Spain and Sweden, calling for action in 2021 to save our global oceans in the face of climate change and other threats.

The EU, with its new approach to a sustainable Blue Economy, aims to lead the way on international ocean governance.

This shows that the EU and its Member States, together with the UK and Norway, have a strong commitment to protecting the ocean and the deep sea. To be credible, they should lead by example by establishing a ban or moratorium in their waters and globally. Seas at Risk calls on the EU, its Member States, the UK and Norway to implement the following 10 steps:

1. Transition to a resource-efficient Green Deal and Blue Economy that focusses on wellbeing of planet and people, i.e. aims for “growth without economic growth”, following EEA, IPCC, IPBES and IRP recommendations.<sup>154</sup>
2. Set binding EU and national material-footprint reduction targets for 2030, 2040 and 2050 – including for mining and metals supplies – and mainstream those into all related EU and national policies e.g. those dealing with circular economy, industry, energy, mobility, climate, renewable energy and digitalisation and urbanisation.
3. Protect the deep sea in line with the nature recovery and protection commitments of the EU Biodiversity Strategy and the Leaders’ Pledge for Nature.
4. Prohibit DSM in European waters/continental shelves following the example of the 2021 DSM ban by Australia’s Northern Territory or set conditions such as established for by the DSCC’s moratorium call.<sup>155</sup> Ensure this is embedded in the EU’s new Blue Economy and International Ocean Governance strategies.

<sup>154</sup> EEA (2021). Sustainability: What are the alternatives to economic growth?. Copenhagen: European Environment Agency. At: <https://www.eea.europa.eu/highlights/sustainability-what-are-the-alternatives>

<sup>155</sup> DSCC (2019). DSCC Position Statement on Deep Seabed Mining. Amsterdam: Deep Sea Conservation Coalition. At: [http://www.savethehighseas.org/wp-content/uploads/2019/08/DSCC-Position-Statement-on-Deep-Seabed-Mining\\_July2019.pdf](http://www.savethehighseas.org/wp-content/uploads/2019/08/DSCC-Position-Statement-on-Deep-Seabed-Mining_July2019.pdf)

5. As members of the International Seabed Authority: advocate a conditional prohibition in international waters along the lines of the European Parliament's 2018 call for an international moratorium and of the DSCC's call for a moratorium. Cease sponsoring and permitting DSM exploration contracts and refrain from sponsoring or permitting exploitation contracts.
6. Following examples such as the Conflict Minerals Regulation,<sup>156</sup> adopt specific trade and sectoral (e.g. batteries) regulations banning import and use of raw materials or manufactured goods that have been obtained from or produced with deep-sea minerals.
7. Stop funding DSM technology, and instead support fundamental research into the role and functioning of deep-sea ecosystems, their contribution to carbon storage and the regulation of planetary processes, as well as into pathways to drastic reduction of resource-use (e.g. post-growth, transition economies and sustainable consumption and production).
8. Ensure institutional reform of the ISA by establishing environmental and scientific committees, enhancing environmental competence and transparency, amending the voting and decision-making and the 'use it or lose it' and two-year trigger clauses, ensuring accountability and full involvement of civil society and stakeholders and enshrining judicially binding human-rights due diligence for companies<sup>157</sup>.
9. Ensure overarching ocean governance through the global Ocean Treaty (on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction) that includes the conservation of the deep seabed and redefines the role of the ISA, integrating it into other existing bodies and treaty organisations.
10. Involve environmental ministries, scientific bodies and stakeholders in the adoption of relevant decisions regarding DSM in national and international waters, raise awareness and establish processes for public participation.

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<sup>156</sup> EU (2017). Official Journal of the European Union. Brussels: The European Union. At: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ:L:2017:130:TOC>

<sup>157</sup> DSCC (2020). Deep Sea Mining: is the International Seabed Authority fit for purpose?. Amsterdam: Deep Sea Conservation Coalition. At: [http://www.savethehighseas.org/wp-content/uploads/2020/10/DSCC\\_FactSheet7\\_DSM\\_ISA\\_4pp\\_web.pdf](http://www.savethehighseas.org/wp-content/uploads/2020/10/DSCC_FactSheet7_DSM_ISA_4pp_web.pdf)

## Annex 1. Country factsheets

### Belgium



ISA Contracts: Global Sea Mineral Resources NV (private)

ISA Council: **YES** (in rotation)

ISA LTC: **YES**

National DSM regulation: **YES** (in force since 2013)

Belgium sponsors an exploration contract for polymetallic nodules in the Clarion-Clipperton Zone by Global Sea Mineral Resources NV (GSR), formerly known as G-Tec Mineral Resources. The contract grants exclusive exploration rights over 76,728 km<sup>2</sup> of seabed in the Pacific Ocean.<sup>158</sup> GSR is a subsidiary of the Belgian dredging and offshore activities company DEME, which had a turnover of €2.622 billion in 2019.<sup>159</sup> It developed the “Patania II” nodule collector and planned to test it in the Clarion-Clipperton Zone in Spring 2021.

The Belgian government has implicitly positioned itself in favour of DSM by expressing its support for scientific research into DSM and stressing the importance of contributing to the elaboration of the ISA's exploitation rules. In a resolution text passed in January 2021, the Belgian Parliament called on the government to support independent fundamental research. This however does not resolve the contradiction with Belgium's role as a Blue Leader and frontrunner in the race to achieve strong treaties on biological diversity of areas beyond national jurisdiction and 30% strongly and highly protected MPAs by 2030. This is being actively contested by Belgian NGOs, including Seas at Risk, WWF, BBL, Greenpeace and Pew, who have been exposing the government's incoherence of claiming to be a leader in ocean protection while supporting DSM exploration.

NGOs were heard for the first time in June 2018 during a conference on DSM organised by the Minister of Economy. Also in 2018, NGOs demanded an environmental impact assessment with public consultation on the equipment test that GSR initially planned for 2019. This was launched by the Secretary of State for the North Sea under the coordination of the economy and environment administrations. When the test was postponed to 2021, NGOs demanded a revision of the environmental impact statement. This is unlikely to happen, however.

<sup>158</sup> Blue Nodules Project. At: <https://blue-nodules.eu/partner/global-sea-mineral-resources-nv/>

<sup>159</sup> DEME (2019). Financial Information. DEME Group. At: [https://www.deme-group.com/sites/default/files/2020-05/Financial\\_Report\\_DEME\\_2019.pdf](https://www.deme-group.com/sites/default/files/2020-05/Financial_Report_DEME_2019.pdf)

As a result of NGO advocacy, a cross-ministerial coordination group was created involving the Federal Ministries of Economy, Environment and Foreign Affairs. This group organises regular stakeholder meetings with NGOs and GSR to discuss the Belgian position at ISA meetings and to provide recommendations for the revision of Belgian DSM legislation. Belgium adopted its seabed mining legislation on 17 August 2013.<sup>160</sup> The revision discussion was initiated in 2019, including language on DSM exploration as well as exploitation, and a report with recommendations was submitted to the ministries. A new legislative proposal is expected in 2021.

Belgium is an active member of the ISA. In the 2019 annual session it presented a “non-paper” proposing the creation of a scientific committee within the ISA. The paper was never formally tabled because it became evident that few council members would support it. Belgium proposed a much-modified proposal for an independent review procedure of environmental impact assessments by three experts, which was adopted. Belgium has also been trying to secure a rotating seat in Council Group E,<sup>161</sup> and will finally have a seat in 2023.<sup>162</sup>

Another important result of NGO advocacy is the current active political debate about DSM, which has taken Belgium's position on DSM out of the back rooms of government. In March 2020, the Labour Party (PVDA/PTB) submitted a draft moratorium resolution to the Federal Parliament.<sup>163</sup> After an initial discussion by the Energy, Climate and Environment Committee, a public hearing was organised in the Belgian Parliament on 24 June 2020, and in January 2021 Resolution 55 1687 on deep-seabed mining was passed, calling on the government to “1) support fundamental scientific research and data collection for further knowledge of the deep sea and for the protection of existing marine ecosystems, and 2) to continue to respect environmental legislation and the precautionary principle when developing possible exploitation rules for deep-sea mining to preserve the biodiversity of marine ecosystems.”<sup>164</sup> This illustrates the highly divided positions of the coalition parties and explains the stance of the ministries of environment and economy, who are not in a position to support a moratorium, and therefore tend towards strict environmental regulations as a way of controlling the sector.

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<sup>160</sup> Law of 17 August 2013 concerning the prospection, exploration and exploitation of the natural resources of the seabed and the subsoil beyond national jurisdiction, BS 16 September 2013, 65612.

<sup>161</sup> Embassy of Belgium (2021). Letter to the president of ISA Assembly. Kingston. At: <https://isa.org.jm/files/files/documents/Letter%20Belgium%20to%20President%20Assembly%2006%2001%202021.pdf>

<sup>162</sup> La Venir (2021). Exploitation des fonds marins: la Belgique en 2023 dans l'organe exécutif international. Namur. At: [https://www.lavenir.net/cnt/dmf20210304\\_01560350/exploitation-des-fonds-marins-la-belgique-en-2023-dans-l-organe-executif-international](https://www.lavenir.net/cnt/dmf20210304_01560350/exploitation-des-fonds-marins-la-belgique-en-2023-dans-l-organe-executif-international)

<sup>163</sup> PVDA (2019). PVDA vraagt moratorium op diepzeemijnbouw. Brussels: Partij van de Arbeid van België. At: [https://www.pvda.be/pvda\\_vraagt\\_moratorium\\_op\\_diepzeemijnbouw](https://www.pvda.be/pvda_vraagt_moratorium_op_diepzeemijnbouw)

<sup>164</sup> Chambre Des Représentants De Belgique (2021). <https://www.dekamer.be/flwb/pdf/55/1687/55K1687003.pdf>

## Bulgaria



ISA Contracts: Interoceanmetal Joint Organization (consortium)

ISA Council: **NO**

ISA LTC: **NO**

National DSM regulation: **YES** (in force since 1999)

Bulgaria is a founding member of the IOM, in which it currently shares membership with Poland, the Czech Republic, Slovakia, Russia and Cuba (see Poland for further details). Bulgaria participates in the IOM's council, where it is represented by Valery Trendafilov, National Expert Directorate of Geology and Protection of Subsurface. Researchers from the Strashimir Dimitrov Geological Institute at the Bulgarian Academy of Sciences have been involved in IOM activities, although Bulgarian contributions to IOM's research have focused mostly on seabed ecology.

While the 1999 Subsurface Resources Act includes within its scope the "subsurface resources in the continental shelf and in the Black Sea exclusive economic zone", there are no significant mineral deposits of commercial relevance within Bulgarian waters.

## Czech Republic



ISA Contracts: Interoceanmetal Joint Organization (consortium)

ISA Council: **YES**

ISA LTC: **NO**

National DSM regulation: **YES** (in force since 2000)

The Czech Republic is a full member of the IOM as a successor state to former Czechoslovakia, an original founding member of the organisation, in which it currently shares membership with Poland, Bulgaria, Slovakia, Russia and Cuba (see Poland for further details). The Czech Republic participates on the IOM's council through its Ministry of Industry and Trade, represented by Pavel Kavina, Director of Raw Materials Policy, in cooperation with the Ministry of Foreign Affairs. As a member of the ISA's council, the representative of the Czech Republic has served as the chairman of and spokesperson for the Regional Group of Eastern European Countries.

The Czech Republic, together with Slovakia, is one of only two landlocked countries participating in deep-sea bathymetric surveying and has contributed to IOM's research at its Clarion-Clipperton Zone contract area in the Pacific. Researchers from the University of Chemistry and Technology (UCT) in Prague are actively involved in IOM activities, conducting chemical and granulometry analysis. Members of UCT Prague's Department of Metals and Corrosion Engineering have often participated in IOM meetings.

The Czech Republic adopted Act No. 158/2000 of 18 May 2000 on Prospecting, Exploration for and Exploitation of Mineral Resources from the Seabed beyond the limits of National Jurisdiction, per their obligation to adopt national DSM legislation under UNCLOS as a sponsoring country.

## France



ISA Contracts: IFREMER (public)

ISA Council: **NO**

ISA LTC: **YES** (Elie Jarmache, IFREMER)

National DSM regulation: **YES** (in force since 1968, modified 2006)

France is involved in DSM exploration through IFREMER, the French research institute for exploitation of the sea. In 2001, IFREMER signed the first ISA contracts for the exploration for polymetallic nodules in the Clarion-Clipperton Zone, and in 2014 a second contract was signed for polymetallic sulphide deposits along the Mid-Atlantic Ridge. France's interest in DSM began in the 1980s and the country has continued to do exploratory work in the waters near Wallis and Futuna in French Polynesia.

Although no DSM licences have been granted in waters under national jurisdiction, existing French laws regulate this possibility: Law No. 68-1181 of 30 December 1968 relating to the exploration of the continental shelf and the exploitation of its natural resources, implemented by Decree No. 71-360 of 6 May 1971 and by Decree No. 2006-798 of 6 July 2006 relating to prospecting, research and exploration of mineral and fossil substances in the seabed. Additionally, Ordinance NO 2016-1687 of 8 December 2016 relating to maritime areas under the sovereignty or jurisdiction of the French Republic also refers to DSM in areas beyond national jurisdiction.

DSM is one of seven areas for innovation included in the Innovation 2030 Commission which was launched by President Hollande in April 2013, identifying eight DSM projects among the initial projects identified by the commission to receive funding under the initiative. France has also been active in seeking broader alliances to support DSM. In October 2015 it signed an MoU with Germany's DeepSea Mining Alliance (see Germany) to further industrial, technological and scientific cooperation, and in the same year a joint French-Japanese workshop on the theme of The Crafting of Seabed Mining Ecosystem-based Management was organised in Tokyo<sup>165</sup> as a result of the EcoDeep collaboration between IFREMER and the Japan Agency for Marine-Earth Science and Technology (JAMSTEC).

In recent years, the French government has initiated a process to define its position on DSM, initiating consultations as part of its Vision of Oceans and gathering input from scientists, civil society and corporate actors. The process has demonstrated the uncompromising support of French representatives to the ISA for DSM, particularly of IFREMER scientists who are both members of the LTC and at the same time hold ISA exploration contracts, generating potential conflicts of interests. While the Ministry of the Environment has failed to become involved in any meaningful way, NGOs including France Nature Environnement, Greenpeace France, Bloom, WWF and Ingénieurs sans frontières are all firmly opposed to DSM.

During a conference organised by IFREMER in March 2020, the agency's openly pro-DSM stance was questioned by participating NGOs (including Seas at Risk, WWF and Greenpeace). In spite of this, in January 2021 a "National strategy for exploration and exploitation of mineral resources in the deep seabed" was launched during CIMer

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<sup>165</sup> Webcat Plus (2015). EcoDeep-SIP Workshop : the crafting of seabed mining ecosystem-based management: assessing deep sea ecosystems in the Pacific Ocean : final report : fact findings and recommendations from the Tokyo international workshop on June 29-July 1st, 2015, Embassy of France in Japan, Tokyo. At: <http://webcatplus.nii.ac.jp/webcatplus/details/book/31390272.html>

(the Inter-ministerial Council of the sea). The strategy, lead by the prime minister, aims to programme oceanographic campaigns in the French Exclusive Economic Zone within 18 months, in partnership with French Polynesia and New Caledonia, and to develop a demonstrator to test operations.<sup>166</sup>

In spite of IFREMER's almost militant support, it appears that no large French corporations are currently involved with DSM. Rather, France is particularly interested in sustaining its strategic position in the Pacific in the face of growing interest in DSM by other powers with regional presence. However, this may prove controversial both in French Polynesia and New Caledonia, both being full members of the Pacific Islands Forum that called for a ten-year moratorium on DSM during its 2019 Civil Society and Private Sector Dialogues.

## Germany



ISA Contracts: BGR (public)

ISA Council: **NO**

ISA LTC: **YES** (Carsten Ruhlemann, BGR)

National DSM regulation: **YES** (in force since 1980, modified in 1995)

Germany currently holds two ISA exploration contracts, one for manganese nodules in the Clarion-Clipperton Zone (up for renewal in 2021), and another for sulphide deposits in the central Indian Ocean. Both licenses were granted to the Federal Institute for Geosciences and Natural Resources of the Federal Republic of Germany (BGR), advising the Federal Ministry for Economic Affairs and Energy. BGR has been conducting exploration in the Clarion-Clipperton Zone since 2006 and in the Indian Ocean since 2015. Germany's designated expert at the ISA LTC is the former head of nodule exploration at BGR.

Germany's DSM policy is flagged in the 2018 coalition government agreement with the intent to provide safe access to resources and security of supply for its industry, especially its high-tech industry. The existing policy highlights the need for environmentally sensitive DSM based on international rules and endorses pilot mining tests.<sup>167</sup> While this is the first time DSM is explicitly mentioned in a coalition agreement, it had already been on the political agenda for years. DSM had been regulated in Germany since the 1980 Interim Regulation of Deep-seabed Mining, followed by the Seabed Mining Act of 6 June 1995 (amended in 2010).

Key political developments include the creation of a coordinator for the maritime industry in 2000 within the Federal Ministry for Economic Affairs and Energy and a 2002 parliamentary decision to develop a world market for maritime technology.

<sup>167</sup> Koalitionsvertrag zwischen (2018). Ein neuer Aufbruch für Europa. Eine neue Dynamik für Deutschland. Ein neuer Zusammenhalt für unser. Berlin. At: <https://www.bundesregierung.de/resource/blob/975226/847984/5b8bc23590d4cb2892b31c987ad672b7/2018-03-14-koalitionsvertrag-data.pdf?download=>

<sup>166</sup> Energies De La Mer (2021). La France Sera-T-Elle À La Hauteur Des Enjeux Pour L'exploration Et L'exploitation Des Grands Fonds Marins ? Itw De Francis Vallat. Paris. At: <https://www.energiesdelamer.eu/2021/01/18/la-france-sera-t-elle-a-la-hauteur-des-enjeux-pour-l'exploration-et-l'exploitation-des-grands-fonds-marins-itw-de-francis-vallat/>

In 2010 the German Minerals Research Agency was established and a national resource strategy (briefly mentioning DSM) established. The revised 2020 resource strategy again referred to DSM and a pilot-mining test if industry should articulate such a demand.<sup>168</sup> In 2015 an MoU was signed between Germany and France for closer DSM cooperation. BGR has also provided scientific support to Belgium's GSM.

In 2011 a National Masterplan for Maritime Technologies was created to coordinate funding for maritime industries and technical research by different ministries. Funding for DSM has been provided by the Federal Ministry for Economic Affairs and Energy to BGR, while research focusing on the long-term impacts of DSM has been supported by the Ministry of Education and Research and EU research programmes. Notable projects with BGR involvement include the H2020 BlueNodules, BlueHarvesting and BlueMining, as well as MIDAS. BGR also contributes to the EU JPIO research action MiningImpact (2015–2017) and MiningImpact 2, which will monitor the environmental effects of “an industrial component trial of a nodule collector system by the Belgian contractor DEME-GSR”. This test is now scheduled to take place in spring 2021. Another mining test exercise is planned to take place in the Indian Ocean contract area with a vertical miner in 2023.

The industrial DSM lobby is organised around the DeepSea Mining Alliance, which includes maritime industry, suppliers and research institutions and focusses on the implementation of commercial DSM projects.<sup>169</sup> The lobby has connections to the Ministry of Economic Affairs, the current maritime coordinator and the Federation of German Industries and are the drivers of the French-German and Norwegian-German MOUs.

At the ISA, the German delegation is headed by the Ministry of Economy, supported by the Ministry of Environment and with the involvement of the German Environmental Agency, the Ministry of Research and the Foreign Office. Germany has expressed the need for strong environmental standards, including mandatory regional environmental management plans. Germany nevertheless remains interested in conducting DSM and/or developing and providing technologies.

It expressed its opposition to a moratorium in a 2019 parliamentary inquiry, arguing that exploitation is still non-existent and that “exploration leads to the collection of important data on the deep sea and expectable effects of possible deep sea mining”.<sup>170</sup>

Civil society movements are organised around the German NGO Working Group on Deep Sea Mining (AG Tiefseebergbau), including member organisations of German NGO Forum on Environment and Development. German civil-society organisations have strong ties to partner civil-society organisations, local communities and churches in the Pacific and together with them is leading a call to ban DSM.

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<sup>168</sup> BMW (2020). Rohstoffstrategie der Bundesregierung. Berlin: Bundesministerium Für Wirtschaft Und Energie. At: [https://www.bmwi.de/Redaktion/DE/Downloads/P-R/rohstoffstrategie-der-bundesregierung.pdf?\\_\\_blob=publicationFile&v=6](https://www.bmwi.de/Redaktion/DE/Downloads/P-R/rohstoffstrategie-der-bundesregierung.pdf?__blob=publicationFile&v=6)

<sup>169</sup> DSMA (2019). Strategic objectives - focus on the future. Hamburg: Deep Sea Mining Alliance. At: <https://www.deepsea-mining-alliance.com/en-gb/objectives>



ISA Contracts: **NO**  
ISA Council: **NO**  
ISA LTC: **NO**  
National DSM regulation: **NO**

Although present on the ISA council until 2021, Italy has only very recently signalled interest in DSM activities. In a 2017 presentation, representatives of the shipbuilding company Fincantieri Oil & Gas S.p.A. and the Istituto Nazionale di Oceanografia “proposed that Italy follow other technologically advanced countries such as Germany, France and Japan in creating a cluster of selected companies and research institutions to work towards establishing a deep sea mining industry in Italy.”<sup>171</sup> This proposal came to fruition in 2020 when Fincantieri and offshore services company Saipem (controlled by Eni S.p.A, an oil “supermajor” controlled by the Italian state) signed an MoU for the development of “business opportunities in the field of designing, engineering, building, and managing DSM systems”.<sup>172</sup> The move was urged by the Ministry of Foreign Affairs.<sup>173</sup>

At the same time, the Ministry of Foreign Affairs and the National Research Council of Italy organised in November 2020 a workshop on the theme “From Offshore Oil & Gas to Deep Seabed Mining: new technologies and emerging issues”, providing formal government support to Fincantieri and Saipem’s venture. The workshop was facilitated by the coordinator of seas and oceans affairs of the Ministry of Foreign Affairs together with Ocean Mining Intel, with the aim of opening up “a platform for further discussion about innovative technologies and consolidated practices for environmental monitoring and deep seabed operations”.<sup>174</sup>

Italian NGO Re:Common revealed “the existence of a memorandum of understanding between the Ministry of Foreign Affairs and the energy giant [that] provides for the allocation of Eni men to the Farnesina with the aim of ‘connecting’ the diplomatic action and the interests of the company”.<sup>175</sup>

Fincantieri’s has noted the existence of poly-metallic sulphide deposits in the southern Tyrrhenian Sea, the only proven deposit of its kind in the Mediterranean. The nature of the sulphide deposits around the Palinuro Seamount have been well studied since the 1990s and extend over an estimated area of 35,000 km<sup>2</sup>. The easy access to Palinuro is seen by Fincantieri as an advantage to develop a pioneering Italian DSM platform, in spite of the environmental vulnerability of the area.

<sup>170</sup> Deutscher Bundestag (2019). , p. 32. <https://dipbt.bundestag.de/dip21/btd/19/160/1916025.pdf>, p. 32.

<sup>171</sup> Keber, M., Ambrosio, L., Camerlenghi, A., Donda, F., Tinivella, U., and V. Volpi. Deep Sea Mining: An Opportunity for the Italian Offshore Industry?. Paper presented at the Offshore Mediterranean Conference and Exhibition, Ravenna, Italy, March 2017. At: [https://moodle2.units.it/pluginfile.php/280516/mod\\_folder/content/0/Keberal\\_2018\\_O-NEWOPP3\\_250.pdf](https://moodle2.units.it/pluginfile.php/280516/mod_folder/content/0/Keberal_2018_O-NEWOPP3_250.pdf)

<sup>172</sup> EO (2020). Fincantieri, Saipem in Deep-Seabed Mining Tie-up. New York: AtCoMedia. At: <https://www.oedigital.com/news/480670-fincantieri-saipem-in-deep-seabed-mining-tie-up>

<sup>173</sup> Civillini, M. (2021). The new gold rush of the mining industry. IRPI Media. March 24. At: <https://irpimedia.irpi.eu/greenwashing-deep-sea-mining/>

<sup>174</sup> Ocean Mining Intel (2020). From Offshore Oil & Gas to Deep Seabed Mining: New Technologies and Emerging Issues. Online Workshop, 18-19 November 2020. At: <https://oceanminingintel.com/news/industry/from-offshore-oil-gas-to-deep-seabed-mining-new-technologies-and-emerging-issues-online-workshop-18-19-november-2020>

<sup>175</sup> IRPI Media (2021). La nuova corsa all’oro dell’industria estrattiva. Milan. At: <https://irpimedia.irpi.eu/greenwashing-deep-sea-mining/>

Regarding a DSM moratorium, Marzia Rovere, researcher at the Institute of Marine Sciences and one of the members of the Italian delegation to the ISA, stated that Italy does not support such a position at the moment, arguing that “a member state cannot support the moratorium because it would be like saying that the ISA makes no sense to exist”.<sup>176</sup>

## The Netherlands



ISA Contracts: **NO**

ISA Council: **YES**

ISA LTC: **YES** (Winifred M. Broadbelt, Ministry of Infrastructure)

National DSM regulation: **YES** (in force since 2002)

While the Netherlands does not have any ISA contracts or significant mineral deposits in its waters, the country remains active at the ISA. This is mainly because of the country's strong offshore/maritime industry, which has interests in DSM through logistic and technical support. The Blue Nodules EU-funded research project, led by Netherlands-based IHC Mining, is one such example of Dutch involvement. Another Dutch company, Seatools, is working with DeepGreen Metals and Allseas developing a nodule collector.<sup>177</sup> The Ministry of Foreign affairs recently asked IHC to discuss the future of raw materials in the deep sea.

In a 2015 report by the Centre of Expertise on Resources entitled *Deep-sea mining: Hitting the Bottom or Taking Off?*<sup>178</sup> the authors strongly recommended more proactive involvement by the Netherlands in DSM, rising its profile on the political agenda and enacting DSM legislation so that Dutch DSM companies can be competitive internationally in the DSM sector. The 2002 Mining Act (Mijnbouwwet) already regulated the extraction of minerals at depths exceeding 100 metres.

Several Dutch companies are involved in DSM operations outside Europe. Boskalis and Deltares have been involved in the Chatham Rise phosphate project, east of New Zealand, for which they received funding from the Dutch government. Boskalis also held significant shares of Fugro, which had been under a contract with DeepGreen Metals for seafloor mineral exploration in the Pacific. Dutch banks such as ING Group and ABN Amro had financed Nautilus Minerals in its failed Papua New Guinea project, Solwara 1. Several academic and scientific institutions in the Netherlands have also been involved in DSM-related research and are frequently involved in DSM events such as the 2020 EIT International Summer School “From Dredging to Deep-Sea Mining” and 2021 Deep Sea Mining Summit.

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<sup>176</sup> IRPI Media (2021). La nuova corsa all'oro dell'industria estrattiva. Milan. At: <https://irpimedia.irpi.eu/greenwashing-deep-sea-mining/>

<sup>177</sup> Offshore Energy (2021). Deep-sea mining game making progress. Amsterdam. At: <https://www.offshore-energy.biz/deep-sea-mining-game-making-progress/>

<sup>178</sup> HCCS (2015). Deep Sea Mining: Hitting the Bottom or Taking Off?. The Hague: The Hague Centre for Strategic Studies.

At: [https://www.hcss.nl/news/deep\\_sea\\_mining\\_\\_hitting\\_the\\_bottom\\_or\\_taking\\_off\\_1](https://www.hcss.nl/news/deep_sea_mining__hitting_the_bottom_or_taking_off_1)

The position of the Netherlands at the ISA has been pragmatic, and often aligned with that of Germany. While stressing that the environmental impacts of DSM should be minimised (i.e., through an overarching environmental management plan and regional environmental management plans) it has not supported a moratorium and indirectly promotes offshore industries. The Netherlands has submitted papers to the ISA council, including one on liability.<sup>179</sup>

Germany and the Netherlands in 2019 organised a workshop, “Towards a standardised approach to Regional Environmental Management Plans in the Area”.<sup>180</sup> The ISA secretariat did not accept the event as an official ISA workshop and consequently organised a parallel workshop in Portugal. Germany sought to further develop regional environmental management plans “aligned with the LTC’s mandate to establish small, non-permanent ad hoc groups of experts”, but this also was dismissed by the council. In a report on a workshop on “Exploring the future together – A scenario analysis for the OSPAR region” organised by the Dutch government, participants concluded, “It seems that the current uncertainties are too big to envision sustainable deep sea mining”.

## Norway



ISA Contracts: **NO**

ISA Council: **YES**

ISA LTC: **YES** (Harald Brekke, Norwegian Petroleum Directorate)

National DSM regulation: **YES** (in force since 2019)

While not having international exploration contracts of its own, Norway actively participates in the ISA and has a highly developed underwater tech industry linked to its off-shore oil and gas background. Norway has significant mineral deposits on its continental shelf, including ferromanganese crusts and sulphide deposits between Jan Mayen Island and Svalbard, as well as polymetallic nodules to the east of Svalbard.

Norwegian entities have worked collaboratively with other EU partners on EU-funded projects including MIDAS and Blue Mining. Norway has also funded ISA efforts to encourage African and Pacific countries to become sponsoring states for DSM through the Norwegian Agency for Development Cooperation.<sup>181</sup>

The University of Bergen was involved in early research during the late 1990s, collecting samples from the area between Jan Mayen Island and the Fram Strait, off the east coast of Greenland. Research was later continued by the Norwegian Petroleum Directorate and in 2005 researchers discovered an area of interest close

<sup>179</sup> ISBA/21/C/13 (8 June 2015). Addressing serious harm to the marine environment in the regulations for the exploitation of mineral resources in the Area.

<sup>180</sup> Umwelt Bundesamt (2019). Towards a standardised approach to Regional Environmental Management Plans in the Area. Hamburg. At: <https://www.umweltbundesamt.de/sites/default/files/medien/2875/dokumente/rem.pdf>

<sup>181</sup> ISA (2017). Supporting Africa's Blue Economy. Kingston: International Seabed Authority. At: <https://www.isa.org.jm/vc/supporting-africas-blue-economy>

to Jan Mayen which they named Soria Moria, after a castle in a Norwegian fairy tale. In 2008, University of Bergen researchers identified another large hydrothermal field with rich mineral deposits 300 km west of Bjørnøya which they named Loki's Castle, referencing the Norse god.

These initial findings prompted further research with the Norwegian University of Science and Technology, Statoil, and the mining company Nordic Mining collaborating in 2013 on a mapping exercise which aimed to provide a more accurate assessment of known deposits. The estimations from this study indicated that the region could contain as much as NOK 1,000 billion (\$110 billion) worth of minerals and metals. A follow-up project (MarMine) including a research cruise by the Polar King in the summer of 2016 was funded by the Norwegian Research Council with 25 million NOK (\$2.8 million) and again coordinated by NTNU with 13 different companies and research institutes. NTNU later became a member of the German DeepSea Mining Alliance pro-DSM industrial lobby.

Several Norwegian companies consider DSM a potentially lucrative activity. Nordic Mining set up the first specialised subsidiary, Nordic Ocean Resources AS. In 2019 more companies were established to advance DSM on the Norwegian continental shelf, including LOKE Marine Minerals and Poseidon Offshore Mining AS, followed in 2020 by Green Minerals AS (a subsidiary of Seabird Exploration) and ADEPTH Minerals AS. Most of these are part of the Norsk Forum for Marine Mineraler (NMM, Norwegian Forum for Marine Minerals), a pro-DSM lobby that includes 25 members from industry and academia. In 2020, NMM signed a cooperation agreement with the German DeepSea Mining Alliance. Others, such as GCE Ocean Technology and the Blue Maritime Cluster, also support DSM in Norway.

The rush of new Norwegian DSM enterprises is related not only to mineral-resource discoveries in Norway's EEZ and continental shelf, but the passing in March 2019 of the country's first law on DSM: the Act on Mineral Activities on the Continental Shelf (Seabed Minerals Act or *Havbunnsmineralloven*).<sup>182</sup> Environmental concerns were virtually absent from the act, generating opposition within the Norwegian environmental movement.

The Forum for Development and the Environment (Forum for utvikling og miljø), representing 50 different organisations, issued a statement calling for a *"moratorium on mineral extraction on the seabed until thorough mapping of the ecosystems that will be affected, until we have overcome the environmental challenges associated with land-based mining, and until a proper assessment of the real societal need to open up the seabed for mineral extraction."*<sup>183</sup>

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<sup>182</sup> LOV (2019). Lov om mineralvirksomhet på kontinentalsokkelen (havbunnsmineralloven). Oslo: Lovdata. At: <https://lovdata.no/dokument/NL/lov/2019-03-22-7>

<sup>183</sup> Forum Norway (2017). Mineralvirksomhet på kontinentalsokkelen. Oslo: Forum for utvikling og miljø. At: <http://www.forumfor.no/nyheter/2017/mineralvirksomhet-p%C3%A5-kontinentalsokkelen>

In January 2021, Norway's Oil and Energy Minister announced preparations are being made for an environmental impact study to allow DSM in its seabed and that companies could be licensed for extraction in 2023 or 2024, following public consultations and a parliamentary vote in the second quarter of 2023.<sup>184</sup>

In April 2021, six environmental organisations, including the World Wildlife Fund and Greenpeace, called on Norway to stop plans to open ocean areas for deep-sea mining.<sup>185</sup>

## Poland



ISA Contracts: Polish Government and IOM (consortium)

ISA Council: **YES**

ISA LTC: **YES** (Piotr Nowak, Dept. of Geology and Licensing)

National DSM regulation: **YES** (in force since 2011)

Poland is a founding member of the IOM, an intergovernmental institution formed within the Eastern Bloc countries that survived the collapse of the USSR and currently includes Bulgaria, Slovakia and the Czech Republic in addition to Russia and Cuba (another similar organisation is the Joint Institute for Nuclear Research). The IOM holds an ISA exploration contract through March 2021 and is in the process of requesting its extension.

The organisation has its headquarters in Szczecin, Poland, and is governed by a council of plenipotentiary representatives from each of the IOM member states. Participating governments offer particular areas of expertise, with Poland being responsible for management. In its host city, the IOM has long-term collaborations with the Maritime Academy of Szczecin – which has a specialisation in DSM – and with the University of Szczecin, which has conducted research on deep-sea organisms for the IOM.

In spite of its participation in the IOM, the government of Poland decided to request its own exploration contract for sulphide deposits in the Mid-Atlantic Ridge (the IOM's contract is in the Clarion-Clipperton Zone); this was granted in 2018 and is valid through 2033.

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<sup>183</sup> Forum Norway (2017). Mineralvirksomhet på kontinentalsokkelen. Oslo: Forum for utvikling og miljø. At: <http://www.forumfor.no/nyheter/2017/mineralvirksomhet-p%C3%A5-kontinentalsokkelen>

<sup>184</sup> Reuters (2021). Norway eyes sea change in deep dive for metals instead of oil. London: Reuters. At: <https://www.reuters.com/article/norway-deepseamining/insight-norway-eyes-sea-change-in-deep-dive-for-metals-instead-of-oil-id USL8N2JJ2NG>

<sup>185</sup> Reuters (2021). Environmentalists call on Norway to stop plans for deep-sea mining. London: Reuters. At: <https://www.reuters.com/world/europe/environmentalists-call-norway-stop-plans-deep-sea-mining-2021-04-12/>

This step was criticised by international and Polish ENGOS, including the MARE Foundation,<sup>186</sup> particularly considering the apparent absence of environmental considerations. Poland's contract extends over a CBD-designated<sup>187</sup> EBSA which includes the "Lost City", a unique hydrothermal vent field where simple hydrocarbons are created abiotically in conditions similar to when life started on Earth.<sup>188</sup>

The ISA has publicly stated that the status of the area as an EBSAA is "of no relevance".<sup>189</sup> In a clear conflict of interest, the ISA LTC recommendations on the potential environmental impact of this 2018 contract were made with Poland's Director of the Department of Geology and Geological Concessions of Polish Ministry of Climate and Environment, Mr. Piotr Nowak, serving in the body. Mr. Nowak previously served as country manager of Celtique Energie Petroleum LTD – a now-defunct UK shale oil and gas company with documented disregard for the environment.<sup>190</sup>

DSM affairs are managed by Poland's Undersecretary of State-Chief National Geologist (*Główny Geolog Kraju*) and government plenipotentiary for the state's raw materials policy, who acts as the government plenipotentiary to the IOM and chairs the Polish delegation at sessions of the ISA. Additionally, an inter-ministerial team for maritime policy, chaired by the Ministry of Maritime Economy and Inland Navigation, has also addressed DSM as part of its mandate. The Polish Geological Institute-National Research Institute also has a department of marine geology involved in DSM research.

While article 22.3 of the 2011 Geological and Mining Law includes within its scope the "extraction of minerals from deposits located within the boundaries of the maritime territories of the Republic of Poland", there are no significant mineral deposits of commercial relevance within Polish waters. A number of Polish companies have nonetheless added DSM to their business profiles. These include Eversub, which focuses on underwater robotics and had previously partnered with Subsea UK on EU-funded research projects. Szczecin hosted the 2016 West Pomerania Deep Sea Mining Conference under the auspices of the IOM,<sup>191</sup> with significant participation from the maritime industrial sector.

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<sup>186</sup> SAR (2017). The MARE Foundation calls on Polish government to cease its support for deep sea mining. Brussels: Seas At Risk. At: <https://seas-at-risk.org/publications-and-videos-2/members-news/785-the-mare-foundation-calls-on-polish-government-to-cease-its-support-for-deep-sea-mining.html>

<sup>187</sup> Boetius, A. (2005). Lost city life. *Science*. 307: 1420-1422. Also see: <https://www.greenpeace.org/international/press-release/23390/scientists-sound-alarm-about-destructive-deep-sea-mining-as-greenpeace-demands-government-action/>

<sup>188</sup> Johnson, D. E. (2019). Protecting the lost city hydrothermal vent system: All is not lost, or is it?. *Marine Policy*. 107: 103593. At: <https://doi.org/10.1016/j.marpol.2019.103593>

<sup>189</sup> Oxygen Project (2020). How Special Interests Are About To Ravage The Ocean's Last Sanctuary. Georgia. At: <https://www.theoxygenproject.com/post/when-conservation-gives-way-to-greedy-interests/>

<sup>190</sup> Power Base (2019). Celtique Energy. Public Interest Investigations and Spinwatch. At: [https://powerbase.info/index.php/Celtique\\_Energy](https://powerbase.info/index.php/Celtique_Energy)

<sup>191</sup> Województwo Zachodniopomorskie (2016). Merging business models with technology development in the deep sea mining value chain. Szczecin. At: <http://www.deepseamining.wzp.pl/>

## Portugal



ISA Contracts: **NO**

ISA Council: **NO**

ISA LTC: **YES** (Pedro Madureira, EMEPC)

National DSM regulation: **YES** (in force since 2015)

Portugal has significant sulphide deposits in the waters around the Azores, an archipelago 1,360 km west of mainland Portugal within the Mid-Atlantic Ridge area. South of the Azores there are several known fields of hydrothermally active vents within the Portuguese continental shelf. Additionally, there are manganese nodules and cobalt-rich crusts within the Portuguese EEZ and extended continental shelf.

Commercial interest on potential DSM in Azorean waters goes back to 2008 when the Canadian company Nautilus Minerals – formerly responsible for the failed Solwara 1 project in Papua New Guinea – submitted a formal exploration request. The government was in favour of granting the request, but Nautilus went bankrupt in 2019. In the meantime, the autonomous government of the Azores created the Marine Park of the Azores, a set of new marine protected areas where DSM exploitation (although not exploration) is explicitly prohibited.

In 2012 Nautilus filed five additional exploration licences in the proximity of the Marine Park, generating a constitutional conflict between the Azores and the central government, as the latter passed new legislation to restrict the powers of autonomous regions to establish resource-use plans and protected areas within the EEZ. Such legislation was challenged by the government of the Azores before the Constitutional Court, and the legal dispute is still unfolding.

Additionally, Portugal adopted a new Geological Resources Law (Law 54/2015 of 22 June) which made explicit reference in its title to resources within the national maritime space. The law adapted the earlier law on mining to include any resources within the EEZ and extended continental shelf and was a direct response to the requests by Nautilus for DSM exploration around the Azores. It has been contested for lack of effective clauses regarding environmental impacts. In 2020 a decree-law developing a regulation for the 2015 act was submitted for public consultations and generated substantial opposition, including a detailed response by the Platform of Portuguese NGOs on Fisheries (PONG-Pesca).<sup>192</sup> This regulation has not yet been approved.

In August 2020, the government opened the “Strategic Vision for the Economic Recovery Plan 2020–2030” to public consultation. Several NGOs, including Sciaena and ANP-WWF, opposed the inclusion of references to DSM and “sustainable development of mineral resources”. The plan includes a “Development of the Azorean sea cluster” with reference to research and development of mineral resources.

Besides consolidating a legal framework for DSM, Portuguese research institutions have also been involved in various EU-funded DSM-related research projects, including MIDAS, Blue Mining and Blue Atlantis.

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<sup>192</sup> PongPesca (2015). Contributo à consulta “Projeto de Decreto-Lei que procede à regulamentação da Lei n.º 54/2015, de 22 de junho, no que respeita aos depósitos minerais. At: [https://pongpesca.files.wordpress.com/2020/07/resposta\\_dl\\_mineraccca7acc83o\\_vfinal-1.pdf](https://pongpesca.files.wordpress.com/2020/07/resposta_dl_mineraccca7acc83o_vfinal-1.pdf)

## At a crossroads:

### Europe's role in deep-sea mining

The Blue Atlantis programme sought to establish the world's only deep-sea mining test facility in Azorean waters covering research and technological development (RTD), mining tests, standards development and market-access support, but never actually took off. Portugal also participates in the ISA LTC, having designated a member of Portugal's extended continental platform mission (Estrutura de Missão para a Extensão da Plataforma Continental).

In October 2017 Oceano Livre, a national movement against DSM, was launched at a conference on "Deep-sea mining – A sustainable choice for Portugal?" which gathered over 100 participants, including Portuguese and Azorean government representatives, NGOs and scientists. Oceano Livre brings together a number of groups, including the Group of Spatial Planning and Environmental Studies, the League for Nature Protection, the National Association for Nature Conservation–Quercus and Sciaena, the Marine Sciences and Cooperation Association.

## Slovakia



ISA Contracts: Interoceanmetal Joint Organization (consortium)

ISA Council: **NO**

ISA LTC: **NO**

National DSM regulation: **NO**

Slovakia is a full member of the IOM as a successor state to the former Czechoslovakia, an original founding member of the organisation, in which it currently shares membership with Poland, Bulgaria, Czechia, Russia and Cuba (see Poland for further details). Slovakia participates in the IOM council, where it is represented by Branislav Žec from the State Geological Institute of Dionyz Stur.

As one of only two landlocked countries participating in deep-sea bathymetric surveying, Slovakia has contributed to the IOM's exploration missions at its Clarion-Clipperton Zone contract area in the Pacific conducted from Russian research vessels. Slovak scientists at the IOM are mostly affiliated to the Technical University of Košice and the Institute of Geology at the Slovak Academy of Sciences. Public references to DSM in Slovakia are relatively rare.<sup>193</sup>

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<sup>193</sup> Blistan, P. et al. (2015). The seabed-an important mineral resource of Slovakia in the future. Acta Montanistica Slovaca. 20(4): 334-341.

## Spain



ISA Contracts: **NO**

ISA Council: **YES**

ISA LTC: **YES** (Adolfo Maestro González, IGME)

National DSM regulation: **YES** (contested)

Several minerals deposits are known to exist both within Spain's EEZ and their proposed extended continental shelf areas. Las Abuelas – a chain of seamounts in the vicinity of the Canary Islands, including Mount Tropic – appear to have significant occurrences of cobalt, nickel, copper, niobium, vanadium, rare earths, yttrium, hafnium and platinum-group elements. In 2017 the existence on Mount Tropic of a deposit of 2,600 tonnes of tellurium was announced. Significant deposits of nodules and crusts have also been identified in the Galicia Bank, Cantabria Knoll and El Cachuchu off the Atlantic coast of Galicia and the Cantabrian Sea. Ferromanganese crusts are present in the Gulf of Cádiz and Alborán Sea.

While Spain lacks specific legislation on DSM, the government has claimed that both the Mining Act 22/1973 of July 21 and Article 132 of the Spanish constitution would allow the granting of exploration and exploitation licenses within the EEZ and continental shelf. This has been contested and there are no precedents of actual claims. Overlapping continental platform claims over Mount Tropic by Spain and Morocco, together with the unresolved Western Sahara issue, have so far deterred attempts for formal claims. Exploration continues under in the guise of scientific research.

For over a decade, DSM has been openly promoted by the public Geological and Mining Institute of Spain (IGME), both at the ISA, where it is present at the LTA, as well as at the ministerial level, where until recently it has set the tone of Spain's positions at the ISA. While the Ministry of Foreign Affairs has attempted to promote public-private partnerships for DSM, no Spanish companies have as yet shown interest. Spain participates in most EU-funded DSM-related research projects, however, including EMODnet Geology, MINEDeSEA (led by IGME), Blue Nodules, etc. IGME also signed an MoU with the UK National Oceanography Centre (NOC) that allowed its participation as a "guest" on research cruises by the RSS James Cook around Mount Tropic as part of the MarineE-tech project.

There has been a strong reaction from civil society, challenging IGME's pro-mining discourse. In 2020, Ecologistas en Acción released a report on DSM<sup>194</sup> and called for the revision of the 1973 mining law to explicitly exclude DSM from its scope. A number of ENGOs have also called on the Ministry of Environment and Fisheries to take an active role in ISA governance as a counter to IGME's pro-DSM discourse. Fisheries organisations have also expressed a strong position against DSM. A 2017 report by the scientific Advisory Committee of the Fishing Vessel Owners Cooperative of the Port of Vigo led to LDAC's May 2019 "Opinion on Deep-sea Mining",<sup>195</sup> which openly called for a moratorium of DSM in international waters. DSM is a recurring topic in Spanish politics, with dozens of parliamentary questions in both the Spanish and Canary Islands parliaments.

<sup>194</sup> Ecologistas en Acción (2020). Out of sight...Deep-sea mining in Spain. Madrid: Ecologistas en Acción. At: <https://www.ecologistasenaccion.org/148756/>

<sup>195</sup> Long Distance Adviroy Council (2019). LDAC Opinion on Deep-sea Mining. At: [https://ldac.eu/images/EN\\_LDAC\\_Advice\\_on\\_Deepsea\\_Mining\\_R.04.19.WG5\\_May2019.pdf](https://ldac.eu/images/EN_LDAC_Advice_on_Deepsea_Mining_R.04.19.WG5_May2019.pdf)

## United Kingdom



ISA Contracts: UK Seabed Resources Ltd. (private)

ISA Council: **YES**

ISA LTC: **YES** (Gordon L. J. Paterson, Natural History Museum)

National DSM regulation: **YES** (in force since 1981, amended 2014)

The UK sponsors two ISA exploration contracts on behalf of Lockheed Martin subsidiary UK Seabed Resources Ltd. and also keeps a high profile at the ISA. The UK is one of the most vocal governments at the ISA, serving both as a member of the ISA council and appointing a member to its LTC. The UK has also been a supporter of controversial ISA Secretary-General Michael Lodge, including supporting his re-election.

The UK has provided significant funding for DSM research, notably through the NOC and the British Geological Survey. Since 2015 they have led the ongoing MarineE-tech project, with a budget of over £1.3 million. The project has focused on the northeast Atlantic, with expeditions to Mount Tropic and the Madeira-Tore complex, and the Rio Grande seamount complex off the coast of São Paulo (Brazil). UK offshore oil- and gas-industry supply chains have expressed significant interest in DSM.

The UK passed its first Deep Sea Mining Act in 1981; this was updated by the Deep Sea Mining Act of 2014, which, rather unusually, was passed as a private member's bill, sponsored by Sheryll Murray and Baroness Wilcox. In a February 2020 parliamentary debate on the "UK Deep Sea Mining Industry" Sheryll Murray requested that financial government support be provided to Lockheed Martin.<sup>196</sup> UK Seabed Resources' CEO had worked with Prime Minister Cameron before being hired by Lockheed Martin as government liaison.

The government's position has come under increasing criticism from environmental groups, scientists and MPs in the last couple of years. In January 2019, the UK's cross-party House of Commons' Environment Audit Committee issued a report<sup>197</sup> concluding that "The case for deep-sea mining has not yet been made", and recommending that "the exploitation of resources must be prohibited in unique ocean environments, such as hydrothermal vents, until it can be determined that adequate mitigation techniques are available".

While the government recently stated<sup>198</sup> that the UK was using "the precautionary principle in relation to deep-sea mining and has agreed not to sponsor or support the issuing of any exploitation licences for deep-sea mining projects until there is sufficient scientific evidence about the potential impact on deep sea ecosystems and strong and enforceable environmental standards have been developed by the ISA

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<sup>196</sup> TheyWorkForYou (2019). UK Deep Sea Mining Industry. At: <https://www.theyworkforyou.com/whall/?id=2019-02-20b.569.2>

<sup>197</sup> Parliament UK (2019). Conclusions and recommendations: Threats to the Ocean. London. At: [https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/980/98010.htm#\\_idTextAnchor062](https://publications.parliament.uk/pa/cm201719/cmselect/cmenvaud/980/98010.htm#_idTextAnchor062)

<sup>198</sup> Parliament UK (2019). Mining: Seas and Oceans. London. At: <https://questions-statements.parliament.uk/written-questions/detail/2019-07-17/278457>

and are in place”,<sup>199</sup> reports in March 2020<sup>200</sup> revealed that an internal government memo from May 2019 described the “need...to avoid overly precautionary regulation for initial contracts”. Lack of transparency concerning UK-sponsored exploration contracts has also been questioned in Parliament.<sup>201</sup>

In a March 2021 letter from Lord Goldsmith, Minister for Pacific and the Environment at the Foreign, Commonwealth & Development Office, to a coalition of UK NGOs, it was stated that “the UK has committed not to sponsor or support the issuing of any exploitation licences for deep sea mining projects unless an until there is sufficient scientific evidence about the potential impact on deep sea ecosystems and strong and enforceable environmental regulations and standards have been developed by the International Seabed Authority (ISA) and are in place”.

Several government ministries are involved in DSM policy, with the Business, Energy and Industrial Strategy Department formally leading and having responsibility for exploration-contract sponsorship, while the Foreign, Commonwealth and Development Office represents the UK at the ISA. However, the Department for Environment, Food and Rural Affairs remains involved, providing evidence to Parliament<sup>202</sup> on potential environmental impacts, including carbon cycling and food production. The Department for International Trade has also convened stakeholders to discuss export opportunities and economic benefits. After years of obstruction, in February 2021 the Blue Marine Foundation and Greenpeace UK finally forced the UK government to make UK Seabed Resources’ licenses public, setting a precedent for other states.

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<sup>199</sup> Parliament UK (2020). Deep Sea Mining. London. At: <https://questions-statements.parliament.uk/written-questions/detail/2020-03-16/29901>

<sup>200</sup> The Times (2020). Sir David Attenborough warns against rush to mine seabed. London: The Sunday Times. At: <https://www.thetimes.co.uk/article/sir-david-attenborough-warns-against-rush-to-mine-seabed-6q55qj6cl>

<sup>201</sup> Parliament UK (2019). UK Seabed Resources: Pacific Ocean. London. At: <https://questions-statements.parliament.uk/written-questions/detail/2019-01-28/213318>

<sup>202</sup> Parliament UK (2018). Written evidence submitted by the Department for Environment Food and Rural Affairs. London. At: HYPERLINK “<http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/environmental-audit-committee/sustainable-seas/written/83282.pdf>”<http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/environmental-audit-committee/sustainable-seas/written/83282.pdf>

## Annex 2. EU-funded research

This table is based on a 2016 research report by Seas at Risk and the DSCC entitled “EU funded deep sea mining related research”. A 2020 update was prepared by Élixa Martínez as part of her research for a master’s thesis in marine sciences at Sorbonne Université: *The 21st century dilemma: A new extraction frontier in the deep sea or a transition towards a transformational circular sharing economy to satisfy our metals addiction?*

**Table 1.** Ongoing research projects (co)funded by the EU

Projects	EU funds	Lead	Duration	Objective	Area	Web
<b>SecPRIME</b> (Securing the supply of primary resources) – FP7	No data	Lulea University of Technology, Sweden	01/01/2014 to 31/12/2020	The consortium behind this project is working towards an integrated, systemic view on primary-resources technologies and related non-technology actions as defined below. The project works in an integrated way, tackling challenges related to exploration (including geometallurgy) deep exploration and primary-resources extraction, including deep-sea mining.	Tech	<a href="https://ec.europa.eu/growth/content/securing-supply-primary-resources_en">https://ec.europa.eu/growth/content/securing-supply-primary-resources_en</a>
<b>ALBATROSS</b> (Alternative Blue Advanced Technology for Research On Seafloor Sulfides) – FP7	No data	ERAMET SA, France	01/01/2015 to 31/12/2020	An EIP on raw materials the aim of which is to develop and test cost-effective technologies to explore and evaluate seafloor massive sulfide deposits and enable sustainable access to resources in EEZ.	Tech	<a href="https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/commitment-detail/431">https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/commitment-detail/431</a>



Projects	EU funds	Lead	Duration	Objective	Area	Web
<b>Blue Nodules</b> (Breakthrough Solutions for the Sustainable Harvesting and Processing of Deep Sea Polymetallic Nodules) – H2020	Total: 7.9 M€ EU budget: 7.9 M€	IHC Mining BV, Netherlands	01/02/2016 to 31/07/2020	The Blue Nodules project will develop a new highly-automated and technologically sustainable deep-sea mining system for the harvesting of polymetallic nodules from the seafloor. The governing project principle is (1) industrial viability, (2) economic and environmentally balanced business case for the complete polymetallic nodules	Tech	<a href="http://www.blue-nodules.eu">http://www.blue-nodules.eu</a>
<b>ATLAS</b> (A Trans-Atlantic Assessment and deep-water ecosystem-based Spatial management plan for Europe) – H2020	Total: 9.2 M€ EU budget: 9.1 M€	University of Edinburgh, United Kingdom	01/05/2016 to 31/07/2020	The ATLAS project strives to improve the scientific knowledge base of complex deep-sea ecosystems and their associated species. This will contribute to (1) international policies to ensure deep-sea Atlantic resources are managed effectively and (2) the European Commission's long-term Blue Growth strategy to support sustainable growth.	Env	<a href="https://www.eu-atlas.org">https://www.eu-atlas.org</a>
<b>GeoERA-MINDeSEA</b> (Seabed Mineral Deposits in European Seas) – H2020	Total: 0.8 M€ EU budget: (0.2 M€)	Nederlandse Organisatie voor Toegepast Natuurwetens- chappelijk Onderzoek, Netherlands	01/01/2017 to 31/12/2021	The MINDeSEA project addresses an integrative metallogenetic study of principal types of seabed mineral resources (hydrothermal sulfides, ferromanganese crusts, phosphorites, marine placers and polymetallic nodules) in the European seas.	Env	<a href="https://geoera.eu/projects/mindesea/">https://geoera.eu/projects/mindesea/</a>
<b>SponGES</b> (Deep-sea Sponge Grounds Ecosystems of the North Atlantic) – H2020	Total: 10.2 M€ EU budget: 9.9 M€	Universitetet i Bergen, Norway	01/03/2017 to 31/08/2020	The SponGES project aims to develop an integrated ecosystem-based approach to preserve and sustainably use vulnerable sponge ecosystems of the North Atlantic. It will address the scope and challenges of the EC's Blue Growth call by strengthening the knowledge base, improving innovation, predicting changes and providing decision support tools for management and sustainable use of	Env	<a href="http://www.deepseasponges.org">http://www.deepseasponges.org</a>



Projects	EU funds	Lead	Duration	Objective	Area	Web
<b>NETFFICIENT</b> (Energy and economic efficiency for today's smart communities through integrated multi storage technologies) – H2020	Total: 11.4 M€ EU budget: 8.9 M€	Ayesa Advanced Technologies SA, Spain	01/03/2017 to 31/08/2020	The NETFFICIENT project will deploy and demonstrate local storage technologies and will develop ICT tools to exploit their synergies with the smart grid and citizens. It will use current state-of-the-art technologies, and further optimise them regarding their interaction and system intelligence.	Tech	<a href="http://netfficient-project.eu">http://netfficient-project.eu</a>
<b>CIRC4Life</b> (A circular economy approach for lifecycles of products and services) – H2020	Total: 9.2 M€ EU budget: 9.1 M€	Nottingham Trent University, UK	01/05/2018 to 30/04/2021	The CIRC4Life project aims to develop and implement a circular-economy approach for sustainable products and services through their value and supply chains. Three new circular-economy business models will be developed including (1) co-creation of products and services, (2) sustainable consumption and (3) collaborative recycling and reuse.	Tech	<a href="https://www.circ4life.eu">https://www.circ4life.eu</a>
<b>EUROFLEETS+</b> (An alliance of European marine research infrastructure to meet the evolving needs of the research and industrial communities) – H2020	Total: 9.9 M€ EU budget: 9.9 M€	Marine Institute, Ireland	01/02/2019 to 31/01/2023	The EUROFLEETS+ project will extend and enhance the capabilities of European research-vessel infrastructure. It will prioritise support for research on sustainable, clean and healthy oceans, linking with existing ocean-observation infrastructures, and it will support innovation through working closely with industry. In addition to comprehensive transnational access activities, the project will undertake joint research in deep-ocean research and exploration, data management and enabling future virtual access.	Tech	<a href="https://www.eurofleets.eu">https://www.eurofleets.eu</a>
<b>BlueHarvesting</b> (Hydraulic Collector for Polymetallic Nodules from the Deepsea) – EIT RawMaterials – DG GROW	No data	Technische Universiteit Delft, Netherlands	01/04/2019 to 31/03/2022	The BlueHarvesting project will focus on the development and improvement of the collector to reduce its environmental impact and optimise its production rate and efficiency. It will build on the development of the collector from the Blue Nodules (H2020) project through improved design to reduce the volume of sediment that will be brought into suspension and hence the volume of the plume.	Env	<a href="https://eitrawmaterials.eu/project/blueharvesting/">https://eitrawmaterials.eu/project/blueharvesting/</a>



Projects	EU funds	Lead	Duration	Objective	Area	Web
<b>iAtlantic</b> (Integrated Assessment of Atlantic Marine Ecosystems in Space and Time) – H2020	Total: 10.8 M€ EU budget: 10.6 M€	University of Edinburgh, UK	01/06/2019 to 31/05/2023	iAtlantic is a multidisciplinary research programme seeking to assess the health of deep-sea and open-ocean ecosystems across the full span of the Atlantic Ocean. Involving marine scientists from countries bordering the north and south Atlantic Ocean, this ambitious project will determine the resilience of deep-sea animals and their habitats to threats such as temperature rise, pollution and human activities..	Env	<a href="https://www.iatlantic.eu">https://www.iatlantic.eu</a>
<b>SeNSE</b> (Next-generation of lithium-ion batteries to power electric vehicles) – H2020	Total: 10.2 M€ EU budget: 10.2 M€	Eidgenössische Materialprüfungs- und Forschungsanstalt, Switzerland	01/02/2020 to 31/01/2024	The SeNSE project aims to create next-generation lithium-ion batteries with a silicon-graphite composite anode and a nickel-rich NMC cathode to reach a volumetric energy density of 750 Wh/l. The new battery will also provide a battery management system coupled to dynamic in-cell sensors to enable faster charging, improved sustainability and recyclability, and reduced production costs.	Tech	<a href="https://northvolt.com">https://northvolt.com</a>



**Table 2. Closed projects totally or partially funded by the EU**

Projects	EU funds	Lead	Duration	Objective	Area	Web
<b>HERMES – FP6</b>	Total: 15.5 M€ EU budget: 15.5 M€	National Oceanography Centre, UK	2004–2009	HERMES study sites extended from the Arctic to the Black Sea and include biodiversity hotspots such as cold seeps, cold-water coral mounds and reefs, canyons and anoxic environments and communities found on open slopes. These important systems were chosen as a focus for research due to their possible biological fragility, unique genetic resources, global relevance to carbon cycling and susceptibility to global change and human impact. HERMES was succeeded by HERMIONE.	Env	<a href="http://www.eu-hermes.net/">http://www.eu-hermes.net/</a>
<b>HERMIONE</b> (Hotspot Ecosystem Research and Man’s Impact on European seas) – FP7	Total: 10.9 M€ EU budget: 7.9 M€	Natural Environment Research Council, UK	01/04/2009 to 30/07/2012	The HERMIONE project was designed to make a major advance in our knowledge of the functioning of deep-sea ecosystems and their contribution to the production of goods and services. This was to be achieved through a highly interdisciplinary approach integrating biodiversity, specific adaptations and biological capacity in the context of a wide range of highly vulnerable deep-sea habitats.	Env	<a href="http://www.eu-hermione.net">http://www.eu-hermione.net</a>
<b>Blue Growth Study:</b> Scenarios and drivers for Sustainable Growth from the Oceans, Seas and Coasts – DG MARE	No data	ECORYS, Netherlands	01/12/2010 to 30/08/2012	The Blue Growth project provided policy-makers with a comprehensive, robust and consistent analysis of possible future policy options to support smart, sustainable and inclusive growth. It allowed the maritime elaboration of smart, sustainable and inclusive economic and employment growth from the oceans, seas and coasts.	Env	<a href="https://webgate.ec.europa.eu/maritime-forum/en/node/2946">https://webgate.ec.europa.eu/maritime-forum/en/node/2946</a>



Projects	EU funds	Lead	Duration	Objective	Area	Web
<b>The Deep-sea minerals Project</b> – DG RELEX	Total: 4.4 M€ EU budget: 4.4 M€	Secretariat of the SPC, New Caledonia	2011–2016	The aim of this project was to (1) support informed and careful governance of any deep-sea mining activities, (2) encourage and support participatory decision-making, and (3) develop of a regional project to help governments strengthen the management of their national deep-sea mineral resources.	Env	<a href="https://dsm.gsd.spc.int/index.phpu">https://dsm.gsd.spc.int/index.phpu</a>
<b>DS3F</b> (The Deep Sea & Sub-Seafloor Frontier) – FP7	Total: 1.1 M€ EU budget: 1 M€	Universitaet Bremen, Germany	01/01/2010 to 30/06/2012	The DS <sup>3</sup> F project provided a pathway towards sustainable management of oceanic resources on a European scale. It developed subseafloor sampling strategies for enhanced understanding of deep-sea and subseafloor processes by connecting marine research in life and geosciences, climate and environmental change with socio-economic issues and policy building	Env	<a href="http://www.-deep-sea-frontier.eu/front_content.php?idcat=491">http://www.-deep-sea-frontier.eu/front_content.php?idcat=491</a>
Study: State of knowledge of deep-sea mining – DG MARE	Total: 2.6 M€ EU budget: 2.6 M€	ECORYS, Netherlands	2012–2014	This study gave an overview of the latest knowledge on deep-sea mining. It examined the geological potential, relevant technologies, economic viability, environmental implications and legal regime. It included an inventory of ongoing exploration and exploitation projects	Tech/ Env	<a href="https://webgate.ec.europa.eu/maritime-forum/en/node/3732">https://webgate.ec.europa.eu/maritime-forum/en/node/3732</a>
<b>ABattReLife</b> (Automotive Battery Recycling and 2nd Life) – DG GROW	Total: 2.1 M€ EU budget: 1.7 M€	Peugeot Citroen Automobiles SA, France	2012–2015	The objective of ABattReLife project was (1) the development and implementation of a knowledge base on high-voltage traction-battery deterioration, (2) a safe management structure for EV battery recycling and (3) strategies and technologies for battery re-use and recycling.	Tech	<a href="https://www.vehiculedufutur.com/abattrelife/project-definition.html">https://www.vehiculedufutur.com/abattrelife/project-definition.html</a>



Projects	EU funds	Lead	Duration	Objective	Area	Web
<b>RES Grid Integration</b> (Regulated Expansion of Electricity Transmission Networks) – FP7	Total: 0.2 M€ EU budget: 0.2 M€	Deutsches Institut für Wirtschaftsforschung e.V., Germany	01/05/2012 to 30/04/2014	The RES Grid Integration project aimed to enhance understanding of how to optimally regulate and expand transmission networks in the light of large-scale RES integration. It proposed a combined merchant-regulatory incentive mechanism and compared it with traditional cost-plus regulation.	Tech	<a href="https://cordis.europa.eu/project/id/297852">https://cordis.europa.eu/project/id/297852</a>
<b>BATTERIES2020</b> (Towards Realistic European Competitive Automotive Batteries) – FP7	Total: 8.4 M€ EU budget: 5.9 M€	IKERLAN S. Coop., Spain	01/09/2013 to 31/08/2016	The BATTERIES2020 project aimed to improve performance, lifetime and total cost of ownership of batteries for EVs by the simultaneous development of high-performing and durable cells, reliable lifetime prediction, understanding ageing phenomena and assessment of second life in renewable energy applications.	Tech	<a href="http://www.batteries2020.eu/index.html">http://www.batteries2020.eu/index.html</a>
<b>Assistance in elaboration and prospective evaluation of the Atlantic Action Plan – DG MARE</b>	Total: 0.4 M€ EU budget: 0.4 M€	COWI, Belgium	2012-2013	The objective was to provide background knowledge and analysis to support the impact assessment to be adopted in summer 2012 following the Green Paper on Marine Knowledge 2020.	-	<a href="https://webgate.ec.europa.eu/maritimeforum/sites/maritimeforum/files/08_Final%2520evaluation_report.pdf">https://webgate.ec.europa.eu/maritimeforum/sites/maritimeforum/files/08_Final%2520evaluation_report.pdf</a>
<b>MIDAS</b> (Managing Impacts of Deep-sea reSources exploitation) – FP7	Total: 12.3 M€ EU budget: 8.9 M€	Seascope Consultants Ltd, UK	01/11/2013 to 31/10/2016	The MIDAS project addressed fundamental environmental issues relating to the exploitation of deep-sea mineral and energy resources. MIDAS assessed (1) physical destruction of the seabed by mining, (2) the potential effects of particle-laden plumes in the water column and (3) the possible toxic chemicals that might be released by the mining process.	Env	<a href="http://www.eu-midas.net">http://www.eu-midas.net</a>



Projects	EU funds	Lead	Duration	Objective	Area	Web
<b>Blue Mining</b> (Breakthrough Solutions for the Sustainable Exploration and Extraction of Deep Sea Mineral Resources) – FP7	Total: 14.7 M€ EU budget: 10 M€	IHC MTI BV, Netherlands	01/02/2014 to 31/01/2018	The Blue Mining project provided breakthrough solutions for a sustainable deep-sea mining value-chain. It addressed all aspects of the value-chain in this field, from resource discovery (WP1) to resource assessment (WP2), from exploitation technologies (WP3) to the legal and regulatory framework (WP4).	Tech	<a href="http://www.bluemining.eu">http://www.bluemining.eu</a>
<b>ABYSS</b> (Training network on reactive geological systems from the mantle to the abyssal sub-seafloor) – FP7	Total: 4.2 M€ EU budget: 4.2 M€	CNRS, France	01/03/2014 to 28/02/2018	The ABYSS project was a platform to develop scientific skills and multi-disciplinary approaches for young scientists. The ABYSS training and outreach programme was set up to promote synergies between research and industry, general public and policymakers.	Env	<a href="http://abyss-itn.eu">http://abyss-itn.eu</a>
<b>ZEBRA2020</b> (Nearly Zero-Energy Building Strategy 2020) – DG GROW	Total: 1.7 M€ EU budget: 1.2 M€	Technische Universitaet Wien, Austria	01/04/2014 to 30/09/2016	The key objective of ZEBRA2020 was to monitor the market uptake of nZEBs across Europe and to provide data and as well as recommendations on how to reach the nZEB standard. It actively contributed to meeting the ambitious target of 100% share of nZEBs for new buildings from 2020 and a substantial increase of deep nZEB renovations.	Tech	<a href="https://zebra2020.eu">https://zebra2020.eu</a>
<b>ERDEM – FP7</b>	No data	BMT Group Ltd, UK	01/06/2014 to 31/05/2019	ERDEM was an EIP to develop a novel set of solutions for exploration, extraction and in situ pre-processing of deep-sea ores and integrated robotic and sensor technologies to achieve lower-cost and more efficient real-time monitoring of environmental impact. It assessed the resilience of deep-sea ecosystems and of biodiversity to resource extraction activities and it provided	Tech	<a href="https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/content/environmentally-responsible-deep-sea">https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/content/environmentally-responsible-deep-sea</a>



Projects	EU funds	Lead	Duration	Objective	Area	Web
<b>EUROASSET</b> – FP7	No data	Dassault Systems Geovia Ltd, UK	01/01/2015 to 31/12/2018	The project facilitated the formation of a globally accepted unified data model for the storage and sharing of all spatial data related to raw materials and overcome the barriers that currently constrain the European Mineral Sector. DSM extraction was included. Geological resource evaluation and visualisation was developed on three initiatives: (1) data model, data storage, connectivity and presentation; (2) rapid exploratory	Tech	<a href="https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/content/3ds-european-mineral-asset-definition-and-valuation-system%20%20">https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/content/3ds-european-mineral-asset-definition-and-valuation-system%20%20</a>
<b>VAMOS</b> (Viable and Alternative Mine Operating System) – H2020	Total: 9.2 M€ EU budget: 9.2 M€	BMT Group Ltd, UK	01/02/2015 to 31/01/2019	The VAMOS project provided a new, safe, clean and low-visibility mining technique and proved its economic viability for extracting previously unreachable mineral deposits, thus encouraging investment and helping to put the EU back on a level playing field in terms of access to strategically important minerals.	Tech	<a href="https://www.vamos-project.eu">https://www.vamos-project.eu</a>
<b>MARIBE</b> (Marine Investment for the Blue Economy) – H2020	Total: 1.9 M€ EU budget: 1.9 M€	University College Cork, Ireland	01/03/2015 to 31/08/2016	The MARIBE project aimed to unlock the potential of multi-use of space in the Blue Economy. This formed part of the long-term Blue Growth strategy to support sustainable growth in several sectors: (1) marine renewable energy, (2) aquaculture, (3) marine biotechnology and (4) seabed mining	Tech	<a href="http://maribe.eu">http://maribe.eu</a>
<b>DexROV</b> (Dexterous ROV) – H2020	Total: 5.3 M€ EU budget: 4.6 M€	Space Applications Services Nv, Belgium	01/03/2015 to 31/08/2018	The DexROV project used and evaluated new technologies to allow safer and more cost-effective undersea operations with remotely operated vehicles (ROVs). The goals of the project were (1) move control of ROVs to shore, (2) overcome latency involved between onshore control centres and ROVs and (3) develop advanced dexterous tools. DexROV is part of the long-term Blue Growth strategy to support sustainable growth in the European marine and maritime sectors.	Tech	<a href="http://www.dexrov.eu">http://www.dexrov.eu</a>



Projects	EU funds	Lead	Duration	Objective	Area	Web
<b>ELSA</b> (Energy Local Storage Advanced system) – H2020	Total: 13.1 M€ EU budget: 9.9 M€	Bouygues Energies & Services, France	01/04/2015 to 31/12/2018	The ELSA project implemented and demonstrated an innovative solution integrating low-cost second-life Li-ion batteries and other direct and indirect storage options, including heat storage and demand-side management, as well as use of intermittent RES.	Tech	<a href="https://www.elsa-h2020.eu">https://www.elsa-h2020.eu</a>
<b>BRIDGES</b> (Bringing together Research and Industry for the Development of Glider Environmental Services) – H2020	Total: 7.8 M€ EU budget: 7.8 M€	Association pour la Recherche et le Développement des Méthodes et Processus Industriels, France	01/03/2015 to 31/08/2019	The BRIDGES project provided a research tool, SeaExplorer, necessary to support long-term in situ exploration and protection services of the coastal and deep ocean. This project realised and promoted the creation of collaborations among sensor and platform manufacturers, oil and gas and mining companies, public-health and safety departments and scientific and engineering experts.	Tech	<a href="http://www.bridges-h2020.eu">http://www.bridges-h2020.eu</a>
<b>Blue Atlantis</b> (Innovative Mining of Marine Mineral Resources – A European Pilot. Mining Test in the Atlantic on Tools, Facilities, Operations and Concepts) – FP7	No data	German Association for Marine Technology, Germany	01/04/2015 to 31/03/2020	Establishment of the first deep-sea-mining test facility, covering RTD, mining tests, development of standards and support of market access in the seafloor around the Azores Archipelago, which was considered an ideal location for a deep-sea-mining test facility in waters under the jurisdiction of the European Union. Partners from the eight EU countries as well as the company Nautilus Minerals of Canada were involved. The consortium had links to MIDAS and Blue Mining.	Tech	<a href="https://ec.europa.eu/growth/content/innovative-mining-marine-mineral-resources-%E2%80%93-european-pilot-mining-test-atlantic-tools_en">https://ec.europa.eu/growth/content/innovative-mining-marine-mineral-resources-%E2%80%93-european-pilot-mining-test-atlantic-tools_en</a>
<b>ROBUST</b> (Robotic subsea exploration technologies) – H2020	Total: 5.9 M€ EU budget: 5.9	TWI Ltd, UK	01/12/2015 to 31/01/2020	The ROBUST project aimed to develop in an efficient and non-intrusive manner in situ material identification through the fusion of two technologies: (1) laser-based in situ element-analysing capability merged with (2) autonomous underwater vehicle technologies for 3D seabed mapping. This technology was to aid the seabed mining industry, reduce the cost of exploration and especially the detailed identification of the raw materials contained in mining sites and enable targeted mining only of the richest resources existing.	Tech	<a href="https://www.twi-global.com">https://www.twi-global.com</a>



Projects	EU funds	Lead	Duration	Objective	Area	Web
<b>STRONGMAR</b> (STRengthening MARitime Technology Research Center) – H2020	Total: 0.9 M€ EU budget: 0.9 M€	Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência (INESC TEC), Portugal	01/01/2016 to 31/12/2018	The STRONGMAR project developed deep-sea technology to create solid and productive links in the global field of marine science and technology. It was aligned with several national and European priorities establishing a consolidation path of INESC TEC's strategy in these areas.	Tech	<a href="http://www.strong-mar.eu/">http://www.strong-mar.eu/</a>
<b>MaDurOS</b> (Material durability for Off-Shore) – EIT RawMaterials – DG GROW	No data	OCAS N.V., Belgium	01/01/2016 to 31/12/2018	The MaDurOS project provided one-stop-shop access to unique equipment while also further enriching the existing set-ups by identifying testing blind spots and linking them to predictive simulation models as well as complementary competences in asset-intensive sectors such as DSM.	Tech	<a href="http://www.merces-project.eu">http://www.merces-project.eu</a>
<b>MERCES</b> (Marine Ecosystem Restoration in Chan- ging European Seas) – H2020	Total: 6.6 M€ EU budget: 6.6 M€	Università Politecnica delle Marche, Italy	01/06/2016 to 31/05/2020	The MERCES project focused on the restoration of different degraded marine habitats, with the aim of: (1) assessing the potential of different technologies and approaches, (2) quantifying the returns in terms of ecosystems services and their socio-economic impacts and (3) defining the legal-policy and governance frameworks needed to optimise the effectiveness of different restoration approaches.	Env	<a href="http://www.merces-project.eu">http://www.merces-project.eu</a>
<b>MUSES</b> (Multi-Use in European Seas) – H2020	Total: 1.9 M€ EU budget: 1.9 M€	Marine Scotland, UK	01/11/2016 to 31/10/2018	The MUSES project reviewed existing planning and consenting processes against international quality standards for MSP and compliance with EU directives used to facilitate marine and coastal development in the EU marine area to ensure that they are robust and efficient and facilitate sustainable multi-use of marine resources.	Env	<a href="https://muses-project.eu">https://muses-project.eu</a>



Projects	EU funds	Lead	Duration	Objective	Area	Web
<b>Areas of particular environmental interest in the Atlantic (EMFF)</b> – DG MARE	Total: 1.5 M€	No data	2017 to -	The main objective of this study is to prepare a strategic environmental plan for the Atlantic area beyond national jurisdiction, and to propose a representative network of areas of particular environmental interest.	Env	
<b>DeepSym (Understanding the drivers of the genetic and functional structure of deep-sea sponge symbiont communities)</b> – H2020	Total: 0.1 M€ EU budget: 0.1 M€	Natural History Museum, UK	01/03/2018 to 30/04/2020	The DeepSym project aimed to determine the next frontier of sponge symbiosis: the functionality of the microbial consortia of deep-sea sponges. It constituted a major breakthrough in bridging the gap between evolution and function in multispecies relationships, attracting the interest of a wide variety of fields.	Env	<a href="https://cordis.europa.eu/project/id/796011">https://cordis.europa.eu/project/id/796011</a>
<b>Nesox</b> (NEw Semi-Solid flow lithium OXygen battery) – H2020	Total: 0.07 M€ EU budget: 0.05 M€	BETTERY Srl, Italy	01/01/2019 to 30/06/2019	BETTERY developed NESSOX, a patented new class of batteries that allow for fast recharge of the battery and outstanding performances in terms of autonomy, size and weight.	Tech	<a href="http://www.bettery.eu">http://www.bettery.eu</a>
<b>DEEPCO</b> (Connectivity of deep-sea ecosystems under increasing human stressors) – FP7	Total: 0.3 M€ EU budget: 0.3 M€	CSIC, Spain	No data	The DEEPCO project is interdisciplinary in order to (1) determine population connectivity in New Zealand and Mediterranean deep-sea habitats and (2) use this information with available data in ecological risk-assessment models to assess the vulnerability of exploited deep-sea systems. The end goal is to provide scientific information that will enable the evaluation of management options to reduce or mitigate mining impacts on benthic systems.	Tech	



Projects	EU funds	Lead	Duration	Objective	Area	Web
SeaFlores (Breakthrough Solutions for Seafloor Mineral Extraction and Processing in deep water environment) – FP7	No data	TECHNIP, France	No data	A European Innovation Partnership (EIP) on raw materials with the aim of developing and testing innovative DSM system. The key innovation in this project is the generic design and in situ demonstration activities of a cost-efficient and environmentally-acceptable deep-sea mining pilot system. This project is complementary to ALBATROSS.	Tech	<a href="http://ec.europa.eu/eip/raw-materials/en/content/breakthrough-solutions-seafloor-mineral-extraction-and-processing-deep-water-environment">http://ec.europa.eu/eip/raw-materials/en/content/breakthrough-solutions-seafloor-mineral-extraction-and-processing-deep-water-environment</a>



**Table 3. Other projects**

Projects	EU funds	Lead	Duration	Objective	Area	Web
<b>CeDAMar</b> (Census of Diversity of Abyssal Marine Life)	No data	Senckenberg Research Institute, Germany	2003–2020	The goal of this project was to document actual species diversity of abyssal plains as a basis for global change research and to increase understanding of historical causes and actual ecological factors that regulate biodiversity. To achieve this, CeDAMar collected reliable data on the large-scale distribution of animals in one of the largest and most inaccessible environments on our planet.	Env	<a href="http://www.cedamar.org/">http://www.cedamar.org/</a>
<b>MiningImpact</b> (Ecological Aspects of Deep-Sea Mining)	Total: 22.9 M€ EU budget: ? €	GEOMAR, Germany	01/02/2013 to 31/02/2022 (on going project)	The MiningImpact 2 project follows up on the results of the first MiningImpact project, which concluded in late December 2017. In this context, it aims to (1) develop and test monitoring concepts, (2) develop standardisation procedures for monitoring GES, (3) investigate potential mitigation measures, (4) develop sound methodologies to assess the environmental risks and (5) explore uncertainties in the knowledge of impacts.	Env	<a href="https://www.-jpi-oceans.eu/ecological-aspects-deep-sea-mining">https://www.-jpi-oceans.eu/ecological-aspects-deep-sea-mining</a>
<b>SUSTAINABLE OCEAN</b> (Accommodating New Interests at Sea)	Total: 1 M€ EU budget: 1 M€	Universiteit Utrecht, Netherlands	01/10/2015 to 20/09/2020	The SUSTAINABLE OCEAN research project developed a theoretical framework and legal tools to aid scholars and stakeholders in managing competing interests in the offshore economic sector. The research ultimately offered a theory of interest- and regime-interaction in ocean governance and thus created a comprehensive framework for the development of legal tools.	Env	<a href="https://www.uu.nl/en/research/sustainable-ocean">https://www.uu.nl/en/research/sustainable-ocean</a>





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