

# **DEME and deep sea mining: assessing emerging investment risks**



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# Introduction

While DEME has an impressive track record of dredging and wind energy, its sustainable reputation stands to crumble over deep sea mining. As more scientists, governments, financial institutions and corporations speak out against this destructive industry, DEME continues its investments in this industry through its subsidiary Global Sea Mineral Resources (GSR).

Last year, Greenpeace joined the Annual General Meeting (AGM) of the DEME Group to alert shareholders and the public to the environmental, financial and reputational risks of deep sea mining. Whilst this led to an exchange with some DEME directors on the continued investments in this industry, Greenpeace saw little understanding of the concerns raised and many questions remained unanswered. Therefore this brochure seeks to shed light on these outstanding questions, informing shareholders on the latest news and risks of deep sea mining.

## What is deep sea mining?

*Deep sea mining is the practice of removing metals and minerals from the ocean's seabed, thousands of metres below the surface. Over millions of years, elements such as manganese, nickel, and cobalt have accumulated on the seabed in the form of nodules.*

*To mine these metals, machines would scoop deposits from the deep ocean floor. Scientists have, however, raised concerns about the large-scale and irreversible impact of such activity on deep-sea ecosystems, which are still largely understudied.*

*Deep sea mining is a very new industry, with only a handful of companies active in the field. Apart from a few small tests, no commercial mining has happened yet.*

*For more information, we refer you to the brochures on our website.<sup>1</sup>*

# The Metals Company: A precautionary tale

Deep sea mining is an untested industry, meaning there is no precedent and no existing supply chains or market for deep sea metals. Just like deep sea ecosystems remain largely a mystery to science, the deep sea mining market is shrouded in uncertain predictions, speculation and untested technologies. There are only a handful of deep sea mining companies, and the one that is the closest to commercial exploitation is The Metals Company (TMC). Before looking into GSR's finances, we therefore dive into the numbers of TMC, as there are many lessons to be learned from their trajectory.

## **Operational costs: rising rapidly**

Firstly, TMC's financial assumptions don't add up and are rising rapidly. TMC estimates offshore costs to be 3.8 to 4.8 times lower than its offshore partner Allseas does, and onshore processing costs 57% lower than its onshore partner PAMCO.<sup>2</sup> Offshore costs surged 152% in TMC's pre-feasibility study relative to TMC's earlier estimates, and nodule production was cut by 35%. Similarly, Nautilus - which later went bankrupt - claimed initial operating costs of \$70/tonne, which rose to \$192/tonne by the time its 2018 economic assessment was filed. This comes to show that the operational costs of deep sea mining are extremely hard to correctly estimate and increase rapidly as new difficulties arise.

## **Nodule valuation: heavily inflated**

TMC heavily inflates the value of nodules without regard to the reality of metal processing. TMC assumes valuations of \$560-790 per tonne of nodules delivered at port. Yet independent analysis established a more realistic value of polymetallic nodules at \$100-250 per tonne.<sup>3</sup> This represents a 200-300% gap with market reality, stemming from the flawed "in-situ valuation trap". Promoters assume they can sell nodules at the theoretical value of the contained metals, while ignoring the massive expenses required to process them. However, no treatment

facility accepts this model for nodules. Processors would purchase raw material at 20-35% of contained metal value (for nickel, cobalt and copper) and own the final product, reflecting the metallurgical, logistical and market risks they assume.

### **Technological assumptions: unrealistic**

TMC's technological assumptions have likewise been assessed as unrealistic by independent analysis.<sup>4</sup> When comparing 2022 test data with TMC's technical assumptions on nodule abundance, collector efficiency and collector speed, analysis found that the collector efficiency might actually be as low as 47% compared to TMC's stated 80%. Likewise, TMC assumes a nickel recovery rate of 95%, while the industry peer media for comparable projects is 83%.

### **Financial collapse: imminent**

TMC Q3 2025 figures reported a net loss of \$184.5 million, or \$0.46 per share, representing a significant deterioration from the \$20.5 million loss in Q3 2024.<sup>5</sup> Operational bleeding is accelerating rapidly, with TMC's Q3 2025 operating loss officially reaching \$55.4 million while generating absolutely no revenue. Financial analysts warn that TMC's balance sheet is severely distressed, pointing to an "enormously negative EBIT margin of -18,287.1%, revealing operational inefficiencies and an inability to cover operating costs from earnings".<sup>6</sup>

All of this does not take into account the fact that the permit TMC is applying for with the United States (US) breaks international law, namely the UNCLOS agreement, and undermines the International Seabed Authority. As states have been discussing the suspension of TMC's exploration contract under the international regime and are looking into ways to ban metals explored through the US regulatory regime, it is yet to be seen if TMC will be able to sell any of its produce.

### **Business case: inexistent**

Even by TMC's own assumptions, TMC would not make any meaningful profit after factoring capital and operating costs into their project in the Clarion-Clipperton Zone (CCZ).<sup>7</sup> This was the unequivocal conclusion of an analysis of the pre-feasibility study (PFS) of TMC. It finds that TMC's PFS relies on a collection of best-case assumptions: optimistic metal prices, exceptionally high recovery rates, no royalty provisions, and minimal allowances for cost escalation or closure liabilities. TMC counts for a third of its projected revenue on manganese silicate markets, and relies on processing infrastructure that does not currently exist at commercial scale. TMC likewise relies on financial markets which do not currently exist at scale, and has not factored in any byproducts or waste management.

Another independent analysis estimated Net Present Value for TMC's flagship Nori-D project at \$721 million, compared to TMC's own projection of \$6.8 billion, and declared all other project areas with lower abundance "effectively dead on arrival."<sup>8</sup> The researchers later updated the findings after the publication of TMC's PFS to conclude the project would actually lose \$1.5 billion - a \$7 billion swing from what TMC claimed. The researchers reached these numbers after adjusting TMC's assumptions to more realistic numbers on nodule abundance, metals recovery rates, supplier costs, and metal prices. It also included a higher discount rate to more accurately reflect the unproven equipment, challenging technical conditions 4km under the watersurface, and the absence of a precedent for cost control. "After adjusting for current metal prices, a 10% U.S. royalty rate, an 83% nickel recovery rate, and a 15% discount rate, the NPV falls to negative \$1.5bn, representing a 127% decline from the reported figure".<sup>9</sup>

# GSR: A liability for DEME

The question remains whether GSR will be able to break even in this unproven market. When even the market frontrunner TMC stands to lose over a billion dollars over this industry, how will GSR's fate - which is far less advanced in the sector - be different from that of TMC?

## Over a decade of financial trouble

GSR's financial figures are not particularly hopeful in that regard. Since its creation in 2012, GSR has never been profitable, with the exception of a symbolic €3926 in its very first short financial year. The cumulative total losses for DEME for the period 2013-2024 amount to ~€38.7 million. GSR survived only thanks to massive and repeated capital injections from DEME initially, then as of 2023 from Transocean.

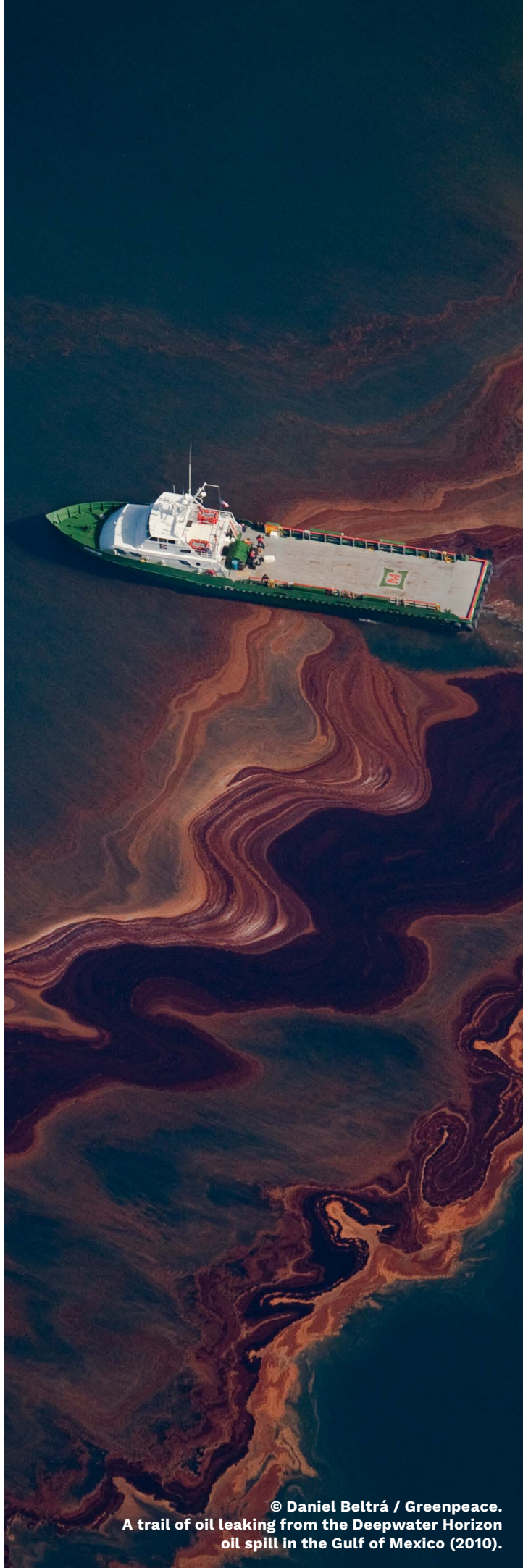
A peak in losses was reached in 2019 with -€9.4 million, the year in which GSR conducted deep-water collector testing campaigns, followed by 2021 with -€6.1 million, when GSR temporarily lost the nodule collector Patania on the deep-sea floor.<sup>10</sup> The costs of services and purchases have systematically exceeded revenues, leading negative gross margin to almost triple between 2022 and 2024.

The GSR board of directors has repeatedly carried out capital reductions in order to absorb accumulated losses by subtracting them directly from the company's official capital. In 2018 this accounted for €7.7 million and in 2022 for well over €13 million. By doing so, GSR has created the illusion of a healthier balance sheet and avoided triggering the alarm procedure, as stated in the yearly report of 2022. However, this was only possible due to continuing capital injections by DEME Concessions NV and after 2023, Transocean Ltd.

## Transocean: a partner with a dirty track record

While DEME financed GSR on its own for the first decade with over €38 million capital injections, GSR needed more to keep afloat. Facing a lack of liquidity and a need for cash investments, Transocean partnered with GSR in 2023<sup>11</sup> contributing approximately €79.7 million in the form of a vessel and approximately €37.4 million in cash. GSR CEO Kris Van Nijen applauded the investment, stating “Transocean is a leader in the global offshore drilling industry and is well known for its ultra-deepwater expertise.” To most people, however, Transocean is most known for its complicity in the Deepwater Horizon oil spill of April 2010 in the Gulf of Mexico, killing 11 workers and triggering the largest accidental marine oil spill in history.

Transocean owned the Deepwater Horizon rig which exploded, and pleaded guilty. Transocean was sentenced to pay \$400 million in criminal fines and a \$1 billion civil settlement<sup>12</sup> - the second-largest environmental crime recovery in U.S. history, behind only BP’s \$4 billion criminal sentence for the same disaster. The US Chemical Safety Board concluded that both BP and Transocean exhibited “deficiencies in their safety management systems” and that neither company had sufficient safety protocols in place, underscoring that Transocean’s negligence was systemic, not incidental.<sup>13</sup> Knowing that deep sea mining is a sector with huge risks of environmental damage, partnering with a company known for systemic negligence in safety management is a disaster waiting to happen. This partnership therefore comes with major reputational risks for DEME.



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A trail of oil leaking from the Deepwater Horizon  
oil spill in the Gulf of Mexico (2010).

## The Cook Islands: a neocolonial relationship

The partnership with Transocean is not the only one that rings alarm bells. Last December, GSR announced that it will give up its share in the Joint Venture it held with the Cook Islands Investment Corporation.<sup>14</sup> That Joint Venture was set on exploiting deep sea nodules both in national and international waters. GSR stepped out of the concession for exploiting national waters, with local sources suggesting GSR is passing on the concession to Wetstone. This US-based company is led by a former Shell executive and has close ties to DYNE Maritime, which invests in military technologies.<sup>15</sup>

GSR is thus stepping out of an industry it convinced the Cook Islands to invest in, leaving the small island state in the hands of a company with ties to fossil fuel extraction and military technologies. When nodules in national waters didn't seem as profitable, GSR left the Cook Islands to its own devices with the national concession, but is still using the Cook Islands as a sponsor for exploitation in international waters. This leaves the Cook Islands with the responsibility to oversee this industry, making it responsible for environmental harm. A foreign company using a country for resource extraction while leaving the risks behind locally - that's an extractive neocolonial power relation DEME would not want its name connected to.

## US Sea Mineral Resources?

While TMC has decided to join the US in their attempt to undermine international law, DEME has thus far remained committed to the UN framework on deep sea mining. However, a review of the lobby transparency register of the US senate suggests that GSR is betting on two horses. Between 2022 and 2025, GSR spent \$290.000 and its partner

Transocean another \$190.000 on lobbying on deep sea mining in the US through Cornerstone Government Affairs. This lobby firm advocates for big oil and gas companies like ExxonMobil as well as defense companies like General Dynamics.

The lobby firm had two former Bush associates Brent Greenfield and Tyler Nelson use their political experience to advocate on deep sea mining for GSR and Transocean. This included advocacy for the exploration and exploitation of polymetallic nodules, the Inflation Reduction Act and domestic refining, both at the US Senate and Congress. The lobbying paid off: various legislative proposals on deep sea mining were proposed and discussed in the US, culminating in the 2025 executive order that advances deep sea mining in international waters, thereby breaking international law.

While DEME has stressed that they will await international legislation, the lobbying efforts by GSR seem to suggest otherwise. Policy makers in the Belgian administration have stressed repeatedly that GSR threatens to move to the US if a mining code is not adopted soon. Likewise, CEO Kris Van Nijen failed to respond to questions about this during the parliamentary hearing on deep sea mining of April 2026. He could not reassure parliamentarians that GSR would refrain from engaging in illegal mining through the US.

Just like the many investments in the US policy landscape, this seems to contradict DEME's position that legislation should first be adopted. The question then remains, how can you trust that GSR will not run off to the US?

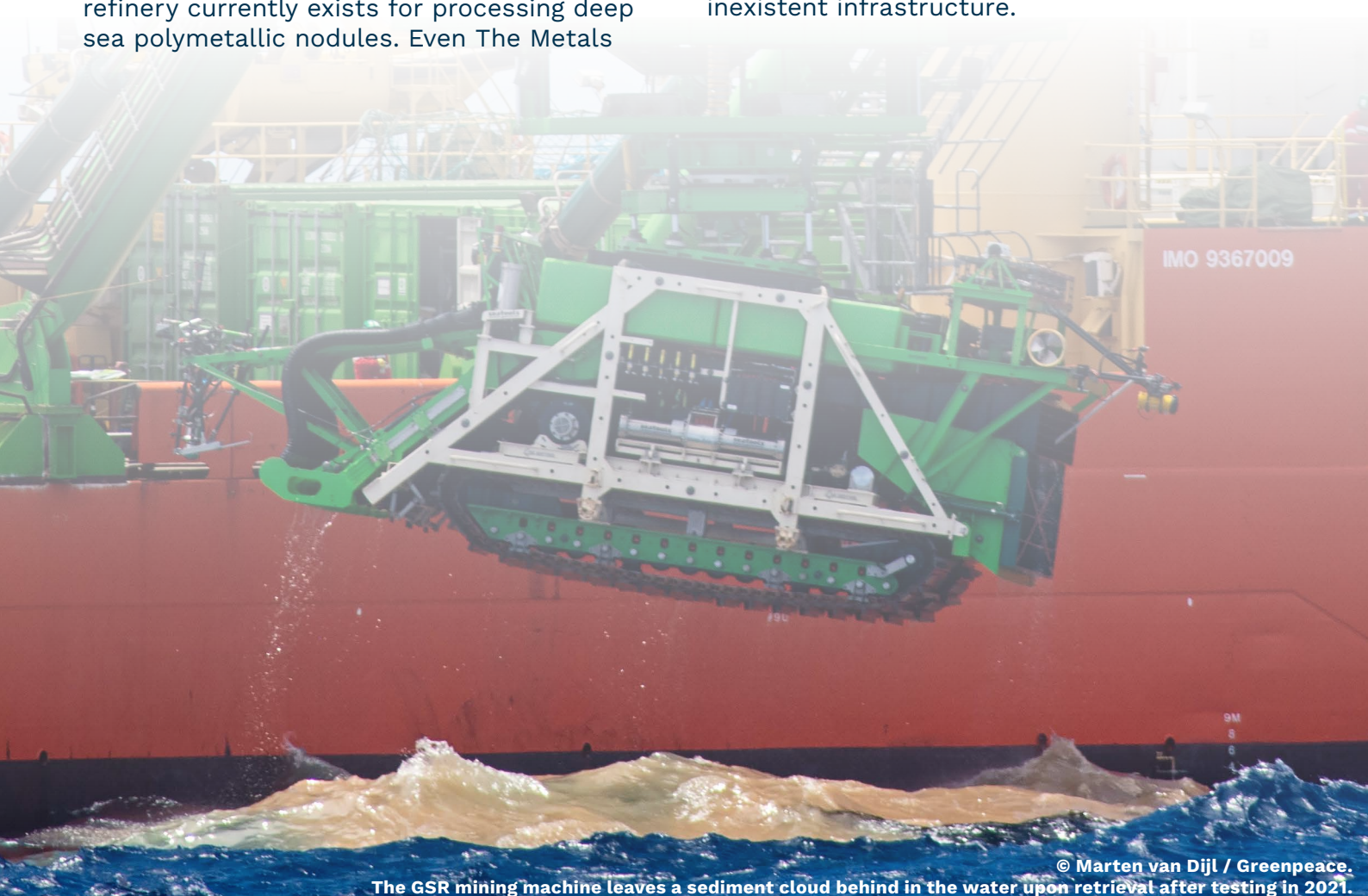
## Can GSR break even?

In March 2026, GSR announced it has signed a Memorandum of Understanding to perform a System Integration Test for DORD, the Japanese company holding a concession for deep sea mineral exploration in the Clarion-Clipperton Zone. While there is no sufficient information yet to assess the way the partnership with DORD has reshuffled the cards, the basic premises have not changed: major investments are needed before GSR is ready to even perform such a test.

As stressed in last year's brochure, further test mining during the exploration phase is projected at 200 million USD<sup>16</sup>, and validation monitoring during the early stages of the exploitation phase is projected at 500 million USD. The repurposing of the mining vessel - the Ocean Rig Olympia, gifted by Transocean in return for shares - is estimated around \$100million.<sup>17</sup> In addition, no operational refinery currently exists for processing deep sea polymetallic nodules. Even The Metals

Company's planned facility would only handle 1.3 million tonnes annually<sup>18</sup> — less than half of GSR's estimated needs for profitability.<sup>19</sup> GSR has no publicly confirmed refining partner, and building a dedicated facility would take years and many millions.

Last year's calculations indicate that at April 2025 refined commodity prices, GSR would yield \$543 million per year for one vessel, or \$1.08 billion for two — barely covering the annual operating costs of over \$1 billion and projected investment costs of nearly \$4 billion.<sup>20</sup> These figures do not yet include taxes, royalties, downtime, and the volatility of the metals market. The projection is also based on the assumption of 24/7 operations, while the Patania II incident in 2021 exemplifies the plethora of accidents possible when operating at 4000 meter depth. Profitability thus hinges on speculative optimism, unrealistic assumptions and inexistent infrastructure.



© Marten van Dijk / Greenpeace.  
The GSR mining machine leaves a sediment cloud behind in the water upon retrieval after testing in 2021.



# Unavoidable, irreversible environmental damage

As more and more deep sea research is conducted, scientific evidence is mounting that the environmental impacts of deep sea mining will be severe, large in scale and irreversible. While other publications detail the environmental impacts such as species extinction and reduced carbon sequestration well,<sup>21</sup> it is worth looking at some of the most revealing research findings from the last year.

First of all, new scientific evidence concludes that environmental damage is irreversible on human timescales. A study on the long-term impact of deep sea mining studied the tracks of an exploration test 44 years ago.<sup>22</sup> It found that the biological impacts in many groups of organisms are persistent over time. This concern was aggravated by a later study that looked at species diversity and abundance in the Clarion-Clipperton Zone after test mining - the largest study yet.<sup>23</sup> It revealed that the mining machine's tracks single-handedly wiped out 37% of visible, sediment-dwelling invertebrates. This massive die-off directly triggered a 32% plunge in overall species diversity in the affected areas.

Secondly, deep sea mining will affect a broad range of species on and beyond the mining tracks. Scientists from the University of Exeter unequivocally confirmed the presence of up to 30 cetacean species in the Clarion-Clipperton Zone, including endangered sperm whales, Risso's dolphins, and beaked whales.<sup>24</sup> A complementary review confirms that the intense, continuous noise from mining machinery will gravely affect whale populations, blinding and disorienting them through noise pollution.<sup>25</sup>

Third, scientists continue discovering new species in the deep. In March 2026, scientists discovered a new superfamily of deep sea amphipods in the Clarion-Clipperton Zone.<sup>26</sup> One of the co-authors described the discovery as if you were to discover dogs exist - another superfamily of a species.<sup>27</sup> This comes to show just how much remains to be discovered in the area, at a time that new evidence cautions for irreversible and large-scale environmental damage.

# DEME's deepest secret lies on the ocean floor

Deep sea mining is a reputational and financial liability. The mining code that seeks to regulate deep sea mining at the global level is nowhere near finished, with critical questions on royalties, environmental thresholds and benefit-sharing yet to be agreed-upon.<sup>28</sup> Given the need for consensus and the position of 40 countries calling for a moratorium on deep sea mining, the mining code is unlikely to be adopted any time soon. There is thus no timeline for mining to happen within the international legal framework.

Meanwhile, there is simply no established market for deep sea mining. The metals market remains volatile as ever, making financial projections for this industry insecure and speculative at best. Even the ISA's own research stresses that metal recovery rates of nodules could be very low, down to 50% for cobalt.<sup>29</sup> As a result of the recovery process, high processing and realisation costs, the collector may have no return on capital at times of low metal prices.

The financial sector has already realised these risks and is increasingly distancing itself from deep sea mining. New research finds that 82 financial institutions managing approximately €24 trillion in combined assets have adopted policies restricting or expressing concerns about DSM.<sup>30</sup> Likewise, major international lenders including Lloyds Banking Group, ABN Amro, NatWest, BBVA, and Standard Chartered have created explicit policies excluding financing of deep-sea mining.<sup>31</sup>

While initially deep sea nodules were presented as batteries, the battery landscape has shifted rapidly towards lithium-based batteries for electric vehicles as well as sodium-ion batteries. New research shows deep sea metals may not be needed for the energy transition.<sup>32</sup> The question remains, who will be purchasing these metals? In the current geopolitical context, militarisation proponents are increasingly publicly calling out for the need to mine for military equipment. Is DEME really ready to swap its sustainable public profile for a military profile?

DEME's reputation as a sustainable company is at risk from its continued involvement in deep sea mining. The company is well aware of this risk: public communication systematically shies away from the topic, and critical comments on social media are instantly censored. But in the face of growing awareness and opposition to deep sea exploitation among the Belgian public and political players alike, silence is a losing strategy. The only way to preserve DEME's green reputation is by divesting from GSR.

# Questions for the Annual General Meeting

- 1** On what basis does GSR claim there is a shortage risk for **nickel, cobalt, manganese and copper** that justifies opening a new, untested, high-risk extraction frontier?
- 2** What **structural advantages** does GSR have that Nautilus (which went bankrupt) did not — and why should shareholders believe GSR will succeed where Nautilus failed?
- 3** Can the board categorically guarantee that metals extracted by GSR will never serve **weapons manufacturers**? How will GSR ensure metals will instead serve the energy transition, as it claims they will?
- 4** Please disclose the full **results of the Patania test mining operation** on nodule abundance, collector vehicle speed, and collector efficiency, to allow shareholders to make an independent assessment of the technical feasibility.
- 5** What is the **expected cost of processing nodules** in the US, and how does that cost affect projected economics? Has the board modelled the full landed cost of refined metal from seabed to processor?
- 6** What is the projected **cost for building the Patania III** and refitting the Olympia ocean rig?
- 7** GSR's projected **CapEx stands at approximately \$700 million**. How does DEME intend to finance this without diverting capital from — or compromising returns on — its profitable offshore wind portfolio?
- 8** What **discount rate** does GSR consider appropriate for its CCZ concession, given the important technical, regulatory, and environmental risks?

- 9** The **Ocean Rig Olympia** is presented in DEME communications as a €1 billion asset. Official documents value it at €79 million. Can the board explain this discrepancy and clarify how this vessel is valued on DEME's balance sheet?
- 10** How does DEME expect a return on the initial investments in the joint venture with the **Cook Islands Investment Corporation**, now that GSR is pulling out of the joint venture?
- 11** Has **lobbying in the US Congress** by DEME and GSR on deep sea mining sought to advance military or geopolitical use of extracted nodules?
- 12** How does the board quantify the **legal and financial liability arising from environmental damage** that cannot be spatially controlled?
- 13** Has the board obtained credible **insurance** commitments for full environmental liability of deep sea mining, and if so, at what cost and with what exclusions?
- 14** Operating heavy industrial machinery in the feeding and breeding grounds of endangered whale species constitutes a **severe ESG violation**. Has the board assessed the risk of immediate institutional divestment and regulatory action if GSR operations result in documented harm to these species?
- 15** If the ISA never adopts exploitation regulations — which is now a realistic scenario — what is **GSR's exit strategy**, and how will DEME recover its invested capital?
- 16** Has the board formally considered **divesting from GSR** to protect DEME's financial health and reputational standing with its institutional clients and partners?

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