



# SHAREHOLDER ADVISORY

**THE PROPOSED BUSINESS COMBINATION  
BETWEEN SUSTAINABLE OPPORTUNITIES  
ACQUISITION CORPORATION  
AND DEEPGREEN**

# DSMC

Deep Sea Mining Campaign

24 May 2021 | This Shareholder Advisory has been produced by the Deep Sea Mining Campaign with the endorsement of the organizations listed below.



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## Abbreviations

DSM	Deep sea/seabed mining
EEZ	Exclusive Economic Zone
EIS	Environmental Impact Statement
ESG	Environmental, Social and Governance
EU	European Union
EV	Electric Vehicles
GSR	Global Sea Mineral Resources
IPO	Initial Public Offering
ISA	International Seabed Authority
LFP	Lithium Iron Phosphate
NGO	Non-Governmental Organization
NORI	Nauru Ocean Resources Inc
PNG	Papua New Guinea
SEC	Securities and Exchange Commission
SOAC	Sustainable Opportunities Acquisition Corporation
SPAC	Special Purpose Acquisition Company
TMC	The Metals Company
TOML	Tonga Offshore Mining Limited
UK	United Kingdom
US	United States
UNCLOS	United Nations Convention on the Law of the Sea

# Executive Summary

**The purpose of this Shareholder Advisory is to inform potential investors in the business combination proposed by DeepGreen Metals and Sustainable Opportunities Acquisition Corporation (SOAC) to form The Metals Company (TMC).**

We believe that the Advisory is of particular relevance to SOAC public shareholders, who would be anticipating an investment with strong sustainability credentials and who will shortly be invited to vote on approving the business combination and/or to elect to maintain or redeem their investment.

The Advisory critiques the Provisional S-4 Prospectus filed by SOAC and DeepGreen with the Securities and Exchange Commission (SEC). Its focus is on the many environmental, social and governance (ESG) risks, which are in our view, either inadequately described in the Prospectus or in some cases not disclosed at all.

We believe the many material concerns raised in this Advisory demonstrate that TMC is not the sustainable venture promoted to SOAC investors. TMC's core business centers on mining rocks (polymetallic nodules) on the sea floor. It plans to establish a massive industrial activity in the deep ocean - an environment that has until now remained ecologically intact.

Due to the ESG risks identified in this advisory, [scientists](#), [legal experts](#), [national](#) and [international governments](#), [local communities](#), [high-profile conservationists](#), [leading businesses](#) and a broad range of civil society voices urge either a [moratorium](#) or a [complete ban](#) on deep sea mining.

We believe that, aside from being fundamentally unsustainable (discussed in [Section 1](#)), the business proposal being advanced by SOAC is riddled with a multitude of risks, including:

- Key determinants of commercial viability and DeepGreen's valuation are unknown;
- Estimates of future revenues, operating expenditures, value and size of mineral reserves are speculative and may be affected by flaws in DeepGreen's financial controls;
- Capacity of TMC senior personnel to manage a large-scale mining project is unknown ([Section 5](#));
- A serious mismatch between DeepGreen's business plan to begin commercial production in 2024 and the status of regulations, terms and conditions for DSM and of equipment and operating systems ([Section 4](#));
- Technology and processes are experimental concepts: no proof of performance or production efficiencies;
- Legal ambiguity of central elements of the regulatory and governance frameworks for DSM including the important issue of effective control of subsidiaries;
- Vulnerability to changes in the political context of DeepGreen's sponsoring states and the

capacity of these small island developing economies to meet requirements for effective control of subsidiaries;

- Worldwide concern from business, governments, scientists and civil society calling variously for a moratorium or ban on DSM;
- The wide-ranging liabilities likely to arise in order to compensate for loss and damage resulting from environmental impacts (Section 3);
- Potential impacts on deep sea and wider marine species, habitats, ecosystems and ecosystem functions and services (Sections 1.1 & 3);
- Potential impacts on Pacific national economies and Pacific Islander livelihoods and cultures;
- Potential impacts on high value fisheries such as tuna, of regional and global importance;
- Possible interference with carbon cycling and storage and the potential to exacerbate climate change;
- Human health - in view of the potential toxicity of mine waste discharged, the reliance of Pacific islanders on seafood, and the migratory nature of commercially fished species;
- Non-compliance with environmental requirements and consequent litigation; and
- Uncertain demand for the metals that TMC's business case hinges on, due to substitution and market resistance to metals sourced from DSM (Section 2.3).

**We believe that the business combination proposed by SOAC and DeepGreen to form TMC offers investors a high-risk mining venture which is predicted by science to destroy deep sea ecosystems and to harm ocean systems more widely. Its social and economic liabilities are potentially far reaching. The technical and regulatory hurdles yet to be overcome mean that financial returns, if any, would not be realized for many years.**

**The demand for metals is shifting: rapidly evolving battery technology is moving away from nickel and cobalt. Recent advances demonstrate that materials can be substituted more rapidly than the timeframe for the development of even a new terrestrial mine, let alone the timeframe of realizing an experimental industry with unproven technology and processes. Investors in TMC may well be left with stockpiles of redundant metals and the world left with a legacy of environmental damage – the full consequences of which science is only beginning to understand.**

1

# DEEP SEA MINING IS INHERENTLY UNSUSTAINABLE

“ There is nothing sustainable about carving up the seafloor for mining ... The deep ocean must remain off-limits to the mining industry to prevent further biodiversity loss and potentially damaging a critical carbon sink.

GREENPEACE SPOKESWOMAN [NELLI STEVENSON](#), WHEN ASKED ABOUT DEEPGREEN'S MINING PLANS

The [Preliminary S-4 Prospectus](#) claims that The Metals Company (TMC) will be a sustainable, environmentally sensitive enterprise that will provide an essential source of metals to power a clean energy future. While painting a positive and benign picture, we believe that this claim is unsupportable. TMC's business case rests upon large-scale industrial mining of swathes of the Pacific Ocean supporting healthy and diverse ecosystems. Scientists predict that TMC's core business, deep sea mining (DSM) will have severe long term environmental impacts, which will be effectively permanent by human timescales. The socio-economic consequences of these impacts may result in a broad range of liabilities. Furthermore, research and advances in battery technology suggest that deep sea metals are not even needed for a clean energy transition. This means that due to the environmental and social costs incurred DSM may not generate any real benefit for the planet and investors may well be left with a stranded asset.

### 1.1 Science confirms mining deep sea polymetallic nodules is a serious environmental risk

The world's ocean environment is under increasing ecological stress, with its resilience severely tested by the [well-documented](#) impacts of climate change, overfishing and pollution.

The deep sea used to be thought of as an ecological desert (and is [referred to by DeepGreen as such](#)), but research is revealing it to be brimming with important and [unique life forms](#) and to play a key role in storing planetary [carbon](#).

The nodules that DeepGreen wants to mine have

their own ecology, about which we know very little. They form surfaces for some animals to grow on and foraging and spawning grounds for others. Nodules take millions of years to form, so the [loss of the habitats](#) they provide and the creatures that depend on them would be permanent in human time frames. Deep sea environments are [extremely slow to recover](#) and the remediation or offsetting of DSM impacts is [estimated to cost up to 1,000 times as much](#) as for terrestrial mines. Scientists have warned that [biodiversity loss from deep sea mining](#) would be inevitable and that biodiversity offsets would be 'scientifically meaningless'.

Even the foreword of DeepGreen's own 'white paper' [Where Should Metals for the Green Transition Come From?](#) acknowledges biodiversity loss as a significant impact of DSM and that it is impossible to determine whether impacts on biodiversity would be less than impacts from land based mining due the paucity of information.

However, we do know that recovery of terrestrial ecosystems after the cessation of mining occurs within decades to hundreds of years as opposed to thousands or millions of years for DSM. This is a *fundamental difference* between terrestrial mining and DSM, and places DSM into a potentially far more severe category of environmental impact than land-based mining.

According to respected University of Hawaii oceanographer [Jeff Drazen](#):

“ **We're going to strip-mine a massive habitat, and once it's gone, it isn't coming back.**

But not only would deep sea mining destroy species and habitats, pollution from mine waste, light, sound and sediment plumes would have potentially [significant consequences](#) on the many other species



that use the Pacific Ocean, including as a migratory highway. Science is just starting to shed light on the interconnections between deep, mid- and surface waters through the movement of species, currents, nutrients, and carbon. Mining the seabed will potentially result in negative consequences for the rest of the ocean and the people who depend on its health. DeepGreen claim that their operations will produce **no tailings or waste** – which are a key environmental impact of mining on land. To the contrary, DeepGreen’s own **materials**<sup>1</sup> show that nodule mining will discharge wastewater laden with sediment back into the ocean after preliminary processing by a surface support vessel. This would occur for the duration of the mining operation and may contain chemicals and heavy metals. These could **contaminate marine food webs** and commercially valuable fisheries.<sup>2</sup>

## 1.2 Mining polymetallic nodules is no solution to the climate crisis

It is increasingly recognized that the transition to sustainable renewable energy will require structural adjustments away from growth in resource extraction and towards **reducing resource consumption**. Demand **management**, better terrestrial mining regulations and practices, and **recycling-based circular economies** grounded in “**cradle to cradle**” **product design** are required to create a **just energy future**. Research **indicates** that these solutions can and must play a greater role than new mining in obtaining minerals for a low-carbon transition.

Rather than contributing to a sustainable future, DSM may instead **undermine** the adjustments needed for clean energy transitions. The World

Bank’s **Climate-Smart Mining Initiative** leaves DSM out of its options for responsible sources of minerals for the climate-driven clean energy transition.<sup>3</sup>

**Research indicates** that 100% renewable energy can be achieved without deep sea mining, including for electric vehicle battery metals. Indeed, an article published by the **World Economic Forum** questions whether DSM should be viewed as a viable source of minerals for batteries due to the risks in this industry, while Amnesty International has excluded DSM in its **set of principles** for cleaner battery supply chains.

The race to net zero carbon is accelerating innovation. As noted in **Section 2.3.2**, the battery landscape is advancing at a rapid pace with new technologies already in use in electric vehicles that do not require the metals from the deep ocean that TMC proposes to mine.

In contrast to DSM, the **urban mining of existing waste streams** promises simple, low-cost, low-risk technologies, flexible scales for diverse locations, and win-win social and environmental outcomes. Described as a state-of-the-art source of metals by the **DSM Observer Magazine**, the scope of urban mining to produce metals from global stockpiles of electronic wastes, and from existing mine tailings wastes, is immense and recession proof. Such enterprises are on the cusp of commercialization and may offer investors an opportunity to support much more sustainable sources of metals.

## 1.3 DeepGreen’s Pacific mining aspirations may catalyze conflict

The social and economic gains for Pacific economies suggested by DeepGreen remain unsubstantiated. Concerned about DeepGreen’s subsidiary Tonga

Offshore Mining Limited (TOML), Tongan civil society has **requested transparency** regarding contract arrangements, environmental impacts and purported benefits. **These requests have not been met.**

The conclusion from the **national consultation** on DSM held in Tonga last November was summarized by Drew Havea of the Civil Society Forum of Tonga as:

“ **All the five island groups said no: No seabed mining for my island; no seabed mining for my region; and no seabed mining for my world. All unanimous, saying no.**

The stakes are high for Tongans and other Pacific islanders: existing ocean-based industries, cultural practices and livelihoods are at risk should the mining of nodules proceed.

Recognizing this and their longstanding role as ocean custodians, Pacific civil society, including the influential Pacific Council of Churches, demands a **global ban on deep sea mining.**

DeepGreen's contracts with Tonga, Kiribati, and Nauru are potentially a catalyst for conflict in the region. Responding to Pacific civil society's opposition to DSM, the Government of Fiji has called on other Pacific nations to **support a moratorium** and is thus far supported by the governments of **Vanuatu and Papua New Guinea.**

In **New Zealand**, fierce opposition over the past decade by traditional owners, environmental organizations, scientists, commercial and recreational fishers have seen two successive seabed mining applications fail and a third be overturned in court, and the May 2021 commencement of a petition to ban seabed mining in national waters.

#### 1.4 Corporate and governmental actors reject claims to sustainability

Concern about the impacts and the unsustainability of DSM is building worldwide.

The United Nations Environment Programme's **practical guidance for finance institutions**, released in March 2021, and the United Nations Conference on Trade And Development's **Towards a harmonized international trade classification for sustainable ocean-based economies** note deep sea mining is not a sustainable investment option. Similarly the final report of the **High Level Panel for a Sustainable Ocean Economy** notes that DSM:

“ **is conceptually difficult to align with the definition of a sustainable ocean economy.**

The **Fisheries Advisory Councils of the EU Commission** stated that DSM is:

“ **incompatible with the objectives of a sustainable Blue Economy and will need to be stopped altogether.**

The EU fisheries advisory councils primarily represent EU companies operating fishing vessels worldwide including in the eastern Pacific where DeepGreen's license areas are located.

Global companies BMW Group, Volvo Group, Google and Samsung SDI have **led a business call for a moratorium** on deep sea mining and **have committed:**

“ **... not to source minerals from the deep seabed; to exclude such minerals from our supply chains; and not to finance deep seabed mining activities.**

Major banks are also making public commitments to exclude investment in DSM including **ABN Amro**,

BBVA, Lloyds Bank Group and NatWest. Active outreach by non-government organizations (NGOs) is alerting the finance and insurance sectors to the risks of DSM.

One maritime journal suggests that DeepGreen investor Maersk Supply Services might also avert reputational damage and withdraw from the project once scientists confirm the rich marine life threatened by TMC's operations.

At an intergovernmental and governmental level, the European Parliament adopted a resolution in 2018 that calls on European states to stop sponsoring deep sea exploration in international waters and to support a moratorium on deep sea mining. Echoing similar concerns the Environmental Audit Committee of the UK Houses of Parliament concluded, in a report issued in January 2019, that deep sea mining would have:

“... catastrophic impacts on the seafloor” in the areas where mining takes place.... and that “the case for deep sea mining has not yet been made.

Heading the 2018 European Parliament Resolution, the EU's Biodiversity Strategy 2030 urges EU member states to advocate against DSM in international waters until:

“... 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.

While a moratorium is being proposed by key Pacific Island states (as noted in section 1.3), on the other side of the Pacific Ocean Chilean academics,

including a former ambassador to the ISA, have called on the Chilean government to support a DSM moratorium. Taking a stronger stance, the Northern Territory in Australia and Washington State in the US have banned seabed mining in their jurisdictions.

#### NOTES

1. “Nodules travel up a purpose-built riser system to our production vessel, where aboard, they're separated from the water and sediment, which we return below the photic zone, to a depth scientifically chosen to have minimal impact.” <https://deep.green/nodules/>. A battery in a rock: Polymetallic nodules are the cleanest path toward electric vehicles. Accessed 18 May 2021.
2. Preliminary research indicates that between 5-15% of the catch of yellowfin, skipjack and bigeye tuna – by Ecuador, USA, Mexico, Spain and Panama could be impacted by DSM waste discharged in the Clarion Clipperton Zone <https://www.sciencedirect.com/science/article/pii/S0308597X21001755>
3. An earlier report published by the World Bank urges Pacific nations to adopt a precautionary management of deep sea minerals - <http://documents1.worldbank.org/curated/en/349631503675168052/pdf/119106-WP-PUBLIC-114p-PPDSMbackgroundfinal.pdf>

# THE SOAC-DEEPCGREEN BUSINESS PROPOSITION IS SPECULATIVE AND EXPERIMENTAL

Metals sourced from deep sea mining may become redundant for EV batteries within short time-frames, with indications that the market is already favoring substitutes



DeepGreen's CEO Gerard Barron is **on record stating** that:

“ ... everyone is a sucker for the story.

The story being presented to SOAC investors is built on a chain of risks that raises serious questions.

## 2.1 DeepGreen's business case is speculative

The S-4 prospectus demonstrates a lack of information about key determinants of commercial viability regarding the company's valuation, future revenues, operating expenditures and royalties.

The business case proposed by DeepGreen hinges on the mining of deep sea polymetallic nodules, yet the following fundamental aspects are unknown:

- size and grade of mineral reserves;
- costs of mining and the potential costs of what could go wrong;
- technical capacity of untested equipment (including equipment production rates and nodule mining efficiency);
- metal recovery rates;
- the cost, efficacy, technical feasibility of metal processing;
- the demand for targeted metals in the future, which is especially important given that electric vehicle batteries appear to be shifting away from nickel and cobalt; and
- royalties and/or profit sharing payable to the International Seabed Authority which are under discussion with some nations demanding much higher royalties and others seeking profit sharing.

Independent journalistic assessments describe the business valuation as 'extremely ambitious', 'difficult to justify' and 'wild guesses'.

One **stock analysis platform** states:

“ DeepGreen's \$3 billion implied market capitalization is extremely problematic for what amounts to nothing more than a concept idea with semi altruistic ambitions ... The company expects deep ocean mining to be instantly EBITDA positive once it starts commercial production in 2024. This is extremely ambitious and leaves almost zero leeway for the operational complexity of commercializing a novel idea. ... Fundamentally, for DeepGreen to make such aggressive estimates so far into the future would mean its analysts would have had an almost god-like foresight. That the company has based its valuation on such estimates means there is almost no upside for current DeepGreen longs as anything short of perfect execution would result in a collapse in its stock price.

Crucially the SOAC Board has not obtained a:

“ ... third-party valuation or fairness opinion in connection with its determination to approve the Business Combination ... Accordingly, investors will be relying solely on the judgment of the SOAC Board in valuing DeepGreen's business and assuming the risk that the SOAC Board may not have properly valued such business. (p.26 S-4 Preliminary Prospectus).

Thus, the success of the new venture relies solely on DeepGreen's internal analysis for the valuation of its business.

Yet the S-4 Prospectus also notes that, "DeepGreen has identified a material weakness in its internal control over financial reporting" which could "affect the reliability of its consolidated financial statements

and *have other adverse consequences*". (p38 our emphasis)

This adds a further layer of uncertainty regarding due diligence. The S-4 Prospectus implies that it will only be corrected after the business combination, bringing into question the accuracy of the information shareholders will base their vote on.

A further example of the lack of rigor is the absence of feasibility studies to determine whether the polymetallic nodules can be mined economically. Instead DeepGreen describes its estimation of mineral reserves and mineral resources as "a subjective process that is partially dependent upon the judgment of the persons preparing the estimates." (p.50, S-4 Prospectus)

DeepGreen has not yet discovered mineral reserves in sufficient "quantity and quality to return a profit from production. Once mineralization is discovered, it may take a number of years from the initial exploration phases before production is possible, during which time the potential feasibility of the project may change adversely." (p.48, S-4 Prospectus)

DeepGreen provides no assurance that the indicated levels of metals can be produced (p.49, S-4 Prospectus) or that TMC "will generate any revenues or achieve profitability, or that the assumed levels of expense associated with our exploration, development, and commercialization processes will prove to be accurate." (p.53, S-4 Prospectus)

Indeed one [market commentator notes](#) that:

“ ... the technology for the commercial recovery of the nodules is completely unproven and [that] estimates of harvesting rates and unit costs of production are, at best, wild guesses, based on extremely limited data.

## 2.2 DeepGreen's technology and equipment: unproven experimental concepts

The exploration and mining of polymetallic nodules is technically difficult due to it occurring at underwater depths of 3 to 6 kilometers, at distances from shore typically over 1,000 kilometers, under extreme conditions of high pressure (300-600 bars) and low temperature (0-10o C).

Should DeepGreen manage to discover economic mineral reserves, the performance and environmental impacts of mining and processing equipment will be key to commercial viability. However, despite DeepGreen's ambition to start mining in 2024, their operating systems appear to be nothing more than preliminary concepts.

The S-4 Prospectus warns:

“ **The equipment and technology that we intend to utilize has not been fully proven in such sub-sea conditions and for this specific material and application, and failure to adapt existing equipment or to develop suitable equipment or recovery and development techniques for the prevailing material and seafloor conditions would have a material adverse effect on the business of our subsidiaries, and the results of their operations and financial condition.** (p.49)

No information on the status of the design, engineering and testing of DeepGreen's mining equipment is provided. Thus, investors could rightfully feel skeptical about the feasibility of the equipment operating under extreme conditions at depth.

In contrast, [Global Sea Mineral Resources NV](#) (GSR) of Belgium has been testing 25 tonne prototypes for several years at depth in the Clarion Clipperton Zone – the region of the Pacific Ocean in which

DeepGreen exploration licences are situated. GSR has encountered significant operational failures and adopts a slow step by step approach due to the risks and technical difficulties, which may see them not progressing to commercialization. GSR conducted an environmental impact assessment (EIA) in 2018, the requisite year before the intended mining equipment test - then its test was delayed nearly three years to 2021, at which time the collector was temporarily lost having become disconnected from the surface vessel.

DeepGreen has yet to notify any equipment test - which means it probably is at least a year away from even beginning in-situ tests. And the risers - pipes that must carry nodules and sediment some 4 kilometers to the surface - appear not to have been built, let alone tested. Yet DeepGreen claims that commercial mining - dependent on all these, and other technologies - will begin in as little as three years from now. It is not clear how that could be physically possible.

DeepGreen's metal processing system appears to exist as a flowsheet design, not yet piloted and evaluated for its feasibility to expand into a full operational system:

“ Additionally, there can be no guarantees that such plants can be developed, or if developed, that such plants will perform in an economically viable manner or provide the projected metal recovery rates at the estimated project capital and operating costs, which could impact projections for DeepGreen's future revenues, cash flows, royalties, and development and operating expenditures. (p.51, S-4 Prospectus)

### 2.3 Market unpredictability for metals produced by TMC

By focusing on electric vehicle batteries and manganese alloys, DeepGreen is taking a huge gamble on several important factors.

#### 2.3.1 DeepGreen hopes markets can absorb a glut of its unconventional manganese silicate product

Market acceptance and likelihood of necessary approvals are unknown. As stated in the Prospectus:

“ ... our financial success will depend in part on the expansion of the global manganese market to consume the additional volume of manganese that we intend to produce. ... We will be producing a novel manganese silicate product which does not have recognition in the marketplace. ... mineral processing industries may be slow to change feed stocks and suppliers, even in the face of potential improvements. Additionally, manganese silicate is not a conventional mineral product and may require additional approvals for export and import .... (p.55)

“ In addition, our proposed full scale production plans would involve placing a large percentage of global manganese production in the market, and we may be constrained in our ability to sell such large volumes, or such production may negatively impact the market price of manganese, which would, in either case, negatively impact our overall economic position. (p.54, S-4 Prospectus)

#### 2.3.2 DeepGreen counts on continued and growing demand for cobalt, nickel, manganese and copper for batteries and electronics

As the S-4 Prospectus notes “Technology changes rapidly in the industries and end markets that utilize our materials. If these industries introduce new technologies or products that no longer require the minerals that we intend to collect and process, or if suitable substitutes become available, it could result in a decline in demand for our materials.” (p.58)

Metals sourced from DSM may become redundant within short time-frames, with indications that the market is already favoring substitutes. **Hydrogen cell** and lithium iron phosphate (LFP) batteries are likely to make nickel, manganese and cobalt increasingly redundant for batteries. LFP batteries are on the market now in **Tesla EVs**. **Volkswagen** is planning to introduce LFP batteries into its electric vehicle (EV) models, and according to [mining.com](https://www.mining.com):

“ **China’s BYD confirmed that it is going all-in on LFP (lithium-iron-phosphate) batteries, scrapping NCM (nickel, cobalt, manganese) technology from its model line-up entirely. BYD ... is the second-largest electric vehicle brand by volume behind Tesla and also supplies other carmakers with its battery technology.**

The **Rocky Mountain Institute** predicts that between 2025 and 2030 technologies other than lithium-ion will make significant commercial breakthroughs, including solid state, flow and high temperature batteries which will change, and likely reduce, the need for key metals such as nickel and cobalt.

It appears that DeepGreen may have been slow to anticipate these technological changes, and now may be facing a rapidly closing window of opportunity to supply markets before cobalt and nickel become redundant for EV batteries. This may explain the company’s aggressive timeframe, which creates its own set of risks as described in Section 4, and also raises questions about TMC’s viability.

### 2.3.3 DeepGreen hopes for market acceptance of metals sourced from the deep seabed

As described in Section 1.4, global brands including BMW, Volvo, Google and Samsung have **committed**;

“ **... not to source minerals from the deep seabed; to exclude such minerals from our supply chains; and not to finance deep seabed mining activities.**

With the encouragement of NGOs, such as WWF and Greenpeace, it is expected that more major corporations, including financiers, will join this call.

Referring to this, the S-4 Prospectus acknowledges that DeepGreen depends on the uptake of DSM metals by the EV and battery industry:

“ **... Some market proponents have recently expressed opposition to acquiring deep sea derived metals, and if this position gains broad traction in the marketplace for EV and Battery metals, it could have a material impact on our business and operations.** (p.52)

### 2.3.4 Assumptions regarding the demand for electric vehicles

The S-4 Prospectus flags that “DeepGreen’s business is highly dependent upon the demand for electric vehicles, which may not develop as expected.” (p.38) **DeepGreen’s estimates** on the number of EVs **appear optimistic** in terms of the rate of switching from internal combustion engine vehicles and the demand for individually owned EVs. Circular economy trends indicate a likely shift towards **greater shared ownership** of vehicles, redesign of cities, and **increased use of public transport**, all of which may be anticipated to reduce the size of national vehicle fleets.



3

# LIABILITIES DUE TO ENVIRONMENTAL DAMAGE ARE INSUFFICIENTLY DISCLOSED



### 3.1 Failure to describe the scope and scale of predicted environmental impacts and associated liabilities

The S-4 Prospectus describes the likely costs of environmental regulations and processes, and the risk of “significant disruption to DeepGreen’s business” as a result of litigation and opposition from NGOs due to environmental concerns (p.38).

It acknowledges that pollution is possible at all stages of the project i.e., during exploration, development, production and processing (p.37). As a result, compensation may be required for loss or damage and civil or criminal penalties may be imposed for violations of applicable laws and regulations (pp. 37-38, 47-48, 56).

However, the Prospectus does not appear to address the environmental impacts predicted by a growing body of scientific literature on DSM. By glossing over this critical area of risk, the Prospectus may greatly understate the scope and magnitude of environmental liabilities investors could face.

Under SEC guidance, issuers must identify known trends, events, demands and uncertainties, including environmental matters, that are reasonably likely to have a material effect on financial condition or operating performance. The well-documented environmental risks cited in the scientific literature on DSM are reasonably likely to have a material impact on TMC’s financial condition and operating performance, and therefore the Prospectus should have included risk factors and other relevant disclosure addressing these material risks.

As described in Section 1.1 of this briefing paper, the mining of polymetallic nodules is predicted to affect deep sea and mid-water ecosystems; a broad

range of species, including migratory, deep diving species and high value fisheries. If DSM disturbs carbon cycling and storage it also has the potential to exacerbate climate change with unknown consequences. A table that lists many of the material risks associated with likely environmental impacts can be [accessed here](#).

The footprint of each nodule mining operation is likely to be vast - the size of entire countries. To be economically viable, each individual operation is expected to mine approximately 400 square kilometers of the seabed each year for the 30 year period of the mining licenses the ISA will issue. In addition, scientists estimate that [plumes generated by mining](#) could be dispersed across an area of seafloor three times that size. The waste that will be discharged into the ocean from the collector ships would extend the footprint even further, potentially [impacting marine life](#) inhabiting tens of thousands (or more) of cubic kilometers of midwater ocean.

The potential cumulative impacts of nodule mining also require careful consideration. Cumulative impacts occur when the effects of several separate activities build on each other and create a larger impact than any of them would alone. It is possible that various sources of impact associated with DSM could be cumulative. For example:

“ [the noise and sediment plumes created by mining might result in avoidance by commercial species, changing distributions or altering migration corridors.](#)”

Furthermore, it is also likely the impacts of nodule mining would interact with other environmental stressors. For example, ocean acidification is a significant issue for some deep sea species and could magnify the impacts of sedimentation on deep

sea animals by reducing their ability to recover from smothering caused by plumes of sediment.

The S-4 Prospectus similarly fails to alert investors to the range of environmental impacts that could arise from subsequent processing.

Claims for loss and damage due to TMC's operations could reasonably be expected to encompass economic impacts on Pacific island nations, on Pacific islander communities, commercial fisheries, and marine-based tourism. Health impacts may be suffered by consumers of mine waste-contaminated seafood, due to heavy metals released from the mining operations bioaccumulating through the food chain, as well as from the pollution generated by processing plants. These impacts could lead to additional liabilities.

Investors would be justified in questioning why a business purporting to be sustainable would not identify the broad range of environmental impacts predicted to be associated with its venture and indicate how it intends to prevent these. Indeed, DeepGreen forewarns investors of the possibility of not complying with environmental regulations or that compliance could limit or prevent operations (p.47, S-4 Prospectus).

### **3.2 Failure to disclose risk of operational and infrastructure related hazards and associated liabilities**

There are risks inherent in the operation of the mining equipment and associated support and transport vessels. In addition to the impacts noted (Sections 1.1 & 3.1), there is also the potential for accidents and equipment malfunctions that could result in spillage of ore slurry, fuel or other hazardous substances on the sea floor, in the

water column or at the water surface. Currents and upwelling may disperse pollutants over significant distances with potential liabilities as outlined in Section 3.1.

We believe that the S-4 Prospectus fails to adequately outline each of these risks and the scope of associated liabilities, erroneously describing contamination and leakage as "unexpected environmental conditions." (p.52), when instead they are known operational risks.



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# **RISKS RELATING TO GOVERNANCE OF DEEP SEA MINING**

#### 4.1 Political risk in regard to sponsoring states and effective control of subsidiaries

As explained in the Prospectus (p.46), the exploration contracts held by DeepGreen's subsidiaries have been granted by the **International Seabed Authority (ISA)** via the sponsorship of the host nations, Tonga and Nauru, which then need to have effective control over the companies TOML and NORI respectively. This arrangement carries risks related to the capacity of under-resourced host states to maintain effective supervision and regulation of a new industrial activity on the ocean floor. It also leaves the mining operations vulnerable to changes in the political context that may see government partners seeking to renegotiate the terms of the contracts and/or respond to civil society concerns about deep sea mining.

The S-4 Prospectus notes:

“ If such arrangement is challenged, or sponsorship is terminated, DeepGreen may have to restructure the ownership or operations of such subsidiary to ensure continued state sponsorship. Failure to maintain sponsorship, or secure new state sponsorship, will have a material impact on such subsidiary and on our overall business and operations. (p.46)

Indeed, such an event could result in one or more DeepGreen subsidiaries losing their contracts from the ISA to mine.

In fact, according to the exploration contracts held by the subsidiaries, if effective control changes, the contracts will be terminated if the contractor (i.e. DeepGreen) does not obtain another sponsor meeting the requirements and within the timeframe **set out in the regulations**.

What constitutes “effective control” is yet to be defined, but persuasive arguments are made that

effective control requires **economic control**, which **clearly is not found** in Tonga or Nauru.

These legal concerns about effective control are highlighted in the S-4 Prospectus:

“ there is little jurisprudence or interpretative guidance regarding the application of the sponsorship regulations that are applicable to our business. For example, with respect to the question over the regulation of which State can impact the activities of any contractor (such as NORI or TOML), we have taken the view that incorporation, registration and the grant of nationality are critical factors, amongst others, notwithstanding the beneficial ownership of a subsidiary by its parent (“beneficial ownership”). While this position has not been challenged by our sponsoring States or the ISA, certain organizations that oppose the deep sea polymetallic exploration and collecting industry have advocated for the use of a beneficial ownership test for state sponsorship, and there are no guarantees that our interpretation will be universally accepted in the future. (p.46)

We believe that this downplays what could be an existential threat to the venture.

#### 4.2 Finalization of DSM regulations, terms and conditions unlikely to meet 2024 production timeline

In order to mine the seabed in the international waters of the Clarion Clipperton Zone, TMC will require the International Seabed Authority (ISA) to finalize a set of regulations, rules and procedures for exploitation.

This will require ongoing negotiations between the ISA's 167 state members plus the European Union. Given competing priorities and the complexity of

the regulations, a swift agreement is unlikely. This is particularly true given the long delay necessitated by the Covid-19 pandemic.

The S-4 Prospectus states that:

“ DeepGreen expects that the final regulations may be approved within the next two years but there can be no assurance that such regulations will be approved then, or at all. Commercial nodule collection can only begin once an application for the ISA Exploitation Contract has been granted based on such final adopted exploitation regulations. (p.127)

DeepGreen has set 2024 as the year for its commercial start-up. This timeframe appears unrealistic in terms of the significant technological and operational gaps described in Section 2 of this briefing; the time needed to finalize the ISA mining regulations; the scientific research that still needs to be conducted to inform these regulations, and the environmental and mining approvals processes. Following the adoption of the regulations, the contractors will have to conduct environmental impact assessments, formulate environmental impact statements, and produce environmental management and monitoring plans. These must be submitted for approval to the ISA Legal and Technical Commission and the ISA Council before application can be made for exploitation permits. Additional impediments to the finalization of mining regulations and the granting of exploitation permits can be anticipated from social opposition to the project. One [maritime journal](#) has asked:

“ Is the public really going to sit by and let a UN body hand over millions of hectares of seabed to private companies to profit from whilst scientists don't understand the ecosystem

properly and many rare and unknown species could be put at risk? Good luck with that sell, Mr. Barron. I foresee significantly more studies will be needed and test operations before widescale ocean bed nodule harvesting is allowed.<sup>1</sup>

“ There can be no assurance that all necessary permits, contracts and licenses will be obtained that may be required to carry out exploration, development, collecting and processing. (S-4 Prospectus p.45)

In addition to these unresolved issues, the financial terms and conditions of seabed mining have not been agreed to. Due to their complexity, key issues such as royalties, liability, funds and equitable benefit sharing have been subject to years of discussions and negotiations.

### 4.3 Negative consequences of triggering the two-year rule

DeepGreen has **threatened to trigger** an ISA rule that would allow mining to start in two years regardless of whether the regulations are finalized. This rule is referenced in the S-4 Prospectus:

“ ... the ISA Council must provisionally approve a plan of work within two years of a formal request being made by any State whose national contractor intends to apply for approval of a plan of work for collection. (p.127)

This action could invite negative diplomatic repercussions and negative publicity for the sponsoring state and TMC. The seeming haste could be characterized as a lack of respect for international processes of negotiation and the concerns expressed by society about DSM.

Furthermore, *according to one legal scholar*, triggering the two-year rule may well fail as the sponsoring state would require broad support from the 36-member ISA Council:

“ It could also possibly backfire and result in a situation that disadvantages the applicant hoping to take advantage of the two-year trigger, such as the imposition of stricter conditions (including higher financial guarantees), the issuance of a provisional (and conditional) approval that could be reversed or significantly altered subsequently, or outrightly deciding to disapprove the application. The regulatory uncertainties ... are certainly not favorable for investors looking to back prospective applicants for exploitation contracts.

Thus, if a contract is granted to TMC subsidiaries under these circumstances, the provisional nature of the approval and the provisional nature of the regulations may introduce a degree of insecurity on returns on investment in the mining activity.

#### NOTES

1. Of course, minerals are not “harvested”: they are not crops, and are not renewable: minerals are mined, whether on land or in the ocean.

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# RISKS RELATING TO INTERNAL GOVERNANCE





### 5.1 DeepGreen's connection with Nautilus Minerals, which filed bankruptcy

The S-4 Prospectus notes that proposed TMC CEO Gerard Barron "has also been a first money investor in industry-leading companies including Nautilus Minerals" (p.179) and the proposed TMC Chief Development Officer "Mr. O'Sullivan began serving as Chief Operating Officer of Nautilus Minerals, a position he held until December 2012." (p.179).

The Prospectus fails to disclose that **Nautilus Minerals declared bankruptcy** because it was unable to raise funds and only recently reorganized with various asset sales. **This may constitute a material omission that investors should be aware of.**

Strong local and international civil society advocacy (including a legal case still pending in the Papua New Guinean courts), played a role in the lack of confidence displayed by financial institutions and investors. The **divestment by Anglo American** was a blow to Nautilus' credibility and finances.

**Barron exited Nautilus** early, but the **bankruptcy left numerous shareholders** who invested in good faith out of pocket, and the purpose-built mining machines for Nautilus are now stranded assets. The project left the **PNG government with a debt of AUD 157 million**, roughly equivalent to one third of the country's health budget in 2018. The PNG Prime Minister has described the project as a **"total failure"**.

The implausible timeframe to commercial operation proposed by DeepGreen raises concerns that TMC could suffer a similar fate to Nautilus. Here the date for mining their Solwara 1 prospect was constantly postponed until it was no longer possible to raise the finance it required. This exemplifies the difficulties and perhaps impossibility of moving DSM from a concept and a public relations exercise to a reality.

As observed by the publisher of the **Mercenary Geologist** in relation to DSM, "I think it's a great idea. I just don't think it's practical. There are too many impediments to getting it done."

### 5.2 Governance concerns within DeepGreen and SOAC

Although SOAC's board has experience of finance and launching SPACs, it appears that they lack expertise relevant to managing a large mining company aiming to rapidly design and scale up an unprecedented form of extraction.

The S-4 Prospectus emphasizes the level of ambition that will be required for DeepGreen to make the leap from a start-up company when it notes that:

“ ... to date, DeepGreen has not generated any revenue. DeepGreen does not expect to generate revenue until at least 2024 and only if NORI and/or TOML receive an exploitation contract from the ISA and DeepGreen is able to successfully collect polymetallic nodules and process the nodules into saleable products on a commercial scale. Any revenue from initial production is difficult to predict. (p.170)

DeepGreen has also disclosed a material weakness in its internal control over financial reporting which could:

“ affect the reliability of its consolidated financial statements and have other adverse consequences. (S-4 Prospectus, p.38) Further,

“ if DeepGreen's independent registered public accounting firm is unable to express an unqualified opinion as to the effectiveness of the internal control over financial reporting,

investors may lose confidence in the accuracy and completeness of DeepGreen's financial reports, the market price of DeepGreen's securities could be adversely affected and DeepGreen could become subject to litigation or investigations by NASDAQ, the SEC, or other regulatory authorities, which could require additional financial and management resources. (S-4 Prospectus, p.60)

### 5.3 Is TMC insurable?

The experimental nature of DSM, the extreme operating conditions at depth in international waters, and the large negative environmental footprint predicted by scientists, means that insurance may be difficult to obtain at an acceptable cost.

The S-4 Prospectus acknowledges that:

“ In the course of the exploration, development, and production of our mineral resource properties, we may be subject to a variety of risks that could result in (i) damage to, or destruction of, transportation vessels and processing facilities, (ii) personal injury or death, (iii) environmental damage, (iv) delays in collecting, transporting or processing, (v) monetary losses, (vi) natural disasters, (vii) environmental matters, and (viii) legal liability, among others. It is not always possible to fully insure against such risks, and we may determine not to insure against all such risks as a result of high premiums or for other reasons. Should such liabilities arise, they could reduce or eliminate any future profitability and result in an increase in cost and a decline in the value of our

securities. We cannot be certain that insurance for some or all of these risks will be available on acceptable terms or conditions, if at all, and in some cases, coverage may not be acceptable or may be considered too expensive relative to the perceived risk. (p.56)

With concerns over DSM mounting, insurers will be presented with arguments as to the high level of risk and the lack of social licence for DSM, as currently happens with insuring fossil fuels, such as coal.

### 5.4 Risk of legal proceedings

Due to the highly controversial nature of deep sea mining, the liabilities highlighted above, the potential for TMC to not comply with regulations as forecasted in the prospectus, and the material weakness identified in DeepGreen's internal control over financial reporting (discussed in Section 5.2), litigation could be expected to arise.

This risk is acknowledged in the S-4 Prospectus as:

“ Due to the nature of our business, we may be subject to regulatory investigations, claims, lawsuits and other proceedings in the ordinary course of our business. The results of these legal proceedings cannot be predicted with certainty due to the uncertainty inherent in litigation, including the effects of discovery of new evidence or advancement of new legal theories, the difficulty of predicting decisions of judges and juries and the possibility that decisions may be reversed on appeal. We can provide no assurances that these matters will not have a material adverse effect on our business. (p.58)

#### 5.4 Specific risks associated with SOAC being a SPAC

A final set of risks are clustered around the nature of the proposed merger with a Special Purpose Acquisition Company (SPAC). The two entities proposing the business combination, the SOAC board and the DeepGreen board, stand to benefit from the deal and their interests may be different to public shareholders.

The S-4 Prospectus notes the strong motivation for the SOAC board and founders to proceed with the arrangement:

“ When you consider the recommendation of the SOAC Board in favor of approval of the Business Combination Proposal, you should keep in mind that the initial shareholders, including SOAC’s directors and executive officers, have interests in such proposal that are different from, or in addition to, those of SOAC shareholders and warrant holders generally.” (p.217), noting “that Sponsor and SOAC’s officers and directors will lose their entire investment in SOAC and will not be reimbursed for any out-of-pocket expenses if an initial business combination is not consummated by November 8, 2021. (p.218)

DeepGreen’s major shareholders (made up of the executive officers and key investors) may benefit more from the business combination than the SOAC public investors, at least in the short term. It is estimated that the public investors in SOAC will hold a maximum of 10% of TMC’s common shares following the combination, while DeepGreen shareholders will collectively own approximately 76.8% of those outstanding shares (preamble, S-4 Prospectus).

Due to the specific rules governing SPACs, the Prospectus can contain non-binding forecasts not permitted for companies listing via an initial public offering (IPO). The [Financial Times](#) has noted:


“ In the US, unlike with a traditional IPO, SPACs are allowed to make forecasts about how they reckon their businesses will develop in the future ... Arguably, for a business with zero revenue, the ability to make these projections is a God-send. Forecast in your investor deck that sales in 2025 will make the current valuation reasonable and, suddenly, a multi-billion dollar price tag for a nascent company doesn’t seem quite so mad.

[Bloomberg](#) notes that the SEC is reviewing the situation:

“ A senior SEC official warned SPACs not to assume they have blanket freedom to publish potentially misleading statements about their future financial performance.

[Another commentator](#) adds that:

“ DeepGreen perhaps embodies the worst of this excess with business operations precipitated on a concept and commercial operations not expected to start until 2024 ... The company is going public at a very early stage as it is currently still conducting studies to baseline the ocean environment to assess the impact of collecting these polymetallic nodules.



We believe that the business combination proposed by SOAC and DeepGreen to form TMC offers investors a high-risk mining venture which is predicted by science to destroy deep sea ecosystems and to harm ocean systems more widely. Its social and economic liabilities are potentially far reaching. The technical and regulatory hurdles yet to be overcome mean that financial returns, if any, would not be realized for many years.

The demand for metals is shifting: rapidly evolving battery technology is moving away from nickel and cobalt. Recent advances demonstrate that materials can be substituted more rapidly than the timeframe for the development of even a new terrestrial mine, let alone the timeframe of realizing an experimental industry with unproven technology and processes. Investors in TMC may well be left with stockpiles of redundant metals and the world left with a legacy of environmental damage – the full consequences of which science is only beginning to understand.

**DSMC**

Deep Sea Mining Campaign