

Race to the Bottom

Deep sea mining provides minimal
financial benefits for countries



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Executive summary

Deep sea mining has gained a lot of attention in recent years, with the promise of offering a more environmentally friendly alternative to mining on land. The International Seabed Authority (ISA) is currently debating whether to authorise deep sea mining in international waters. While previous research by Planet Tracker and others has highlighted that deep sea mining could be worse for the environment¹ and the climate² than mining on land, there is an urgent need to assess whether the financial benefits of deep sea mining could outweigh these costs, particularly for the countries that are members of the ISA.

The ISA is responsible for governing deep sea mining in international waters and is supposed to develop rules for the “equitable sharing of financial and other economic benefits” arising from mining activities. However, there are significant questions about the value of these financial benefits and whether they will make a meaningful contribution to ISA Member States, and particularly those that sponsor deep sea mining companies. This report investigates the financial benefits, if any, that taxes on deep sea mining could bring to nation States.

Countries would receive minimal financial benefits from deep sea mining

Deep sea mining taxes would probably provide insignificant financial benefits to countries.^{3 4} This analysis estimates that the current 169 ISA Member States could receive on average US \$42,000 - \$7.35 million each annually from deep sea mining corporate income tax and royalties, a trivial amount in comparison to the size of all but a few national economies.

The race to the bottom for corporate income tax

According to the UN Convention on the Law of the Sea (UNCLOS),⁵ companies can only submit an application for deep sea mining in international waters if they are sponsored by a State. In theory, this means deep sea mining companies could face corporate income tax through these sponsorship agreements.

This report reveals that countries could theoretically earn up to US \$6.25 million per year each in corporate income tax (at a 25% rate), an insignificant contribution to government revenues. However, there is a strong chance that sponsoring States will not levy any corporate income tax on deep sea mining companies. Sponsorship agreements already exist that include no corporate income tax altogether.¹ Deep sea mining companies are also unlikely to generate profits, resulting in little to no tax revenues.⁶ This situation highlights that sponsoring States have very little bargaining power when negotiating taxes because they do not own the deep sea mineral resources and contractors can easily seek sponsorship from any ISA Member State.⁷

Countries could receive little to no money from royalties

Currently any company engaged in deep sea mining in international waters would be required to make payments to the ISA, which must share these benefits with Member States. The ISA is supposed to develop rules for the “equitable sharing of financial and other economic benefits” from deep sea mining in international waters.³

This analysis estimates that each ISA Member State on average could receive US \$42,000 - \$1.1 million per year from deep sea mining royalties, again an insignificant contribution to government coffers. While the ISA could receive on average up to US \$270 million per year from royalties, there are on average US \$80 million of deductions from these funds that could be required each year.² This includes covering the ISA's administrative costs (US \$13 million per year) and payments to an economic assistance fund for developing states negatively impacted by deep sea mining (25% of the funds value). However, the ISA is entitled to make unlimited further deductions before royalties are distributed which could significantly reduce the amount of money available for countries.

In summary, deep sea mining would generate little to no royalties and taxes for countries, on top of causing large-scale environmental damage.

Call to action

Financial institutions should therefore support a [*moratorium on deep sea mining*](#) and prioritise efforts to improve the social, economic, and environmental governance of land-based mining.

Introduction

Deep sea mining has gained a lot of attention in recent years, with the promise of offering a more environmentally friendly alternative to mining on land. While research from Planet Tracker and others has found that deep sea mining could have significant negative impacts on deep sea ecosystems⁸ which are technically and financially impossible to restore,⁹ as well as potentially being more carbon intensive than mining on land,^{10 11} the International Seabed Authority (ISA) is currently debating whether to authorise mining in international waters.

There are now increasing calls to understand whether the costs of deep sea mining could be outweighed by financial benefits. The ISA is supposed to ensure that deep sea mining in international waters is carried out for the benefit of the of “humankind as a whole”, including developing rules for the “equitable sharing of financial and other economic benefits” from mining, and with particular consideration for the interests and needs of developing States.⁴

However, research to date has questioned whether deep sea mining will deliver financial benefits both to investors in the form of profits and dividends¹² and to countries in the form of tax and royalties.¹³ At the same time, countries may also bear significant financial risk for the deep sea mining companies they sponsor, as seen when the deep sea mining company Nautilus Minerals collapsed in 2019, leaving the sponsoring state Papua New Guinea with a US \$175 million bill.¹⁴

It is also increasingly being argued that deep sea mining is not needed to meet the critical mineral demands of the low-carbon energy transition.¹⁵ One study has estimated that circular economy strategies and new technologies could reduce cumulative mineral demand by 58% from 2022 – 2050 compared to a business as usual scenario.¹⁶ This can already be seen in terms of evolving technologies. For example, while polymetallic nodules have been promoted as a source of minerals for car batteries on the sea floor, around 40% of passenger electric vehicles sold globally in 2023 used lithium-iron-phosphate batteries which do not require nickel or cobalt.¹⁷

Opposition to deep sea mining has been growing, likely due to these significant economic and environmental risks. There are now companies, investors, national governments, scientists and civil society organizations calling for a moratorium on deep sea mining.

Purpose, methodology and scope of this report

This report aims to analyse the economic benefits and risks countries may be exposed to from deep sea mining and aims to provide a practical working resource for financial institutions to understand and assess their exposure to the key financial risks associated with deep sea mining from a sovereign perspective. The analysis and recommendations are intended for financial institutions with exposure to deep sea mining activities and countries that may be negatively impacted by deep sea mining, as well as those seeking to support the transition towards a more sustainable economy.

Countries would receive insignificant taxes from deep sea mining

There has been a lot of debate about the financial benefits of deep sea mining in recent years with several studies showing that countries are likely to receive economically insignificant benefits from both corporate income tax and royalties.^{1 2} This report estimates that the current 169 ISA Member States could receive on average US \$42,000 - \$7.35 million each annually from both deep sea mining corporate income tax and royalties, which some countries have argued is not fair compensation¹⁸ and which are certainly insignificant amounts compared to the size of most national economies.

Table 1 below provides a breakdown of the maximum and minimum range of estimated financial benefits from corporate income tax to sponsoring States and royalties. The maximum financial benefits total is mainly comprised of corporate income tax to sponsoring States. However, there is a strong chance that sponsoring States will not levy any corporate income tax against deep sea mining companies, as explored in the next section.

*Table 1: Summary of the range of financial benefits from deep sea mining to ISA Member States.
Source: Planet Tracker, 2024.*

Direct financial benefits from deep sea mining for ISA Member States	Minimum annual amount per ISA Member state (USD) (net present value)	Maximum annual amount per ISA Member state (USD) (net present value)
Corporate income tax to sponsoring States	\$0	\$6,250,000
Royalties to ISA Member states (after deductions)	\$42,000	\$1,100,000
Total	\$42,000	\$7,350,000

Therefore, the actual amount that countries could receive in terms of these direct financial benefits is likely to be significantly lower than the upper end of the estimated range above. In addition, countries face a significant legal risk if deep sea mining investments go wrong. For example, Papua New Guinea lost US \$175 million when the deep-sea mining company Nautilus Minerals collapsed in 2019,⁷ equivalent to 3% of government expenditure that year.¹⁹

This report will explore what is currently known about royalties and corporate income tax for deep sea mining and the uncertainties in estimating the funds States are likely to receive.

Sponsoring state tax: a race to the bottom

There is significant debate around the potential revenues that might arise from corporate income tax paid by deep sea mining companies to sponsoring States. If (and this is a big 'if') deep sea mining companies were to pay tax to their sponsoring States, this is often assumed to be at a 25% rate.²⁰ This rate is supposedly based on an average of the 'average effective tax rate' for mining companies across the world,⁵ and is used in a study the Massachusetts Institute of Technology (MIT) conducted on behalf of the ISA to analyse different deep sea mining payment regime options.²¹ However, studies have estimates that the average effective tax rate for terrestrial mining globally is typically 46% - 49%,²² higher than the corporate income tax rate (25%) plus the royalties rate (maximum 6%²¹) proposed by the ISA. Critics have also pointed out that this should not be seen as an upper limit for deep sea mining, where the tax rate should be higher to compensate the whole of human kind (rather than the citizens of one county) for the loss of their non-renewable resources and to compensate the negative impacts on terrestrial miners, including those with higher tax rates for mining.¹⁵

According to UN Convention on the Law of the Sea (UNCLOS) (Article 153(2)(b)), non-state actors can only submit an application for deep sea mining in international waters if they are sponsored by a state and there are currently 21 sponsoring states with exploration contracts, six of which jointly sponsor one contract. The African Group (one of the ISA's regional groups) has estimated that a 25% corporate income tax rate would bring in a maximum of US \$3 billion over a 30 year contracting period,⁶ or US \$6.25 million annually on average per contract (or per country for the solo sponsoring states).²³

However, the African Group¹³ and others¹⁵ have stressed that this assumed tax rate is significantly overestimated, and that the tax rate is likely to be much lower (the African Group estimate 1%) or non-existent, despite terrestrial mining tax rates being on average significantly higher than 25%. Disturbingly, there are already sponsorship agreements that include no corporate income tax altogether, for example between Nauru and The Metals Company.¹ This could apply to other taxes on deep sea mining companies which sponsoring states could reduce or remove, leading to a race to the bottom with deep sea mining contractors shopping around for low or no tax sponsoring states.

This demonstrates how little bargaining power sponsoring States have in negotiating sponsoring fees or taxes, because they do not own the deep sea mineral resources and contractors can seek sponsorship from any ISA Member State.⁵ In comparison, terrestrial mining companies are confined to the country where the metals and minerals are located and the accompanying tax regime. On top of this, if sponsoring States and deep sea mining companies do not disclose sponsorship agreements (which is currently the norm), it makes it impossible to know what level of corporate income tax is being charged, or whether it is being charged at all, further eroding Member State's bargaining power.

It is also worth noting that a significant share of the economic benefits from terrestrial mining are from taxes not factored into the average effective tax rate, including payroll taxes and indirect taxes from economic activities around a mine.¹⁵ Deep sea mining is not projected to provide

similar benefits. For example, very few additional mainly high-skilled jobs (only around 100 jobs per operation) are likely to be created by deep sea mining, in comparison to over 330,000 people directly employed in Chile’s mining sector in 2023 (the largest producer of copper globally).²⁴

Lastly, for corporate income tax to flow into government coffers, corporate profits need to be generated. Previous Planet Tracker analysis found that this is unlikely to be the case for deep sea mining companies.⁴ Even if these companies did become profitable, they could carry forward the accumulated years of losses for tax purposes, ensuring little to no corporate tax is paid for a long period of time. For instance, as of 30th June 2024, The Metals Company has generated losses that led to an equity deficit of US \$594 million.²⁵



Countries would receive insignificant royalties from deep sea mining

The legal basis for deep sea mining royalties

Currently, countries that are Members of the ISA could receive financial benefits from deep sea mining royalty payments in international waters if mining were to go ahead. The ISA has the right to design and administer the financial terms of contracts with sponsored deep sea mining companies,¹⁵ and any company engaged in deep sea mining in international waters would be required to make payments to the ISA, which must share these benefits with Member States. It is important to note that while there could be other potential economic benefits from deep sea mining, including consumers benefitting from lower metal prices, there is no way for the ISA to capture and redistribute these.²

UNCLOS provides some high-level guidance on several factors the ISA must take into consideration when developing a payment regime for deep sea mining, which will be explored in the following subsections. But it is still unclear exactly how much money, if any, could be available to countries via the ISA, and how these funds would be distributed.

How much money would the ISA receive in royalties

There are a significant range of estimates when it comes to the amount of funds that the ISA would be able to collect in royalties from deep sea mining, largely due to uncertainties in how profitable deep sea mining would be. This paper examines two estimates: at the upper end of the range is Wilde et al.'s estimates that the ISA could earn US \$7.69 billiona over a 29 year life of mine period,² based on a replication of a model developed by MIT²¹ (the same model which estimated corporate income tax above). This translates to on average up to US \$270 million ISA income per year from royalties.

a In 2018 US.

Wilde et al.'s model assumes two polymetallic nodule mines will be in operation, with the first mine starting commercial production in 2028, achieving full production of 3 million dry tones of nodules in 2030 paying a 25% royalty to 2032 and then a 6% royalty till 2054, as illustrated in Table 2 below. The second mine starts commercial production in 2032, reaches the full production in 2033, paying a 2% royalty to the end of 2035 and a 6% royalty till 2057. This equates to US \$37 million - \$321 million per year in revenue to the ISA.

Table 2: Estimated gross revenue for the ISA from two nodule mines, based on a replication of the MIT model. Figures in 2018 US \$ million per year. Source. Wilde et al., 2023.

	Medium-term (2018-2030):	Long-term (2031-2035):	Very long-term (2036-2056):
	1 mine, ramping up to full production and paying a 2% royalty	2 mines, first mine at full production paying a 2% royalty for the first 2 years and then a 6% royalty; second mine ramping up to full production for the first 3 years and paying a 2% royalty for all years	2 mines both paying a 6% royalty and operating at full production until the first mine ceases production
ISA Average Revenues	US \$37 million/year	US \$168 million/year \$0	US \$321 million/year \$6,250,000

On the other hand, the Deep Sea Conservation Coalition (DSCC) estimates royalties of between US \$285 – 660 million in net present value over a 30 years for a single mine, or US \$60,000 - \$130,000 per year to each Member State.¹ These figures were also derived from scenarios the MIT study for the ISA, and represent a much lower estimate than Wilde et al., even when scaled up to two mines.

In addition, the African Group, one of the ISA's regional groups, has estimated that the ISA's revenues from royalties could give each Member State (excluding the European Union) US \$2.93 million over a 30 year period,⁵ or US \$97,800 per year in net present value, excluding any deductions the ISA might make.⁶ This figure is also much lower than Wilde et al.'s estimate, and doesn't provide the range of the DSCC's estimate which has been used for analysis in this report.

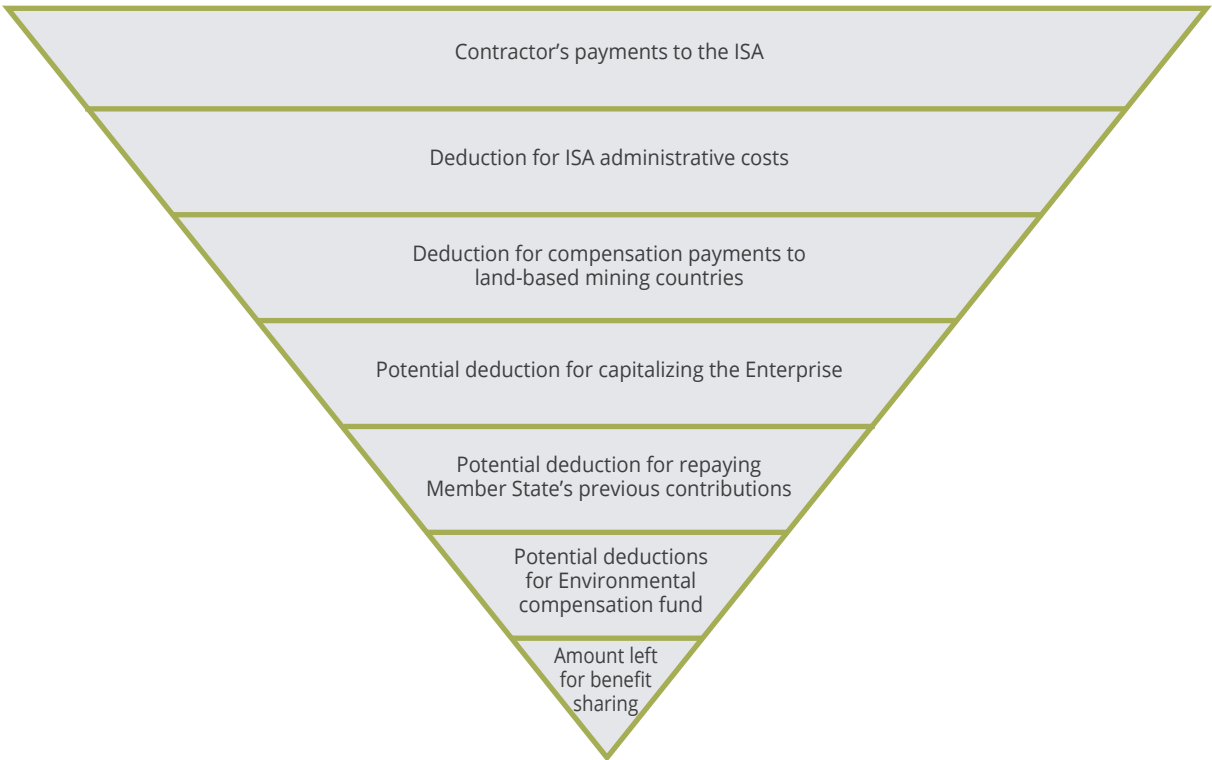
It is important to note that without an accurate estimate of the revenues to the ISA from royalties, ISA Member States and other stakeholders will not be able to assess whether deep sea mining in the Clarion-Clipperton Zone will benefit them and "humankind as a whole" (as required by UNCLOS). Another key point is that there are significant deductions that would be made from the above estimated ISA funds before they could be distributed to countries. The following sections will explore the potential deductions, before finally calculating the average annual payment per each ISA Member State.

What deductions could be made from ISA royalty payments?

There are two deductions that UNCLOS outlines from the ISA royalty payments fund: 1) the ISA's administrative costs and 2) payments to the economic assistance fund. There are significant uncertainties in estimating both of these deductions, but Wilde et al. estimate these costs could be US \$22 million - \$93 million per year, or on average US \$80 million each year over 29 years.²

It's also important to highlight that the ISA can make unlimited further deductions before royalties are distributed as highlighted in Figure 1 below. This could include funds to capitalize the ISA's dormant mining entity² (the Enterprise), to repay Member States' past contributions to the ISA²⁶ and to finance an Environmental Compensation Fund to mitigate and manage damage caused to deep sea ecosystems.²⁷ These would further reduce the amount of money available to for distribution to Member States, but these additional deductions remain highly uncertain so they have not been included in the estimates calculated in this report. However, it is interesting to note that one estimate suggests the costs for capitalising the ISA's mining entity could reach US \$110 million,² while Planet Tracker's previous research has highlighted the cost of deep sea mining restoration could be US \$5.3 – \$5.7 million per km² which is more than the revenue a company would make from mining.⁹

Figure 1: ISA income and deductions used to calculate the amount available to distribute to Member States. Source: Wilde et al. 2023.



Significant deductions for the ISA's administrative costs

Focusing on the two established deductions: the ISA's administrative costs are currently covered by contributions from ISA Member States, and these are likely to be fully or at least partially financed by deep sea mining contractor's royalty payments.² The ISA highlighted a US \$13 million (in 2018 dollars) gap between the ISA's budgetary requirements and the fees received from deep sea mining exploration contracts, and Wilde et al. have suggested this is a conservative estimate of the cost that will need to be covered by contractor's royalty payments.² The actual administrative costs of the ISA would be likely to increase considerably if deep sea mining were to take place, with the ISA evolving from a meeting convenor, to an environmental and resource regulator.² This will further reduce the funding available for benefit sharing among Member States.

Deductions for the economic assistance fund would not provide adequate compensation for countries

UNCLOS also stipulates that the ISA is responsible for compensating developing countries for revenue losses caused by deep sea mining as well as any other negative economic impacts caused to land-based mining by deep sea mining. As such, the economic assistance fund aims to provide assistance to developing countries which "suffer serious adverse effects on their export earnings or economies" from lower metal prices from the increased supply of metals from the deep sea.²⁸ There is a significant degree of uncertainty in estimating the amount of compensation that should be paid to terrestrial mining countries, as well as conceptual and practical difficulties in calculating such a figure, leading to the current lack of research into this area.² There is also a real possibility that full compensation could exceed the ISA budget, considering the sizeable contribution copper, cobalt, nickel and manganese mining make to national economies.

Taking all of this into consideration, Wilde et al. have highlighted that it is unlikely that the economic assistance fund budget would be derived from a bottom-up calculation of the potential negative economic impact to terrestrial mining countries. Instead, they suggest any budget is likely to be a percentage of the total royalties the ISA receives from deep sea mining companies and for illustrative purposes their study assumes 25% of the ISA's revenues would be allocated to an economic assistance fund. This results in US \$9 million - \$80 million in deductions from the ISA's funds from royalties from 2028 - 2056. It's important to note that while these figures and the underpinning assumption are subject to a high degree of uncertainty, they indicate potentially significant deductions from the ISA royalty fund as well as a critical policy decision facing the ISA around how to fairly compensate terrestrial mining countries.

How would the funds be distributed?

Once the above deductions have been made from the ISA's royalty fund, there is significant debate as to how these funds should be distributed. According to UNCLOS, the ISA is responsible for facilitating "the equitable sharing of financial and other economic benefits derived from activities in the Area", defined as the seabed area beyond national jurisdiction.³ This includes developing a payment regime for deep sea mining that maximizes revenues for the benefit of humankind, while also attracting investment in deep sea mining without negatively impacting land-based mining.¹⁵ As discussed above, this payment regime must also compensate developing countries for revenue losses caused by deep sea mining and any other negative economic impacts caused to land-based mining caused by deep sea mining.³

What counts as "equitable" sharing of financial benefits from deep sea mining is not clearly defined, but Wilde et al. have suggested that this should mean a per capita distribution that takes into account population, as well as a measure of each countries level of economic development.² In their study, the evaluated two scenarios for distributing ISA royalty funds where each State's share increases with a larger population size and decreased as per capita income rises. Importantly, this study found that under both scenarios, Member States would receive very small payments which in all cases are insignificant in comparison to the size of their economies. For example, India (the biggest recipient of funds under both scenarios) could receive US \$8.6 million - \$34.4 million^b per year in the long term (from 2031 - 2035), a tiny fraction of the country's US \$12.9 trillion GNI in 2023.²⁹

^b Values in 2018 US.

How much would the average country gain from the ISA royalty fund?

This analysis estimates that each ISA Member State on average could receive US \$42,000 - \$1.1 million per year from deep sea mining royalties (see Table 3 below), if no equitable sharing measures were in place based on the above ISA revenues and deduction estimates. Again, this provides insignificant financial benefits to all Member States, in comparison to the size of their economies.

<i>Table 3: Estimate of the funds from royalties available to the ISA for sharing with Member States. Source: Wild et al. 2023; DSCC, 2023; Planet Tracker, 2023.</i>	
Parameters	Amount (2018 US)
Maximum estimated ISA revenues over 29 years ^c	\$7.69 billion ³⁰
Minimum estimated ISA revenues over 30 years ^d	\$285 million ³¹
Annual ISA administration costs	\$13 million ³²
Annual ISA economic assistance fund deductions rate	25% ³³
Maximum annual average ISA royalties per Member State (minus ISA administration costs and economic assistance fund deductions)	\$1.1 million
Minimum annual average ISA royalties per Member State (minus ISA administration costs and economic assistance fund deductions)	\$42,000

c Over a 29 year period: 2028 – 2056.

d Over a 30 year period: 2028 – 2057.

The ISA Common Heritage Fund – the answer to small financial benefits?

Perhaps as a result of the estimated insignificant financial benefits from royalties, the ISA has proposed directing revenue from royalty payments into a central fund, most recently in the form of a 'Common Heritage Fund',³⁴ and previously as the 'Seabed Sustainability Fund'.³⁵ Examples of the activities that could be funded by the Common Heritage Fund include:

- research supporting the protection of deep sea ecosystems;
- building up the network for ocean data and science;
- supporting scientists and technical experts from developing States to participate in international marine research;
- increasing developing countries' institutional capacity around deep sea legislation, education and technology and;
- establishing and running regional training centres.

Critics have highlighted that the proposed activities for the Common Heritage Fund include items that the ISA and international community are already obliged to undertake as a condition of exploiting deep sea mineral resources.² This includes, increasing scientific knowledge about deep sea ecosystems, capacity building and technology transfer, all of which UNCLOS stipulates as prerequisites for deep sea mining. These activities should therefore not be seen as additional benefits to be funded by deep sea mining royalties, or as a substitute for the financial and economic benefits that could be delivered by deep sea mining.

The idea of a central fund has also been criticised for being narrow in scope, particularly in comparison to the broad benefits that are expected from terrestrial mining revenues for States.² While terrestrial mining is associated with many negative social, economic and environmental impacts, from habitat destruction, to poor working conditions and negative health impacts, these industries can also generate governments revenues which can be used to finance key priorities such as education, healthcare and social welfare. In comparison, the activities that could be funded by a Common Heritage fund or similar are relatively limited.

Conclusions

This report concludes that countries would gain minimal financial benefits from deep sea mining corporate income tax and royalties, while they could be exposed to significant financial risks from sponsoring deep sea mining companies. This negative net financial outcome for countries comes in addition to the negative impact deep sea mining would have on the ocean,⁹ climate,⁸ natural capital, corporate profits and investor returns.¹²

Call to action

On top of exposing financial institutions to significant policy, regulatory, reputational and financial risks, deep sea mining could also negatively impact the countries financial institutions invest in or lend to.

Governments and financial institutions should therefore support [a moratorium on deep sea mining](#). Financial institutions should engage with governments who have not yet explicitly supported a moratorium and develop investment policies that exclude deep sea mining companies.

Instead, financial institutions should support improving the social, economic, and environmental governance of terrestrial mining.

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ABOUT PLANET TRACKER

Planet Tracker is an award-winning non-profit financial think tank aligning capital markets with planetary boundaries. Created with the vision of a financial system that is fully aligned with a net-zero, resilient, nature positive and just economy well before 2050, Planet Tracker generates break-through analytics that reveal both the role of capital markets in the degradation of our ecosystem and show the opportunities of transitioning to a zero-carbon, nature positive economy.

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