

## Deep Seabed Mining Fiscal Framework

### Introduction

A fiscal regime is a broad variety of financial (e.g., tax) and related contractual arrangements. The Bellagio working group on the fiscal regime held the following discussion around the system of payments for deep-sea mining in the Area. The discussions quickly focused on harvesting of polymetallic nodules. The results built upon discussions that took place in relation to the fiscal regime during the Joint ISA-CIL Workshop on Mineral Exploitation in the Area held in Singapore in June 2015. In particular, it was recalled that there was consensus among participants in that workshop that any financial system should be simple and easy to implement and administer. Furthermore, a proposal had been made at Singapore for a transitional financial regime to encourage the growth of the seabed mining industry and ensure its sustainable development. Such a regime would comprise a simple fee structure of an annual flat fee and a royalty payment. To provide stability in the initial years, this regime should be in place for an appropriate length of time (10 years was suggested) after which there should be a review where any changes agreed upon would apply prospectively.<sup>1</sup>

### Different goals for different stakeholders

The financial and non-financial goals and related risk mitigation of a fiscal regime vary for each of the key stakeholders, who may broadly be defined as States, the ISA, and companies. Goals for States, both within the Area and in national jurisdiction, may include raising revenue, diversification of their economy, skills transfer, scientific knowledge, and environmental protection. Goals for the ISA within the Area may include effectively managing operations, raising revenue for its member States that allocates rents “fairly” between mining companies and States collectively as resource owners, and administrative ease and minimizing cost, as well as to attract investment and technology to the exploration and exploitation of the Area.<sup>2</sup> The ISA’s environmental goals include minimizing adverse impacts to the extent practicable, and more broadly, managing the environment. Goals for companies can include profits, minimizing their risk profiles (that can vary between privately and publically owned companies), administrative ease and minimizing cost, and enhancing predictability and transparency.<sup>3</sup>

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<sup>1</sup> ISA Briefing Paper 04/15, Report of the Joint ISA-CIL Workshop on Mineral Exploitation in the Area, 16-17 June, 2015.

<sup>2</sup> See Articles 150, 151 and Annex III, Art.13(1) and (14), of the 1982 United Nations Convention on the Law of the Sea (LOSC) as read with Sections 6 and 7 of the Annex to the 1994 Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea (1994 Agreement).

<sup>3</sup> Entities that are qualified to undertake deep seabed mining in the Area include States Parties to the 1982 UN Convention on the Law of the Sea (LOSC), state enterprises and natural and juridical persons when sponsored by States Parties. For ease of reference, the term ‘mining entities’ is used in this document as a collective reference to all such entities.

## **Spillover effect**

Relevant considerations with regard to the fiscal regime's scope can also potentially vary by whether the mining takes place solely in the Area, on continental shelves where the activity may affect the Area, or in the Area but with potential impacts on coastal States. Notably, when mining occurs in the last two cases, there can be an environmental spillover effect from one location to another, such as a drifting plume from mining in the Area to adversely affect an adjacent coastal State's environment. When the spillover effect creates an adverse environmental impact, the mining entity creates a cost upon citizens in the recipient area that can be unaccounted for, and the wellbeing of the adversely affected citizens can decline. The fiscal regime should ideally account for all costs and benefits, and include environmental spillover effects that are otherwise not considered.

## **Current investment climate**

The following stylized facts and principles informed the discussion and draft fiscal regime. Minerals prices display considerable volatility over time, generating long-term cyclical swings in revenue. Mining requires lengthy periods of exploration and development during which no revenue is generated. Deep-sea mining equipment is highly specialized, and much of the technology remains under development, further lengthening the time prior to mining and increasing risk.<sup>4</sup> The amount of capital required during the development and construction phase is relatively larger than in most other industries. Once the mine is developed, the capital is not malleable, i.e., it forms a sunk cost (a fixed cost that is not recoverable). Mines can have long lives, making them potentially subject to fiscal regime changes and policy instability, called time inconsistency. The long time periods involved, large upfront but sunk capital costs, technology still under development, substantial transition time to mining, uncertain reserves and environmental impacts, a still-emerging regulatory and fiscal framework, mineral price volatility, all come together to create considerable risk and uncertainty and the need for predictability, notably in the fiscal framework.

## **Economic and fiscal principles**

The following economic and fiscal principles informed the fiscal regime discussion. Different fiscal regimes create stronger or weaker incentives for economic efficiency and stronger or weaker conditions of risk and uncertainty. Ideally, the fiscal regime creates neutrality, so that the selected charges that serve as revenue-raising instruments cause the least possible unintended disturbance to the mining entity's economic decisions. A non-neutral charge that affects actions taken by such entities is distortionary, giving rise to different incentives

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<sup>4</sup> Sources of risk include exploration, mineral prices, cost uncertainty, technology development, environmental damages, and policy-regulatory uncertainty.

regarding research and development (technology), exploration, rate extraction, time of abandonment, over- or under-exploitation, method of extraction, etc. Different revenue-raising instruments allocate risks differently among mining entities, ISA, and States. A potential trade-off exists between creating incentives and the appropriate allocation of risk; where economic efficiency requires those best able to bear risk to absorb risk. The fiscal regime should minimize risk to mining entities, States, and the ISA to the maximum extent practicable, by creating a stable and predictable environment, including a stable fiscal regime (thereby contributing to solving what is called the time inconsistency problem). Transparency, critical for the fiscal regime, leads to concerns over transfer pricing (prices at which an enterprise transfers goods and services that can vary according to location or situation) and arm's length pricing (buyers and sellers of a product act independently and have no relationship to each other).<sup>5</sup> Ease and low cost of administration forms another principle. Mining entities and the ISA hold different amounts of information (i.e., asymmetric information), and obtaining sufficiently comprehensive information on costs and other sensitive financial information may or may not be feasible. Ideally, the fiscal regime is driven by the optimum structure and information needs and the regime is crafted accordingly, but should such information, such as reliable and representative costs, not be obtainable, then the regime must be adjusted accordingly. The potential absence of cost information and absence of an international tax and accounting code and tax treaties with the ISA all limit the fiscal regime. Payments to the ISA should be levied as close as possible to the point of extraction, ideally the point of first offloading of the ore or point of first third party sale, an issue requiring further attention (as noted below). The fiscal regime should reflect the mineral content of the ore and take account of the price and revenue volatility. Revenue-raising charges are ideally levied at the project level, so that accounts from the project are not mixed with accounts for activities outside of the project, i.e., there is ring fencing (accounts from the mine are not mixed with accounts for activities outside the mine). The LOSC specifies that the administrative expenses of ISA are to be a first call upon revenue raised from the Area.

### **Inter-generational equity**

Inter-generational equity is an inherent concern with an exhaustible resource, and reflects the need to balance current with future consumption. The welfare of future generations is contemporaneously considered with that of the current generation. Reducing current consumption to save and invest preserves opportunities for higher consumption by and hence contributes to enhancing welfare of future generations. There are two components to achieving this inter-generational equity. One is the optimum rate of exhaustible resource extraction, where the social discount rate used to assess the net present value of resource royalties over

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<sup>5</sup> The *OECD Transfer Pricing Guidelines* provides one international framework for applying the arm's-length principle.

time incorporates the interests of future generations, which includes benefits enjoyed through managing and enjoying the environment as well as net revenues. (The social discount rate captures the preferences of society for current versus future consumption in this assessment.) The second component balances current consumption versus future consumption of the realized resource royalties through current saving and investment to achieve higher consumption in the future. (Ideally these two components would be simultaneously considered, but in practice they are separated.) With economic growth, it is expected that higher incomes, consumption, and welfare in the future can lead to comparatively higher current consumption.

### **Types of revenue-raising charges**

The major types of revenue-raising charges that are available include: (1) unit-based (specific) royalties when the charge base is a physical unit (volume or weight); (2) *ad valorem* royalties based on the value (revenue) of production; (3) profit-based royalty or business income tax; (4) economic (resource) rent<sup>6</sup>; and (5), hybrid systems combining a profit or rent based system with an *ad valorem* system for example. Other approaches include production sharing, joint ventures, fixed fees, auctions, and pure service agreements. Economic rent-based charges are considered ideal from the broad perspective of society, because they are neutral (non-distortionary), but they are notoriously difficult to measure and implement. The absence of an international and common tax and cost accounting code makes economic rent-based charges particularly problematic. For example, different capital recovery rules, allocation of common and fixed costs, specification of an appropriate level of normal profit, can all make the process of defining and measuring profit-based and economic rent-based charges ambiguous, hard to audit, and open to disputes. Moreover, mining entities may not favour such economic rent-based charges because these charges potentially capture part or all of the “super normal” profits that mining entities seek to make in light of their risk profile and capital investment. As a result, due to the asymmetric information held between mining companies and the ISA, incentives are created for weakened compliance and for providing the requisite cost information required to estimate economic-rent based charges. Royalties (unit-based or *ad valorem*) and hybrid systems are the most widely applied in terrestrial mining.

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<sup>6</sup> Economic or resource rent is the net value of the resource, before charges and other payments to or from authorities, above costs necessary to make the resource available, where costs include normal profit or a “normal” rate of return to capital. This normal rate of return, which is the minimum rate of return required to hold capital in the activity, had two components: a risk-free rate of return and a risk premium that compensates risk averse private investors for the risks incurred in the activity.

### Proposals for revenue-raising charges for seabed mining

Consideration of the above principles and information availability leads to two different fiscal regimes: (1) a hybrid fiscal regime comprised of a fixed fee during the long pay-back period for investors that is supplemented by an *ad valorem* royalty that incorporates changes in international market benchmark prices. [See figure 1 – Scenario (a)] The fixed fee can be set at a level to finance ISA operations that can include cost recovery by the ISA. It must be noted that some participants felt it would be difficult to reach consensus on a fixed royalty alone during the payback period. (2) However, the view was expressed during both the Singapore and Bellagio workshops that the royalty regime should start as simply as possible, given the embryonic state of the sector. Today there is no seabed mining industry and it may take a few decades for the industry to mature and potentially prove economically viable at all. Copying fiscal regimes from mature industries may become a disincentive for investment in the sector. Given the above, it was suggested that a fiscal regime, comprised of a fixed fee for cost recovery by the ISA *that is supplemented by a unit-based royalty*, would be the easiest to administer whilst providing the most predictability for investors. As such an appropriate time should be allowed for the sector to mature before *ad valorem* or profit-based royalties are foreseen. [See figure 1 – Scenario (b)]

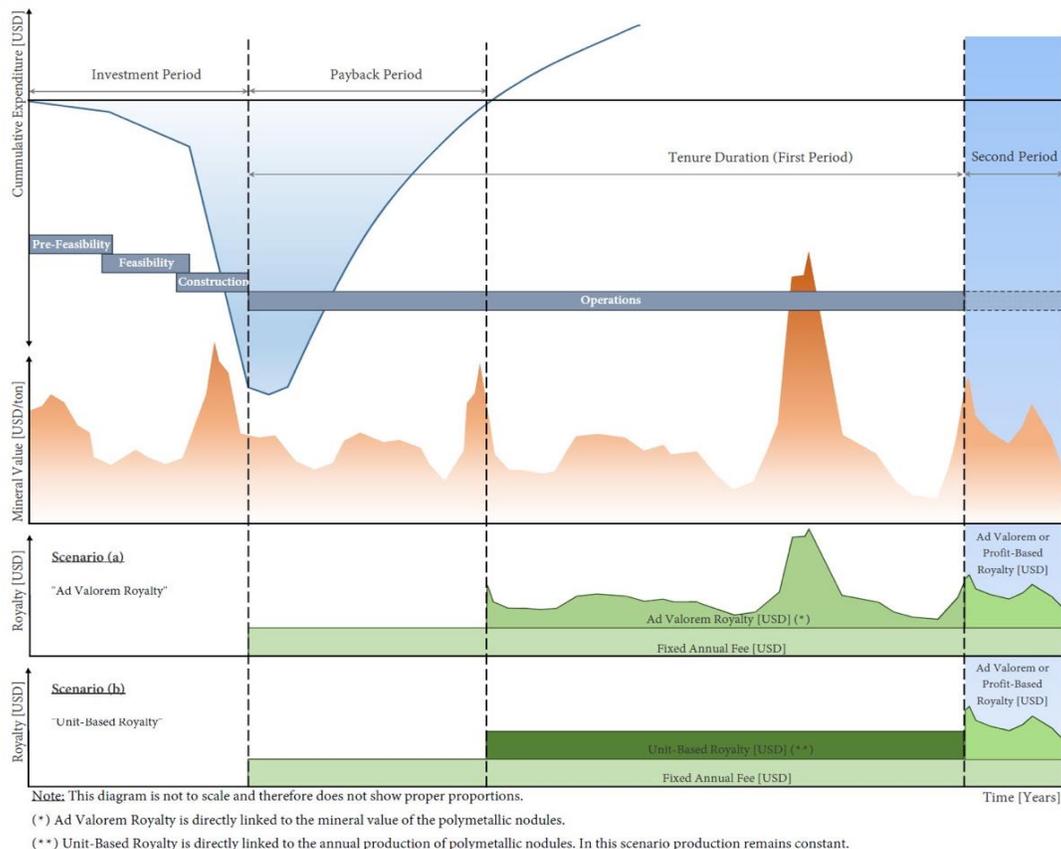


Figure 1: Alternative scenarios for payment mechanism

Unit-based royalties are a fixed amount of money paid for each tonne of mineral that is produced. Sliding scales are common with this type of royalty and are generally set based on production levels. (The royalty rate of sliding scale unit-based royalties, rather than being uniform for all sales, varies according to the volume of material sold.) Unit-based royalties are easy to compute, collect, monitor and provide a royalty as long as a mine operates. Furthermore, they are transparent, and easy to administer.

In order for a unit-based royalty to be implemented, stakeholders need to agree beforehand on a fixed cost per tonne of mineral that will be produced, consequently reducing investor uncertainty and increasing predictability and transparency enabling contractors to further develop the deep seabed mining sector.

Consideration was also given to a profit-based charge following an appropriately long period of unit-based or *ad valorem* royalty (periods between 10 and 30 years were mooted), although concern was expressed over its potential applicability due to the difficulty in obtaining reliable cost information from all entities to form representative and reliable costs and hence a profit-based tax. Consideration was also given to this *ad valorem* royalty as being either fixed (but adjusted for inflation) over the entire time period or changing over time according to changes in an international market baseline price, such as from the London Metal Exchange. However, proponents of scenario (a) thought that a fixed *ad valorem* royalty would be subject to changes in the fiscal regime (i.e. time inconsistency) during periods of peak prices, and that instead predictability and risk minimization for all parties were better served in the end by an *ad valorem* royalty that tracks the international market baseline prices.

To satisfy concerns over transfer pricing and arm's length pricing, the *ad valorem* royalty can be assessed upon the gross value of the ore at the first point of offloading or point of first third-party sale using international benchmark prices, such as those from the London Metals Exchange. These prices could potentially be adjusted for differences in costs, such as transportation and insurance, to form the f.o.b. (freight on board) price at the point of first offloading. Different metals prices could be linked to the different minerals comprising the ore, i.e. its grade, weighting by the average mineral content. The average mineral content could be established from mining entities' resource assessments<sup>7</sup> of their concession over some prescribed area, where mineral content is assumed to be homogenous and constant over a large area.<sup>8</sup> Such an approach means that the mineral content or grade of offloaded ore does not require further assessment or verification, for example, by sampling, at the point of off-

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<sup>7</sup> Presented according to the Resource Classification guidelines issued by the International Seabed Authority (ISBA/21/LTC/15).

<sup>8</sup> Consideration would need to be given to which minerals to include in the calculation, as well as the fact that metal prices can differ depending on the end product. The discussion in the working group assumed that Mn, Cu, Ni and Co would be included, but recognized that further discussion of this issue would be required.

loading. Different formulae exist by which to measure the overall ore price that incorporates the different minerals contents, and further research on producer price indices will be required to inform the ideal price index formulae. A key issue becomes accurate measurement of the off-loaded ore's weight or volume; however, it was considered that this would be easily achievable and relatively inexpensive with modern technology. Another approach simply takes the realized value as shown on mining entities' invoices of at-arm's-length sales submitted with their royalty returns, although the issue is then raised of transfer pricing and appropriate assaying and payable recovery, the latter of which is particularly appropriate with polymetallic ores. Realized hedging gains or losses can be netted out of the realized value.

An *ad valorem* royalty capturing changes in international market benchmark prices leads to revenue and tax receipt procyclicality that tracks both short-term price variability and the longer-term price cycle. Such volatility creates upside risk to mining entities at the peak of minerals prices during a cycle and downside risk to States (for example through unstable revenues to finance budgets) that are recipients of the tax receipts at the troughs of minerals prices during a cycle. During price troughs, mining entities with narrow-margin operations can also become unprofitable and net cash flows may fall below the corresponding marginal cash operating costs, justifying mine closure, during price troughs, thereby creating downside price risk for mining entities. A price ceiling and a price floor, creating a corridor of admissible prices for the *ad valorem* royalty, was recommended to minimize risks for both mining entities and States. The actual magnitudes of the price ceiling and floor require further attention.

Another potential source of risk arises due to exchange rate fluctuations. To minimize this potential currency risk, International Monetary Fund Special Drawing Rights, which is a basket of reserve currencies, could be used as a unit of account to value the revenues upon which the *ad valorem* royalty is levied.<sup>9</sup> The use of major reserve currencies or Special Drawing Rights limits any impact of large royalty inflows upon exchange rates (the so-called "Dutch Disease").

The setting of the actual unit-based or *ad valorem* royalty rate requires additional attention. Section 8 (Financial Terms of Contracts) of the Implementing Agreement stipulates that rates of payments to the Authority shall be within the range of those prevailing in land-based mining of the same or similar minerals to avoid conferring on deep seabed mining entities an artificial complete advantage or imposing on them a competitive disadvantage.<sup>10</sup> The size of the

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<sup>9</sup> Special Drawing Rights or SDRs, an international reserve asset, are created by the International Monetary Fund, and valued and based on a basket of four key international currencies, the euro, Japanese yen, U.S. dollar, and the UK pound sterling. SDRs can be freely exchanged for usable currencies. In addition to its role as a supplementary reserve asset, the SDR serves as the unit of account of the International Monetary Fund and some other international organizations.

<sup>10</sup> However, this is not straightforward given that land-based rates vary substantially and ISA will need to set a royalty that is appropriate to the resource and business model, taking into account the various factors set out above.

annual fixed fee and how it relates to the unit-based or *ad valorem* royalty and any potential user charge for cost recovery within the fiscal regime were not discussed and require further attention, as does the question of different royalty rates for different resource categories. The relationship between the fiscal regime and the mining entities' home State tax codes, tax credits, and other such issues may also require further attention. Another area requiring further attention is the information needs corresponding to the optimum fiscal regime structure (subject to the needs of a simple and cost-effective regime). Such information includes cost information, and international tax and accounting codes that include agreed definitions and measurement of costs. Yet another area requiring further attention is the point at which the unit-based or *ad valorem* royalty is levied, such as the point of first offloading or first third-party sale.

### **Environmental charge**

Environmental damages from seabed mining, which create an external cost, are unlikely to receive substantive remediation, if at all, due to the deep-sea nature of the resource. (External costs are costs borne by society but not borne by producers or consumers of the final product.) Without remediation, mining entities do not bear corresponding remediation costs, as they are normally supposed to do on land.

Environmental damage can also create liabilities that are both known and unknown. Known environmental damage can be addressed by an environmental charge that differs from the unit-based or *ad valorem* royalty and should be kept distinct. The environmental charge receipts can be placed into an environmental fund (or sustainability fund) that is distinct and ring-fenced from the royalty receipts.<sup>11</sup> The unit-based or *ad valorem* royalty is due to payment for exploitation of the “publically owned” (i.e., by humanity, in the Area) exhaustible resource, whereas the environmental charge and fund represent payment for the environmental damage (“internalizing the external cost”). These two purposes are completely distinct and should not be conflated.

The environmental charge receipts may be used to fund, for example, activities that benefit the Area and its marine environment and which protect and preserve the marine environment, including vulnerable marine ecosystems and ecologically or biologically sensitive areas. Accepted international principles and best-practices for such offsetting actions favour conservation that is as close as possible in ecological equivalence to the environmental damage (i.e., ‘like-for-like’ rather than ‘out-of-kind’) and that address residual impacts following the avoidance, minimization, and remediation steps of the conservation mitigation hierarchy. Open questions include the offset unit of account (currency or the definition and measurement of the

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<sup>11</sup> Such an environmental charge is called a double-dividend Pigouvian charge. A Pigouvian charge is priced at the marginal external cost and increases economic welfare.

damage), uncertainty through offset multipliers, offset duration, the basis upon which to set the environmental charge, and the administration of the environmental fund and offsets. Monitoring and compliance are additional concerns. Other issues include whether the offsets should only achieve 'no net loss' or instead aim for a 'net gain' and also whether the offsets pertain to only the residual impacts after all other steps in the mitigation hierarchy have been followed to the maximum extent practicable and accounting for risk or whether the offsets offer lower-cost and/or higher risk-adjusted ecological returns and not only for minimizing residual impacts. Who is liable among mining entities, the sponsoring State, and the ISA was not established.

Liability for environmental damage was also discussed, including unknown liabilities and strict liability rules and negligence rules. Both assurance bonds and insurance, whether private or administered through the ISA, were discussed as means of ensuring that funds are available to meet possible remediation measures needed due to unanticipated, unintended or extreme environmental impacts. A liability fund, as suggested by the International Tribunal for the Law of the Sea in the Seabed Mining Advisory Opinion, was also discussed.

### **Topics that remain to be discussed**

Topics that were not covered and remain for discussion include whether or not the prices forming the *ad valorem* royalty should directly and immediately track changes in the international benchmark prices or should only partially track the international benchmark prices and whether the *ad valorem* prices should track with a time lag, such as through a moving average calculated over an as yet undetermined time period. An additional topic that requires further discussion is limiting procyclicality by delinking expenditures from *ad valorem* receipts. (Procyclicality refers to higher ISA spending associated with higher resource revenue, as resource prices or production rise, and conversely, lower ISA spending is associated with lower resource revenue as resource prices drop or production falls.) Such procyclicality, if left unaddressed, could in turn lead to procyclical sharing of mining royalties with States under the Common Heritage of Mankind. Medium-term fiscal rules and precautionary savings can delink expenditures from receipts and thereby limit procyclicality. One approach limits current consumption to save resource royalties receipts through a liquidity fund built up during periods of high prices, allowing revenues to be tapped to smooth ISA sharing of benefits with States when inflows fall short. A related issue pertains to ISA payments that sustain a constant flow of funds to States equal to the (implicit) return on the present value of future *ad valorem* royalty revenue (the permanent income hypothesis), modified by consideration for investment, inter-generational equity, uncertainty over reserves, credit constraints, and other factors. Once extraction is in full swing, much of the royalties is saved to build up the stock of non-resource assets to provide sustainable benefits in the future. The return on these assets sustains the

spending annuity even after extraction has ended plus smoothes out spending due to price and production changes. Sovereign wealth (natural resource) funds are one vehicle to achieve this limiting of procyclicality and the ISA's sharing of the benefits under the Common Heritage of Mankind responsibility.