

Financial Regimes for Deep-Sea Mining and Implications for Environmental Protection

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Deep Seabed Mining Payment Regime Workshop #3
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Workshop Objectives....(1)

- Review and supplement current:
 - (1) environmental policy instruments
 - (2) payment regime
- Included two highly seasoned ex-IMF and ex-World Bank mining economists.
- Incorporates (unofficial) experiences and viewpoints of two key global institutions otherwise excluded to date.

Workshop Objectives....(2)

- Review incentive-based environmental policy instruments starting from first principles and with 50+ years of experience from industries addressing:
 - environmental pollution,
 - climate change,
 - ozone depletion,
 - energy,
 - water,
 - fisheries,
 - whaling,
 - mining,
 - agriculture,
 - terrestrial and marine conservation,
 - oil and gas

Organization...(1)

- 1. Environmental
- 1.1. Key Characteristics When Choosing Environmental Policy Instruments
- 1.2. Basic Principles When Choosing Policy Instruments
- 1.3. Suite of Possible Policy Instruments for Protecting the Marine Environment
- 1.4. Summary of Potential Incentive-Based Policy Instruments

Organization...(2)

- 2. Payment Regime
 - 2.1. Fundamentals
 - 2.2. Payment Regime Issues
 - 2.2.1. Contractor Mining Costs
 - 2.2.2. Risk
 - 2.2.3. Royalties
 - 2.3. Intrinsic Value

1. Environmental

1.1. Key Characteristics When Choosing Environmental Policy Instruments

1. Environment

Key Characteristics When Choosing Policy Instruments...(1)

1. Uncertainty about the magnitude of damages
2. Difficulty in monitoring and measuring impacts
3. Insufficient information on means to reduce impacts

1. Environment

1.1. Key Characteristics When Choosing Environmental Policy Instruments

Key Characteristics When Choosing Policy Instruments...(2)

4. Inability to restore impacted habitats
5. Spatial gradients, non-linear damage functions and thresholds
6. Heterogeneity of impacts across mining sites.

1. Environment

1.1. Key Characteristics When Choosing Environmental Policy Instruments

1.2. Basic Principles When Choosing Environmental Policy Instruments

1.2.1. Who Should Bear the Costs of Ensuring Adequate Protection?

- Should the “polluter pays principle” (PPP) be applied?
- Or should beneficiary pays principle” (BPP)?
 - Implies sharing of costs among contractors, sponsoring States and the ISA.
- Some policy instruments implement PPP, while others are consistent with BPP.
- Choice of cost-bearing approaches also determine sources of funds needed for compensation.

1.2.2. Who Bears the Environmental Risks?

- Entirely by contractors/sponsoring States?
- Society (ISA) bear some of those risks in return for share of monetary returns?
- Policy instruments differ in how they allocate risks.

1.2.3. Least-Cost Incentives to Protecting Marine Environment?

- Policy instruments based on performance standards provide contractors greater flexibility in meeting environmental protection goals.
 - Performance standards: limit on outcomes
- This flexibility can lead to lower costs than process-based or technology-based standards
 - Process of production
 1. Environment
 - 1.2. Basic Principles When Choosing Policy Instruments

1.2.4. Who Should Bear Costs of Monitoring and Enforcement?

- Borne by regulated parties (contractors and/or sponsoring States) as charges separate from fiscal arrangements?
- Or ISA assumes burden of those costs?
 - Relying, for example, on royalty payments?

1. Environment

1.2. Basic Principles When Choosing Policy Instruments

1.3. Suite of Possible Policy Instruments for Protecting Marine Environment

Differ along dimensions outlined
above

1.3.1. Direct Regulation

1. Environment

1.3. Suite of Possible Policy Instruments for Protecting the Marine Environment 15

Standard Progression of Environmental Regulations in Industries

- Start with direct regulation and eventually transition to incentive-based approaches
- Direct regulation:
 - Performance standards
 - limits on production outcomes
 - Process standards
 - limits on production process
 - Technology standards
 - prescribed technology and operating methods on process

1. Environment

1.3. Suite of Possible Policy Instruments for Protecting the Marine Environment ¹⁶

What Are Limits to Direct Regulation?

- Costly because typically “one size fits all”
- Not least-cost
- Fails to harness companies’ ability to devise their own solutions in their own ways subject to environmental requirements and markets.

Penalty for Non-Compliance

- Effective regulatory scheme must include penalty for non-compliance more costly to regulated parties than compliance.

1.3.2. Liability for Environmental Damages...(1)

- Contractors and/or sponsoring States can be held liable for environmental damages exceeding some baseline.
- Either:
 - 1. fault-based liability
 - effectively, a negligence rule or
 - 2. strict liability
 - imposed even in absence of negligence or wrongful act.

1.3.2. Liability for Environmental Damages...(2)

- Annex III to UNCLOS provides for fault-based liability.
- Strict liability:
 - more consistent with Polluter Pays Principle (PPP)
 - has been used in international law for activities particularly or inherently dangerous
- See Report Appendix for more.

1.3.3. Other Incentive-Based Approaches

1. Environment

1.3. Suite of Possible Policy Instruments for Protecting the Marine Environment 21

What Are Incentive-Based Policy Instruments?

- Incentivizes contractor decision-making and behavior to avoid damages on on-going basis.
- By accounting for environmental and economic costs and benefits that are not currently included in market prices.
 - External costs and benefits in language of economics

Examples of Other Incentive-Based Policy Instruments from Many Industries

- Carbon or green taxes
- Subsidies (under certain conditions)
- Cap-and-trade systems
 - Kyoto Protocol
 - SO₂ pollution
 - Fisheries and water rights
- Liability laws
- Superfund (USA)
- Assurance bonds
- Insurance
- Biodiversity offsets
- Payments for Ecosystem Services
- Conservation easements

1. Environment

1.3. Suite of Possible Policy Instruments for Protecting the Marine Environment

Other Incentive-Based Policy Instruments from Workshop

- Based upon key characteristics and basic principles discussed previously.
- 1. Environmental Taxes
 - “Double dividend”
- 2. Certification/Eco-Labels
- 3. Transferable Rights-Based Approaches
 - Credits vs. rights

1.3.3.1. Environmental Taxes

- Taxes on units of environmental impact that can be quantified and measured
 - (e.g., volume of impacted sea floor).
- Double Dividend
 - Second social benefit is tax revenues used for further conservation and/or environmental funds.
- Ring fenced from fiscal payments.

1.3.3.2. Certification/Eco-Labels

- Eco-labels focus on products while certification can also apply to producers.
- For minerals closely identifiable in consumer products.

1.3.3.3. Transferable Rights-Based Approaches

- Permits that allocate and allow trade in allowable impacts could also be considered.
- Performance-based approach
- Provides contractors with additional flexibility in meeting impact limits.
- Requires identification of a quantifiable unit (e.g., volume or acreage) that can be regulated by permit and traded.
- Transferable habitat quotas

1.3.4. Environmental Trust Fund

- Two basic types discussed:
- 1. Environmental Liability Trust Fund
- 2. Seabed Sustainability Fund

1. Environment

1.3. Suite of Possible Policy Instruments for Protecting the Marine Environment

1.3.5. Summary of Potential Incentive-Based Policy Instruments

Multiple Policy Instruments

- Likely to be multiple policy instruments
- Example: combination of direct regulation, liability or insurance, plus other incentive-based to alter contractor behavior on an on-going basis.
- Costs to contractors eventually shared with supply chain and consumers
 - In principle, according to price elasticities of demand of each group.

List of Potential Incentive-Based Policy Instruments

- Based upon key characteristics & basic principles when choosing policy instruments.
 1. Liability (strict or negligence-based)
 2. Insurance
 3. Environmental (assurance) bonds
 4. Environmental trust fund
 - 4a. Environmental Liability Trust Fund
 - 4b. Seabed Sustainability Fund
 5. Environmental taxes/fees (double dividend tax)
 6. Certification/eco-labeling
 7. Transferable rights-based approaches
 8. Biodiversity offsets (not from PEW workshop, but under discussion)

1. Environment

1.4. Summary of Potential Incentive-Based Policy Instruments

We are only half way there, I am afraid...



**"Mr. Osborne, may I be excused?
My brain is full."**

2. Payment Regime

1. Environment
2. Payment Regime

2.1. Fundamentals

2. Payment Regime

Two General Considerations when Designing Regimes & Regulations

- 1. Evaluate how those rules would function in terms of monitoring, compliance, and enforcement.
- 2. ISA payment regime and environmental regulations should anticipate future developments and provide appropriate adaptability.
 - Contracts, regulations, and rulings will extend many years into the future.

2.2. Payment Regime Issues

2. Payment Regime

2.2.1. Contractor Mining Costs...(1)

- Sources for obtaining ISA contractor's mining costs might include:
 1. Costs reported by contractors for income tax payments to their sponsoring States;
 2. ISA analogues to "Annex C" of production sharing agreements, wherein rules for allowable costs are set out.

2.2.1. Contractor Mining Costs...(2)

- Sometimes can more accurately measure *changes* in contractor costs than *levels* of costs or profits per se.
 - Changes in costs and profits are what are most relevant for an ad valorem progressive sliding scale.

2.2.1. Contractor Mining Costs...(3)

- Real costs of operations and capital should be distinguished from financial costs such as interest payments.

2.2.2. Risk...(1)

- Risk imposes a cost upon whichever entity (ISA, contractor, Sponsoring State) bears that risk.
- Risk-sharing options have implications for size of royalty rate.

2.2.2. Risk...(2)

- For example:
- 1. Risk Shared by Contractors and the ISA.
- Royalty rate would higher than if risk were shared between contractors and their Sponsoring States due to associated higher cost of risk to ISA.
- Includes “combined” contractor-State

2. Payment Regime Issues

2.2. Payment Regime Issues

2.2.2. Risk...(3)

- 2. Risk Shared by Contractors and their Sponsoring States
- Royalty rate would be lower because ISA does not bear risk and associated cost.
- Instead, Sponsoring State bears risk of lower income tax rates, while other costs of risk are shared between Sponsoring State and contractor.

2.2.2. Risk...(3)

- Contractor pioneers bear more risk than later entrants.
- This risk is typically borne by those pioneers (or their commercial partners).
- Not by resource owners (here ISA).

2.2.3. Royalties...(1)

- Please do not shoot the messenger (me!!)....
- Same rules and royalty rates should apply to contractors at any stage (early to late) and without regard to economic-development status of Sponsoring State.
- Contractors and their Sponsoring States that can bear risks should pioneer.

2. Payment Regime Issues

2.2. Payment Regime Issues

2.2.3. Royalties...(2)

- If mining not commercially feasible, then no subsidies should be employed.
- Royalty as minimum payment for resource.
- If project cannot bear this cost, resource should be left on seabed for future generations.
- My addendum outside of report: ignores “external benefits” of creating new technology and new industry knowledge & “Pigouvian subsidies”.

2.2.4. Payment Regime Options

2. Payment Regime Issues

2.2.4. Payment Regime Issues

2.2.4.1 Fixed-Rate Ad valorem Royalty

- Already discussed in this workshop.

2.2.4.2. Sliding-Scale Ad Valorem Royalty with a Fixed Floor Rate...(1)

- Fixed-floor rate same as fixed-rate ad valorem royalty.
- Sliding-scale is linked to profitability measure.
- Royalty increases as ratio of sales to costs increases.

2.2.4.2. Sliding-Scale Ad Valorem Royalty with a Fixed Floor Rate...(1)

- Sliding-scale rate calculated each year as ratio of profits
 - Before interest, taxes, depreciation, and amortization [EBITDA] to sales revenues.
 - Ratio can be taken directly from financial accounts that contractor prepares and submits to its Sponsoring State for income-tax.

2.2.4.2. Sliding-Scale Ad Valorem Royalty with a Fixed Floor Rate...(2)

- A key decision is whether to allow capital recovery as one of costs
 - measure is then earnings before interest and taxes [EBITA].
- Two standard options for making such calculations:
- (1) on an annual basis; or
- (2) on cumulative basis over life of project
 - with no discounting.

2.2.4.2. Sliding-Scale Ad Valorem Royalty with a Fixed Floor Rate...(3)

- Sliding scale royalties should be based upon measure of profit, not price.
 - Change in price not good proxy for change in profitability
 - Because costs often rise at same time as prices.

2.2.4.3 Production Sharing...(1)

- Common in petroleum sector but rare in mining.
- Depending on how production is shared, ISA could receive minimum payment plus additional production should project prove more profitable.

2.2.4.3 Production Sharing...(2)

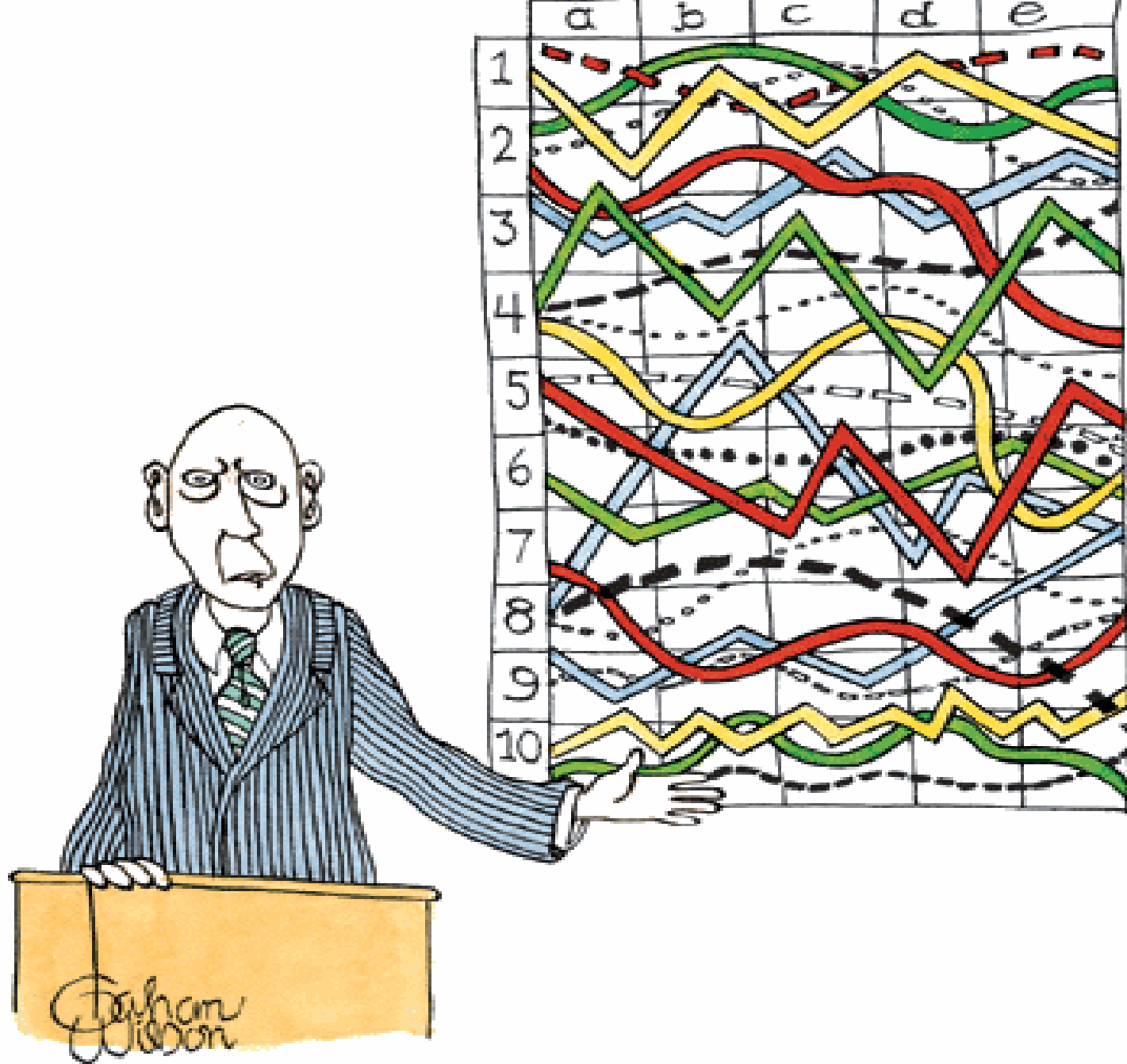
- ISA would retain rights to mineral resources.
- Contractor does not own anything until production.
- Investor-contractor agrees to bear risk, cost, and expense of development.
- ISA and contractor share production.
- If ISA *participates* in production, it may receive portion of total contractor share.

2.2.4.3 Production Sharing...(3)

- Contractor typically sells oil on resource owner's behalf.
- Some agreements have explicit royalty but not always.
- Contractor recovers costs (operating and capital), for example up to 70% of costs (cost oil).
- Contractors pays any corporate income tax on its share of net profit oil to the sponsoring State.
- See Report Appendix for more details.

2.3. Intrinsic Value

- Intrinsic value of metals beyond the 4: not from workshop report but discussed.
 - Raise the royalty rate by very, very amount
 - + credit in price discussed by Ian Potter
 - Same as London workshop result



"I'll pause for a moment so you can let this information sink in."

Thanks! Questions?

