

Received from Greenpeace on 24 November 2020 (10:11hrs)

Please see the attached letter providing you with an opportunity to comment in advance of a planned publication by Greenpeace International on deep sea mining.

In order for us to be able to take your comments into account in finalising the publication, we would need to receive them no later than 27 November 2020 17:00 GMT. Please address any communication to me, using the contact details below.

Yours sincerely,

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Louisa Casson
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Greenpeace: DEME and two other companies' subsidiaries have sought arrangements with Island Developing States to allow these North American and European parent companies to access areas of international seabed 'reserved' for developing nations. Despite calls for disclosure, details of the arrangements between the companies and the governments remain secret, making it difficult to ascertain what benefit, if any, the States will derive from the partnership in return for the risks taken.

GSR: GSR or Global Sea Mineral Resources NV, is the deep-sea exploratory division of the DEME Group, world leader in dredging, marine engineering and environmental remediation.

All contractors working with the International Seabed Authority (ISA or the Authority) are subject to the confidentiality conditions for contracts established by the ISA, as the regulator. GSR complies with these conditions.

However, what is known publicly is that GSR submitted its application for a Plan for Exploration in 2012. Pursuant to article 8 of Annex III of the Law of the Sea Convention (LOSC) and article 15 of the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area, when a contractor applies for its Plan for Exploration, the contract area must be divided into two parts of equal estimated commercial value; the ISA decides which part can be further explored by the contractor, with the other part becoming a reserved area for developing States.

In 2016, the Cook Islands Investment Corporation (CIIC), representing a developing State, applied for the reserved area. Given GSR's familiarity with the relevant contract area, CIIC used GSR's information to apply for its own exploration contract. Following its successful application, CIIC developed a joint venture arrangement (JVA) with GSR to assist with the implementation of its contract according to Best Available Techniques (BAT). GSR is honoured and proud to be partnering with the Cook Islands (CI).

The effective participation of developing States (article 148 of LOSC) and the transfer of technology and scientific knowledge to those States (article 144), is one of the principles governing activities carried out in the Area (legally defined as the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction). One of the ways in which

a transfer of technology may take place is, as established in Section 5 of the Annex to the LOSC Implementation Agreement, through joint-venture agreements for acquiring deep seabed mining technology on fair and reasonable commercial terms and conditions, consistent with the effective protection of intellectual property rights.

To facilitate the acquisition of deep seabed mining technology by developing States and their effective participation in activities in the Area, the Authority may request all or any of the contractors, which can be private companies, and their respective sponsoring State or States, to cooperate with it in facilitating the acquisition of deep seabed mining technology by a developing State or States.

If these provisions did not exist, developing States could be deprived of the opportunity to benefit from deep seabed mining technology and scientific knowledge related to activities in the Area.

Greenpeace: Questions include: Whether sponsoring States such as these Pacific Island nations are expected or able to regulate parent companies like Belgium-based DEME.

GSR: The CI have a long history in seabed minerals due to their large exclusive economic zone (EEZ) of approximately 2,000,000km². Since 1970, various research expeditions have taken place in their EEZ to assess the nature and extent of the polymetallic nodule resource. This led to the development of the Seabed Mining Act and ensuing regulations in 2009.¹ In 2012, the CI government set up the Seabed Minerals Authority tasked with the management and regulation of seabed mineral activity under the jurisdiction of the Cook Islands government.² The 2009 regulations were updated in 2019 and again in 2020, following the lessons learned through stakeholder's consultation and international collaboration with the ISA. Few countries in the world have gained such extensive knowledge on seabed minerals regulations.

Greenpeace: Half of the 16 contracts to explore for minerals in the Pacific's Clarion-Clipperton Zone are now in the hands of just four entities – including three private companies. By working through networks of sub-contractors, partnerships and shell companies, the dominance of Belgian corporate Dredging, Environmental and Marine Engineering NV (DEME), and two others, is not immediately obvious or accountable.

GSR: The contracts for nodule exploration in the CCZ have been approved by the ISA in accordance with requirements set out in and pursuant to the LOSC. GSR complies with these requirements.

The involved entities controlled by DEME and its subsidiaries are not shell companies. They have a specific business purpose and their financial statements, including assets, liabilities, revenues and expenses, among others, are incorporated in the consolidated financial statements of DEME.

Greenpeace: In April 2020, the Belgian deep sea mining company Global Sea Mineral Resources (GSR), owned by DEME, (see below) announced it had signed a memorandum of understanding with Keppel FELS, a subsidiary of Keppel Offshore & Marine, for the development of machinery to “collect, transport and store polymetallic nodules”. Their press release does not mention Keppel's subsidiary OMS, but includes a quote

¹ <https://www.ecolex.org/details/legislation/seabed-minerals-act-2009-lex-faoc152481/>

² <https://www.sbma.gov.ck>

attributed to Aziz Merchant, Executive Director of Keppel Marine and Deepwater Technology Pte Ltd who is elsewhere described as ‘Director of OMS’.

GSR: This is a technical collaboration as described in the press release.³ The mission of GSR is: “Using Best Available Techniques (BAT) and the highest scientific standards, GSR aims to be a global leader in the responsible exploration and exploitation of polymetallic nodules, contributing to the sustainable development of the planet.”⁴ The Keppel group – through its subsidiary OMS – is engaged in the Area. Contractors have a duty to develop the most responsible technologies for the recovery of seabed minerals according to BAT and GSR is very proud of the responsible approach it is taking towards project development.

Greenpeace: G-TEC Sea Mineral Resource had DEME’s Financial Manager for Benelux Operations, Daniel Boen, on its board and used a site owned by the DEME Group for its offices. G-TEC Mineral Resources’ application to the ISA for an exploration contract in 2012, sponsored by Belgium, mentioned the support of an unnamed “Belgian industrial partner”.

GSR: In 2010, given DEME’s 140 years of experience in marine operations and the growing need to obtain responsible sources of minerals, DEME started investigating the potential for deep sea minerals. As this potential new industry would require highly experienced expert personnel to design and operate state-of-the-art, custom-built equipment, DEME began its investigation via a joint venture with Royal IHC, called OceanfLORE. During that time, Kris Van Nijen was acting General Manager and he became acquainted with a variety of seabed mineral projects (e.g., seafloor massive sulphides, polymetallic nodules, iron sands, diamonds, phosphate nodules, metalliferous muds and cobalt crusts).

In 2012, the CEO of the Belgian company G-TEC, geologist Prof. Dr. Lucien Halleux, began exploring the resource potential of polymetallic nodules in the Area and set up the company G-TEC Sea Mineral Resources to apply for a Plan of Work for the exploration of polymetallic nodules at the ISA.

G-TEC and DEME, both Belgian companies, have a long history of working together. For many years, G-TEC has provided services (i.e., geotechnical and geophysical soil investigations) to DEME. Given that DEME had shown an interest in polymetallic nodules, G-TEC requested its technical, logistical and financial support.

In 2014, DEME acquired G-TEC Sea Mineral Resources and renamed it as Global Sea Mineral Resources NV.

Greenpeace: GSR entered into a joint venture arrangement (JVA) for nodules exploration in the international seabed with the Cook Islands Investment Corp (CIIC). CIIC is the Cook Islands State-owned enterprise responsible for holding national state assets. CIIC itself holds the ISA exploration contract, and has subcontracted the delivery of the contract to the JVA. GSR is providing technical expertise and assisting with financing, and is thus involved in the 75,000km² exploration contract area sponsored by the Cook Islands, which fits neatly in between parts of the 75,000km² area

³ <https://www.deme-gsr.com/news/article/press-release-gsr-and-keppel-om-to-collaborate-on-deep-sea-riser-and-mining-vessel-technology/>

⁴ <https://www.deme-gsr.com/about-gsr/>

sponsored by Belgium in the Clarion-Clipperton Zone. Despite this Belgian company's involvement in both areas, GSR's original ISA exploration refers to the "fairness and equitability" whereby the ISA would be able "to allocate one part of the area to GSR and to retain the other part as a reserved area" for a developing nation to apply for. However, as the State sponsoring the contract, the Cook Islands bears full legal responsibility for the performance of the ISA contract and potential liability for any damages that may be caused as a result of those activities – even if, in practice, a third party like GSR is carrying out the work. As CIIC holds government assets, such as the Cook Islands' telecommunications infrastructure, water system and airport, the risk of being sued for liabilities is an issue of high public concern.

GSR: The joint venture arrangement with the CIIC contributes to the implementation of LOSC article 148 in facilitating the effective participation of developing States in the Area.

Under the LOSC, the sponsoring State shall have responsibility to ensure that activities in the Area are carried out in conformity with Part XI of the LOSC and damage caused for failing to carry out its responsibilities under this Part entails liability (Art. 139). The International Tribunal for the Law of the Sea (ITLOS) analyzed this provision in 2011 in its Advisory Opinion of 1 February 2011, concluding that the obligation of sponsoring States is an obligation of "due diligence". The sponsoring State is bound to make best possible efforts to secure compliance by the sponsored contractors. This "due diligence" obligation requires the sponsoring State to take measures within its legal system. These measures must consist of laws and regulations and administrative measures. The applicable standard is that the measures must be "reasonably appropriate".

The Cook Islands has met this through its regulatory system. The Seabed Mining Act of 2019 establishes obligations pertaining to the conduct of seabed mineral activities in the Area in Part 5. Particularly, the Act makes sponsored parties responsible for the performance of all ISA seabed mineral activities carried out within the contract area, as well as for compliance with the rules of the ISA, and makes them directly liable for the actual amount of any compensation, actionable damage to third parties, the environment, penalties arising out of its failure to comply, and out of any acts or omissions in the conduct of the ISA seabed mineral activities (SBMA Article 142).

Greenpeace: Almost a decade before GSR announced its work with Singapore-registered Keppel FELS, GSR's owners DEME set up a deep sea mining company with the Dutch IHC Merwede Holding B.V (known as Royal IHC today), called OceanfLORE, which was originally located in the Netherlands but then moved to Singapore. Press reports indicated OceanfLORE's interest in exploring seabed mining potential within the national waters of Pacific nations, and company staff participated in the Secretariat of the Pacific Community's Deep Sea Minerals (DSM) Project workshops. The DSM Project received funding from the EU, and gave input to regional legal frameworks setting the conditions of collaboration between Pacific nations and contractors for applying for ISA contracts. OceanfLORE does not appear to exist beyond 2016. Senior former OceanfLORE staff (General Manager Kris Van Nijen, Manager for R&D Paul Vercruysse and project engineer Simon Boel) work for DEME's newer deep sea mining company, GSR.

GSR: In 2011, Kris Van Nijen, as general manager of OceanfLORE, was invited by the Pacific Community/DSM Project, as a subject matter expert, to give a talk on Marine Technology and to present marine technologies that are or would be manufactured by the

company.⁵ Neither OceanfLORE, nor Kris Van Nijen has any relationship to the DSM Project.

From 2014 onwards, DEME took over G-TEC Sea Mineral Resources with a specific focus on the ISA contract. Employees that had developed experience with the project under OceanfLORE were moved to GSR.

Greenpeace: As DEME is not a State-owned company, Belgium may never take ownership of any minerals mined [from the international seabed] so would not benefit from their sale.

GSR: The statement on DEME not being a State-owned company is correct. The rest of the statement is not. Given that GSR is a Belgian company, Belgium will benefit from the development of a Blue Economy Ecosystem delivering state-of-the-art research in the deep sea, employment ranging from master's degree students, PhDs, technical and operational expertise, innovation in the offshore marine sector and corporate income tax on future profits. In addition, Chapter 8 of the Belgian law of 17 August 2013 on prospecting, exploration and exploitation of the seabed resources and the ocean floor beyond national jurisdiction, requires contractors to pay a fee for processing the application for a sponsorship certificate and an annual fee for supervision of the activities provided for in the work plan, which is indexed annually according to the consumer price index.

Greenpeace: The private companies dominating deep sea mining exploration also exert a heavy influence over the international negotiations determining the future of the seabed, lobbying governments to urgently finalise rules that would allow for full-scale mining exploitation to begin, with a financial regime that would maximise any corporate profits.

GSR: Twenty countries are now actively engaged in DSM exploration. All have an interest in a clear and settled regulatory regime to govern exploitation, as indeed does humankind as a whole.

The below timeline provides an overview of the step-by-step development of the regulations since 2011, which hardly seems like an urgent effort towards the finalization of the regulations. On the contrary, regulation development has entailed a step-by-step, multi-stakeholder process taking almost 10 years already, including 10 global stakeholder surveys (See Table 1).

In July 2011, the delegation of Fiji, as a member of the Council, highlighted that the ISA had reached a new phase in its existence.⁶ At that time, and since 2001, the ISA had granted several exploration contracts and more recently two exploration contracts had been granted to developing countries (Nauru and Tonga). In order to transition from exploration to exploitation, as per the mandate of the LOSC, the Fijian representative requested the Council to request that the Secretariat deliver a strategic workplan for the development of exploitation regulations. This request was adopted by the Council and marked the start of a transparent, multi-stakeholder participation process. Technical papers, working papers, and written surveys were published, and workshops were held worldwide, addressing the administrative, environmental, legal, technological and financial considerations of a state-of-the-art regulatory framework (Table 1). As far as

⁵ https://dsm.gsd.spc.int/public/files/DSM%20Project%202012%20Annual%20Report_Mar2013%20final.pdf

⁶ https://ran-s3.s3.amazonaws.com/isa.org/im/s3fs-public/files/documents/isba-17c-22_0.pdf

GSR is aware, this is the first time in history that so much thought has been put into regulating an industry that doesn't yet exist.

Table 1 – Developing exploitation regulations

<i>Date</i>	<i>Description/Doc. Number</i>	<i>Content</i>
2011-07	ISBA/17/C/21	+ Council requests Secretariat for a strategic workplan
2012-07	ISBA/18/C/4	+ Workplan for the formulation of regulations
2013-07	ISBA/19/C/5	+ Towards the development of a regulatory framework
2014-02	Working Paper (*)	+ Making the most of deep seabed mineral resources
2014-03	Stakeholder survey #1 (*)	+ Stakeholder survey on exploitation regulations, including financial terms, environmental management, health and safety, stakeholder communication and transparency
2015-03	Stakeholder survey #2	+ Draft framework for the regulation
2015-03	Stakeholder survey #3 (*)	+ A discussion paper on the development and implementation of a payment mechanism
2015-06	Workshop (*)	+ Joint CIL-ISA workshop on the exploitation code and FPR (Singapore)
2015-07	Revision	+ Revised regulation: Developing a regulatory framework
2015-07	ISBA/21/C/16	Priority deliverables (#7) for the development of the exploitation code over the next 12-18 months
2015-10	Workshop (*)	+ Towards transparency and best practices – A multi-stakeholder dialogue (Bellagio)
2016-02	Stakeholder survey #4	+ A first working draft of the regulations and standard contract terms
2016-05	Workshop (*)	+ Deep seabed mining payment regime workshop (San Diego)
2016-05	Workshop	+ ISA-Griffith university in Brisbane on environmental regulations
2016-07	Workshop	+ Enhancing stakeholder participation and transparency (Ocho Rios)
2016-07	Stakeholder survey #5	+ Working draft on exploitation regulations
2016-12	Workshop (*)	+ Deep seabed mining payment regime workshop (London)
2017-01	Stakeholder survey #6	+ A discussion paper on the development and drafting of regulations (Environmental matters)
2017-03	Workshop	+ Towards an ISA environmental management strategy (Berlin)
2017-05	Workshop (*)	+ Deep seabed mining payment regime workshop (Singapore)
2017-08	Stakeholder survey #7	+ Draft regulations
2018-02	ISBA/24/C/CRP.1	+ Briefing note on the submissions to the draft regulations
2018-02	Workshop	+ Draft regulations: Policy, legal and institutional considerations (London)
2018-06	ISBA/24/LTC/WP.1	+ Revised draft regulations
2018-07	ISBA/24/LTC/WP.1/REV.1	+ Revised draft regulations
	Stakeholder survey #8	
2018-11	ISBA/25/C/CRP.1	+ Briefing note on the submission to the draft regulations
2019-03	ISBA/25/C/WP.1	+ Draft regulations submitted to the Council
2019-12	ISBA/26/C/2	+ Comments on the draft regulations
	Stakeholder survey #9	
2019-12	ISBA/26/C/CRP.1	+ Draft regulations on exploitation of mineral resources in the Area Collation of specific drafting suggestions by members of the Council Prepared by the Secretariat
2020-08	Stakeholder survey #10	+ Stakeholder consultations on draft standards and guidelines to support the implementation of the Draft Regulations for Exploitation of mineral resources in the Area

(*) Development of the payment regime

Greenpeace: GSR in particular have been instrumental in influencing the design of a proposal for the ISA's payment regime for contractors. These negotiations began with a

series of small, unofficial, and contractor-dominated workshops during which a financial model was created using inputs from GSR.

GSR: In July 2015, the LTC proposed a list of seven priorities that would enable the development of a regulatory framework for the exploitation of seabed minerals (ISA, 2015a). All priorities considered together would form the basis of the exploitation regulations.

1. *A zero draft of exploitation regulations and standard contract terms;*
2. *Financial modelling for proposed financial terms and payment mechanism;*
3. *Data management strategy and plan;*
4. *Environmental assessment and management;*
5. *Operationalisation of the “Adaptive management approach”;*
6. *Operationalisation of the term “Serious Harm”;*
7. *Rules and principles for responsibility and liability.*

*It is within the context of the second priority that information was gathered via a series of workshops, leading to the identification of apparent research gaps concerning a payment regime (i.e., a “system” and “rate” of payments). According to the LOSC, the payment regime must ensure optimum revenues for the ISA, attract investments and technology to the Area and ensure contractors receive equal treatment and have comparable financial obligations. The regime must have a system of payments to the ISA that is fair to both the contractor and to the ISA. The system should not be complicated and should not impose major administrative costs on the ISA or on contractors. Last but not least, the system should not advantage or disadvantage land-based mining over seabed mining.*⁷

Although different payment regimes exist in the extractive industries within national jurisdictions, no payment regime currently exists in the context of the common heritage of mankind. In addition, more research was required on the level of risk of the project and the resulting minimum economic performance that would be required to attract investment and technology to the Area.

Please find a list of the participants of these workshops in annex. The workshops convened representatives from contractors (32 per cent), industry experts (8 per cent), civil society and academic communities (27 per cent), national governments (17 per cent), and international organizations (16 per cent).

Greenpeace: Subsequently, the ISA Secretariat contracted the Massachusetts Institute of Technology (MIT) to undertake further economic modelling work focused on nodules in the Clarion-Clipperton Zone, which produced recommendations for a royalty rate that appeared to be heavily influenced by the GSR work. The ISA royalty rate that has been proposed from the MIT model, which started at just 2% of the metals’ value, is based largely on private sector arguments about the need for a high internal rate of return for them, in order to incentivise the initial investment required at the outset to start deep sea mining operations.

GSR: In January 2019, MIT published a report that compared four different economic models. The four models were (1) the African Group Model, (2) the China Southern

⁷ LOSC, Part XI, Section 3, Article 150(a) & Annex III, Article 13(1) of the Convention and Annex, Section 8 of the Agreement

*University Model, (3) the German Federal Ministry for Economic Affairs and Energy Model (BMWi), and (4) the MIT Model.*⁸

Greenpeace: A revised financial model presented to governments in February 2020 estimates a majority of any overall profits from a mining operation going to the contractor (54%), with the rest divided between the sponsoring state (18%), an environmental fund (3%) and a quarter to the ISA to cover administrative costs, compensation claims for economic losses from land-based mining States and the equitable distribution to the ISA's 160+ member state governments in a bid to honour the 'common heritage of [hu]mankind'. The African Group, representing 47 nations, have noted this could lead to 'pitiful' pay-outs for developing countries.

GSR: Following the above calculation, the total tax burden for the contractors is 46%, which – according to the LOSC and its Implementing Agreement – should be compared to land-based mining regimes so as not to advantage or disadvantage land-based mining over seabed mining. Therefore, upon a request from the Council of the ISA at its meetings in February 2020, the Secretariat contracted CRU and RMG Consulting in April 2020 to prepare two complementary parts of a comparative analysis of the financial aspects of seabed mining and land-based mining in order to assist the Council to develop an appropriate payment mechanism that would fulfil the requirements of the LOSC and the Agreement relating to the Implementation of Part XI of the LOSC of 10 December 1982.

The above studies identified the average royalty rate(s) and methodology to determine a taxable base that would neither advantage or disadvantage the contractors of the Authority in relation to land-based producers. The study also considered the corporate income tax regimes of major land-based producer jurisdictions and drew a comparison with those of sponsoring States and other States that would be involved in the entire value chain of contractors of the Authority.

On 28 October 2020, the Secretariat of the ISA hosted a webinar to present the findings of the comparative analysis of the financial aspects of seabed mining and land-based mining, as well as the developments of the MIT financial model, as requested by the Council during its last meetings in February 2020. During this webinar, the following reports were presented in anticipation of the fourth meeting of the Open-Ended Working Group (OEWG), which will meet when circumstances allow in 2021:

- i. Report by RMG Consulting*⁹
- ii. Report by CRU International Ltd*¹⁰
- iii. Report by MIT*¹¹
- iv. Joint summary of the reports*¹²

⁸ https://isa.org.jm/files/files/documents/model_comparisons_0.pdf

⁹ <https://isa.org.jm/files/files/documents/20201012-RMGAnlaysia-Rev3-withLinks2.pdf>

¹⁰

https://isa.org.jm/files/files/documents/CRU_ISA%20Polymetallic%20nodule%20valuation%20report_24Aug2020.pdf

¹¹

<https://isa.org.jm/files/files/documents/Nodule%20Financial%20Payment%20System%20Report%20October%202020%20V3.pdf>

¹² <https://isa.org.jm/files/files/documents/Joint-summary-FInalDraft-20201012.pdf>

Table 1 – Participants in Singapore workshop

Joint CIL-ISA Workshop on Mineral Exploitation in the Area ^a		
1	Jalila Binte Abdul Jalil	Maritime Institute of Malaysia (MIMA)
2	Tomasz Andrzej Abramowski	Interoceanmetal Joint Organization
3	Adesina Thompson Adegbie	Nigerian Institute for Oceanography and Marine Research, Lagos
4	Michael Aroi	Department of Foreign & Trade, Republic of Nauru
5	Robert Beckman	Centre for International Law, NUS
6	Erwan Louis Bertevas	Dept of Mechanical Engineering, NUS
7	Marie Bourrel	Secretariat of the Pacific Community
8	Harald Brekke	Norwegian Petroleum Directorate, LTC Member
9	Joshua Brien	Commonwealth Secretariat
10	Christopher Brown	Northwest University of Politics and Law
11	Yongsheng Cai	International Seabed Authority
12	Charlene Chan	Ministry of Foreign Affairs, Singapore
13	Lena Chan	National Parks Board, Singapore
14	Caroline Chang	Keppel Corporation Ltd
15	Denise Cheong	Centre for International Law, NUS
16	Michael Chia	Keppel Offshore and Marine Technology Centre
17	Mandar Anil Chitre	Tropical Marine Science Institute, NUS
18	Yean Khow Chow	Keppel-NUS Corporate Lab, NUS
19	Kelvin Chua	Keppel Corporation Ltd
20	Annabel Chua	Ministry of Trade and Industry, Singapore
21	Gerard Cockx	Royal Embassy of Belgium in Singapore
22	Duncan Currie	Globelaw
23	Zongyu He	China Ocean Mineral Resources Research & Development Association
24	Michael John Henry	Cook Island Investment Corporation
25	Robert Heydon	Offshore Mining Council
26	Russell Howorth	Matadrevula Advisory Services
27	Anis Hussain	Keppel Offshore and Marine Technology Centre
28	Ruria Iteraera	Ministry of Fisheries and Marine Resources Development
29	Amit Jain	Keppel Offshore and Marine Technology Centre
30	Bharath Kalyan	Tropical Marine Science Institute, NUS
31	Lara Kamal	Keppel Offshore and Marine Technology Centre
32	Natsumi Kamiya	JOGMEC
33	John Khoo	Ministry of Foreign Affairs, Singapore
34	Tommy Koh	Centre for International Law, NUS
35	Boon Poh Koh	Singapore Telecommunications Limited
36	Choon Shiong Kuan	Singapore Telecommunications Limited
37	Ee Yoon Kuet	Pacific Radiance
38	Sreekala Kumar	Keppel Offshore and Marine Technology Centre
39	Cao Khao Le	Dept of Mechanical Engineering, NUS
40	Rena Lee	Attorney-General's Chambers, Singapore
41	Yan Li	Central South University
42	Mingcheng Lim	Keppel Corporation Ltd
43	Delphia Lim	Ministry of Law, Singapore

44	Vanessa Lim	Ministry of the Environment and Water Resources, Singapore
45	Swee Cheng Lim	Tropical Marine Science Institute, NUS
46	Michael Lin	Attorney-General's Chambers, Singapore
47	Yuan Lin	Dept of Mechanical Engineering, NUS
48	Shaojun Liu	Central South University
49	Michael Lodge	International Seabed Authority
50	Pascal Loubière	Institut Français de Singapour, French Embassy
51	Jeffrey Low	National Parks Board, Singapore
52	James Jonathan Lowe	Nautilus Minerals (Tonga Offshore Mining Limited)
53	Youna Lyons	Centre for International Law, NUS
54	Sudhakar Maruthadu	Ministry of Earth Sciences
55	Aziz Merchant	Keppel Offshore and Marine Technology Centre
56	Nickolas Merritt	Norton Rose Fulbright (Asia) LLP
57	Erik Daniel Millet	DNV GL
58	Phan-Thien Nhan	Dept of Mechanical Engineering, NUS
59	Juhairul Marzuk Nizamudeen	Ministry of Foreign Affairs, Singapore
60	Joanna Kathleen O'Shea	Australian Department of Foreign Affairs and Trade
61	Nii Allotey Odunton	International Seabed Authority
62	Ye Kung Ong	Keppel Corporation Ltd
63	Juan Pablo Paniego	Legal and Technical Commission, ISA
64	Angela Png	Maritime Port of Authority, Singapore
65	Michael James Pollen	Jones Day
66	Steven William Potter	Jones Day
67	Bertrand Camille Robert Pous	Institut Français de Singapour, French Embassy
68	Vijayan Rajan	Minerals and Geoscience Malaysia
69	Linda Reiners	UK Seabed Resources
70	J Ashley Roach	Centre for International Law, NUS
71	Dominic Roughton	Herbert Smith Freehills
72	Alejandro Javier Salas Montelongo	ProMéxico – Trade Commission of Mexico in Singapore
73	Zhixiang Seow	Attorney-General's Chambers, Singapore
74	Hitoshi Shimoda	Deep Ocean Resources Development Co., Ltd. (DORD)
75	Pui Ming Soh	Ernst & Young, Singapore
76	Romeo Spimelli	JS Capital Power
77	Koh Siang Tan	Tropical Marine Science Institute, NUS
78	Luke Tang	Attorney-General's Chambers, Singapore
79	Paul Makameone Taumoepeau	Tonga Offshore Mining Limited
80	Ian Richard Teare	Norton Rose Fulbright (Asia) LLP
81	Paul Tham	Keppel Corporation Ltd
82	Ho Xuan Thinh	Dept of Mechanical Engineering, NUS
83	Duc Thien Tran	Dept of Mechanical Engineering, NUS
84	Karenne Tun	National Parks Board, Singapore
85	Christine Valentin	World Ocean Council (WOC)
86	Kris Van Nijen	Global Sea Mineral Resources
87	Philomène Verlaan	University of Hawai'i
88	Rong Wang	Keppel Offshore and Marine Technology Centre
89	Jennifer Warren	UK Seabed Resources
90	Douglas Ian Wilson	Foreign and Commonwealth Office, UK

91	Yang Yang	Singapore Maritime Institute
92	Meng Fai Yue	Singapore Telecommunications Limited
93	Daniel Zhang	Singapore Maritime Institute

^a CIL is the Center for International Law of the National University of Singapore

Table 2 – Participants in Bellagio workshop

Toward Transparency and Best Practices for Deep Seabed Mining: An Initial Multi-Stakeholder Meeting		
1	Tariq Al Barwani	Mawarid Mining
2	Jeff Ardron	Commonwealth Secretariat
3	David Batker	Earth Economics
4	Duncan Currie	Globelaw / Deep Sea Conservation Coalition
5	Gillian Davidson	World Economic Forum
6	Nishan Degnarain	Mauritius Government
7	Paul De Morgan	Resolve
8	Kaiser de Souza	United Nations Economic Commission for Africa
9	Stephen D'Esposito	Resolve
10	Mariah Grubb	Resolve
11	Mike Johnston	Nautilus Minerals
12	Anisa Kamadoli Costa	Tiffany & Co. Foundation
13	Lisa Levin	Scripps Institution of Oceanography
14	Michael Lodge	International Seabed Authority
15	Paul Lynch	Cook Islands Seabed Minerals Authority
16	Chris Mann	Pew Charitable Trusts
17	Scott Moore	Council on Foreign Relations
18	Linda Reiners	UK Seabed Resources
19	Kathy Segerson	University of Connecticut
20	Romeo Spinelli	JS Capital Power
21	Dale Squires	University of California – San Diego
22	Sebastian Unger	Institute for Advanced Sustainability Studies, Potsdam
23	Kris Van Nijen	Global Sea Mineral Resources

Table 3 – Participants in San Diego workshop

Deep Seabed Mining Payment Regime Workshop No. 1: The Design of a Payment Regime		
1	Harald Brekke	Norwegian Petroleum Directorate, LTC member
2	Chris Brown	Northwest University of Politics and Law
3	Margaret Brownjohn	Process Engineer and Development Economist
4	Paul Demorgan	Resolve
5	Kaiser de Souza	United Nations Economic Commission for Africa
6	Marc Jacobsen	UCSD Economics
7	Norman Kaneshiro	UK Seabed Resources
8	Lisa Levin	Scripps Institution of Oceanography
9	Michael Lodge	International Seabed Authority
10	Jonathan Lowe	Nautilus Minerals
11	Pedro Madureira	EMEPC Portugal, LTC member
12	Theophile Ndougsa Mbarga	University of Yaoundé, Ministry of Mines, Industry & Technology Cameroon, LTC member

13	Ekpen Omanbude	Commonwealth Secretariat
14	Anthony Rogers	Pew Charitable Trusts
15	Kathy Segerson	University of Connecticut
16	Ralph Spickermann	UK Seabed Resources
17	Dale Squires	UCSD Economics
18	John Stevens	UK Seabed Resources
19	Kris Van Nijen	Global Sea Mineral Resources
20	Daniel Wilde	Commonwealth Secretariat

Table 4 – Participants in London workshop

Deep Seabed Mining Payment Regime Workshop No. 2: Cost Components of a Financial Model		
1	Pater Balaz	Interoceanmetal Joint Organization
2	Maya Breitburg-Smith	Resolve
3	Harald Brekke	Norwegian Petroleum Directorate, LTC member
4	Chris Brown	International Seabed Authority
5	Paul De Morgan	Resolve
6	Robert Heydon	Nauru Ocean Resources Inc.
7	Peter Jantzen	Capital Power Management, Ltd (UK)
8	Norman Kaneshiro	UK Seabed Resources
9	Michael Lodge	International Seabed Authority
10	Kurt Machetanz	LBEG, Germany
11	Pedro Madureira	EMEPC, Portugal
12	Aziz Merchant	Keppel Offshore & Marine Technology Centre and Ocean Mineral Singapore
13	Conn Nugent	Pew Charitable Trusts
14	Petero Okotai	Cook Islands Investment Corporation
15	John Parianos	Tonga Offshore Mining Limited
16	Anthony Rogers	Pew Charitable Trusts
17	Carsten Rühlemann	Federal Institute for Geosciences and Natural Resources (BGR)
18	Dale Squires	UCSD Economics
19	John Stevens	UK Seabed Resources Ltd.
20	Kris Van Nijen	Global Sea Mineral Resources
21	Philomène Verlaan	University of Hawaii
22	Xiangxin Xu	COMRA

Table 5 – Participants in Singapore workshop

Deep Seabed Mining Payment Regime Workshop No. 3: Developing a Financial Modeling Framework		
1	Nabha Battul	Ministry of Trade and Industry, Singapore
2	Harald Brekke	Norwegian Petroleum Directorate, LTC member
3	Chris Brown	International Seabed Authority
4	Georgy A. Cherkashev	VNIIOkeangeologia
5	Duncan Currie	Deep Sea Conservation Coalition
6	Kaiser de Souza	United Nations Economic Commission for Africa
7	Robert Heydon	Nauru Ocean Resources Inc.
8	Sup Hong	Korea Institute of Ocean Science and Technology

9	Tadayuki Ishiyama	Deep Ocean Resources Development Co., Ltd
10	Peter Jantzen	Capital Power Management Ltd (UK)
11	Ji Yingfan	China Ocean Mineral Resource R&D Association
12	Megan Jungwiwattanaporn	Pew Charitable Trusts
13	Lara Zalena Kamal	Ocean Mineral Singapore
14	Norman Kaneshiro	UK Seabed Resources Ltd.
15	Gopakumar Kuttikrishnan	NIOT/MoES, Govt of India
16	Chivy Li	Ministry of Foreign Affairs, Singapore
17	Liu Feng	China Ocean Mineral Resource R&D Association
18	Liu Shaojun	Central South University China
19	Aziz Merchant	Keppel Offshore & Marine Technology Centre
20	Petero Okotai	Cook Islands Investment Corporation
21	John Parianos	Tonga Offshore Mining Limited
22	Ian Potter	Lion City Capital
23	Winnie Roberts	Pew Charitable Trusts
24	Carsten Rühlemann	Federal Institute for Geosciences and Natural Resources (BGR)
25	Rahul Sharma	CSIR-National Institute of Oceanography, Dona Paula, Goa, India
26	Samantha Smith	Blue Globe Solutions
27	Dale Squires	UCSD Economics
28	Ambassador Karen Tan	Ministry of Foreign Affairs, Singapore
29	Torsten Thiele	LSE Institute of Global Affairs
30	Laura Bartock	Resolve
31	Kris Van Nijen	Global Sea Mineral Resources
32	Philomène Verlaan	Sargasso Sea Commission
33	Wang Rong	Ocean Minerals Singapore
34	Jennifer Warren	UK Seabed Resources Ltd.
35	Daniel Wilde	Commonwealth Secretariat
36	Xue Julia	Centre for Polar and Deep Ocean Development, Shanghai Jiao Tong University
37	Zhang Baozhong	Changsha Research Institute of Mining and Metallurgy Co., LTD.
38	Zhuo Xiaojun	China Minmetals Corporation
