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**WORKSHOP ON**

**PROCESSING TECHNOLOGIES, METAL RECOVERIES & ECONOMIC FEASIBILITY OF DEEP SEA MINING**

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Jointly organized by the International Seabed Authority, Kingston,  
Jamaica;

Interoceanmetal Joint Organization (IOM)  
(Bulgaria, Cuba, Czech Republic, Russian Federation, Slovak Republic and Poland), &  
Ministry of the Environment, Republic of Poland

**AGENDA**



**Warsaw, at the Ministry of the Environment**  
**3 to 6 September 2018**

## MONDAY 3 SEPTEMBER 2018

08:30 – 09:30	Registration
09:30 – 09:45	Inaugural Address <a href="#">Hon. Minister Mr. Mariusz Orion Jedrysek, Government of Poland</a>
09:45 – 09:55	Welcoming remarks <a href="#">Dr. Tomasz Abramowski, Director-General, IOM</a>
09:55 – 10:05	Introduction <a href="#">Mr. Michael Lodge, Secretary-General (video), International Seabed Authority</a>
10:05 – 10:30	Introduction of the participants <a href="#">Participants</a>
10:30 – 10:50	DeepGreen processing technologies from an environmental perspective <a href="#">Dr. Jeffrey Donald, DeepGreen Metals</a>
10:50 – 11:10	<b>COFFEE BREAK</b>
11:10 – 11:30	<b>Group Photograph</b>
11:30 – 11:50	International cooperation, regulations, and the role of the ISA as regulator <a href="#">Mr. Thembile E. Joyini, South Africa</a>
11:50 – 12:10	National experience of alternative payment systems, a case study from Chile <a href="#">Mr. Sergio Hernandez Nunez, Chile</a>
<b>I.</b>	<b>R&amp;D in metallurgical processes, including functional materials, ore pre-treatment, metal recovery, energy utilization &amp; waste disposal [Moderator: Georgy Cherkashov, Rapporteur: Hong Vu]</b>
12:10 – 12:30	Potential alternative utilization of manganese nodules <a href="#">Prof. Ng. Hong Vu, Czech Republic</a>
12:30 – 12:50	Smelting of polymetallic nodules in electric furnace – results from laboratory tests <a href="#">Dr. Andrzej Chmielarz and Dr. Tomasz Sak</a>

## **CONTRACTORS' EFFORTS**

12:50 – 13:50

### **LUNCH BREAK**

13:50 – 14:10

#### **IOM**

Identification and determination of complexity factors encountered in marine minerals processing, influencing world metal markets.

[Mr. Mario Cabello \[Caribbean Nickel SA\]](#)

14:10 – 14:30

Status and prospect of polymetallic nodules process development in Korea

[Dr. Kyungho Park, Republic of Korea](#)

14:30 – 14:50

Process consideration and economic evaluation of polymetallic nodule by DORD

[Mr. Tadayuki Ishiyama, DORD](#)

14:50 – 15:10

[Representative, GSR](#)

15:10 – 15:30

### **COFFEE BREAK**

15:30 - 15:50

Metallurgical Processing of Manganese Nodules – Indian Perspective

[Dr. Sanjay Kali, MOES](#)

15:50 – 16:10

Hydrometallurgical Processing of Polymetallic Nodules from the Clarion Clipperton Zone (CCZ)

[Dr. David Dreisinger, UKSRL](#)

16:10 – 16:30

[Representative, YUZHMOREGEOLOGIYA](#)

16:30 – 16:50

JOGMEC's activities on processing and metallurgy for CFC

[Dr. Nobuyuki Okamoto, JOGMEC](#)

16:50 – 18:00

Formulation of three Working Groups

18:30 – 21:00

### **COCKTAIL RECEPTION (ISA)**

**TUESDAY 4 SEPTEMBER 2018**  
**CONTRACTORS' EFFORTS**

09:00 – 09:20	Representative, BGR
09:20 – 09:40	Representative, NORI
09:40 – 10:00	Representative, COMRA
10:00 – 10:20	Representative, China Minmetals Corporation
10:20 – 10:40	The influence of Metals Processing Economics on the choice of a Financial Payment Mechanism for DSM polymetallic nodules Dr. Richard Roth
10:40 – 11:10	<b>COFFEE BREAK</b>

**II. ECONOMIC FEASIBILITY OF DEEP SEABED MINING, including product market, cost model from deep sea mining to shipment to land, cost analysis for metallurgical process, techno-economics and venture comparison study to terrestrial resource exploitation [Moderator: Richard Roth, Rapporteur: Harald Brekke/Mario Juan A. Aurelio]**

11:10 – 11:30	Determination of uncertainties in economic models and searching for ways to eliminate them Mr. Peter Balaz [IOM]
11:30 – 13:00	<b>Working Group 1:</b> would address the overview of R & D in processing technologies and metal recovery, comprehensive utilization and waste disposal. Nobuyuki Okamoto (Chairperson), Sanjay Kali (Rapporteur), Georgy Cherkashov, Hong Vu, Piotr Nowak  <b>Working Group 2:</b> would address the economic feasibility issues such as economic consequences of different processing options, the cost model, global metal market, supply and demand, techno-economic feasibility & venture comparison. Richard Roth (Chairperson), Peter Balaz (Rapporteur), Pratima Jauhari, Harald Brekke, Tomasz Abramowski  <b>Working Group 3:</b> would determine environmental concern including the waste disposal issue, processing plant location choice and determination Sandor Mulsow (Chairperson), Jeffrey Donald (Rapporteur), Sergio Hernandez, Thembile E. Joyini

13:00 – 14: 00	<b>LUNCH BREAK</b>
14:10 – 15:00	<b>Working Groups Resume</b>
15:00 – 15:20	<b>COFFEE BREAK</b>
15:20 – 16:30	<b>Working Groups report</b> to the plenary
16:30 – 18:00	Concluding Remarks <a href="#">ISA and IOM</a>

### **WEDNESDAY 5 SEPTEMBER 2018**

08:00	Depart from Warsaw
13:00 - 14:00	Arrive in Glogów; lunch in Copper Smelter
14:00	Begin visit at Glogów Copper Smelter
15:30	End of visit; drive to Qubus Hotel
17:00	Depart from Qubus Hotel
17:30	Dinner in Lesna Dolina tavern
	Overnight in Glogów (Qubus Hotel)

Please note that attendees should wear casual clothes (sport shoes recommended, preferably coloured).

### **THURSDAY 6 SEPTEMBER 2018**

09:00	Depart from Glogów
14:00	Arrive in Warsaw