

- **Benefits of the sponsoring state - Belgium**
GSR's perspective



07/08/2019

Nauru Island

Céline Taymans



GSR

Global Sea Mineral Resources



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Ecosystem of an emerging industry in Belgium





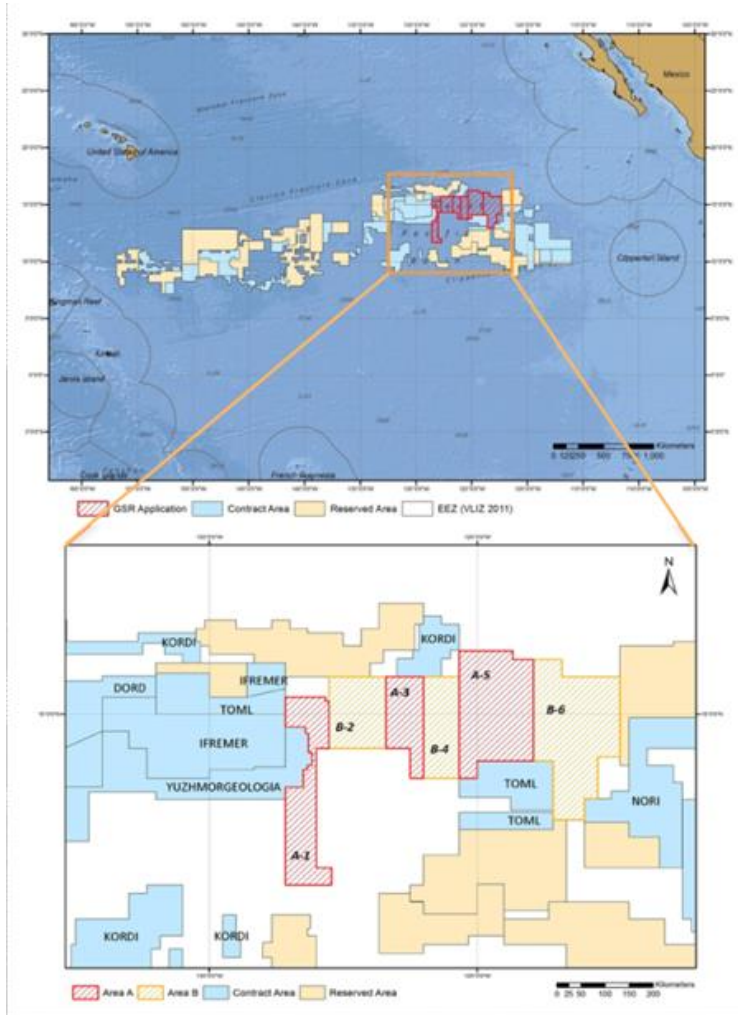
The Group can build on more than 140 years of know-how and experience and has fostered a pioneering approach throughout its history, being a front runner in innovation and new technologies. Although DEME's activities originated with its core dredging business, the portfolio diversified substantially over the decades. DEME's vision is to work towards a sustainable future by offering solutions for global, worldwide challenges: rising sea levels, climate change, the transition towards renewable energy, polluted rivers and soils, growing population and the scarcity of natural resources.

www.deme-group.com

GSR – Benefits to sponsoring state| The company




GSR – Benefits to sponsoring state| The company



- Global Sea Mineral Resources (“GSR”) is a privately owned concessionaire with exclusive control over 75,000 km² of seabed located in the Pacific Ocean.
- GSR has 100% control over GSR for a period of 15 years; during that period GSR has the exclusive right for exploration and a Right of First Refusal for exploitation.
- GSR has obtained approval of a plan of work including environmental baseline monitoring :
 - ▶ **2014 – 2015:** Execution of the first (GSRNOD14) and second (GSRNOD15) GSR Offshore Expeditions for baseline studies (Environment & Resource definition);
 - ▶ **2017:** Execution of the third offshore campaign GSRNOD17 with PATANIA I;
 - ▶ **2018:** Execution of the fourth offshore campaign in the CIIC License Area;
 - ▶ **2018:** Submission of the Environmental Impact Statement relating to the 2019 Patania II Disturbance Experiment (Joint Programming Initiative Healthy and Productive Seas and Oceans – JPIO II);
 - ▶ **2018:** Development, construction and test of the pre-prototype collector PATANIA II.





GSR
Global Sea Mineral Resources

RESPONSIBLE MARINE RESOURCE HARVESTING

As the world continues to see the devastating impact of global warming, the DEME Group feels that it is vitally important to address this issue by providing pragmatic solutions.

Therefore the company established its in-house, marine resource harvesting specialist Global Sea Mineral Resources (GSR). This pioneering company aims to develop technological and environmental deep sea mining expertise to contribute to the sustainable development of our planet.

Why do we need to consider marine resource harvesting?

DRIVING DEMAND

Phase-out of fossil fuel
The G7 leaders have agreed to phase out fossil fuel by 2100. WWF promotes 100 % renewable energy by 2050. Today renewables make up 9.57% of the global energy mix.

Rise in renewable energy infrastructure and storage
Decreasing the world's dependence on fossil fuel increases dependence on minerals. A 2017 World Bank Report highlights those minerals expected to see heightened demand include (amongst others): cobalt, copper, manganese, nickel and molybdenum. Exponential demand for electrical cars will put an enormous pressure on nickel-manganese-cobalt (NMC) batteries.

Declining land-based mineral resources & more expensive extraction
Meanwhile, conventional land-based mining deposits have been exploited for decades, if not centuries. The quality of ore on land is declining, thereby increasing the amount of energy and water required for exploitation. Future land-based deposits will be more difficult and expensive to extract.

DRIVING SUPPLY

THE DEME VISION

Introducing GSR, 'Global Sea Mineral Resources'

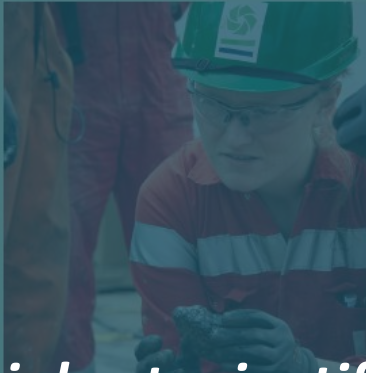
One approach to mitigate the impact of these challenges is to explore the potential of deep sea mineral resources.


In 2013, the International Seabed Authority (ISA) and GSR signed a 15-year contract for the prospecting and exploration for polymetallic nodules. Under the contract, GSR has exclusive rights to explore 76,728 square kilometers of seabed in the Central Pacific Ocean.

As GSR will require a minimum nodule abundance to obtain commercial production, only a fraction of the nodules will be allocated as a precautionary measure to safeguard local ecosystems and provide sources for local resource regeneration.


GSR is supporting the development of the regulations for responsible seabed mining, including environmental impact assessments, financially acceptable financial payment systems, and a resource administrator (ISA) and its member states.

It is DEME's belief that responsible seabed mining has the potential to contribute to future metal demand and eliminate the worst performing land-based mines, reducing humankind's footprint on the planet. As future seabed mining will be carried out in an operationally controlled, monitored and environmentally responsible way, DEME believes it can make a significant contribution to the global challenges we face in maintaining balanced and healthy ecosystems.





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Global Sea Mineral Resources



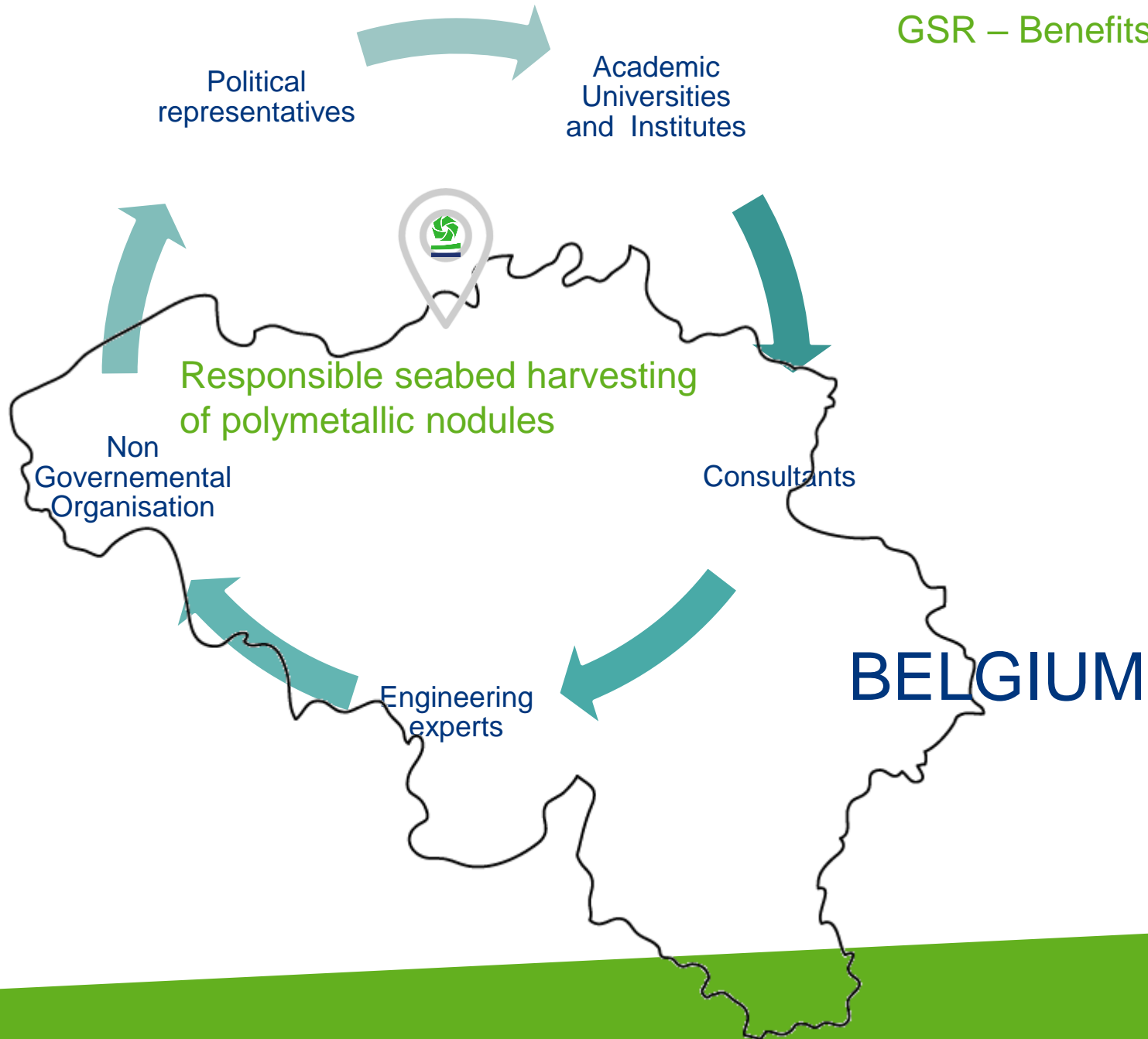
DEME
Dredging, Environmental & Marine Engineering

Creating land for the future

“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.”



GSR – Benefits to sponsoring state| Ecosystem





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Belgian Partners & benefits



► **Academic collaboration, working in a transparent manner**

■ University of Ghent :

- › Benthic biological communities : Marine Biology Group
- › Marine Geology in Abyssal Plains : Renard Centre of Marine Geology | Alphonse Renard, part of the HMS Challenger expedition
- › Life Cycle Assessment : Faculty of Bioscience Engineering
- › International law : Faculty of law and criminology



Access to unique research questions, unique data and unique position via GSR

■ University of Liège :

- › Mineralogy and metallurgy



■ University of Leuven :

- › Metal needs forecast



► **Consultants**

■ Abs-Int :

 › International and national Access and Benefit-Sharing legislation

■ International Marine & Dredging Consultants :

 IMDC › Hydrodynamic & sediment plume expertise

■ RDC Environment :

 › Life cycle assessment

■ Flanders Hydraulic Research center :

 › Testing & modelling of water dynamic expertise

■ G-Tec :

 **G-tec** › Geographical Information System, database management expertise
Experts in Geo-Engineering

*Access to unique,
challenging themes
and state of the art
innovation offered by
GSR*



► **Technical collaboration**

- DotOcean :

 **DotOcean** › *In situ* bearing strength investigation expertise
nautical innovations

- De Meyer :

 **DE MEYER** › Mechanical engineering expertise
MASTERS IN MECHANICS

- NumFlo :

 **NUMFLO** › Computational Fluid Dynamics simulations expertise



- Maintenance Partners :
› Rotating, Turbomachinery engineering expertise

- DSG Belgium :

 **DSG** › Medium and high voltage installations expertise

*Access to unique,
challenging themes
and state of the art
innovation offered by
GSR*

► **Public society involvement**

■ NGOs

- › WWF
- › Greenpeace Belgium
- › Seas At Risk
- › Pew Charitable Trusts
- › Deep Sea Conservation Coalition
- › Natuurpunt

→ Offer the possibility to foster an open debate,
with all stakeholders engaged

→ Brussels, June 5th 2018

→ Brussels, September 27th 2018



► **Political representatives in Belgium**

- Federal Public Service Public Health, Food Chain Safety and Environment
- Federal Public Service Economy, SMEs, Self-Employed and Energy
- Federal Public Service Foreign Affairs
- Federal Public Planning Service Science Policy
 - ➔ Position paper on the need of 3 independent experts
 - ➔ Position paper on the election of the LTC member
 - ➔ Position paper on public participation

Unique interaction and discussion with the ISA via its position of sponsoring state



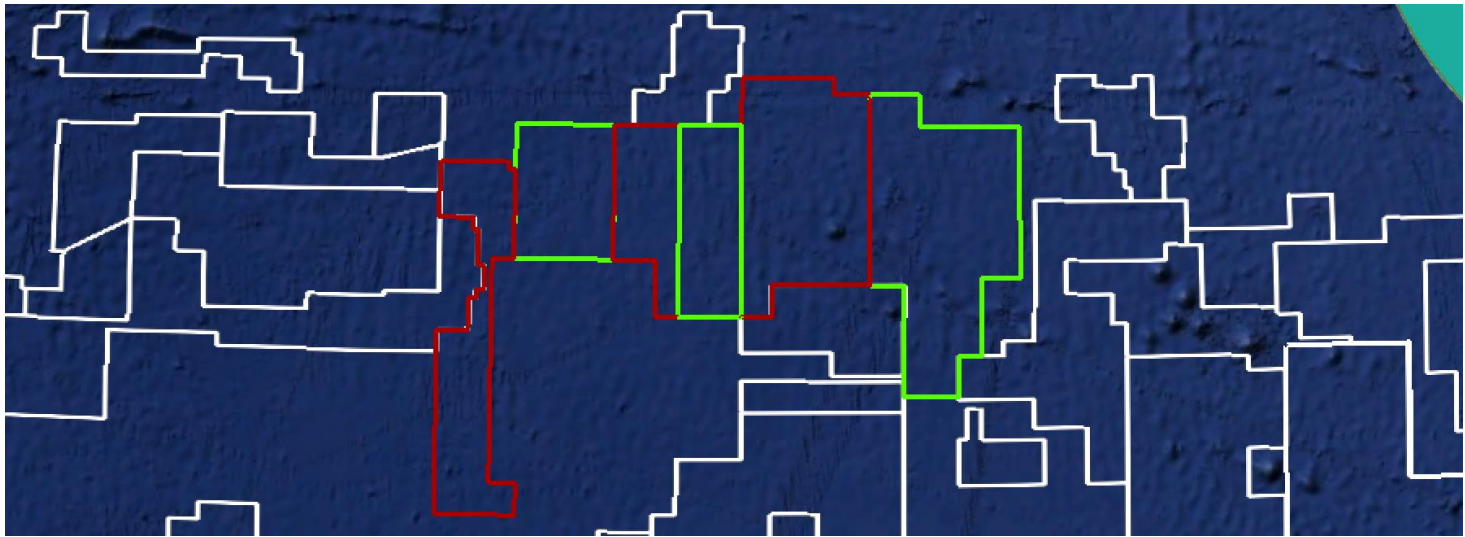
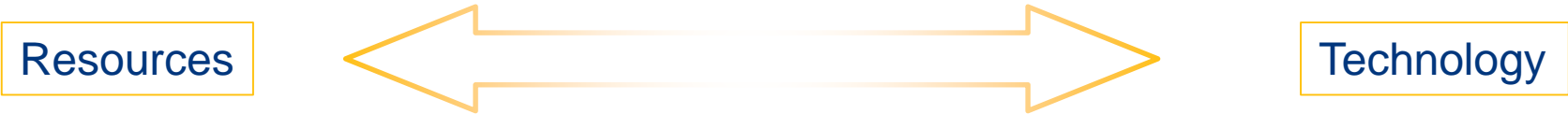


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Collaboration with the Cook Islands



GSR – Benefits to sponsoring state | Cook Islands



July 2016



► Benefits under exploration

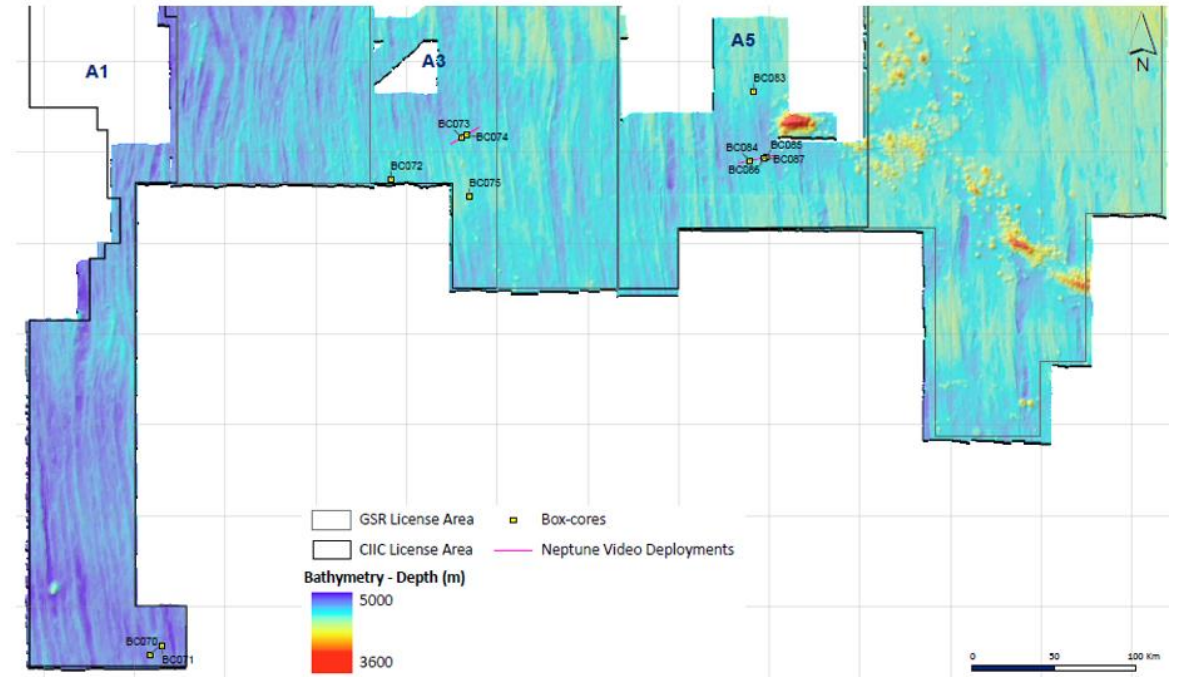
- Exploration work in the CCZ carried by GSR

- › CIIC[GSR]NOD18 : First campaign in the CIIC blocks of the CCZ | Multibeam data, boxcores data

- Capacity building

- › Mr. Eusenio Fatialofa, an engineer from the CI, welcomed during the two technology offshore campaigns | During the deployments of Patania (GSRNOD17) and Patania II (GSRNOD19 - Postponed)

- › Training program with the ISA | Ten capacity-building program to be set up per 5 years





HOW CAN THE WORLD MEET AN INCREASING METAL DEMAND, IN THE MOST ENVIRONMENTALLY RESPONSIBLE MANNER?

www.deme-group.com/GSR

