LEGAL ORDER IN THE WORLD’S OCEANS

UN Convention on the Law of the Sea

Fostering Technological Change for Sustainable Harvesting of Ocean Mineral Resources in a Volatile Global Environment
Introduction

DEME NV
Belgium

Creating land for the future by providing sustainable solutions for the global threats and challenges.

Kris Van Nijen
General Manager
Global Sea Mineral Resources
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Introduction | Business

Suez Canal Expansion Project

Egypt
Introduction

Business

Widening and deepening Panama Canal

Panama
Introduction | Annual Turnover

<table>
<thead>
<tr>
<th>Year</th>
<th>Turnover (€ Millions)</th>
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Marine mineral resources

"About 71 percent of the earth’s surface is water-covered" [USGS]
Marine mineral resources

- Iron sands
- Diamonds
- Phosphate
- SMS
- Nodules
- Crust
- Hydrates
“Nodules in the Pacific Ocean have more Mn, Ni, Mo and Co than the entire global terrestrial reserve base for those metals.” [Hein et al., 2012]
Supply & Demand
Increasing metal demand

Video | How can the world meet an increasing metal demand, in the most environmentally sustainable manner?
Project development
Northwind wind farm

Belgian Coast
Exploration for polymetallic nodules
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-1B 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.
Exploration for polymetallic nodules | Expeditions
Exploitation of polymetallic nodules

~ Technological Change
Technological Change | Offshore Drilling & Production

Worldwide Progression of Water Depth Capabilities for Offshore Drilling & Production (Data as of March 2015)

Legend:
- Platform/Floaters
- Exploration
- Subsea

Denotes Current World Record

Notes: 1. Assistance from Quest Offshore Resources, Inc. (www.questoff.com)

COURTESY: WOOD GROUP WESTCRAFT
Technological Change | Offshore Wind
Regulation
• Polymetallic Nodules have a great potential, but will require a continuum of investor types willing to:
  ✓ Take higher risk than norm in different phases
  ✓ Demonstrate considerable patience before seeing return

• Investors will require:
  ✓ Certainty (Access)
  ✓ Stability (Regulations)
  ✓ A Rate of Return on their investment consistent with the risk they are taking

• Reducing risk will increase likelihood of attracting stable investment
“Competitiveness, as measured by market share, is based on costs of production, including the costs as regulatory requirements and royalties.” (Tilton)

- Cost of production
- Royalty regime
- Environmental cost
- Tenure duration
- Sponsoring State?
- Income tax in Sponsoring State?

Increase costs, decrease Internal Rate of Return (IRR), potentially below the hurdle rate.
(A hurdle rate is the minimum rate of return on an investment required in order to compensate for the risk. The riskier the project, the higher the hurdle rate.)
Questions?

Thank you