SPACE & OCEAN: NEW ECONOMIC FRONTIERS?

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Space and Ocean Today…

Exploration
Exploitation
But this all started by mapping the stars…

Pedro de Medina (1555), L’Arte del Navigar

William Cunnigham (1559), The Cosmographical
Space and Ocean...

John Selller (1694), Practical Navigation
An Introduction to the Whole Art

Fra Mauro da Firenze (1534), Sphera Volgare
Novamente Tradotta
Today’s space economy:
Around USD 280 billion

…With a transformation of the sector
Ocean-based industries’ value-added to double (from USD 1.5 to 3 trillion) by 2030

USD 3 000 000 000 000

OCDE (2016), The Ocean Economy to 2030
## Vibrant ocean-based industries

<table>
<thead>
<tr>
<th>Established ocean-based industries</th>
<th>Emerging ocean-based industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial capture fisheries</td>
<td>Industrial marine aquaculture</td>
</tr>
<tr>
<td>Industrial seafood processing</td>
<td>Deep- and ultra-deep water oil and gas</td>
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<tr>
<td>Shipping</td>
<td>Offshore wind energy</td>
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<tr>
<td>Port activities</td>
<td>Ocean renewable energy</td>
</tr>
<tr>
<td>Shipbuilding</td>
<td>Marine and seabed mining</td>
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<tr>
<td>Offshore oil and gas (shallow water)</td>
<td>Maritime safety and surveillance</td>
</tr>
<tr>
<td>Marine manufacturing and construction</td>
<td>Marine biotechnology</td>
</tr>
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<td>Maritime and coastal tourism</td>
<td>High-tech marine products and services</td>
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<td>Marine business services</td>
<td>Others</td>
</tr>
<tr>
<td>Marine R&amp;D and education</td>
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<tr>
<td>Dredging</td>
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</tbody>
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Ocean-based industries’ value-added to double (from USD 1.5 to 3 trillion) by 2030

Today’s Ocean Economy: An Interactive, Interdependent System

- **Ocean Economy**
  - **Ocean-based industries**
    - Market flows and services
    - Physical capital stock ocean-based industries
  - **Marine ecosystems**
    - Non-market flows and services
    - Natural capital assets

… “business-as-usual growth of economic activities in the ocean is not an option for the future”

We need to know more!
Global Ocean Observing System: Operational and funding sustainability
Disruptive innovations that fundamentally shift knowledge acquisition and industry practices...

Tomorrow’s intelligent ship

E-navigation

Subsea robotics

Bio- & nanotechnology

Source: Rolls-Royce, SINTEF, Subsea robotics, Society Biological Engineering.
... And emerging and new patterns of collaboration in ocean R&D appearing...

Ongoing OECD exploration of innovation networks in the ocean economy

Source: OpenInnovation.eu, 2017
Three areas for action based on a number of in-depth case studies:

1) approaches that could produce win-win outcomes for ocean business and the ocean environment across a range of marine and maritime applications;

2) the creation of ocean-economy innovation networks;

3) new initiatives to improve measurement of the ocean economy.
Ocean – Space

• New Economic frontiers?
  – Numerous challenges but also opportunities
  – Still a need to reinforce the links between the space and marine/maritime communities…

• Improved ocean management and governance – including in the Atlantic – require ever more science… and adequate sustained observing tools