



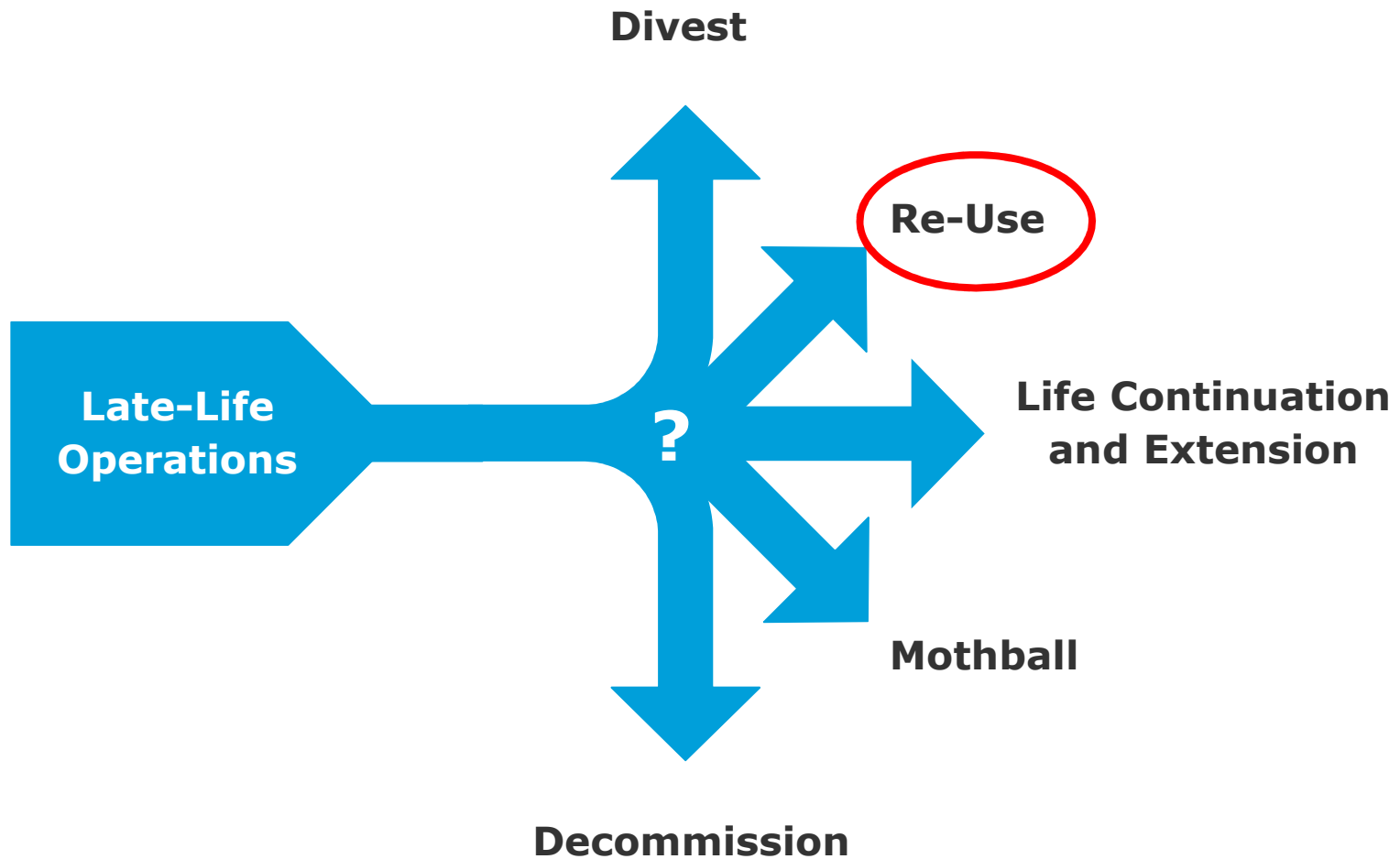
**Decommissioning offshore –
thinking out of the box**

Tobias Rosenbaum

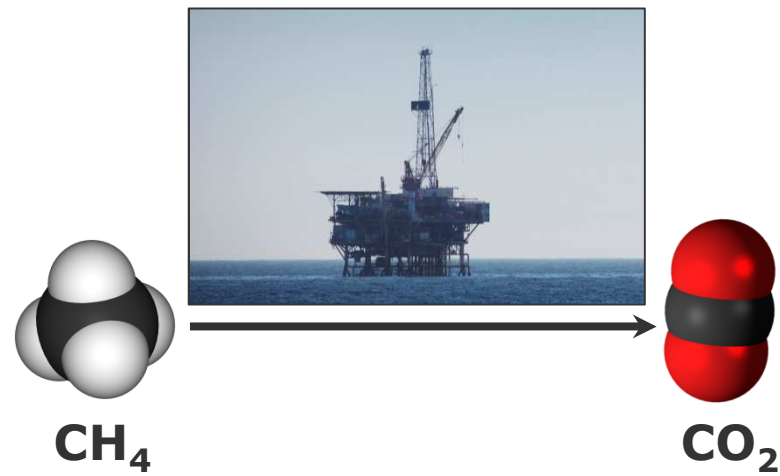
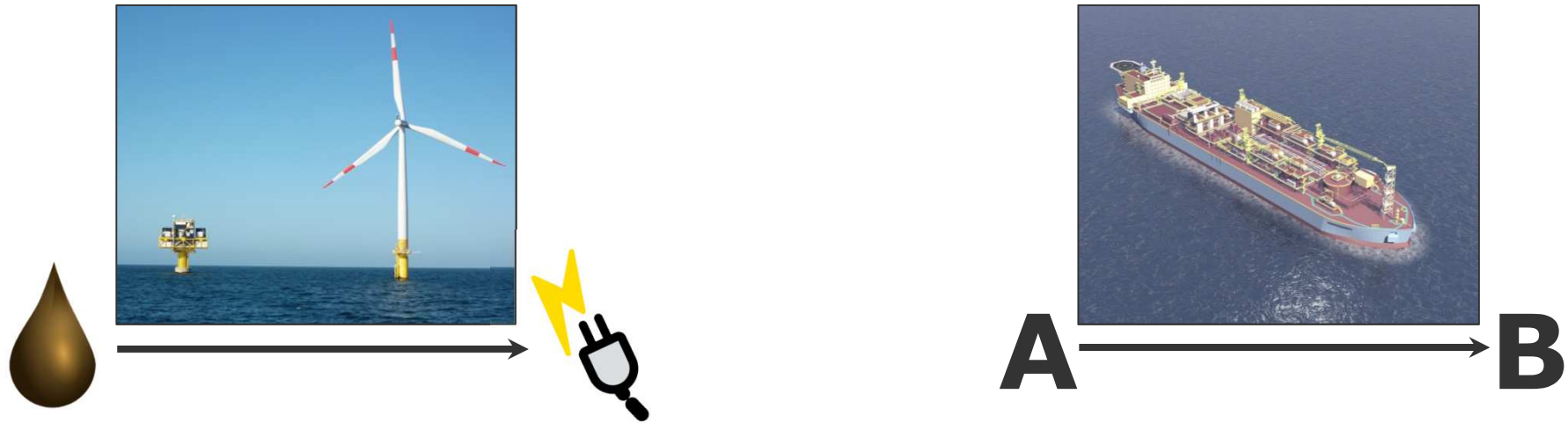
Challenges in Offshore Decommissioning



Decision making



Re-using offshore assets



Motivation for offshore Power-to-Gas

POTENTIAL OF AVOIDING SIGNIFICANT INVESTMENT COSTS IN ELECTRICITY CABLES AND GRID CONNECTIONS OF NEW OFFSHORE WIND FARMS



THE CONVERSION OF THE FLUCTUATING ENERGY OUTPUT OF WIND GENERATION ASSETS INTO A STORABLE ENERGY CARRIER ADDS VALUE



SIGNIFICANT FINANCIAL BENEFITS BY DELAYING DECOMMISSIONING OF OIL AND GAS INFRASTRUCTURE SUCH AS PLATFORMS AND PIPELINES



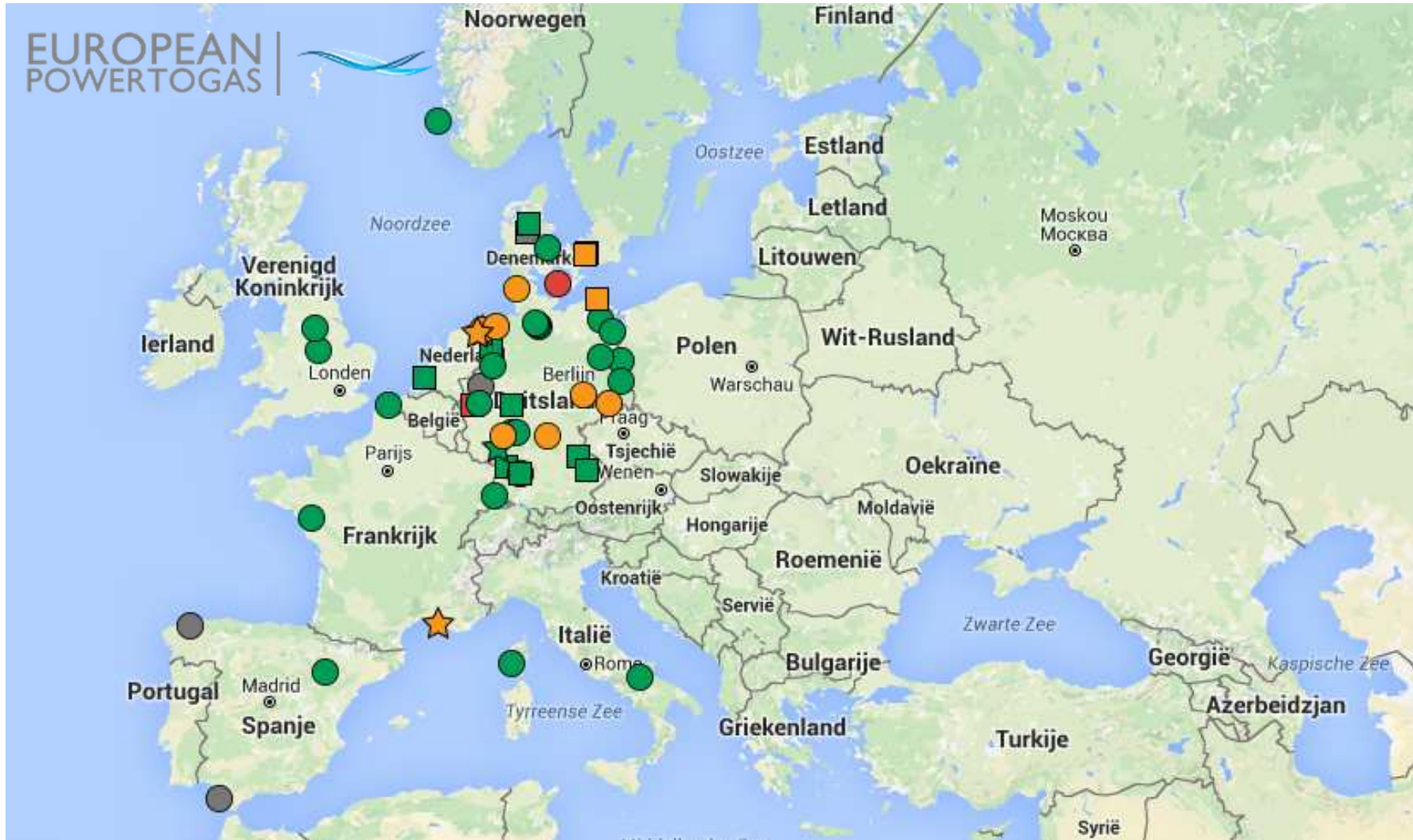
PIPELINE CAPACITY FACTOR (CF) OF EXISTING PIPELINE INFRASTRUCTURE MAY BE IMPROVED OR MAINTAINED AT DECLINING NATURAL GAS PRODUCTION RATES

European Power to Gas Platform

- Initiated and managed by DNV GL
- Started 2012
- The goal of the platform is:
 - To support the development of knowledge on Power-to-Gas on conceptual and technical level.
 - Raise and facilitate collaborations on Power-to-Gas projects, and to
 - Further gain and disseminate know how on Power-to-Gas,



Current Power-to-Gas projects in Europe: from incubation phase to full-commercial phase projects



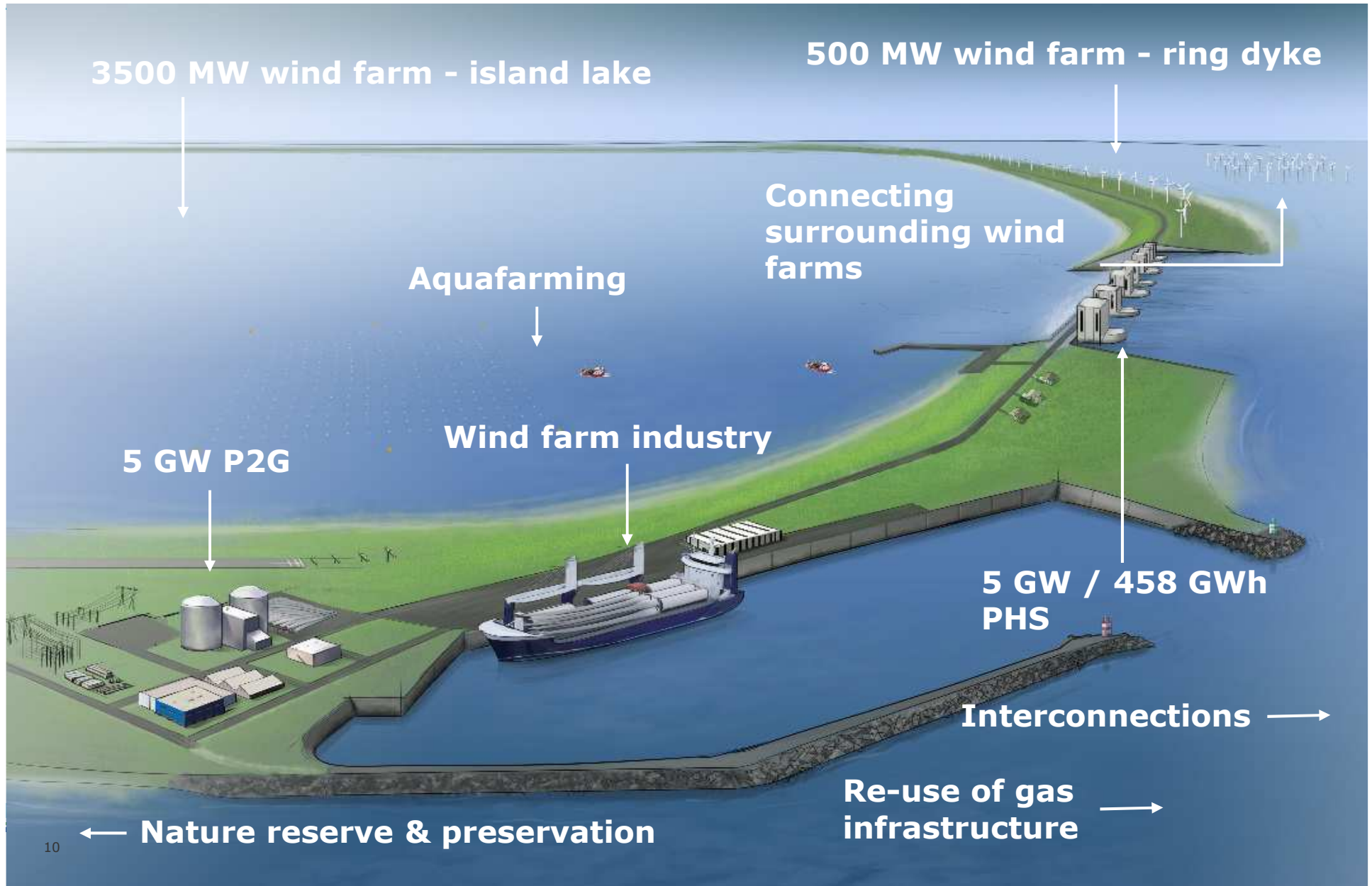
General considerations in re-using offshore assets

- **Grid connection** with wind farms
- Power-to-Gas components such as electrolysers, methanation, desalination and water treatment, gas purification equipment to be **adapted to offshore** use
- Repurposing of existing pipelines is challenging due to **corrosion and material selection issues**, however, blending is possible

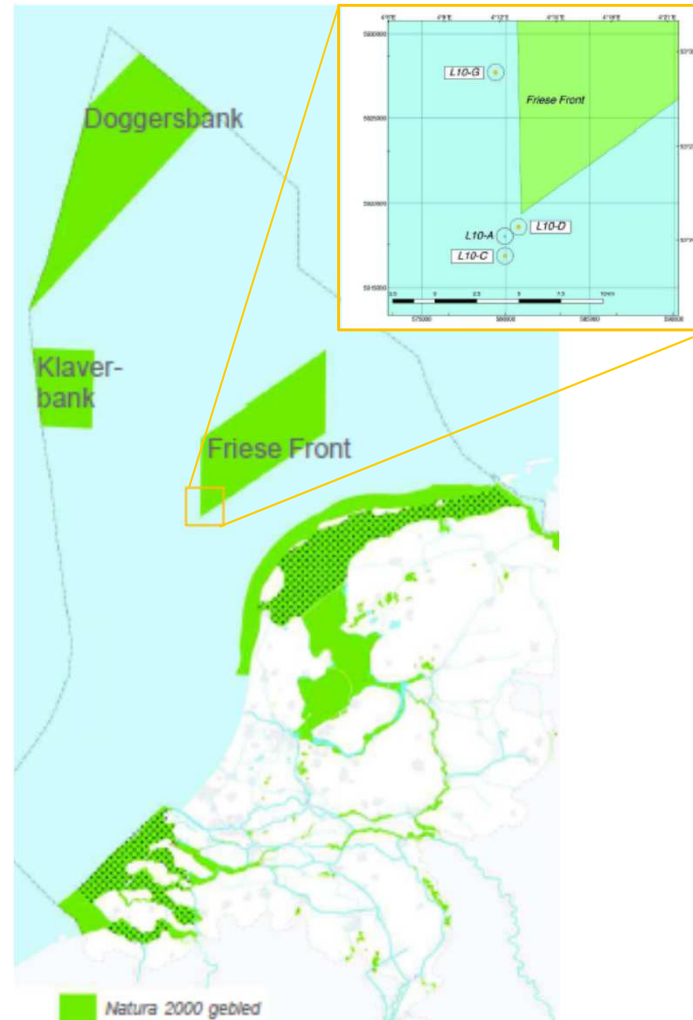
Direct desalination of seawater – ocean oasis



Multi-functional marine infrastructure

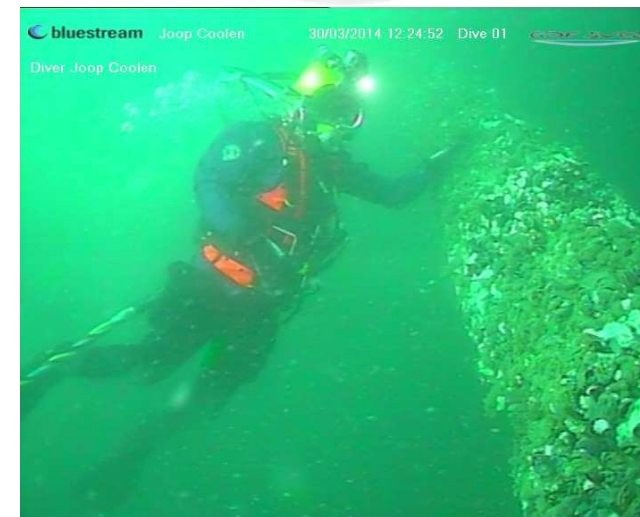


Repurposing jackets for artificial reefing: pilot project of ENGIE E&P and EBN

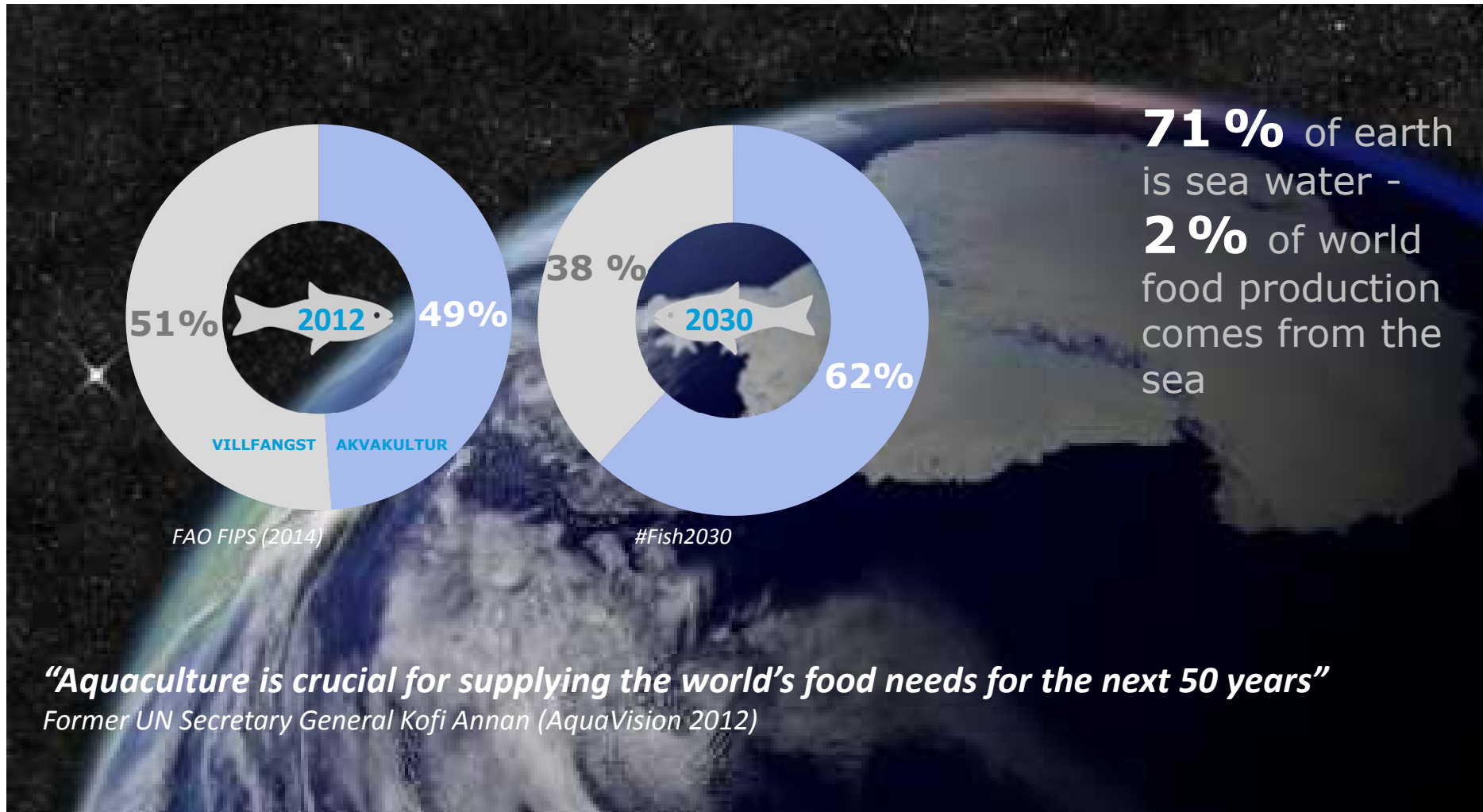


Project aims to provide habitat both on the sea floor as well as top side

- Only jackets will be left, no topsides or wells.
- Wells will be plugged and abandoned.
- The existing thriving habitat around the platforms will be preserved by keeping structure and 500m zone in place.
- The artificial reef around the jacket legs will be expanded by installation of reef balls or rocks.
- Species of shellfish, e.g. flat oyster, will be reintroduced.
- The top of the jackets will be developed into a breeding place for seabirds



Global consumption supports aqua culture industry



Conclusions

- Concepts and ideas for re-use of offshore assets need a combined approach
- Hydrogen production and storage shows potential but renewable energy need to be used preferably
- Viable business cases in combining multiple purposes and benefits
- Incentive schemes suggested to stimulate investments
- Aqua culture and artificial reefing thrive habitat and are environmentally valuable

Thank you!

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