Setting Vision / Mission
& Technical Innovation

Providing Inspiration
& Technical Innovation

Developing Strategic Options
& Demonstrating Action

Neil Durno – Infrastructure Segment Manager, ABB Power Grids UK

Transport Infrastructure to achieve decarbonisation

Technical Innovation and Strategic Options

Climate emergency mitigation measures and opportunities

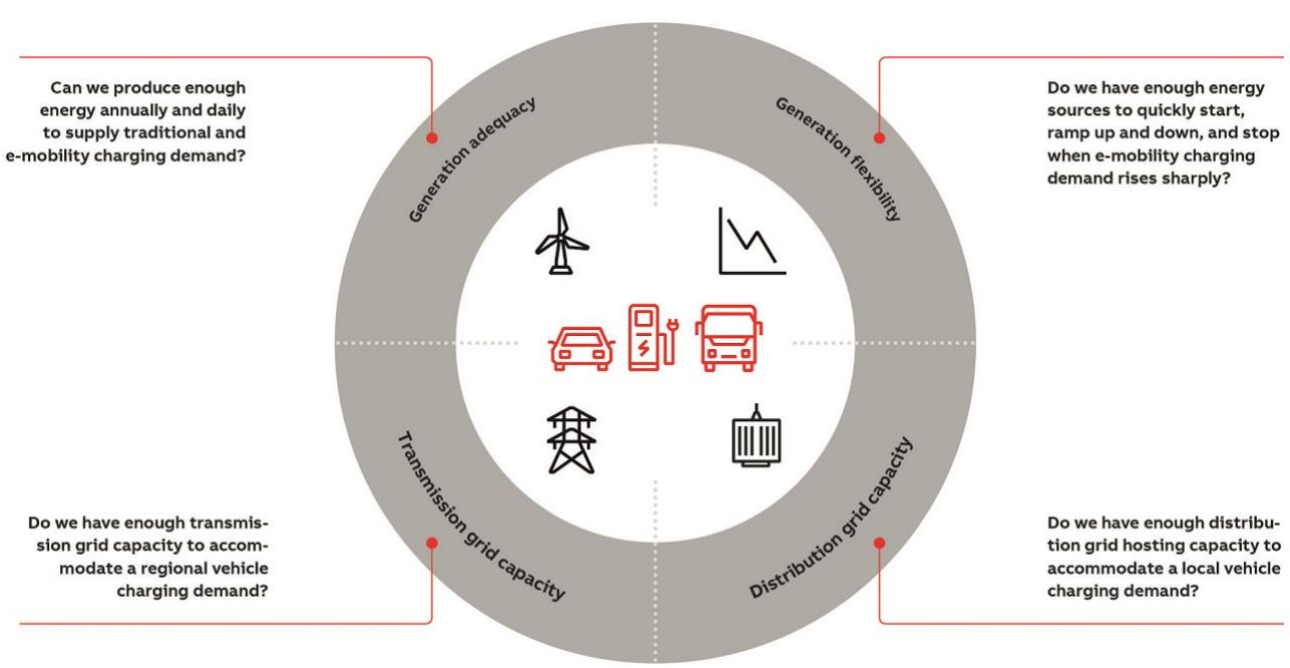
- Science based targets to drive cost:benefit ratios
- Innovate business models: “thinking out of the box”
- Promote pilot / early development projects

Technical innovation approach

- Enhance the penetration of renewable energy in hubs
- Accelerate shore-to-ship power (S2SP) adoption
- Alternative fuel bunkering and fuelling solutions
- Digital devices for measurement and safer control

Strategic development and collaboration

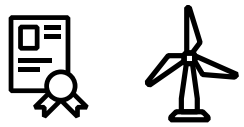
- Partnerships: collaboration and sharing best practices for optimised costs and benefits
- Government policy shaping and planning: reducing carbon demand/intensity through transition to low carbon fuel vectors



Transport Infrastructure fit for the future

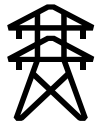
In a changing energy market and a climate emergency

Both types of load and methods of generating are significantly changing

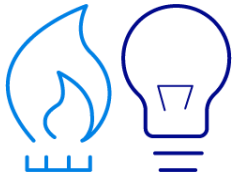


Low Carbon Generation

New energy sources:
- High variability, or
- Low volume vs demand
- Low predictability …
  for Solar and Wind
- Local production



Connect, store operate and maintain Safely and reliably



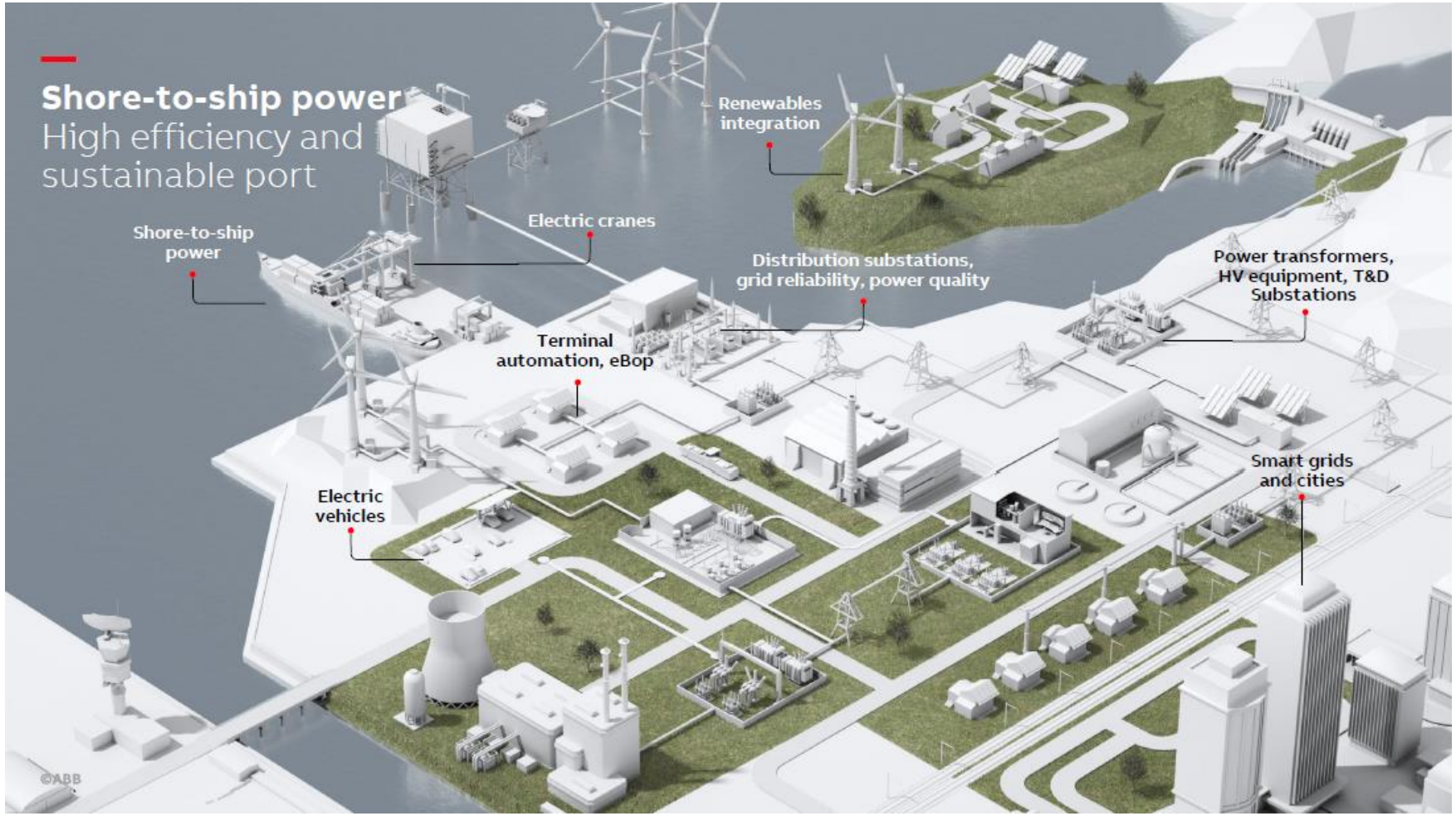
Consumption

New loads:
- Highly distributed and variable
- Alternative fuel solutions for commercial vehicles and vessels
- Shore-to-ship power for in-port operation

Reducing environmental impact through efficiency is a key priority

Port Infrastructure to improve efficiency, resilience and safety

Demonstrating action to improve private networks



Port Infrastructure to improve air quality

Demonstrating action to reduce in-port emissions

Shore-to-ship power and smart ports

Selected references

Gothenburg, Sweden

Ystad, Sweden

Vancouver, Canada

Rotterdam, Netherlands

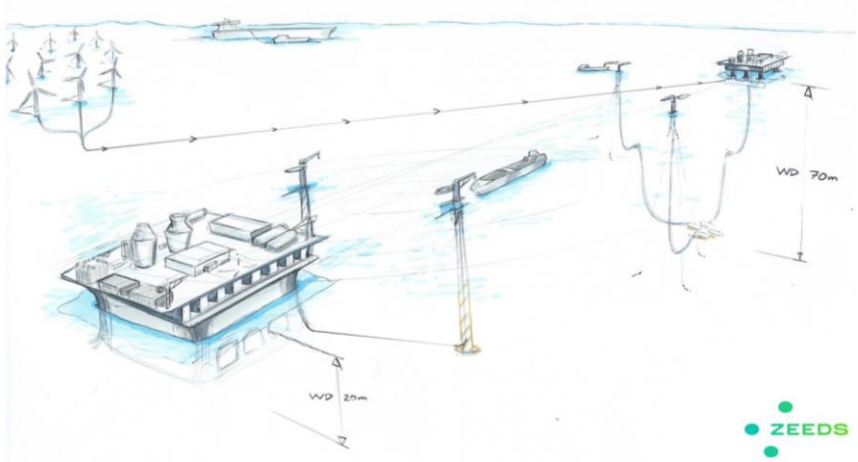
Fincantieri, Italy

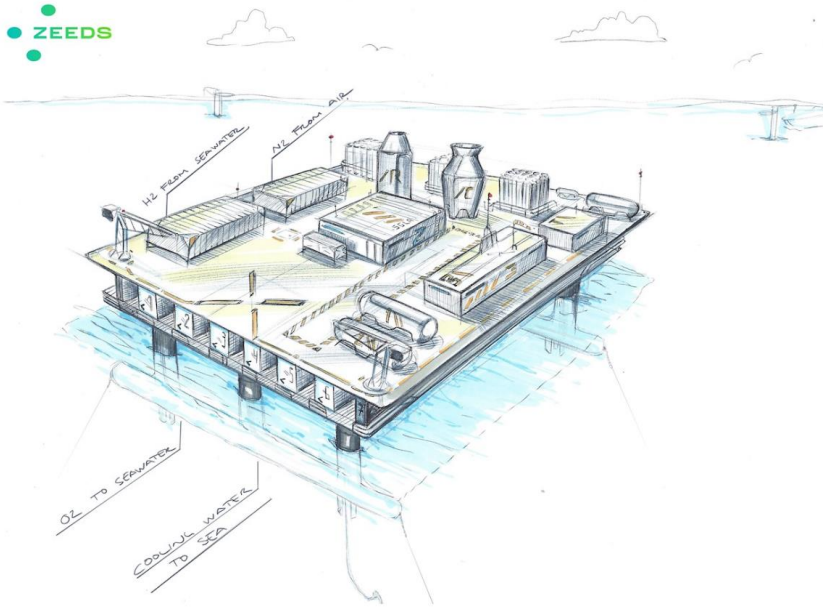
Delimara, Malta

Dalian, China

Moin, Costa Rica

ZEEDS - All at sea!
Strategic Options and Technical Innovation





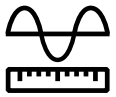
"Our goal is a faster route to zero-emission shipping, but the goal has to be met with 100 percent renewable energy" ZEEDS project spokesperson Cato Esperø.

"In order to develop a sustainable solution to this challenge, we, as a society have to work together," says Espero. "In saying that we need the support from authorities and are calling for them to implement incentives that will enable us to find the fastest route to zero emission shipping," Espero concludes.

https://new.abb.com/news/detail/46259/the-floating-filling-station-bunkering-zero-emission-fuel-at-sea

Collaborating on the delivery of integrated low carbon transport

Much more than a electrical equipment manufacturer!



Needs assessment

Develop customer vision, strategy and needs:

- Transport hub development vision and optionality
- Power demand and generation requirements
- Future vehicle and vessel power / fuel requirements

Project inception

Evaluate current asset capabilities / limitations:

- Evaluate asset condition and performance capabilities
- Consulting for OPEX-CAPEX optimization
- Developing a tailored engineering solution

Project execution

Lead or partner for technical and benefits delivery:

- Turnkey implementation
- Engineered package supply
- According to customer requirements
- Benefits review and realisation

Service

Asset performance management evaluation:

- Reliable system operation
- Structured maintenance planning
- System lifecycle extension and optionality

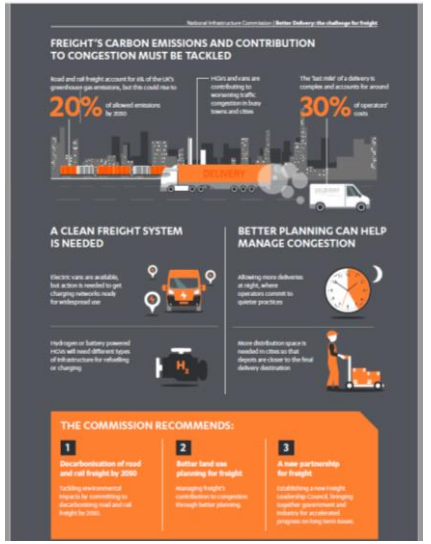
Defining customer options and solutions for delivering emissions reduction programmes

National Infrastructure Commission

The world is changing, however, and freight must continue to adapt. Action on carbon emissions is needed across all aspects of the economy and everyday life, and worsening congestion is harming the economy. While freight may only be one of many contributors to these issues, the sector must play its part in the solutions.

Government must set the trajectory for a clean freight system, outlining clear, long term objectives that enable the industry to be zero emissions by 2050 – tackling air pollution and delivering on the UK's climate targets. Managing freight's contribution to congestion will mean properly acknowledging its needs within the planning system so that operators can make efficient choices and maintain excellent levels of service, at low cost.

Delivering change of this scale will require a new relationship between government and the freight industry, taking account of all types of freight transport. This relationship must consider freight's land needs to realise the best outcomes for society and freight.



Thank you!

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