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Marine Power train caracteristics

ABB – a strong business partner

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MOZEES
Mobility Zero Emission Energy Systems

ABB i Norge – demand market

Hva *(portefølje)*	**Innovativ teknologi**		
	Kraft ~ 55 % av driftsinntektene	Automatisering ~ 45 % av driftsinntektene	
For hvem *(kunder)*	**Energiselskaper**	**Industri**	**Transport og infrastruktur**
	~ 50 % av driftsinntektene	~ 40 % av driftsinntektene	~ 10 % av driftsinntektene
Hvor (*geografiske områder)*	**Norge**		
	Fra Norge 60 %		Fra resten av verden 40 %

~ NOK 10 milliarder ordreinngang	~ 13 lokasjoner	~ 2,300 ansatte

ABB i Norge – demand market

Hvordan vi gjør forretninger

Forstå

Forstå markedet
Kjenne kunden

Nyskapende

Investere i R&D
Investere i mennesker
Produsere solid teknologi

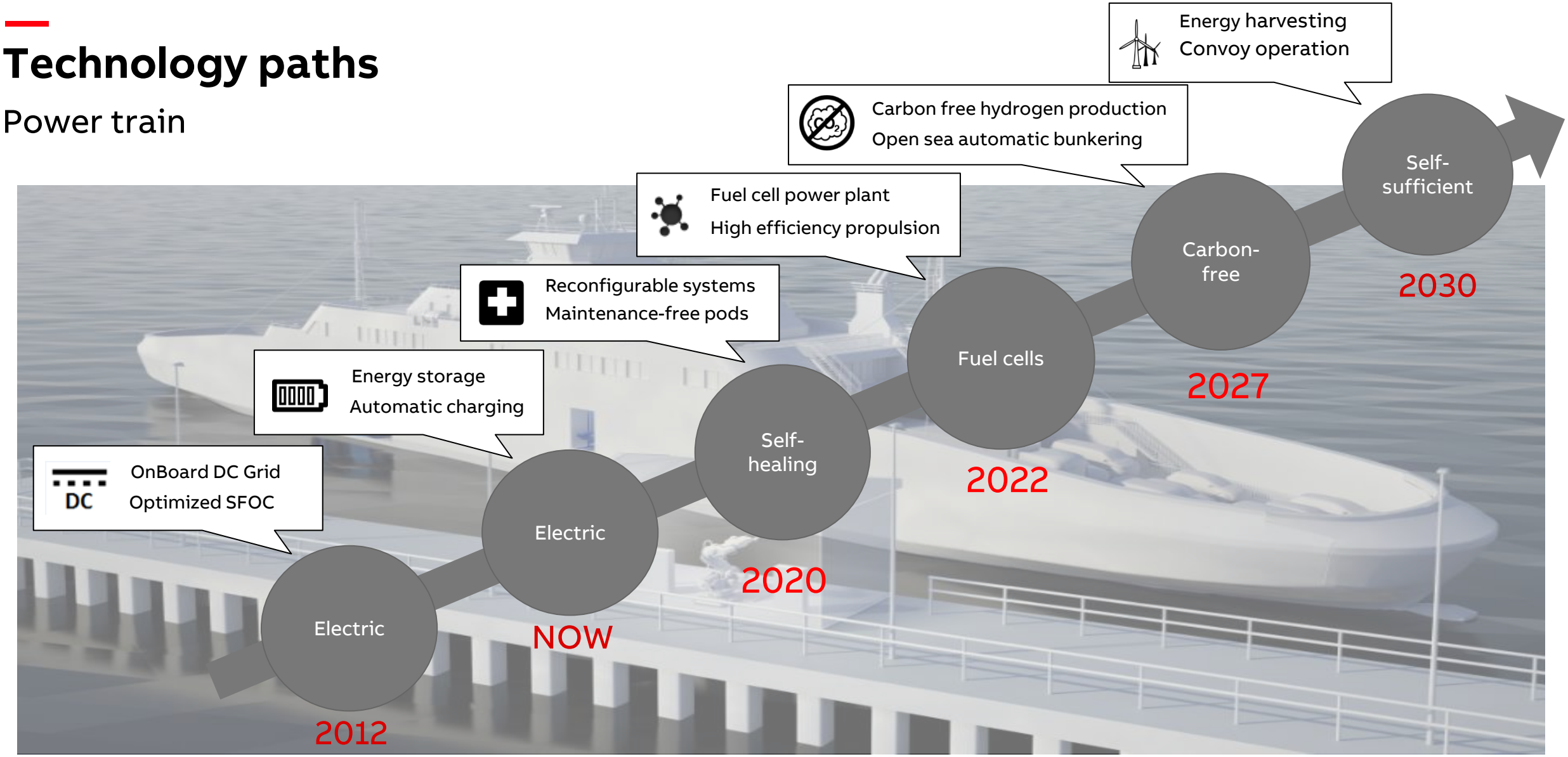
Levere

Produsere og levere innovative løsninger
Støtte kunden gjennom hele livssyklusen

Forstå - Nyskapende - Levere

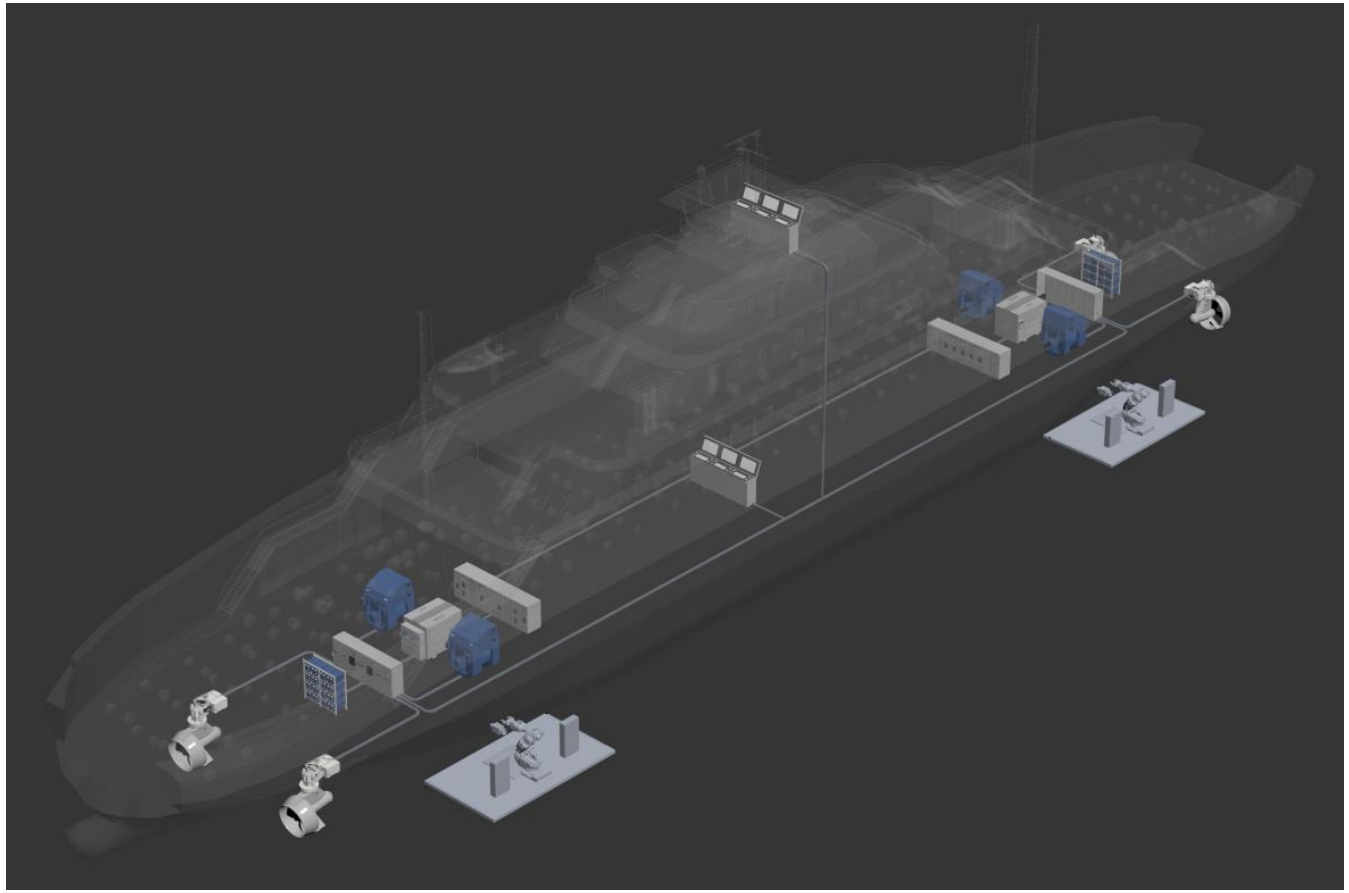
Technology paths

Power train



Typical vessel power train characteristics

- Fueled with MDO/HFO/LNG
- Some applications can use battery only
- Direct driven or electrical propulsion
- Very often loaded at low load (and far away from design point)
- High degree of redundancy and safety

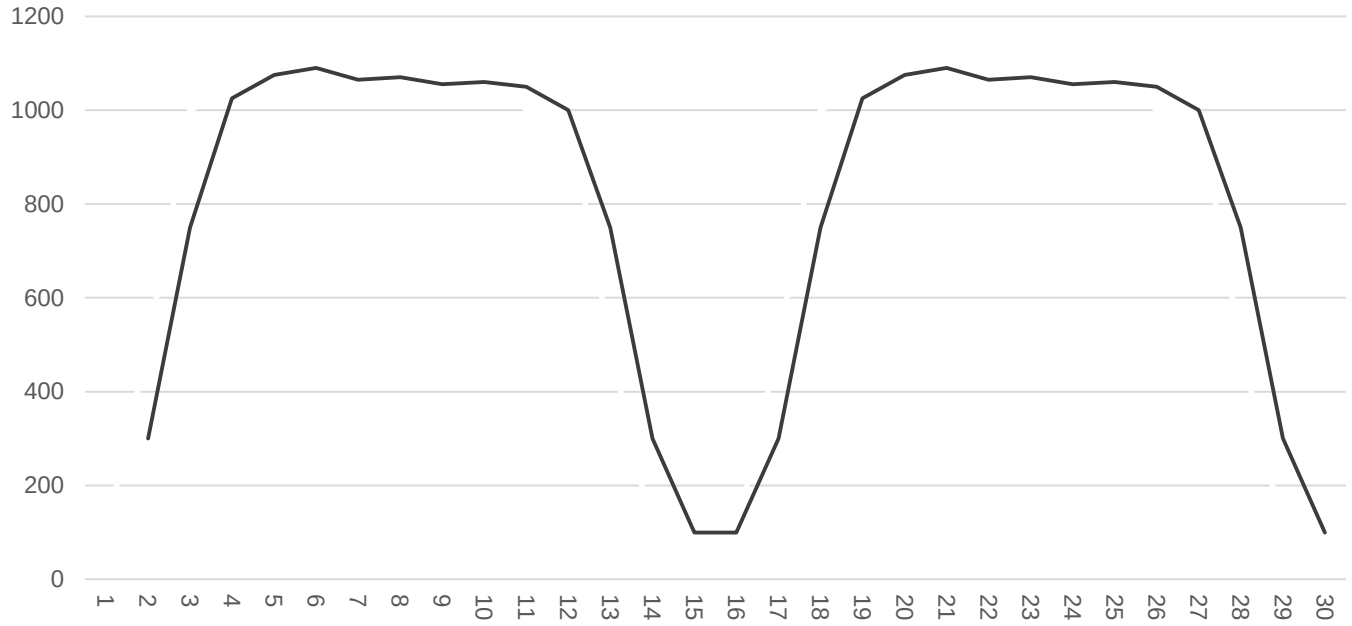


Characteristics

Typical vessel power

Power train

- Power ranges: 500 kW to 15 000 kW
- Mostly stable power, but cases with high demand for high power increase/decrease rates (>10%/sec.)
- Redundancy requirements
- Back-Up requirement, spinning reserve

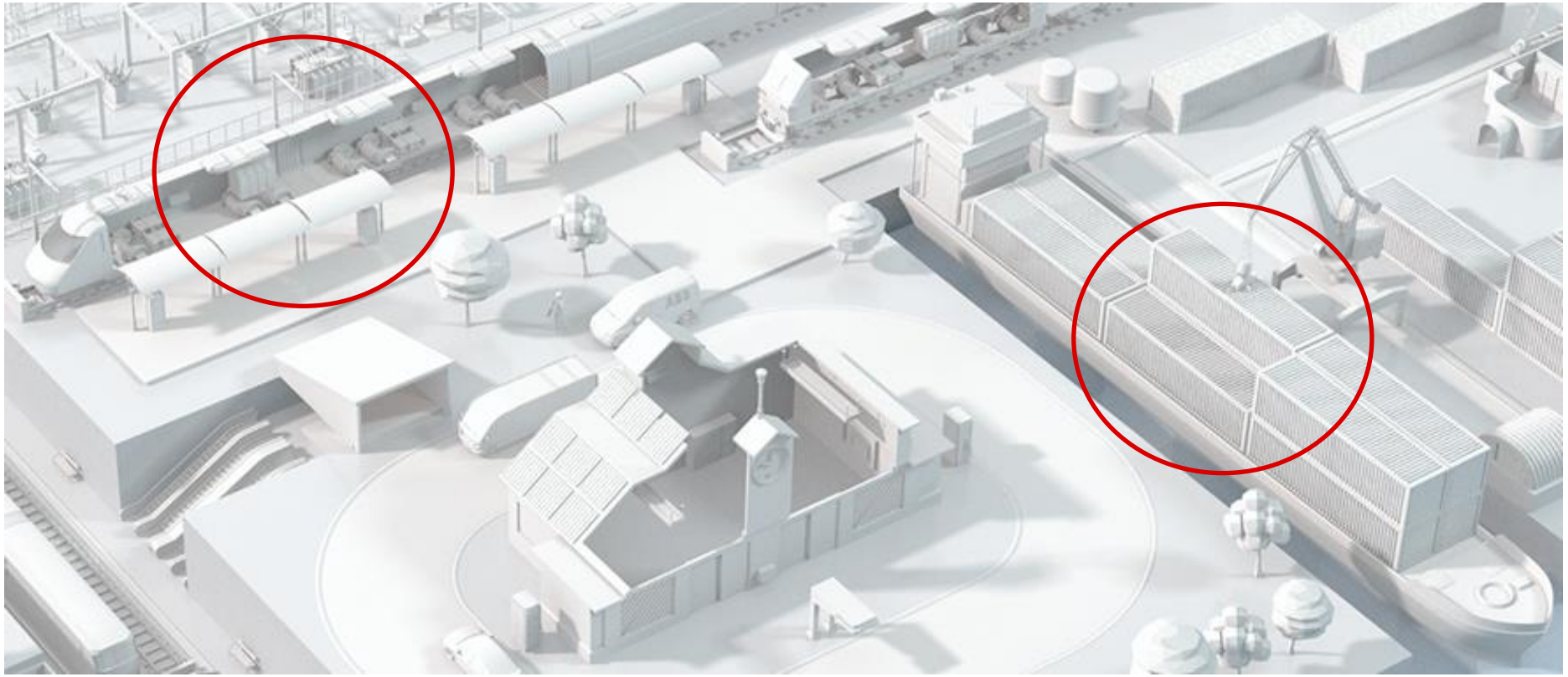


Energy demand....

Marine and rail power train similarities

Similarities

- Limited space
- Power requirement: From 500 kW to 20 000 kW
- Similar load profiles
- Similar safety requirements



From development to installation

Video from Vision of The Fjords

Demands to get new technology ready

Lack of emission free compact energy carrier, for use in longer journeys.

- H2 based fuel cells will be a good alternative for these applications
- Batteries will be a good combination and a system supporter
- In combination with DC Main Distribution system