MARITIME

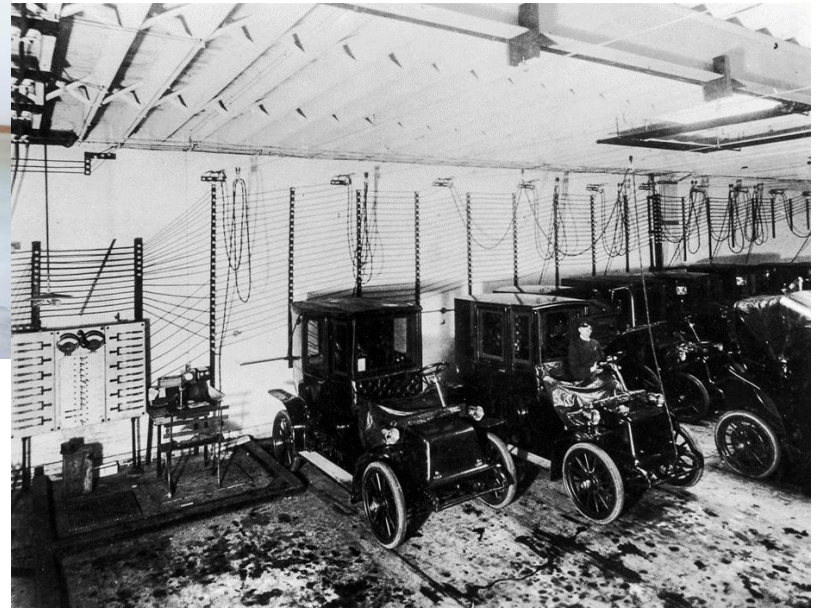
Status of ships with batteries

Why and Uptake? – DNV GL Battery Seminar, Houston

Sondre Henningsgård

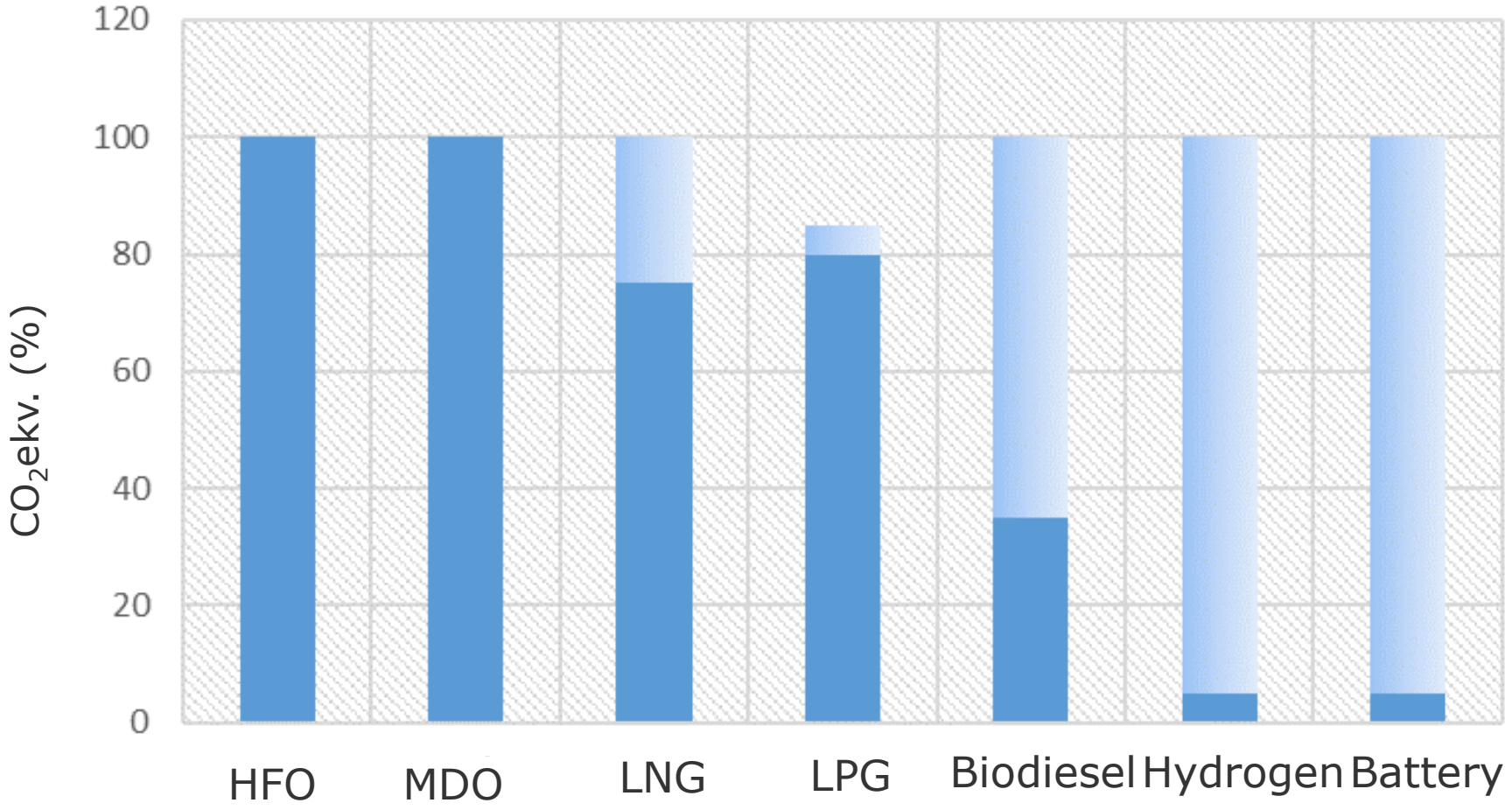
26 March 2019

Batteries are a revolutionary new tech that has just been invented…?



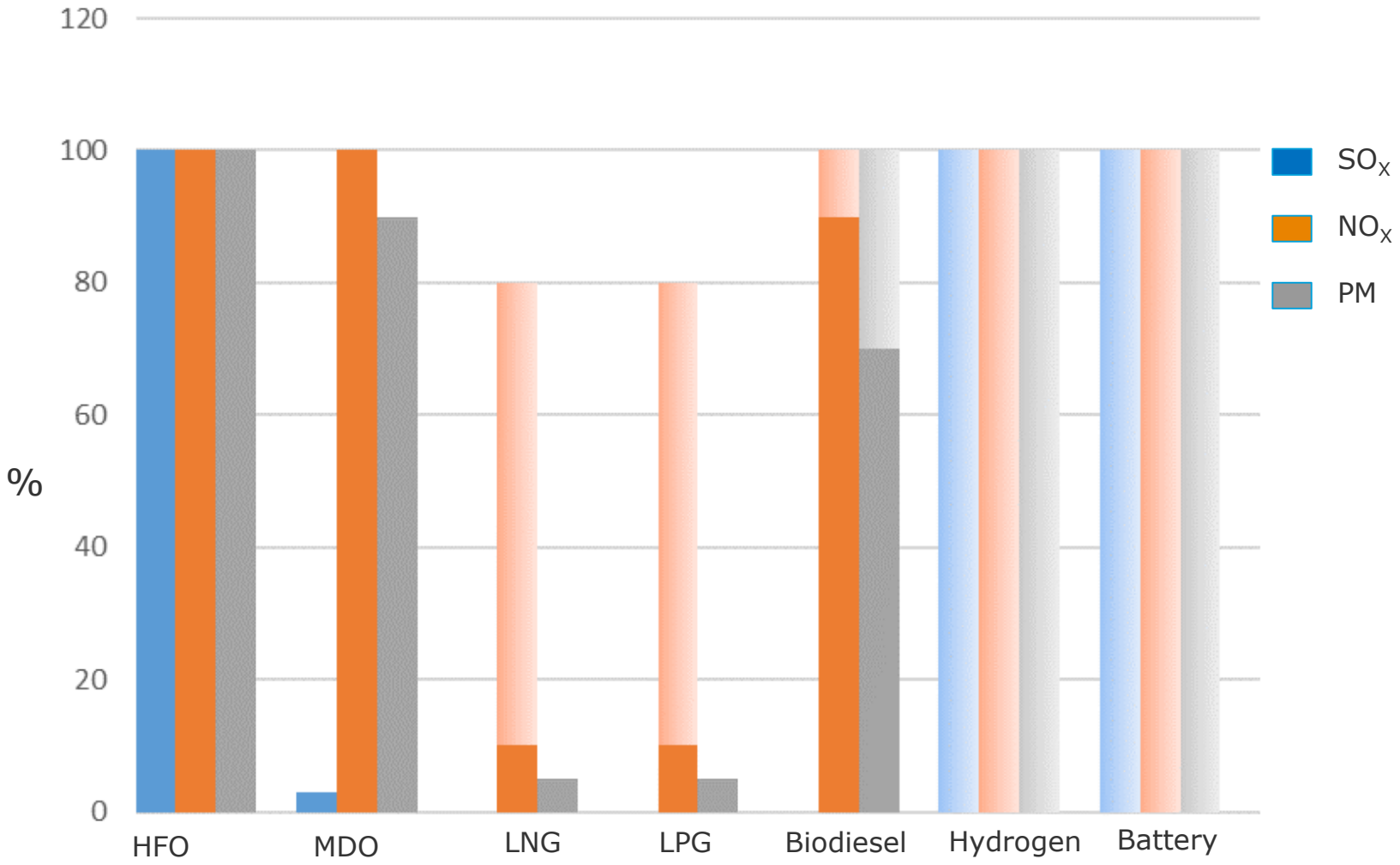
- Detroit Electric
  - Produced by Anderson Electric Car Company
  - Nickel-iron battery
  - Range advertised: 130 km
    - Record one charge: 340 km
    - (top speed abt 32 km/hr ☺)
  - Year: 1911 – 1916
    - Produced until 1939

GHG



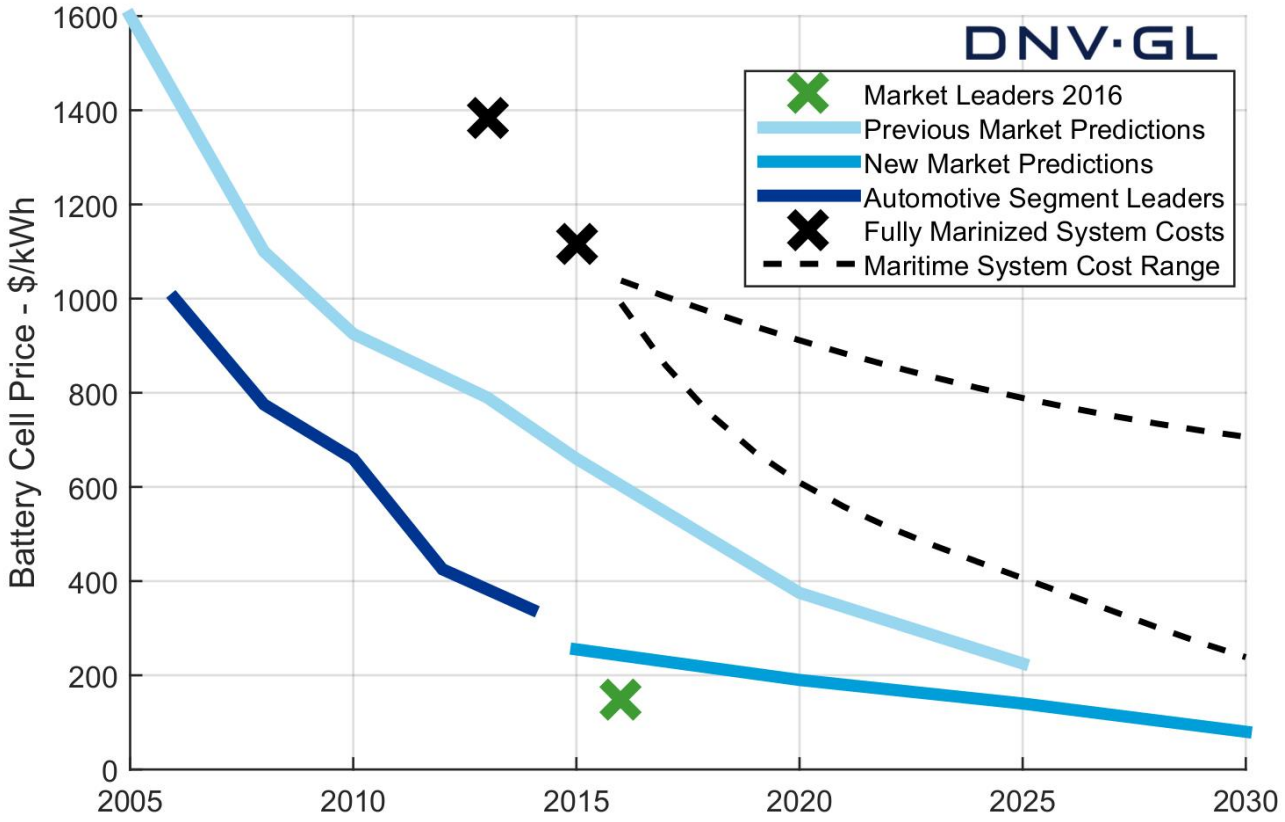
Source: DNV GL

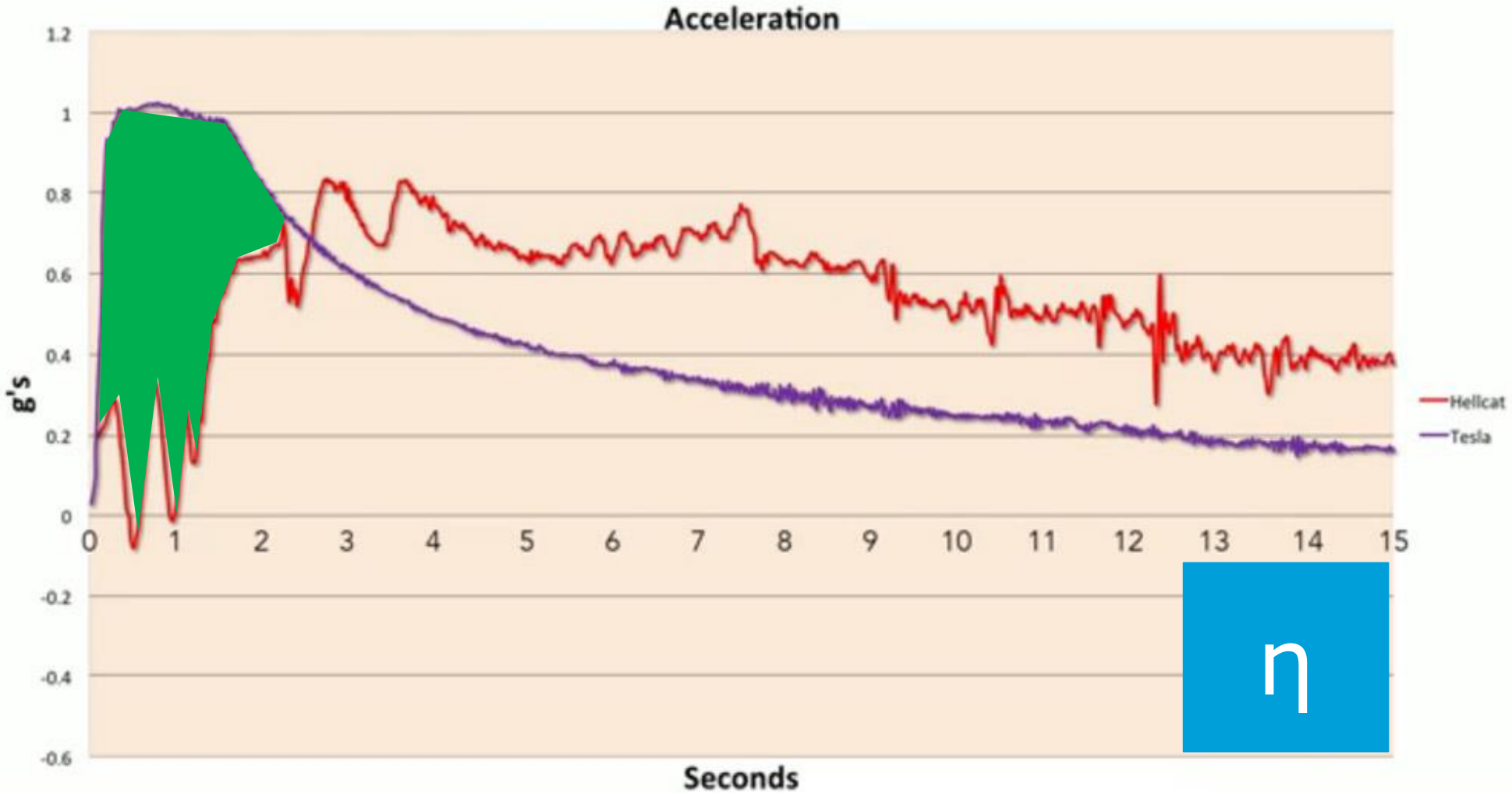
Other



Source: DNV GL

Lithium ion battery price trends





NB: figure is unofficial, however, it illustrates the benefit of "instant Torque"

Batteries and hybrid systems represent a new way of providing power and propulsion – the trick is figuring out how to apply for your system

Spinning reserve

- Backup for running generators
- Fewer turbines needed online

Peak shaving

- Act as a buffer
- Level power seen by engines

Optimise load

- Optimise the operating point of the generators
- Reduce maintenance

Harvest energy

- Recover energy from cranes, drilling equipment, etc.
- Accommodate energy from renewables

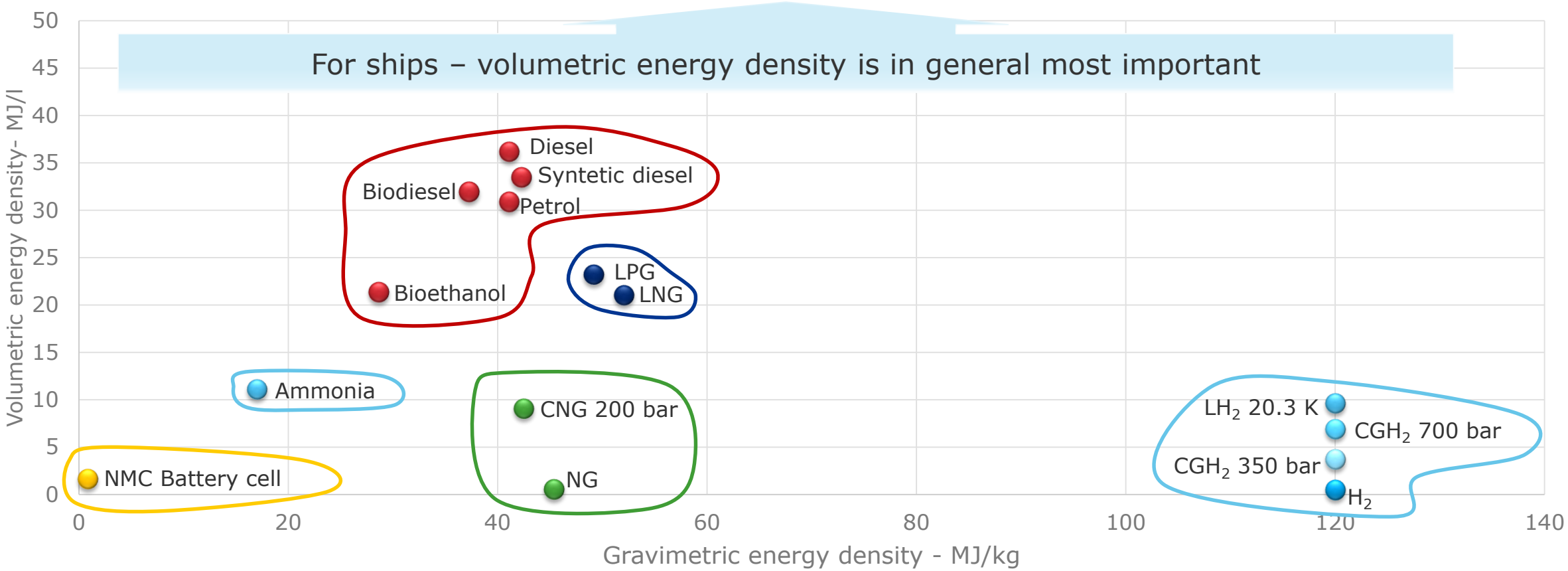
Immediate power

- Instant power in support of generators

Backup power

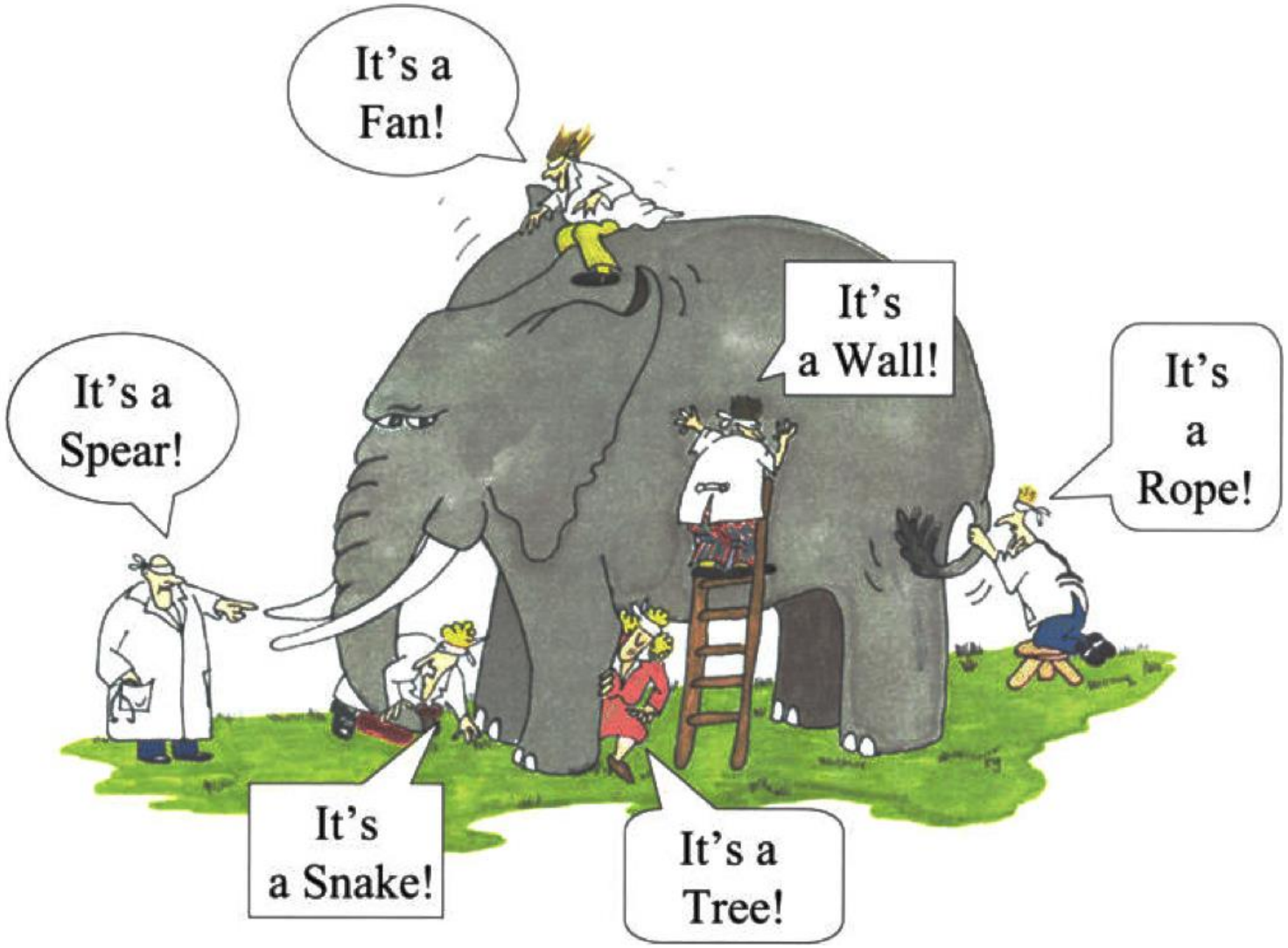
- Battery system provides backup power, UPS like functionality

Energy density of various fuels

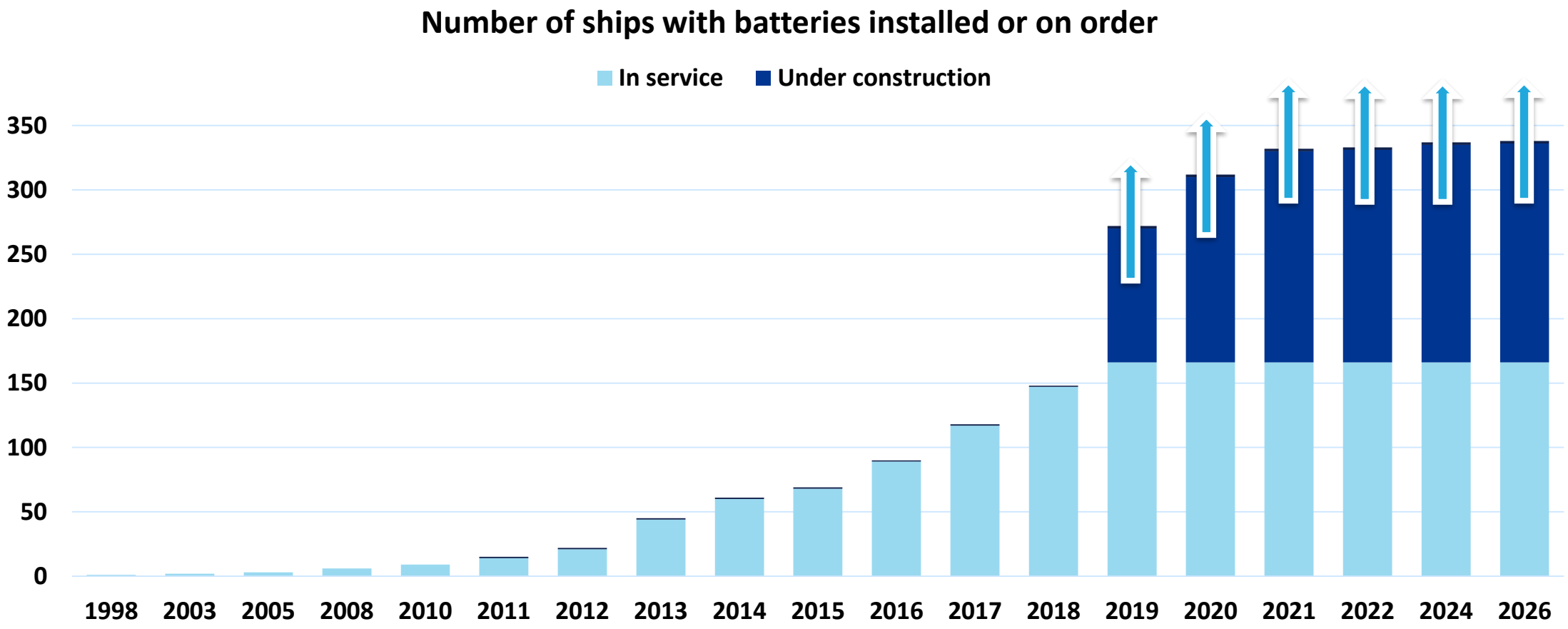


https://en.wikipedia.org/wiki/Energy_density

To make it simple – consider the system as a whole

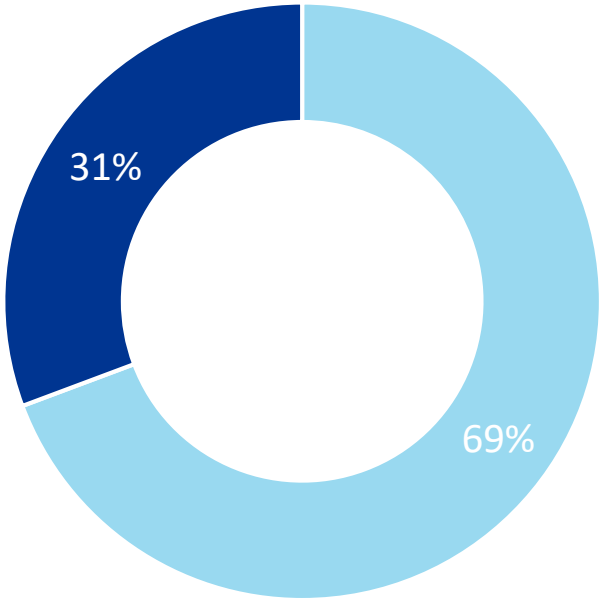


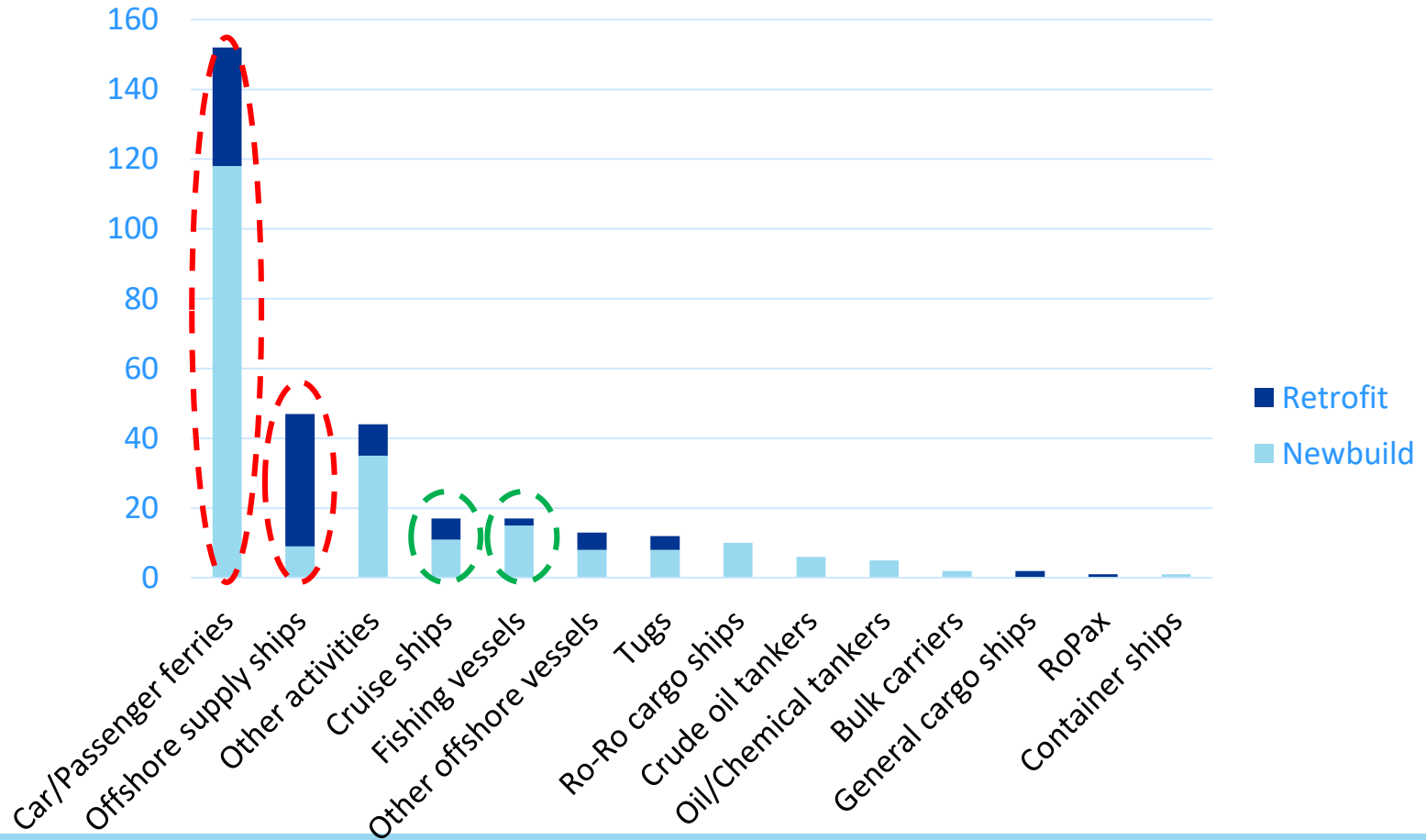
Development in ships
Based on year battery is installed



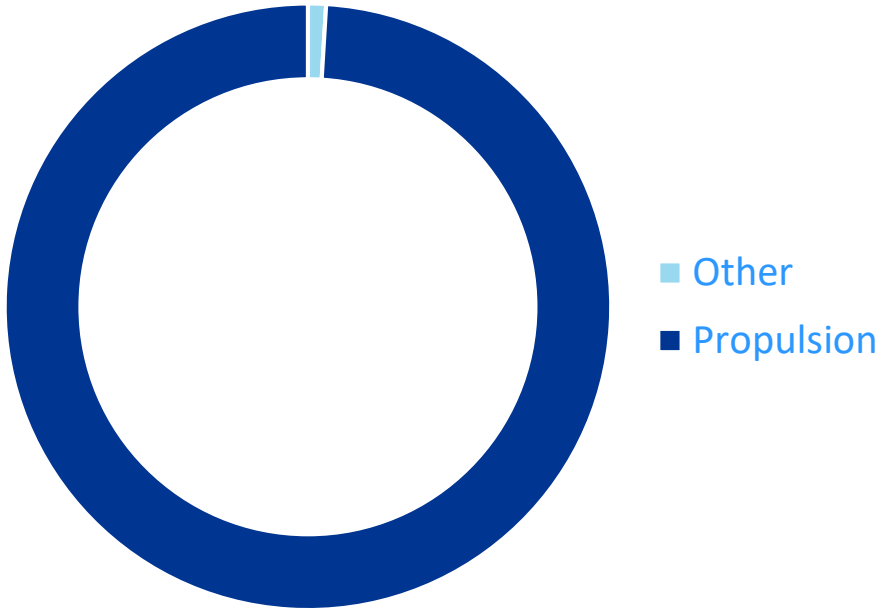
Newbuild or retrofit?

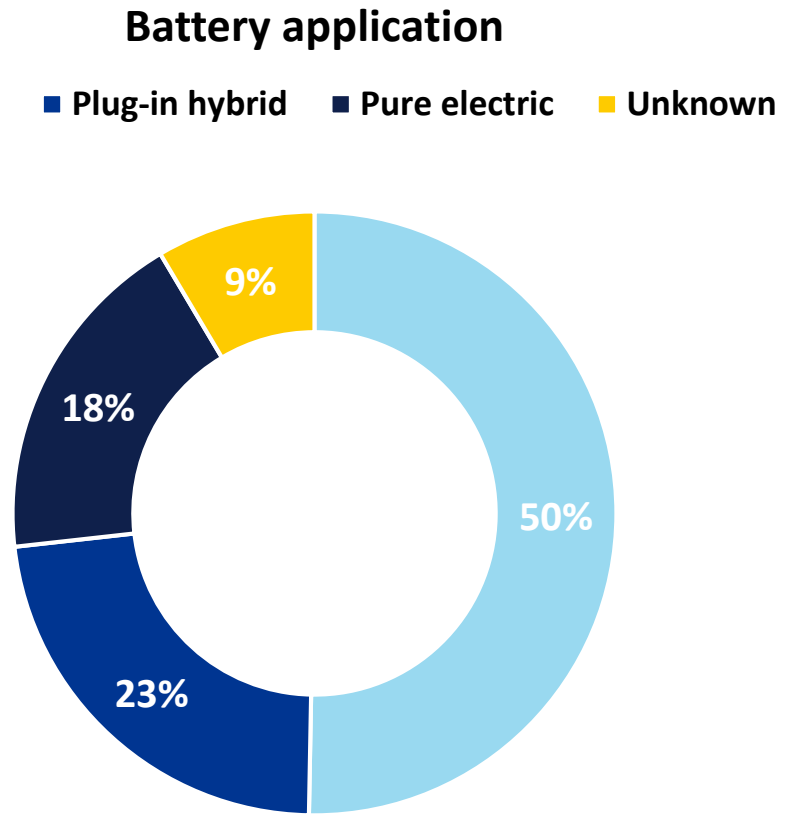
- Still mainly newbuilds. Share has been around 30/70 for a while now.





Technology

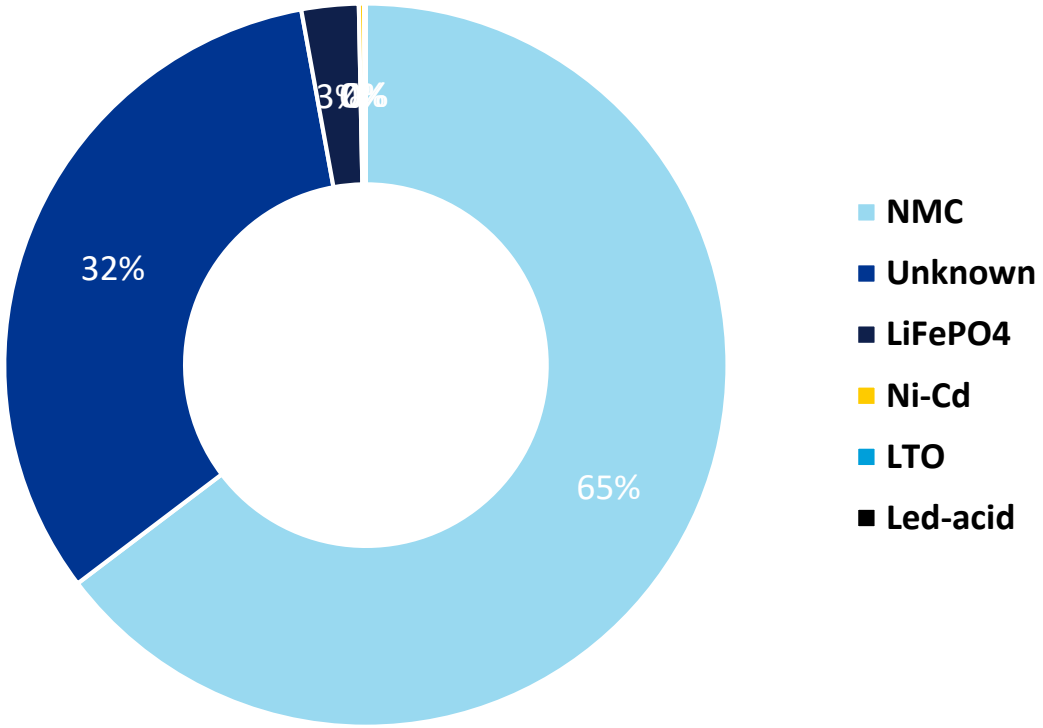




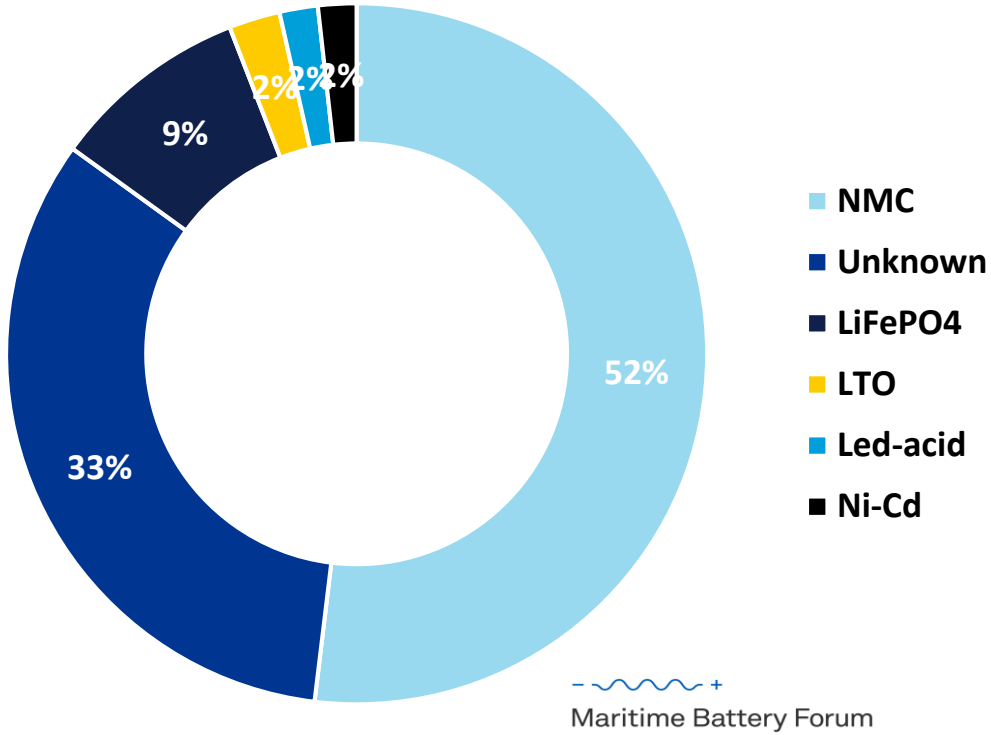
NB! Figure indicative as not all projects state if they are plug-in or not

Which batteries are being used?

Cell Chemistry (by installed capacity)



Cell Chemistry (by number of ships)



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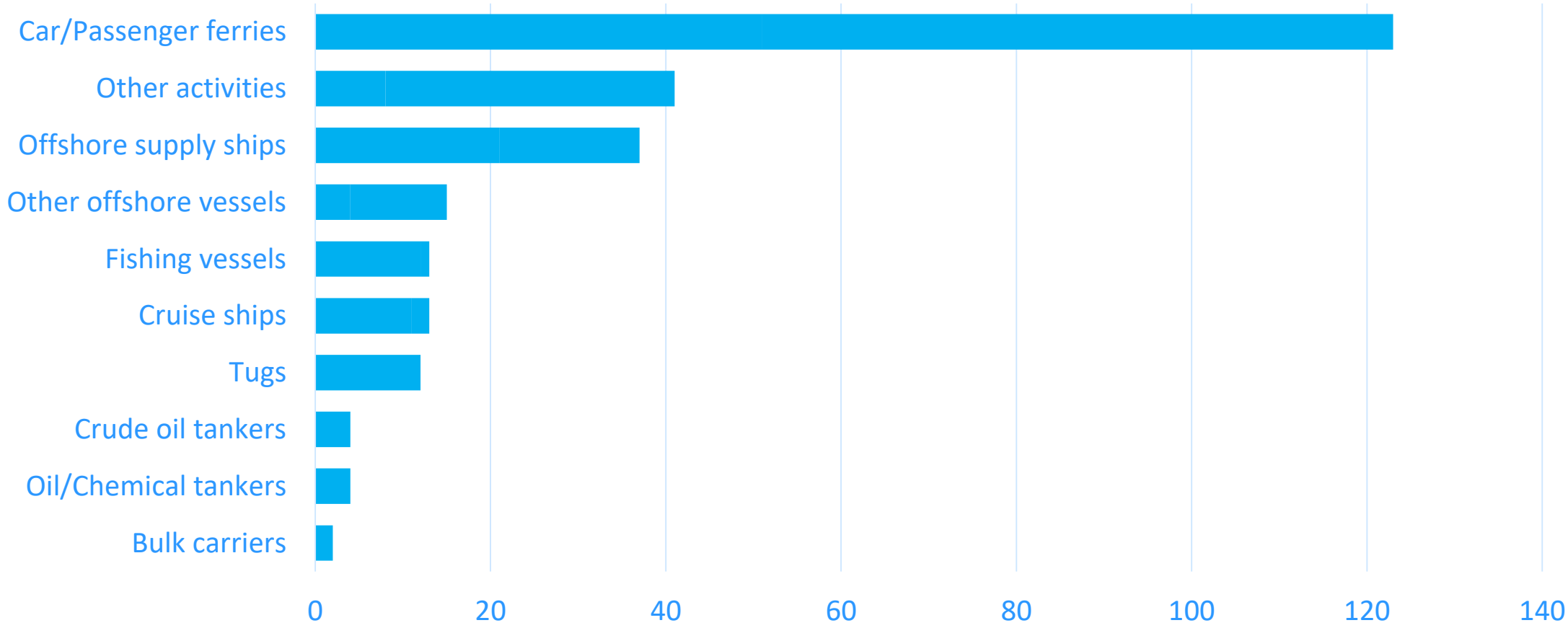
Segments (top 10)



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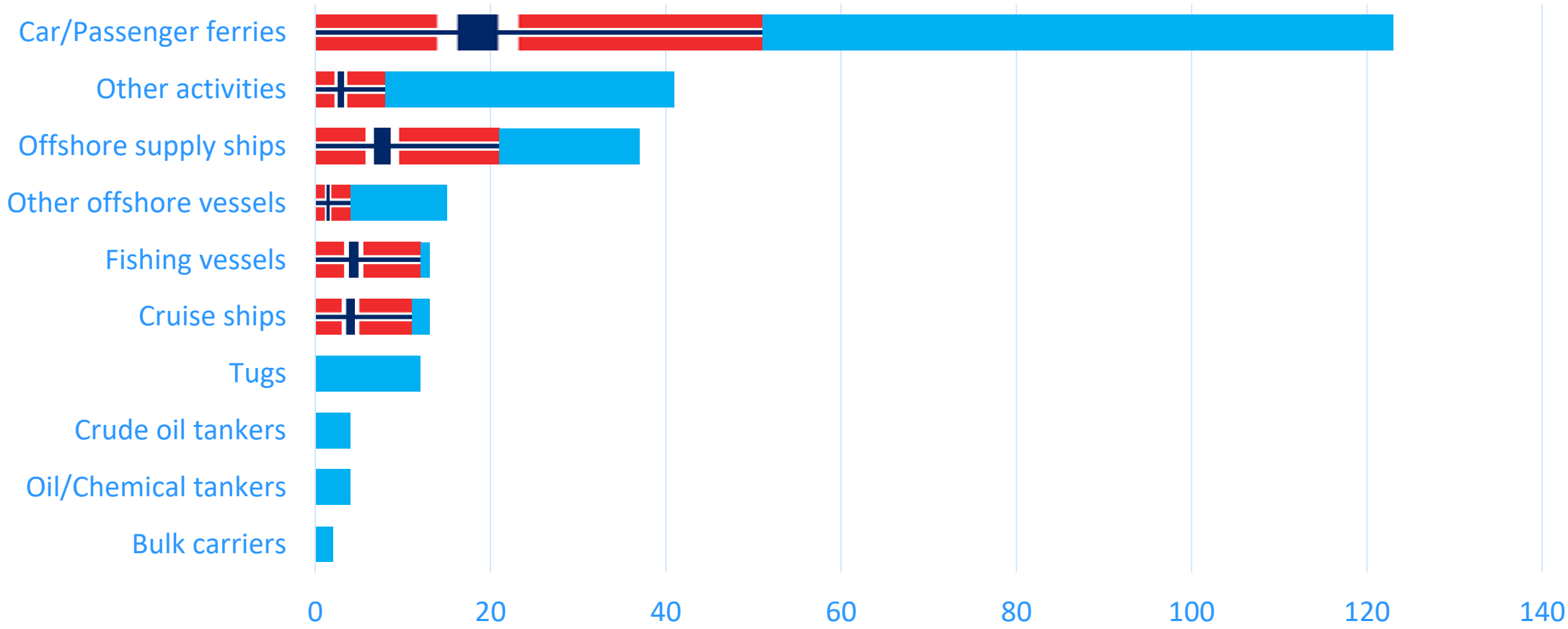
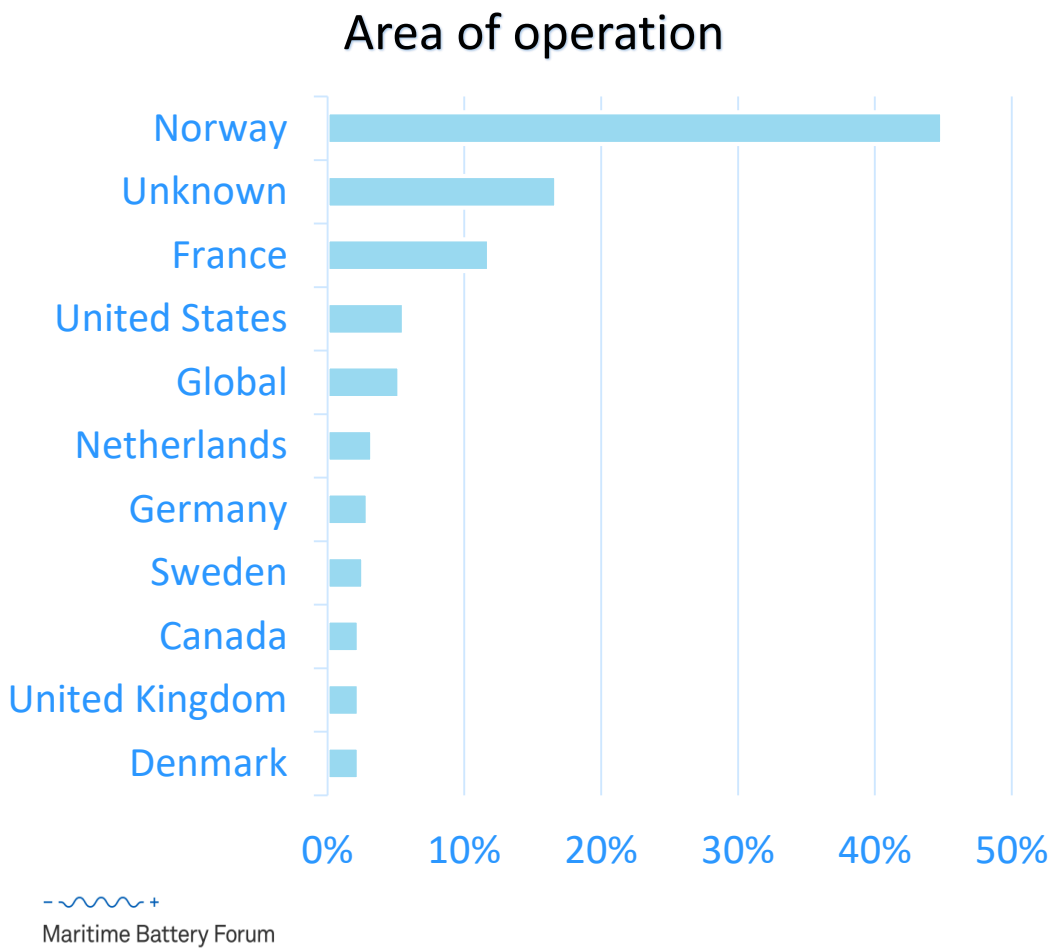
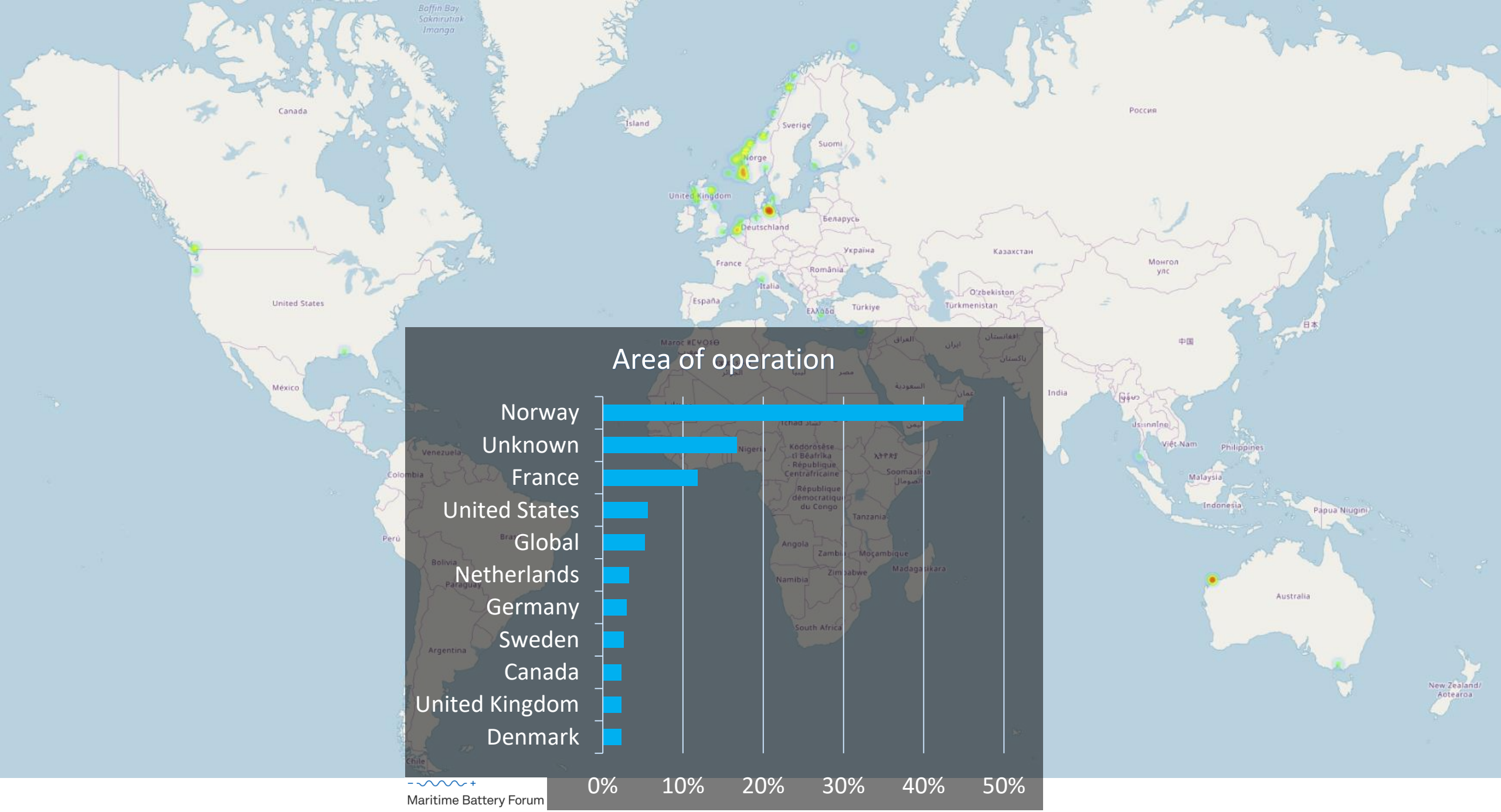


Country of operation





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How many PSVs should be hybridised?

Currently 47 are/will be hybridised

1491 PSVs age 20 or younger*

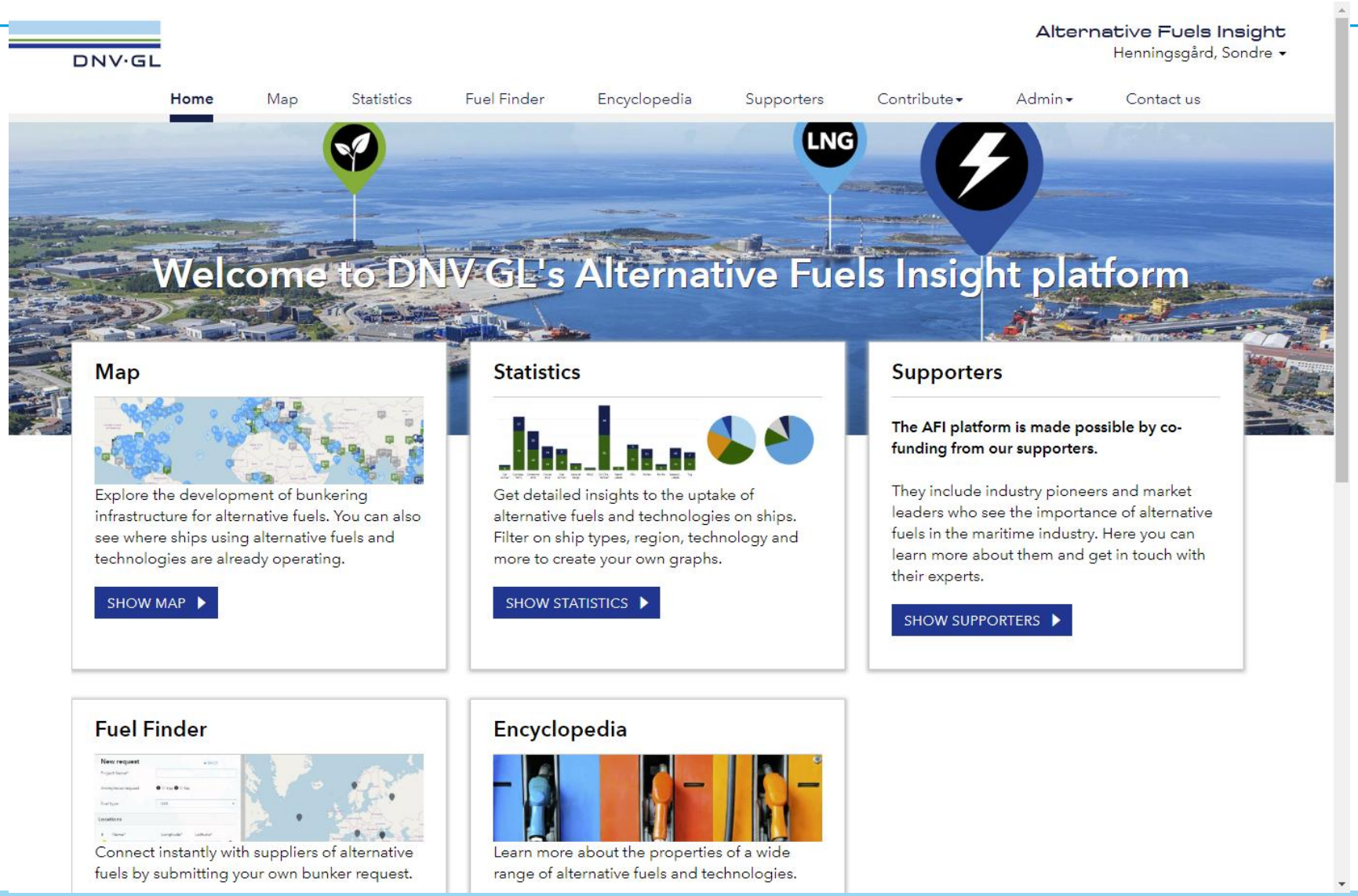
1192 with DP2 or higher – should be candidates for battery*

Average battery size in fleet: 570 kWh

Potential for: 680 MWh of batteries (if drawing a straight line with 570)

*Data source: Clarkson Platou

MBF ship register – sign up!



MBF members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NORSIRK
DNV·GL
GrenlandEnergy
Fjord1
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POWER TECHNOLOGY
ULSTEIN
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CATERPILLAR®
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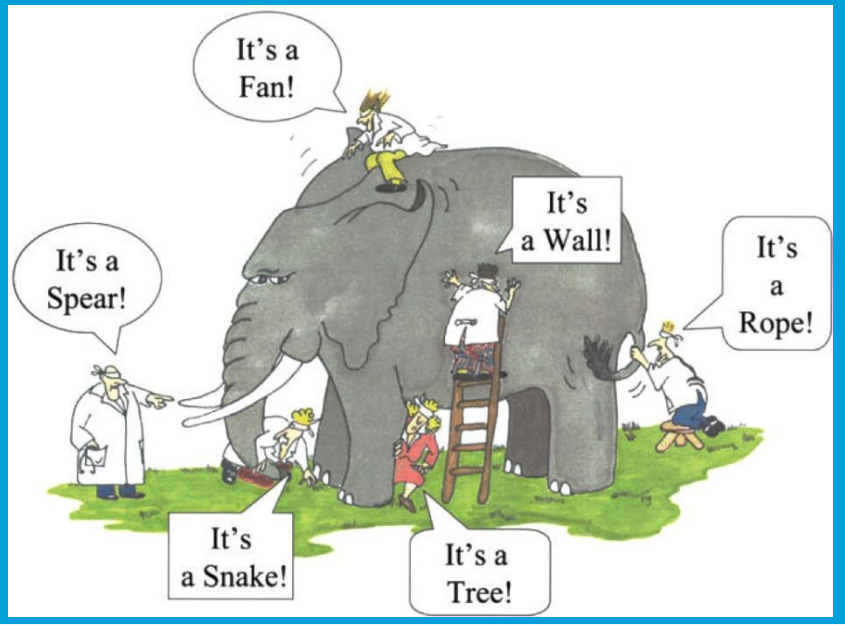
FFI Forsvarets forskningsinstitutt
Norwegian Ministry of Climate and Environment
ENOVA
Sjøfartsdirektoratet
Norwegian Maritime Authority
Norwegian Centres of Expertise
NCE Maritime CleanTech
BELLONA
Statens vegvesen
Norwegian Public Roads Administration

Thank you for your attention!

(keep your eyes on the full picture)



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