The E-ferry project and beyond
- Potential and barriers

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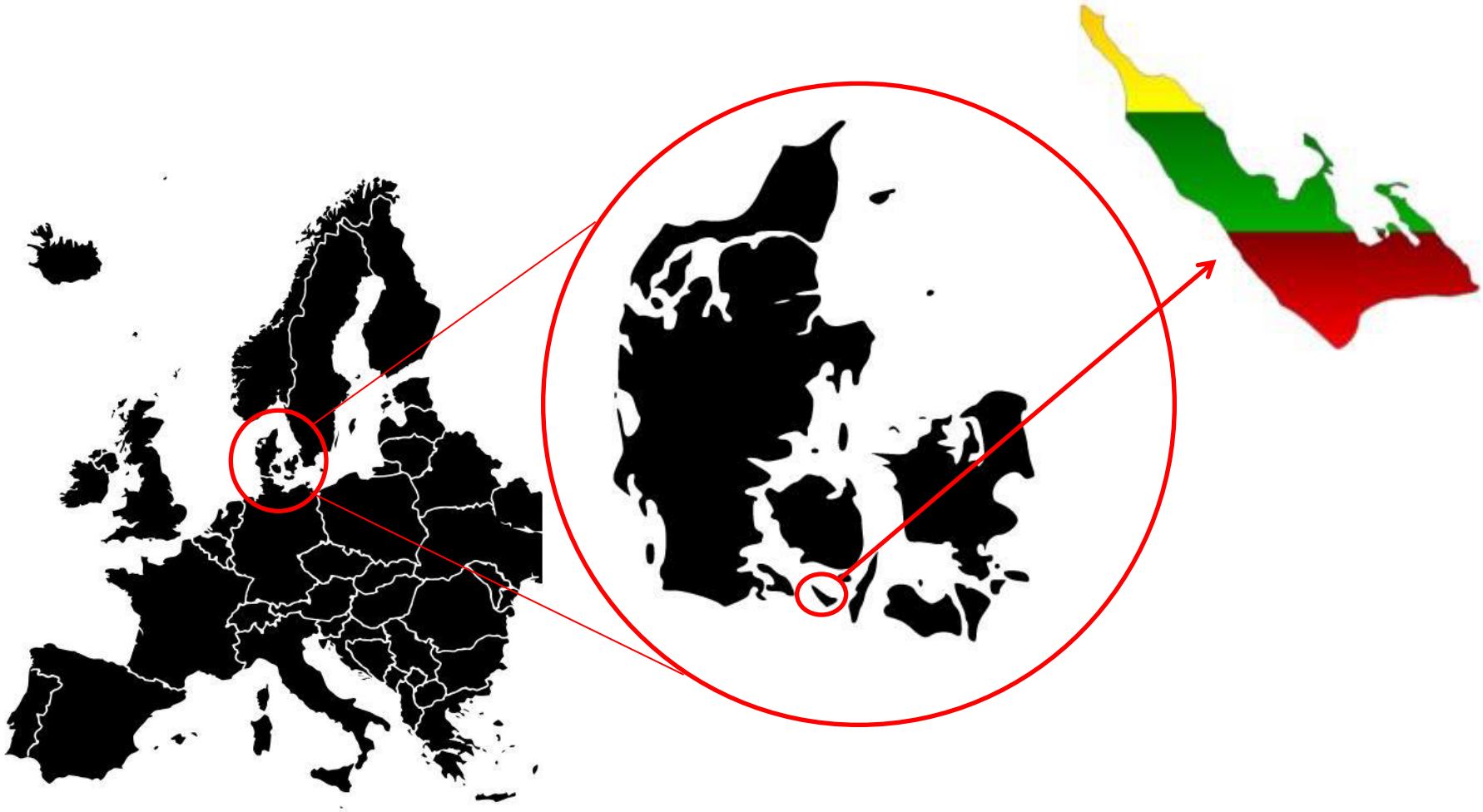
1. The E-ferry project at a glance

The objective is to design, construct and demonstrate a 100% electrically powered, medium sized, battery ferry for passengers and vehicles that can travel longer distances between charging.

June 2015 — **May 2019**

Development → Construction → Demonstration

1. The E-ferry project at a glance



1. The E-ferry project at a glance

2. Benefits from electric operation

- Reduced pollution and GHG emissions
  - 2000 tons CO2, 41 tons NOx, 1.3 tons SO2, 2.5 tons particulates annually
- More energy efficiency
  - Hydrodynamic hull design
  - Weight reduction
  - Only 20-30 % energy loss in the full chain

2. Benefits from electric operation

- Reduced operating costs
  - Higher up-front costs
  - Lower operating costs due to
    - Lower fuel prices
    - More automation
    - Less maintenance

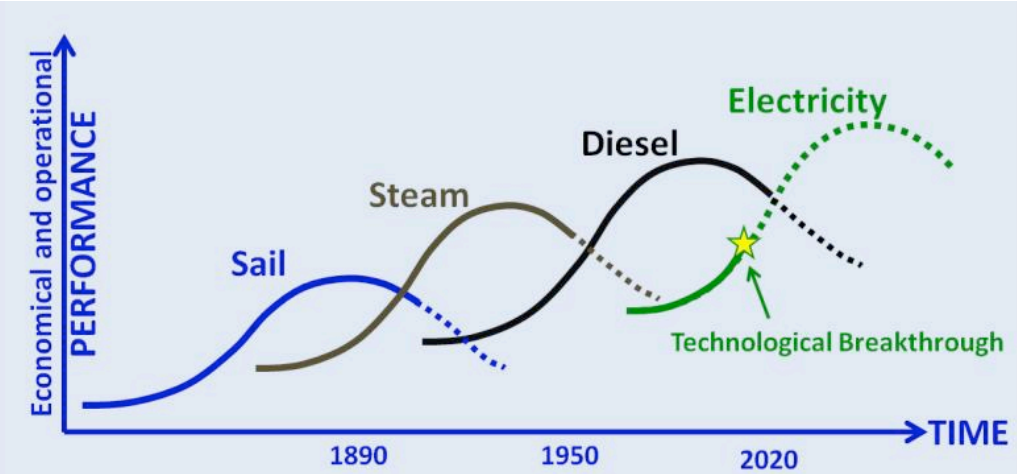
- Reduced noise and vibration
  - Improved comfort for crew, passengers and neighbors

3. Potential for electric operation

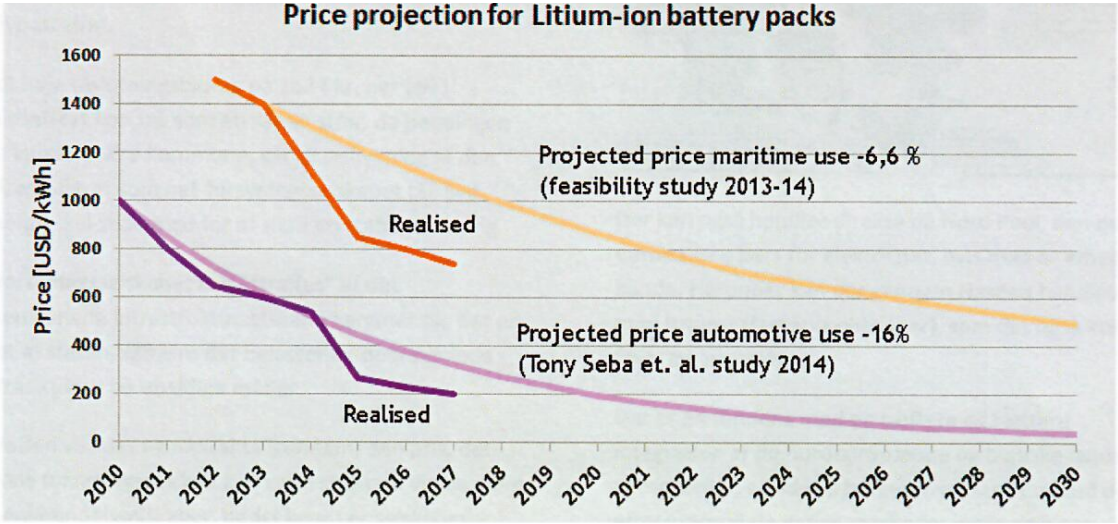
What do we know?

- **Green Ferry Vision (2015)**: 65-80% of Nordic ferry routes are suitable
- **Siemens Danmark (2016)**: 7 in 10 Danish ferry routes would be more profitable
- **E-ferry Business Study (2018)**: Fully electric operation is feasible on 900 ferry routes in Europe

3. Potential for electric operation



Source: Green Ferry Vision (2015)



3. Potential for electric operation

4. Barriers to the transition

- April 2018: IMO revise strategy
  - Reduce GHG emissions by 50 % by 2050
  - Phase out GHG emissions within this century

  BUT
  - Aimed at **international shipping** principally long-distance
  - Focus on energy efficiency, speed reduction and zero-carbon fuels (2nd half of this century)

  → Missing support for short distance ferry operation

  → Missing support for battery electric operation

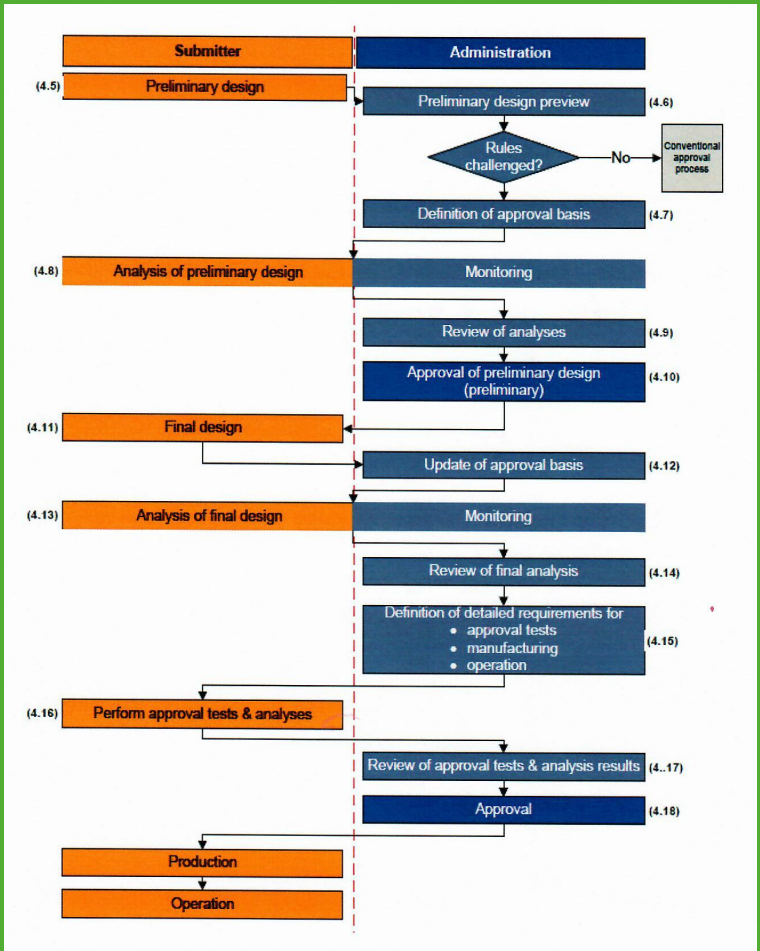
4. Barriers to the transition

IMO's 1455 risk analysis for "alternative design"

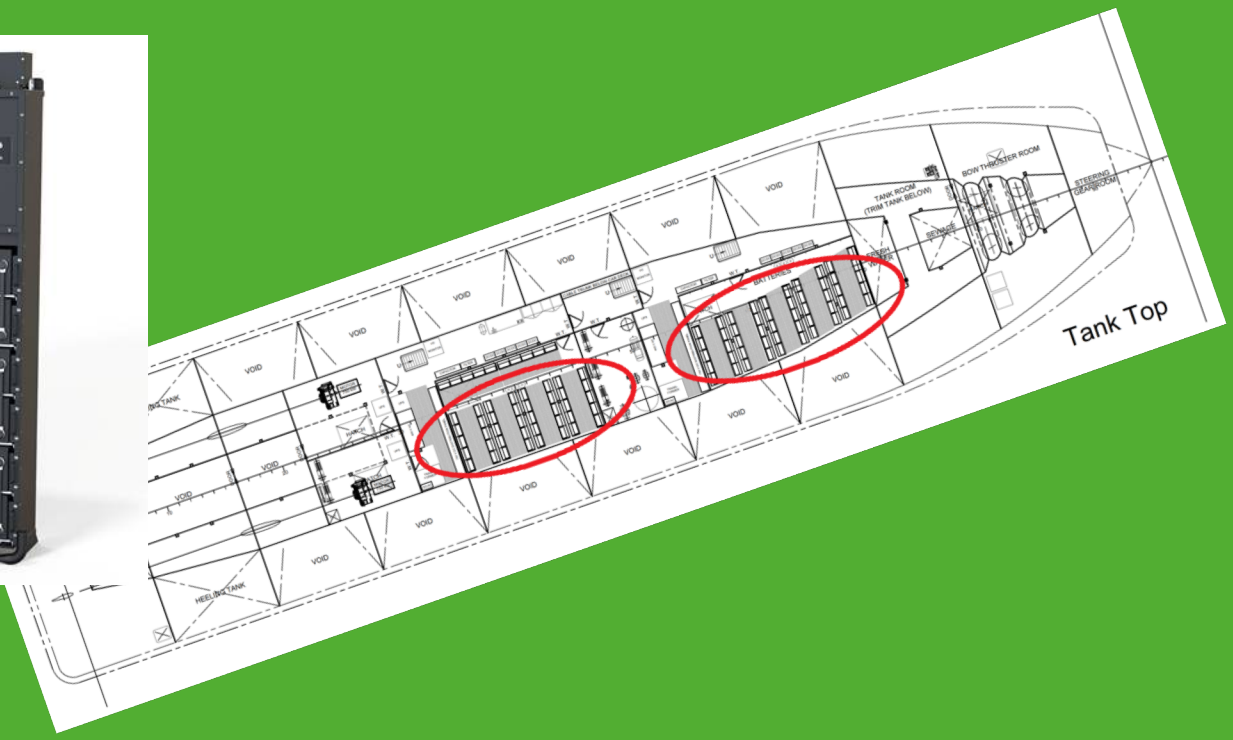
+ battery type approval from the class (e.g. DNV-GL)

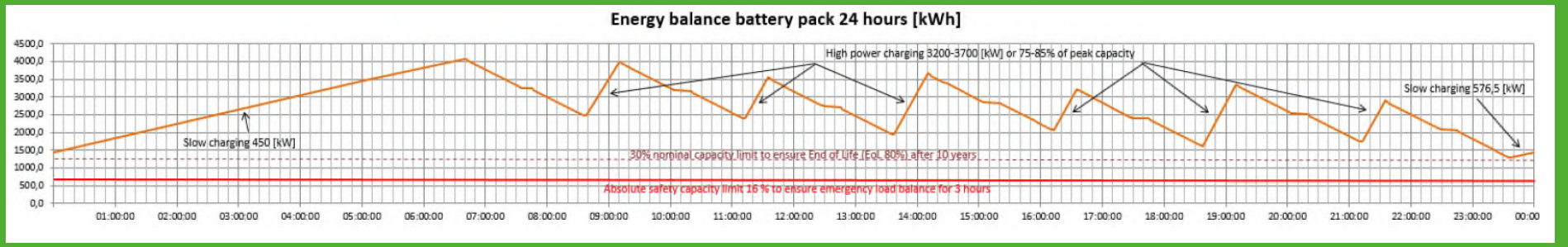
+ battery safety analysis

+ battery power analysis



4. Barriers to the transition





4. Barriers to the transition

- **Solution**
  - Type approved marine battery now on the market
  - Authorities are familiar with the process
  - Requirements adapted to the new reality with battery ferries
  - … may take years
  - Regional and flag state action is needed!

4. Barriers to the transition

- Good practice example: **Norway**

Goal =
50 battery ferries by 2020

- How?
  - → Local county requirements in tenders
  - → Financial support from the State

Thank you for listening

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