



WHEN TRUST MATTERS

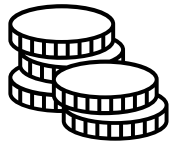
Regulatory development for hydrogen and ammonia

Overcoming three key barriers – Nordic Roadmap Conference 3rd December 2024

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03 December 2024

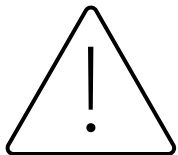
Overcoming the three key barriers hindering the uptake of zero-emission fuels



Cost remains a significant challenge



Lack of **fuel availability** and **bunkering infrastructure**



Lack of **safety requirements** and **experience** for ammonia and hydrogen, limiting early uptake

Source: DNV – Nordic Roadmap project, <https://futurefuelsnordic.com/>
DNV (2022), Insight paper on green shipping corridors, <https://futurefuelsnordic.com/insight-paper-on-green-shipping-corridors>



Hydrogen-powered

H₂ HYDROGEN POWER
CLEAN ENERGY OF THE FUTURE

NH₃

NH₃

NH₃

NH₃

NH₃

Ammonia

Ammonia

Ammonia

Ammonia

Maritime regulatory framework

International Maritime Organization (IMO)

International regulations



Flag State

Statutory regulations



Classification Society

Classification rules

Maritime approval process



Conventional oil-fuelled ship

Predictable approval process where the ship rules state, “what to do” and “how to do it”



Ship with new fuels and technologies

Risk-based approval process to demonstrate that the safety is ensured

M/F Hydra – the world's first liquefied hydrogen-fuelled ship



M/F Hydra
World's first LH2 fuelled ship
(Picture: Skipsrevyen 2021)

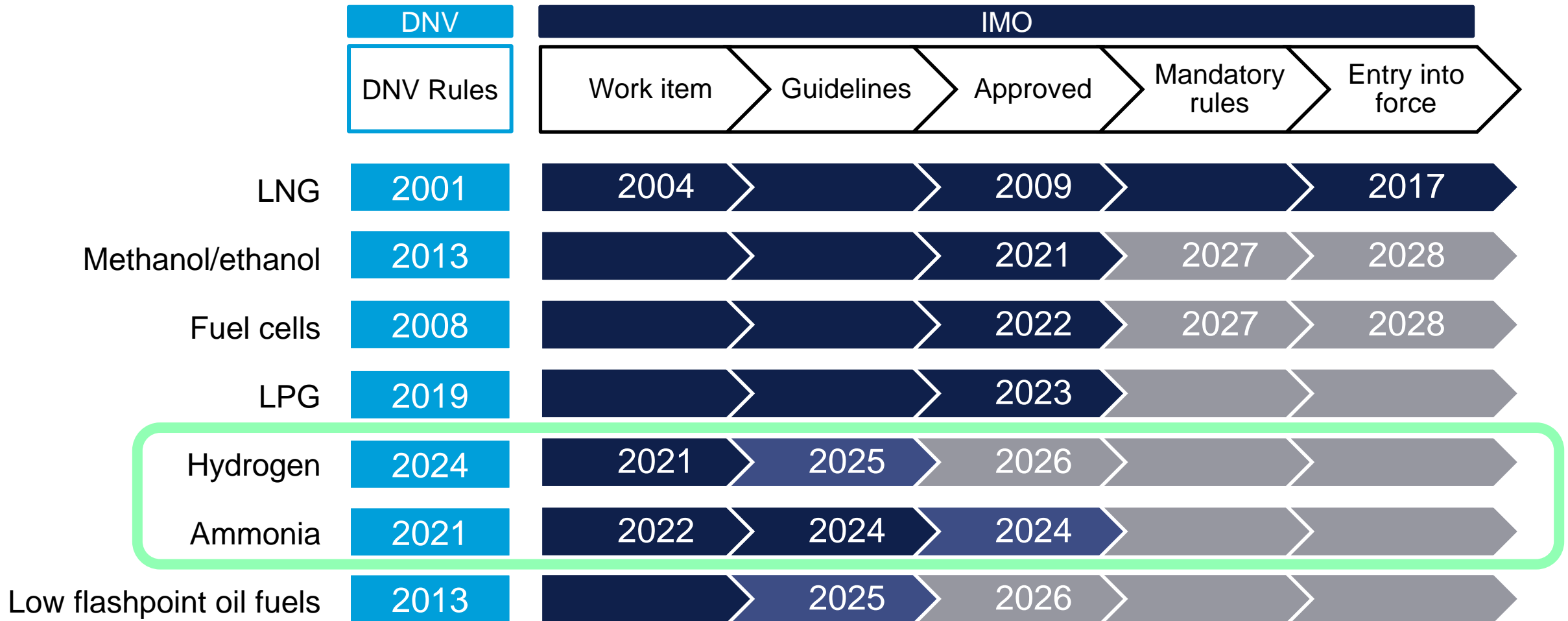


Source: Norled

In operation on batteries only, 2021. Sailing with hydrogen fuel cells since March 2023.



Development of safety requirements for alternative fuels



Source: Updated work plan for the development new alternative fuels under the IGF Code, CCC 10/WP.6, Annex 3, various IMO documents and DNV estimates. Future dates are indicative.

What is done in the Nordic Countries?

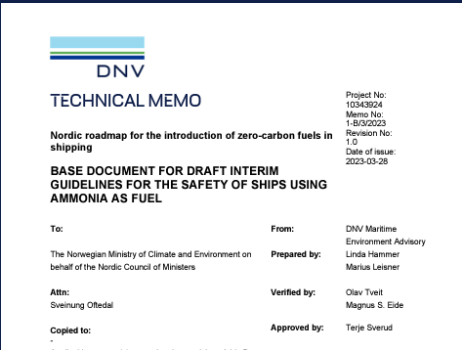
The Nordic Roadmap Future Fuels for Shipping project (2022-2025)



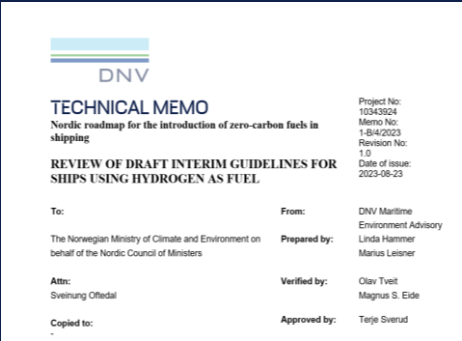
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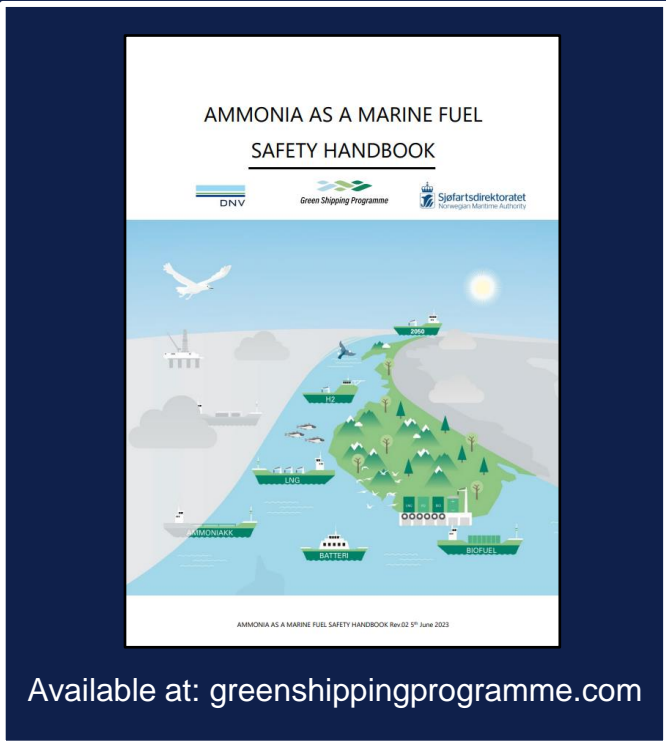
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Continued focus on safety is essential for a successful and timely fuel transition

Widespread adoption of ammonia and hydrogen as fuels requires predictable mandatory IMO safety regulations

The Nordic countries should continue supporting the regulatory developments in the IMO

Meanwhile, a **Nordic Future Fuels Playground** with a unified approach to fuel safety can help overcoming this barrier by providing a more predictable framework



futurefuelsnordic.com

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