

Zero-carbon fuel pathway


How can the shipping industry get to a zero carbon future?

The choice of fuels and uptake rate is important to generate the right momentum to decarbonise shipping by 2050.

Fossil and grey fuels

Heavy fuel oil, medium diesel oil, liquefied natural gas, grey hydrogen, ammonia or methanol


Feedstock: crude oil, coal or natural gas without carbon capture and storage (CCS)



Blue fuels

Blue hydrogen, ammonia or methanol


Feedstock: natural gas with carbon capture and storage (CCS)



Scalable zero emission fuels (SZEf)

Green hydrogen, ammonia or methanol


Feedstock: renewable energy

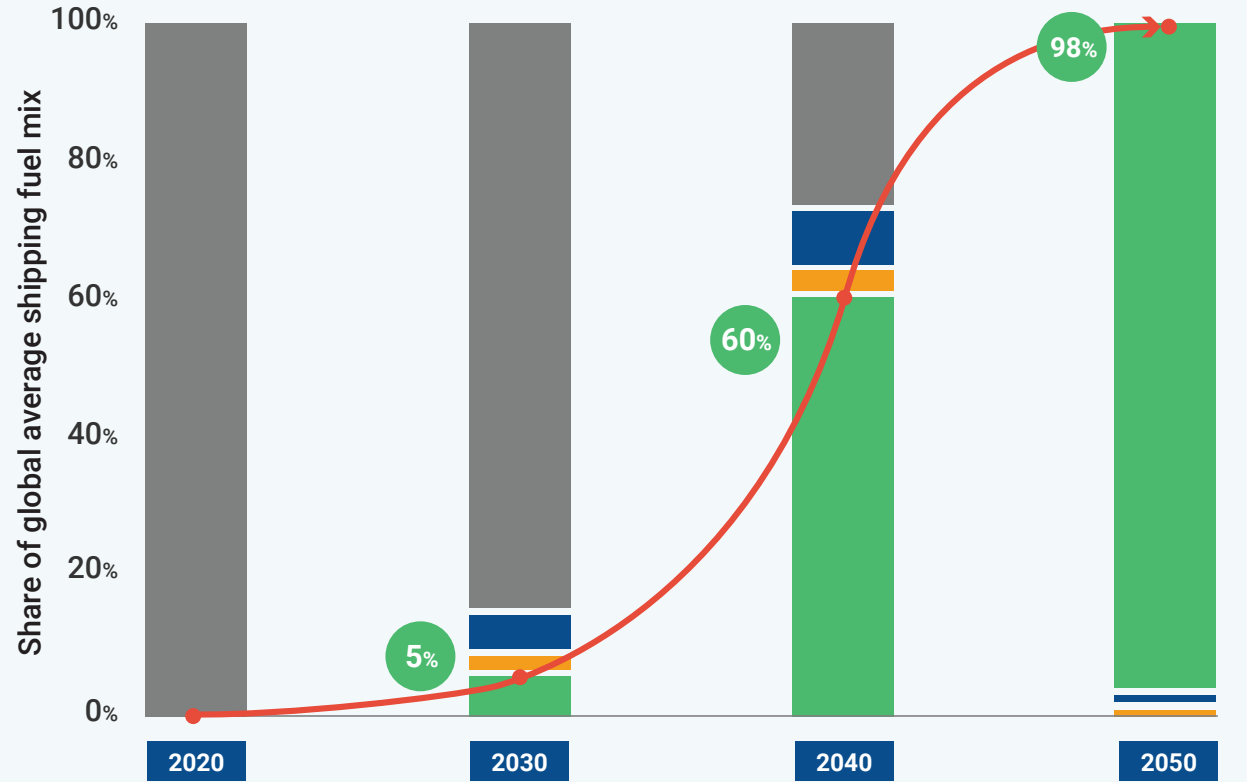


Biofuels

Bio-diesel or bio-methanol

Feedstock: biomass





First movers

Groups of developed nations will capitalise on the ideal conditions that can enable up to 10% of their shipping energy consumption to transition to SZEf by 2030.

Scaling the transition

Regulations on fugitive methane emissions, cheaper renewable energy and carbon taxes means fossil fuels and blue fuels are likely to be superseded by green hydrogen and ammonia. Investment into CCS technology could cause technology lock-in and stranded assets. Bio-fuels may play a small role in the short term until supply constraints make them infeasible.

Fossil fuels to green fuels

Extensive development of green hydrogen supply chains through the expansion of cheap renewable energy and large-scale electrolyzers will allow SZEf to become increasingly available and price competitive with conventional fuels.

The US, being one of the countries identified as having a strong potential for the production and distribution of SZEf, would be expected to have a quicker transition than the global average represented in this chart.