

NEw sustainable fuel Deployment Scenarios (NEEDS)

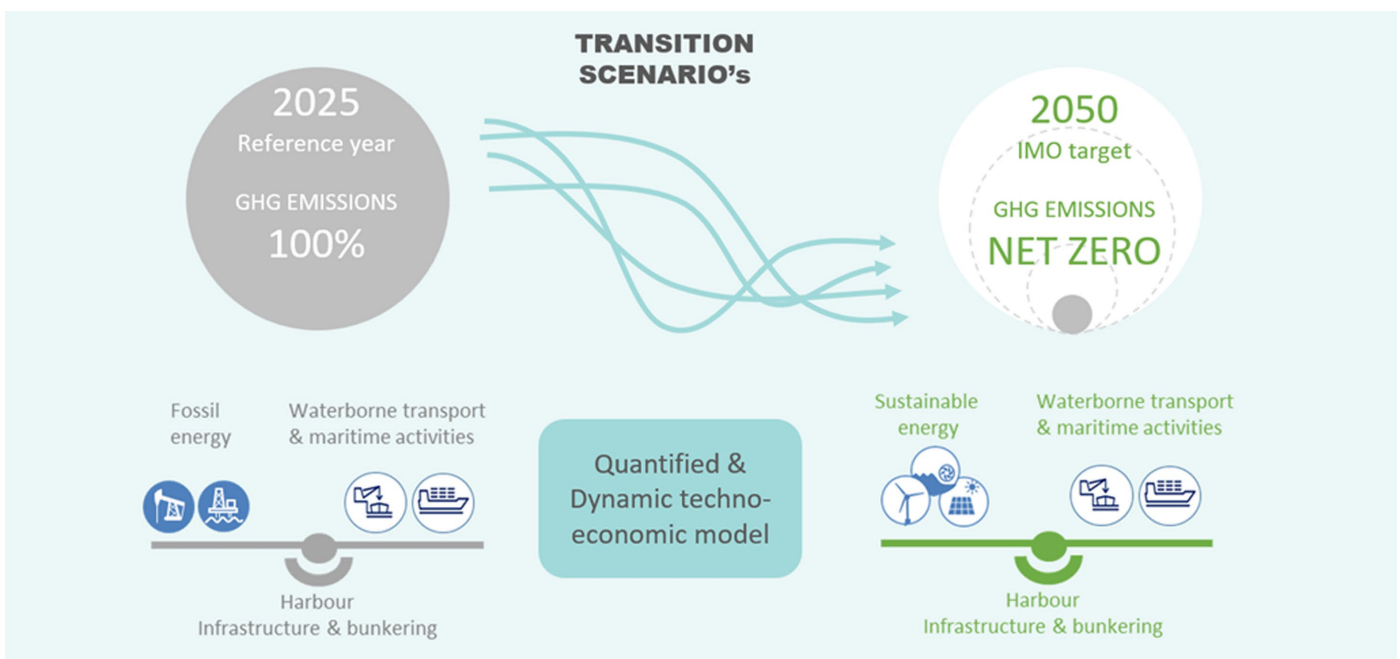
Decarbonisation efforts are accelerating across the maritime sector as IMO and EU regulations become increasingly stringent. Measures such as CII, EEXI, EEDI, the EU ETS, and FuelEU Maritime are reshaping requirements for vessel efficiency, emissions performance, and fuel choices. These regulatory shifts influence operational economics and long-term fleet strategies, creating the need for integrated assessment tools. NEEDS framework can serve as such a model, providing structured insights that will benefit evaluations of retrofits, newbuilds, and the adoption of low- and zero-carbon energy solutions.

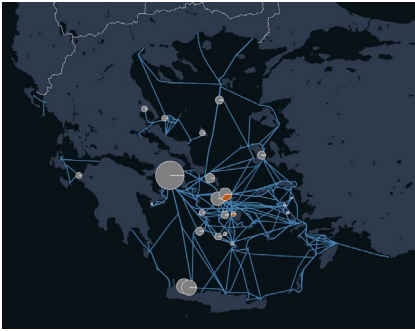
- Services to:**
- Baseline performance analysis
 - Capacity impact assessment
 - Cost modelling (CAPEX & OPEX)
 - Regulatory compliance planning

What is the purpose of NEEDS?

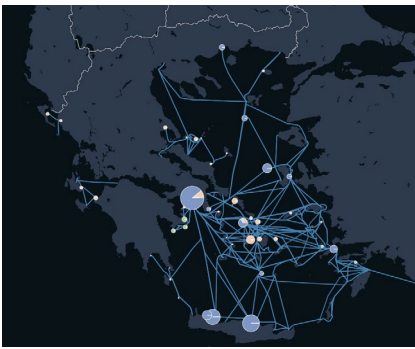
To create a dynamic techno-economic model that acts as a digital twin of your vessel or fleet helping you make confident decisions in a changing regulatory landscape. Through this modelling framework, users can:

- ✓ Predict compliance with IMO regulations (CII, EEXI, EEDI)
- ✓ Quantify costs under EU ETS and FuelEU Maritime
- ✓ Evaluate alternative fuels, retrofits, and operational strategies before investing





Baseline: Visualises current energy demand for the Greece region



Future: Visualises projected future energy mix for the Greece region

Related topics:

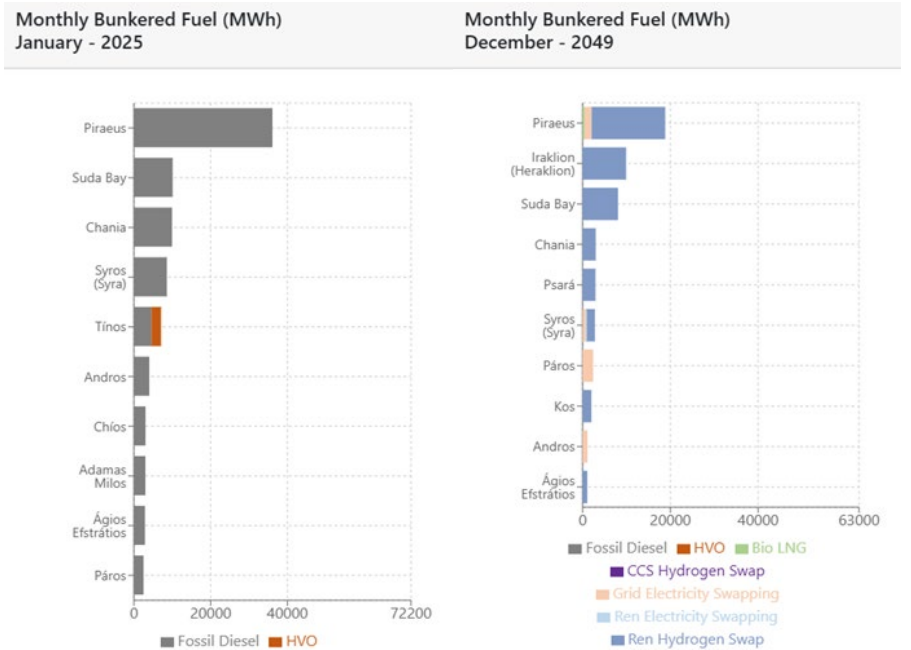
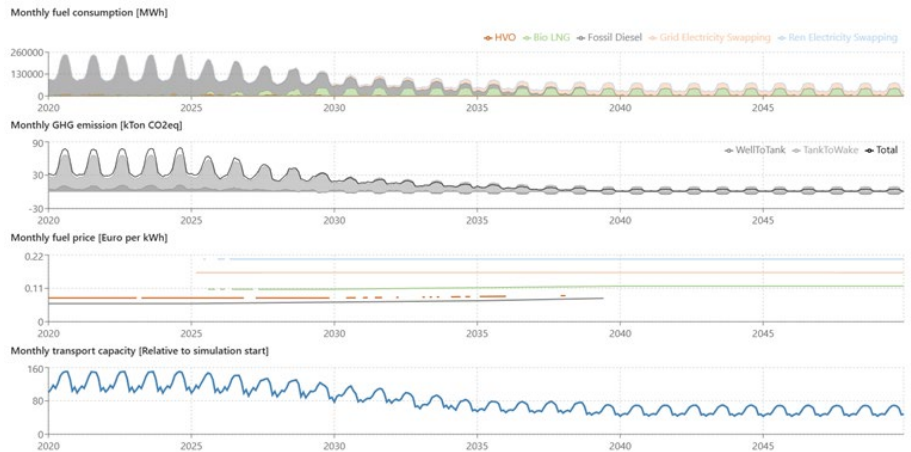
- Digital twin
- Voyage optimisation
- Energy transition
- Scenario simulation
- CII evaluation

What information is needed?

1. **Ship:** represents a real ship (fuel consumption, bunker, cargo)
2. **Port:** represents a port (bunker capacity, stored energy carriers)
3. **Route:** represents a geographical connection between ports
4. **Scenario:** external influence over time on a simulation parameter (ex: rising carbon price over years)
5. **Region:** group of ports and routes within a limited area (ex: Greece)
6. **Pathway:** combination of scenarios influencing the simulation (ex: fuel-price + carbon-tax + demand-growth scenarios together)

What are the expected outcomes?

- **Baseline:** Estimate fleet fuel use, emissions, and energy needs
- **Scenarios:** Compare conventional vs. alternative fuels
- **Costs:** Project CAPEX/OPEX for retrofits and newbuilds
- **Infrastructure:** Assess bunkering and regional energy needs
- **Capacity:** Quantify payload and voyage impacts
- **Emissions:** Evaluate tank-to-wake and well-to-wake



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