



**Unlocking the potential of energy efficiency technologies
with Fund for Energy Efficiency Technologies (FEET)**

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Director of Projects

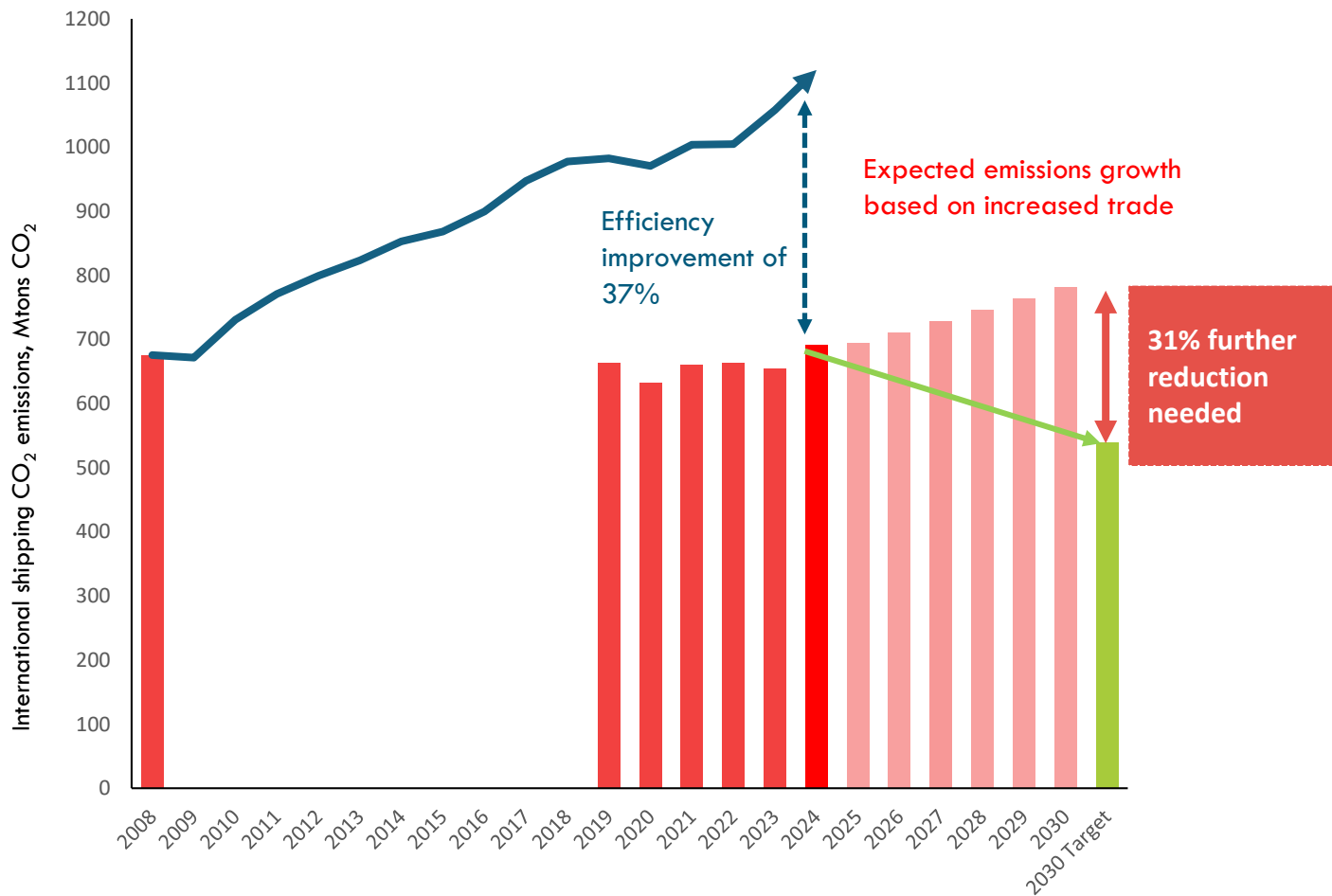
Shipping Decarbonization Forum, 20 May 2026, HKUST

The uncertain payback of Energy Efficiency Technologies (EETs)

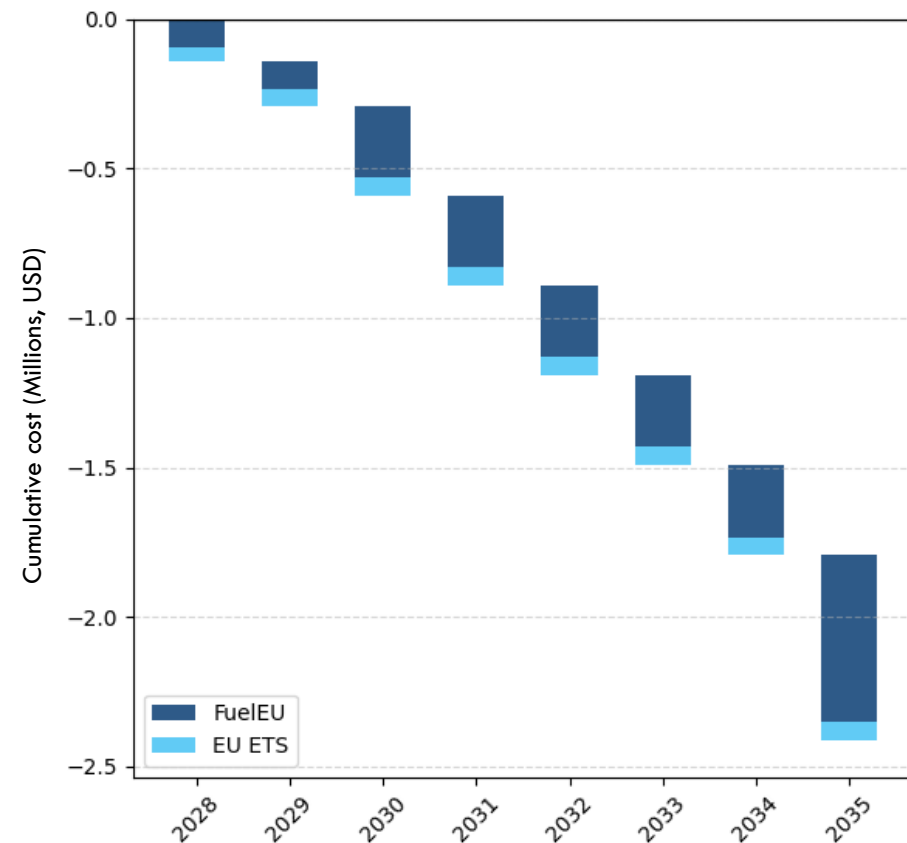
- + Vessel routes and weather conditions are **unpredictable**
- + Performance is **hard to measure**; lack of standard methodology for measurement
- + **Split incentives** and **high CAPEX** further weaken business case



Regional measures can fill global regulatory gaps

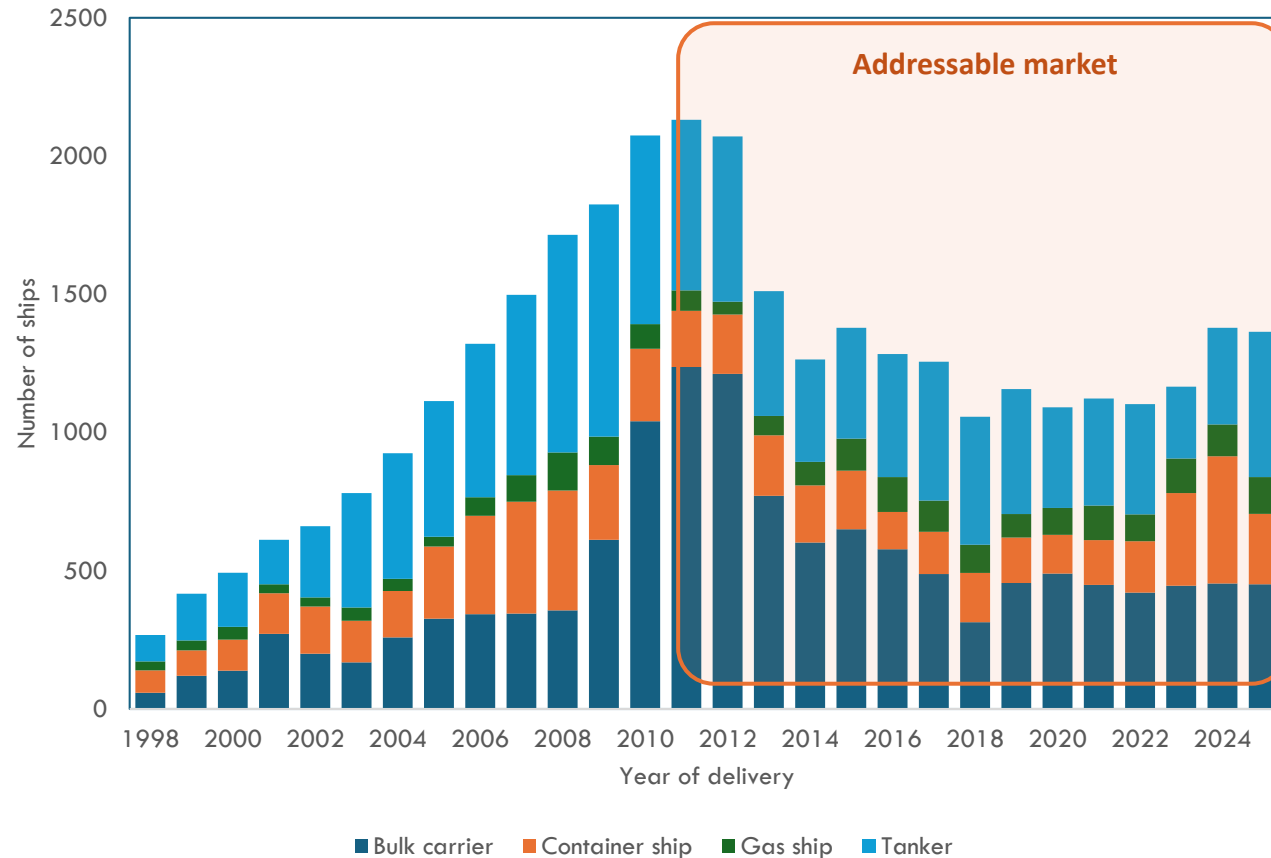


Cumulative compliance FuelEU and EU ETS costs
for a mid-sized vessel consuming 4,500 MT/yr of fuel, with 33% EU trading exposure



USD 20B¹ addressable market to meet industry targets

Based on an estimated fleet of 20,300 vessels of suitable age and size



Factors driving uptake

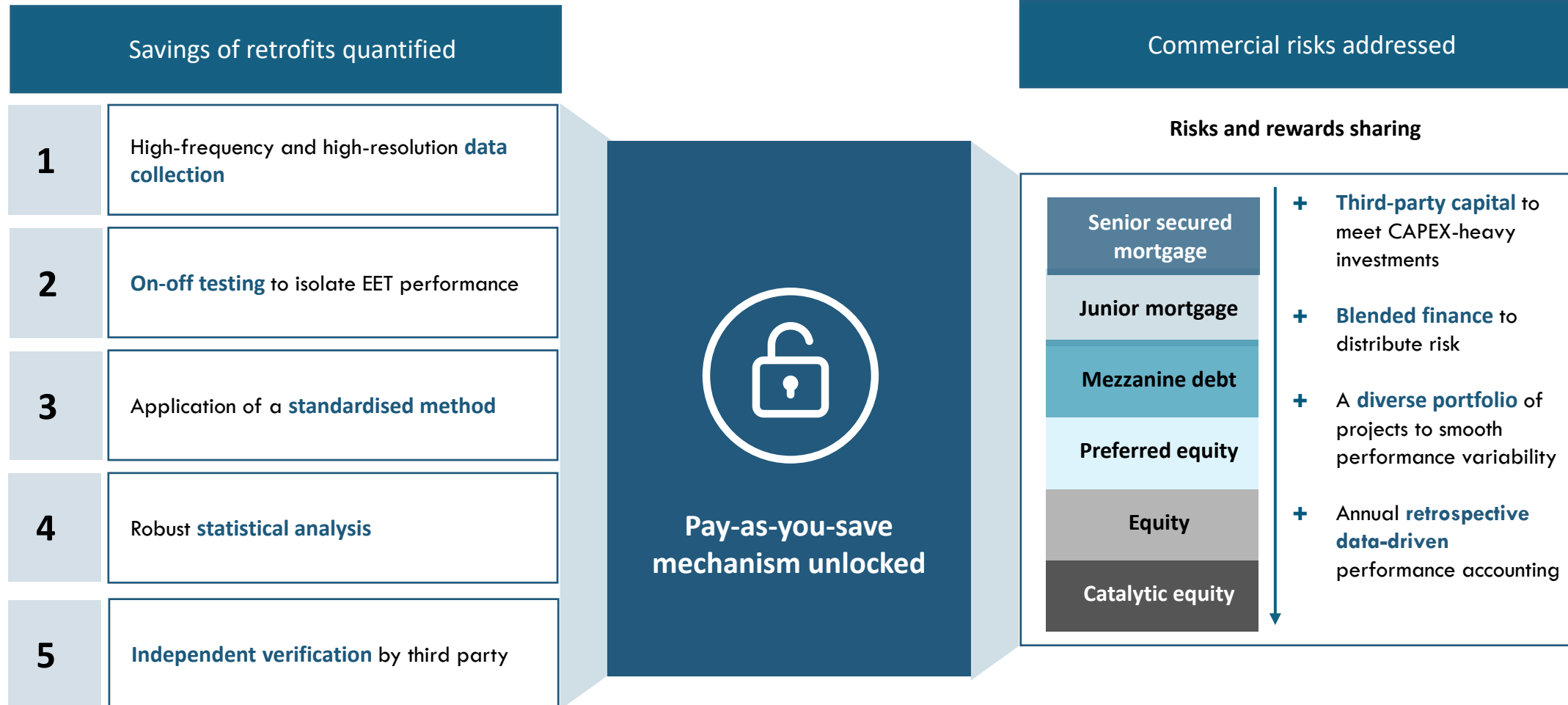
- Scale of retrofits: 2,000** vessels expected to be retrofitted by **2030**
- Fleet dynamics:** Older tonnage remains active with orderbook backlogs and future fuel uncertainty
- Investment case:** Efficiency gains on less efficient vessels make a stronger business case for EETs
- Room to grow: 72** commercial vessels with WAPS and **271** with ALS as of **2025**

Source: GCMD analysis, Clarksons Research, Kpler, S&P maritime, DNV AFI, World Bank: Keys to energy efficient shipping

¹High level estimates based on total vessels of c. 20,300 between 2011 – 2025, 40% uptake and USD 2.5M per EET

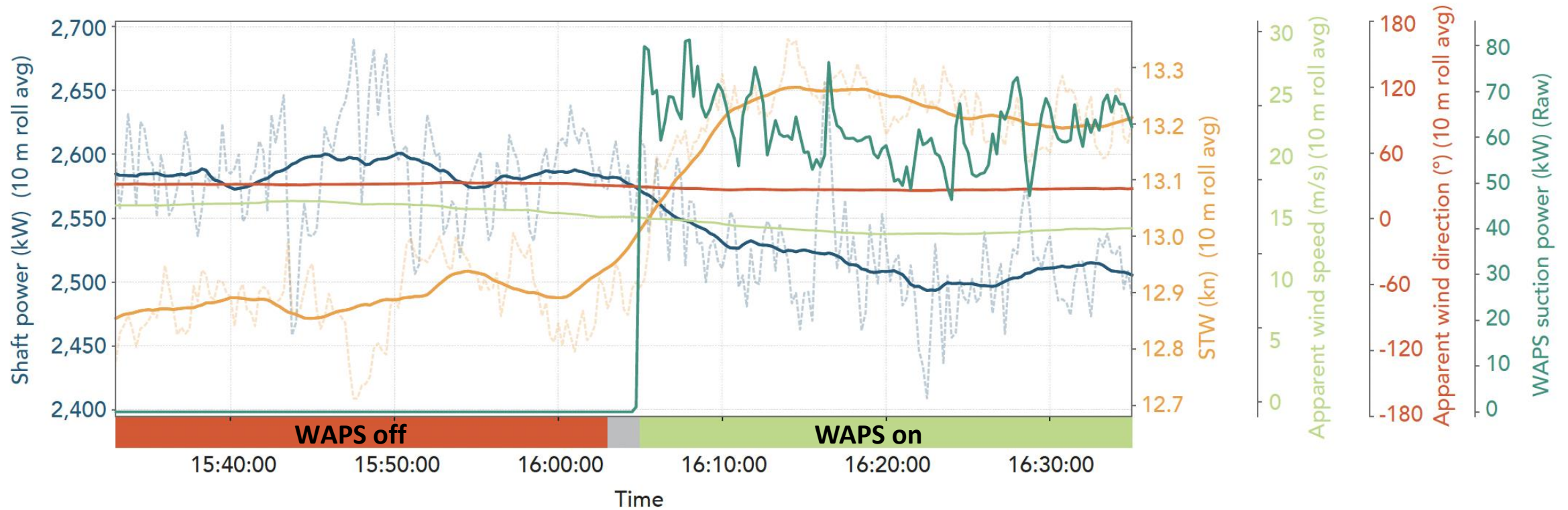
Pay-As-You-Save can potentially resolve barriers

A mechanism to share risks and – accordingly – share rewards



Fuel savings highly volatile

Data from a representative on-off test from the Pacific Sentinel

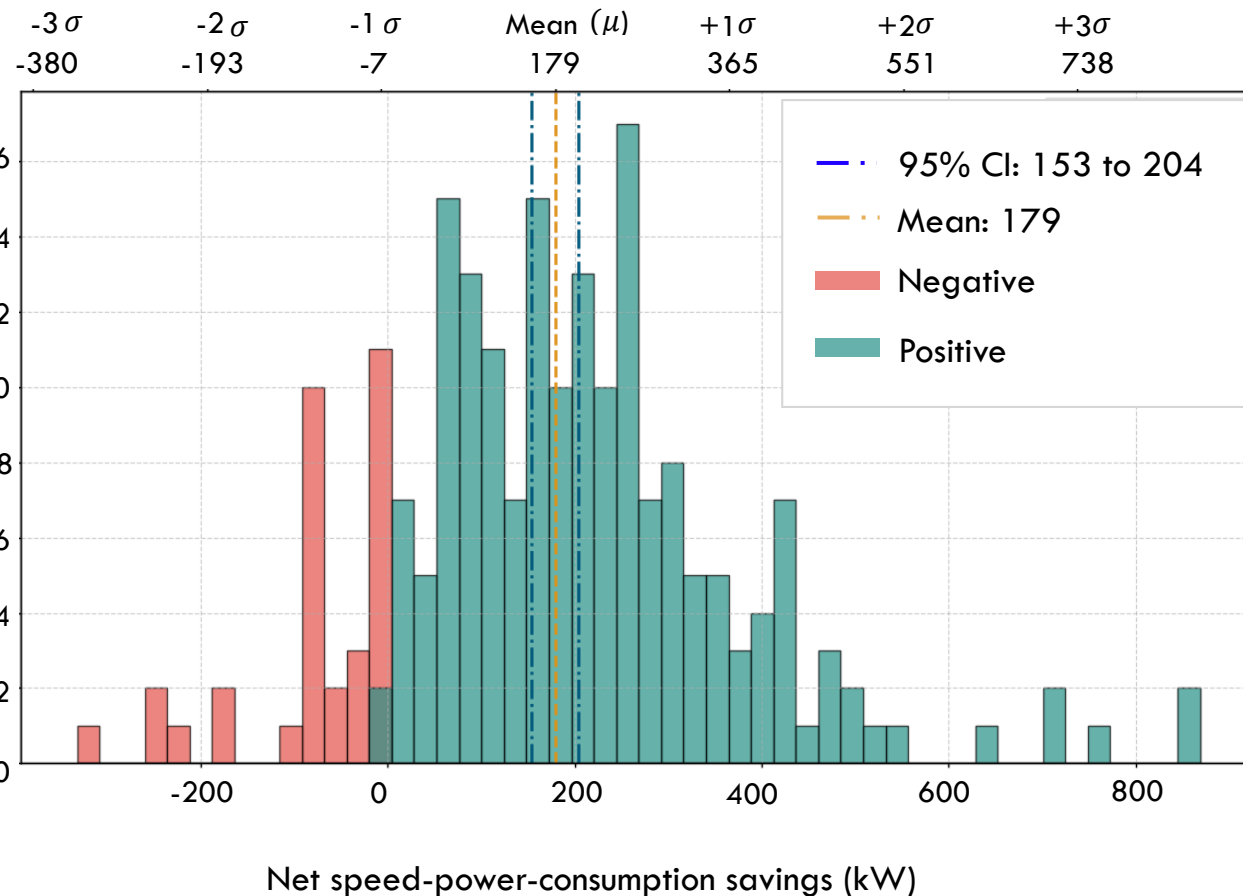


<p>Data collection on the Pacific Sentinel</p>	<p>Data acquisition system</p> <p>Automatic high-frequency data-gathering system connected to a suite of dedicated sensors</p>	<p>Recording frequency</p> <p>Every 15 seconds; uploaded to cloud for analysis</p>	<p>Parameters monitored</p> <ul style="list-style-type: none"> + Speed through water + Shaft power + Fuel flow for main and auxiliary engines, boilers + Navigational data + Suction sail status + Wind conditions
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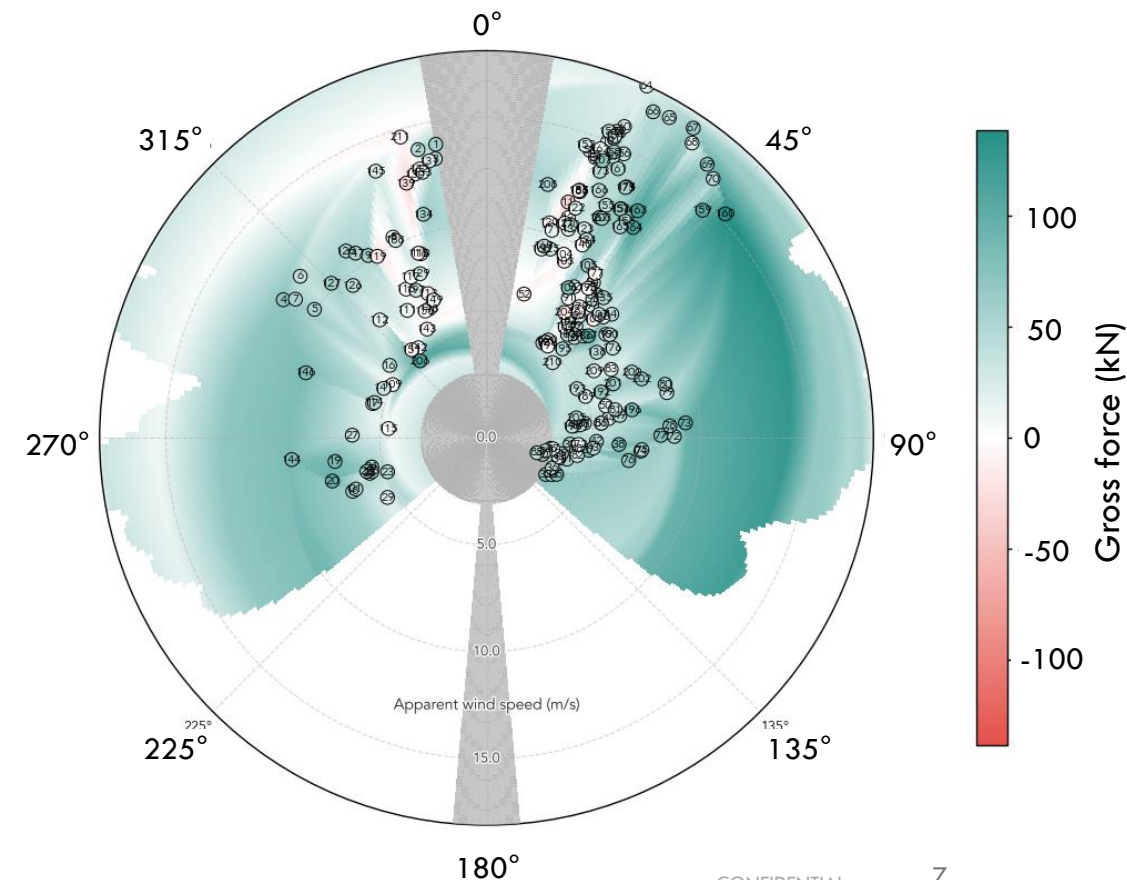
Tracking weather conditions + test results to build certainty

- + 276 million data points collected and processed during a 4-month window
- + 3,000 on-off transitions identified; 203 valid transitions used to quantify performance after data screening

Distribution of instantaneous power savings from on-off tests



Polar heatmap of gross force



Deploying pay-as-you-save

- ✓ Quantification of savings
- ✓ Blended finance stacked against a diversified portfolio of projects

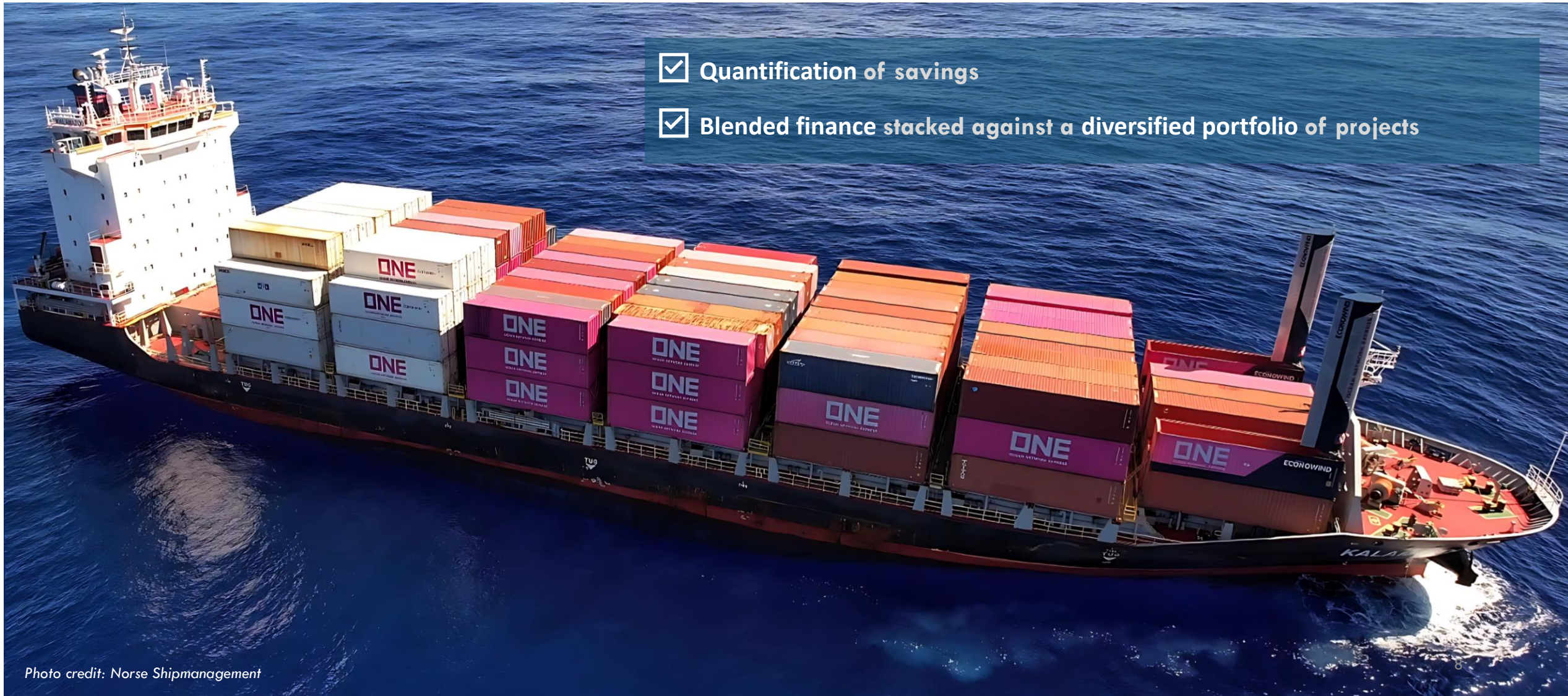
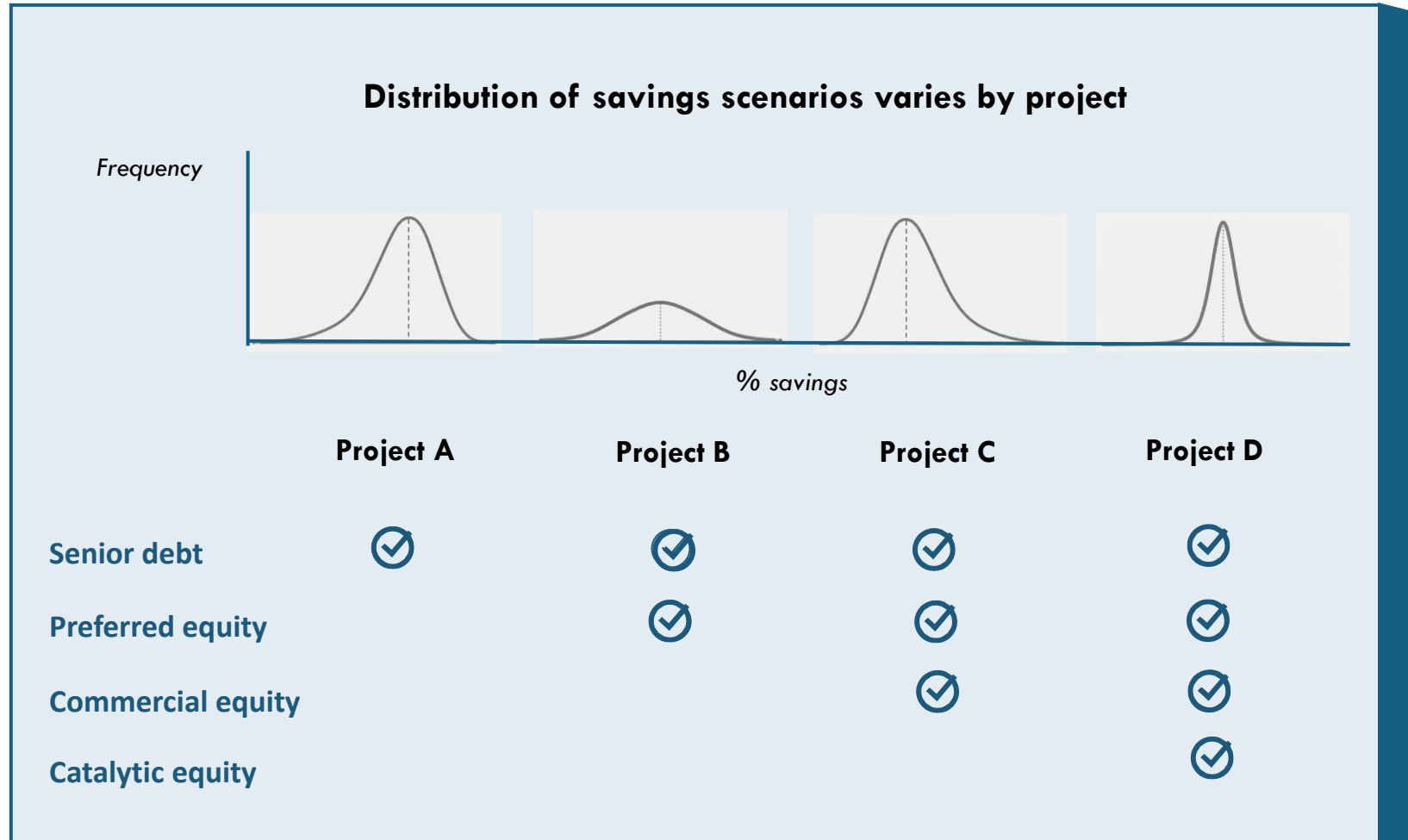


Photo credit: Norse Shipmanagement

Blended financing + project diversification lower risk



✓ Likely to receive payout contribution

- + **Project diversification** through complementary EETs, regional exposure, ship types and trading patterns
- + **Portfolio savings** less influenced by vessel utilisation or operating conditions of individual projects
- + **Blended finance** leverages senior debt to lower costs and equity investors to absorb risk
- + **Payments** flow through investor waterfall to provide risk-adjusted returns

Critical building blocks to execute PAYS



3 Savings actively monitored

- + Standardised, transparent method for measurements
- + Tested on case studies; to be deployed for all projects
- + Savings to be validated by third party

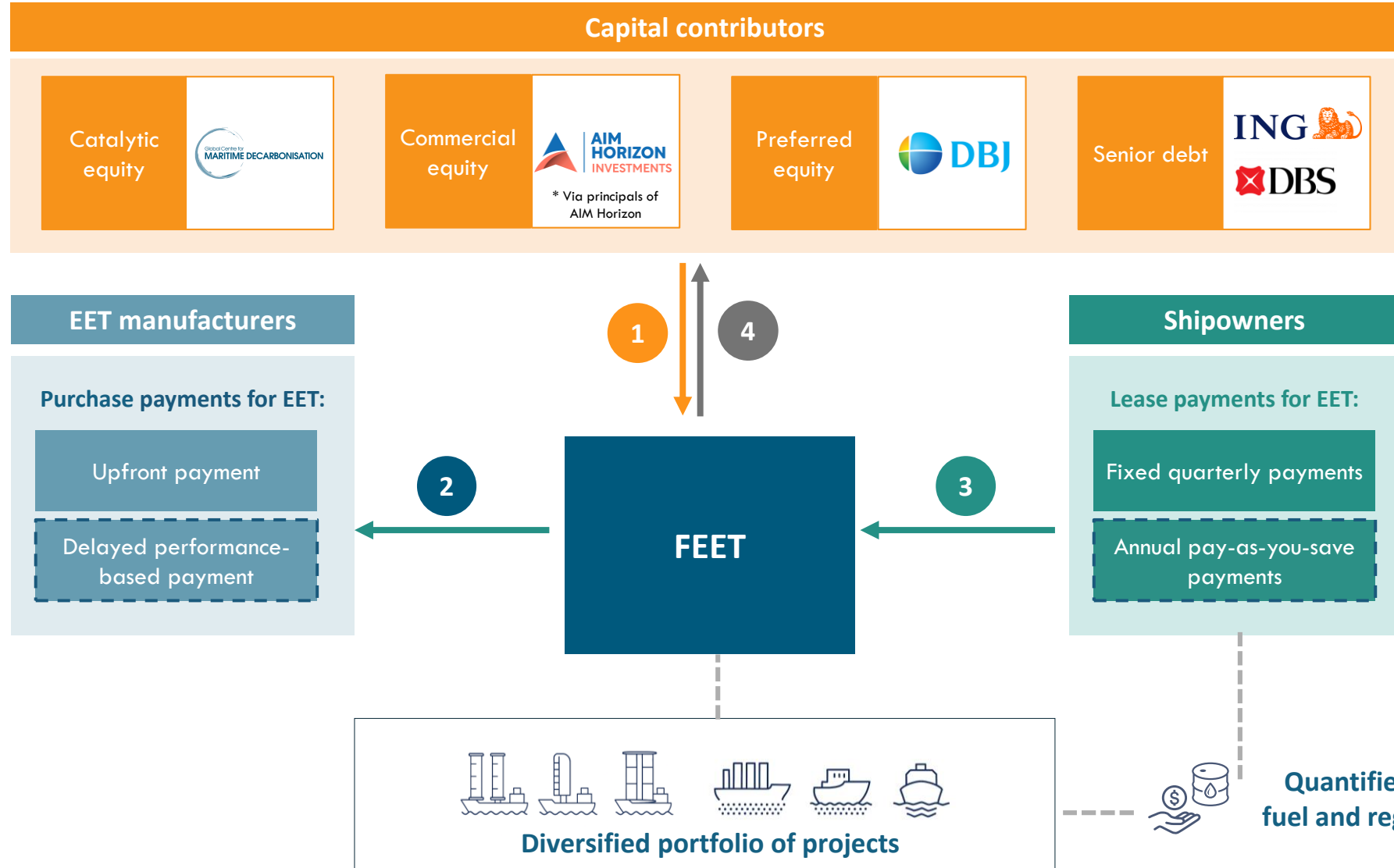
2 Catalytic capital committed

- + First loss insulation to investors
- + Crowded in **6x** additional capital to address financing gap


1 Leasing platform established

- + Provides unsecured capital
- + Avoids complex intercreditor agreements or subordination

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