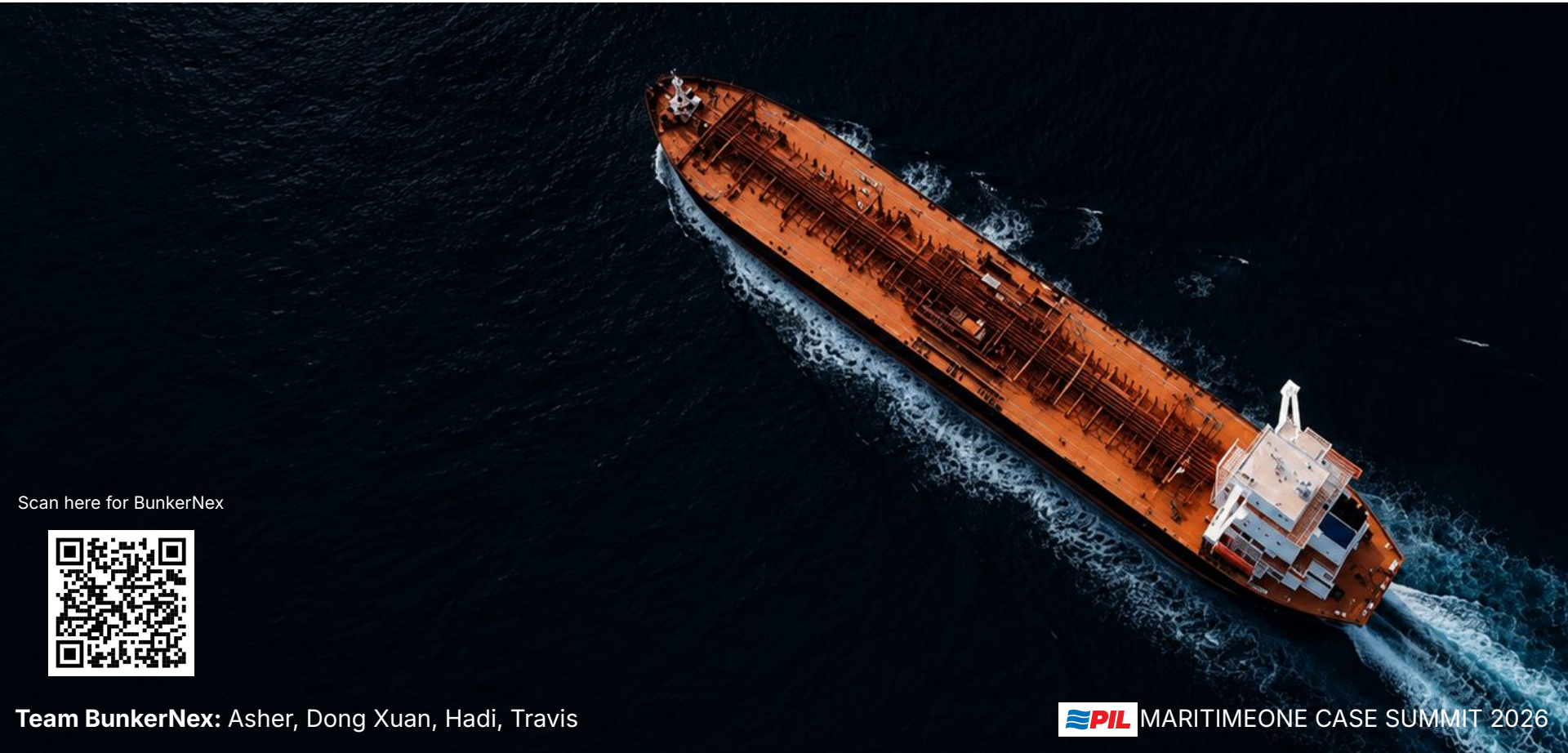
BunkerNex

Optimising where, when and how much to bunker



Scan here for BunkerNex

Team BunkerNex: Asher, Dong Xuan, Hadi, Travis

PIL MARITIMEONE CASE SUMMIT 2026

Executive Summary

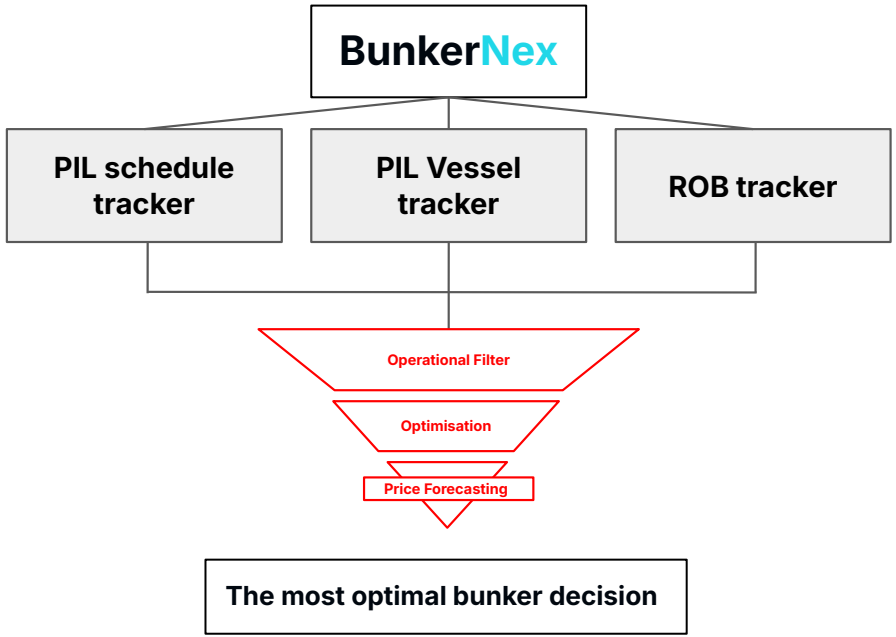
BunkerNex

Solution Overview	BunkerNex is an **integrated bunker planning and procurement decision-support platform** that determines where, when and how much to bunker across a vessel's service route.
Operational Intelligence	**Liner schedules, vessel specifications and projected ROB are integrated** to create a forward operational view of vessel movements, fuel requirements and upcoming bunker needs.
Decision Methodology	BunkerNex applies **compliance, vessel and operational feasibility filters** before evaluating commercially viable bunker options.
Most Optimal Decision	The optimisation engine selects the **lowest-cost executable bunker strategy**, specifying port, timing, quantity, supplier and a viable backup plan.
Case Example	**A representative vessel and PIL service** lane demonstrate how BunkerNex converts voyage and market inputs into an actionable bunker recommendation.
BunkerNex Workflow	Chief Engineer, Fuel Operations and Fuel Procurement inputs are **connected within one decision workflow**, from onboard fuel requirement through commercial execution.
Business Impact	BunkerNex **supports faster decision-making, improved procurement cost visibility, stronger term-contract evaluation and greater resilience** to operational or market changes.

Answering Where, When & How Much to Bunker

BunkerNex

BunkerNex converts PIL's service schedule, vessel data, ROB position and bunker market signals into an executable bunker recommendation.



https://bunker-nex.vercel.app

1. Service Layer
PIL liner schedule tracker extracts service lanes, port rotation and next bunker opportunities.

2. Vessel Layer
Vessel tracker maps vessel position, specs, fuel type, tank capacity and assigned service route.

3. Fuel Layer
ROB tracker calculates fuel burn, remaining onboard fuel and reserve breach timing.

4. Operational Filter
Chief engineer inputs updates actual ROB, bunker need, port window, pump rate and operational constraints.

5. Optimisation Engine
Decision model selects feasible port, supplier and bunker quantity based on cost, capacity, compliance and timing.

6. Forecasting Engine
Forward bunker benchmark produces 10-day, 1.5-month and 3-month price outlooks to support spot timing and term-contract negotiation.

Most Optimal Output: where to bunker, when to bunker, how much to bunker

The 3 building layer - Schedule,Vessel,ROB

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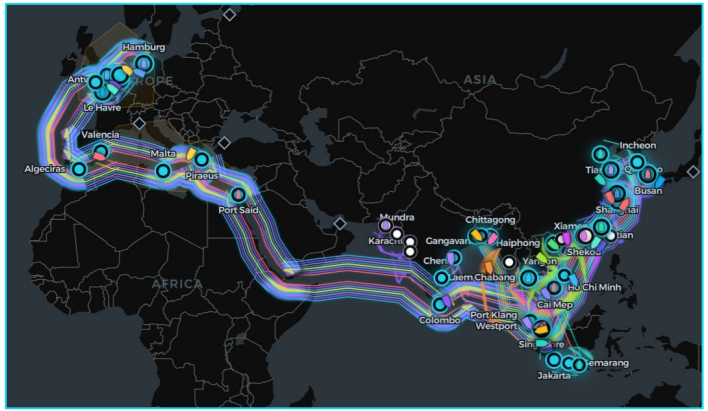
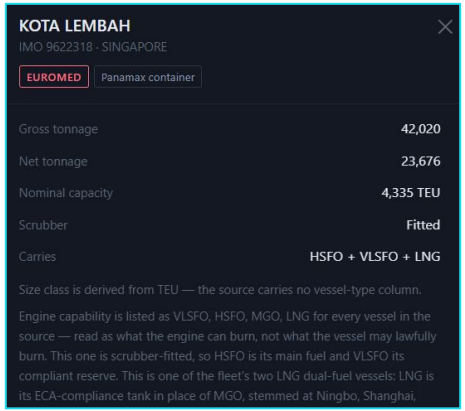
PIL schedule tracker
"Where is the vessel going?"

PIL Vessel tracker
"What can the vessel do?"

ROB tracker
"When does it need fuel?"





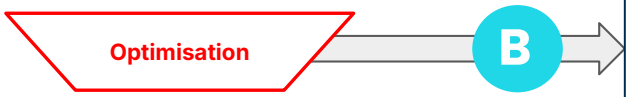
Together, these three layers tell BunkerNex where the vessel is going, what it can carry, and when its fuel position requires bunker action.

The BunkerNex Methodology

BunkerNex

Hard feasibility gate:
ROB tracker detects that fuel will be required, it evaluates whether each potential bunker option is actually executable through operational inputs.
1. Chief Engineer / vessel inputs
2. Port / procurement inputs
3. Compliance inputs – ECA and DECA Emission Regulations

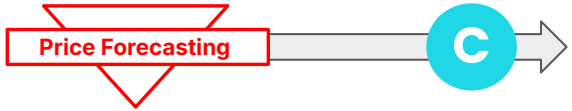
BunkerNex does not optimise price until the bunker option is operationally executable.



BunkerNex Optimisation Engine
Once operational filters produce a set of feasible choices, the mathematical optimisation engine takes over.
This addresses two of PIL's core questions: Where to bunker? + How much to bunker?

What the optimiser considers:
1. Commercial - Spot quotation, Term contract price, Supplier, Port price differential
2. Operational - Current ROB, Expected consumption, reserve, tank capacity, Bunker quantity limits, Future ports
3. Risk - Supplier reliability, Supply tightness, Port congestion, Backup availability

BunkerNex searches across the entire forward voyage rather than simply buying at the next port.



Price Forecasting Engine
This addresses PIL's core question: When to bunker / when to procure?
1. 10 Days - Supports upcoming spot bunker nominations
2. 1.5 Months - Supports upcoming service rotations and procurement planning.
3. 3 Months - Supports term contract negotiation.

How BunkerNex Thinks: Demand, Supply, Match

BunkerNex

01

Demand

Based purely on service schedule, route, and consumption profiles, based on ECA zone consumption rules, MARPOL Annex VI global sulfur cap.

Evaluates what grade and quantity of fuel the vessel requires without price influence

02

How does BunkerNex model fuel consumption behaviour?

Evaluate Service route → Determines ECA and compliance zones, an defines port calls and supplier availability.

Evaluate Vessel specification → Checks if scrubber installed, determining HSFO allowance.

These two factors when combined, allows us to model vessel fuel consumption behaviour and bunkering logic.

And this calculation, and behaviour runs at all times

03

BunkerNex will evaluate these considerations and provides the suggested bunkering location, based on fuel consumption logic

04

BunkerNex will factor Chief Engineer's inputs, through a button that replicates a real bunker procurement form, defining:

1. Required fuel grade and quantity
2. ETA, dwell time, and other operational remarks such as temperature and cold flow

05

BunkerNex will then:

1. Recommend bunkering combination based on given route

2. Generate visualisations that assist in HQ teams making the final decision on who to contact, and how to negotiate

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How BunkerNex Caters to two main users

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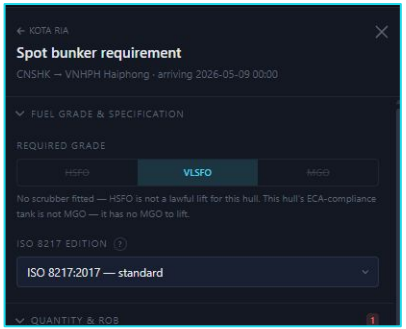
Chief Engineer and Engineers

HQ Bunker Operations & Procurement

Chief Engineer on board Vessel uses **BunkerNex to input operational constraints.**
We replicated **a bunker procurement form that the chief engineer fills**, inputs into BunkerNex helps the optimisation engine to come up with the **most optimal bunkering decision**
Additionally, **BunkerNex** allows the engineer to save the procurement form, and communicate with HQ via email, saving time and manual work.

Bunker Operations uses **BunkerNex to track vessels,view chief engineer inputs**, and **analyse suppliers across every port.**
For the Bunker Procurement team **Bunkernex provides valuable insights beyond market benchmark prices, but supplier transaction history, supplier positioning scatterplots** to assist the HQ in knowing who to contact for a negotiation
Additionally, BunkerNex has an in–built bunker price forecasting model that forecast **probable bunker prices 10D, 1.5M, 3M into the future**



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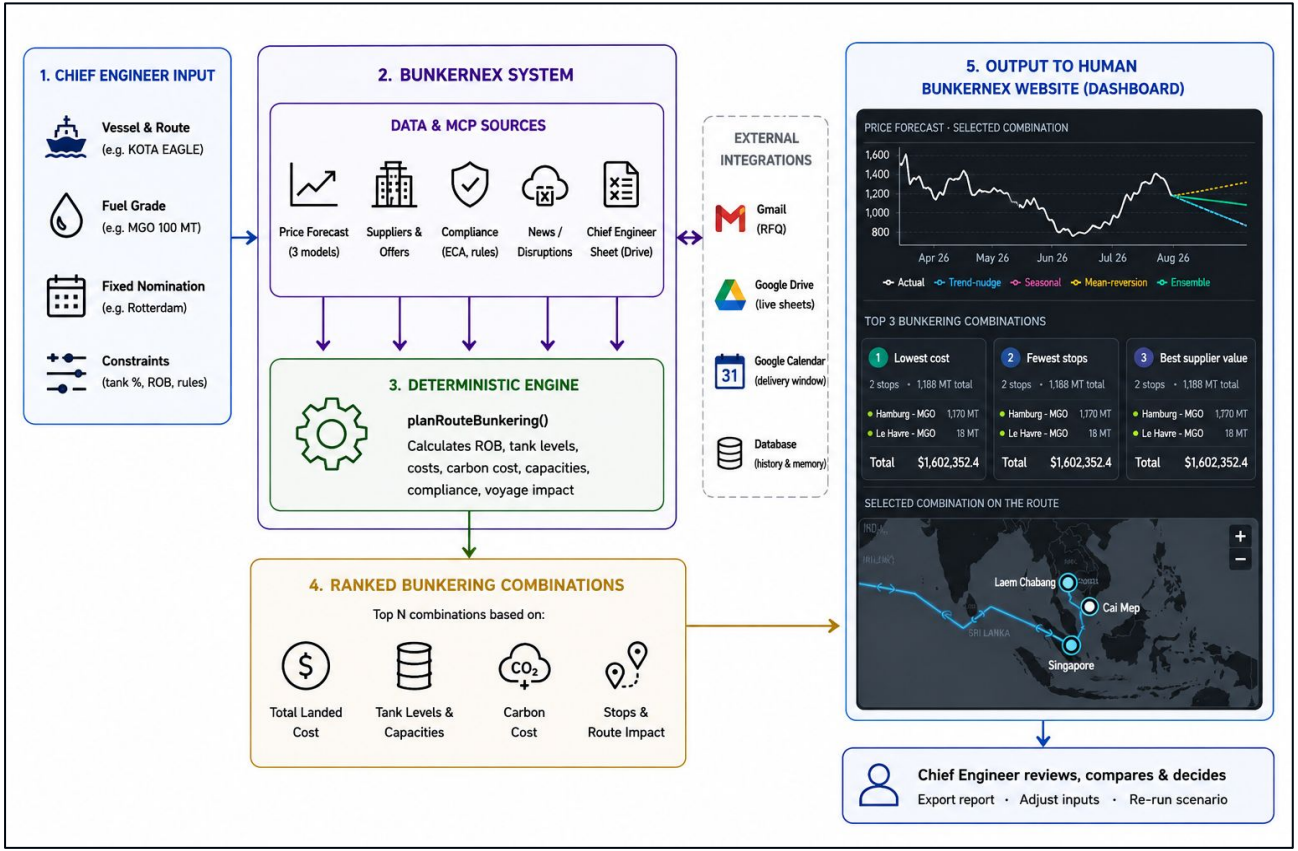
HQ perspective: Suggested Bunkering Combination

BunkerNex



BunkerNex AI Logic

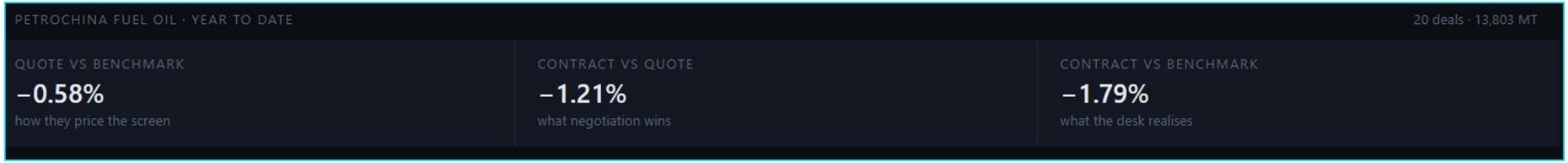
Referring to the diagram:

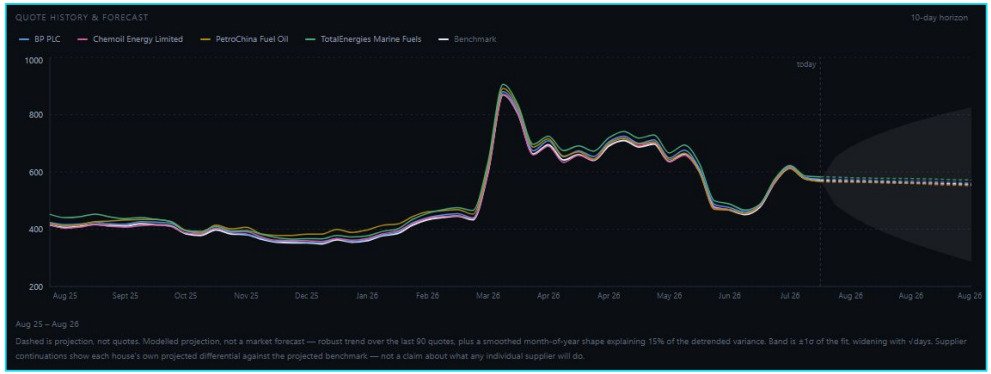
The system takes the **Chief Engineer's inputs and combines them with fuel prices, supplier offers and compliance requirements**.

It then **calculates and ranks the best bunkering combinations along the service route**, with the results displayed on the **BunkerNex dashboard for review and comparison.**

HQ perspective: Supplier Evaluation Tool

BunkerNex





This page on **BunkerNex evaluates suppliers in comparison to others, While tracking our internal bunkering deals with them.**

We understand that the bunkering process happens over real negotiations.

Thus we developed a dashboard that tracks:

1. Internal negotiation performance with each given supplier
2. Supplier price and service compared to others
3. Forecasted price movements 10 days and 30 days, based on fuel demand by seasonality.

This allows the HQ Procurement team to have extreme visibility when it comes to procurement of fuel at anytime, place and supplier.

Where the Numbers Come From

BunkerNex

No Arbitrary Demos or Guesswork

Every dataset is clearly tagged by its level of realism, with that label carried wherever the data appears. Every figure is traceable to its source, ensuring full transparency, auditability, and production-grade trust.

What Dataset	Source & Context	Realism Tag
Service schedules	PIL's own published schedule PDFs, 20 services	REAL
Vessel fleet specs	PIL Vessel Specifications sheet, 109 vessels	REAL
Fleet movement	Schedules + consumption and ECA rules	SIMULATED
Bunker prices (Hubs)	10 major global hubs (SG, RTM, ARA, etc.)	REAL
Bunker prices (Ports)	28 ports via documented basis differentials: Bunkerwire, platts, MPA singapore supplier list	MODELLED
Singapore LNG hub	Published JKM anchors, self-checked	MODELLED
7 route ports	Left completely blank instead of guessing	BLANK
Fuel availability	Chief Engineer's own real-time sheets	REAL
Supplier marketplace	73 suppliers (24 real PIL list, 49 added)	SIMULATED
Emissions references	IMO MEPC.364(79), ISO 8217, EU ETS	REAL

CCS - CHINA CALCUTTA SERVICE

1 **Xiamen**
Dwell <1 Day
Transit 2 Days

2 **Shekou**
Dwell <1 Day
Transit 2 Days

3 **Haiphong**
Dwell 1 Day
Transit 3 Days

4 **Singapore**
Dwell 1 Day
Transit 5 Days

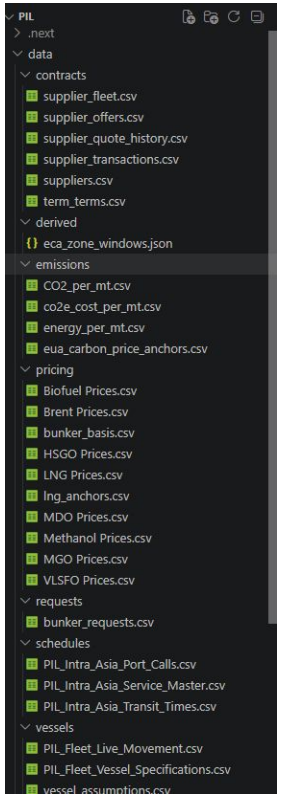
3 **Kolkata**
Dwell 3 Days
Transit 11 Days

4 **Xiamen**
Dwell <1 Day
Transit 2 Days

We uploaded 11 of PIL's intra asia services

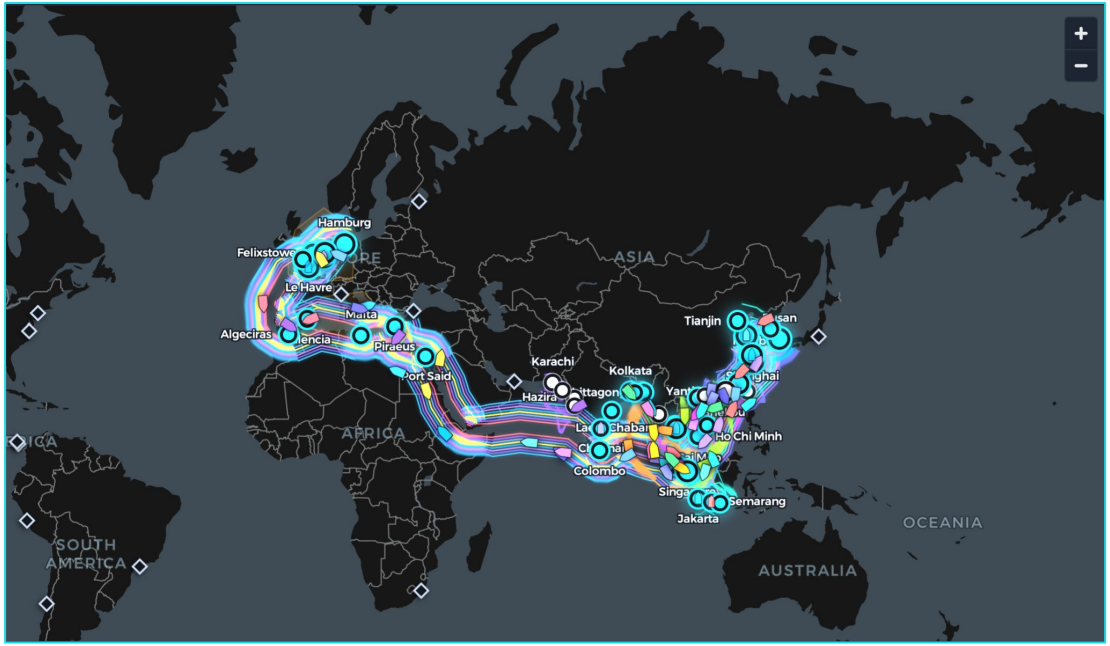
And mocked data for 9 Europe services that other carriers operate

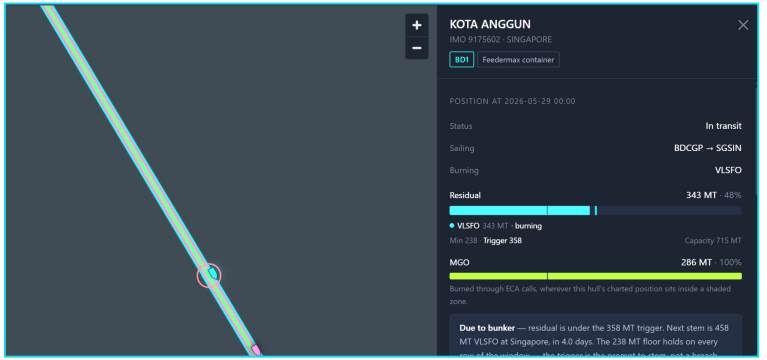
So that we can involve the complexities of ECA regions

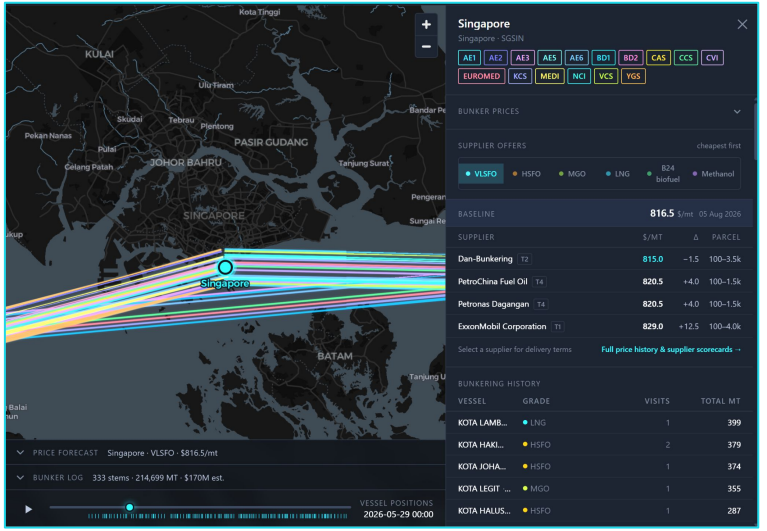


BunkerNex UserFlow

- **Live map of PIL's container-service routes and a 62-vessel simulated fleet, on a dark MapLibre basemap**
- Click **port** → prices, supplier offers, bunkering history, schedule
- Click **Vessel** → residual/compliance tank levels







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