



SEABOUND

An alternative approach to OCCS:
turning CO₂ into limestone



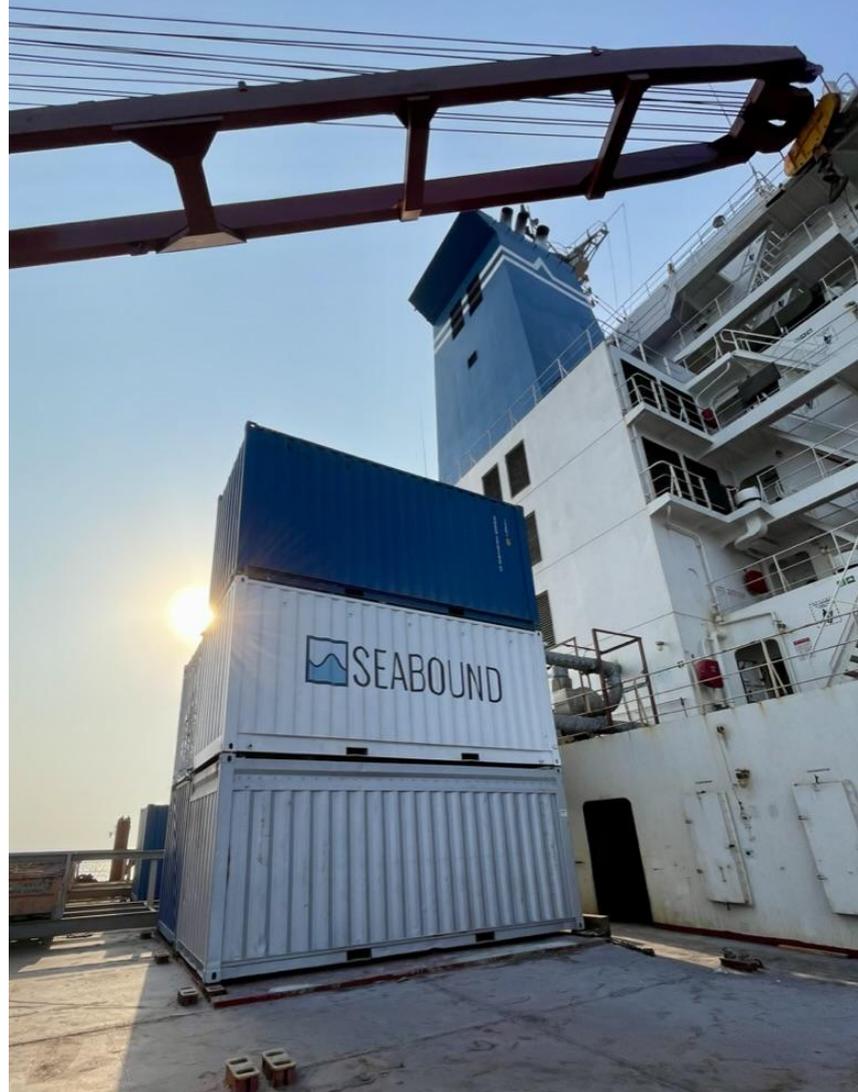
SEABOUND

IMO Technical Seminar | Sept 11, 2025
Alisha Fredriksson (CEO)

W/L 35 TON

Agenda

1. Intro to Seabound
2. Technology Overview
3. Key Advantages
4. Indicative Case Study
5. Pilot Projects & Next Steps



Seabound is an award-winning startup developing modular carbon capture systems for the shipping industry.

KEY STATS:

- Founded in late 2021 by serial entrepreneur, ex-SpaceX engineers, PhD chemical engineers
- 20-person team, based in London
- \$10M raised to date between equity & grants
- 2 world-first pilot projects completed



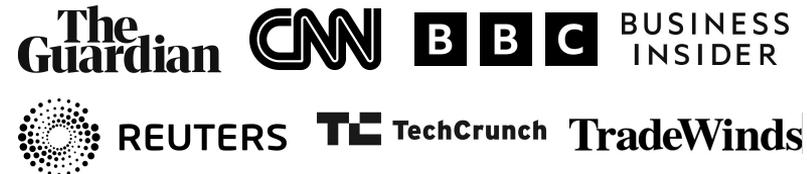
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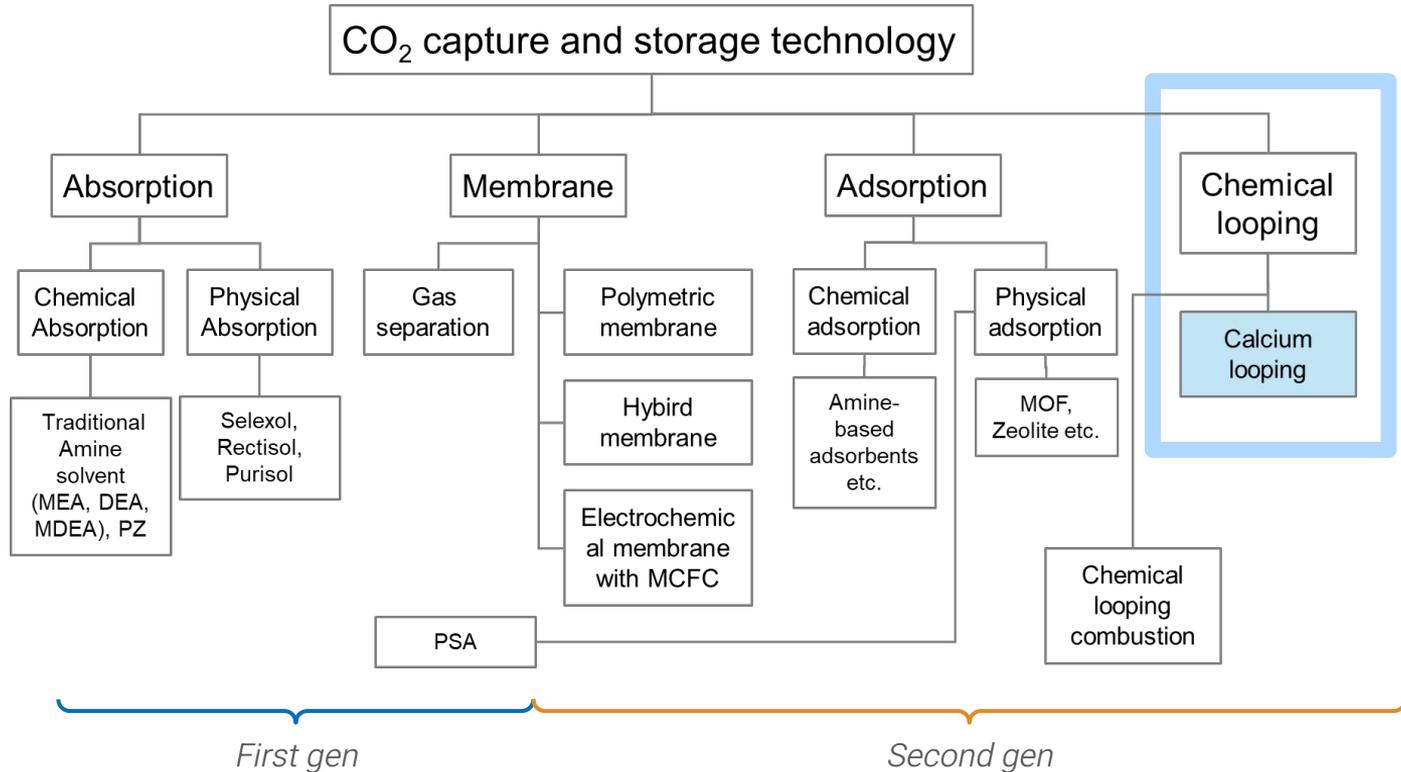
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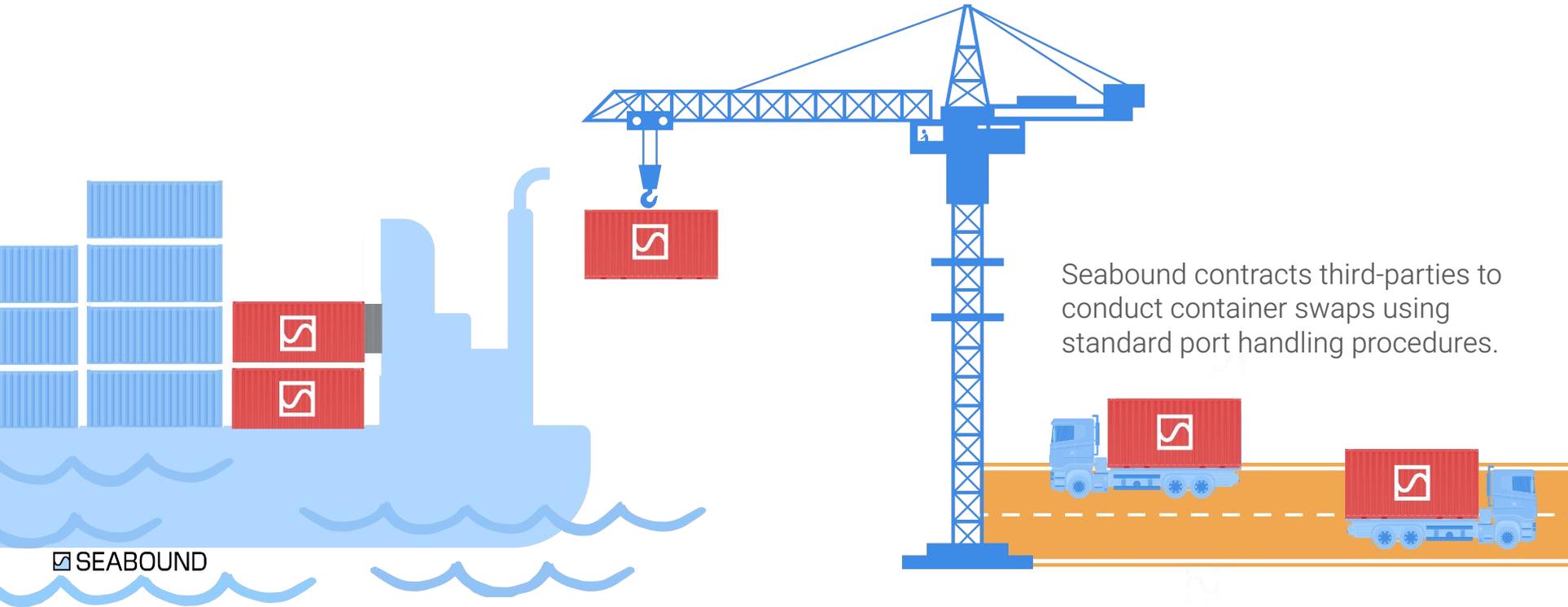
We **reviewed all types** of carbon capture technologies to find the best fit for shipping – **selecting 2nd-generation calcium looping**.



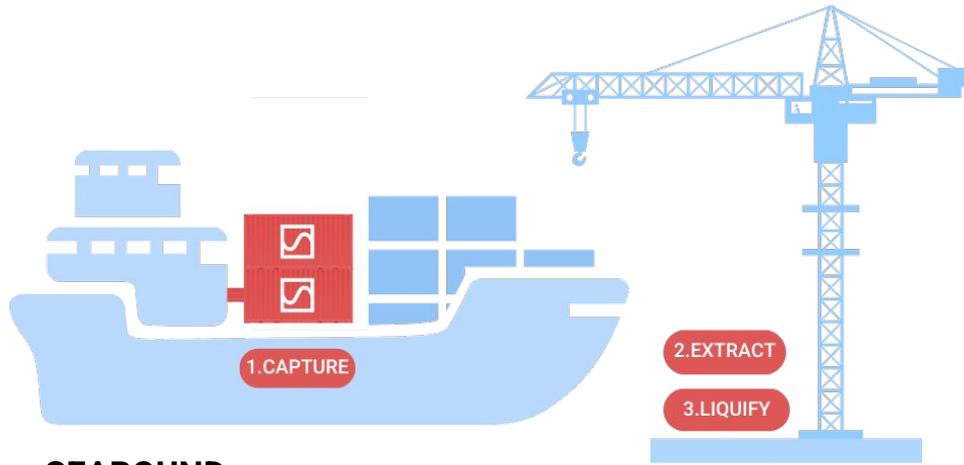
“Seabound Containers” are modular carbon capture systems filled with lime that absorb CO₂ and convert it into limestone.



Seabound Containers connect to a ship's exhaust with minimal retrofits. At port, saturated containers are swapped for fresh ones — just like regular cargo.



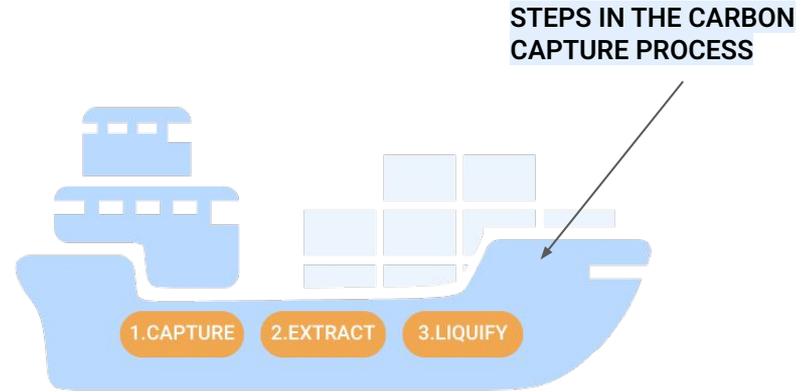
Seabound **uniquely decouples** the carbon capture process between ships and shore to **reduce cost and complexity**.



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First principles thinking: Designed specifically for maritime constraints; decouple onboard and onshore parts, leverage 2nd gen tech (lime).

Low CAPEX, low onboard energy, just offload limestone.

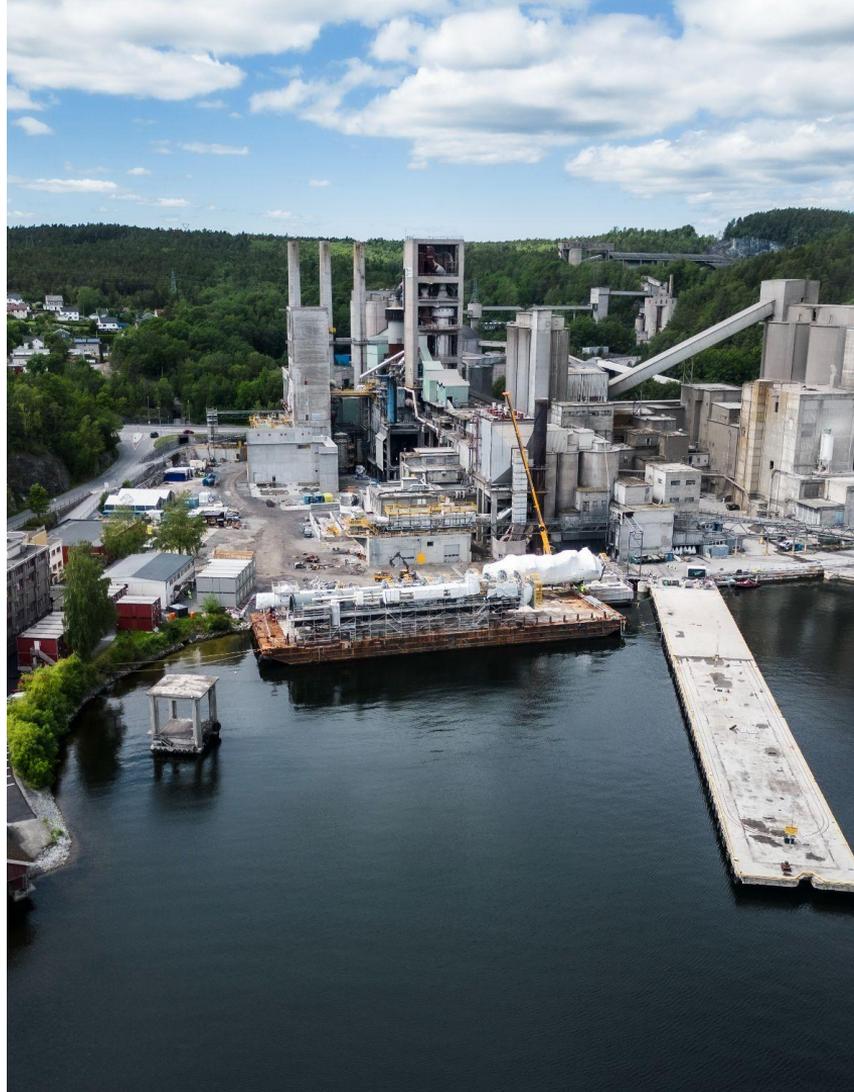
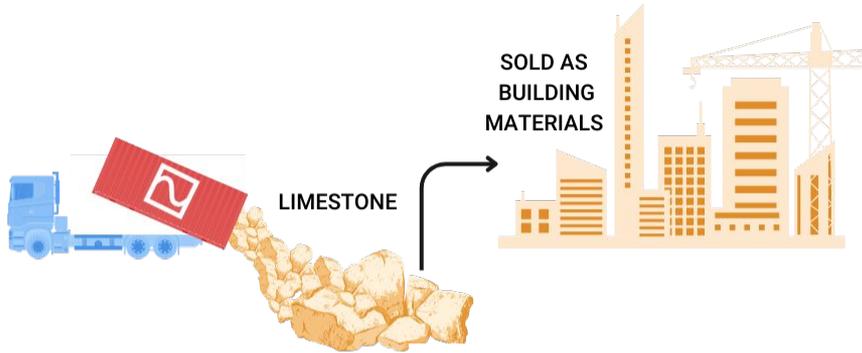


ALTERNATIVES

Conventional thinking: Miniaturize and transfer full carbon capture process (steps 1-3) from land to ships, using 1st gen tech (amines).

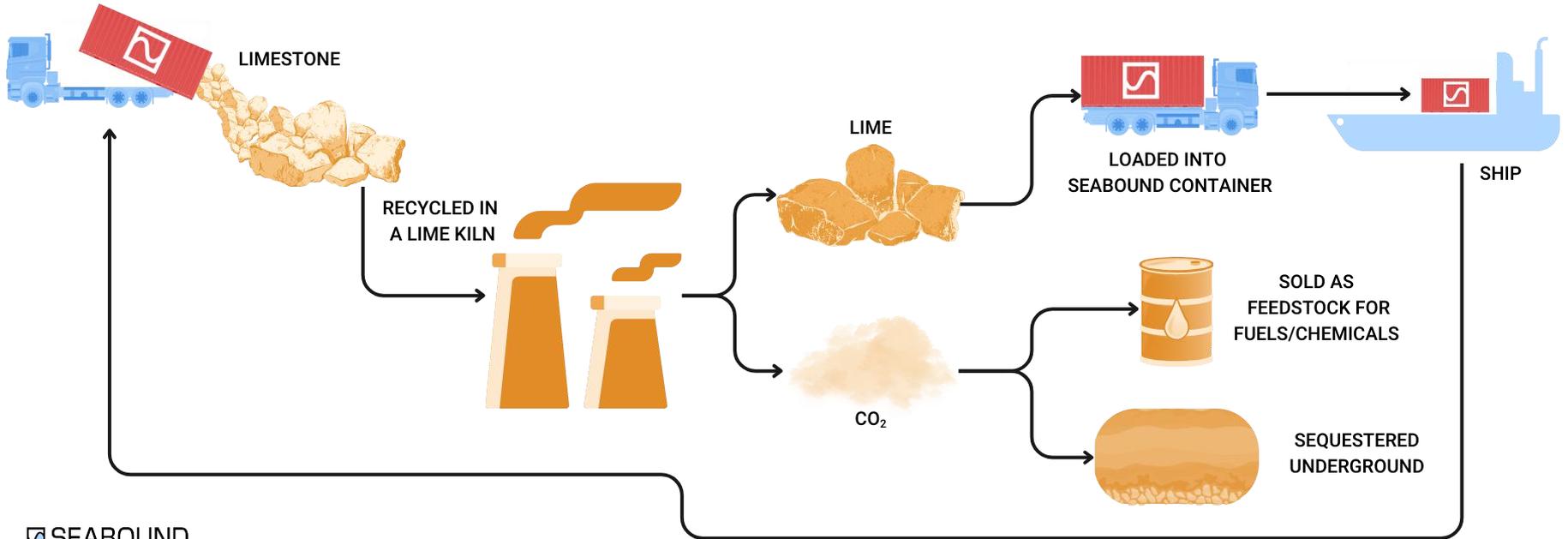
High CAPEX, high onboard energy consumption, limited scalability as ports can't receive pure CO₂.

Onshore, limestone is sold as a building material in Seabound's "open loop" operating model.



Alternatively, limestone can be **recycled to reuse the lime and sell/sequester pure CO₂** in Seabound's "closed loop" model.

Seabound partners with major lime companies to enable both pathways.



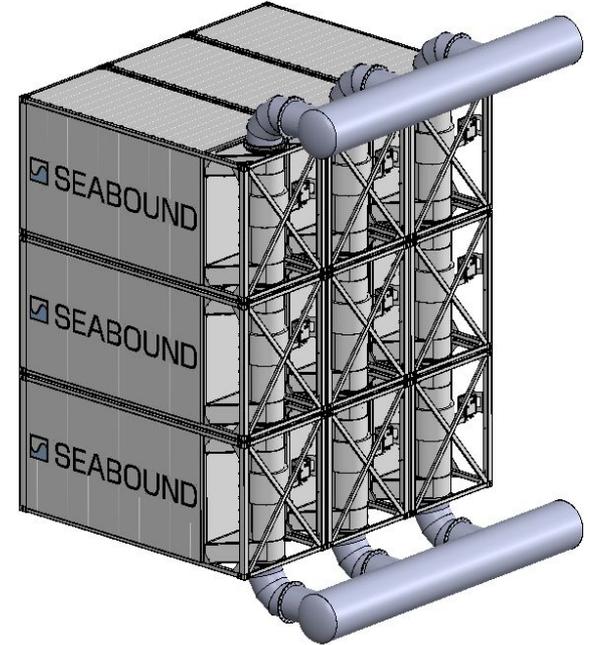
Seabound Containers follow **standard TEU conventions** for **maximum simplicity and scalability**.



KEY INNOVATIONS:

- Miniaturized and modularized calcium looping system
- Decoupled process between onboard & onshore components
- Patent-pending design
- Proprietary lime/sorbent recipe
- Automated optimized operations

Seabound Containers follow **standard TEU conventions** for **maximum simplicity and scalability**.



Seabound's key advantages are **low CAPEX**, **low onboard energy consumption**, and **low infrastructure requirements**.



1

LOW CAPEX

- Decoupled process and modular design minimize equipment needs onboard and simplify vessel retrofit
- Scale capture with regulation and swap Seabound systems across vessels – investing in fleets vs ships



2

LOW ONBOARD ENERGY CONSUMPTION

- Onboard reaction is exothermic, reducing energy demand to <math><10\text{ kWh/ton CO}_2</math>
- Future waste heat recovery possible to repurpose thermal energy onboard



3

LOW INFRASTRUCTURE REQUIREMENTS

- Limestone is a safe, non-toxic material that can be easily offloaded in ports worldwide
- No specialized tanks required onboard nor new infrastructure required in ports; Seabound Containers can be fitted onto various vessel types and lifted on/off vessels using standard port cranes

Case study:

Key Inputs/Assumptions:

- Panamax vessel; 5000 TEU
- ~43 metric tonnes of HFO per day
- Intra-EU voyage; 7 day route
- 2028 operations
- Vessel avoids IMO and EU penalties

Case study: To **meet IMO's base threshold**, a Panamax ship needs **20 Seabound Containers**, paying back in **<4 years**.

Key Inputs/Assumptions:

- Panamax vessel; 5000 TEU
- ~43 metric tonnes of HFO per day
- Intra-EU voyage; 7 day route
- 2028 operations
- Vessel avoids IMO and EU penalties

**Capture
Rate**
7-18%
of CO₂ emissions

**Seabound
Containers**
<20
Onboard

**Space
Needs**
<0.5%
of TEU capacity

**Payback
Period**
3.75
years

By 2031, a Panamax ship could capture **40% of CO₂** emissions with **~40 Seabound Containers** and a **<2 year payback**.

Key Inputs/Assumptions:

- Panamax vessel; 5000 TEU
- ~43 metric tonnes of HFO per day
- Intra-EU voyage; 7 day route
- 2031 operations
- Vessel avoids IMO and EU penalties and earns surplus units

Capture Rate
40%
of CO₂ emissions

Seabound Containers
43
Onboard

Space Needs
<1%
of TEU capacity

Payback Period
1.81
years

PILOT #1 SUCCESS

Seabound's **world-first pilot** with Lomar and Hapag-Lloyd captured CO₂ at ~80% efficiency.



British Start-up Completes Sea Trial of Onboard Carbon Capture System

Seabound demonstrates carbon capture technology at sea for first time

The UK start-up worked with Lomar's corporate venture lab lomarlabs on the project, which took place in 2023.

Environment

A container ship just tested a system to capture its own CO₂ emissions

Shipping companies are experimenting with onboard carbon capture systems, but they face difficult trade-offs on energy and space for regular cargo



[CNN](#), [Reuters](#), [Mini documentary](#)



Seabound's second pilot – **the world's first port-based CO₂ capture** – achieved 94% efficiency, unlocking a new application.



Next up, we're launching our **first commercial demonstration with Hartmann Group and Heidelberg Materials** in Norway.



SUSTAINABILITY

This cargo ship is turning its CO2 emissions into green cement

The first commercial carbon capture system for boats has

July 16, 2025 - 9:00 am

Home > Green Marine >

Brevik becomes home to new onboard carbon capture project

CLIMATE

Meet the cement transport ship that makes cement ingredients while sailing

Tim De Chant · 7:11 AM PDT · July 16, 2025

USAGE & STORAGE

News

Seabound launches carbon capture initiative on cement vessel

Seabound's carbon capture technology uses calcium looping to capture up to 95% of CO₂ and 98% of sulphur emissions from ship exhaust.

July 16, 2025



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Thank you.

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