# London start-up's quicklime units capture 78% of cargo ship emissions in pioneering sea trials



An industrial park in Chingford, London, has become the unlikely birthplace of a promising innovation aimed at tackling one of the world’s most challenging pollution problems: carbon emissions from cargo shipping. Seabound, a start-up co-founded by Alisha Fredriksson, is developing a compact carbon capture unit that can be installed directly on cargo ships. The unit employs thousands of quicklime pellets that chemically absorb carbon dioxide from ship exhaust, converting it into limestone. This invention could significantly reduce the shipping industry’s footprint, which currently produces about 3% of global greenhouse gas emissions—surpassing even aviation.

Fredriksson, who was inspired to pivot her career into climate action after reading an Intergovernmental Panel on Climate Change report on global warming, explains that the Seabound device emerged from the idea of miniaturising industrial-scale quicklime carbon capture technology. Having secured around $4 million in funding—including support from shipping companies—the team progressed rapidly from conceptualisation to prototyping. Testing on active vessels, including a recent three-week voyage through the Suez Canal, demonstrated the system’s capacity to capture 78% of carbon emissions and 90% of sulphur pollutants from ship exhaust.

The current model is designed as a standard 20-foot shipping container that can be loaded and stacked alongside regular cargo, allowing vessels to add multiple units depending on their route length and decarbonisation goals. On reaching port, the limestone-filled containers can be swapped for fresh quicklime units, with an emphasis on sourcing green quicklime produced using renewable energy. This modular approach provides flexibility while adhering to tighter emissions regulations being introduced worldwide. For example, in April, the International Maritime Organization agreed to impose escalating charges on ships exceeding emissions thresholds, encouraging adoption of technologies like Seabound’s and a shift toward greener fuels.

Seabound’s solution has been successfully trialled in partnerships with maritime operators such as Lomar Shipping and engineering firms like STAX Engineering, which recently demonstrated a fully integrated emissions and carbon capture system at the Port of Long Beach. The trials underline the device’s practical application and cost-effectiveness as a retrofit option for the shipping industry, which faces the daunting task of upgrading roughly 100,000 vessels globally. With a price in the tens of thousands of pounds per unit, Seabound aims to roll out its containers on hundreds, potentially thousands, of ships while establishing ports as hubs for swapping and recharging the quicklime containers.

Notwithstanding the enthusiasm, some climate advocates caution against relying solely on carbon capture technology, warning it should not justify prolonging fossil fuel use or detract from the development of zero-emission fuels such as ammonia or wind power. One critic, Blánaid Sheeran from Opportunity Green, stresses the importance of ensuring carbon capture acts as a transitional tool rather than a long-term crutch. Fredriksson, however, views Seabound’s device as complementary—enabling immediate emissions reductions while the industry transitions towards truly sustainable alternatives.

Government support has also played a crucial role. UK innovation funding has backed the development of this technology, which has the potential to cut shipping emissions by as much as 95%. Beyond climate benefits, the captured CO₂ turned into limestone can be sold for reuse in construction, further closing the loop in carbon management.

As the shipping sector faces intense pressure to reduce its environmental impact, innovations like Seabound’s offer a tangible, scalable means to curb emissions on existing vessels immediately. While challenges remain in scaling production and uptake, the company’s vision of widespread deployment—integrated into the fabric of global maritime trade—signals a step toward cleaner oceans and a more sustainable shipping future.

### 📌 Reference Map:

* Paragraph 1 – [[1]](https://www.theguardian.com/environment/2025/jun/26/global-shipping-emissions-invention-clean-up-cargo-fleets-net-zero), [[2]](https://www.theguardian.com/environment/2025/jun/26/global-shipping-emissions-invention-clean-up-cargo-fleets-net-zero)
* Paragraph 2 – [[1]](https://www.theguardian.com/environment/2025/jun/26/global-shipping-emissions-invention-clean-up-cargo-fleets-net-zero), [[4]](https://www.lomarshipping.com/news/lomarlabs-portfolio-company-seabound-demonstrates-potential-of-carbon-capture-device-following-sea-trials-on-a-lomar-vessel/)
* Paragraph 3 – [[1]](https://www.theguardian.com/environment/2025/jun/26/global-shipping-emissions-invention-clean-up-cargo-fleets-net-zero), [[5]](https://www.ukri.org/who-we-are/how-we-are-doing/research-outcomes-and-impact/innovate-uk/clean-maritime-capturing-and-reusing-carbon-emissions/)
* Paragraph 4 – [[1]](https://www.theguardian.com/environment/2025/jun/26/global-shipping-emissions-invention-clean-up-cargo-fleets-net-zero), [[3]](https://www.seabound.co/news/stax-engineering-and-seabound-successfully-demonstrate-first-of-its-kind-integrated-emissions), [[4]](https://www.lomarshipping.com/news/lomarlabs-portfolio-company-seabound-demonstrates-potential-of-carbon-capture-device-following-sea-trials-on-a-lomar-vessel/), [[7]](https://www.energy-reporters.com/environment/seabound-transforming-carbon-capture-for-shipping/)
* Paragraph 5 – [[1]](https://www.theguardian.com/environment/2025/jun/26/global-shipping-emissions-invention-clean-up-cargo-fleets-net-zero), [[6]](https://www.staxengineering.com/stax-hub/stax-engineering-secures-70m-in-funding-to-expand-emissions/), [[7]](https://www.energy-reporters.com/environment/seabound-transforming-carbon-capture-for-shipping/)
* Paragraph 6 – [[1]](https://www.theguardian.com/environment/2025/jun/26/global-shipping-emissions-invention-clean-up-cargo-fleets-net-zero), [[5]](https://www.ukri.org/who-we-are/how-we-are-doing/research-outcomes-and-impact/innovate-uk/clean-maritime-capturing-and-reusing-carbon-emissions/)
* Paragraph 7 – [[1]](https://www.theguardian.com/environment/2025/jun/26/global-shipping-emissions-invention-clean-up-cargo-fleets-net-zero), [[3]](https://www.seabound.co/news/stax-engineering-and-seabound-successfully-demonstrate-first-of-its-kind-integrated-emissions), [[4]](https://www.lomarshipping.com/news/lomarlabs-portfolio-company-seabound-demonstrates-potential-of-carbon-capture-device-following-sea-trials-on-a-lomar-vessel/), [[5]](https://www.ukri.org/who-we-are/how-we-are-doing/research-outcomes-and-impact/innovate-uk/clean-maritime-capturing-and-reusing-carbon-emissions/)

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## Bibliography

1. <https://www.theguardian.com/environment/2025/jun/26/global-shipping-emissions-invention-clean-up-cargo-fleets-net-zero> - Please view link - unable to able to access data
2. <https://www.theguardian.com/environment/2025/jun/26/global-shipping-emissions-invention-clean-up-cargo-fleets-net-zero> - An industrial park in Chingford, London, is the site of Seabound's innovative carbon capture technology. This system uses quicklime pellets to absorb carbon dioxide from ship exhaust, converting it into limestone. Seabound aims to deploy this technology on cargo ships, addressing the shipping industry's significant contribution to global greenhouse gas emissions, which exceeds that of aviation.
3. <https://www.seabound.co/news/stax-engineering-and-seabound-successfully-demonstrate-first-of-its-kind-integrated-emissions> - Seabound and STAX Engineering have successfully demonstrated a fully integrated emissions and carbon capture solution at the Port of Long Beach. This system filters out pollutants and captures carbon dioxide directly from ship exhaust, providing maritime operators with a practical path to meet environmental regulations and decarbonisation requirements.
4. <https://www.lomarshipping.com/news/lomarlabs-portfolio-company-seabound-demonstrates-potential-of-carbon-capture-device-following-sea-trials-on-a-lomar-vessel/> - Lomar's corporate venture lab, lomarlabs, announced the successful completion of sea trials of Seabound's carbon capture system on a Lomar vessel. The pilot project demonstrated the feasibility of reducing CO₂ emissions and introducing a new, cost-effective technology to the shipping industry.
5. <https://www.ukri.org/who-we-are/how-we-are-doing/research-outcomes-and-impact/innovate-uk/clean-maritime-capturing-and-reusing-carbon-emissions/> - The UK government has funded Seabound's novel carbon capture device, which could reduce shipping emissions by up to 95%. The system captures CO₂ emissions at source, converting them into limestone, which can be offloaded at port and sold for reuse as building materials.
6. <https://www.staxengineering.com/stax-hub/stax-engineering-secures-70m-in-funding-to-expand-emissions/> - STAX Engineering has secured $70 million in funding to expand its emissions capture technology and launch carbon capture trials with Seabound. The investment will scale the deployment of emissions capture and control technology, bringing the company closer to its goal of capturing 1% of global greenhouse gas emissions.
7. <https://www.energy-reporters.com/environment/seabound-transforming-carbon-capture-for-shipping/> - Seabound's onboard carbon capture system is designed as a cost-effective retrofit for existing ships, requiring minimal onboard space and integrating easily into engine exhaust systems. The captured CO₂ can either be processed for reuse or turned into limestone for construction, addressing the urgent need to retrofit approximately 100,000 ships currently contributing to global CO₂ emissions.