TRANSPORTATION AND LOGISTICS

# Demand for Low-Carbon Shipping Has Fallen, but Long-Term Value Persists

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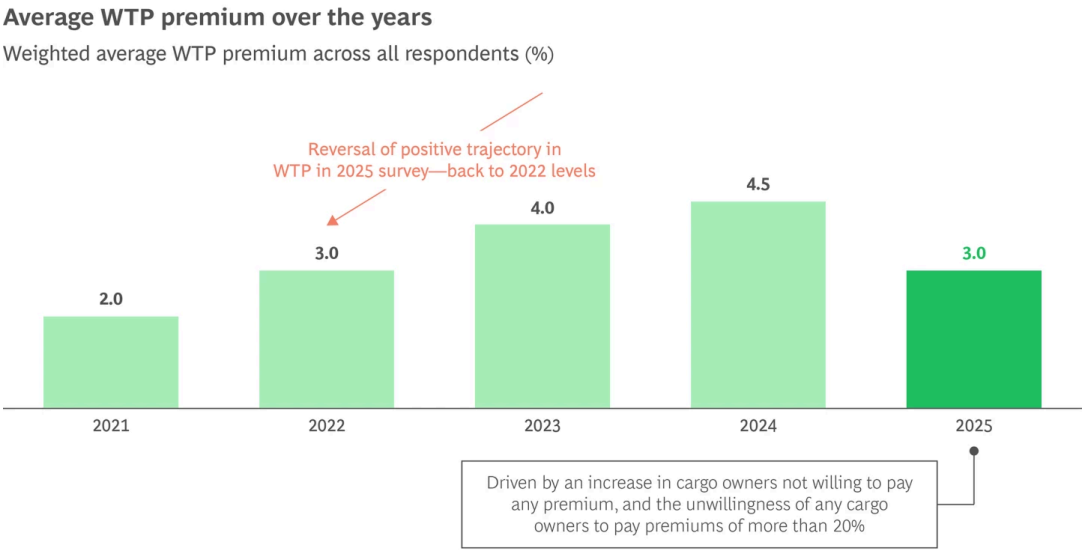
**ARTICLE** APRIL 30, 2026 12 MIN READ

Cargo owners' willingness to pay (WTP) a premium for low-carbon fuels is crucial to maritime sector decarbonization. But this year, the results of BCG's annual Shipping Decarbonization Survey reveal a marked drop in WTP, from 4.5% in 2024 to 3% in 2025, a level not seen since 2022. (See Exhibit 1.) This lower WTP, combined with cost pressures and continued regulatory uncertainty, means that carriers that wish to capture low-carbon value must seek pockets of demand while focusing ever more closely on economics and customer-centricity. (See the sidebar, "Survey Methodology.")

**EXHIBIT 1**

## After Four Years of Growth, Willingness to Pay Declined in 2025 and Is Back at 2022 Levels




**Sources:** BCG Shipping Decarbonization Survey, June 2021, n=125; BCG Shipping Decarbonization Survey, September 2022, n=125, BCG Shipping Decarbonization Survey, September 2023, n=125; BCG Shipping Decarbonization Survey, October 2024, n=125; BCG Shipping Decarbonization Survey, October 2025, n=125.

Lower WTP is just the latest obstacle to progress on marine decarbonization. Industry leaders are already grappling with geopolitical uncertainty and the reemergence of tariffs, which is causing inflation, trade route shifts, and supply chain instability. Regulatory uncertainty hampers shippers' ability to make long-term plans, particularly since the decision in late October 2025 to delay the potential adoption of the International Maritime Organization's Net-Zero Framework. Accordingly, our survey found that 60% of carriers see regulatory uncertainty as a barrier to optimizing fleet, investment, and commercial decisions.

Despite contributing a large and rising share of global carbon emissions, maritime shipping is still the most energy-efficient way to move goods at scale. And in recent years, it has made significant efficiency gains. The industry has shown a readiness to innovate, whether through adoption of dual-fuel vessels or deployment of energy-efficiency technologies that combine proven upgrades such as rudder bulbs, propeller ducts, and stator fins with emerging solutions like wind-assisted propulsion, air lubrication, waste heat recovery, and AI-powered voyage optimization. However, falling WTP is preventing green fuel sales from reaching the volumes needed to meaningfully narrow the price gap with fossil fuels, creating uncertainty over who will foot the bill for shipping decarbonization. For carriers, it raises a question: Can they still make the business case for green solutions? Despite the challenges, we believe they can. This means gaining an understanding of what is driving the price sensitivity surrounding low-carbon fuel and using those insights to identify the opportunities. Carriers that do can still tap into low-carbon shipping's long-term economic value.

# A Pivotal Moment for Maritime Decarbonization

What is striking about this year's survey results is the structural shift in demand for low-carbon shipping that has occurred since we conducted the research last year. The share of cargo owners unwilling to pay any decarbonization premium has increased by 4 percentage points. And, notably, the group willing to pay double-digit premiums has shrunk: Last year, 3% of respondents were willing to pay premiums above 20%; now, none are.

This adjustment is visible across segments and customer types, including those that previously anchored demand. Among European cargo owners, for example, WTP has declined from 5% to 3.5%, despite strong regulation. Among cargo owners primarily using containers, WTP dropped from 4.5% to 3.5%. Although these groups continue to show higher WTP than the global average, the decline indicates that the steady upward trajectory seen in recent years has ended.

The survey results show that WTP is becoming more selective and dependent on context. Regulatory uncertainty, tighter budgets, and weaker confidence in near-term economics are driving commercial decisions. But caution is not limited to the near term. The share of cargo owners saying they expect to be willing to pay more for low-carbon shipping within the next five years has also declined, from 65% in 2025 to 45% this year.

# What's Driving the Price Sensitivity?

Underpinned by evolving policies, technological innovation, and improving economics, the green economy is growing. It now exceeds $5 trillion in annual value and is projected to surpass $7 trillion by 2030, according to BCG and the World Economic Forum. Yet shipping's decarbonization trajectory differs from that of the broader green economy. While a growing share of the future maritime order book is for vessels equipped to use alternative fuels such as bio methanol, use of these fuels in shipping remains nascent.

As a hard-to-abate sector, shipping depends on decarbonization technologies that remain costly and limited in supply. And while energy efficiency could help achieve shipping's decarbonization goals, it can't do it alone. With cost curves for shipping fuels moving more slowly than in other green sectors, prospects for achieving cost parity with conventional fuels remain uncertain. Cargo owner sentiment reflects this economic reality, with 40% of those we surveyed citing low-carbon-fuel costs that are too high relative to benefits as the primary barrier to adoption.

Shipping faces an economic mismatch. Maritime decarbonization requires long-term planning and capital-intensive assets with lengthy development and retrofit cycles—yet demand and WTP remain volatile and discretionary. Unlike in sectors where green solutions are in (or close to) economic parity with others, in shipping decarbonization, capital will not accrue at the scale required unless the cost gap is addressed through regulation or unless decarbonization starts making economic sense for carriers and cargo owners. Meanwhile, the global, system-level economic signals needed to shift the industry as a whole have yet to emerge.

In addition to these broader trends, we see three central factors shaping the recent decline in average WTP for low-carbon fuels.

**Regulatory Uncertainty.** Of our survey respondents, 59% said that they pursue low-carbon shipping primarily because of regulatory requirements. But the world still lacks a global price on carbon, and enforcement mechanisms vary across jurisdictions. No regulation yet requires cargo owners to act on Scope 3 shipping emissions (those that come indirectly from third parties), which limits urgency. Adding to the uncertainty, in October 2025, at an International Maritime Organization meeting, member states voted for a 12-month delay in discussions about adopting the IMO's Net-Zero Framework.

Maritime decarbonization regulations are still being implemented. Through its emissions-trading system, the EU is phasing in requirements for ships to purchase allowances. Further, the EU's FuelEU Maritime regulation promotes use of low-carbon fuels and clean-energy technologies. The IMO has introduced the Energy Efficiency Existing Ship Index (EEXI) regulation and the Operational Carbon Intensity Indicator (CII) metric.

Still, binding requirements on shipping emissions seem unlikely in the near term, with 57% of shipowners and 64% of cargo owners expecting further delays. This reduces the incentive to commit to higher shipping costs today and contributes to more selective WTP.

**Geopolitical and Market Uncertainty.** In response to shifting dynamics, corporate priorities are realigning. In BCG's 2025 Guide to Cost and Growth, cost management has moved to the top of the agenda, while other priorities include energy security and resilience. Meanwhile, in our survey, low-carbon shipping is increasingly deprioritized, with nearly one-third of cargo owners citing uncertainty as a reason for stepping back. And because shipping emissions typically account for a small share (often less than 5%) of cargo owners' overall footprint, it's easy to push this down the agenda.

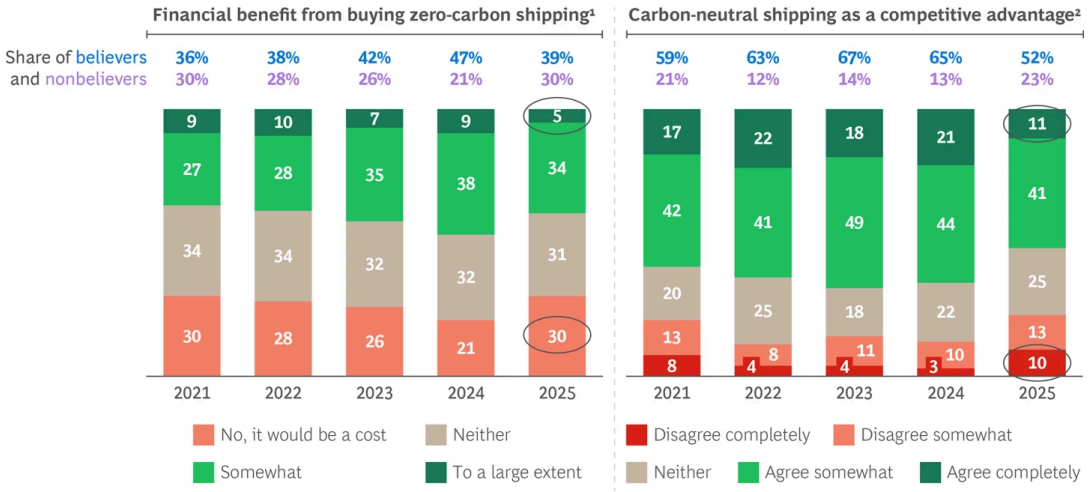
As scrutiny of discretionary spending increases, low-carbon transportation commitments are weakening even among cargo owners with ambitious decarbonization goals. The share of companies with both Scope 3 targets and budgets dedicated to low-carbon shipping fell to 50% this year from about 60% last year.

**Economic Uncertainty.** Cargo owners are losing confidence in the financial returns greener shipping solutions can yield. Those seeing the ability to benefit financially from zero-carbon

shipping fell from 47% last year to 39%, while belief in low-carbon shipping as a source of competitive advantage fell from 65% to 52% this year. (See Exhibit 2.)

**EXHIBIT 2**

Cargo Owners' Belief in the Financial Benefit and Competitive Advantage from Low-Carbon Shipping Has Weakened Since Last Year—Back to 2021 Levels




**Sources:** BCG Shipping Decarbonization Surveys, September–October 2021, 2022, 2023, 2024 2025, n=125.
¹To what extent do you believe you would be able to benefit financially yourself from carbon neutral marine shipping?"
²To what extent do you agree with this statement: "I would primarily expect to use carbon-neutral shipping as a way to achieve an advantage over my competitors."

These findings point to a move away from a broadly optimistic view of low-carbon shipping's value creation potential to one that is more cautious and influenced by economic variations. Of course, cargo owners that make early and large-scale commitments without sufficient visibility into demand, costs, and regulations risk locking in uncompetitive economics. But inaction carries the risk of falling behind as regulation, technology, and customer expectations evolve.

# Harnessing Shipping's Green Economy Opportunity

Demand for low-carbon shipping has not disappeared. What has changed is the assumption that demand will grow automatically. Rather, it is now limited to specific geographies, customer segments, and use cases where regulatory signals are clear. Capturing growth is still possible, but doing so depends on identifying where the opportunities lie.

Differences among regions are striking. Europe continues to stand out owing to its tighter regulations, a carbon-trading mechanism, and clearer compliance pressure. China could shape future demand through scale. According to the BCG-WEF research, China invested almost $660 billion in clean energy in 2024, significantly more than Europe's $410 billion or the US's $300 billion. Over time, China's investment in green technologies and fuel pathways could create localized demand.

For cargo owners, WTP reflects decarbonization maturity. Those with clear Scope 3 commitments and dedicated budgets will pay materially higher premiums, of 5% on average, compared with roughly 1% for companies without Scope 3 targets. The effect will be most pronounced in consumer-facing sectors such as fashion and beauty.

But although WTP for low-carbon shipping is becoming more uneven, carriers are still investing. According to Clarksons Research, 37% of the current order book includes energy-saving technologies, up from 22% in 2021, while the number of vessels in the existing fleet equipped with these technologies has increased by 66% over the same period. A rise in the average age of vessels equipped with these technologies from eight to ten years indicates that adoption is not limited to new builds but also includes retrofits. Moreover, uptake of low-carbon fuels is increasing with the emergence
of bunkering hubs (which supply vessels with clean fuels) in ports such as Singapore and Rotterdam and of green corridors (designated trade routes where infrastructure, policy, and partnerships promote use of low-carbon fuels).

All this suggests that it is still possible to make the business case for green shipping. Yet given the current price sensitivity around green fuels, carriers seeking to derive value from the low-carbon economy now need a clear strategy and a structured approach that includes the following actions.

**Identify pockets of value.** The starting point is assessing where decarbonization creates value. Rather than treating low-carbon shipping as a fleetwide decision, carriers need to assess vessels, routes, and customers individually, identifying where regulatory exposure, customer readiness, and economics align—and where they do not.

**Create an economically feasible roadmap.** As routing, speed optimization, digitalization, and AI reshape both emissions and economics, decarbonization is not just a fuel or fleet question. A coherent strategy integrates fuel and fleet strategies with decisions on operational and technological efficiency. In our survey, three out of four carriers say they are already using digital and AI tools in operational decision making.

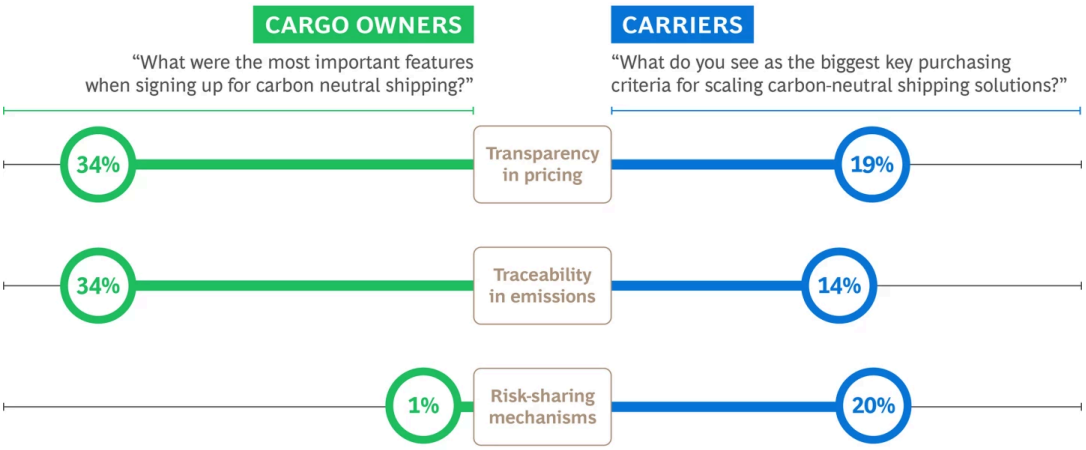
**Secure fuel access.** Sourcing decisions translate strategy into commitment. Many carriers are working to secure access and price predictability, with some 60% planning to sign off-take agreements (guaranteeing purchase at pre-agreed terms for a fixed period) with fuel suppliers or producers. While such arrangements can reduce risk, overcommitting ahead of proven demand may lock in costs and volumes the market cannot yet absorb. This makes careful planning essential.

**Become more customer-centric.** Our survey highlights a mismatch: Cargo owners are almost twice as likely as ship owners to value pricing transparency and more than twice as likely to prioritize emissions traceability. And while 20% of ship owners view risk sharing as a key purchasing criterion, fewer than 1% of cargo owners see this as an important feature when signing up for low-carbon shipping. (See Exhibit 3.) This suggests carriers have an opportunity to align their offerings more closely with what cargo owners value. They can do this by applying AI or advanced analytics to pricing, customer segmentation, and go-to-market decisions.

**EXHIBIT 3**

In a Purchasing Criteria Mismatch, Carriers Push Risk Sharing but Cargo Owners Buy on Transparency and Traceability

**Key purchasing criteria for buying zero-carbon shipping**




**Source:** BCG Shipping Decarbonization Survey, October 2025, n=125.

**Ensure that performance can be sustained.** Converting intent into results that can be sustained over time goes beyond individual initiatives. Clear ownership, governance structures, and performance tracking are needed to ensure that value is captured as strategies are executed. Close customer engagement yields insights into WTP, enabling better fleet planning.

**Plan for the long term.** In an industry with long timelines, carriers must go beyond optimizing for the short term. Given that a ship ordered today will be delivered in three to five years and used for 10 to 20 years, carriers need to predict where demand for low-carbon-shipping will exist over these time periods.

# From Ambition to Precision

Low-carbon shipping has entered a new era. Ambition and experimentation are being tempered by cost pressure, uncertainty, and sharper prioritization. Opportunities remain but must now be sought out. At every step in the value chain, players remain unwilling or unable to absorb the higher costs, creating obstacles to action. This, along with fluctuating green premiums, increases the pressure to develop clear funding mechanisms and to understand customer readiness to pay across diverse regions and contexts.

For carriers, this both raises the bar and creates opportunities. Navigating this phase requires moving beyond isolated initiatives toward a coordinated approach that balances efficiency, commercial clarity, and risk management and takes a long-term approach to identifying demand. Winners will be those that decide not to rely on assumed demand or generic green narratives but to combine strong unit economics with deep customer insights, deploy business-case discipline, and tailor their offerings to customer maturity.

In a market defined by selective and uneven demand, those able to align unit economics, customer readiness, and execution speed will be positioned to reap the benefits of low-carbon shipping's next phase.

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