WINDWARD

Managing environmental risk and making sustainability work for your business

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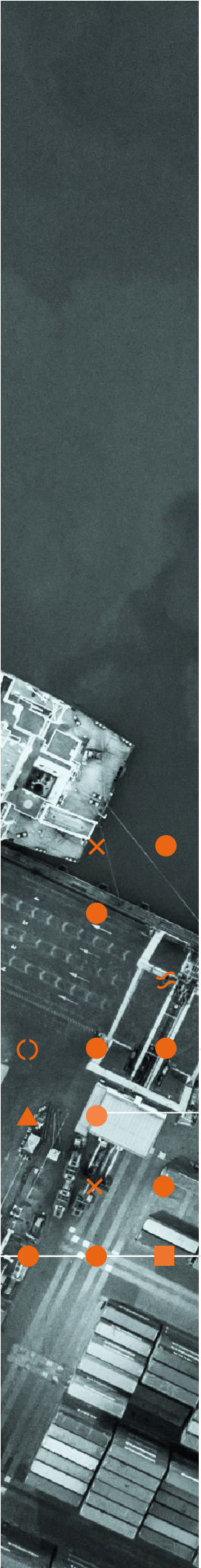


WINDWARD

Executive summary

The shipping industry is under a magnifying glass like never before.

According to the UN, the climate situation is nothing less than a code red for us all. Contrary to other business challenges, in which each company can excel independently, when it comes to climate, no one can succeed alone. If one nation reduces its carbon emissions by 50% and the rest of the world doesn't, the impact still won't be enough.

There are two principal ways to address the level of greenhouse gas (GHG) emissions created by the shipping industry: better fuels, or better operational decisions. Change requires either smarter voyage management or optimized vessel performance.

On the operational side, there is incredible opportunity. Trade is dynamic and so are our oceans; where, when, and how a vessel operates dramatically impacts its fuel consumption and hence its carbon emissions.

This makes AI the perfect fit for tackling the challenge of decarbonization. But developing and building an accurate solution will only be successful if boosted by the power of a strong network of data, evolution of commercial processes, and thought leaders. This collaboration, we believe, will be essential in leading the industry toward the best outcomes in curbing global emissions.

AMI DANIEL,
WINDWARD'S CEO

In this eBook, we will identify the challenges of managing carbon emissions expectations for each stakeholder in the maritime ecosystem. We'll also show why a strong technological and data-driven approach to decarbonization is crucial to meet the future of regulation requirements and successfully manage environmental governance.

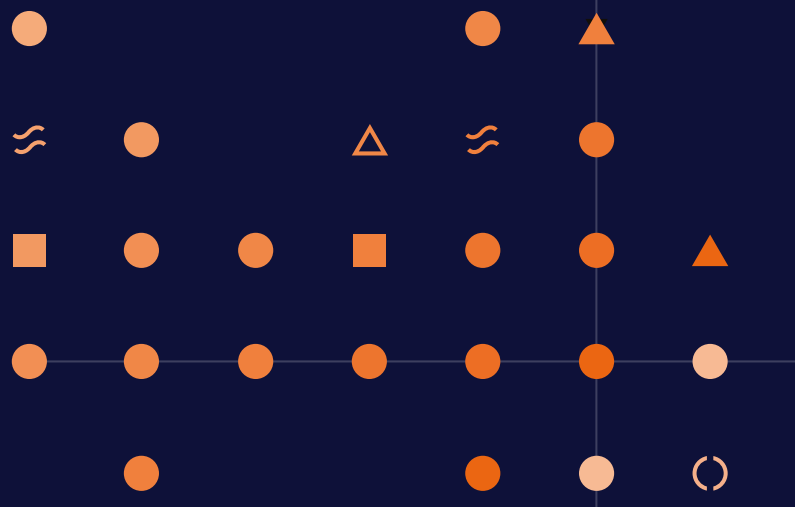
A challenge worth tackling

Global trade would be impossible without the shipping industry, which faces a formidable challenge. World leaders and the scientific community have come to the consensus that humans must drastically reduce greenhouse gas (GHG) emissions in the next 30 years — a task that won't be easy. In fact, according to the latest U.N. climate panel's report, unless immediate, rapid, and large-scale action is taken to reduce emissions, the average global temperature is likely to reach or cross the 1.5-degree Celsius (2.7 degrees Fahrenheit) warming threshold within 20 years.

The shipping industry is the backbone of global trade, making it a critical stakeholder for the success of maritime sustainability initiatives. This sustainability transformation poses a significant challenge but also presents a generational opportunity for shipping companies to drive business with partners at every level of the industry, boost their investment profile and make their companies more attractive to customers.

Regulators, like the IMO, will likely set moving targets and will not level the playing field. The best way forward is to lean on strong partners. Stakeholders who can work together to boost carbon efficiency will be well-positioned to maximize decarbonization efforts, without setting the industry back.

> Doing nothing or doing just enough is not going to cut it. We have to act in this decade to avoid the most severe environmental and socioeconomic effects of a changing climate."
>
> — Dickon Pinner, senior partner and global leader, McKinsey & Company's sustainability practice



Decarbonization presents challenges in the form of regulations as well as industry standards for your partners. These changes impact every step of the supply chain. Tier 1 energy companies are under both the regulatory microscope and public pressure not just to meet aggressive climate targets, but to be proactive in setting a green agenda. Charterers want to be able to plan based on which vessels are most efficient. Shipowners want to be able to stand out in their offerings to charterers. Banks face mandates from both boards and investors to invest in companies with green profiles. Even consumers at the far end of the supply chain now demand carbon labeling on products.

All that pressure will filter down to the companies these stakeholders work with. Those that can demonstrate — with reliable data — that they're compliant, or even ahead of the curve, in meeting environmental regulations will position themselves as the most attractive partners in the shipping industry.

Cooperation from the entire maritime ecosystem is the only way to protect both the planet and the long-term interests of the industry.

How the global green economy impacts the shipping industry

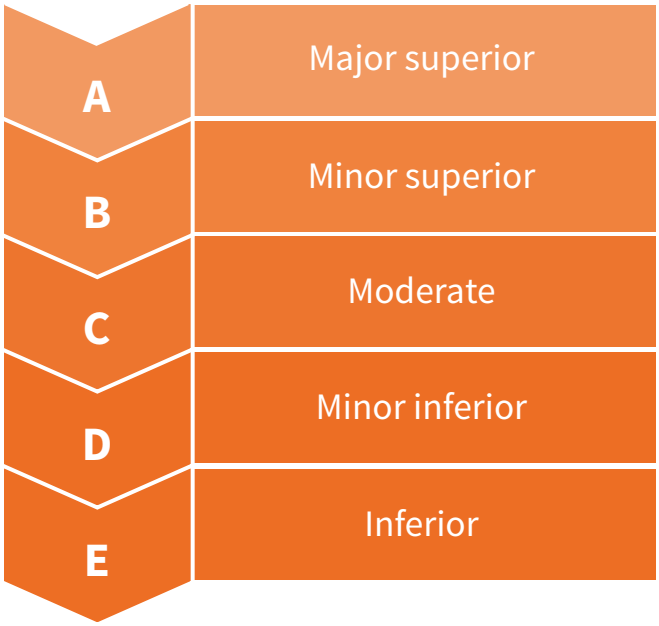
The shipping industry, which transports roughly 80% of global trade, currently produces about 3% of all GHG emissions but, according to one recent study, could represent as much as 10% of such emissions by 2050. That number must come down even as demand goes up.

The pandemic has illustrated just how important a role the shipping sector plays in the global economy, ensuring the flow of essential goods around the world.

With the shipping industry projecting double-digit growth over the next three years alone, the maritime ecosystem as a whole must rise to the challenge of integrating significant sustainability measures today.

The initial GHG strategy from the International Maritime Organization (IMO) laid out aggressive targets for the shipping industry, aiming to reduce CO2 emissions for transport work by at least 40% by 2030 on average across international shipping. Now, the IMO has approved a draft amendment to assign ratings to ships of 5,000 gt or more, using an annual operational carbon intensity indicator. This rating system would be public, and while there would be no specific penalties for noncompliance, the potential business implications of a consistently poor rating are obvious.

IMO CII Rating System



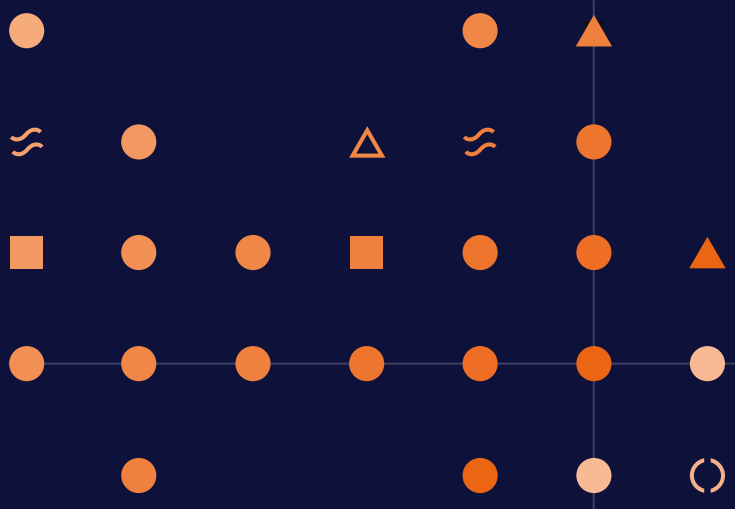
The industry is already on a cleaner path forward. As ships have grown in size, they've reduced both cost per container and carbon intensity. Alternative fuel options such as hydrogen and ammonia may offer partial solutions, while carbon capture at sea could provide a breakthrough in sustainability.

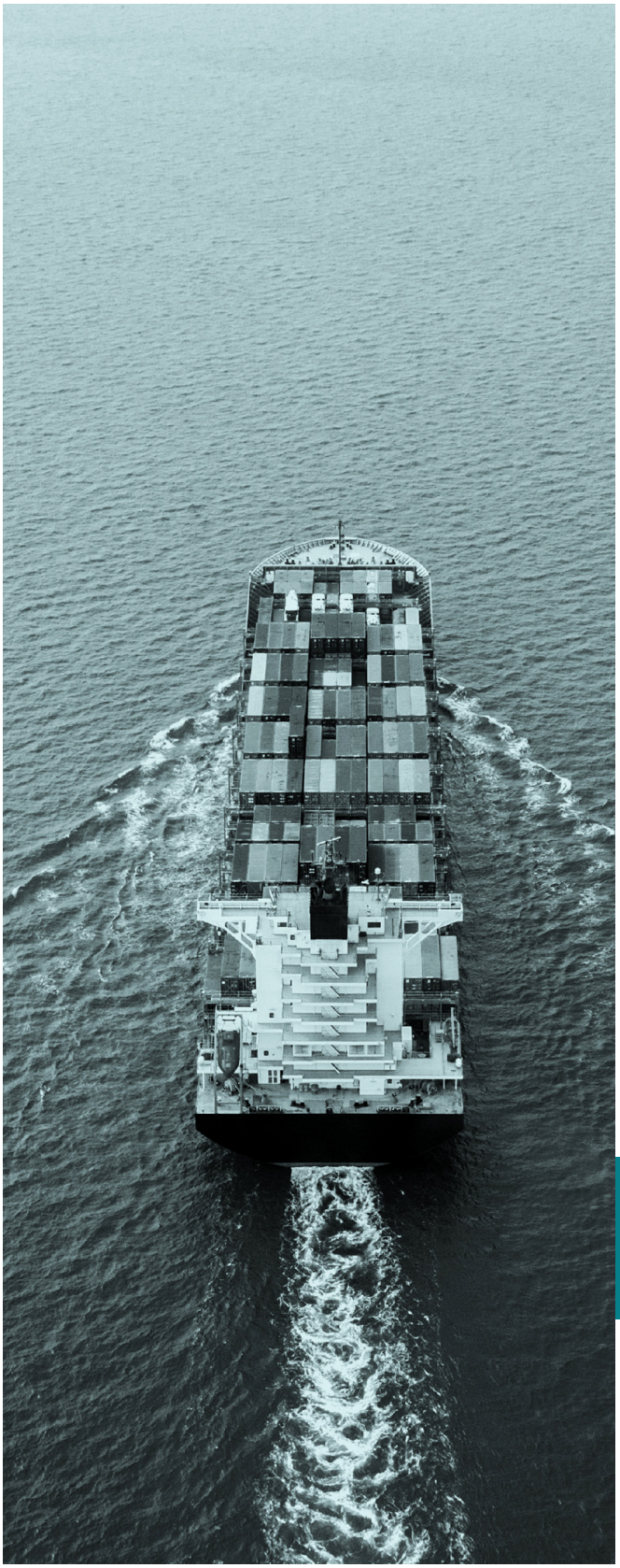
> "If you're only aspiring to IMO's targets of 50% by 2050, LNG could be a great solution. But if you want net zero it's just not enough"
>
> -Guy Mason, Former SVP at BP

With fleet renewal happening roughly every 30 years, there will be opportunities to take advantage of these technology breakthroughs, but this alone is not enough. It will be crucial to consider alternative options to remain competitive and to continue to improve your ratings, as the industry will only continue to grow.

> Meeting the ambitions of the IMO Greenhouse Gas reduction strategy requires immediate actions."

— Deputy Secretary General Lars Robert Pedersen, BIMCO





While industry efforts — including the proposed $5 billion shipping R&D Fund — are already underway, companies need to proactively adapt to stay ahead of regulations and attract business in a competitive marketplace. The first step is accurately measuring every vessel's daily emissions to power decision-making. Most current emissions measures, such as the IMO's CII and EEDI indices, are simple estimates that don't account for many dynamic factors, such as weather and vessel path and interactions.

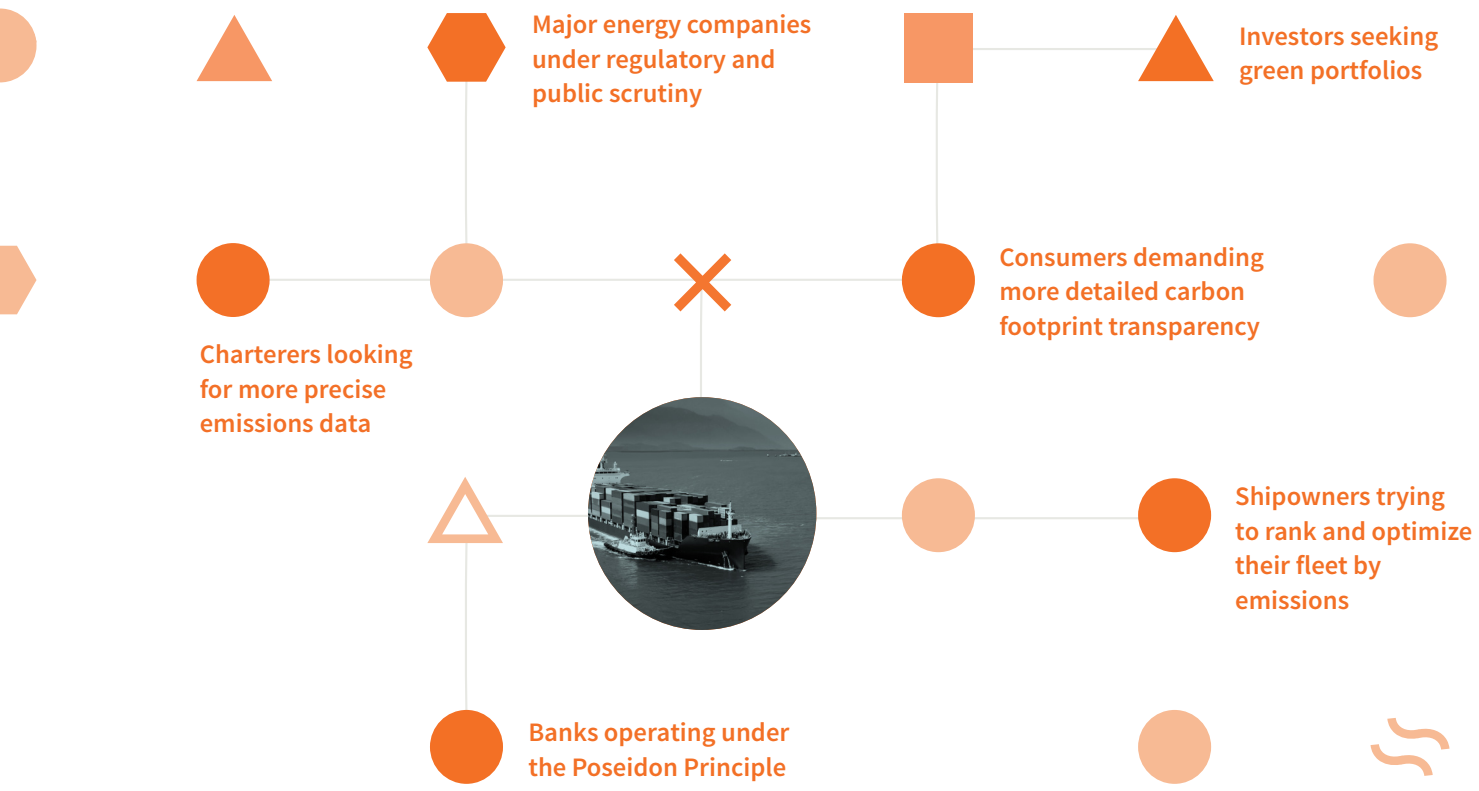
The way a vessel is operated can dramatically impact its fuel consumption and its resulting carbon emissions. For example, the same cargo will have dramatically different carbon footprints if it is transported by two smaller vessels rather than one large vessel.

Comprehensive data can show you exactly where you stand now on sustainability, which can help you demonstrate all the ways you can improve and meet your goals moving forward.

Why you should care: Because of who else cares

The entire shipping industry needs to care about these impending changes because of who else cares. Being proactive will not only make you more attractive to potential business partners across the maritime industry but also raise your profile in the eyes of investors and consumers.

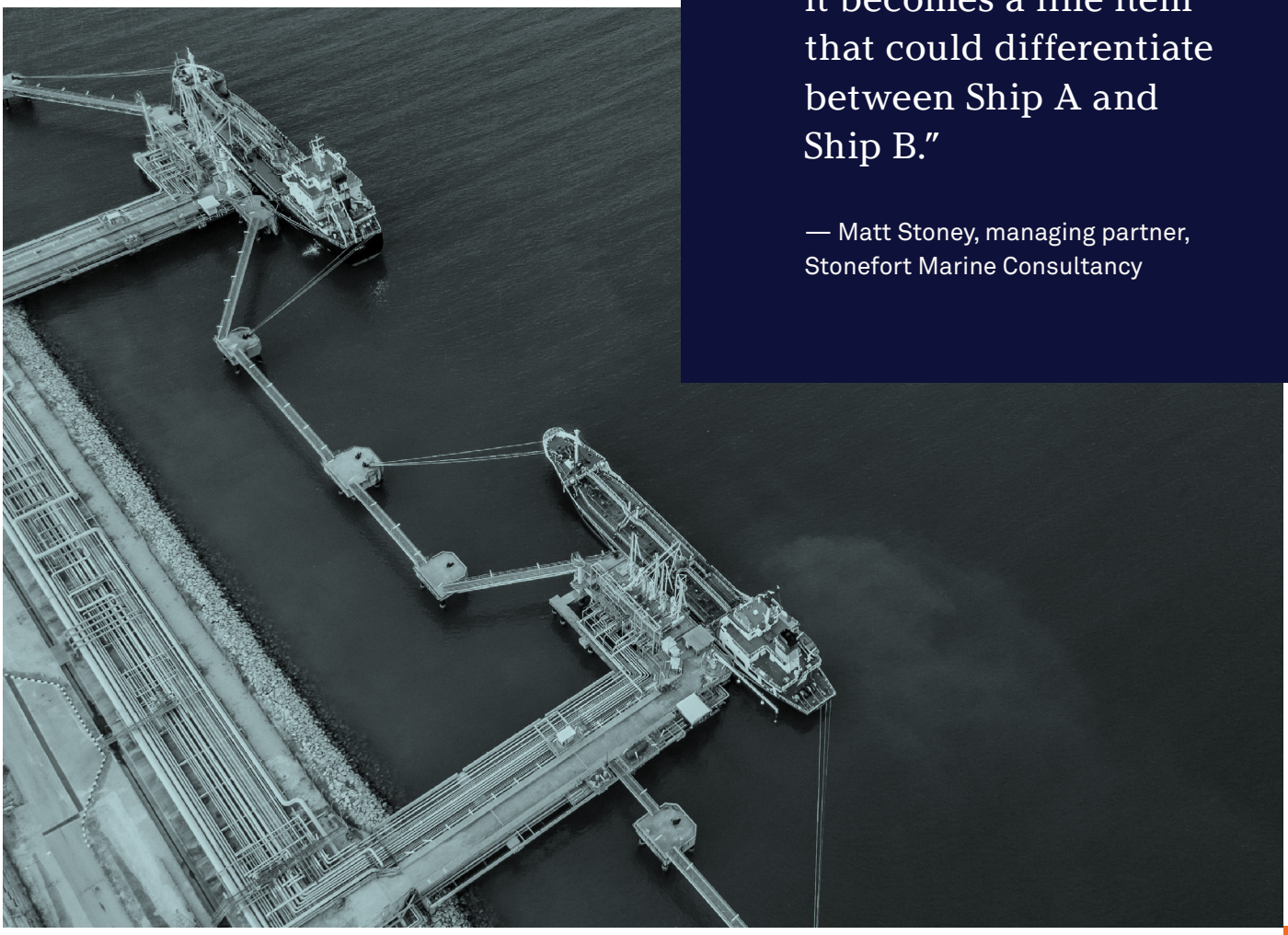
Staying ahead of the curve in managing your environmental risk is about far more than appeasing regulators. Embracing sustainability offers you the chance to build a better version of your company for the future.



Efficiency for charterers

The Sea Cargo Charter requires charterers to track emissions far more precisely than in the past, by calculating both the carbon intensity of voyages and total annual activity in terms of climate alignment. Simply put, the old ways of doing things are no longer enough.

> "Today, when charterers compare ships as they look at their short list to hire, there is no line item in there for emissions. But as soon as people have to pay for what they emit, it becomes a line item that could differentiate between Ship A and Ship B."
>
> — Matt Stoney, managing partner, Stonefort Marine Consultancy



With noon reports, all you're doing is measuring — not managing. Their self-reported nature and lack of accuracy don't meet the coming international standards. Without detailed behavioral data that account for the differences in each journey, your reporting simply won't be accurate enough.

Moving forward, charterers need precise, comprehensive data and a system that can help them easily understand what it means and predict the directions it will trend in next. This requires reliable, real-time reports that only a fully integrated, predictive platform can provide. Despite being far more comprehensive than a noon report, a streamlined system actually saves critical time during vetting, compliance and credit checks, as well as when it comes to environmental reporting.

A predictive platform will also allow charterers to proactively recommend vessels with the lowest environmental impact, maximizing cost savings and planning time and helping you and your partners meet your KPIs.

Flexibility for shipowners

Although they understand the major changes on the horizon, two-thirds of shipowners have no plan for decarbonization. Alternative fuel sources may contribute to long-term GHG reduction, but understanding and experimenting with alternative options starts now.

Shipowners have access to a great deal of data on their fleet's fuel consumption. But they don't have a way to understand how their fleet ranks against those of their competitors by IMO indices. In addition, it can be challenging for them to optimize fuel consumption without costly equipment. Many vessels today are equipped with IOT devices that capture their data.

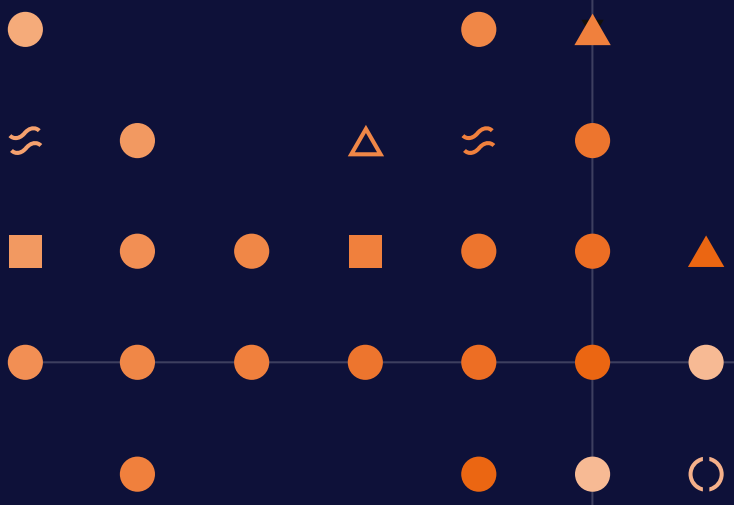
However, these require continual data collection, extensive resources, time, and expertise. And some of the parameters are simply not easily measured, like the causal areas of hull fouling. In order to benefit from the carbon market, shipowners require actionable insights.

Doing so will keep shipowners one step ahead of regulators. More importantly, it will enable them to stay competitive in the market by maximizing voyage optimization. In this way, shipowners can stay ahead of their peers, position themselves to charge green premiums, and attract better financing from banks.

Shipowners with decarbonization plan

> Shipping has always worked on the concept of minimum compliance. Now, the market is demanding best management practices."

— Anuj Chopra, co-founder and CEO of ESGplus



Sustainable financing for banks

An EY report found that 52% of banks view environmental and climate change as a key emerging risk over the next five years, up from 37% one year ago. However, without the right data, it's no small task to incorporate climate risk management. Why? You can't push green financing without accurate emissions reporting to back it up.

Unlike shipowners or charterers, banks are the most far removed players from data on shipping emissions. And yet, as the financing entities, they are major stakeholders in a greener future. Understandably, they are under growing pressure on several fronts to expand their green portfolios. The Poseidon Principles lay a basic framework but are just as subject to change as IMO regulations. Further, signatories of the Poseidon Principles will only need to measure the carbon intensity of their shipping portfolios on an annual basis. The industry needs a more dynamic and real-time approach.

To ensure banks stay current as guidelines shift — and to appease both board members and portfolio investors — they need flexible solutions to responsively account for decarbonization in their transactions without having to depend on counterparty reporting. AI-based solutions can transform standard maritime data into predictive and measurable emissions recommendations. This will be key in supporting financing decisions that influence the move to a lower carbon future.

Boost your investment profile

Don't be fooled by the misconception that working toward and publicly disclosing environmental sustainability is at odds with shareholder interest. Investors have always valued transparency and, increasingly, they have been prioritizing sustainability.

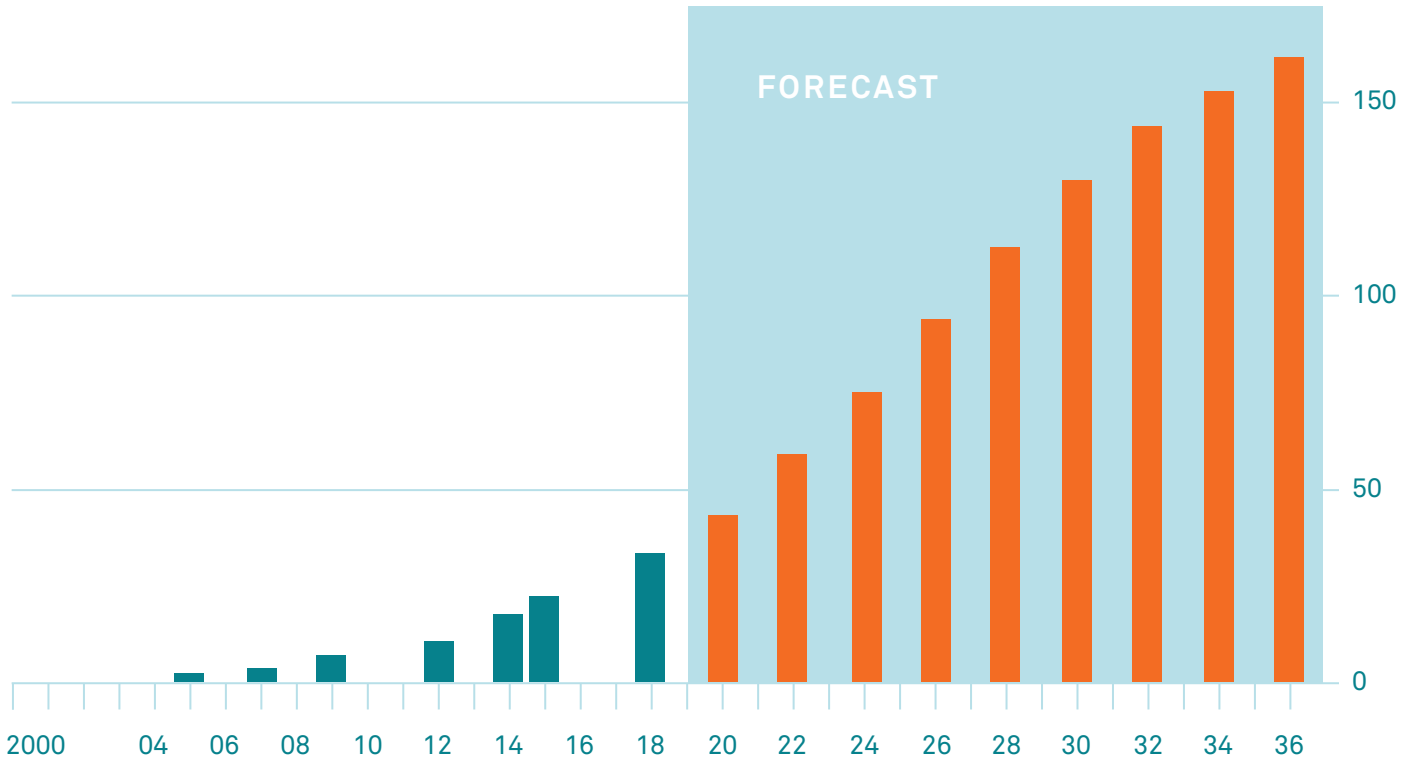
> "Our wealthiest clients want to know their investments are making a difference to make the world a better place."
>
> — Rina Kupferschmid-Rojas, head of sustainable finance at UBS Group

At UBS, the world's largest wealth management group, sustainable and impact investment more than tripled from the end of 2016 to the spring of 2019. Overall, sustainable investing more than doubled from 2012 to 2018, from $13.3 trillion to $30.7 trillion. In the next 15 years, that number is projected to hit $150 trillion.

Green stocks have surged past the S&P 500 in recent years, and leading ESG companies have outperformed those at the bottom by 40%. Spending on the front end to make your business more environmentally friendly can be an investment with an opportunity for even greater return.

Investors set to pour trillions more into ESG funds

Global assets with an ESG mandate ($†n)



BASED ON AVAILABLE DATA

SOURCES: DEUTSCHE BANK; GLOBAL SUSTAINABLE INVESTMENT ALLIANCE

Meet customer demand for transparency

A generation ago, the push for detailed nutrition labels transformed the food industry. Today, as consumers become more aware of their own carbon footprint in every one of their actions, they are increasingly looking to companies to deliver that information as well.

While more consumer-direct industries are putting labels on their products touting environmental practices, companies such as Unilever have committed to achieving net zero carbon products. This is an essential part of their next 10-year strategy to empower consumers to choose greener products.

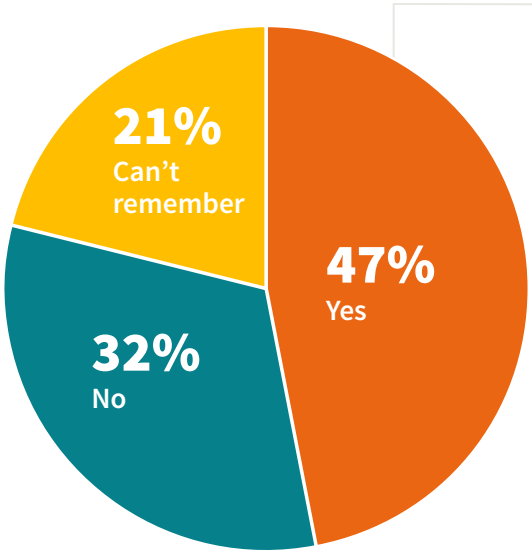
> "If shipping companies can track their carbon footprint for every voyage, they will provide the clarity and visibility that will set them apart when carbon labeling takes off."
>
> — Mark Fortnum, managing partner, Stonefort Marine Consultancy

Emissions come from every stage of the supply chain, including ocean freighter travel. The process of monitoring that chain of events has often been opaque, especially in the shipping industry. Yet companies with a business motive to create visibility have done so. Even if IMO carbon targets continue to be nonbinding and unambitious, consumers will continue to demand lower-carbon solutions from the industry.

More than anything, companies need to avoid being labeled as environmentally unfriendly. A 2019 Hotwire survey found that 47% of worldwide respondents reported ditching a brand that violated their personal values. The top values listed? Environmental protection, followed by transparency, climate change mitigation and corporate social responsibility.

Internet users worldwide who have switched a product/service because the company violated their personal values, Jan 2019

% of respondents



REASONS WHY THEY SWITCHED PRODUCT/SERVICE

Protecting the environment	11%
Lack of transparency	9%
Climate change	5%
Corporate social responsibility	5%
Data security	5%
Ethnic discrimination and equality issues	5%
Financial corruption	5%
LGBTQ discrimination and equality issues	5%
Toxic workplace culture	5%

NOTE: AGES 18+

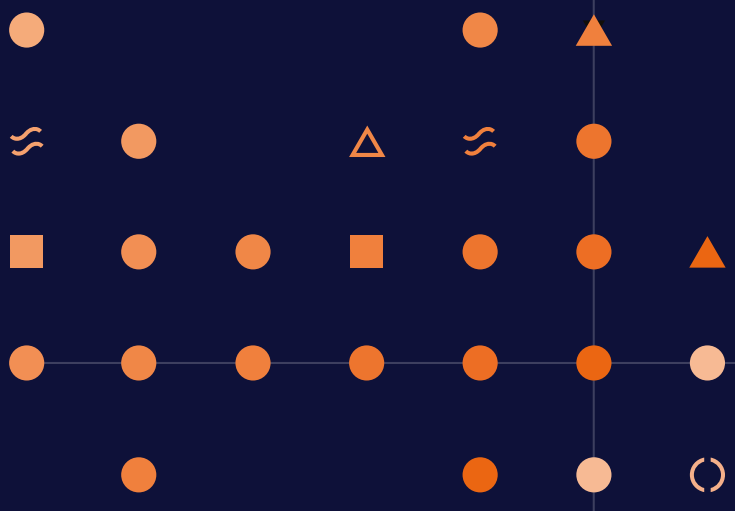
SOURCES: HOTWIRE, "HIGH-STAKES LEADERSHIP IN A POST-B2B WORLD", CONDUCTED BY SAPIO RESEARCH, MARCH, 2019

Additionally, younger consumers value sustainability in both their brands and their workplaces. According to Nielsen, two-thirds of millennials are willing to pay more for products made by sustainable brands. Perhaps even more enlightening, three-quarters of millennials want to work somewhere they feel there is a sense of purpose toward people and the planet. Meanwhile, 60% of millennials and Gen Z respondents fear that the pandemic will weaken businesses' resolve in addressing climate issues, which, as we've already established, is consistently a top value. Companies like Unilever need to be responsive to those demands, which means they need shipping partners that take decarbonization as seriously as they do.

Even companies not used to the spotlight need to understand the public interest in and motivation toward sustainable companies. With added visibility into every aspect of the supply chain from rating systems like the IMO's, pressure is even greater for public-facing companies to work with partners they can point to as champions of sustainability.

> "Perhaps driven by the sense of responsibility to future generations, customers are starting to select suppliers based on their carbon performance. This isn't regulation forcing the change. It's responsible leadership."
>
> -Guy Mason, Former SVP at BP

> It's somewhat remarkable that respondents' minds remained focused on environmental issues when threats to their health, family welfare, and careers are more personal and imminent."
>
> — Deloitte Global 2021 Millennial and Gen Z Survey



The importance of being proactive

The IMO wants to reduce the shipping industry's GHG emissions by at least 50% from 2008 levels. Considering that these GHG emissions rose nearly 10% between 2012 and 2018, due primarily to increases in trade, any pandemic-related drop-off should be viewed as temporary, and the task at hand remains daunting. But that's all the more reason to get ahead of the game, rather than trying to react and catch up to the rest of the industry.

> "If the world is to achieve the goals of the Paris Agreement to tackle climate change, it is crucial that sectors such as shipping cut their carbon emissions and do so fast."
>
> — Huibert Vigeveno, downstream director, Shell

Although industry consolidation and pandemic-related factors have driven up freight rate prices, they may not stay high in the long term. Continually improving efficiency, something the industry has already made strides in, will keep you ahead of ever-shifting regulations and help bolster profit margins, regardless of outside circumstances beyond your control.

IMO Shipping Industry Target Goals

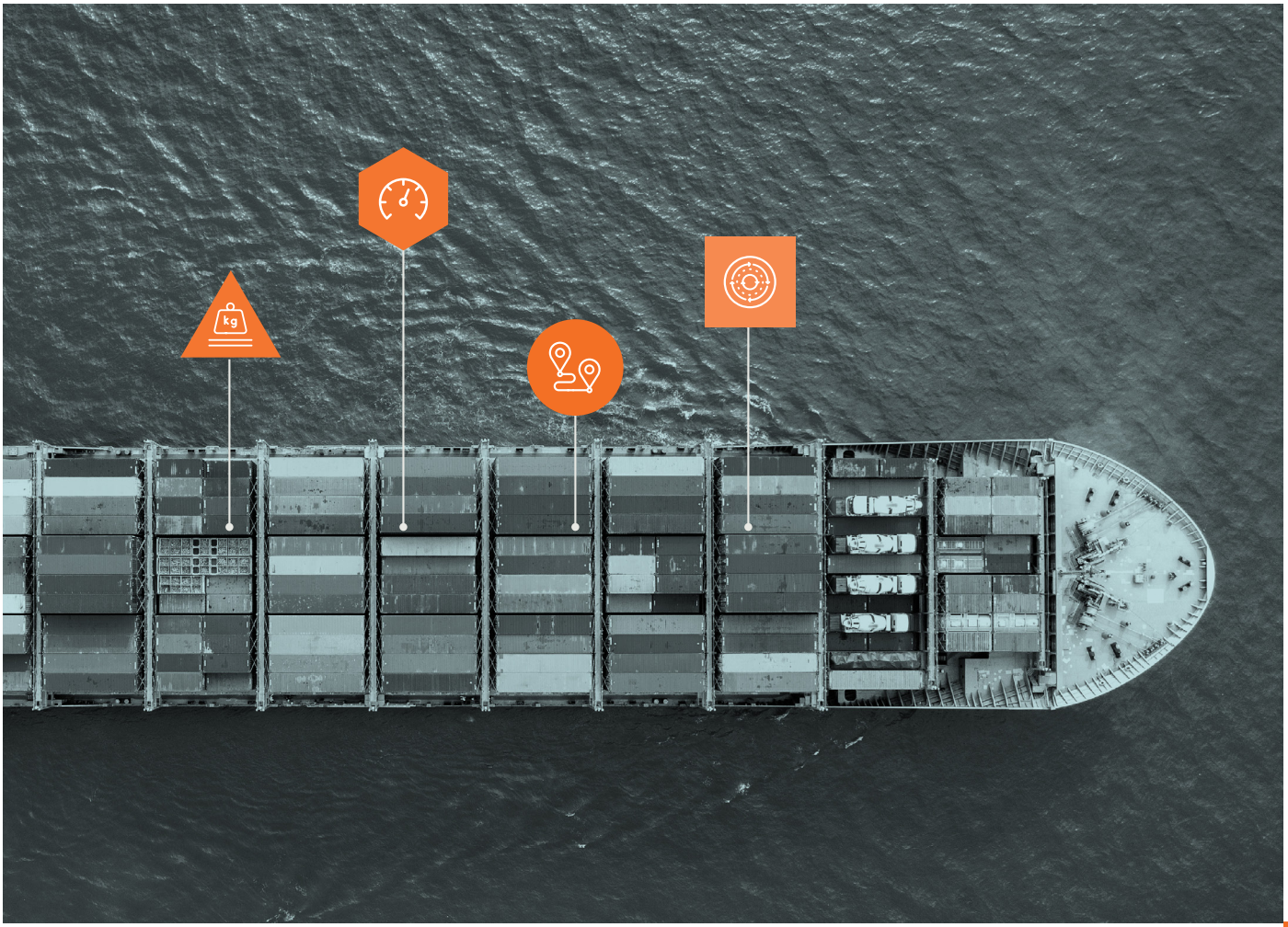
Reduce GHG emissions
at least 50% by 2050

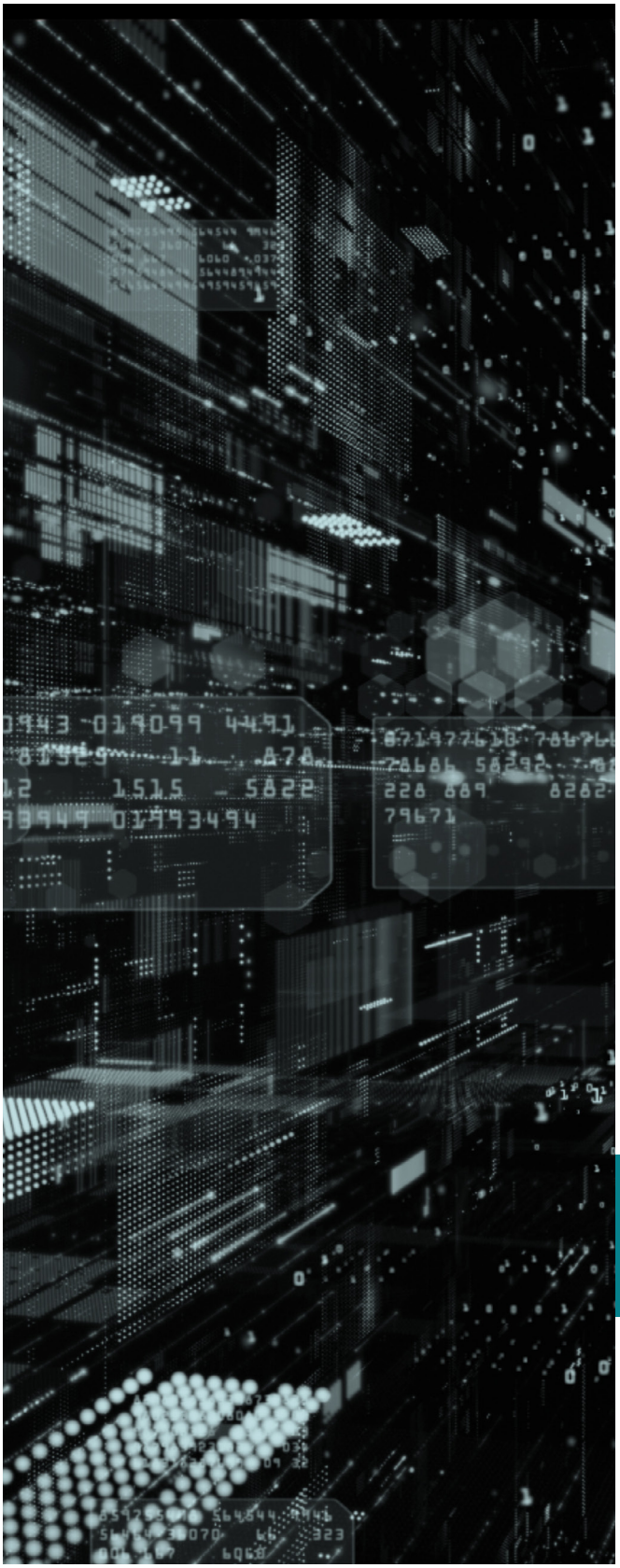
Reduce carbon intensity of emissions
40% by 2030, 70% by 2050

Benefits now, benefits later

Now is the time to take the initiative on sustainability, before outside forces press action on the industry. Waiting for agency regulation to emerge and depending on that to effectively drive change is not the right answer. The path forward requires real cooperation between shippers, regulators, financiers and technology companies, working together to drive sustainable impact. It's the only way to protect both our environment and the long-term interests of the industry.

There is good news: You may already be ahead of the curve in ways you're simply not aware of yet. The power of dynamic behavioral data is that it will help you see where you're on track, where you need to improve, and how to make the smartest changes to your business, big or small. From vessel paths to weather to vessel interactions and more, keeping track of and responding to challenges in real time will help mitigate your carbon emissions.





There are no single, silver bullet answers. But the more you know, the more effective your decision-making about handling environmental concerns will be.
The right data can drive stakeholder decision-making and reduce carbon emissions on a day-by-day, week-by-week and quarter-by-quarter basis.

Responsive and predictive AI will help you identify changes you can make now while also planning for both short- and long-term investments that will make you more attractive to partners, investors and consumers.

What you can do now and how data can help

Various entities have rolled out frameworks to tackle emissions. Banks have the Poseidon Principles and charterers have the Sea Cargo Charter, just two of the many global initiatives in different market sectors. Still, these are siloed approaches, not a collaborative, industry-wide effort that leverages strong and predictive data.

What if you could forecast the daily fuel consumption of each IMO vessel? Imagine instant access to the actual vessel's behavior characteristics, along with hundreds of dynamic vessel spec data points. Now, what if you added AI into the picture and could get real-time predictions on vessel emissions?

The business impact could be massive. Let's consider the EU Emissions Trading System (EU ETS), which currently doesn't include shipping. Expanding it to do so would be a game-changer for carbon cost in the industry.

Think of a typical LR tanker, consuming VLSFO for its main engine and generators, loading at Corpus Christi (US) for Amsterdam. This is usually a 17-day voyage at 12.5kts. Using a CO2 emissions factor of 3.1 (t/CO2/t) and a carbon price of $65 million, this would yield an additional voyage cost in the region of $16,000. Sometimes, this cost will fall on shipowners. Other times, it will land on the charterer's account. Either way, it's a cost that needs to be accounted for and understood before a voyage, not after.

Why? That's when the owner or charterer can still optimize voyage planning, by evaluating options for vessel employment or cargo transportation. AI models that can account for probablilistic weather forecasts for the various voyages on offer can enable operators to fix the vessel that provides the highest expected earnings before establishing commercial terms (e.g. cargo intake, speed clause, laycan), all of which will ultimately impact emissions.

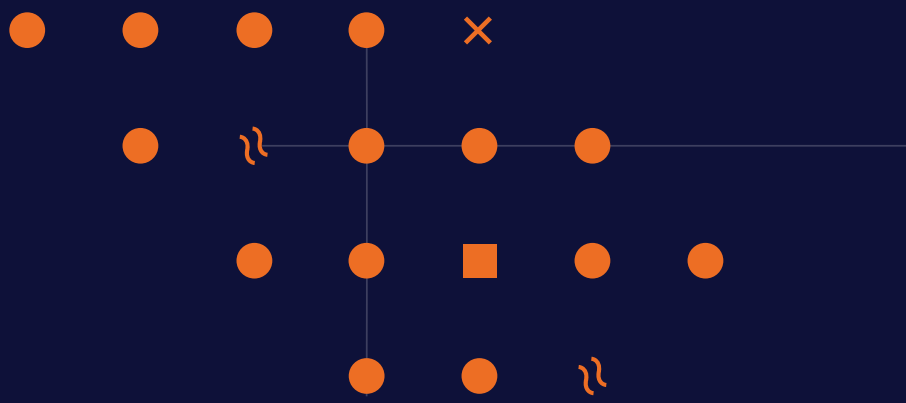
With predictive insights, powered by AI, at the vessel and voyage level, it becomes possible to leverage the data needed to make profitable decisions and operate with confidence.

This is just one use-case — the benefits will ultimately trickle down the entire supply chain. With access to explainable, dynamic data at the right time, you don't have to sacrifice business performance for emissions performance. Using the same maritime AI tools that helped the industry adapt to sanctions regulations, the promise of accelerating decarbonization is within your grasp.

About us

Windward was founded in 2010 to solve the problem of data visibility in the maritime domain. Over the past 10 years, the potential applications of maritime visibility have expanded far beyond security and intelligence. Thanks to our best-in-class AI models and behavioral vessel data, we are bringing the same innovation that has helped global organizations mitigate compliance and security risk to provide industry leaders with a way to measure and predict their global carbon emissions.

Contact us to learn how Windward can help you streamline operations, without compromising on the path towards a greener future.



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