



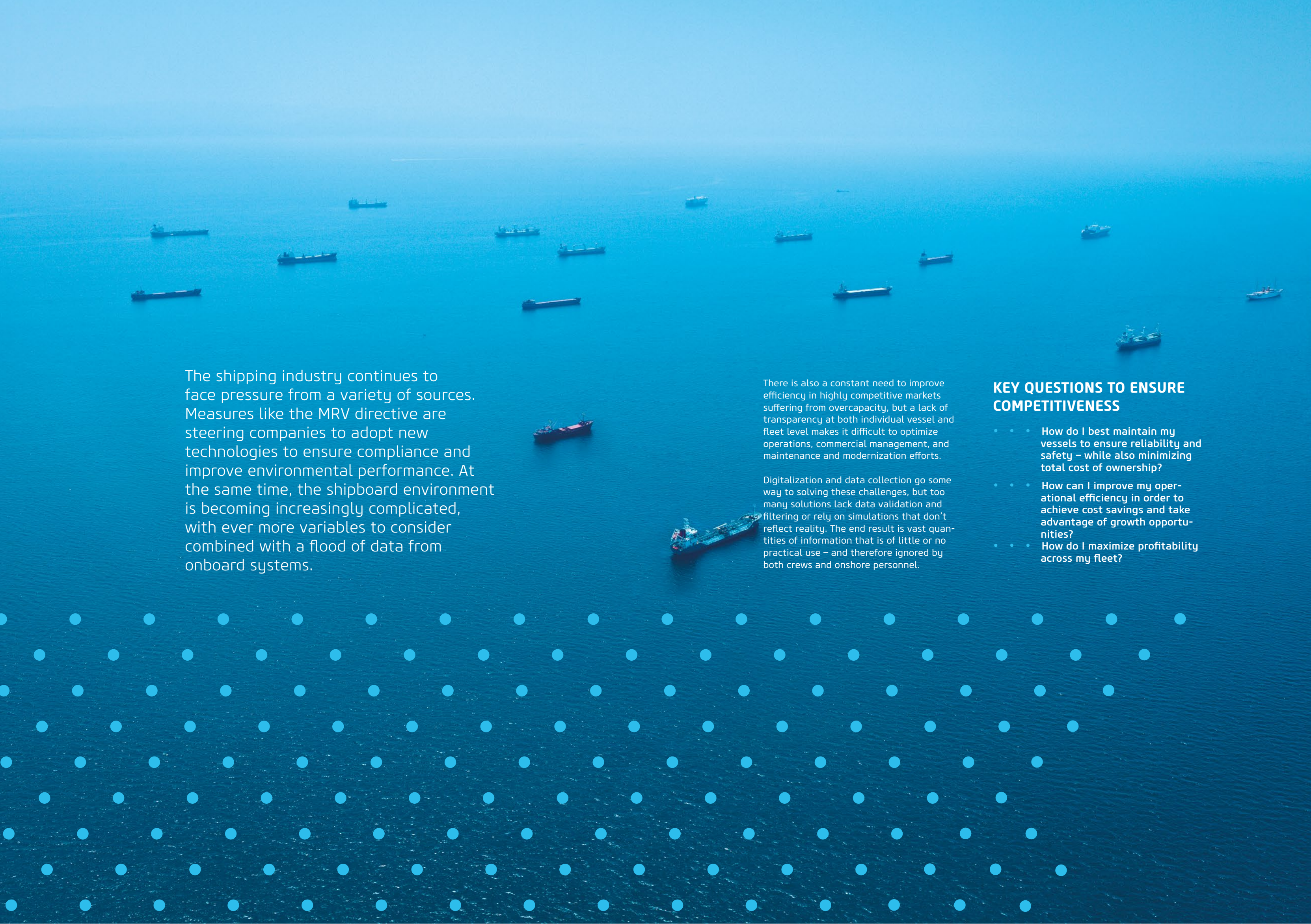
eniram

A WÄRTSILÄ COMPANY

See **BEYOND**



Bring your
shipping
operations into
the 21st century



The shipping industry continues to face pressure from a variety of sources. Measures like the MRV directive are steering companies to adopt new technologies to ensure compliance and improve environmental performance. At the same time, the shipboard environment is becoming increasingly complicated, with ever more variables to consider combined with a flood of data from onboard systems.

There is also a constant need to improve efficiency in highly competitive markets suffering from overcapacity, but a lack of transparency at both individual vessel and fleet level makes it difficult to optimize operations, commercial management, and maintenance and modernization efforts.

Digitalization and data collection go some way to solving these challenges, but too many solutions lack data validation and filtering or rely on simulations that don't reflect reality. The end result is vast quantities of information that is of little or no practical use – and therefore ignored by both crews and onshore personnel.

KEY QUESTIONS TO ENSURE COMPETITIVENESS

- • • How do I best maintain my vessels to ensure reliability and safety – while also minimizing total cost of ownership?
- • • How can I improve my operational efficiency in order to achieve cost savings and take advantage of growth opportunities?
- • • How do I maximize profitability across my fleet?

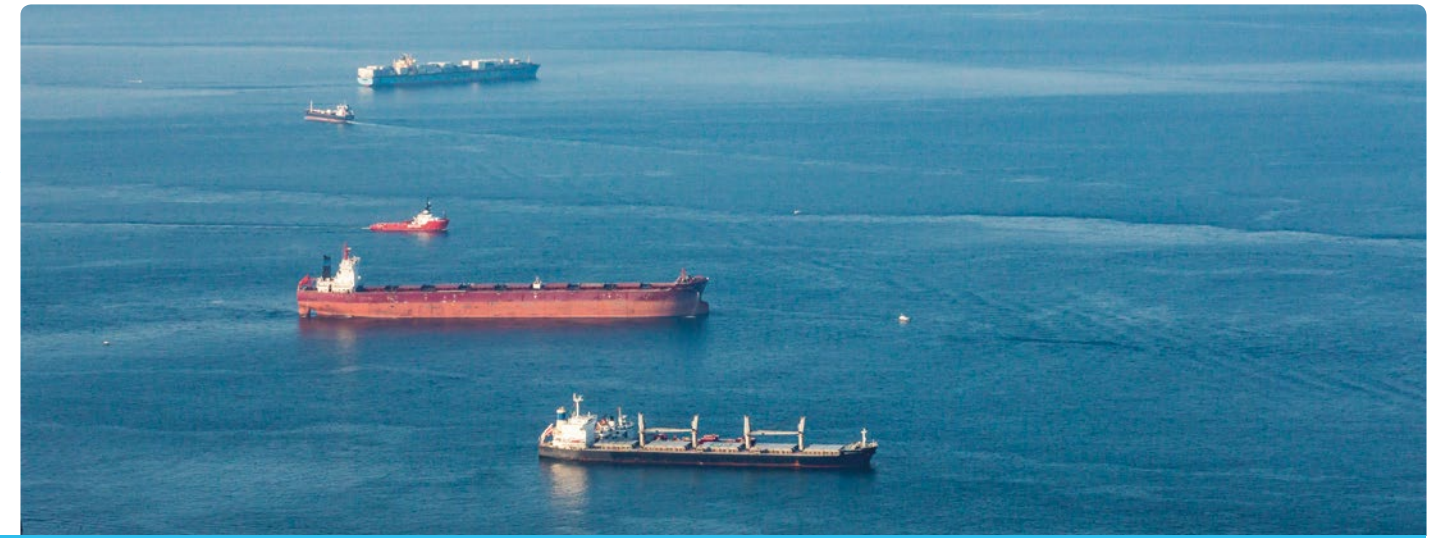
How partnering with Eniram can help you thrive in tough markets

1) INSIGHTS TO IMPROVE ASSET MANAGEMENT

We help you move from time-based to truly predictive maintenance with solutions that ensure reliability and minimize total cost of ownership. Our advanced modeling takes into account your vessel's unique parameters and

overall performance. Data is filtered and analyzed to find the right balance between reliability and maintenance costs – while also ensuring safety.

- • • Cut maintenance costs
- • • Maximize asset uptime
- • • Enhance operational reliability
- • • Improve efficiency



2) INSIGHTS TO OPTIMIZE YOUR OPERATIONS

We help you minimize operational costs while maximizing revenue, safety, and reliability by bringing an unprecedented level of transparency to your operations. With our solutions, you not only see what's happening on board your vessels in near real time, you also get actionable

insights that help the crew make the best possible decisions. In our experience, increased transparency between onboard and onshore operations also leads to better collaboration on planning and execution, which in turn translates into greater cost savings.

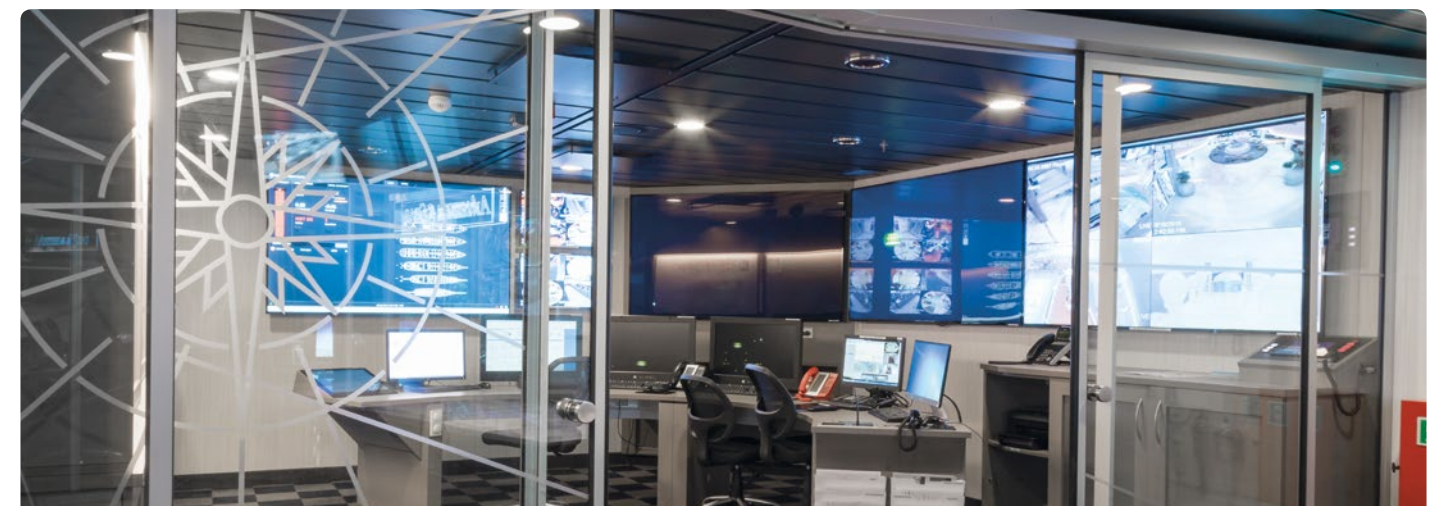
- • • Efficient crew operations
- • • Reduced operational costs
- • • Optimized energy efficiency
- • • Proactive safety management
- • • Emission reductions

3) INSIGHTS FOR COMMERCIAL SHIPPING

Our solutions help you to make smart decisions – based on hard data – that help you maximize profit from your vessels. We go beyond data collection to give you action-

able insights about vessel performance in clear, easy-to-use reports. Our performance tracking as a service minimizes investment and the need for onboard installations.

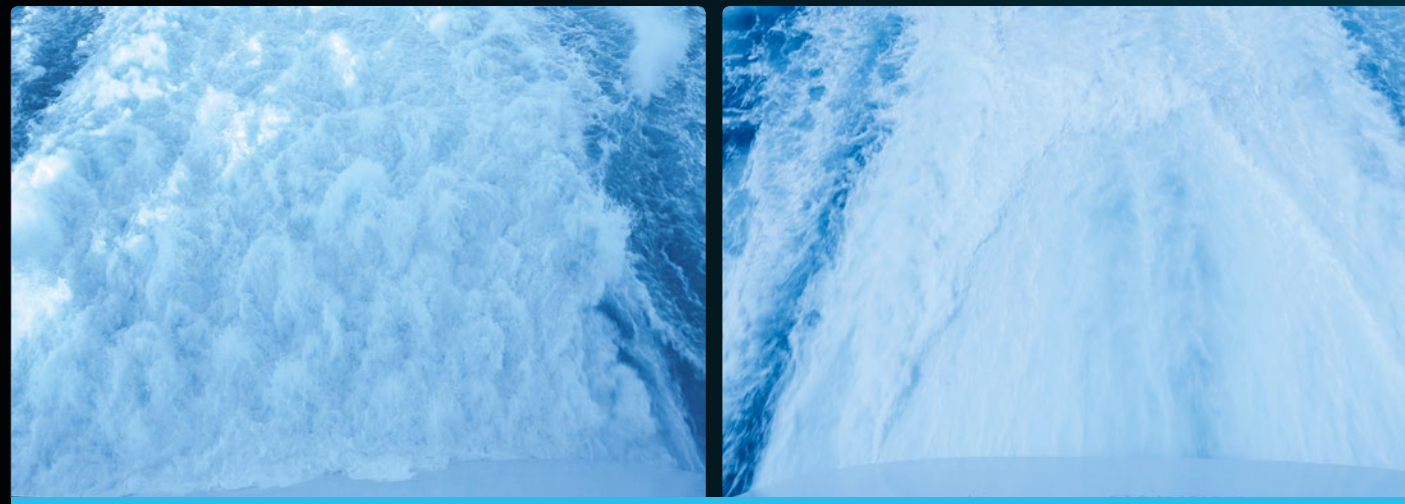
- • • Fuel performance and efficiency optimization
- • • Charter-party compliance monitoring
- • • MRV reporting for emissions monitoring
- • • Weather map, nautical chart and route management
- • • Improved commercial efficiency management



What makes Eniram different?

Today's ships are equipped with numerous sensors and advanced systems to help the crew operate efficiently. However, this onboard data is far from being utilized to its full extent. At Eniram, we collect 3 billion mea-

surements every day from hundreds of vessels – that's almost 35,000 measurements per second. Our database already includes 96,000 sea days of highly accurate real-time data.



WE GO BEYOND DATA COLLECTION TO GIVE YOU CONCRETE INSIGHTS

But collecting data is not enough. Our unique Eniram Insight Factory approach is based on a mathematical model of each vessel that shows the connection between crew operations and efficiency, while also including external factors like current, wind, waves, and trim.

We filter and analyze all this information with solutions based on naval architecture and state-of-the-art machine-learning algorithms to give you highly accurate insights based on real measured data, not artificial estimates from simulations or laboratory tests.



MAKING PROACTIVE MANAGEMENT A REALITY

Eniram brings together experts with a unique set of skills – including seafarers, coders, and innovators – to develop solutions for the key issues facing your industry. We are moving beyond retroactive analysis towards

proactive management with predictive insights and mobile alerts. Our solutions ensure that the right personnel know when a potential issue needs attention – even before problems happen.

WE COLLECT DATA



Eniram Insight Factory utilizes data collected from the vessels' bridge, automation systems, and onboard sensors. We also integrate third-party information like

weather forecasts. For performance monitoring as a service, we supply a battery-powered transponder that installs quickly and accurately tracks the vessel's movements.

YOU GET INSIGHTS



We use the advanced mathematical models to create insights for each vessel based on real measured data – like how to achieve optimal trim

in real time, the exact RPMs needed to reach port in time, or an accurate speed-fuel curve.

YOU TAKE ACTION



With Eniram, you get real-time decision-making support to help teams improve your operational efficiency and asset management. For commercial optimization, regular

reports are sent in an easy-to-read PDF format that allows you to track performance, monitor compliance, and improve efficiency.

We partner with leading players in the shipping industry



The Hull and Propeller Performance online application is one of the best solutions Eniram has ever developed.

I would recommend it to any ship owner or charterer who wants to improve hull performance. It helps us measure and track the impact of hull fouling and optimize timely hull cleanings. A great tool leading to savings!

— **Mauricio Lacayo, Royal Caribbean Cruises**



We are very pleased with the early results. However we see this as just the beginning. We can achieve

significant further savings through utilizing the additional data and analysis provided by the Eniram solution.

— **Leo Huisman, President of Norgas Carriers Pte Ltd**



Over the past 12 months, we have consistently seen significant fuel savings on all vessels on which we have installed Eniram Trim. We see this system as a 'must-have' on any new vessels entering our fleet to ensure that they are as efficient and environmentally friendly as possible. Hamburg Süd is one of the first container lines to use this system. Evaluation of the results revealed fuel economies of 3 to 5 percent.

— **Mr. Fred Deichmann, Managing Director, Hamburg Süd**



With the installation we hope to achieve a fuel saving of 2 to 4%. This could translate into US \$200-400k

savings in fuel per year, as well as significant reduction in air emissions.

— **Miltiades Sfantsikopoulos, Superintendent Engineer, Maran Tankers**

Eniram solutions for **SHIPPING INDUSTRY**

CRUISE SHIPS

New growth opportunities in the cruise market, combined with an increasingly complicated onboard environment, mean that more and more companies are turning to digital solutions to improve efficiency and create a competitive advantage. Partnering with Eniram gives you a high level of transparency through reliable data and predictive insights, helping you to optimize operations and asset management across your entire fleet – while also meeting service power needs and keeping customers safe and happy.



LNG CARRIERS

Variables like boil off, dual or tri-fuel diesel-electric propulsion, and the operation of reliquefaction plants or gas combustion units are critical not just for efficiency, but also for safety. The current oversupply of tonnage, combined with low LNG prices and low charter rates, adds further pressure. By partnering with Eniram, you get the increased visibility, control, and predictability you need to cut costs and excel in this competitive industry.



CONTAINER VESSELS

In a market suffering from overcapacity and low shipping rates, you need to make operations as efficient as possible to compete – not just at the level of an individual vessel, but for your entire fleet. Partnering with Eniram brings you visibility into your overall vessel operations, vessel lifecycle, and commercial management. Our reliable data and insights help you to maximize the performance of your vessels, improve budgeting and planning, and verify charter party performance.



TANKERS

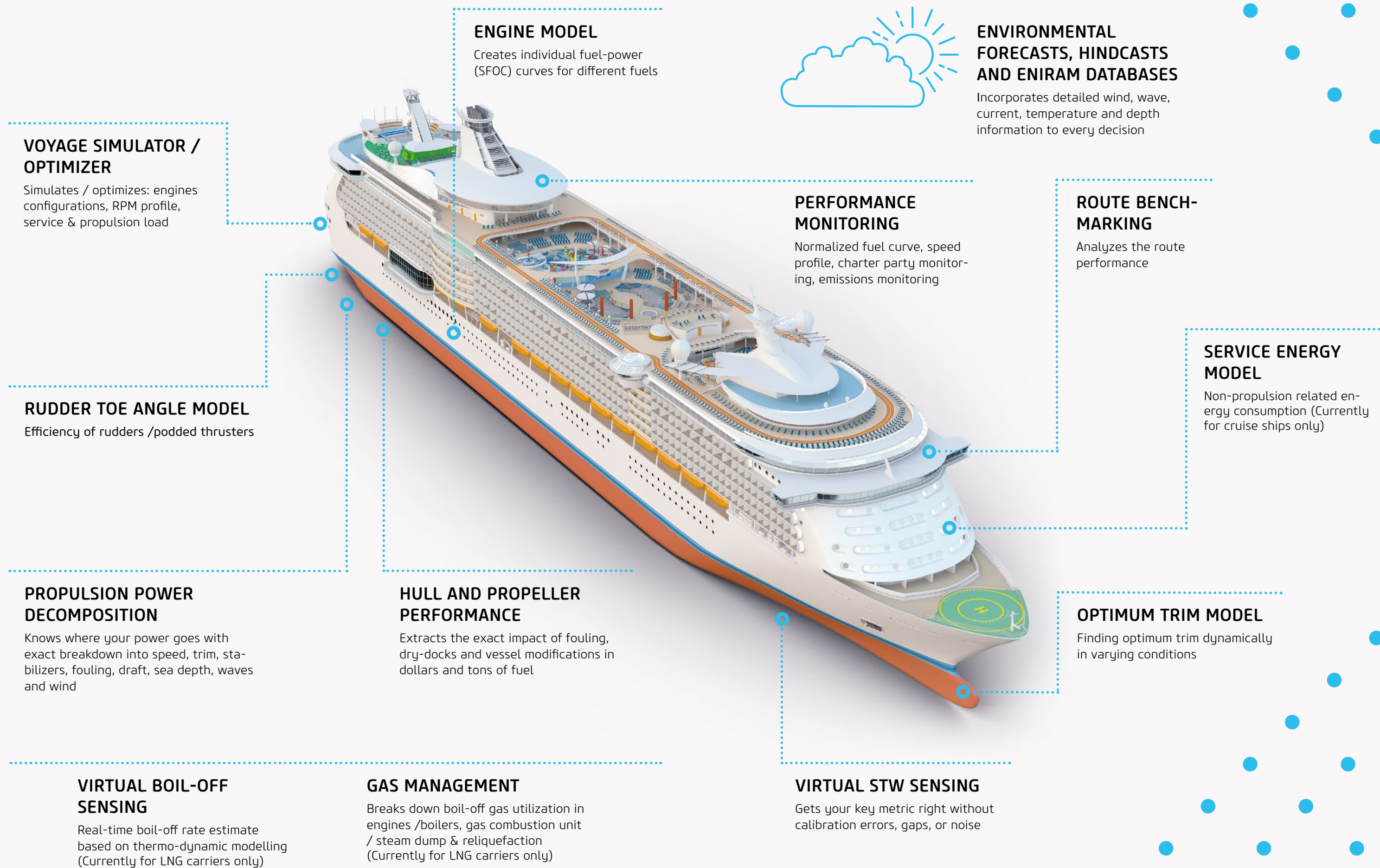
The tanker industry continues to face pressure as new regulations like the MRV directive coincide with the need to improve efficiency in a highly competitive market. Partnering with Eniram gives you full visibility into operations onboard your vessels. Our reliable data and insights enable you to make informed decisions to optimize vessel and fleet performance, improve budgeting and planning, and verify charter party performance.



BULK CARRIERS

In a competitive market with low shipping rates, you need cost-effective solutions to improve your operational efficiency and find savings. Being able to verify charter party performance is also key to ensuring strong customer relationships. Partnering with Eniram gives you reliable and relevant insights into your vessel's performance – while minimizing investment costs and the need for onboard installations.

Eniram – From data to predictive insights



Contact us

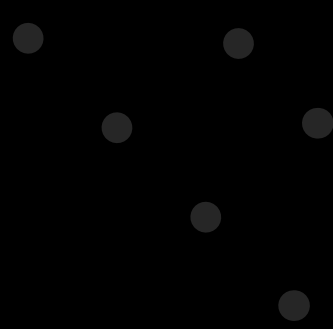
Are you looking for insights to manage your operations and maximize performance and efficiency? Join our customers in creating a more efficient future.

Eniram Ltd.	Phone: +358 10 843 3800
Itälahdenkatu 22a	Fax: +358 10 843 3999
FI-00210 Helsinki, FINLAND	www.eniram.fi



The time of early adopters is now over and digitalization has become a trend that everybody follows. Now, ship owners and operators simply cannot afford to overlook it, but they need to equip themselves one way or another.

**– Johan Backas,
Managing Director, Eniram**



Since 2005 Eniram has provided the marine industry with leading insights for asset, operations and commercial shipping management. The Eniram Insight Factory gives decision-making support for its partners based on real time data collection, statistical modeling and predictive simulations. Our mission is to maximize the efficiency of the industry through digital insights, saving costs and maximizing overall profitability, while cutting the emissions harmful to our environment.

Eniram's solutions range from single vessel services to comprehensive fleet wide solutions. Among Eniram's customers are leading players in the cruise, LNG, container, tanker and bulker markets. We also offer a subscription-based service to expand into performance management for the commercial and charter market.

Eniram is headquartered in Helsinki, Finland and has subsidiaries in the UK, Netherlands, the USA, Germany and Singapore. Eniram is a Wärtsilä Company, catalyzing a digital and performance driven business.

