



KONGSBERG



KONGSBERG

THE FULL PIC TURE

Kongsberg Maritime's
scope of delivery

DETERMINED
INNOVATIVE
COLLABORATIVE
RELIABLE // :

Maximizing performance by providing

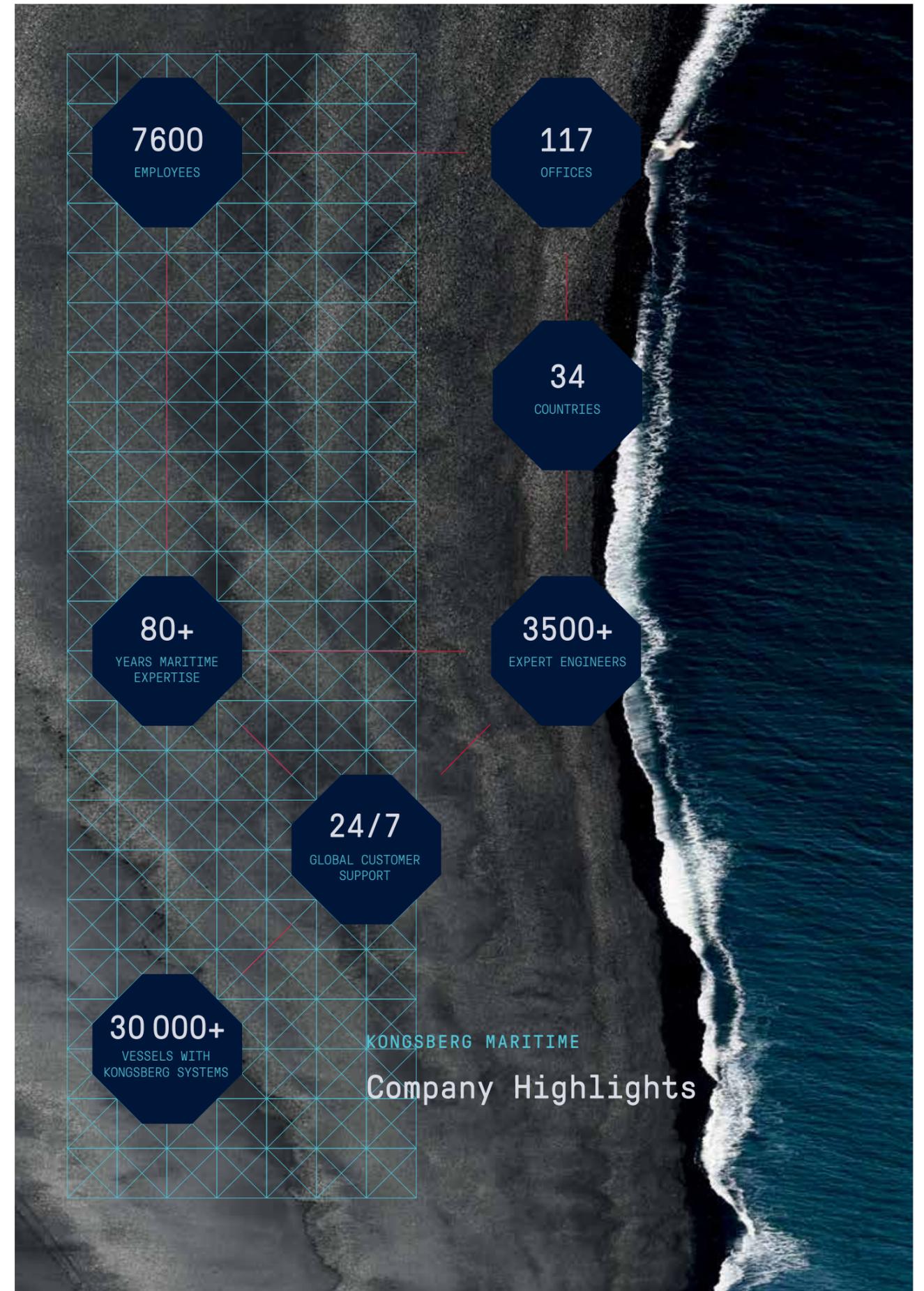
THE FULL PICTURE

We are determined to provide our customers with innovative and dependable marine systems that ensure optimal operation at sea. By utilising and integrating our technology, experience and competencies within design, deck machinery, propulsion, positioning, detection and automation we aim to give our customers the Full Picture - shaping the future of the maritime industry.

Welcome to the Full Picture. Welcome to the future.

DETERMINED
INNOVATIVE
COLLABORATIVE
RELIABLE///:

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Performing Together, Delivering as One

Navigate to a sustainable future with The Full Picture, a portfolio of unified technology and engineering solutions created and delivered by the world's foremost maritime innovators.

THE FULL PICTURE

The unification of Kongsberg Maritime and Rolls-Royce Commercial Marine enables our combined expertise to cover a fleet of more than 30,000 vessels.

Rolls-Royce Commercial Marine's world-class technical capabilities encompass vessel design, the integration of complex systems and the supply and support of power and propulsion equipment, boasting one of the broadest product ranges in the world, from the engine room to the working deck.

The Full Picture consists of two product portfolios with two world-class support networks and almost twice as many expert staff and global locations.

While we are the largest marine technology specialist organisation in the world, with the most extensive product and knowledge base, our focus continues to be on customers and the environment. Only by listening to you and predicting industry needs can we enable the transformation needed to put safety and sustainability first, while continuing to generate value for all stakeholders.

We are shaping the maritime future with leading-edge operational technology, solutions for big data and digital transformation, new electric and hybrid power systems and truly game-changing developments in remote operations and Maritime Autonomous Surface Ships (MASS).





CUTTING YOUR ENVIRONMENTAL
FOOTPRINT, EVEN IN THE MOST
EXTREME CONDITIONS

Offshore Exploration & Production

The convergence of our state-of-the-art integrated propulsion units, engines, deck machinery and control and safety systems empower you to reduce CAPEX, optimise OPEX and cut your environmental footprint, even in the most extreme conditions.

Reduced engineering hours, fewer interface meetings and streamlined cabling at the design and build phase deliver tangible savings, while our cutting-edge operational technology and a proven life cycle management system enable you to maximise uptime and efficiency.

OPERABILITY

A user-friendly and intuitive human machine interface across diverse systems empowers operators to work safely and effectively, while a powerful Information Management System enables sophisticated collaboration with experts on shore as well as dynamic mission planning.

PRODUCTIVITY

Sophisticated advisory and situational awareness systems extend your operational weather window by providing the data and insight required to make the right decisions quickly. Well Specific Operational Guidelines also improve crew understanding of the key limiting factors they face.

EFFICIENCY

Deep integration between Dynamic Positioning, drilling systems, engines, thrusters and future-proof hybrid electrical systems enables more compact, lightweight vessel and platform design and can deliver a tangible decrease in non-production time, as well as lower CAPEX and lifetime OPEX.

PERFORMANCE

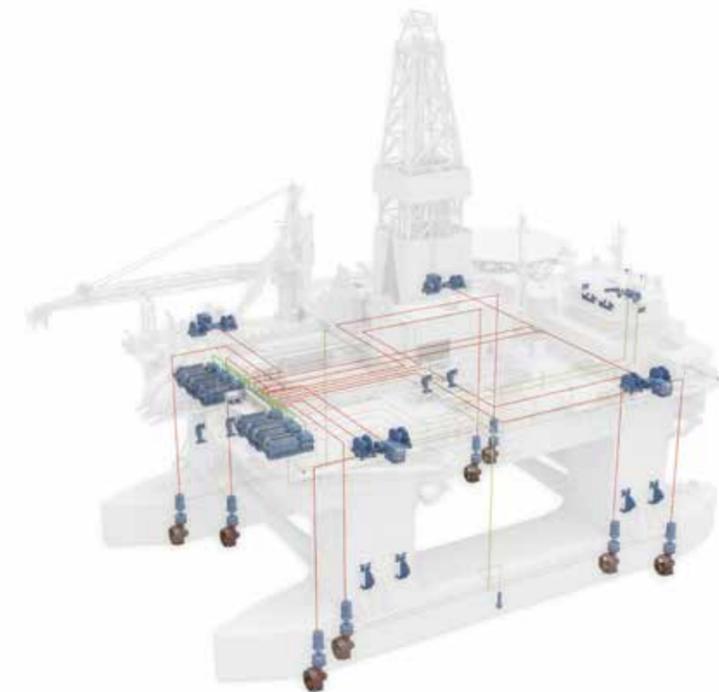
Unlocking the potential of your technical data is key to improving operational performance. Powering our comprehensive advisory functionality, integrated data is analysed with historical data on a single Information Management System, making it much easier to maximise performance and reduce costs.

SAFETY

Achieve full situational awareness with our complete Integrated Safety System. Improved power plant control secures integrity and reduces human errors, while the KONGSBERG integrated Riser Management System, Wellhead Fatigue System and Automatic BOP enable safe drilling operations.

ENVIRONMENT

A KONGSBERG Full Picture delivery mitigates the environmental footprint of a drilling unit, while our advanced, user-friendly advisory systems for Risers, BOP and wellhead minimise the risk of pollution, and our advanced energy control technologies reduce fuel consumption and emissions.



Offshore Supply and Service Vessels

KONGSBERG innovations keep the offshore fleet running. Safety and efficiency, from drawing board to shipyard and port to field, is only possible when you have the Full Picture.

Our Dynamic Positioning and automation systems kick-started the offshore boom over 40 years ago. Today, our technology and people are enabling a new generation of offshore sustainability through seamlessly integrated energy, handling and control systems which give you the power to transform operations and secure success in a highly competitive industry.

PRODUCTIVITY

Integration reaches out across the bridge, the engine room and the working deck to connect diverse vessel and work-specific applications. It allows a more holistic approach to operations and enables support from experts ashore who can contribute to single vessel operations or an entire fleet.

PERFORMANCE

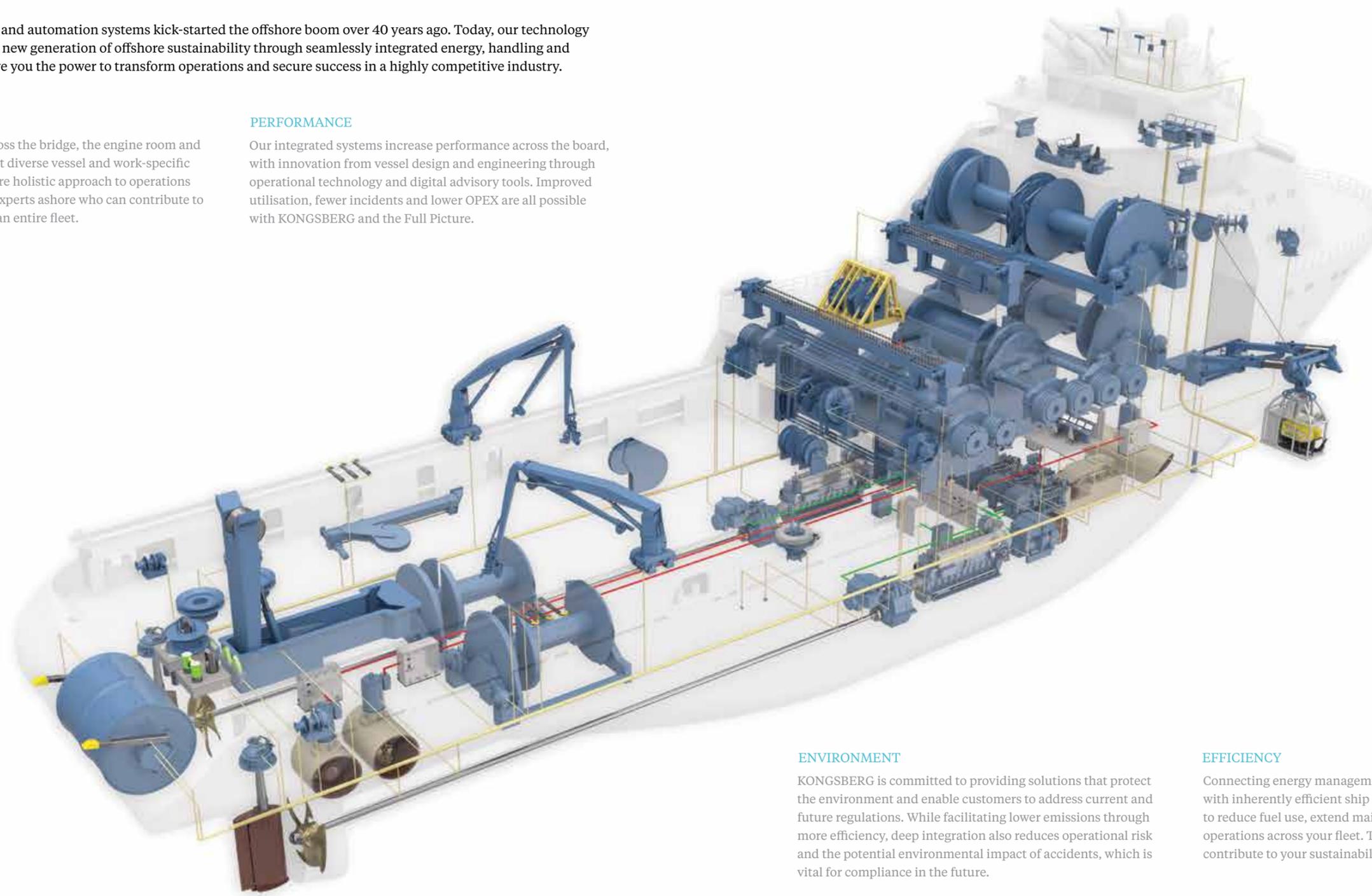
Our integrated systems increase performance across the board, with innovation from vessel design and engineering through operational technology and digital advisory tools. Improved utilisation, fewer incidents and lower OPEX are all possible with KONGSBERG and the Full Picture.

SAFETY

The intersection of sensors, operational technology and digital infrastructure boosts situational awareness by providing a clear view of the maritime domain. With accurate data, a vessel's energy, propulsion and control systems work in unity, bringing new possibilities for safety in all conditions.

OPERABILITY

The Full Picture combines cutting-edge offshore vessel designs and diverse engine options with unified Dynamic Positioning, energy, deck handling and control systems, empowering offshore crews to deliver on best practice for safety and efficiency, even in the most extreme weather and seas.



ENVIRONMENT

KONGSBERG is committed to providing solutions that protect the environment and enable customers to address current and future regulations. While facilitating lower emissions through more efficiency, deep integration also reduces operational risk and the potential environmental impact of accidents, which is vital for compliance in the future.

EFFICIENCY

Connecting energy management, handling and control systems with inherently efficient ship designs presents the opportunity to reduce fuel use, extend maintenance cycles and streamline operations across your fleet. The resulting cost savings contribute to your sustainability in a challenging market.

Tugs & Workboats

Achieving safe and efficient shallow and deep-water operations around other vessels and structures takes power and dexterity, both of which are on tap when using integrated solutions from KONGSBERG.

From thrusters and powerplant, through deck gear and winches, to automation and control systems, the Full Picture provides the operational foundation for your professional crews to work smarter and more effectively at sea and in port.

OPERABILITY

Powerful and proven propulsion systems, deck equipment and stabilisation and manoeuvring technology can now be integrated with cutting-edge energy management, automation and control systems to deliver safer, better managed and more economic operations at sea.

PRODUCTIVITY

Maximise the utility of your vessels by harmonising mechanical systems and operational technology to generate more effective power and control, while securely sharing technical data so your experts on shore can manage multiple projects at sea, significantly enhancing their productivity.

EFFICIENCY

Through the Full Picture, KONGSBERG's operational and digital technology integrate seamlessly with our energy management, propulsion and handling systems to enable more efficient fuel use, resulting in tangible reductions to vessel and fleet OPEX, and ultimately, your financial bottom line.

PERFORMANCE

Powerplants and thrusters are subject to significant stress, making proactive maintenance vital. With KONGSBERG's integration of sensors and operational technology, however, servicing can be planned using predictive and condition-based monitoring, so vessels are only off-hire when they need to be.

SAFETY

Integrated energy management, handling and control systems with a single common interface are easier to understand and operate than traditional systems, and should crew need to react to a situation, sophisticated decision support tools provide the data and insight on how to approach it.

ENVIRONMENT

A collision when working close to structures and other vessels could have disastrous environmental consequences, but risk can be radically reduced when navigation and manoeuvring systems are deeply integrated to sophisticated power management and cutting-edge autonomous functions.





TECHNOLOGY FOR
SUSTAINABLE FISHERIES

IMAGE (C) Matt Kieffer

Fisheries

When the most advanced ship design and marine systems are harmonised with the tools and solutions that fishermen need to operate responsibly, they can contribute to global environmental sustainability while maximising performance at sea, and ultimately, earn a good living from working in such dangerous conditions.

By providing the Full Picture on shore, on board and underwater, KONGSBERG provides the control and insight that fishermen need to stay safe and improve their catching capabilities, as well as maintain stock levels for future generations.

OPERABILITY

Smart predictive tools for vessel motion and forecasting deliver real-time decision support, redefining the modern operability determination process and enabling significant savings on operational expenditure.

PRODUCTIVITY

Enhancing supply chain processes from port, to ship, to fish farm, integrated systems and solutions measurably improve productivity, generating more value per day for both trawling and aquaculture operations.

EFFICIENCY

Optimised operations; automatic catch functionality maximises performance, intelligent energy management lowers fuel costs and emissions, while extended life cycle management streamlines service requirements.

PERFORMANCE

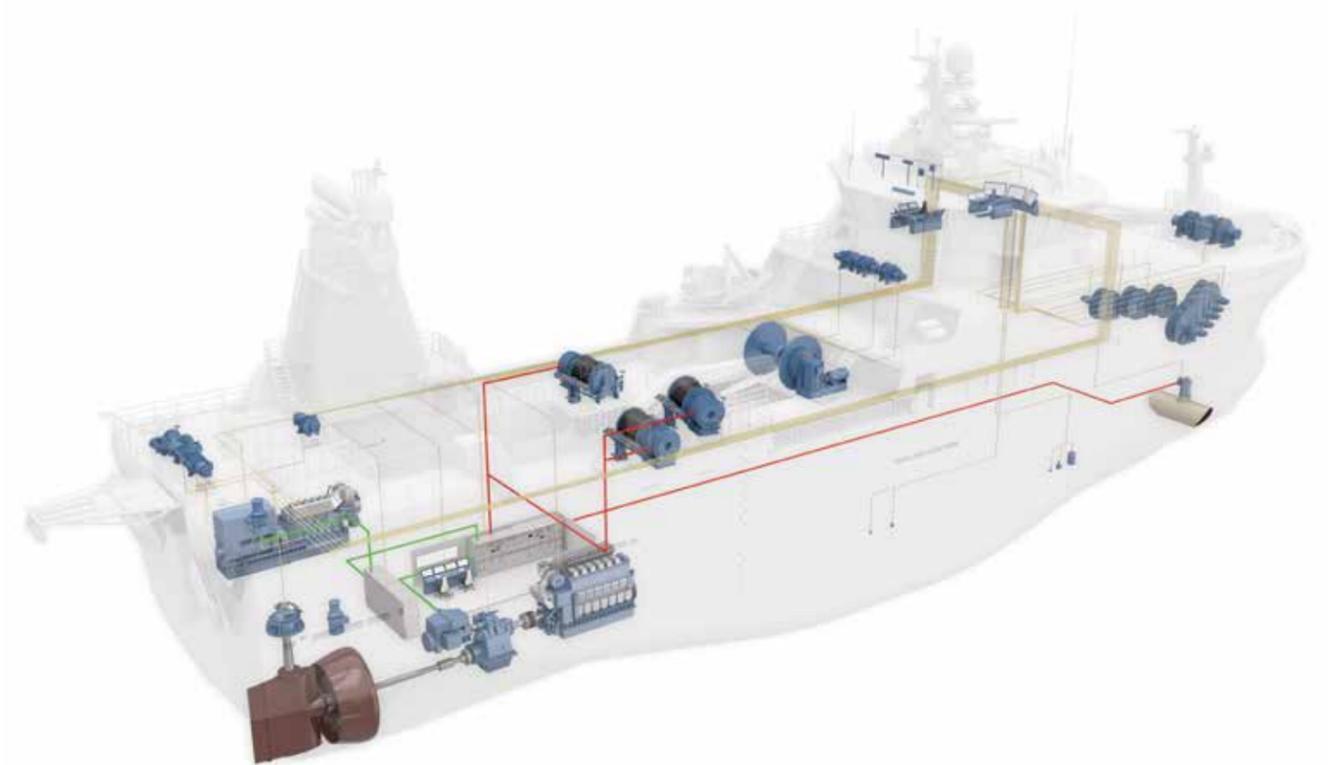
Innovative, decision-enhancing Vessel Performance Systems unlock the full value of technical data, from engine optimisation to speed profile and optimal trim, plus many more touch-points that drive lower operating costs.

SAFETY

Fishing is one of the most dangerous and demanding jobs in the world, but deploying and integrating a fault-tolerant control platform and handling solution will significantly reduce operational risk across the board.

ENVIRONMENT

Contributing to minimising the ecological impact of fishing operations, autonomous and automatic systems can steer the vessel and trawl along optimal paths, while constantly adjusting for changes in the environment.



Cargo carriers

Shaving just a few percentage points from your fleet's fuel consumption will slash your bunkering costs by millions of dollars every year and reduce the amount of greenhouse gas emissions that your vessels produce.

Through innovative vessel designs and the deep integration of energy, propulsion, handling and control systems, KONGSBERG delivers operational efficiency and support throughout a vessel's entire lifetime. We help to streamline marine operations and fleet management, supporting your financial sustainability and reducing the impact of shipping on our fragile environment.

PRODUCTIVITY

Proof-enabled vessel optimisation and online simulation deliver tangible OPEX savings, while smart maintenance tools with Condition Based Monitoring and predictive measures combine to maximise task management and ensure that vessel and crew can operate to their full potential.

PERFORMANCE

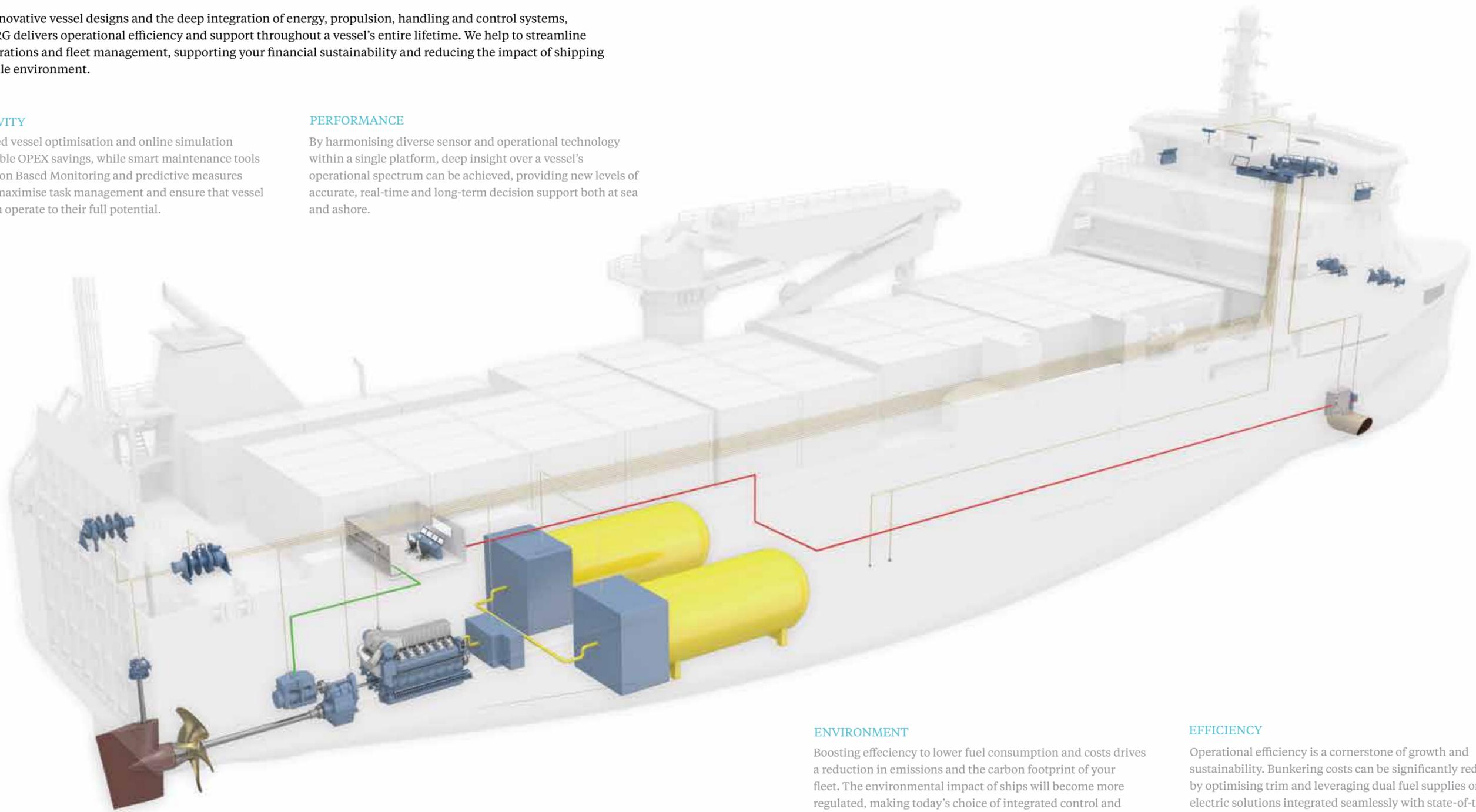
By harmonising diverse sensor and operational technology within a single platform, deep insight over a vessel's operational spectrum can be achieved, providing new levels of accurate, real-time and long-term decision support both at sea and ashore.

SAFETY

Harmonising data and control systems helps to reduce operational risk. It enables your vessels to avoid hazards, empowers your crew to react effectively should an incident occur, and gives your experts on shore a platform to improve safety through analysis of the data that your ships produce.

OPERABILITY

Deep integration of automation and control systems enables a connected platform for unified operations. Fewer third-party interfaces are needed and crew can perform their job with familiarity of the technology on board, supporting safety, improving performance and reducing incidents.



ENVIRONMENT

Boosting efficiency to lower fuel consumption and costs drives a reduction in emissions and the carbon footprint of your fleet. The environmental impact of ships will become more regulated, making today's choice of integrated control and energy systems vital for compliance in the future.

EFFICIENCY

Operational efficiency is a cornerstone of growth and sustainability. Bunkering costs can be significantly reduced by optimising trim and leveraging dual fuel supplies or hybrid electric solutions integrated seamlessly with state-of-the-art control and manoeuvring systems.



INTEGRATED ENERGY, HANDLING AND
CONTROL SYSTEMS COMBINE TO
**REDUCE ENVIRONMENTAL
IMPACT**

Tankers

Oil, gas and chemical tankers perform a vital function, but staying competitive while reducing your fleet's environmental footprint in a challenging global market is a huge undertaking.

With KONGSBERG at your side, from ship design and engineering through the entire operational lifecycle, you can drive new operational efficiencies at the vessel and fleet level, resulting in lower bunkering costs and reduced emissions. Ultimately, choosing the Full Picture optimises both CAPEX and OPEX while boosting safety at sea and contributing to your corporate social responsibility strategy.

OPERABILITY

Whether transporting chemical or petroleum products, a connected approach unlocks significant value for the vessel and fleet management, by empowering your crews to work safely and effectively through a single, user-friendly interface for operation of all Full Picture systems on board.

PRODUCTIVITY

With data storage, analysis and application intersecting seamlessly with operational technology, the Full Picture can enhance utilisation across your fleet, enabling you to maximise your return on investment in modern assets and deliver services according to your clients' expectations.

EFFICIENCY

KONGSBERG is focused on leveraging the power of integrated technologies to reduce your fuel consumption and bunkering costs. Enabling tangible savings, our inherently efficient tanker designs are complemented by state-of-the-art sensors, energy management, control and digital systems.

PERFORMANCE

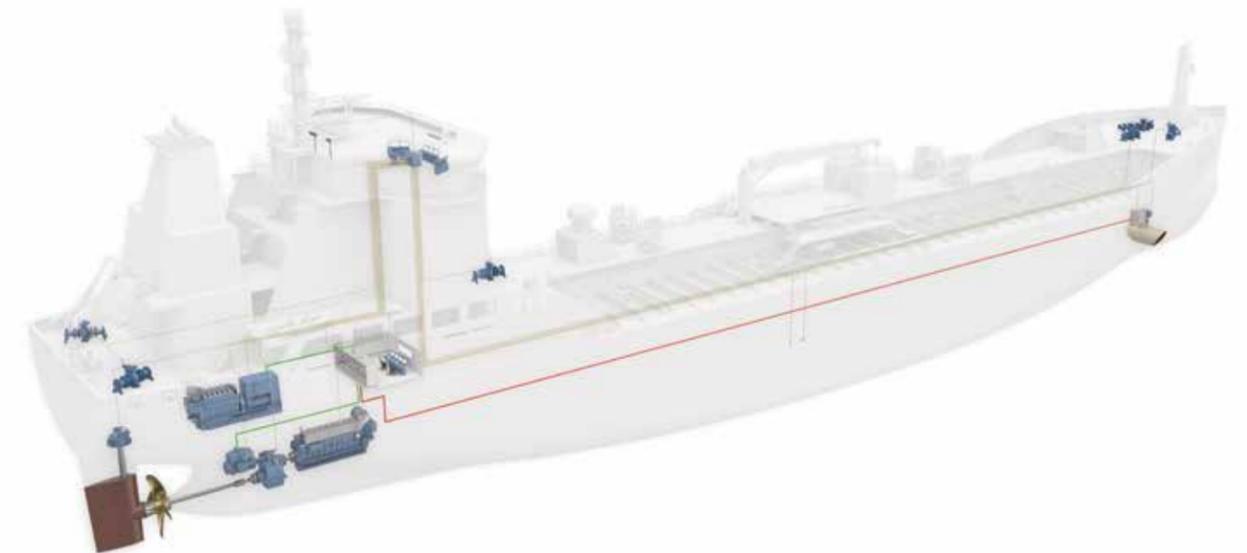
With accurate and real-time data available from connected systems on board, your vessels and fleet can be supported and managed more effectively from shore. At sea, your crews can leverage integrated technologies to streamline operations, improving operational safety and performance.

SAFETY

It's vital to give your crew the tools to avoid risk and act effectively should an incident occur. The KONGSBERG Integrated Safety Management system is a key enabler, and when inter-connected with all energy, handling and control systems on board it becomes a powerful platform for safe operations.

ENVIRONMENT

KONGSBERG's integrated systems are a catalyst for reducing your environmental impact. Facilitating safe navigation at sea and precise manoeuvring at the terminal the Full Picture also helps to avoid accidents that could result in catastrophic environmental damage.



Passenger vessels

Aside from passenger and guest satisfaction, safety and energy are the two key operational concerns on any vessel designed for transporting people.

Integrating the technology that delivers navigational and manoeuvring safety with the energy management and propulsion systems, helps to streamline and simplify the vessel engineering phase, while introducing significant efficiencies throughout the entire lifecycle. Further, deep integration on board is a pre-requisite for more automated operations which, when developed with KONGSBERG, will result in even better safety standards.

PRODUCTIVITY

At sea or in port, the fusion of distinct technology platforms introduces a new holistic approach to cruise ship and ferry operations. With trustworthy, integrated technology at their disposal and the support of experts on land enjoying live data streams, crew are empowered to work efficiently at sea.

PERFORMANCE

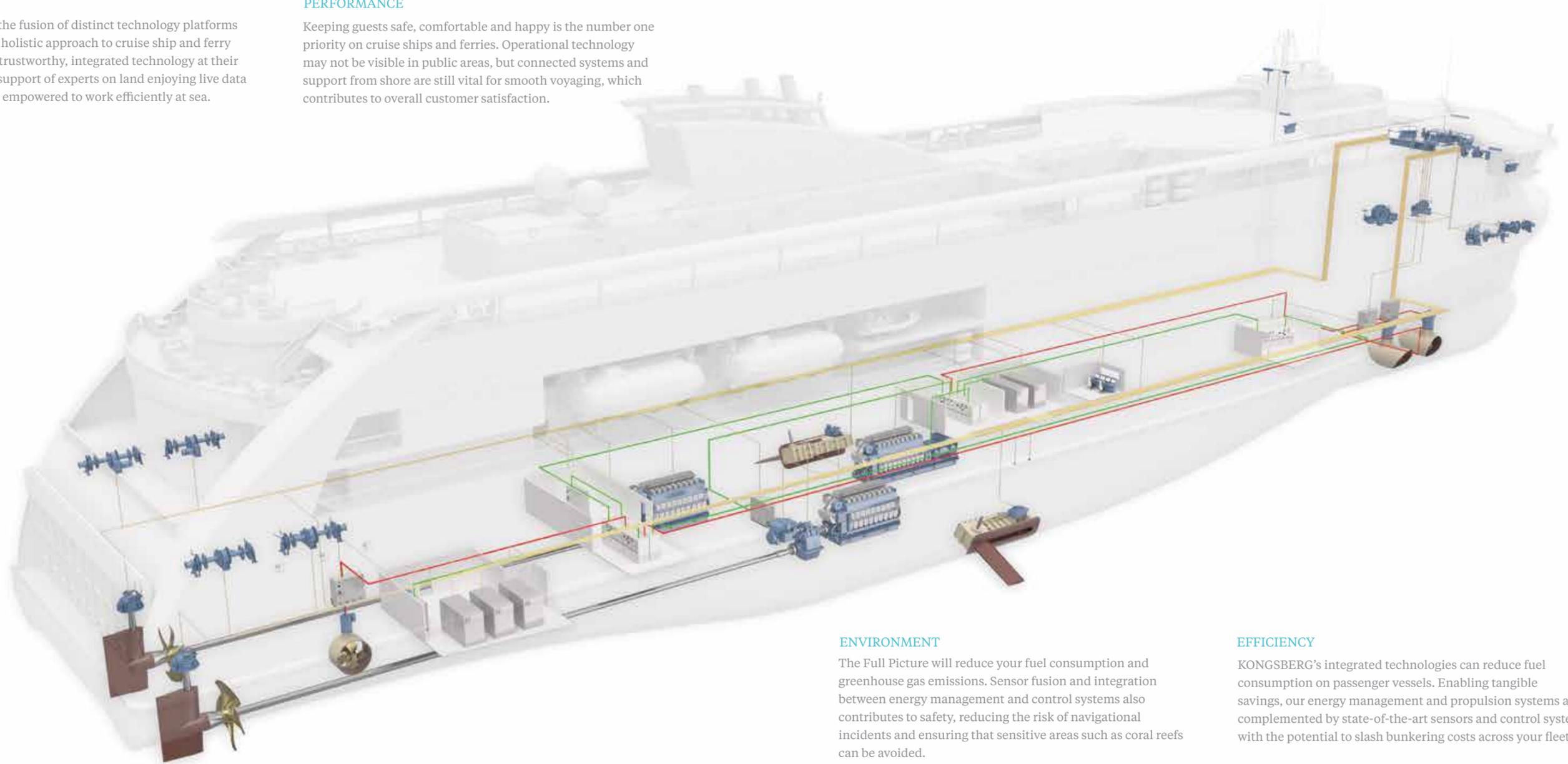
Keeping guests safe, comfortable and happy is the number one priority on cruise ships and ferries. Operational technology may not be visible in public areas, but connected systems and support from shore are still vital for smooth voyaging, which contributes to overall customer satisfaction.

SAFETY

Putting safety first is essential on any ship, but when you have thousands of guests on board the risk grows exponentially. The KONGSBERG Integrated Safety Management system keeps your passengers and crew safe, offering a connected platform for safety planning and support should an incident occur.

OPERABILITY

Cutting-edge solutions, like our new Auto-docking technology, combine autonomous ship functionality, sensing and communication solutions influenced by KONGSBERG Integrated Bridge Systems, Dynamic Positioning and Propulsion Control to optimise safety and efficiency.



ENVIRONMENT

The Full Picture will reduce your fuel consumption and greenhouse gas emissions. Sensor fusion and integration between energy management and control systems also contributes to safety, reducing the risk of navigational incidents and ensuring that sensitive areas such as coral reefs can be avoided.

EFFICIENCY

KONGSBERG's integrated technologies can reduce fuel consumption on passenger vessels. Enabling tangible savings, our energy management and propulsion systems are complemented by state-of-the-art sensors and control systems with the potential to slash bunkering costs across your fleet.



Specialised Vessels

Coast guard patrol craft, walk-to-work vessels, marine research ships, survey vessels and wind farm support workboats demand innovation and integration to overcome diverse, complex operational challenges.

Starting from innovation-led ship design, KONGSBERG integrates power and handling systems, automation and control technology plus application specific solutions such as sonar, echo sounders, automatic gangways and energy-saving winches to enable the reliability and performance that specialised vessels need to operate sustainably with integral safety, reliability and efficiency.

OPERABILITY

Specialised vessel crew need intuitive human machine interfaces across diverse integrated systems to perform during complex or hazardous operations. Access to extensive data through the KONGSBERG Information Management System also ensures that experts ashore can support operations at sea.

PRODUCTIVITY

Powerful advisory and situational awareness systems extend the operational weather window by providing the data and insight required to make the right decisions quickly, while a mode-dependent operator environment improves understanding of any situation and limiting factors.

EFFICIENCY

Tight integration between Dynamic Positioning, deck handling equipment, engines, thrusters and hybrid electrical systems enables innovative vessel design with, e.g., automated walk-to-work systems, energy re-generating winches and integrated above and below surface solutions for research vessels.

PERFORMANCE

Unlocking the potential of your technical data is key to improving operational performance. Powering our comprehensive advisory functionality, integrated data is analysed with historical data on a single Information Management System, making it much easier to maximise performance and reduce costs.

SAFETY

The Full Picture includes innovative safety solutions. For instance, our wind farm installation vessel Dynamic Positioning systems monitors diverse performance indicators and can initiate contingency strategies, such as automated release of the pile gripper and activation of a pre-planned escape route.

ENVIRONMENT

With a Full Picture delivery from KONGSBERG it's possible to significantly lower the environmental footprint of construction and other specialist vessels. Advanced energy control provides further operational sustainability by reducing fuel consumption and greenhouse gas emissions.



Intelligent Asset Management

As technology continues to change the way we live and work, embracing data is essential to remain competitive. Choosing a partner with a world-class reputation for technical innovation and the understanding to unlock new operational efficiencies, create new business models and reduce the environmental impact of maritime and energy industry operations will ensure that you are ready for the transformation ahead.

02 SMART SHIPPING

With sophisticated new hybrid power solutions and easy access to diverse data on board and ashore, the relentless progress of maritime technology and digitalisation has become the catalyst for global change. Smart ships are intelligent and agile platforms for sustainability. They represent a paradigm shift for the maritime industry and international trade. And they are already here, with KONGSBERG technology contributing to streamlining the seaborne logistics chain and reducing greenhouse gas emissions, while at the same time cutting operating costs for ship owners.

KONGSBERG INFORMATION MANAGEMENT SYSTEM (K-IMS) – A PORTFOLIO OF TECHNICAL APPLICATIONS INTEGRATED WITH OUR CUTTING-EDGE OPERATIONAL TECHNOLOGY TO IMPROVE EFFICIENCY ACROSS ALL VESSEL OPERATIONS.

SHIP INTELLIGENCE

01 SMART DRILLING

Leveraging the power of connected and integrated operational technology with the Internet of Things (IoT) and cloud-based digital ecosystems opens the door to the almost limitless opportunities data brings to offshore operations. KONGSBERG offers the tool-set and expertise to help you deploy a unified platform for intelligent asset management with state-of-the-art real-time monitoring and advisory solutions that provide significant benefits for operational safety, while reducing non-productive time (NPT) in harsh deepwater environments.

KOGNIFAI – AN INTELLIGENT DIGITAL PLATFORM WITH THE POTENTIAL TO REVOLUTIONISE YOUR BUSINESS BY BRINGING CUTTING-EDGE KONGSBERG AND 3RD PARTY APPLICATIONS AND DATA TOGETHER IN A SINGLE OPEN ECOSYSTEM.

03 SMART SUBSEA

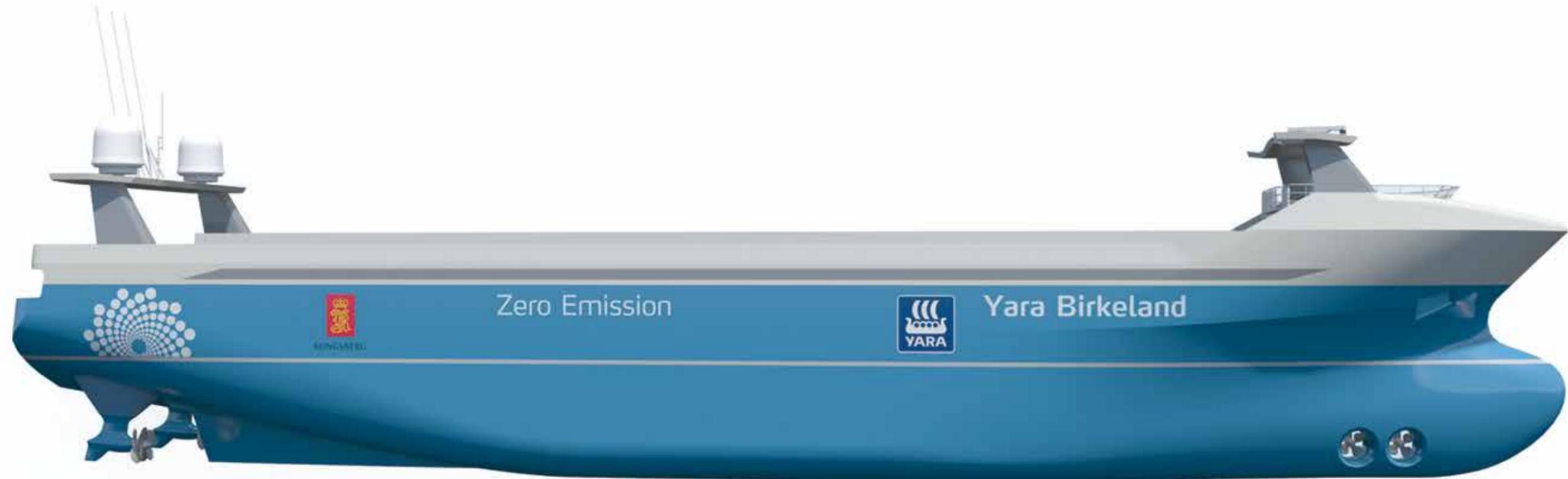
We know more about the surface of Mars than we know about the oceans on our own blue planet. Improving our ability to manage the ocean space as a more sustainable resource and reduce the environmental impact we have on it demands global co-operation. Digitalisation is the answer, and using KONGSBERG's cloud-based technology to streamline data handling, sharing and collaboration will become the medium to a greater understanding of what lies beneath. And with this, together we can leverage the oceans as a truly sustainable resource.

MAPPING CLOUD – A CENTRALISED PLATFORM FOR SHARING AND PROCESSING REAL-TIME DATA PRODUCED BY KONGSBERG EM™ SYSTEMS USED IN SEABED MAPPING, CONSTRUCTION AND INTERVENTION OPERATIONS.

Intelligent Remote & Autonomous Operations

Once the sole domain of science fiction, autonomous vehicles are now a reality. Modern unmanned aerial vehicles have been in operation since the early 1980s and today are becoming mainstream. The common denominator is improved safety and increased fuel efficiency. With KONGSBERG, these transformations are also possible for ships, with possibilities for reaching a larger part of the maritime logistics infrastructure.

SHIP INTELLIGENCE



DELIVERING AUTONOMY

Substantial change throughout the maritime industry is happening right now as the drive for environmentally-friendly, low emissions and sustainable transport solutions gains pace. At the same time, technology is enabling significant safety, insight and performance improvements. Green autonomous ships are coming and will change the game of seaborne logistics sooner than you may think.

Throughout KONGSBERG's history, we have built the blocks that enable the next phase in shipping. We are now on the precipice of Maritime 4.0 and once again, we are helping to shape the future. Leveraging developments in A.I., machine learning and remote, integrated technologies, KONGSBERG is behind a new generation of highly advanced Maritime Autonomous Surface Ships (MASS) with the ability to radically transform the environmental footprint of global trade and usher in a new era of maritime and industrial sustainability.

Innovative new ships, like the *Yara Birkeland* all-electric, autonomous and zero-emissions container vessel are spearheading new business cases, validating the use of sustainable battery and hybrid powertrains, and automating the entire logistics chain. Ultimately, deploying the best, safest and most effective solutions within a wider holistic strategy will deliver the operational and financial efficiencies needed for companies to stay competitive, while remaining sensitive to the ecological balance of the Earth.

ACHIEVING AUTONOMY

- Collision avoidance - Enabled by deep sensor fusion, KONGSBERG autonomy controllers have a complete real-time picture of the ship's surroundings for safe navigation and manoeuvring.
- Condition monitoring - Sensors measure hull stress as well as wear and tear on ball bearings, and enable predictive maintenance based on need rather than a set schedule.
- Connectivity - Mission planning happens in the Cloud, but the processing will be on the vessel with triple redundant communication for failsafe remote and autonomous running.
- Security - KONGSBERG cloud-based communication solutions guarantee complete cyber security.
- Digital Twin - Voyages are optimised in a cloud-based Digital Twin where data, including weather, currents, tides and temperature is integrated with detailed physical ship and operational area models.
- Electric power - Sophisticated energy management solutions ensure optimal use of power in addition to safe manoeuvring, with carbon neutrality possible when renewable energy charges batteries.