



Exploring green horizons

Promoting longevity and optimizing energy efficiency with marine access solutions

01

Executive summary

Cruising keeps growing in popularity.

Cruising is a uniquely inclusive and accessible way to see the world, offering a comfortable travel experience for guests across generations and mobility needs. The sector continues to grow, with new vessels generally becoming larger – in gross tonnage (GT) terms – more efficient and more complex hospitality environments.

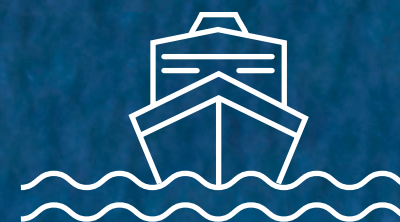
As operators invest in future fuels and new ship designs, there is also an immediate efficiency opportunity inside the vessel: the hotel load. HVAC (Heating, Ventilation and Air Conditioning), lighting and onboard services can account for a significant share of energy use, even when a ship is alongside. Intelligent access solutions - automatic doors, smart locks and connected sensors - help reduce unnecessary air exchange, support stable interior climates and improve the use of energy throughout the ship.

For cruise operators, sustainability can therefore be viewed not only as a matter of regulatory compliance but also as an opportunity to improve operational efficiency. Measures such as optimizing access points may help reduce operating costs, support more predictable maintenance planning, and contribute to a consistent guest experience. While broader decarbonization efforts, including propulsion transitions, will require longer-term investments, improving access systems represents a practical measure that can be implemented in the near term.



Modern cruise ship

Average 1990s
cruise ship



ca. 70,000 GT



often >200,000 GT

The hotel load opportunity

To keep passengers comfortable across changing climates, cruise ships rely on a complex hotel load: HVAC, lighting and other onboard services. Industry reporting indicates that this hotel load can account for up to 40% of total energy use onboard. Unlike propulsion systems, many access-related interfaces are accessible and can be optimized through targeted upgrades.

Maintaining a comfortable interior climate is an operational challenge in marine conditions. Each door cycle creates an exchange between conditioned indoor air and humid outside air or between warm inside and cold outside air, depending on the location. Reducing unnecessary openings and closing doors at the right moment helps preserve the onboard climate and can lower the work required from the HVAC system.

Intelligent access solutions - automatic doors, smart locks and connected sensors - offer a practical way to reduce avoidable energy loss. Selected connected dormakaba automatic-door systems can exchange status and control data with higher-level management systems through project-specific interfaces. Where a Ship Management System is configured to use this data, it can support energy-saving control strategies without compromising passenger flow or comfort.

87% 

The percentage of global travelers who state they want to travel sustainably.
(How Sustainable Practices Influence Hotel Choices, OpenKey, 2024.)

Total cruise ship energy use



(Preparing for zero-emission buildings at sea, SINTEF, 2023)



02

Climate control starts at the door

Keeping cool air in and the breeze out

During busy sea days in the Mediterranean and year-round in the Caribbean, passengers seamlessly transition between sun-drenched open decks and the comfort of air-conditioned indoor spaces. For guests, this flow should remain seamless. From an energy perspective, each door cycle creates an exchange between conditioned indoor air and humid marine air. Well-tuned automatic doors and sensors help preserve the indoor climate and reduce the workload on the HVAC system.

Gaining access to energy savings

Published dormakaba Door Efficiency Calculator (DEC) modeling compared the same automatic swing-door operator with and without MotionIQ under a defined Berlin retail scenario. Estimated annual thermal energy loss was 13,278 kWh without MotionIQ and 6,361 kWh with MotionIQ, corresponding to a modeled potential saving of 52%.* The DEC calculation methodology was developed and scientifically validated with ILK Dresden. On board, actual savings will depend on door location, passenger traffic, wind exposure and HVAC configuration; a vessel-specific assessment is therefore required.

"The challenge on a ship is the environment: the sea, the salt water, the humidity and waves rocking the ship pose unique requirements for door hardware." Jari Pulkkinen, Key Account Manager - Marine Vertical, dormakaba Scanbalt

* Source: dormakaba, Reference Report on possible energy savings with MotionIQ, April 2024.
The figures are estimates for the specified land-based scenario and are not measured marine performance.





The smarter way to keep energy on board

Intelligent sensors: Reading the crowd

In busy public areas, passengers often pass by automated doors without intending to enter. Intelligent sensors use vector-based technology to distinguish between people simply passing and those approaching to go through the door.

By analyzing direction and speed, the sensors ensure that doors open only when needed and close promptly afterward, reducing unnecessary operating cycles and hold-open time. Across multiple automated doors, this helps minimize thermal exchange, improve energy efficiency, and maintain smooth passenger flow.

Ship Management System (SMS) integration: Smart rooms

Energy use can rise when doors leading outside remain open while HVAC continues to condition the interior area. Connected door sensors allow the Ship Management System to adjust the climate automatically when an exterior door is open. This active cooperation optimizes room climate and reduces unnecessary energy use.

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Motion IQ

Vector-based sensor technology that adapts opening cycles to traffic flow.



03

Environmental product declarations

For better informed choices

Cruise lines increasingly need transparent product data for reporting Scope 3 emissions and the embodied carbon of vessel interiors. EPDs provide independently verified lifecycle information for products and materials. Specifying access hardware with published EPDs helps architects and shipbuilders document the environmental impact of interior components more accurately.

Built to last, designed for circularity

Durability and circular design go hand in hand. Products designed for repair, disassembly and recycling can reduce waste over the service life. Verified recycled content adds further transparency and supports more informed specification decisions.



Sustainability at dormakaba

Environmental Product Declarations (EPDs): dormakaba provides Environmental Product Declarations (EPDs) in accordance with ISO 14025, the standard for environmental product declarations, offering verified data on a product's lifecycle environmental impact.

GreenCircle certified: dormakaba provides third-party verification of recycled content in door hardware.

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Operational efficiency and longevity

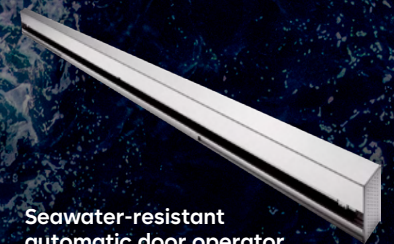
Durability supports sustainability

Marine environments place exceptional demands on access hardware. Exposure to salt spray, humidity, and continuous vessel movement can accelerate wear and increase maintenance needs. Long-term reliability and performance therefore depend on solutions specifically designed for these challenging conditions.

Seawater-resistant (SWR) solutions with 316L stainless steel and Ingress Protection (IP)-rated electronic components help extend service life in exposed areas. Longer lifecycles reduce premature replacements, service logistics and waste. Durability is the first step; predictive maintenance helps keep that durability measurable in daily operation.



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Seawater-resistant automatic door operator

IP-rated electronic components with a specialized coating for exterior decks, pool areas, and balconies exposed to constant salt spray. Prevents premature corrosion and extends the asset's lifespan.

Connector One

Connects doors directly to the Ship Management System. Provides live status, cycle counts and error codes for automated dormakaba doors on the vessel, enabling data-driven maintenance decisions rather than "run-to-failure" operation.



"Predictive maintenance improves the guest and crew experience while saving costs and supporting durability. It helps avoid breakdowns and ensures reliable operations."

Sven Hackbarth, Vertical Business Owner Marine, dormakaba Deutschland

Maintenance planning and lower-impact logistics

Even high-quality doors include wear parts. The opportunity is to identify and service them before failure affects operation. Unexpected downtime can require fast service coordination and urgent parts logistics across regions. Predictive maintenance helps engineering teams detect wear early, plan interventions and consolidate spare parts, making lower-impact shipping options more feasible where schedules allow.

A connected door operator can stream live status, cycle counts and error codes to the ship's engineering team. Instead of reacting only when a door jams, the system can alert the crew when motor resistance increases and adjustment may be needed. This supports reliable operation, avoids disruption for guests and crew and can reduce emissions associated with urgent logistics.

60% Predictive maintenance can reduce logistics-related emissions by over 60%.

(Sources: Wärtsilä (2024), Ship maintenance; Climate Action Accelerator (2025), Shift from Air to Sea Freight; Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping / Mærsk analysis (2026). Actual savings depend on route, weight, carrier, lead time and transport mix.)

05

Efficiency through smart technologies

Beyond the keycard

A modern guest journey can begin before passengers reach the terminal: with digital check-in, mobile credentials or biometric verification where appropriate. While physical keycards remain a proven access solution, mobile access provides a resource-efficient alternative that can reduce the production, distribution, programming, and disposal of polyvinyl chloride (PVC) cards over time.

Switching part of the credential mix to mobile access can reduce material use and simplify operations.

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Quantum Pixel+

Minimalist lock supporting radio-frequency identification (RFID) and Bluetooth Low Energy (BLE) for modern cabin design.



Ambiance

Access management software integrating mobile keys.





Biometric access: Just show yourself

Smart access can reduce reliance on physical credentials at selected touchpoints. Where permitted and consent-based, biometric authentication such as facial recognition verifies identity without cards, phones, or tokens. After a single enrollment - e.g., before boarding - passengers can move more seamlessly through designated areas.



Data-driven energy optimization

Beyond the key, smart access control can function as a sensor network. When integrated with the Ship Management System, locks and room sensors can detect occupancy and help adjust lighting, curtains and HVAC settings automatically. This can save energy without reducing guest comfort.

06

Case Study AIDAcosma – Lower-emission cruising in practice

Durability and efficiency in practice

The AIDAcosma, one of the world's first cruise ships powered by LNG (liquefied natural gas), reflects the industry's investment in lower-emission cruising. Interior systems can contribute to the same efficiency ambition by combining reliability, durability and connected operation.

AIDAcosma is outfitted with ST Flex automatic sliding doors and specialized seawater-resistant operators for exposed exterior decks. Their IP-rated components and corrosion-resistant materials are designed for constant salt spray and high winds. By extending service life and reducing premature replacements, durable access hardware helps align onboard operations with long-term efficiency goals.

"An exterior door on a cruise ship faces some of the harshest conditions. Using seawater-resistant door operators ensures durable door operation for years." Jari Pulkkinen, Marine Expert, dormakaba Scanbalt



The durability dividend

Standard operator: may require earlier replacement in exposed marine conditions.

Seawater-resistant operator: IP-rated and coated for long service life in salt-spray environments.

Result: fewer premature replacements and lower embodied-carbon impact over the ship's life.

07 Outlook

Collaboration and smart innovation

Connected access solutions as part of future-ready ship operations

Real-time data from connected doors, locks and complementary sensors can help crews understand passenger flows - for example after a theater show - and adjust HVAC distribution across populated zones while reducing energy use in less active areas.

To enable this level of smart optimization, access solutions need open Application Programming Interfaces (APIs) that integrate seamlessly with intelligent Ship Management Systems.

Efficiency expectations will continue to evolve. Operators may increasingly look for retrofit-ready, connected access hardware that supports operational efficiency, maintenance planning and future digital upgrades.

New frontiers: Floating platforms

Maritime hospitality is also expanding into stationary floating platforms and offshore hotels. Because these structures are permanently moored, their environmental footprint and operating costs are strongly influenced by hotel-load efficiency.

"The value of door hardware no longer lies only in opening and closing; it also lies in the data it provides - data that can help optimize passenger flow, maintenance and sustainability."

Sven Hackbarth, Vertical Business Owner Marine, dormakaba Deutschland

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Open standards (API integration)
dormakaba access systems use open APIs, allowing communication with major Ship Management Systems (SMS) and helping hardware installed today stay compatible with future digital upgrades.



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Conclusion

The business and environmental case

The story of cruise ship innovation often centers on the future: alternative fuels, new energy systems and innovative hull designs. In marine access solutions, durable and well-designed products can help reduce energy use today, minimize maintenance requirements, extend service life and support a seamless guest experience.

- The business case for smart access rests on three clear pillars:
- **Support efficiency targets:** Better energy performance can strengthen resilience and support future reporting requirements.
 - **Lower costs:** Reducing HVAC demand, service visits and premature replacements can improve margins.
 - **Enhance experience:** Frictionless, mobile-first and connected access can make journeys smoother for passengers and crew.

- Optimizing your access solutions is therefore both an operational and environmental opportunity:
- **Potential HVAC** savings through smarter door control.
 - **Resource savings** through reduced card use and mobile credential options.
 - **Operational savings** through digital gates, connected maintenance and smoother passenger flow.

As dormakaba, we help partners build ships that are smarter and more efficient.

Get in touch

We are happy to help assess where secure, seamless and connected access solutions may support energy efficiency, maintenance planning and passenger flow - for newbuilds and retrofits.

go.dormakaba.com/en/marine





Our Sustainability Commitment

We are committed to fostering sustainable development along our entire value chain in line with our economic, environmental and social responsibilities toward current and future generations.

At dormakaba, we are dedicated to finding sustainable solutions that reduce the environmental impact of both our operations and our products. To ensure transparency regarding our products' environmental impacts, we offer credentials such as Environmental Product Declarations (EPDs), Health Product Declarations (HPDs), and Recycled Content Certificates. These sustainability-related credentials provide insights into energy efficiency, material composition, recyclability, and compliance, empowering our customers to make informed choices and support their own sustainability objectives.

Download our sustainability-related product declarations and certifications here: <https://www.dormakabagroup.com/en/sustainability/product-declarations>



Our offering

Access Automation Solutions

Entrance Automation
Entrance Security



Access Control Solutions

Electronic Access & Data
Escape and Rescue Systems
Lodging Systems



Access Hardware Solutions

Door Closers
Architectural Hardware
Mechanical Key Systems



Services

Technical Support
Installation and commissioning
Maintenance and Repair



Key & Wall Solutions

Key Systems
Movable / Sliding Walls



Safe Locks

Electronic Safe Locks
Mechanical Safe Locks
Boltworks and Accessories



Glass systems

Manual door systems
Glass fittings
Horizontal Sliding Walls



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