
ABB

INTRODUCING ABB DYNAFIN™

Movement perfected by evolution

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Master Mariner

IRSO 2024 VANCOUVER

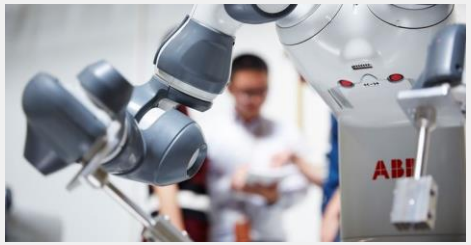
ABB across global markets

ABB is a technology leader in **electrification** and **automation**, enabling a more sustainable and resource-efficient future.

The company's solutions connect engineering know-how and software to optimize how things are **manufactured**, **moved**, **powered** and **operated**.


ABB Purpose
We enable a low-carbon society
We reach carbon neutrality in our operations by 2030 and partner with our customers and suppliers to reduce their emissions.
Integrity
We promote social progress
We take care of our people and promote social progress with our partners, suppliers and in communities.
Transparency
We preserve resources
We embed circularity by reducing waste, improving recycling and fostering reusability.

Fully decentralized business model with 20 divisions

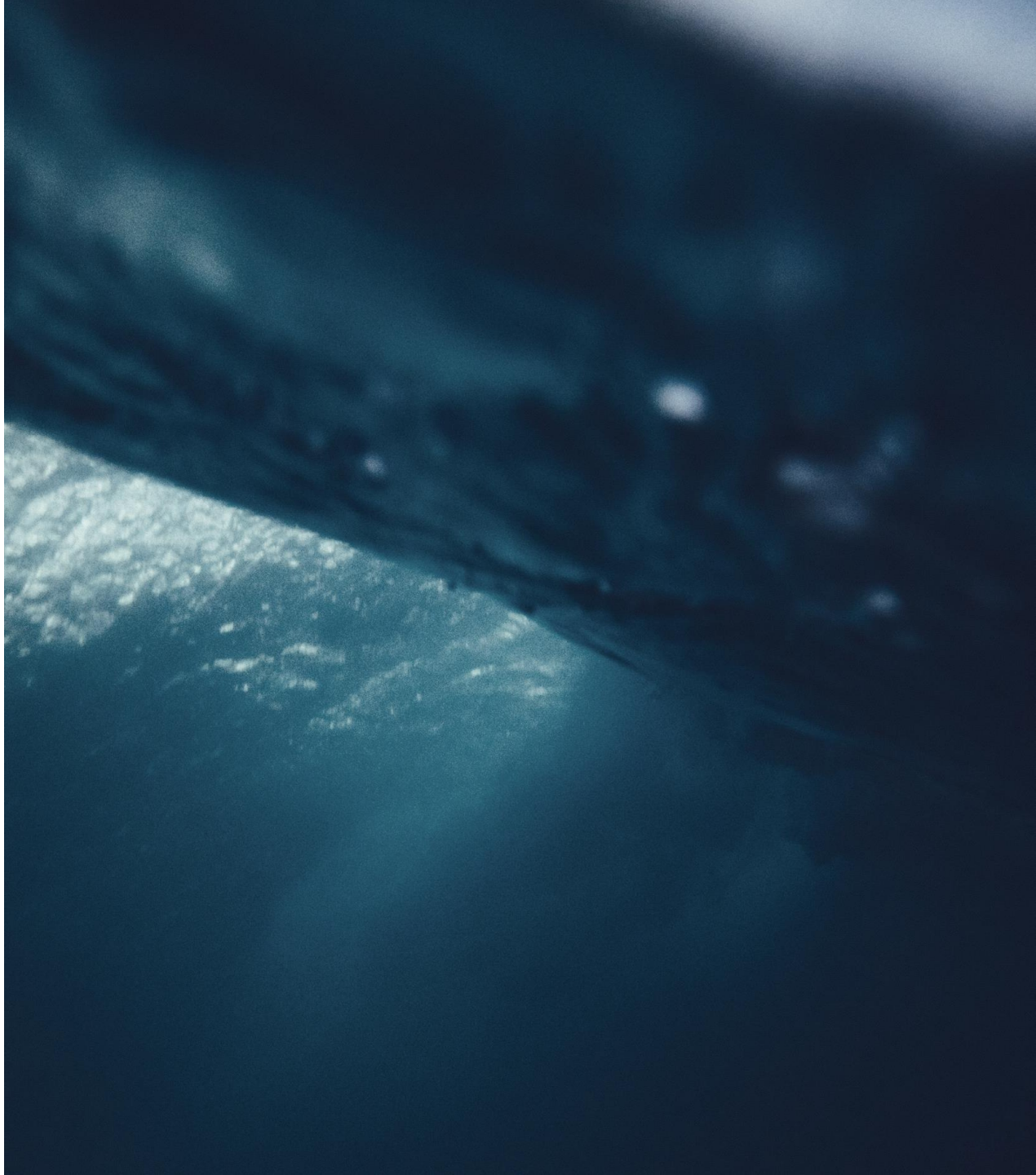
BUSINESS AREA	Electrification	Motion	Process Automation	Robotics & Discrete Automation
				
DIVISION	Distribution Solutions	IEC LV Motors	Energy Industries	Robotics
	Smart Power	Large Motors & Generators	Process Industries	Machine Automation
	Smart Buildings	NEMA Motors	Marine & Ports	
	Installation Products	Drive Products	Measurement & Analytics	
	Power Conversion[1]	System Drives		
	Service	Motion Service		
		Traction		
	E-mobility[2]			

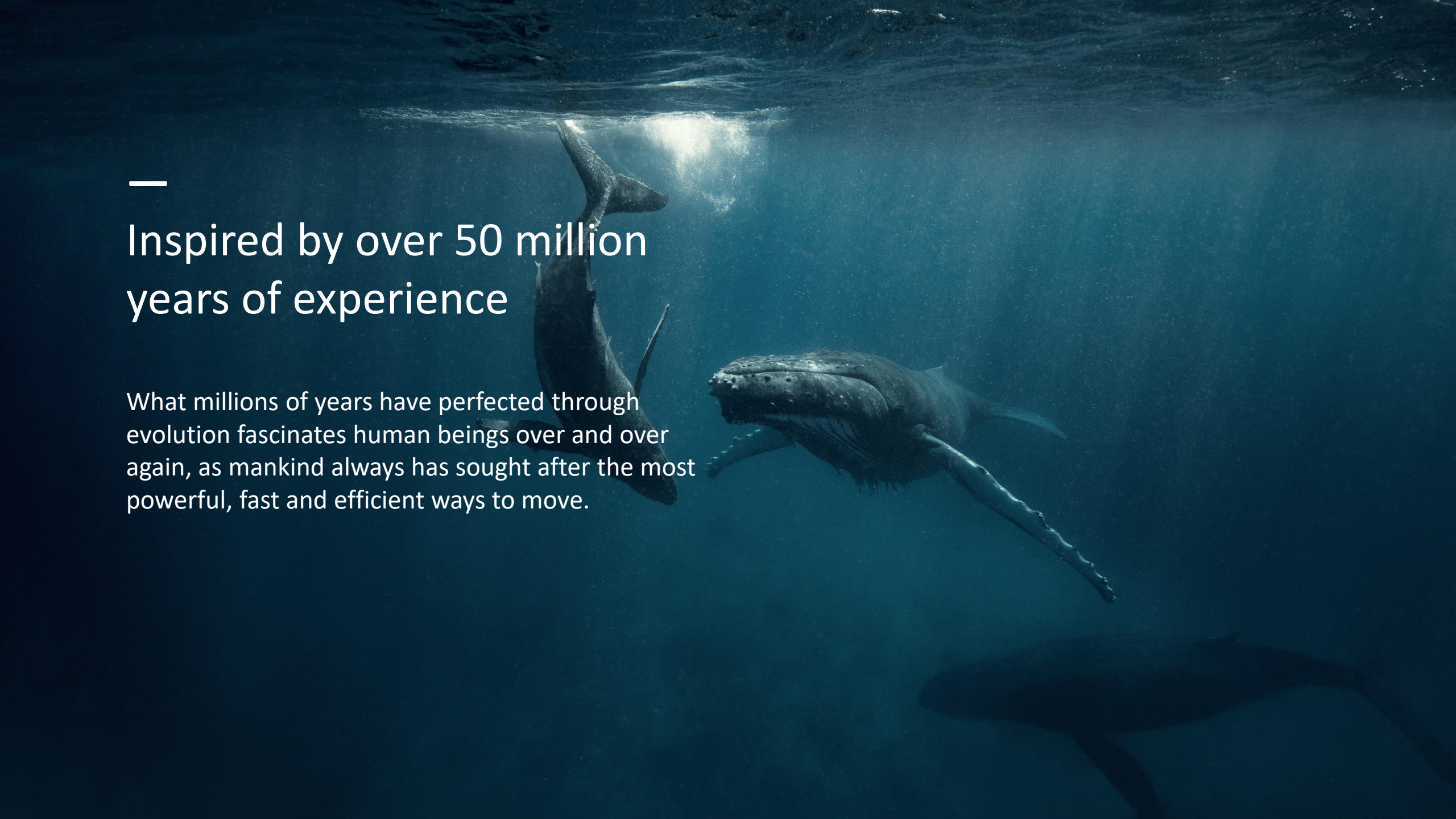
1. Divestment announced. Expected to be completed in H2 2023. 2. Reported as part of “Corporate and Other” as of Q1 2023.

The new wave of efficiency

ABB Dynafin™ is a brand-new propulsion concept engineered to offer a major leap in efficiency for the marine industry.

Standing for radical innovation and progress, it's all about operational convenience and enabling zero-emission goals made possible by a technology that represents the future of propulsion units.





Inspired by over 50 million years of experience

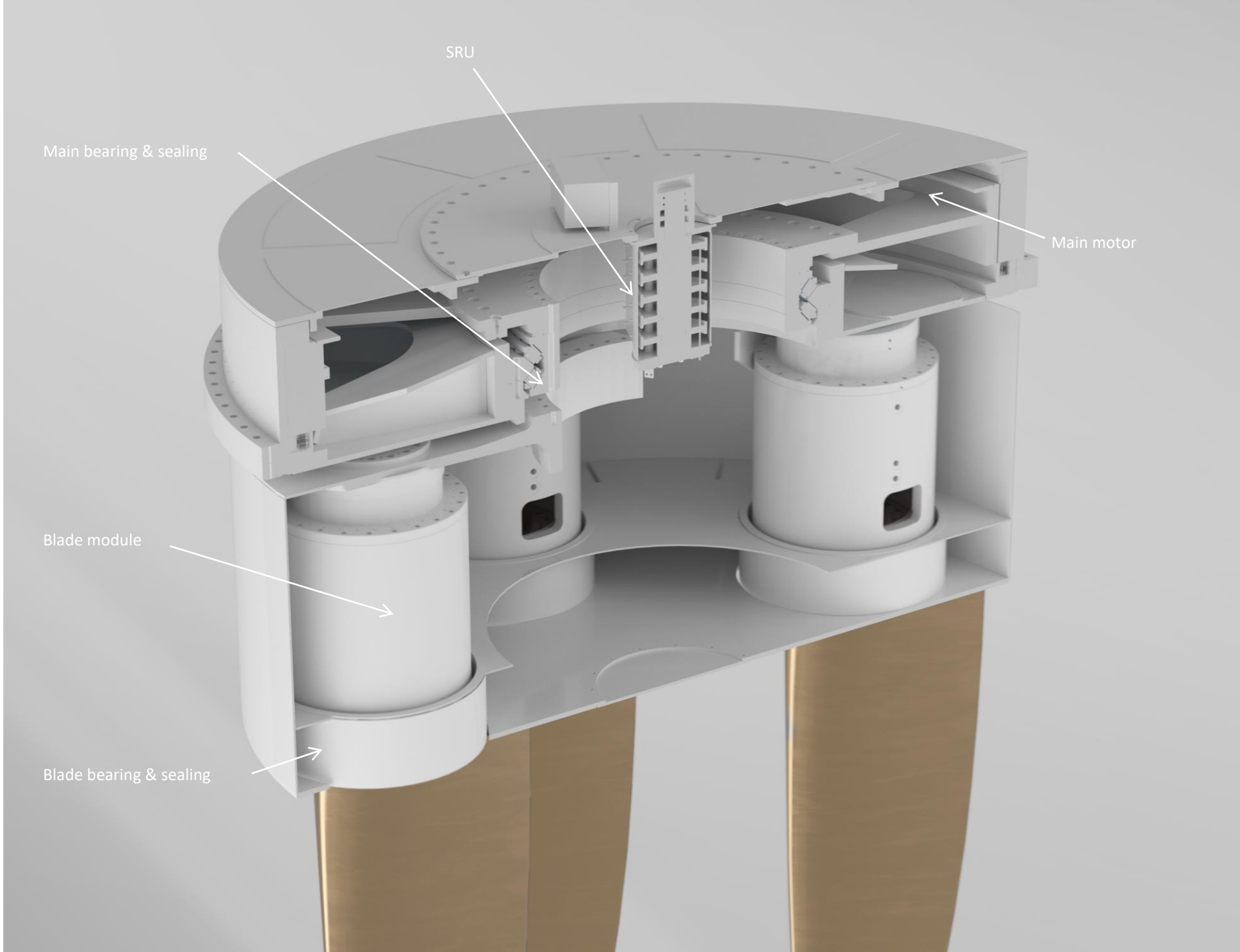
What millions of years have perfected through evolution fascinates human beings over and over again, as mankind always has sought after the most powerful, fast and efficient ways to move.

Main features

- Power range 1-4 MW per unit
- Solution is suitable for both fully electric and diesel-mechanical powertrains
- Minimum number of components: propulsion and steering in a one simple package

ONE ABB DYNAFIN™ UNIT CONSISTS OF

- Main motor
- Blade modules with independent control (electric motor + blade)
- Slip ring unit for power, signal and fluid transmission
- Bearings and sealings



Excellent maneuverability

Immediate control

Precise dynamic positioning

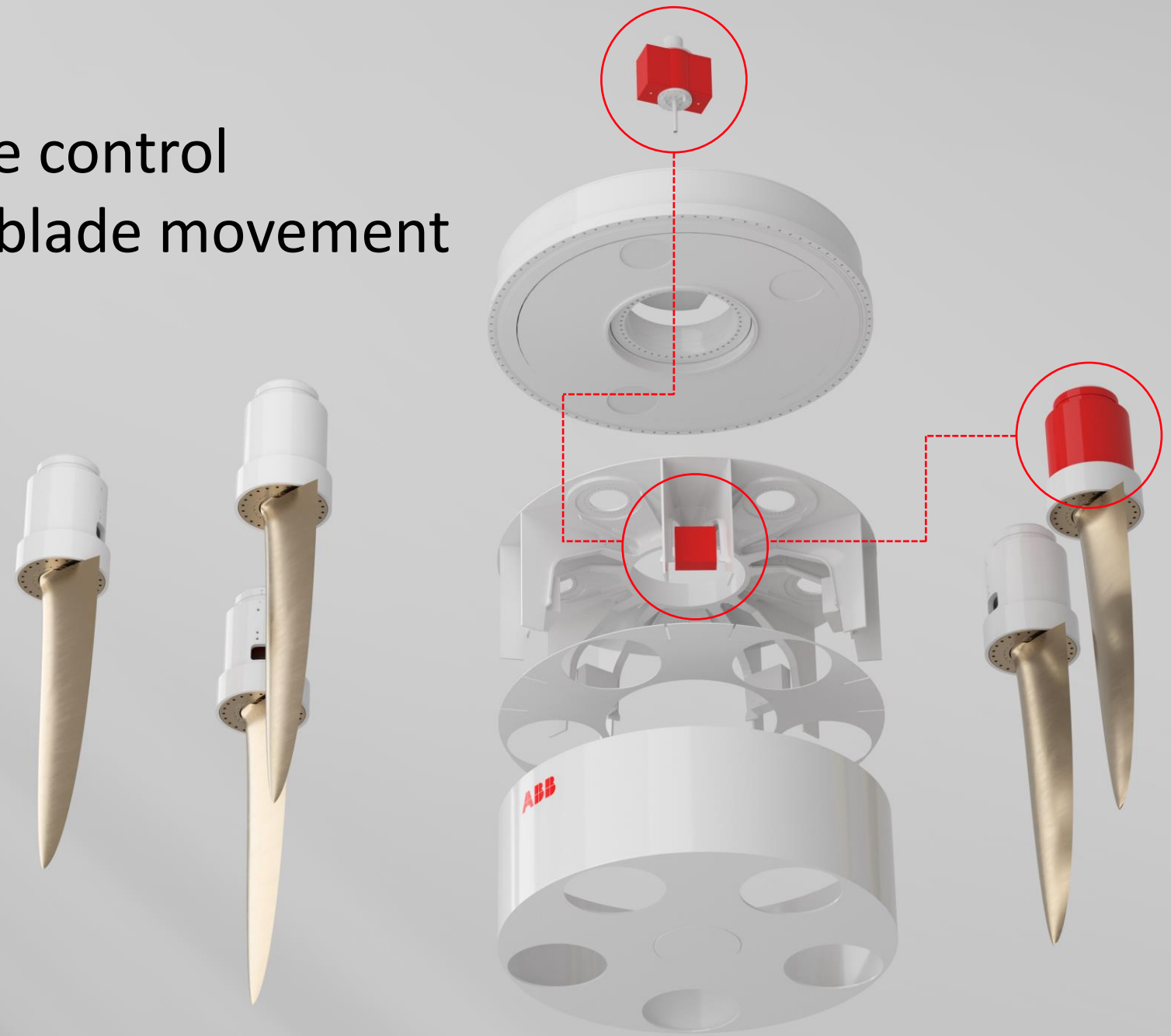
Suitable for demanding operations

Technology

Three key factors in obtaining high efficiency and superior maneuverability

1) The propulsor is extremely lightly loaded as the blades can cover a larger cross-sectional area of the vessel. This increases the ideal efficiency of the propulsor and consequently the actual open water efficiency.
2) The high aspect ratio of each blade, causing the lift/drag ratio of each blade to be much higher than with conventional screw propellers
3) Each blade is individually controlled, imitating high efficiency whale tail movement and enabling optimal operation both in transit and DP applications

Individual blade control and optimized blade movement



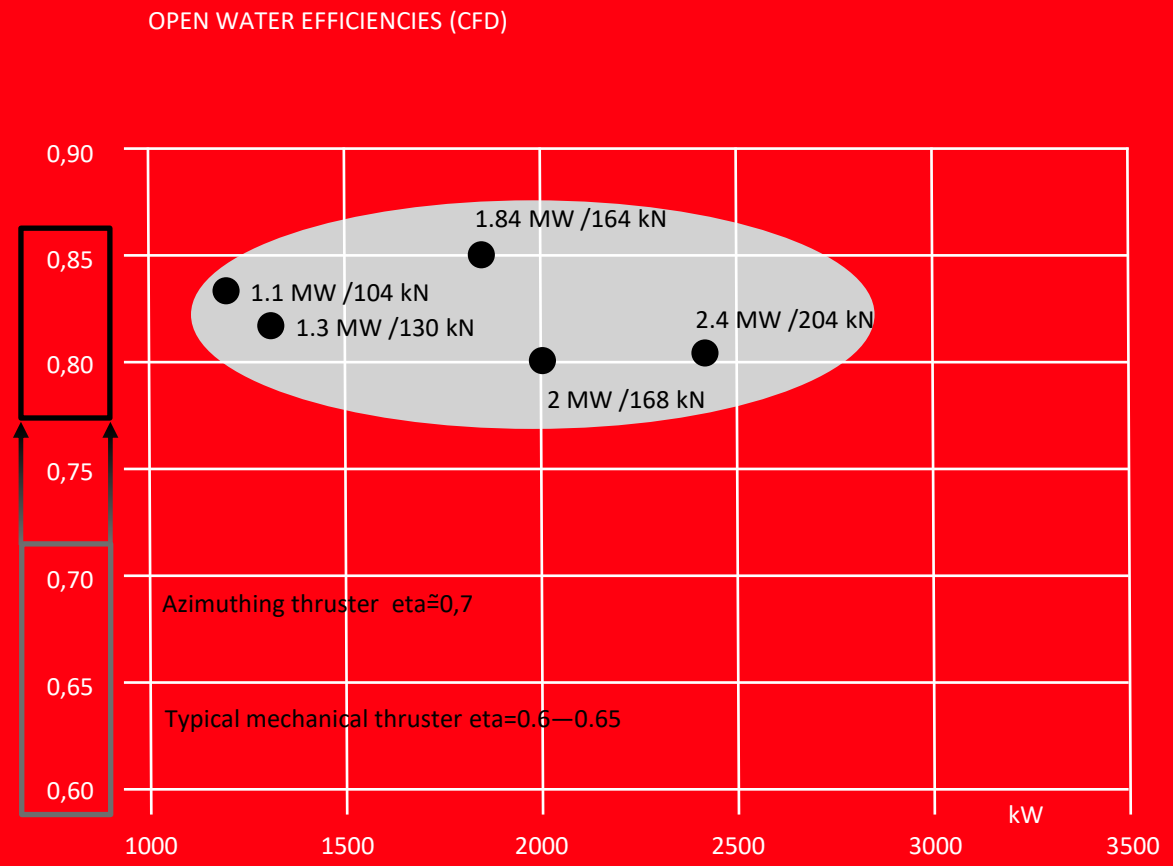
A revolutionary leap

Open water efficiencies

Revolutionary leap in efficiency

Individual blade control enables

- Superior efficiency in wide range of operating points vs. conventional screw or cycloidal propellers
- Adaptation to project specific speed/thrust requirements by control system, not by customized propeller design as of today
- Up to 25% better propulsion efficiency compared to typical mechanical thrusters, converting to major fuel savings and emissions avoidance



Low maintenance costs

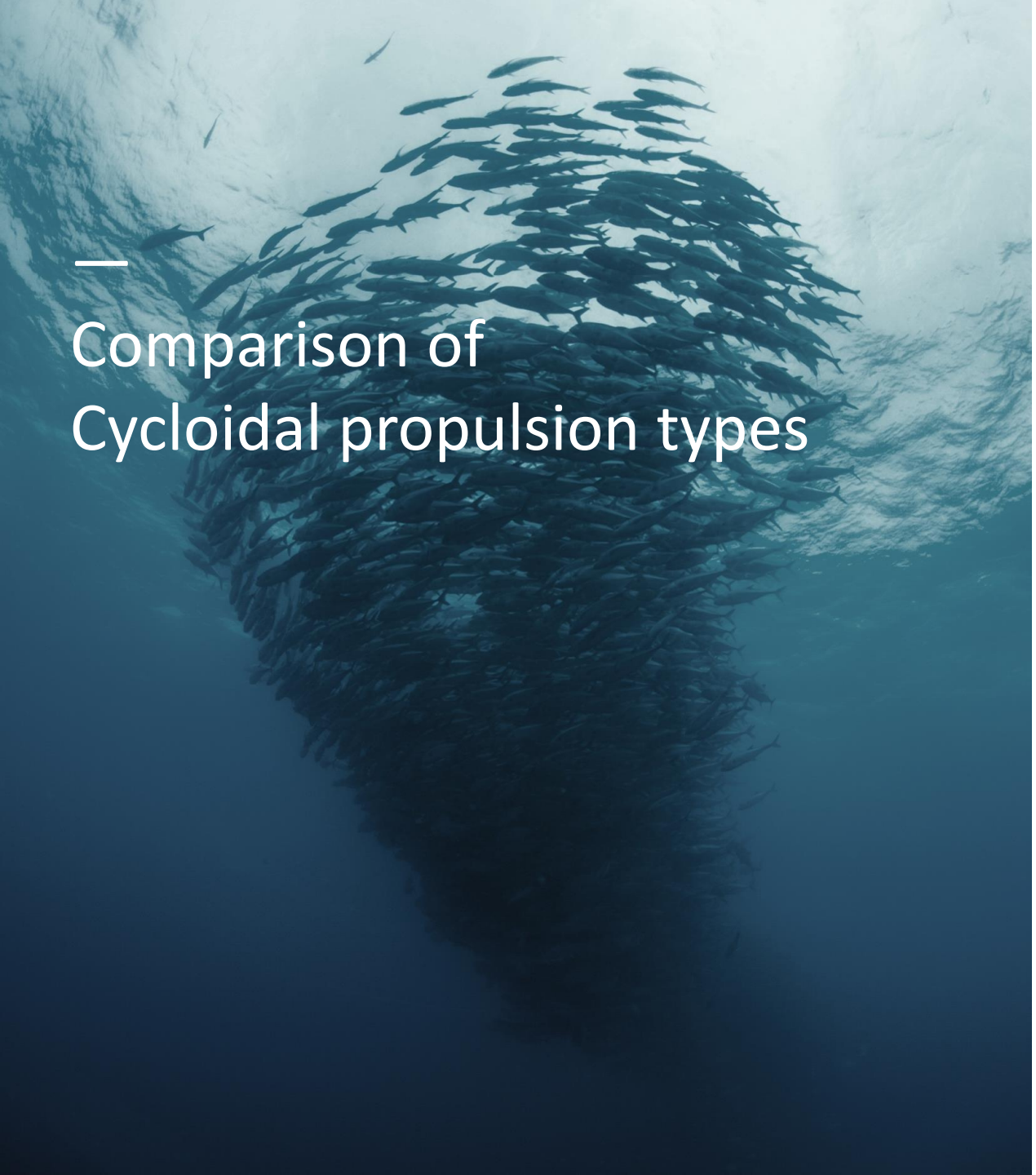
Low number of components with good accessibility

Modular structure

Improved availability of spare parts

Providing unique value

- Up to 25% better propulsion efficiency compared to shaftline propulsion
- Converting to major fuel savings and emissions avoidance
- Increased onboard comfort and reduced underwater noise
- Enabling more flexible ship design



Comparison of Cycloidal propulsion types

Cycloidal propeller with mechanically linked blades

Mechanically constrained, not capable of driving curtate cycloid thus leading to loss of efficiency.

ABB Dynafin™

Independent blade control simulating whale tail movement enabling radical efficiency gains.

ABB Dynafin™ at a glance

Extremely high efficiency

Open water efficiency up to 0.85

Significant fuel savings and emissions avoidance

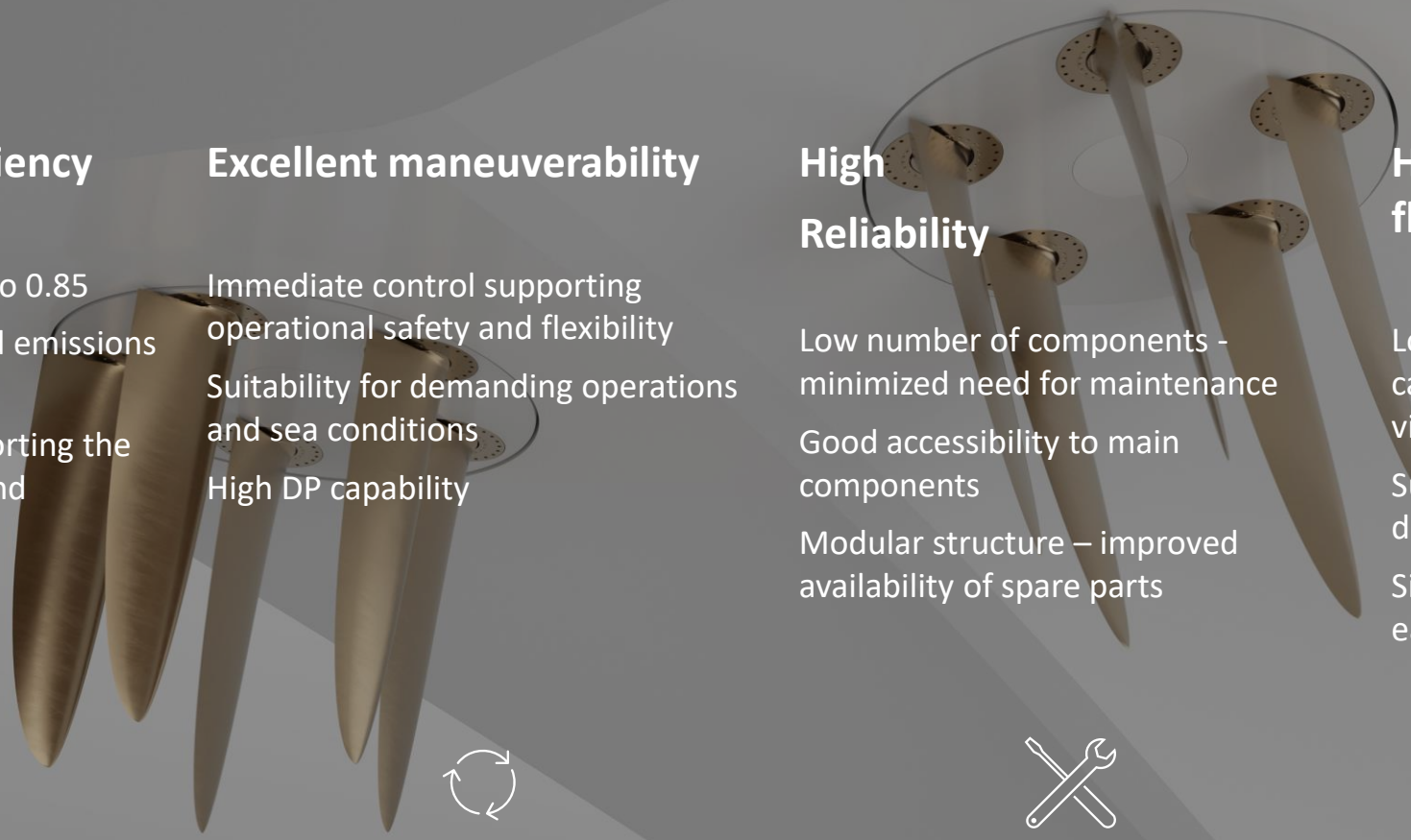
Less installed power supporting the electrification of vessels and utilization of greener fuels

Excellent maneuverability

Immediate control supporting operational safety and flexibility

Suitability for demanding operations and sea conditions

High DP capability



High Reliability

Low number of components - minimized need for maintenance

Good accessibility to main components

Modular structure – improved availability of spare parts

High comfort level and flexibility

Low rotational speed minimizing cavitation, pressure pulses, noise and vibration

Suitable for both electric/hybrid and diesel-mechanical propulsion

Simple integration to hull lines and easy installation

The new wave of efficiency

ABB Dynafin™

abb.com/marine/dynafin