

WHITEPAPER · ENERGY SAVING SOLUTIONS

HOPPE FLOWSAVE

Demand-Based Speed Control for Cooling Pumps & Engine Room Fans — Less Electrical Load, Less Fuel Burned.

Hoppe FlowSave matches the speed of cooling pumps and engine room fans to actual demand. Lower electrical consumption translates directly into reduced fuel burn — at sea and in port — and into measurable improvements in CII rating, EEXI compliance, and operating cost.

75+

Years Marine
Experience

7,500+

Ships
Equipped

<2 yrs

Typical
Payback

20 wk

Delivery
from Order



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THE CHALLENGE

DESIGNED FOR THE WORST CASE. RUNNING AT THE WRONG SPEED.

Cooling and ventilation systems are engineered for tropical full-load conditions: 32°C seawater, 100% main engine load. Real-world operation rarely comes close. Pumps and fans run at full speed regardless — burning fuel that doesn't need to be burned, both at sea and during port stays.

DESIGN CONDITION

Engineered for maximum

- Main engine: 100% MCR
- Seawater temp: 32°C (tropical)
- Cooling demand: 100% of design
- Engine room: maximum heat load
- Pumps & fans: fixed full speed

ACTUAL OPERATION

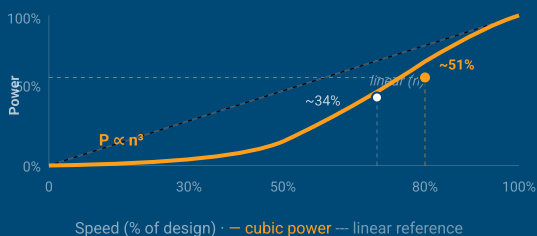
What ships really experience

- Main engine: 10–75% MCR (typical trading)
- Seawater temp: 12–27°C (most trade routes)
- Cooling demand: 25–50% of design
- Engine room: moderate heat loads
- Pumps & fans: still at full speed

PUMP AFFINITY LAW

$$P \propto n^3$$

Power scales with the *cube* of rotational speed.
Reduce speed by 20% → save ~49% of pump energy.
Reduce speed by 30% → save ~66% of pump energy.



~50%

of pump energy wasted
during typical partial-load operation

100%

speed maintained even when
cooling demand drops to 25%

THE OPPORTUNITY

Demand-based speed control recovers this energy continuously and automatically — without modifying the existing cooling system design or compromising safety margins.

THE SOLUTION

SPEED FOLLOWS DEMAND. SAVINGS FOLLOW SPEED.

FlowSave reduces the electrical load of cooling pumps and engine room fans by adjusting their speed to actual demand.

The complete control logic runs on Hoppe's HOMIP2 controller — flexible enough to be applied to a single consumer or to all three, in any combination, on any vessel configuration.

Optimized for Retrofit

Suitable for New Build

Any Vessel Type



SEA COOLING WATER PUMP CONTROL

- Speed controlled by LT cooling water temperature
- High-quality VFDs — built for marine environment
- VFDs bypassable — full fallback to fixed speed
- Integrates with existing standby control system
- Optional: motor winding & SW cooler temp. monitoring

Typical saving: 35–55%
of pump energy per year



LT FRESH COOLING WATER PUMP CONTROL

- Speed primarily controlled by main engine load
- Monitoring of cooler inlet, ME lube oil & charge air temps.
- High-quality VFDs — built for marine environment
- VFDs bypassable — full fallback to fixed speed
- Integrates with existing standby control system
- Optional: motor winding & further aggregate monitoring

Typical saving: 40–60%
of pump energy per year



ENGINE ROOM FAN SPEED CONTROL

- Speed controlled by engine room temperature & pressure
- High-quality VFDs — built for marine environment
- VFDs bypassable — full fallback to fixed speed
- Integrates with existing standby control system

Typical saving: 30–50%
of fan energy per year

OPERATING MODES

Automatic Energy Saving Mode

Normal Operation (Fixed Speed)

Manual Speed Control

Fallback / Standby Mode

Switchable at any time via HOMIP2. Automatic return to Normal Operation on standby pump activation. Full normal operation possible without HOMIP2 controller — minimal impact on existing layout.

+ MIOT DATA ACQUISITION

The MIoT unit logs all operating data on board and transmits it shore-side. Additional vessel data can be integrated, and electrical savings are automatically converted into fuel and CO₂ savings — delivered as periodic performance reports.

HOW IT WORKS

THREE SYSTEMS. ONE INTELLIGENT CONTROLLER.

FlowSave can be applied to the sea cooling water pump, the LT fresh water pump, the engine room fan — or any combination of them. The HOMIP2 controller runs the complete control logic and adapts flexibly to any vessel configuration. Cooling capacity is always guaranteed; energy is used only when needed.



System	Primary Control Signal	Additional Monitoring	Operating Range	Bypass / Fallback
SW Cooling Pump	LT cooling water temperature	Optional: motor winding & SW cooler outlet temps.	Variable — min. speed guaranteed	VFD bypassable to fixed speed
LT Fresh Water Pump	Main engine load (Analogue / Modbus)	Cooler inlet, ME lube oil & charge air temps. · optional: motor winding	Variable — full demand coverage	VFD bypassable to fixed speed
Engine Room Fan	Engine room temperature & pressure	Optional: monitoring of further aggregates	Variable — individual ER setpoint	VFD bypassable to fixed speed

HOMIP2 CONTROLLER

- Runs the complete FlowSave control logic on board
- Visualization, parameterization & alarm handling in one unit
- Adapts flexibly to any pump / fan configuration
- Pumps & fans remain operable without HOMIP2 in the loop

SAFETY FIRST

Cooling capacity is never compromised. Every VFD can be bypassed to fixed-speed operation, and the system automatically reverts to full speed if a standby pump activates or any monitored value exceeds its limit.

Proven component technology. Marine class approval supplied per project.

APPLICABILITY

ONE PLATFORM. EVERY VESSEL TYPE.

FlowSave is engineered to be vessel-agnostic. The modular system adapts to the existing pump and fan configuration of any commercial vessel — from feeder container ships to large bulk carriers. Indicative fuel-saving and CII impact estimates below are based on industry simulation data for typical vessels in each segment.

VESSEL TYPE	ME MCR	SW Pump	LT Pump	ER Fans	Annual Fuel Saving	Annual Cost Saving
 CONTAINER Feeder ~3,000 TEU	20,000 kW	65 kW design	65 kW design	2 × 25 kW	~127 MT/year 	~€76,300
 CONTAINER Large ~10,000 TEU	50,000 kW	145 kW design	130 kW design	4 × 30 kW	~277 MT/year 	~€166,500
 TANKER MR2 ~60,000 DWT	9,500 kW	50 kW design	55 kW design	2 × 18 kW	~100 MT/year 	~€60,000
 BULK CARRIER Handysize ~27,000 DWT	7,000 kW	35 kW design	40 kW design	2 × 15 kW	~74 MT/year 	~€44,500
 RORO / ROPAX Passenger / Cargo Ferry	24,000 kW	105 kW design	100 kW design	4 × 25 kW	~213 MT/year 	~€127,800

Basis for calculation: Savings cover SW Pump · LT Pump · ER Fans · ~50% pump & ~40% fan energy reduction · 8,000 operating hours/year · SFOC 187 g/kWh · Fuel price €600/MT (LSFO)

Note: Fuel savings depend on vessel configuration, operational profile, and sea conditions. Hoppe Marine delivers a vessel-specific ROI calculation before any project commitment — based on real P&IDs, pump data, and your actual trade pattern.

CII

Lower electrical demand reduces overall fuel consumption — a direct, measurable improvement to the vessel's annual CII rating.

EEXI

Frequency-controlled consumers are eligible for inclusion in EEXI re-certification scope as energy-efficient aggregates.

STRATEGIC BUSINESS CASE

MORE THAN FUEL. A LONG-TERM ASSET DECISION.

Fuel savings are only the most visible benefit. FlowSave delivers value across four strategic dimensions — improving regulatory standing, asset value, operating economics, and equipment longevity. The investment pays back fast and keeps paying for the lifetime of the vessel.



REGULATORY

CII · EEXI · MARPOL

Improved CII rating moves vessels into a higher band, protecting them from operational restrictions. FlowSave contributes to EEXI compliance without engine power limitation.



CARBON COST

EU ETS · FuelEU Maritime

Since 2024 EU ETS applies to shipping. Every MT of LSFO carries ~€220 in EU ETS cost on top of fuel — at €70/t CO₂. Each MT saved is a double saving.



ASSET VALUE

Charter & Resale Premium

Energy-efficient vessels increasingly command charter premiums from cargo owners with Scope 3 commitments. Better CII = better charter rates and higher resale value.



EQUIPMENT LIFE

Less Wear · Lower Maintenance

Pumps and fans operate at moderate, demand-matched speeds instead of continuous full load. Result: reduced mechanical wear, fewer maintenance interventions, extended service intervals.

CARBON-ADJUSTED SAVINGS (incl. EU ETS)
Container Feeder ~3,000 TEU example · €600/MT LSFO · €70/t CO₂

~€104,000
per year · per vessel

10-YEAR CUMULATIVE NET VALUE (Container Feeder example)

Year 0		-€135,000 (CAPEX)
Year 1		-€31,000
Year 2		+€73,000
Year 3		+€177,000
Year 5		+€385,000
Year 10		+€905,000

Investment ~€135,000 · Payback ~1.3 years · carbon-adjusted

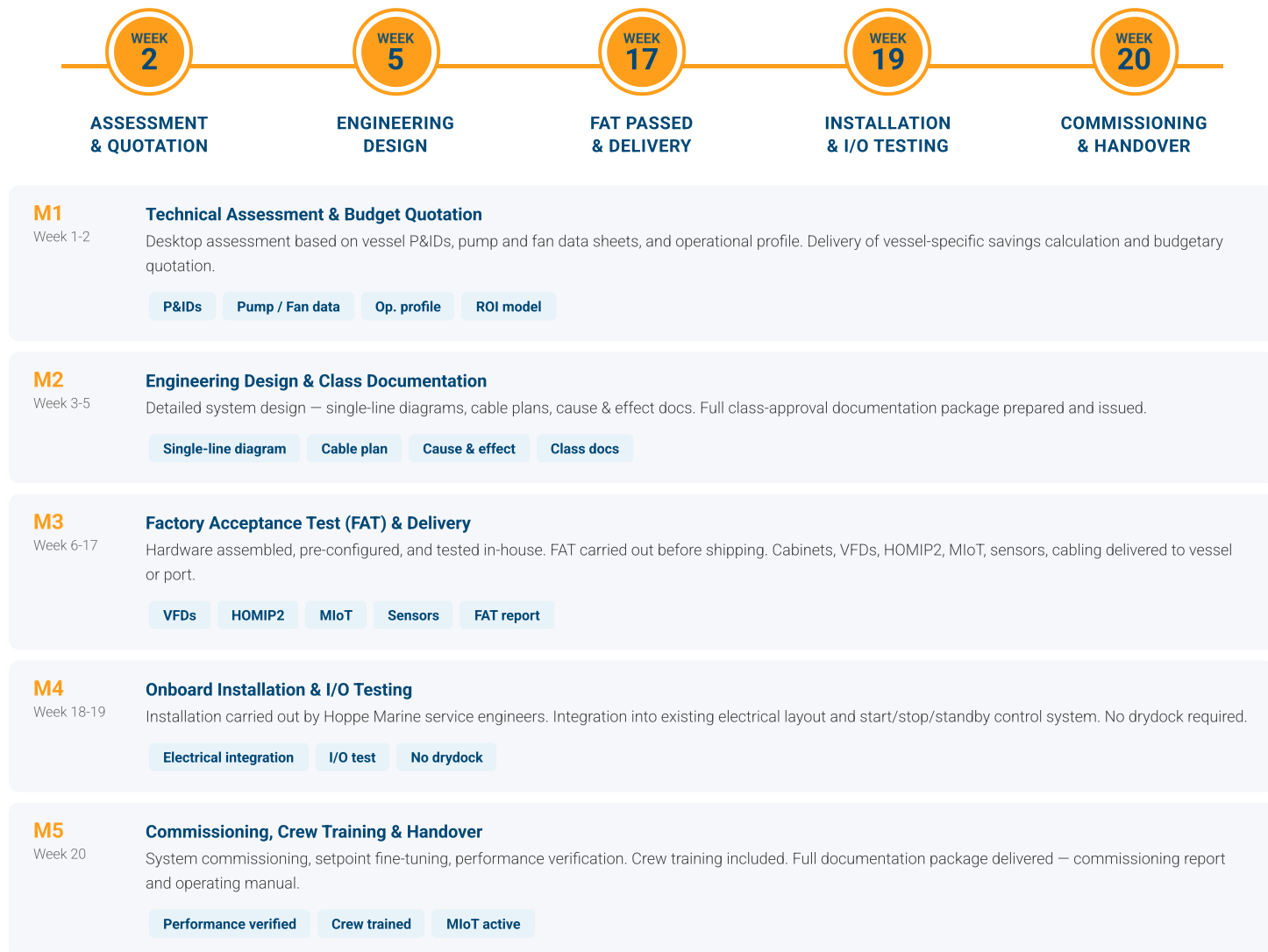
~7× return over 10 years

Per fleet of 10 vessels, a Container Feeder operator could realize ~€9 million in cumulative carbon-adjusted savings over 10 years — a structural shift in fleet economics that compounds with every regulatory tightening cycle. Hoppe Marine delivers a vessel- and fleet-specific business case before any commitment.

IMPLEMENTATION

FROM FIRST CALL TO COMMISSIONING. IN 20 WEEKS.

A structured, low-disruption process brings FlowSave from initial assessment to commissioned system in approximately 20 weeks — with Hoppe Marine as single point of contact throughout. No drydock required.



TOTAL PROJECT DURATION

~20 Weeks · Order to Commissioning

No drydock required · Retrofit & new build



READY TO OPTIMIZE YOUR FLEET?

Contact Hoppe Marine for a vessel-specific assessment and savings calculation. We deliver a tailored ROI model and system concept within two weeks — at no obligation.

TO GET STARTED, SHARE

- Vessel name & IMO number
- P&IDs for SW & LT cooling systems
- Pump & fan motor data sheets
- Operational profile (or we estimate)

NEXT STEPS

- 1 • Discovery call (online, 1 hour)
- 2 • Vessel-specific assessment & ROI model
- 3 • Tailored scope & quotation
- 4 • Pilot installation with full Hoppe support

WHY HOPPE MARINE

ENGINEERING EXPERTISE. MARITIME TRUST.

75+ Years of Marine Experience

Deep domain knowledge in maritime measuring and control technology — from shaft power to dynamic draught.

7,500+ Ships Equipped Worldwide

Proven track record across all vessel types and shipowners — globally recognized and trusted.

VFD Engineering Expertise

Years of engineering experience in marine variable frequency drive applications — the foundation FlowSave is built on.

MIoT Proven Data Platform

The same MIoT data acquisition platform already in service across thousands of vessels worldwide.



Class-Approved Components

All FlowSave hardware carries individual class approval. Full class-approval documentation supplied with every project.

20w ~20 Week Delivery

From order to commissioned system in approximately 20 weeks — design, FAT, delivery, installation, and crew training included.



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Hoppe Marine GmbH · Hamburg

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