




FUELSAVE



NEXT GENERATION EFFICIENCY ENHANCEMENT FOR MARITIME VESSELS.

*Innovative cleantech solution with high
social, ecological & economical impact*

 Save energy.

 Save money.

 Save the planet.



MARINE

GREEN
TECHNOLOGY

1/ BACKGROUND – PROBLEM – OPPORTUNITY

BACKGROUND

- **Shipping industry is the backbone of global economy with 95% of global trade volume** → further to increase until 2050 through globalization
- The **shipping industry struggles since 2008** with enormous competition & bankruptcies & consolidation with a further negative outlook
- **60-80% of OPEX / transport costs in shipping is for fuel costs** → Customers seeking to **cut their operational costs & secure profits**
- Dropping Freight rates & increasing oil prices and regulations on efficiency & emissions put **economical & ecological pressure**
- Governments and regulatory bodies **force ship owners to become more efficient every 5 years & cut emissions**



PROBLEM

High Fuel Costs

High Emissions

Low Efficiency

Applicability



→ Diesel powered marine vessels suffer from bad fuel efficiency and have a high fuel consumption
→ by 2020 ships will be the biggest single emitter of air pollution (**Co2, NOX, PM etc.**) in EU
→ Lot of energy is wasted in the process and is not being used efficiently.
→ Many solutions not applicable in certain operation modes. FS MARINE+ works when the engine runs

FS MARINE+ SOLUTION

FS MARINE+ is an easy to deploy, state-of-the-art retrofit solution for maritime vessels that **generates on demand through onboard electrolysis a hydrogen synthgas which is injected with water & methanol into the air intake of the engine(s)** which leads to a cleaner and more efficient combustion process.



"This project is being funded from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 806083"

MARINE
GREEN
TECHNOLOGY

3/ FS MARINE+ PRODUCT



- **FS MARINE+** is a unique, **patented**, novel & disruptive **cleantech / efficiency enhancement solution**, which is **FIELD- & LABORATORY-PROVEN** to reduce **FUEL COSTS** and **EMISSIONS** of ship engines, helping customers to reduce operating expenses (OPEX) and increase cashflow and profitability.



- **FS MARINE+** can be **cost-effectively retrofitted** to any type of combustion engine (MDO / MGO / HFO / LNG, etc.) and is the **world`s first** solution of such technology being approved by the DNV GL.



- **FS MARINE+** has a **guaranteed ROI** with a performance guarantee and helps ship owners to **save significant amounts of money**, while **saving the environment** for a unique win-win

HIGH POSITIVE IMPACT

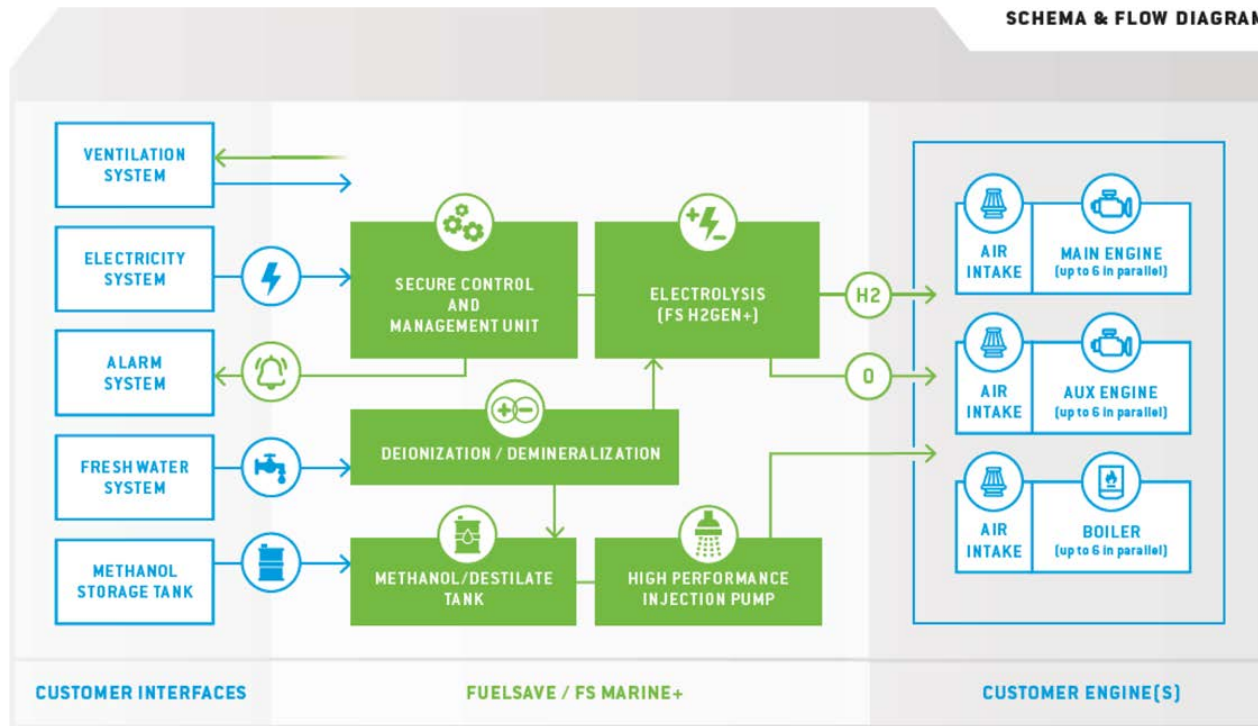
ECONOMICAL IMPACT → our customers increase profitability

ECOLOGICAL IMPACT → less air pollution for environment

SOCIAL IMPACT → reduction in health impact

4/ FS MARINE+

HOW DOES IT WORK?

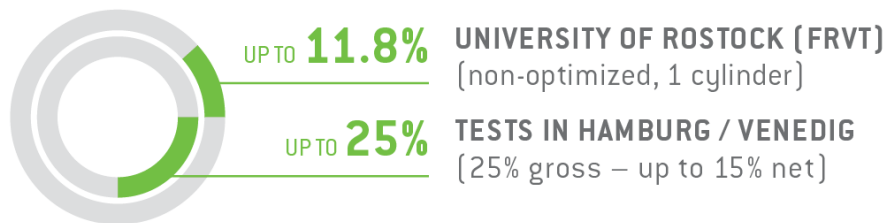


1. By **injecting an onboard-generated proprietary hydrogen-based synth gas** into the engine under approved and tested security mechanisms, we improve the combustion efficiency
2. Due to the **higher energy potential** of the gas mix the fuel is being burned more complete providing more energy **with a more efficient combustion.**
3. Simultaneously the **operating temperature is decreased** on the combustion parts, by a **specific water methanol injection.**

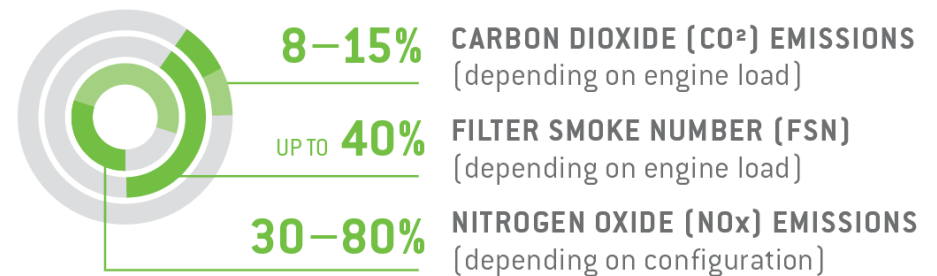
5/ FS MARINE+

PROVEN BENEFITS

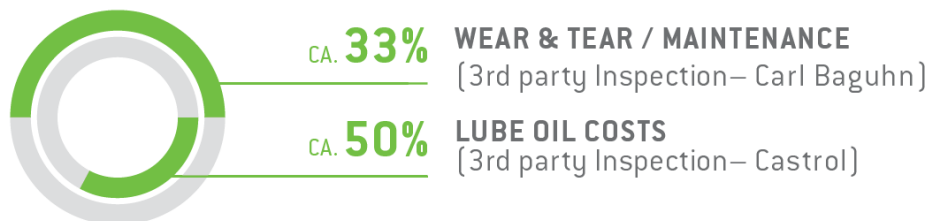
1 — REDUCED FUEL CONSUMPTION



2 — REDUCED EMISSIONS IMO tier I & IMO tier II compliant



3 — REDUCED ENGINE WEAR & TEAR



4 — NO HARM TO THE OPERATING ENGINE

- ✓ UNIVERSITY OF ROSTOCK (FRVT)
No harm observed on the operating engine
- ✓ DNV GL / CARL BAGUHN HAMBURG
Two inspections > excellent results

7/ FS MARINE+

SALES & BIZ MODELS

Direct Sales & Via worldwide Service & Assembly & Installation Partners acting as sales & service channels with worldwide footprint (i.e. Carl Baguhn Hamburg)

BUY



Outright sale with service and warranty & performance guarantee

- ✓ The FS MARINE+ module becomes property of the buyer from day 1
- ✓ The option with the lowest price & highest ROI for the customer

LEASE (BLT)



FS MARINE+ module is leased from FUELSAVE for a defined period of time.

- ✓ At the end of lease FS MARINE+ becomes property of the customer.
- ✓ The option for ship owners that want fixed monthly costs of the module
- ✓ Lower OPEX from day 1 – customer profits from day 1

SHARE (EaaS)



Performance based Profit sharing model between ship owner & FUELSAVE GmbH

- ✓ FS MARINE+ always belongs to FUELSAVE for the usage duration
- ✓ The option with the lowest financial hurdle for the customer
- ✓ Lower OPEX from day 1 – customer profits from day 1
- ✓ **WITH SMART CONTRACTS – MONEY TRANSFER BASED ON SAVINGS CONNECTED TO REAL-TIME MONITORING & BI REPORTING**

8/ FS MARINE+

GROWTH STRATEGY

1. **Validate business models** (BLT, EaaS) with market leaders
2. **Establish leasing vehicles** with financial service providers
3. **Enter contracting models** to keep cashflow positive & have multipliers

BLT / EaaS

As the solution pays itself from the achieved savings from the allocated OPEX, it is ideally suited for financing & leasing schemes. Several leasing providers already expressed interest to offer leasing models once the solution is established

GROWTH

FS MARINE+ will create its own momentum, as FS MARINE+ is helping customers to become more profitable and create positive cashflow from OPEX savings

STRATEGY

Facilitating buy-in of key customers and establishing **the leasing model with respected market leaders** by providing a FS MARINE+ installation under **leasing (BLT) models or Energy as a Service (EaaS) models** for visibility, acceptance and positioning it for subsequent rollouts once they experience the benefits first hands and want to capitalize on the benefits.

9/ FS MARINE+ TRACTION

MARKET TRACTION EVEN BEFORE MARKET INTRODUCTION / LAUNCH

- Within 2 weeks FS received LOIs for over 200 ships before launch and without active market approach or marketing (for EU H2020 application)

3BN SALES FUNNEL IDENTIFIED AND INCREASING

- FS got invited by MAERSK / CARNIVAL / CMA CGM / HYUNDAI HEAVY INDUSTRIES; CROISI, and visited by COSCO agents etc. etc.

FIRST CUSTOMERS ARE SATISFIED & COMMITTED

- SAL HEAVY LIFT GmbH have validated the solution for 2,5 years to full satisfaction and are now finalizing contracts to procure 4 units of **FS MARINE+** to equip 4 sister vessels (4 Mio Euro revenue)

GREAT RESPONSE FROM THE MARKET

- MAERSK invited FS to DNK HQ in 2017 and wish to start a pilot 3 months into the first project from SAL Heavy Lift GmbH



10/ FS MARINE+

MARKET (TAM/ SOM)

The market is concentrated with good visibility, governed by IMO as sole international body and the majority of vessels are owned by a small number of ship owners which is an advantage as new technologies become established in a short period of time due to good visibility and awareness and a universal governing body and regulations. .

TOTAL ADDRESSABLE MARKET (TAM/ SOM)

FUELSAVE - FS MARINE+ Total Addressable Market (TAM) per Segment									
#	Market	Numbers	Viable %	Viable no.	Average engine power in kW	FS MARINE+ Price per kW	TAM in USD	TAM in Mio USD	Comment
1	Inland Europe	15.572	30%	4.672	1.000	\$114,34	\$534.151.678,32	\$534,15	Inland Europe is included in Inland Worldwide
2	Inland Worldwide	200.000	30%	60.000	1.000	\$114,34	\$6.860.412.000,00	\$6.860,41	
3	Seagoing AUX Worldwide	51.405	50%	25.703	3.000	\$114,34	\$8.816.486.971,50	\$8.816,49	
4	Seagoing MAIN Worldwide	51.405	50%	25.703	12.500	\$76,50	\$24.577.051.781,25	\$24.577,05	
5	Seagoing MAIN SOX-Reducer Worlwide	51.405	5%	2.570	12.500	\$88,30	\$2.836.939.140,00	\$2.836,94	
6	Container COMBINED Worldwide	5.239	50%	2.620	15.000	\$76,50	\$3.005.758.372,50	\$3.005,76	container is already included in Seagoing AUX & MAIN Worldwide
OVERALL TOTAL TAM (recurrent every 15 years)							\$43.090.889.892,75	\$43.090,89	

Conservative approach excluding 50-70% of ships. The **TAM / SOM** is **RECURRENT every 15 years**



Overall TAM / SOM (2+3+4 from above) :

ca. 40 BN USD

13/ FS MARINE+

WHERE WE ARE?

We developed, built, patented and validated an innovative new tech with huge potential.

WHAT WE ARE LOOKING FOR?

We are now looking for Series A funding for our GTM to take the operation to the next level and prepare rollout.

2018: SERIES A FUNDING **4,575 Mio EUR**

- Company Growth & Scale Up
- 15% equity based on 30,5 valuation from 49 NPV

2020: SERIES B FUNDING **10,00 Mio EUR**

- Worldwide Acceleration & Growth
- **5 MIO CAPEX** (LOCATION / OFFICE / WORKSHOP / R&D LAB / ASSEMBLY LINE / MACHINERY)
- **2,5 MIO - BLT / EaaS / Contracting**
- **2,5 MIO - BLT / EaaS / Contracting**



FUNDING / INVESTMENT

USE OF FUNDS SERIES A – GROWTH & SCALE UP

3,35 Mio EUR COMPANY STRUCTURE SCALE UP

- ✓ STRUCTURE (Dashboards, Accounting, CRM, Time Management)
- ✓ CAPEX / HR – Staffing / IP Management
- ✓ Create Inventory for Sales
- ✓ Inventory Optimization for economies of scale
- ✓ Get Certifications & Type Approvals
- ✓ Establish Marketing & Sales team
- ✓ Marketing / Trade Shows / PR

0,45 Mio EUR SECURE 3 MIO LOAN (15 years for 2-3 % interest)

- ✓ Financing & Funding concept established to validate EaaS sales model with EU market leaders (i.e. MAERSK / CMA CGM) establish monthly cashflows from EaaS / BLT / contracting

0,75 Mio EUR BENEFIT FROM EU GRANT SCHEME

- ✓ Need to spend around 750k to receive further 860k from EU commission (grant agreement existing & signed)

OVERALL TOTAL 4,575 Mio EUR

14/ FS MARINE+

CONCLUSION / SUMMARY

- + **FUNDED BY THE EU**
(TOP SME IN EUROPE H2020 CHAMPION)
- + **MARKET DRIVERS SUPPORTING ADOPTION**
(HIGH COMPETITION, RISING OIL PRICES, CLIMATE DIRECTIVES,
(PARIS CO2 REDUCTION AGREEMENT / GLOBAL SULPHUR CAP 2020, etc)
- + **UNIQUE & PATENTED TECHNOLOGY**
PROTECTED IN 40 COUNTRIES
- + **HUGE OPPORTUNITY & MARKET**
(FIRST MOVER → 40BN + RECURRING EVERY 15 YEARS)
- + **FIELD & LABORATORY PROVEN + RIGHT TIMING**
(SOLUTION THAT ADDRESSES CURRENT CHALLENGES IN THE MARKET)
- + **APPRAISED BY 3rd PARTIES + FIRST CUSTOMERS COMMITTED**
SAL HEAVY LIFT GMBH / HARREN & PARTNER – WORLD MARKET LEADER
- + **STRONG TRACTION FROM WORLD MARKET LEADERS**
MAERSK / CMA CGM / HHI / CROISI, ETC. ALL EXPRESSED INTEREST ALREADY
- + **WELL-SKILLED TEAM – READY FOR THE TASK**



This project has received 1.6 Mio funding from the European Union's Horizon 2020 research and innovation program under grant agreement No. 806083"



*JOIN THE
EFFICIENCY REVOLUTION!*