



MARINE

GREEN
TECHNOLOGY

OPEX SAVINGS & EMISSION REDUCTION
FOR MARINE FOR A SUSTAINABLE
CLEAN-FUEL TRANSITION THROUGH
ADVANCED COMBUSTION
CONDITIONING.



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FUELSAVE
GREEN
TECHNOLOGY

+ Marine Hydrogen Synthgas Generator.

+ Reduced Fuel Consumption [10-15%].

+ Reduced Emissions.

+ Increased Operational Profits.



MARINE

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FS MARINE+

NEXT GENERATION EFFICIENCY ENHANCEMENT FOR MARITIME VESSELS

With FS MARINE+ FUELSAVE GmbH (FS) launched in 2018 a unique field & laboratory proven disruptive retrofit solution, which achieved several worlds first, for addressing challenges in the maritime market for decreasing significantly net fuel consumption [10% - 15%] and cut emissions, [10-20% Co₂, 10-20% SO_x, 30-80% NO_x, 40% FSN, 33% BC, etc.] with a contractually guaranteed ROI for a unique value proposition, creating a unique win-win for the environment and our customers.

Save energy.

Save money.

Save the planet.

FUELSAVE GmbH became **TOP SME Europe** with the highest evaluation score by the EU commission, first german company to ever achieve that and was voted "best cleantech company" in Microsoft NERD center / Boston MIT end of 2018.

RECOGNIZED INNOVATION

- FS MARINE+ is patented & being registered in 40 countries
- FS got funded in 2018 by the EU for developing the 4 stroke application
- FS got funded in 2020 by the EU for developing the 2 stroke application
- FS MARINE+ was voted by the industry in Europe as "Solution of the future" at the Neptune Awards in Q1 2020



PROVEN BENEFITS WITH HIGH IMPACT



EFFICIENCY ENHANCEMENT FOR OPEX & EMISSION REDUCTION FOR MARITIME VESSELS

ADVANCED COMBUSTION CONDITIONING
USING RENEWABLE CLEAN-FUELS

DYNAMIC LOAD-BASED INJECTION
INTO 3 DIFFERENT LOCATIONS
OF THE AIR INTAKE OF:

HYDROGEN

OXYGEN

**WATER &
METHANOL**

CA. **10%**
CO₂
REDUCTION

CA. **50%**
NO_x
REDUCTION

CA. **33%**
BLACK CARBON
REDUCTION

CA. **40%**
PM
REDUCTION

Save energy.

Save money.

Save the planet.



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FOR A SUSTAINABLE CLEAN FUEL TRANSITION



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FUELSAVE GmbH

FUELSAVE GmbH is a pioneering energy efficiency enhancement & cleantech company from Germany with a strong R&D and engineering background and patent portfolio that combines its own patented innovations & core technologies with industry leading providers to offer highly innovative & efficient turnkey energy solutions in a variety of sectors, following their credo to:

- Save Energy
- Save Money
- Save the Planet

TECHNOLOGY

FS MARINE+ dynamically injects hydrogen, oxygen, water & methanol in 3 different locations of the air intake in different q'tys and combinations to optimize the stoichiometric mix and lead to a cleaner and more efficient combustion at controlled combustion temperature to achieve fuel economies and significant emissions saving.

APPLICATIONS

The technology can be utilized for various applications with combustion engines, including but not limited to :

- MARITIME VESSELS & ASSETS
- OFFSHORE & ONSHORE DRILLING
- STATIONARY POWER GENERATION
- DIESEL ELECTRIC / LNG TRAINS
- CONSTRUCTION & HEAVY DUTY VEHICLES
- etc.

REFERENCES

- Following 2,5 years successful trial period to validate the solution in all regions and climate zones, FS signed their first commercial project end of 2019 to equip 6 ships with 93MW combined engine power for the customer SAL Heavy Lift GmbH, part of the Harren & Partner Group.
- FS signed a contract with Van Oord, for a DP3 vessel and entered into a partnership with Seadrill for their drilling rigs, helping actively to decarbonize the offshore industry.
- FS has LOIs for over 220 ships and several projects in design & approval phases with shipping & drilling contractors.

HIGH FUEL COSTS
HIGH EMISSIONS
LOW COMBUSTION EFFICIENCY
LOW APPLICABILITY
RETURN ON INVESTMENT (ROI)
RISK MITIGATION / ROI INSURANCE

HIGH POSITIVE IMPACT

ECONOMICAL IMPACT: CUSTOMERS INCREASE PROFITABILITY
ECOLOGICAL IMPACT: LESS EMISSION & AIR POLLUTION REDUCTION
SOCIAL IMPACT: IN HEALTH IMPACT
GOVERNMENT IMPACT: REDUCTION IN HEALTH COSTS (BNS OF USD)

BUSINESS MODEL

- FS is currently offering B2C and B2B models for end-customers and business partners / engine manufacturers. B2C and B2B models are being established with interested parties and market leaders with worldwide sales & service channels. FUELSAVE is offering a customer centric business model where we analyze the usage profile and aim to offer a ROI of under 3 years with 5 year standard warranty / support and maintenance and performance guarantee.

COMPETITION

- When using the official DNV GL / IMO „EE Appraisal Tool“, FS MARINE+ is outperforming other measures in impact and ROI.
- Carbon War Room as largest NGO in the sector with efficiency data of over 70k vessels, mentioned that FS MARINE+ is "the only emission reduction solution with such positive ROI", since it combines the unique value proposition of being an efficiency enhancement and emission reduction solution.
- FS technology pairs well with other measures for decarbonization, since it does not treat a symptom but directly tackles the root of the problem, which is dirty in-efficient combustion of dirty fossil fuels and is therefore complementary to other measures before or after the combustion process.

STAGE OF DEVELOPMENT

- The solution is patented, field and lab proven and currently being deployed on the largest 4 stroke single row engine in the market with MAN.
- FS established a working relation with MAN as the first and largest engine manufacturer.
- The solution is ready for commercialization for 4 stroke engines in various applications & sectors.
- For 2 stroke applications, FUELSAVE GmbH won the EU funding project for next generation clean propulsion technologies for 3M Euro and is starting testing in Q1 2022 with one of the largest international engine manufacturers and largest container ship operators worldwide.

LOWER FUEL CONSUMPTION
LESS EMISSIONS (CO2, SOX, NOX, PM, FSN)
HIGHER EFFICIENCY
AVAILABLE & EASY TO RETROFIT
GUARANTEED ROI FOR A WIN-WIN
WARRANTY + PERFORMANCE GUARANTEE