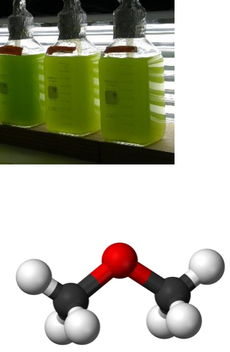
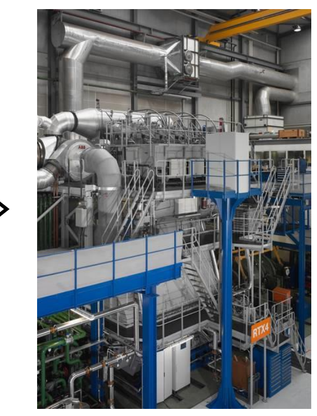
# WP 1 Fuel Flexible Engine

## WP OBJECTIVES

To develop **engines able to switch between fuels**, whilst operating in the most cost effective way and complying with the regulations in all sailing regions.

- Study ignition capability of selected fuel candidates
- Develop a fuel injection system for multi fuel purposes
- Demonstrate fuel flexible engine operation
- Perform feasibility study on Rapid Compression Expansion Machine (RCEM)

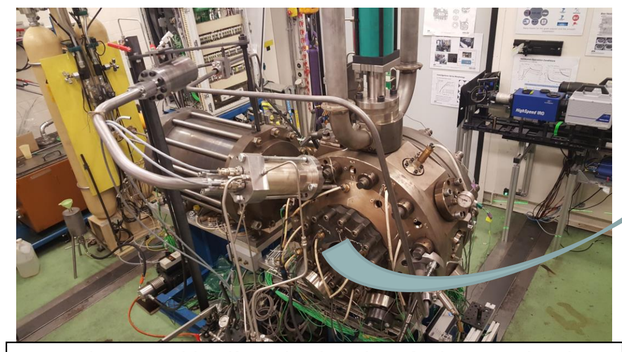





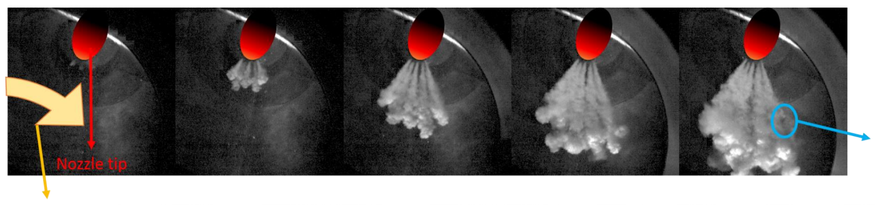
**Define and develop fuel injection system and demonstrate fuel flexibility on the engine**

## ACHIEVEMENTS & FINAL RESULTS

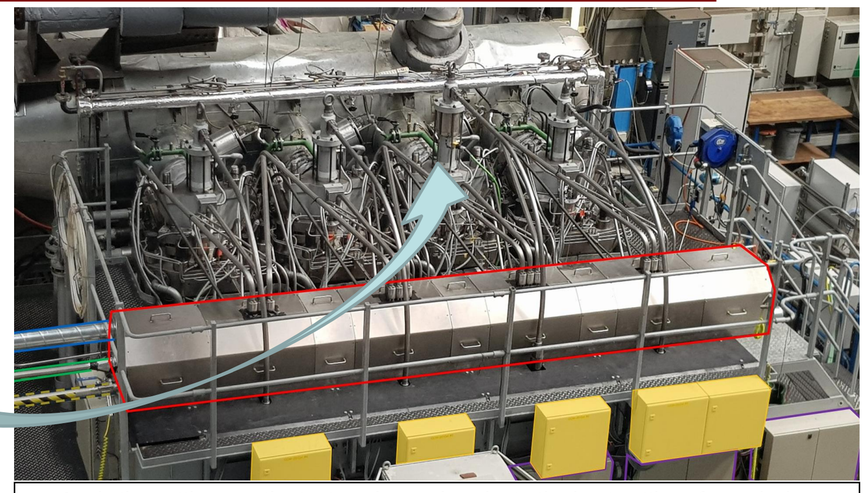
### 2-stroke



Experiments to identify optimal settings for best combustion

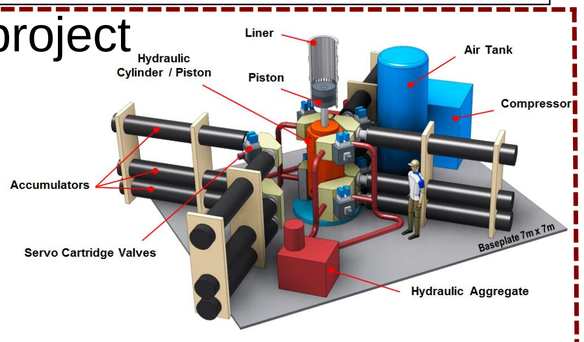


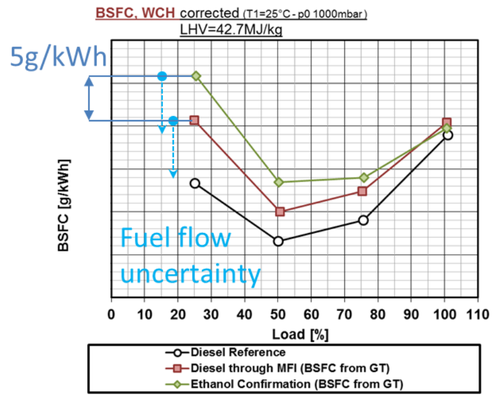

Understand combustion, relation between pilot an main injection, etc

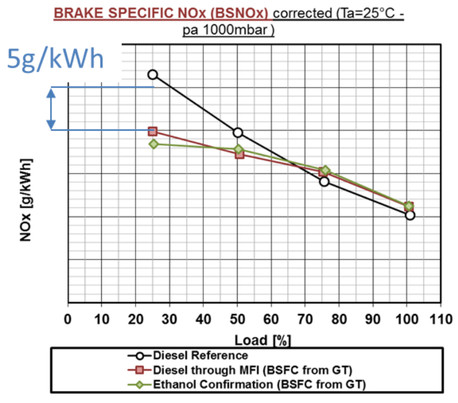


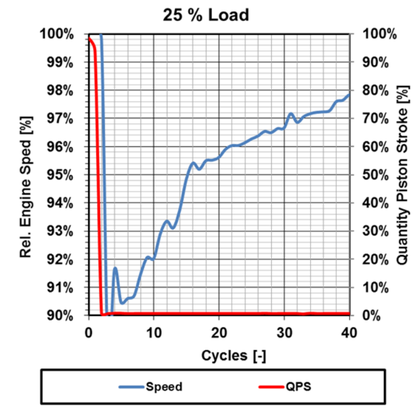
Apply the settings on the test engine and evaluate the best settings for emission reduction and fuel economy

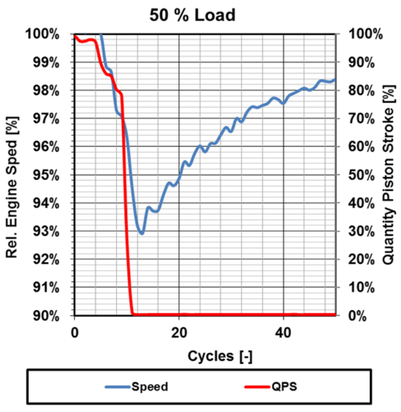
Subproject 1.2



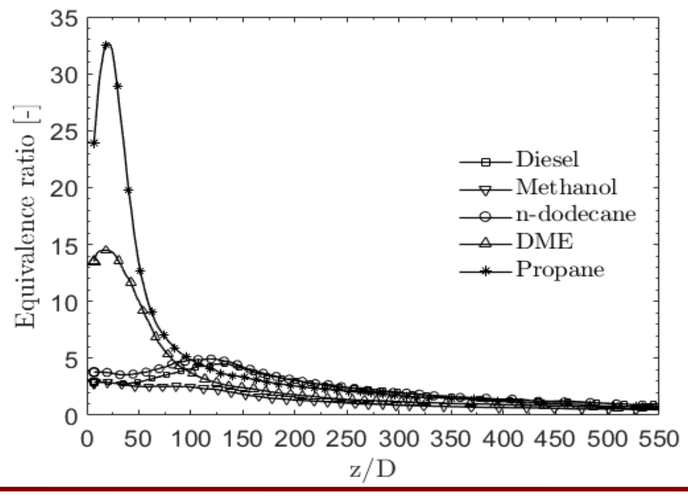



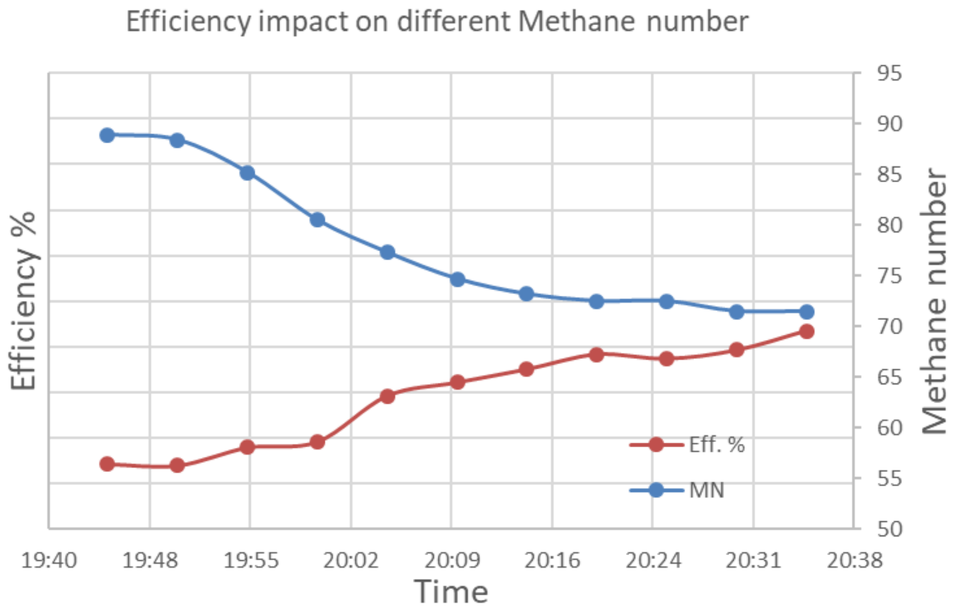




### 4-stroke

For the first time ever, we measured the droplet sizes (SMD) of methanol sprays.

LES simulations of various fuels indicated significant differences in the local equivalence ratio fields within the fuel sprays. This could have fundamental effects on e.g. emission during combustion.




A variation in gas quality is having a clear impact on the engine performance. This should and can be controlled with online gas measurement and control

## WP PARTICIPANTS

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