

Green fuels for small combustion engines

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INTRODUCTION

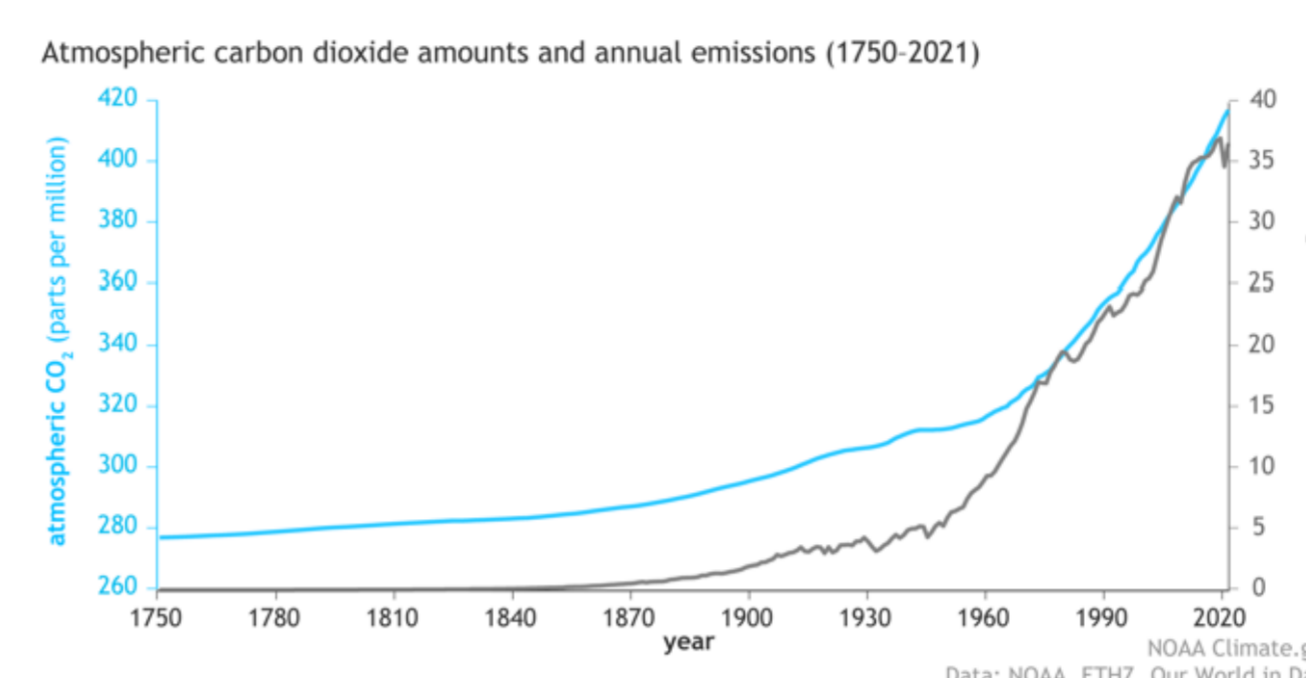
- Availability, properties, and ecology
- of green fuels for small SI combustion engines,
- used in sports equipment.



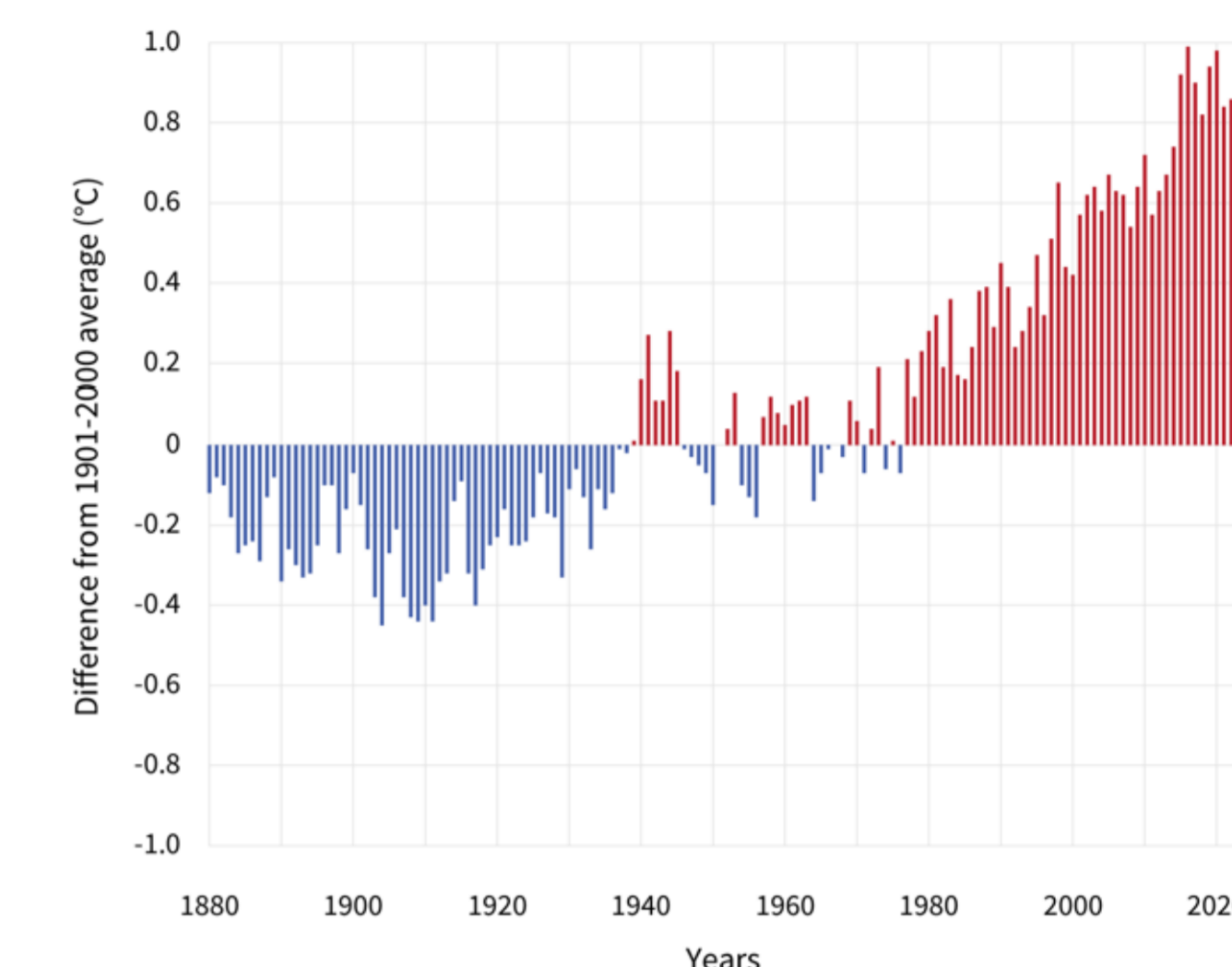
MOTIVATION

- Rising GHG (CO₂) emissions
- Rising Earth surface temperature

CO₂ emissions and atmospheric concentration

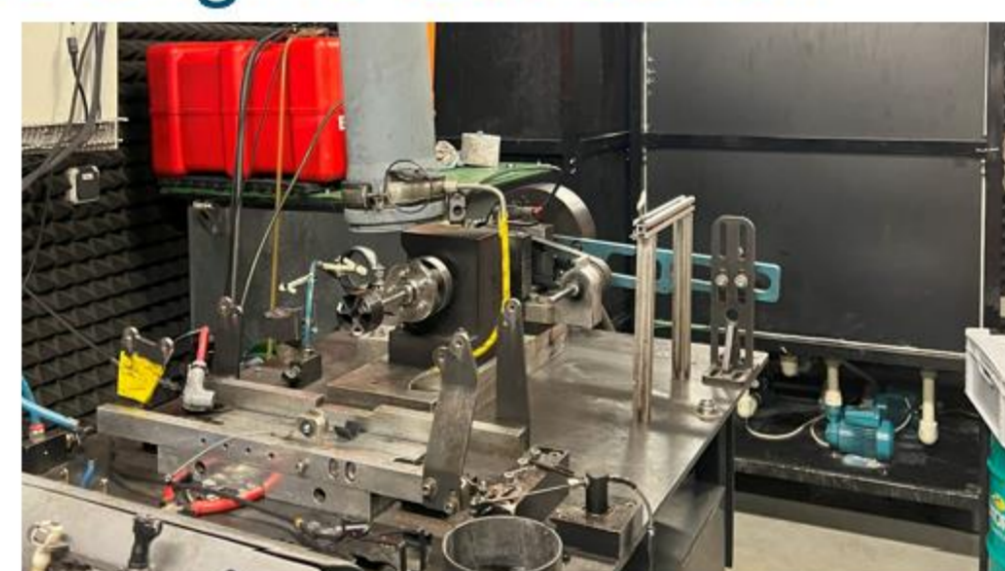


GLOBAL AVERAGE SURFACE TEMPERATURE

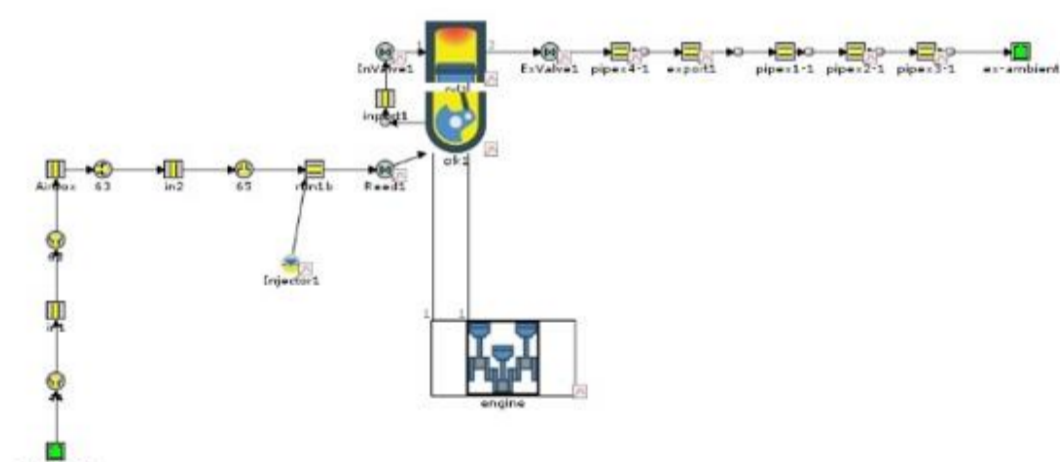


GOALS OF THE STUDY

- Selection of available alternative fuels
- Experiment with different fuels on the engine test bench

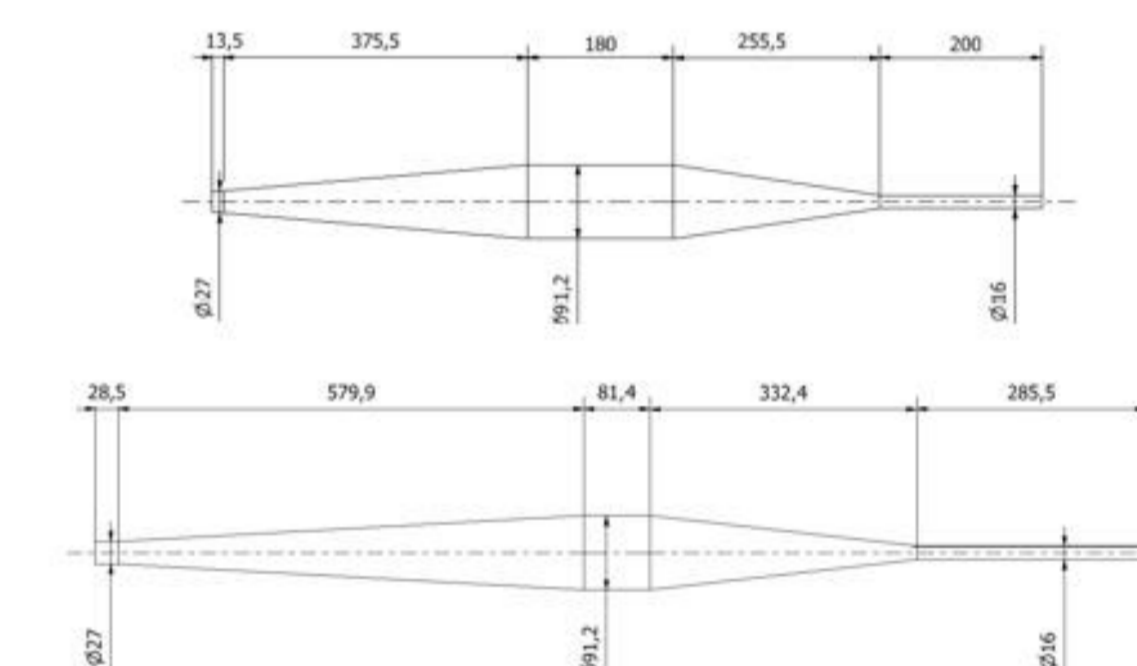
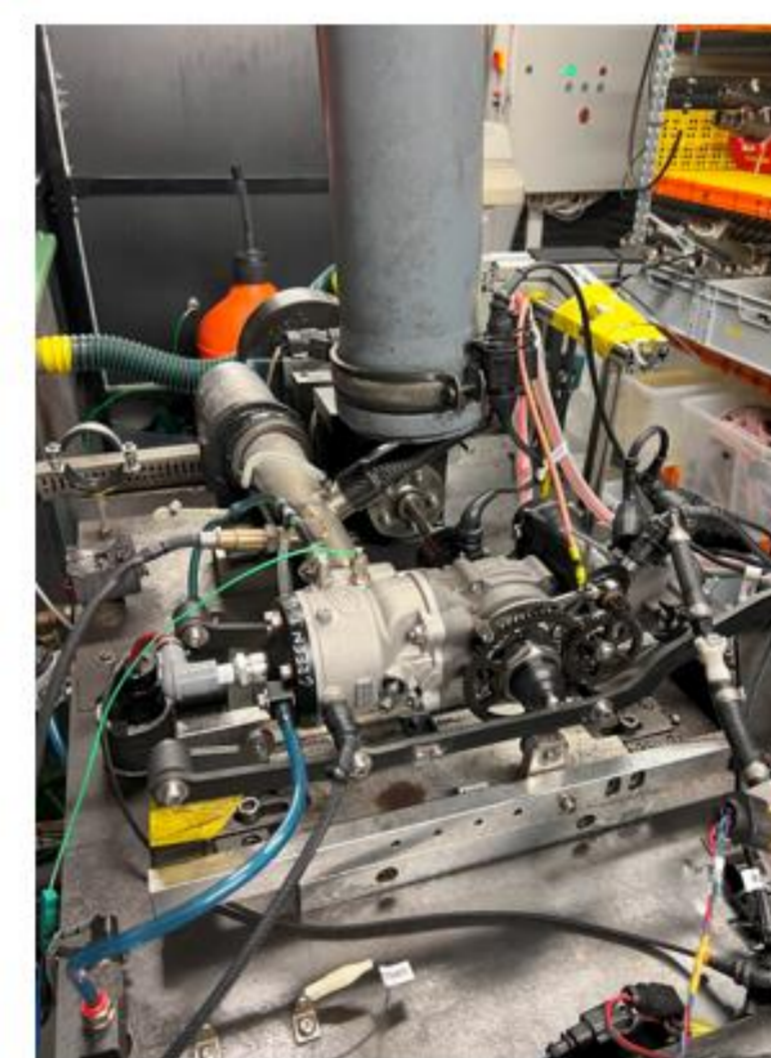


- Simulation of a heat cycle
- Comparison of conventional fuel with newly selected alternative fuel



EXPERIMENT AND SIMULATION

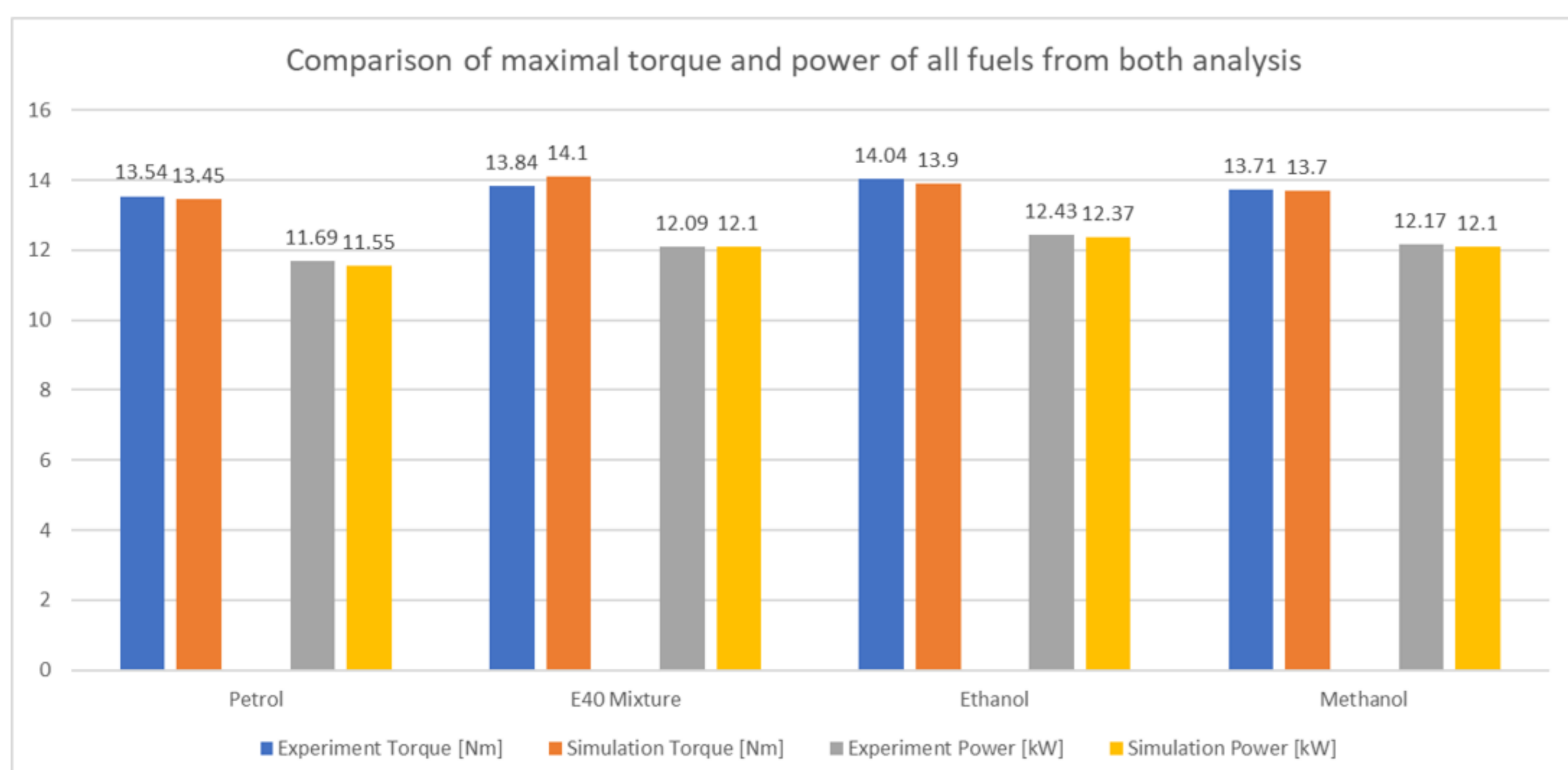
- Selected fuels are tested on the engine test bench
- Torque, power, BSFC and emissions (CO₂, CO) are compared for different fuels
- Simulation of heat cycle with computational optimized exhaust for different fuels



- Performance analysis
 - Torque output
- Efficiency analysis
 - Emissions and BSFC

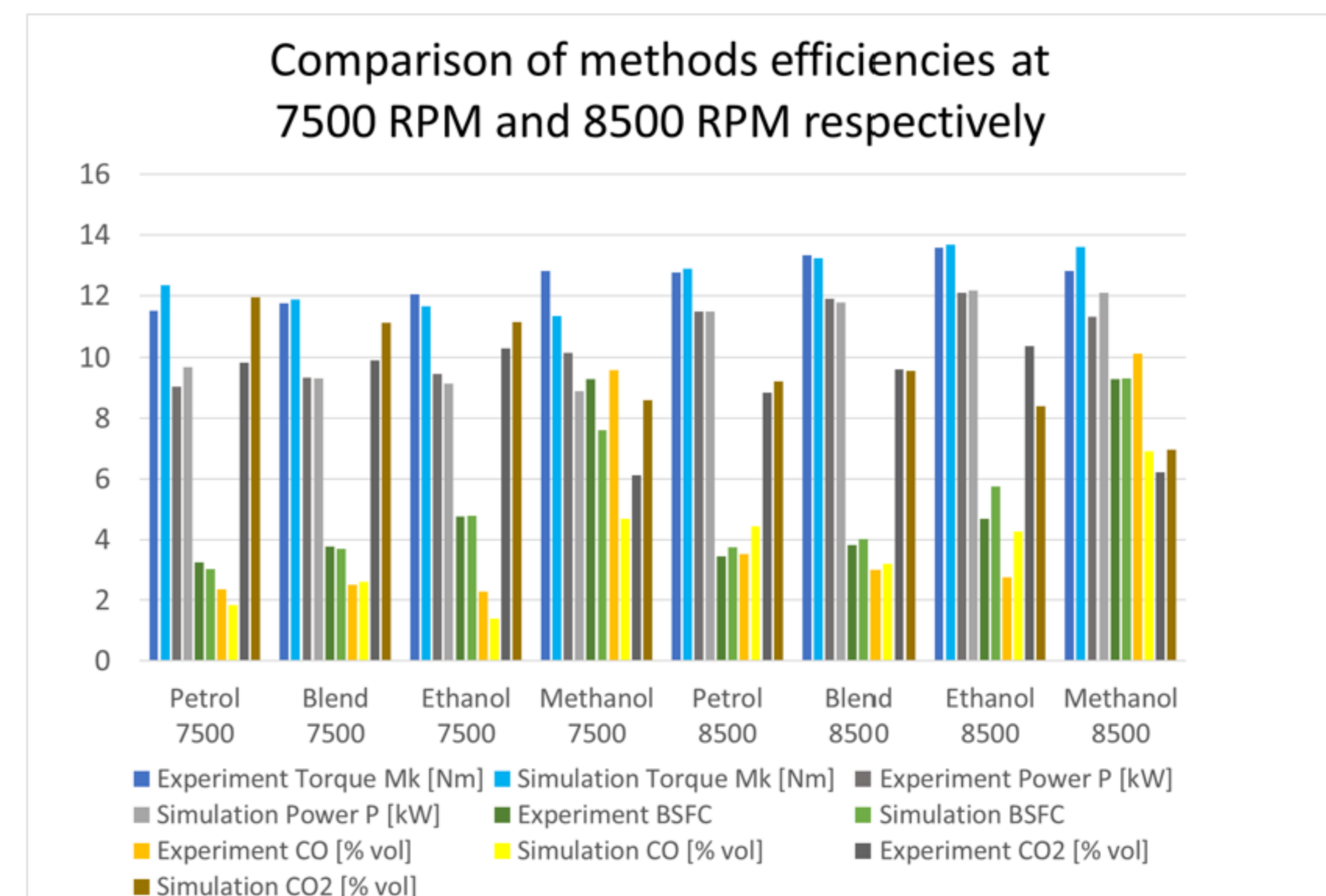
COMPARISON OF BOTH METHODS

- All results are affirmative, analysis can be proclaimed valid



CONCLUSION

- Possible to use green fuels for small SI ICE



- Slightly lower emissions of CO₂, and CO during use
- Ethanol fuel
 - Highest increase in torque and power
 - Notable increase of BSFC
 - Fully sustainable
- E40 mixture
 - Increase in torque and power
 - Small increase in BSFC
 - Partially sustainable