# Internal Combustion Engines research in the TU/e Zero Emission Laboratory

**20 September 13:00**

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**Assistant professor Power & Flow, Mechanical Engineering, Eindhoven University of Technology**

**Abstract:** There is a serious demand for diverse system changes to achieve the current targets of emission-free, future-proof mobility for people & goods by 2050. As outlined in the Dutch climate agreement, renewable- and advanced biofuels are part of the solution, along with gains in efficiency, (partial) electrification, and behavioral changes. Within the Zero Emission Laboratory (ZEL), internal combustion engines and ultra-clean combustion concepts are studied using a wide range of experimental setups and fuels, including advanced biofuels, synthetic fuels (often oxygenated & drop-in), and hydrogen. In this webinar, the engine-related facilities of the ZEL will be presented, ranging from setups that are close to the real-world application, all the way to more simplified fundamental systems. Some recent projects and activities will be highlighted, followed by some future aspirations.

**Short CV:**

Noud Maes is an Assistant Professor working for the Power & Flow group in the department of Mechanical Engineering at the Eindhoven University of Technology. He is jointly-responsible for the Zero Emission Laboratory, which hosts several experimental setups to study ultra-clean engines and the fuels of the future. His key areas of expertise include high-pressure sprays, internal combustion engines, fuel technology, combustion, high-speed (optical) diagnostics, and laser-based measurement techniques. Current lecturing activities include courses called “Clean Engines and Future Fuels”, “Sustainable fuels: plan A or B?”, “Sustainable Energy Sources”, and “Experimentation for Mechanical Engineering”. Noud is also chairman of the educational committee for the master Automotive Technology since 2023.

Noud studied Mechanical engineering at the Eindhoven University of Technology and obtained his PhD in 2019 at the same university on the topic of high-pressure, high-temperature fuel sprays. During his PhD, he worked as a visiting researcher at the French Institute of Petroleum (IFPEn) in Rueil-Malmaison and later at the Combustion Research Facility (CRF) of Sandia National Laboratories in Livermore, California, USA. In 2019, he started a post-doc position at Sandia’s CRF in Livermore, and since 2020 he holds his current position at the Eindhoven University of Technology. During his career, he has given several invited talks at (web) meetings and conferences organized by the international Engine Combustion Network (ECN), the International Energy Agency (IEA), and various research institutes and universities. In 2020, he organized the emissions topic of the ECN meeting, one out of 10 topics in a two-day conference. In 2022 he organized the vaporizing sprays topic, and in 2023 he organized the emerging topic on hydrogen jets, for which he was asked again working towards the next workshop in 2025.