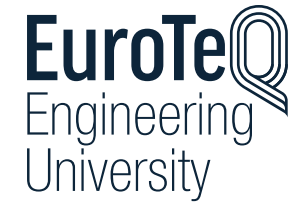


The AVL logo consists of the letters 'AVL' in a bold, white, sans-serif font on a blue rectangular background.

Challenge: Technologies for a sustainable future of combustion engines for passenger cars

The logo for EuroTeQ Engineering University, featuring the text 'EuroTeQ' in a large, bold, blue font, with 'Engineering University' in a smaller, white font below it, all set against a dark blue background.

Introduction

Throughout its history, personal mobility has gone through many changes and rapid development that were motivated by the needs of individuals as well as civilizations. Recently the whole society is looking for technologies that will allow to keep and further develop current demands for mobility and transportation of goods with a minimal negative impact on the environment.

Current state of technology offers wide range of different solutions of the powertrain systems for personal vehicles while each variant brings the specific pros and cons. Technical evolution of four stroke internal combustion engine and its accessories came a long way in the last almost 150 years. The question however remains whether this evolution has run its course.

Do we really have nothing to improve on internal combustion engines? Is there really no way to run combustion engines ecologically and sustainably?

Who is behind this initiative?

AVL develops and optimizes engines, drive concepts for leading car manufacturers as well as high-performance components for motor racing. Our portfolio is complemented by other technologies of the future, such as the development of hybrid drives or cogeneration devices. The main goal of our projects is the implementation of environmentally friendly technical solutions, the permanent reduction of CO₂ emissions and the reduction of dependence on fossil fuels. AVL is the largest consulting company and research institute focused on the automotive industry, covering areas from mechanical engineering, mechatronics to software and testing. AVL services are applied from concept development to series production. The international group has its headquarters in Austria and technical centers in many countries around the world. In June 2023, a new AVL tech center for the Czech Republic was established in Mladá Boleslav.

What is the challenge?

Can you come up with a comprehensive technological solution that allows for the use of internal combustion engines sustainably in passenger cars?

Try to focus on following topics:

- A brief estimation of the number of cars in the world is around 1,4 billion vehicles.
 - Is it even possible to use those cars till the end of their live cycle that their impact on environment is limited to the minimum?
 - Can you imagine any innovative technology or process it can reduce environmental impact of those vehicles?
- Use of synthetic fuels.
- Internal combustion engine can run on different fuels / means of reactions.
- Innovative technologies of air intake and aftertreatment.
- Technologies for total efficiency increasement.
- Can we use a piston engine in a different way?

Interested student teams are asked to engage in the above area by

- Providing a description of the proposal.
- Provide a brief feasibility study including a risk assessment.
- Provide an assessment of environmental improvement of your proposed solutions at least in terms of CO₂ savings.

Relevant considerations for the challenge / theme

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