

## COMET MODULE

### LEC HYBTEC – HYBRID TECHNOLOGIES FOR ENHANCED RELIABILITY OF ULTRA HIGH-PERFORMANCE ENGINES

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**Logo:**



**Main location:**

Inffeldgasse 19, A-8010 Graz, Styria, Austria

**Other locations:**

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**Thematic area:**

Energy & Environment

**Thematic focuses:**

- Hybrid simulation by combination of physics-based and data-driven model approaches
- Significant extension of the virtual development process of holistic energy and propulsion systems
- Innovative material combinations and design approaches for highly stressed engine components

**Planned realisation and outcomes:**

The **hybrid approaches** considered in the research program focus on combining physical and data-driven models to understand stochastic phenomena such as cycle-to-cycle variations or knocking in engines, **improve the predictive quality of simulation**, and enhance the quality of engine and combustion control as well as overall system performance, especially with regard to operation with **CO<sub>2</sub>-neutral fuels**. In addition, the LEC has further developed its simulation methodology so that it can be successfully used to **optimize energy systems and reduce emissions** from entire industrial sites. Different combinations of novel technologies can be **tested virtually** and the best solution to **achieve CO<sub>2</sub> reduction** from a technical and economic perspective can be found and extended by the use of hybrid models. The use of novel **ceramic-metal material combinations** in the design of highly stressed engine components such as spark plugs and pistons extends the hybrid approach in the materials field.

**Selected company partners** (max. 10):

1. AVL List GmbH
2. INNIO Jenbacher GmbH & Co OG
3. HOERBIGER Wien GmbH

**Selected scientific partners** (max. 5):

1. Graz University of Technology
2. Know-Center GmbH

## COMET-FACTSHEET

3. Montanuniversität Leoben

**Selected international<sup>1</sup> partners** (max. 5):

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**Duration:** 01.01.2020 – 31.12.2023 (4 years)

**Number of personnel:** 8.5 FTE, thereof 8 scientists

**Project management:**

- Dr. Gerhard Pirker, LEC GmbH, Area Manager

**Contact/ COMET Centre:** LEC EvoLET

Ao.Univ.-Prof. Dr. Andreas Wimmer, CEO & CSO  
Dipl.-Ing. Nina Simon, COO & Interim CEO  
(01.08.2021-31.01.2022)

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Status 11.08.2021

The COMET Module is funded within COMET – Competence Centers for Excellent Technologies – by BMK, BMDW as well as the co-financing federal province Styria. The COMET programme is managed by FFG.

[www.ffg.at/comet](http://www.ffg.at/comet)

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<sup>1</sup> Partners with headquarters outside Austria