

# COMET CENTRE (K1)

## LEC GMBH

### RESEARCH PROGRAMME: LEC GETS - LEC GREEN ENERGY AND TRANSPORTATION SYSTEMS

**Main location:** Graz (Styria)

**Other locations:** none

**Thematic area:** Energy & Environment

<https://www.ffg.at/comet/netzwerk>



#### Thematic focuses

- Sustainable energy and transport systems (towards zero emissions)
- E-fuels (hydrogen, ammonia, methanol, etc.) for climate-neutral large engine applications
- Virtual development platform (digital twins for various applications)
- Innovative sensor technology, systems for measurement data transmission and condition-based monitoring

#### Planned realization and outcomes

The objective of the LEC COMET research programme is to develop innovative solutions for sustainable energy and transport systems. The focus is on drastic emission reduction. Using renewable energy sources (green e-fuels such as hydrogen, ammonia, methanol, etc.) for climate-neutral large engine applications, optimizing the overall system and the intensive use of digital technologies form the core of research. Having a highly flexible infrastructure enables a wide range of experimental investigations from the basics to the entire energy or propulsion system. The continuous development of detailed simulation models and methods (such as in the COMET module LEC HybTec), their seamless integration into a consistent development methodology and their successful application play a decisive role. Based on innovative solutions in the field of sensor technology, measurement data transmission systems and condition-based monitoring, the LEC develops intelligent engine components in order to monitor the systems' condition and thus increase their robustness, life span and environmental soundness. To further minimize pollutant and greenhouse gas emissions, advanced exhaust gas aftertreatment systems are developed and integrated into the overall system.

#### History of establishment

Modern large engine research at Graz University of Technology started in 1994 when the first single-cylinder research engine, an INNIO Jenbacher type 6 gas engine, was set up. From the very beginning, a focus of the research work was put on developing and using simulating methods for optimisation. Based on this research, an industrial competence center (KIND) was founded in 2002 and the LEC brand was introduced. Since 2015, the LEC has been a COMET-K1 center.

The following COMET research programs have been approved:

- COMET research program LEC EvoLET – LEC Evolutionary Large Engines Technology for Sustainable Energy and Transport Systems (duration 2015-2022)
- The COMET research program LEC GETS – LEC Green Energy and Transportation Systems (duration 2023-2030)
- The COMET module LEC HybTec – Hybrid Technologies for enhanced reliability of ultra high-performance engines (duration 2020-2023)

## COMET FACTSHEET

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

1. AVL List GmbH
2. Robert Bosch AG
3. INNIO Jenbacher GmbH & Co OG
4. Miba Gleitlager Austria GmbH
5. VERBUND Thermal Power GmbH
6. KS Engineers - Kristl, Seibt & Co GmbH
7. ANDRITZ AG
8. COMET-Partner Network: <https://www.lec.at/network/>

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

1. Graz University of Technology (Austria)
2. Montanuniversität Leoben (Austria)
3. Technische Universität Wien (Austria)
4. Fraunhofer Institute for Solar Energy Systems ISE (Germany)
5. Universitat Politècnica de València - CMT-Motores Térmicos (Spain)

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

1. Accelleron – Turbo Systems Switzerland Ltd (Switzerland)
2. ExxonMobil Technology and Engineering Company (USA)
3. Winterthur Gas & Diesel Ltd. (Switzerland)
4. Hug Engineering AG (Switzerland)
5. Wabtec Corporation (USA)

<b>Duration:</b>	01.01.2023 - 31.12.2030 (8 years)
<b>Staff employed at the Centre:</b>	62 FTE, thereof 38 scientists
<b>Management:</b>	Ao. Univ.-Prof. Dipl.-Ing. Dr. Andreas Wimmer, CEO & CSO
<b>Contact:</b>	LEC GmbH Inffeldgasse 19, 8010 Graz +43 316 873-30101 <a href="mailto:office@lec.tugraz.at">office@lec.tugraz.at</a> <a href="http://www.LEC.at">www.LEC.at</a>

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