



since 2014 **(fen) systems**

Strategy, Project & Product Development

Quality Assurance & Monitoring

Dissemination & Training

since 2018 **(fen) research**

Research Facility for Interdisciplinary Systems and Logistics Research in accordance with the Union framework

- **Project Acronym:** WIVA P&G HyTrain
- **Call year:** 2017/18
- **Call:** Energy Model Region - 2<sup>nd</sup> Call
- **Funding Instrument:** Flagship Projects
- **Energy Model Region:** WIVA P&G – Wasserstoffinitiative Vorzeigeregion Austria Power & Gas
- **Project duration:** 01.09.2020 to 31.08.2024
- **% stage of implementation 01.11.2023:** 80 %
- **Total project budget:** 5.027.819 €
- **KLIEN max. contribution:** 3.187.100 €
- **Consortium:** FEN Sustain Systems GmbH (**FEN Systems**), Zillertaler Verkehrsbetriebe AG (**ZVB**), PROSE GmbH (**PROSE**), HyCentA Research GmbH (**HyCentA**), Verein WIVA P&G (**WIVA**)



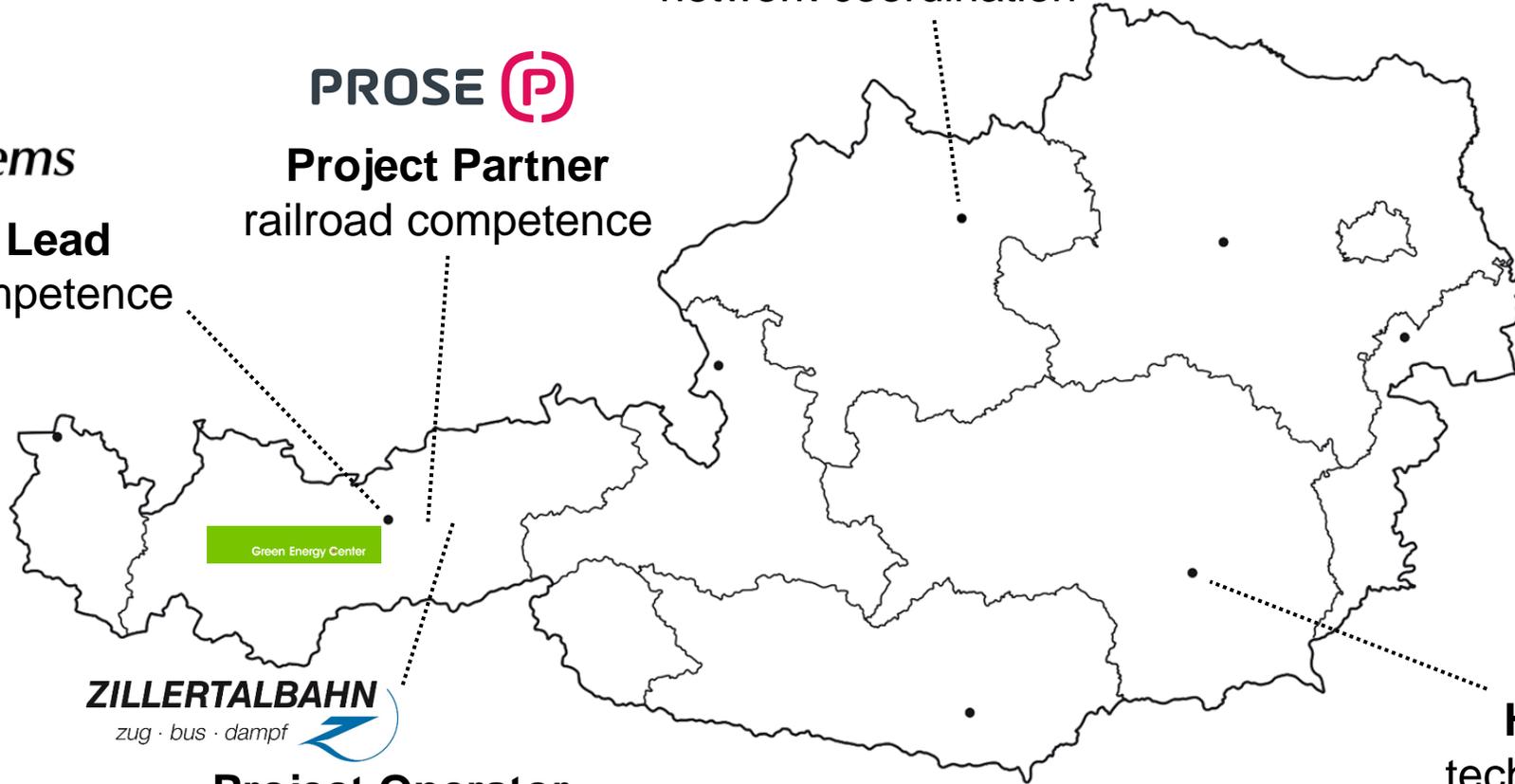
WIVA P&G HyTrain  
Project Consortium



**Project Partner**  
network coordination

**fen)systems**  
**Consortium Lead**  
systemic H<sub>2</sub> competence

**PROSE**   
**Project Partner**  
railroad competence



**Project Operator**  
rail operation competence

**HycentA**  
HYDROGEN CENTER AUSTRIA  
**Head of Research**  
technical H<sub>2</sub> competence

*This project is supported with the funds from the Climate and Energy Fund and implemented in the framework of the RTI-initiative "Flagship region Energy".*



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**Green Energy Center**

- Establishment of the **state of the art** for **hydrogen (narrow gauge) trains** by means of:
  - Train simulation & test bench operations
  - H2-Infrastructure concept development and simulation
- Determination of criteria & parameters (standards) for the **quality assurance** and **risk minimization process** for Hydrogen Trains and corresponding H2-Infrastructure regarding:
  - Tendering,
  - Contracting,
  - Commissioning,
  - Acceptance,
  - Operation and
  - Guaranty
- **Application of findings & results** to the implementation project “*Zillertalbahn 2020+ with hydrogen*” if possible

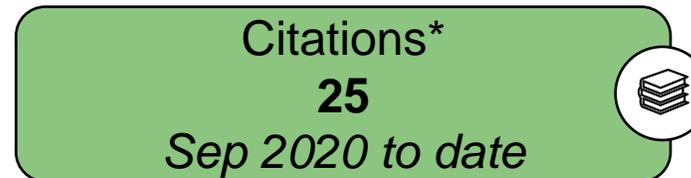
## Concept Hydrogen Refuelling Station (HRS)

- ✓ Fundamental investigations on heavy-duty train **HRS concept** and components
- ✓ Elaboration of **refuelling protocols** of heavy-duty vehicles based on simulation results
- ✓ Preparational work for **safety workshops**

## Energy Storage and Power Train System

- ✓ Elaboration of a **basic operation strategy** using *Longitudinal vehicle Dynamic Simulation (LDS)*
- ✓ Optimization of the operation strategy regarding **lifetime** and overall **energy consumption**
- ✓ Preparation of hardware and signal analysis for the **State of Health** and **State of Operation**

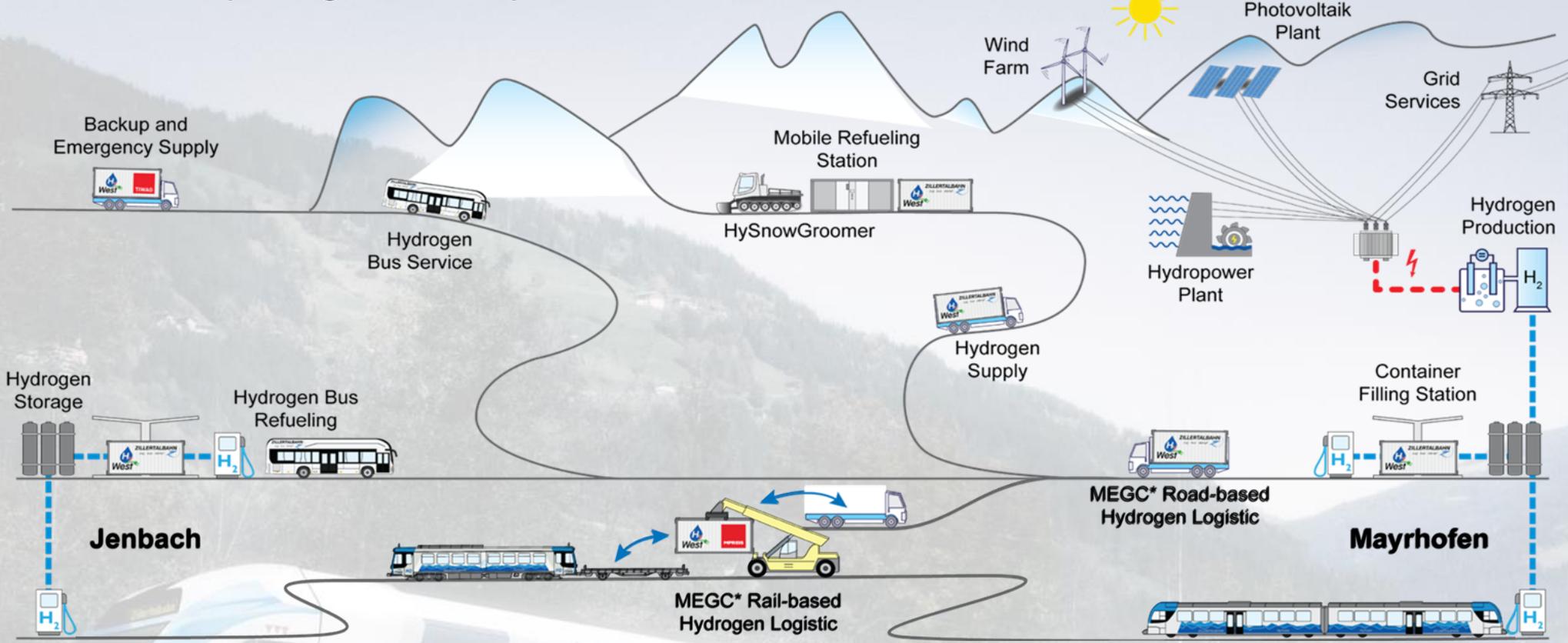
## Dissemination, Communication & Exploitation





# Zillertalbahnhof 2020+ Energy Autonomous with Hydrogen within the Hydrogen Valley Zillertal

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← „Zillertalbahnhof 2020+ energy autonomous with hydrogen“ →

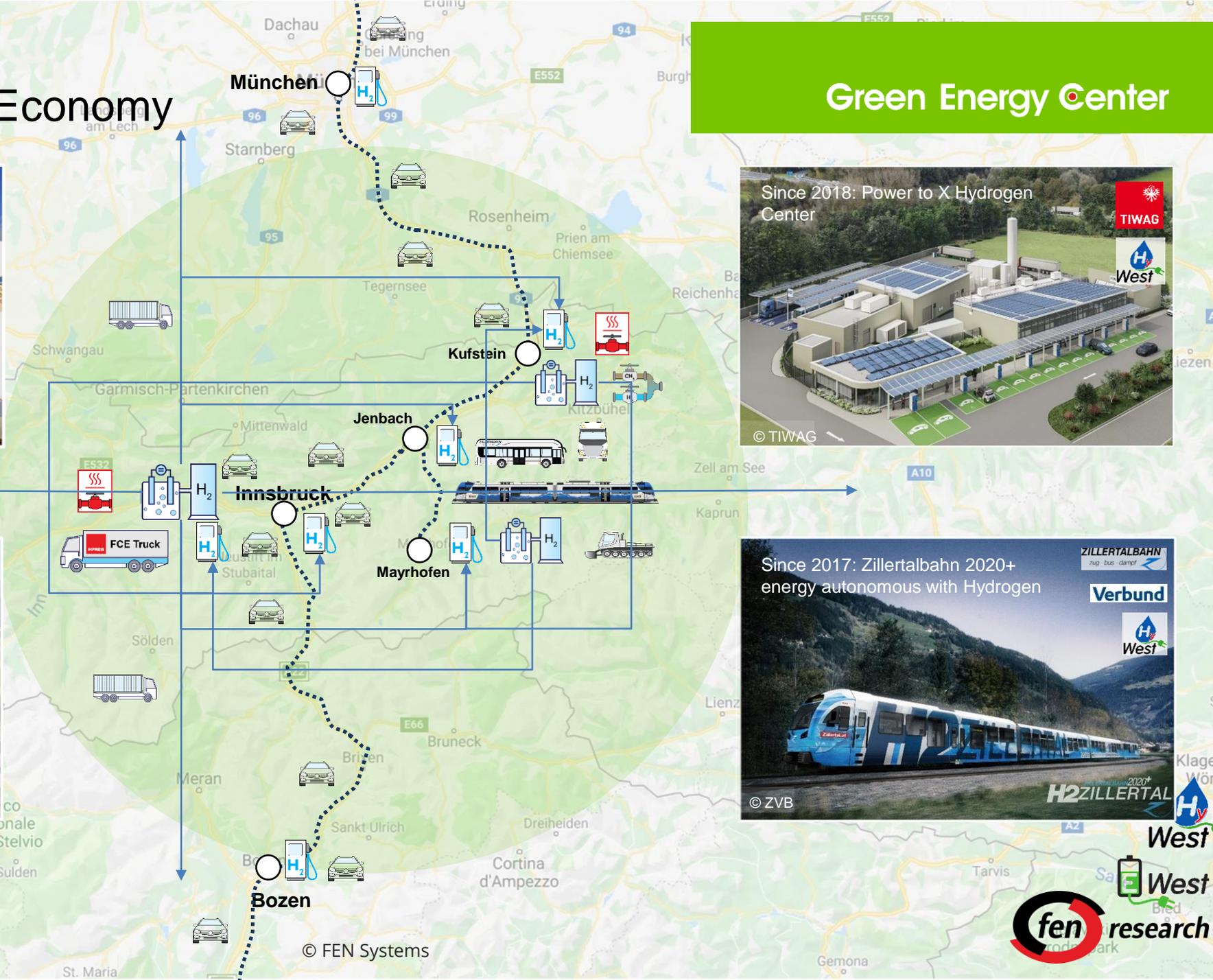
Substitution: 900.000 Liter Diesel/year = 2.400 tons CO2 equivalent/year





# Establishment Green Hydrogen Economy

**Green Energy Center**



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