When EVs and heat pumps help the power grid: EU research project CREED launches

A new European research project led by VIRTUAL VEHICLE is exploring innovative new approaches to how electric vehicles, heat pumps, batteries, and other flexible energy technologies can contribute to a stable power grid and make better use of renewable energy.

Graz, Austria – Oct.20, 2026

As Europe produces more electricity from renewable sources such as wind and solar power, one challenge is becoming increasingly important: electricity is not always produced at the same time it is needed. At the same time, millions of electric vehicles, heat pumps, home batteries and other energy technologies are entering everyday life.

The new European research project CREED – Cross-sectoral Renewable Energy-Enabled Demand management investigates how these devices can become part of the solution.

Rather than viewing electric vehicles, heat pumps or batteries simply as electricity consumers, CREED will investigate how their energy use can be intelligently coordinated. Charging an electric vehicle, for example, can potentially be shifted to a period when plenty of renewable electricity is available. Batteries can store energy for later use, while heat pumps and thermal storage offer additional possibilities to adjust when electricity is consumed.

The goal is to make electricity demand more flexible without compromising the needs of consumers – and thereby help distribution grids accommodate a growing share of renewable energy.

"The energy transition is not only about producing more renewable electricity. We also have to become smarter about when and how we use it," explains **Dr. Alois Steiner, CREED Project Coordinator at VIRTUAL VEHICLE.** *"Electric vehicles, heat pumps and storage systems offer*

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enormous potential for flexibility. With CREED, we want to find ways of using this potential intelligently while keeping the needs of citizens at the centre."

Artificial intelligence meets the electricity grid

To achieve this, CREED brings together expertise from the energy, mobility, building and digital technology sectors. Researchers will develop forecasting methods to better predict energy production, consumption and available flexibility. Digital Twins – virtual representations of physical systems – will model technologies including electric vehicles, heat pumps and thermal storage. The project will also combine different optimisation approaches. These include mathematical optimisation as well as Reinforcement Learning, a branch of artificial intelligence in which algorithms learn how to make decisions through interaction with their environment.

Together, these technologies are intended to help determine when and how flexible energy resources can be used while respecting the requirements of consumers and electricity grids.

Additionally, CREED will investigate new mechanisms through which flexibility can be coordinated and traded locally. This could provide new opportunities for distribution system operators, energy aggregators and energy communities to make use of the flexibility already available in homes, buildings and mobility.

From research to real energy systems

A central element of CREED is testing the technologies beyond individual computer simulations. The solutions will be demonstrated and validated across seven pilot sites in Austria, Germany, Portugal and the Czech Republic. The different pilots will allow the researchers to investigate the approaches under varying technical and regulatory conditions and examine how solutions can be transferred between countries and applications.

VIRTUAL VEHICLE coordinates international research consortium

The Graz-based research centre VIRTUAL VEHICLE Research GmbH coordinates the 30-month CREED project and is also responsible for leading its dissemination and exploitation activities.

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VIRTUAL VEHICLE will have a particularly strong role in the project's artificial-intelligence research. Its researchers will lead the development of Reinforcement Learning-based control and optimisation methods for managing flexible electricity demand at the level of individual prosumers and energy communities.

The research centre will also develop Digital Twins for electric vehicles, heat pumps and thermal storage systems and contribute to integrating and validating the technologies across the different pilot sites.

CREED brings together nine research and industry partners from across Europe:

VIRTUAL VEHICLE Research GmbH

University of West Bohemia

SEnerCon GmbH

Grazer Energieagentur GmbH

Reduxi DACH GmbH

Centrale Lille Institut

Instituto Superior de Engenharia do Porto (ISEP)

AEE – Institute for Sustainable Technologies

Hochschule Burgenland

Helping renewable electricity go further

CREED addresses a fundamental challenge of Europe's energy transition: increasing renewable electricity production also requires an energy system capable of responding when that electricity is available.

Making electricity demand more flexible could reduce pressure on local grids and allow existing infrastructure to accommodate more renewable generation. Instead of considering mobility, buildings, electricity storage and the grid as separate systems, CREED therefore investigates how they can work together.

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The project builds on research in smart charging and grid integration already being conducted in projects such as XL-CONNECT, which investigates smart & bidirectional charging of electric vehicles.

CREED starts on 1 October 2026, has a duration of 30 months and a total project budget of approximately EUR 1.29 million.

CREED Facts Overview

- **Full title:** Cross-sectoral Renewable Energy-Enabled Demand management
- **Project coordinator:** VIRTUAL VEHICLE Research GmbH, Austria
- **Start:** 1 October 2026
- **Duration:** 30 months
- **Project budget:** EUR 1.29 million
- **Pilot countries:** Austria, Germany, Portugal and the Czech Republic
- **Pilot sites:** 7
- **Consortium:** 9 partners

Project Funding & Disclaimer:

The project CREED was funded by the program "Clean Energy Transition Partnership (CETPartnership) under the Joint Call 2025" of the Austrian Federal Ministry for Innovation, Mobility and Infrastructure (BMIMI) and co-funded by the European Union. The project is supported by the CETPartnership and its members. Austrian Research Promotion Agency (FFG) has been authorised for the programme management.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the CETPartnership. Neither the European Union nor the granting authority can be held responsible for them.

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About VIRTUAL VEHICLE

Virtual Systems. Real-World Impact.

For more than two decades, VIRTUAL VEHICLE has been making **cutting-edge research accessible to industry.** In doing so, we draw on the experience gained from over 1,000 research and development projects.

An international team of **more than 250 experts in research and engineering** works in Graz. Together, we develop methods and technologies that make complex systems safer, smarter, and more efficient. Partners from industry and research rely on our expertise, particularly in the areas of **trustworthy simulation, autonomous systems, and software-based systems.**

Our expertise spans **automotive and rail, energy and healthcare technology, as well as maritime, defense, and aerospace.** We systematically transfer insights, methods, and solutions across these industries.

At the heart of our work is our **Virtual Assurance approach.** We combine simulation, artificial intelligence, digital twins, and physical testing to reliably evaluate and validate the behavior of complex systems under real-world operating conditions.

Throughout the entire lifecycle, we support our partners in **managing complexity, reducing risks, and bringing innovations to market faster** - from early development through operation to continuous improvement.

Virtual Vehicle Research GmbH is funded within the COMET K2 Competence Centers for Excellent Technologies by the Austrian Federal Ministry for Innovation, Mobility and Infrastructure (BMIMI), Austrian Federal Ministry for Economy, Energy and Tourism (BMWET), the Province of Styria (Dept. 12) and the Styrian Business Promotion Agency (SFG). The Austrian Research Promotion Agency (FFG) has been authorised for the programme management.

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Pictures & Download Links:

The **CREED European research project** explores innovative new approaches to how electric vehicles, heat pumps, batteries, and other flexible energy technologies can con-tribute to a stable power grid and make better use of renewable energy.

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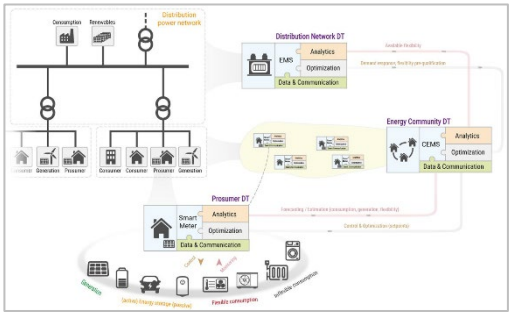

CREED Overall Methodology: CREED emphasizes the decoupling of complexity related to the observability and optimization of a holistic energy environment, aiming to enable the synergistic operation of diverse stakeholders. CREED targets the development of system integration comprehensive framework relying on decomposition of overall system complexity to three digital twinning technologies (DT Prosumer, Energy Community, Distribution Network), where three kinds of functionalities can be abstracted (Data & Communication, Analytics and Control & Optimization).

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