

*MS-RECONNECT*

Multi-Scale Resilience Enhancement and Coordinated Orchestration of Next-gen Networks for Energy and Coupled Traffic V2G systems

Abstract for the general public

English:

This project aims to boost international academic cooperation by bringing together top researchers from China and Poland. By working together, they hope to make groundbreaking discoveries in energy management and resilience. Currently, there's not enough data on how renewable energy sources interact with power electronics, power systems, and IT control systems. This collaboration will fill that gap by gathering new empirical and theoretical data.

The project focuses on managing urban energy microgrids, which are small-scale power grids. Key topics include:

- Modeling complex interactions between traffic and power systems.
- Detecting faults and improving resilience in vehicle-to-grid (V2G) systems under extreme conditions.
- Enhancing energy management and resilience in power-traffic microgrids using advanced optimization techniques.
- Developing a simulation platform for real-time testing and validation.

The research will use cutting-edge equipment and methods like data collection, machine learning, and optimization algorithms. The goal is to create predictive models for energy distribution and improve system resilience with real-time monitoring and adaptive control. A key part of the project is a simulation platform that uses digital twin technology for large-scale simulations.

By combining advanced modeling with real-world data, this project aims to develop accurate, robust, and scalable solutions for urban energy and transport management. The collaboration will also foster cross-disciplinary innovation and accelerate the transition from theory to experimental verification. Bilateral visits and workshops will help build long-term cooperation and a better understanding of local needs.