RESili8

Resilience for Cyber-Physical Energy Systems

> *RESili8 aims at improving resilience for cyber-physical energy systems through new methods used in planning, implementation, and system operation.*

Resilience for future energy systems cannot be ensured by over-provisioning, as is done today. It is not socially sustainable and cannot address the complexity and challenges of the digital transformation that energy systems are undergoing. Resilience thinking and practice for energy systems needs to be reinvented.

RESili8 does this through a novel resilience solution package for cyber-physical energy systems, including optimal and sustainable planning and AI-based analysis of resilient architectures, continuous implementation and validation of resilient applications, and new solutions for resilient operation of energy systems.

This innovative solution package will advance the green energy transition by ensuring security of supply and facilitates the further integration of green energy technologies.

RESili8 is executed by leading European research institutes, industry, and need-owners, working together to develop and test the RESili8 solution in lab and pilot demonstrations.

Project Duration

01.05.2022 - 30.04.2025

Project Budget

Total Budget: € 2,059,530.-
Funding: € 1,555,100.-

Project Coordinator

AIT Austrian Insititute of Technology GmbH (Austria)

Project Partners

- Wiener Netze GmbH (Austria)
- OFFIS e.V. (Germany)
- Fraunhofer Institute for Solar Energy Systems ISE (Germany)
- Solandeo GmbH (Germany)
- KTH Royal Institute of Technology (Sweden)
- Dlaboratory Sweden AB (Sweden)
- Eindhoven University of Technology (Netherlands)

Project Website

www.resili8-project.eu

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ERA-Net Smart Energy Systems Joint Call 2020 (MICall20)

This project has been awarded funding within the ERA-Net SES Joint Call 2020 for transnational research, development and demonstration projects. 22 Mio EUR of funding have been granted to 21 projects active in 17 regions and countries.

ERA-Net Smart Energy Systems

Main Objectives

Resilience engineering support: Based on inputs from need-owners, RESili8 will develop a toolkit that will support system operators to optimally design, plan, and evaluate cyber-physical system architectures that ensures system resilience and are future-proof against new scenarios, such as sector coupling, and at the same time consider a trade-off between system quality attributes and (social) sustainability.

Implementing resilient applications: To be resilient, all parts of the system must be implemented accordingly, which also includes applications such as control and monitoring functions. In RESili8, an implementation and validation solution will be developed, which can significantly reduce the time-to-market of new strategies. This will allow stakeholders (e.g., system integrators and operators) to exhaustively and rapidly test and refine their solutions at the system level, before deploying them in the field, which in turn will increase the total system security.

Resilience runtime support: Today, resilience is mostly assured by planning for worst case scenarios. This is usually achieved through over-provisioning, which is expensive and not sustainable. RESili8 proposes a runtime support system for increasing resilience in energy systems, which will be able to suggest—and execute—actions that will recover a system back to a normal state. This can be a mixture of physical actions (e.g., switching, load curtailment) and cyber actions (e.g., deploying new functionality, update security measures).

Main Results

The main result from RESili8 will be a novel resilience solution package with three central innovative contributions.

- Resilience engineering, planning and evaluation support, where RESili8 will create a new toolbox for the analysis of complex system architecture, as well as provide a facility to derive resilient operation strategies.

- RESili8 will integrate modern software development and integration solutions, which will be combined with an innovative validation framework for rapid iterations of development-integration-test cycles.

- RESili8 will create new solutions for resilience runtime support based on an AI-concept for learning new strategies to counter existing and new threats.

**Joint Programming for Flourishing Innovation –
from Local and Regional Trials towards a Transnational Knowledge Community**

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