



## POLICY MAKERS EDITION








### BACKGROUND

The energy system in Europe is in a process of profound transformation. It is faced with many changes that affect how energy producers, operators, regulators and consumers interact in an increasingly complex environment. Challenges include the growing share of renewable and decentralized generation, the progressive increase in energy efficiency along the whole energy value chain, the increasing need for flexibility in the energy system, the emergence of the consumer as an active player in the energy system and the appearance of new market roles.

MERLON will develop and provide a holistic framework for the operational optimisation of local energy systems at remote and isolated areas/villages and will allow for the maximum integration of renewables at the local energy system towards realising ambitious decarbonisation goals at the local level, while contributing at the same time to the global decarbonisation goals set at EU level. Optimisation in MERLON applies to multiple levels spanning optimal coordination of local generation as well as flexibility provision to facilitate maximum integration of renewable energy, avoidance of curtailment and satisfaction of balancing/ancillary grid needs.

### OBJECTIVES

Among others, MERLON aims at significantly contributing to the short-, mid- and long-term EU energy policy targets and facilitate the realisation of multiple benefits, mainly focusing on:

-  The significant reduction of GHG emissions
-  The decrease of electricity prices through the introduction of cheap electricity sources in the market displacing electricity from conventional plants
-  Better electricity market integration by eliminating technical barriers that prohibit the full absorption of intermittent renewables generation in the energy system
-  Enhanced security of supply and independence from energy imports
-  More democratised energy markets, enabling the proportional and fair sharing of benefits between all involved stakeholders

### SOLUTION

MERLON introduces an "open" and modular end-to-end interoperability and data management framework that will offer single, open-standards-based interfaces for ensuring smooth and seamless communication and data exchange between all actors, systems and components involved in the value chain of integrated local energy systems. The MERLON interoperability and data management framework couples proven technologies to ensure end-to-end interoperability between local energy management systems, demand response optimisation systems and flexibility sources management systems, while being enhanced with the appropriate intelligence to enable flexibility control optimisation. Built on this backbone, the MERLON solution will be totally open for utilization by any third party interested to get involved in optimisation of local energy systems. Moreover, the modular character of the MERLON solution allows for its easy deployment in different contexts and locations.



## POLICY MAKERS EDITION

# MERLON

WHAT'S IN IT  
FOR ME?

### WHY SHOULD WE CARE?

The Clean Energy for all Europeans Package empowers European consumers to become fully active players in the energy markets. MERLON will build on that and take special provisions and "invest" in local citizen engagement and relevance, by establishing a concrete framework characterized by the following principles:

- Delivery of a human-centric flexibility control optimisation framework
- Minimisation of intrusiveness
- Provision of personalised support to consumers towards figuring out the best option for their unique situation, through flexibility profiling and flexibility strategy shaping, considering also the comfort and indoor environment quality requirements of each individual occupant in the built environment
- Promotion of transparent and fair distribution of the benefits achieved through the utilization of prosumer flexibility
- Enhanced data privacy and protection, to significantly enhance local acceptance

Special focus within the project is also given on standardisation issues and policy & market reform as key enablers for the successful distribution of the MERLON solution. Additional attention is given on establishing knowledge transfer and synergies with similar projects and projects listed under the BRIDGE Initiative to further reinforce and catalyse collaborative advancements in research, innovation, regulatory and market issues around integrated local energy systems.

### GOOD TO KNOW

In the context of the evolving electricity grid and in order to effectively accommodate the upcoming challenges from the anticipated large-scale integration of variable distributed renewable energy sources, MERLON and the integrated local energy systems optimisation framework it introduces, will offer the required flexibility volumes that are needed not only for balancing demand and supply, but also for enhancing stability and reliability through voltage/frequency regulation and other ancillary services.

Enabling such large integration of renewables into the distribution grid will allow the avoidance of the anticipated curtailment of variable renewable energy sources in the high-RES scenario of the EU Energy roadmap 2050, estimated at 217 TWh. Subsequently, additional investments in conventional generation capacity will be avoided, offering significant economic savings in investments for peak generation capacity and respective transmission and distribution grid reinforcements.

The avoidance of this extra conventional generation capacity, achieved by maximisation of integration of renewable energy sources, will lead to 100 million tons of CO2 emissions reduction annually, while the (almost) full decarbonisation of the electricity grid with the integration of large shares of renewables (over 90%) until 2050 will result in over 1 billion tons annual CO2 emissions reduction.



# WWW.MERLON-PROJECT.EU