

Consortium

INCREASE is oriented at delivering tools and solutions to DSOs. To ensure that these tools and solutions are well accepted and fit the needs of this target group as much as possible, 4 DSOs from different regions in Europe are partner in the project, apart from several research institutes and industrial partners.

Austria

■ **Energie Netze Steiermark**
www.e-netze.at



■ **JOANNEUM RESEARCH**
www.joanneum.at



Belgium

■ **Eandis**
www.eandis.be



■ **Elia**
www.elia.be



■ **Ghent University**
www.ugent.be



Greece

■ **Aristotle University of Thessaloniki**
www.auth.gr



■ **ILPRA (Greece)**
http://ilpra.gr



Netherlands

■ **Liander**
www.liander.nl



■ **MASTERVOLT**
www.mastervolt.com



■ **Technische Universiteit Eindhoven**
www.tue.nl



Slovenia

■ **Elektro Gorenjska**
www.elektro-gorenjska.si



■ **KORONA**
www.korona.si



■ **University of Ljubljana**
www.fe.uni-lj.si



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Increasing
the penetration of
renewable energy sources in the
distribution grid by developing control
strategies and using ancillary services.

More information about the project:
www.project-increase.eu



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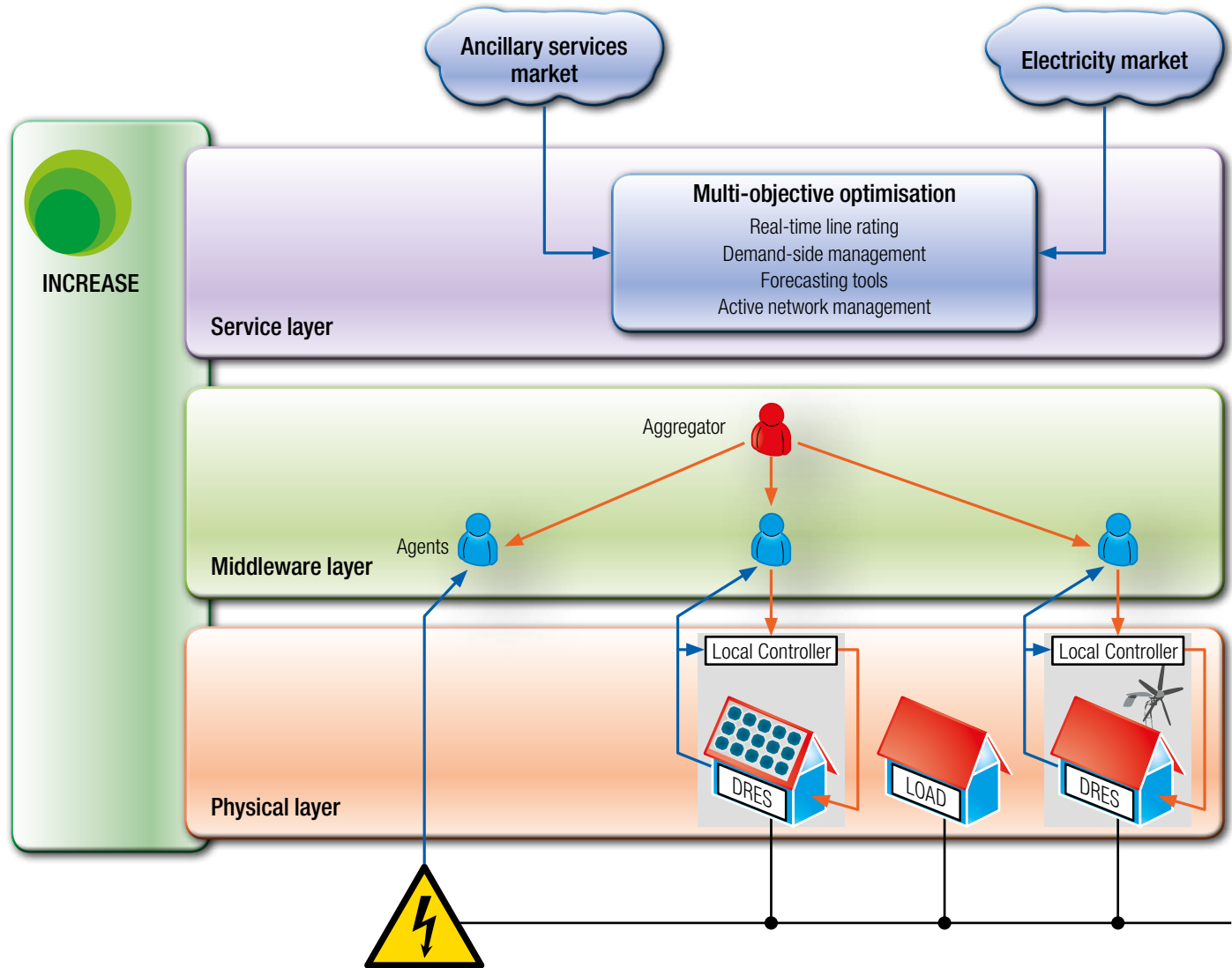
Challenge

- The significant rise in distributed renewable energy sources has placed an enormous burden on the secure operation of the electrical grid, impacting both the transmission system and the distribution system operators.
- The massive increase of the intermittent Distributed REnewable Resources (DRES) in Low Voltage (LV) and Medium Voltage (MV) networks has led to a bidirectional power flow which raises the urgent need for new operational and control strategies in order to maintain the ability of the system to provide consumers with reliable supply of electricity at an acceptable power quality level and cost.
- INCREASE wants to focus on how to manage renewable energy sources in LV and MV networks, provide ancillary services towards Distribution System Operators (DSOs) but also towards Transmission System Operators (TSOs), in particular voltage control and the provision of reserve.

Objectives

- INCREASE investigates the regulatory framework, grid code structure and ancillary market mechanisms, and proposes adjustments to facilitate successful provisioning of Ancillary Services (AS) necessary for the electricity grid operation, including flexible market products.
- It enables DRES and loads to go beyond just exchanging power with the grid which will enable the DSO to evolve from congestion to capacity manager. This will facilitate higher DRES penetration at reduced cost.
- The simulation platform will enable the validation of the proposed solutions and provides a tool for the DSOs to investigate the DRES influence in their network.
- Not only by lab test at TU/e and at Lemcko (UGent), but also real field trials in Austria, Slovenia and the Netherlands will validate the INCREASE solutions.

INCREASE solution



This figure depicts the main target of INCREASE, here for the example of the LV grid (for the MV grid INCREASE also proposes a similar solution).

The **physical layer** represents buildings connected to the existing power grid, some equipped with PV panels, a wind turbine or a CHP, others without any renewable energy source. All of them are linked to a local controller, but not to each other. Therefore INCREASE aims

at the development of control strategies for inverter-connected units: local control for obtaining a reliable network and by using agents and aggregators in a **middleware layer** to obtain an optimal network. The agents allow communication and as a result the optimization of the penetration of power into the grid is achieved. The **service layer** consists of tools optimizing the whole process by using multi-objective optimization methods.