



www.dream-smartgrid.eu

Collaborative Project

Distributed Renewable resources Exploitation in electric grids through Advanced heterarchical Management

Planned project outcomes

Exploit distributed intelligent devices, smart and self-organizational solutions with market driven prosumers involvement to draw future distribution grid architectures.

Allow for larger amounts of distributed generation from renewable energy sources by leveraging new coordinated response methods, decreasing costs without compromising quality of service.

Validate the concept on different grid types and propose evolution for wider contribution by energy distribution players and final users to more efficient management of demand/response, congestion and contingency conditions.

The DREAM project will lay the foundations for a novel heterarchical management approach of complex electrical power grids, providing new mechanisms for stable and cost effective integration of distributed renewable energy sources, as well as for enhanced consumer involvement in economic and ecological electricity use.

Applying the principles of autonomous agent-based systems to the control and management of the electricity distribution grid will allow the system to constantly adjust to current operational conditions and make it robust to exogenous disturbances. In turn, this will allow for greater penetration of intermittent resources and will make the distribution grid more resilient to failures. DREAM will include several layers of controls for normal, congested and post-contingency situations that will use different coordination strategies ranging from market-based transactions to emergency demand response and create ad-hoc federations of agents that will flexibly adjust their hierarchy to current needs.

The system will transition smoothly between control layers depending on local operational conditions, so that responses to disturbances will be sized precisely, margins will be used parsimoniously and full network flexibility will be tapped. The system will involve only limited data transfers and no centralized control, promoting extensibility, heterogeneity and easy deployment across countries with different network architectures and hardware manufacturers.

DREAM will demonstrate the economic and technical feasibility of these novel control mechanisms thanks to several real-world small-scale pilots dedicated to different use-cases, and computer simulations will be used to study further scalability.

Furthermore, economic viability will be modelled and examined for the various actors in the grid taking into account the unpredictability of consumer power production, market dynamics, novel regulation schemes and the adoption of DREAM mechanisms over time.



DREAM is a Collaborative Project funded by the European Commission under FP7 grant agreement 609359





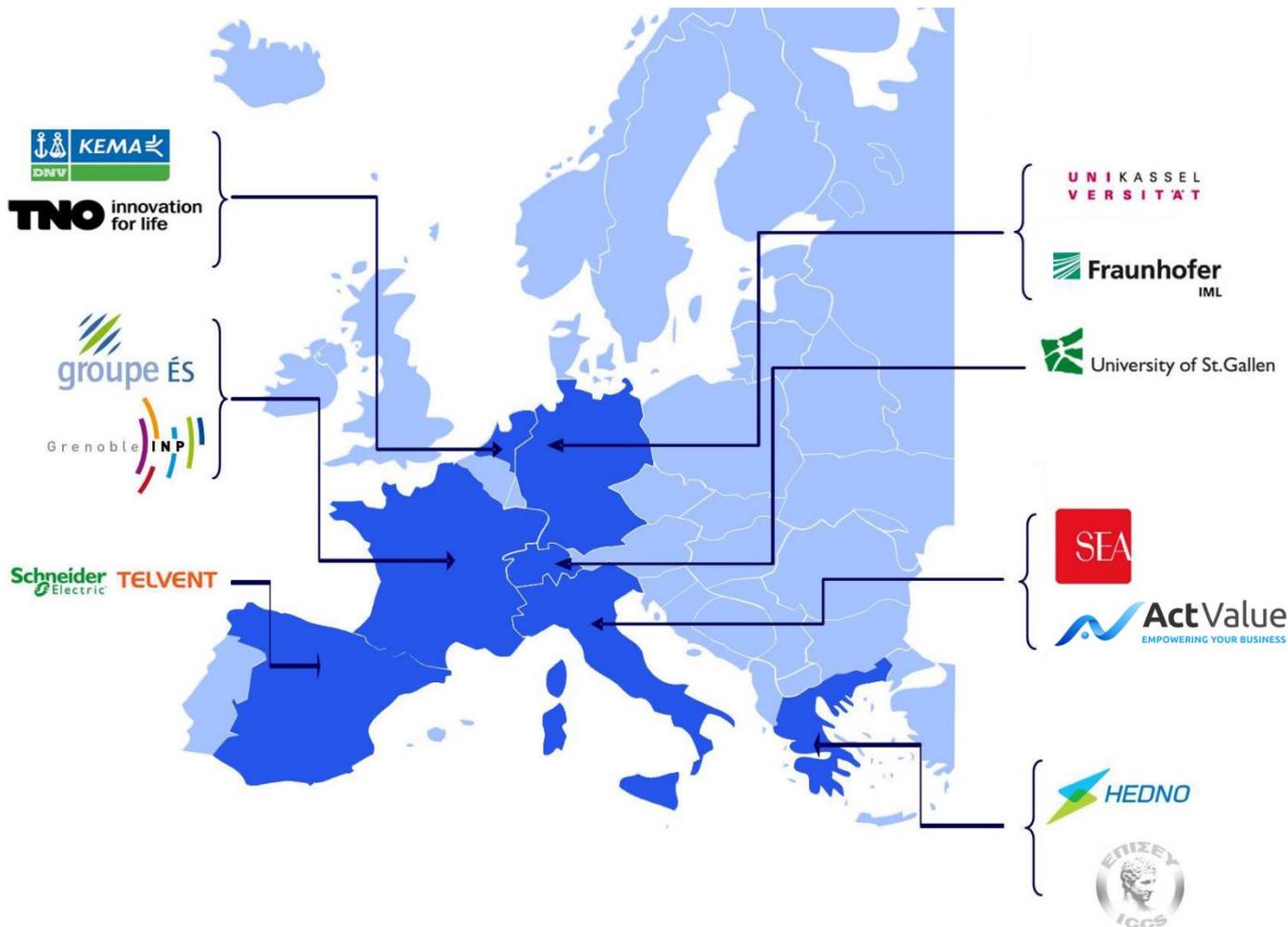
www.dream-smartgrid.eu

Consortium and main Figures

12 partners

7 countries

3 types of players
(DSOs, R&D centers, ICT & manufacturing Industry)



Effort nearly 600 person-months

36 month duration

Project Coordination

Ass. Prof. Raphael Caire, Institut Polytechnique de Grenoble

Raphael.Caire@G2Elab.grenoble-inp.fr



DREAM is a Collaborative Project funded by the European Commission under FP7 grant agreement 609359

