



How to optimize the overproduction of photovoltaic electricity into the grid with the utilization of ICT infrastructure – The Orpheus project

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The OrPHEuS project elaborates hybrid energy network control strategies for smart cities implementing novel cooperative local grid and inter grid control strategies for the optimal interactions between multiple energy grids. The OrPHEuS project aims at optimising the synergies between multiple energy grids by enabling simultaneous optimization for individual response requirements, energy efficiencies and energy savings as well as coupled operational, economic and social impacts.

The project will investigate the implementation of the control strategies on specific use cases scenarios in two demonstration sites located in the City of Skellefteå in Sweden and in the City of Ulm in Germany. The operational focus of the project is the cross-domain coupling of energy infrastructures in order to increase energy efficiency through energy transformation and grid coupling. In particular, the project researches scenarios for transition between energy resources and flexible infrastructures e.g. along Power-to-Heat processes. In particular, balancing of fluctuating renewable energy generation against the flexibility in supply, demand and storage capacities within the power grid and via process coupling across energy networks will be investigated. The project will look on technical as well as socio-economical aspects considered as multi-dimensional strategy framework.

With respect to the hybrid energy characteristics, both demonstration sites are quite distinct. At the Sweden demonstration site, the reduction of vertical production (unsustainable because of fossil fuels) is in the centre of the targeted control strategies. Looking on the specifics of the Ulm testing site, the major issue is the balancing of the high penetration of solar generation under today's operation with a pre-dominant operational challenge for PV control. The key focus is to define control strategies to increase the intake of the energy supply from PV on the roof generation into the grid while maximizing the benefits for the low voltage power grid.

The OrPHEuS project is a European project, co-financed by the European Commission under the 7th Framework Programme. The project started in September 2013 and will end in August 2016. The poster intends to inform the energy meteorology community about this activity.