Picture: PlaMES Kick-Off Meeting, Aachen.

PLAMES – INTEGRATED PLANNING OF MULTI-ENERGY SYSTEMS

Fraunhofer Institute for Applied Information Technology FIT

Schloss Birlinghoven
53754 Sankt Augustin | Germany

Director
Prof. Dr. Stefan Decker (executive)
Prof. Dr. Matthias Jarke

Digital Energy
Maria Vasconcelos
+49 241 80-93039
maria.vasconcelos@fit.fraunhofer.de
www.fit.fraunhofer.de

Project partners
RWTH Aachen
University of Bologna
Optit S.R.L.
Osmangazi Elektrik Dağitim Anonim Sirketi
Fraunhofer FIT

Climate goals targeting a carbon-free economy induce new challenges for energy systems and thus the need for comprehensive planning tools. These tools should permit identifying both the target systems and transitions paths.

The targeted decarbonization process requires a transformation of the existing system characterized by a mainly fossil generation towards a power supply based on renewable energy sources (RES) such as photovoltaic, wind, hydropower and biogas / biomass. Due to the confinement of renewable generation to the electricity sector, a cross-sectoral decarbonization requires a widespread electrification of flexible assets and loads. The deployment of RES as well as the cross-sectoral electrification lead to a decentralization, which arises new challenges for energy systems. All things considered, a fundamentally new and complex planning task results for the development of sustainable energy systems.

The goal of the H2020 research project "PlaMES" is the development of methods for the integrated planning of multimodal, sustainable energy systems. The formulation of the underlying optimization problem envisages first the identification of all relevant technical energy system components and degrees of freedom. The latter shall include, in particular, the interdependencies between plants and infrastructure expansion as well as innovative operational strategies.

Furthermore, the exogenous influencing factors, such as the legal-regulatory framework or the forecasted price developments will be considered. By applying suitable mathematical methods, the resulting optimization problem is then decomposed and efficient solvers are devel-oped. Finally, the project team will compile a pan European scenario framework based on a comprehensive database containing representative subsets of European energy system models. The exemplary application of the tool enables the evaluation of the economic added value of an integrated energy system planning for achieving the climate goals in the European context.