

## ANNEX

1)

### **Prof. Dr. Mario Ragwitz**

Director of the Fraunhofer Institution for Energy Infrastructures and Geothermal Systems (IEG)

Professor Mario Ragwitz is Director of the Fraunhofer Institution for Energy Infrastructures and Geothermal Systems (IEG) since December 2019. Before that, he was Deputy Director of the Fraunhofer Institute for Systems and Innovation Research ISI in Karlsruhe.

As scientific director of the Fraunhofer Cluster of Excellence "Integrated Energy Systems" he coordinates the joint research of eight Fraunhofer Institutes in the field of energy system transformation, since 2019. He was also appointed as spokesman of the Fraunhofer Hydrogen Network in April 2020, which coordinates the work of 35 institutes in this field. He holds a chair in "Integrated Energy Infrastructures" at the Brandenburg University of Technology, a position as an honorary professor at the Albert-Ludwigs-University of Freiburg and is part-time professor at the Robert Schuman Centre for Advanced Studies at the European University Institute in Florence.

2001 Ph.D. University of Wuppertal

1998 - 2002 Max-Planck-Institute for Physics of Complex Systems

2002 - 2019 Fraunhofer-Institute Systems and Innovation Research

2019- Fraunhofer Research Institution for Energy Infrastructures and Geothermal Systems

2022- Brandenburg University of Technology

2)

## **Hydrogen infrastructures in an integrated European energy system – determinants and modelling options**

Mario Ragwitz, Benjamin Pfluger

**Fraunhofer IEG**, Research Institution for Energy Infrastructures and  
Geothermal Systems, Gulbener Str. 23 | 03046 Cottbus | Germany

E-mail of the corresponding author: [mario.ragwitz@ieg.fraunhofer.de](mailto:mario.ragwitz@ieg.fraunhofer.de)

Hydrogen infrastructures need to be planned as part of an integrated energy system considering the spatial and temporal evolution of demand, supply and related infrastructures for electricity and natural gas. Thereby also the demand and supply will need to be assessed for all energy carriers of a future energy system. We will show how a system planning approach will consider these elements in a holistic manner and that future energy systems need to be planned based on such a paradigm. The optimal infrastructure expansion and topology will be determined based on modern modelling techniques called “grid-based multi-energy-system-models”. We will show first results for the European energy system using such an integrated planning approach.