

Context-Based Evaluation of Dynamic Coupling Effects in Integrated Energy Systems

Christine Settgast*, Anne Hagemeier

Fraunhofer Institute for Environmental, Safety, and Energy Technology UMSICHT, Osterfelder Straße 3, 46047 Oberhausen, Germany

* Phone: +49 208 8598-1534, E-Mail: christine.settgast@umsicht.fraunhofer.de

Motivation

- Integration of energy systems to compensate fluctuating infeed of renewable energy systems
- Project IntegraNet: Investigation of energy systems integration potentials in Germany
- Focus on grid-bound sectors, i.e. electric, gas, thermal

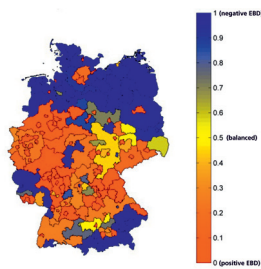


Figure 1: Estimated regional differences of balancing demand in Germany due to consumption and high infeed of RE in 2050 [1]

Problem

- Metric-based evaluation of technological, economic, and ecologic potentials of integrated energy systems
- Context-based evaluation of coupling technologies for different balancing objectives

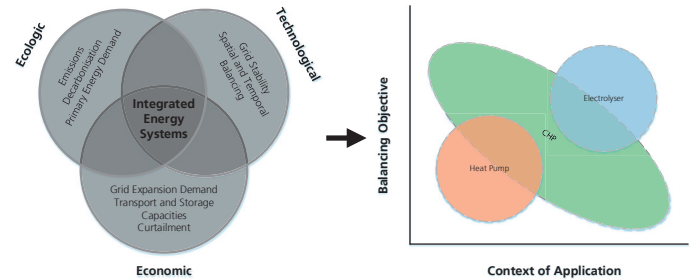


Figure 2: Investigation of context-based balancing potential for different coupling technologies according to technological, economic, and ecologic metrics

Approach



[1] C. Beier, P. Bretschneider: Modellbasierte, regional aufgelöste Analyse des Bedarfs an netzgekoppelten elektrischen Energiespeichern zum Ausgleich fluktuierender Energien. Oberhausen, 2013

[2] Bundesnetzagentur: Zahlen, Daten und Informationen zum EEG. 2016

[3] P. Favre-Perrod, M. Geidl, G. Koeppel, B. Klöckl: A Vision of Future Energy Networks. IEEE Inaugural Conference and Exposition in Africa, Durban, South Africa, 2005