

Challenges of RES Integration

IRENA Innovation Week "The Age of Renewable Power" Bonn, 13 Mai 2016 Olivier Feix





50Hertz - part of the Interconnected European Electricity System





RES Integration has been extremely successful in the 50Hertz grid area

Installed capacity of RES in the 50Hertz grid area [MW]

Feed-in of RES in 50Hertz grid area [TWh]





In 2015 RES electricity production covered approx. 49% of electricity consumption in the 50Hertz grid area.



German Transmission Grids are heavily congested and have to be extended

50Hertz congestion costs [Mio. Euro]

Grid expansion projects



In 2015 German congestion costs at transmission level exceeded 1 billion Euro.

Olivier Feix / Bonn, 13.5.2016

Quellennach



Flexibility is key for ensuring secure RES integration



Power ramps Germany 2013

Solar eclipse 2015

New and improved market products, a level playing field for flexibility technologies and interconnected RES areas allow the integration of large quantities of variable RES.

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High Flexibility potentials are available waiting for technical and commercial realization

50Hertz cooperation with DSOs on ancillary services

- Cooperation with DSOs on development of new concepts for the integration of renewable energies into ancillary services
- Mutual data exchange as essential prerequisite

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- WindNODE project as real-life lab for the intelligent energy system of the future
- 50Hertz with more than 70 partners



Innovative flexibility solutions

Wind power in control reserve market Start of pilot phase: wind power plants can be prequalified for negative tertiary control power.

In February 2016 a pool of two windfarms (60 MW) was prequalified in the control area of 50Hertz.

- New batteries
- Electric boilers
- Industrial facilities





Communication and coordination based on intelligent IT systems is a key success factor.



European market integration will facilitate further increase of intermittent RES

Offshore interconnections with our Nordic partners

- Combined Grid Solution
- Germany Denmark
- Interconnection between offshore wind farms
- Capacity of ~ 400 MW
- Hansa Power Bridge
- Germany Sweden
- > Subsea interconnection
- Synergy between wind & hydro
- ➤ Capacity of ~ 700 1400 MW





European Market Coupling



Markets will become more short term to accommodate for increasing fluctuation.



Summary: Elements for a successful Energy Transition

