
Policy and regulatory frameworks for German and European grid planning

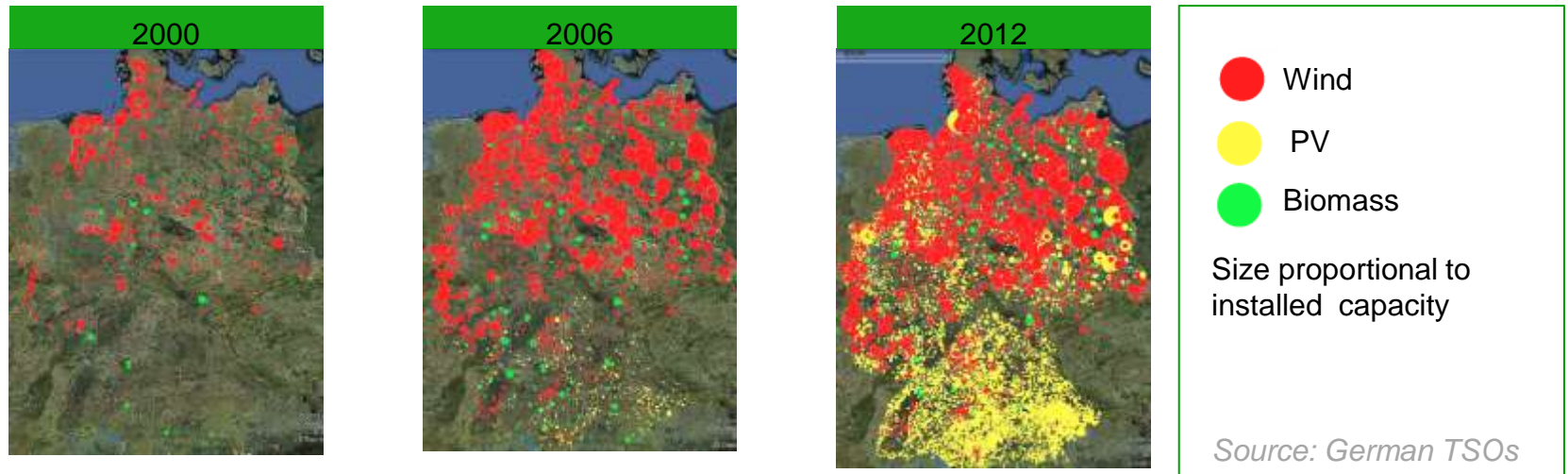
Workshop on “Forecasting, Balancing and Scheduling of Renewable Energy”

Delhi, 5/6 May 2014

Theresa Schneider

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1. **Options to balance variable energy in Germany: from short to long-term**
 2. The balancing power of an integrated European grid
 3. The Renewables-Grid-Initiative

TSOs in Germany manage increasing shares of Variable Renewable Energy (VRE)



- TSOs are used to dealing with fluctuating demand – decades of experience and data for demand drivers
- BUT: Are established measures sufficient to tackle also fluctuating supply side?

Two main acts that form the basis for grid operation and development

1. Energy Industry Act

- General structure of electricity and gas markets
- Grid operation and development
- TSO measures to balance grid

2. Renewable Energy Act

- Guaranteed feed-in tariffs and connection requirement
- Priority access

German Industry Act foresees different means to balance the transmission grid

1. Grid related means

2. Market related means

3. Feed-in management
- conventional
- RES

Grid development

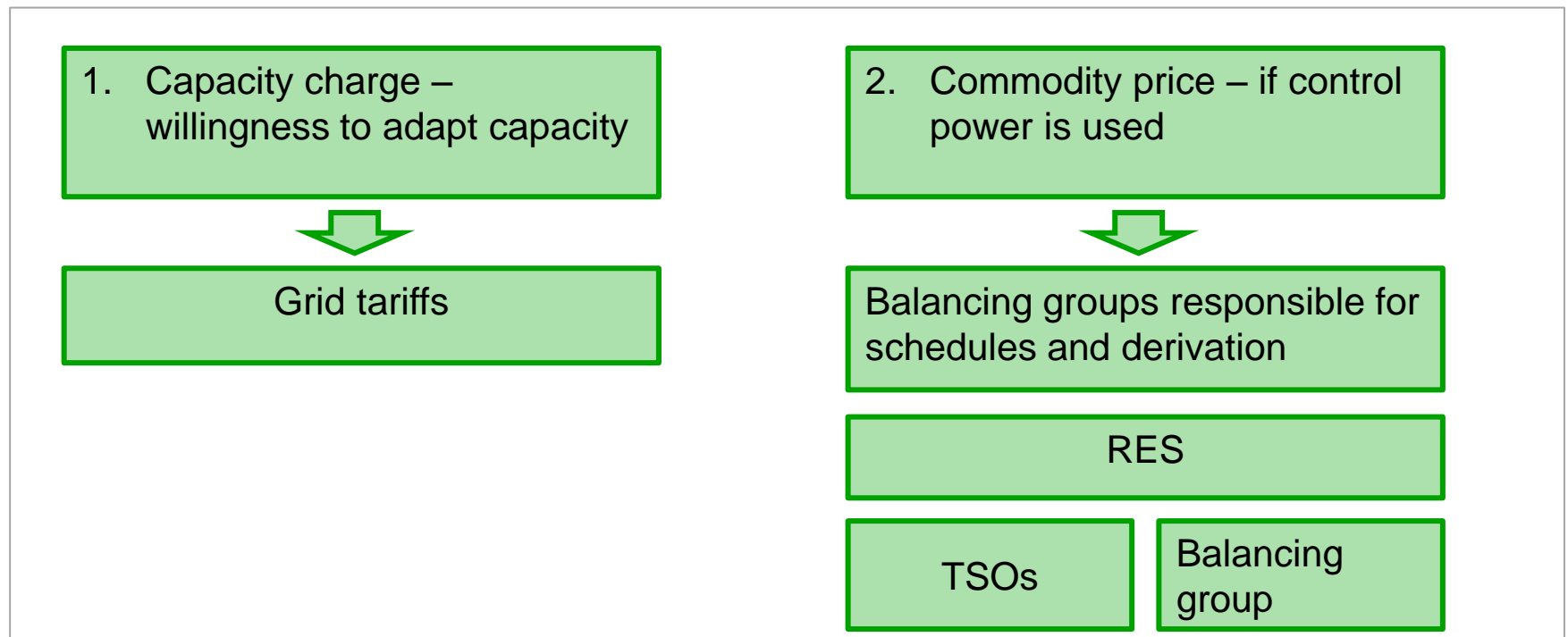
- German
- Regional/ European



Control and balancing power – who bears the costs?



- Primary, secondary control power and minute reserve
- Price: weekly or daily tender for reserve requirements by TSOs
- 7.000 MW positive control power, 5.500 MW negative control power

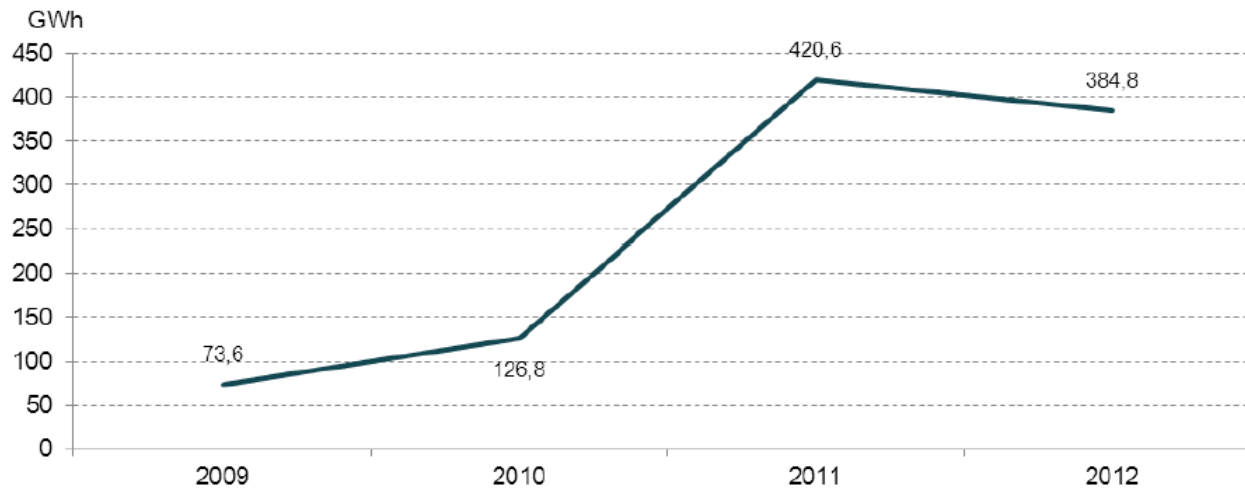


Curtailment of RES: last resort for TSOs



- Grid cannot transmit produced energy – TSOs manage feed-in
- Decrease 2011 – 2012: beneficial weather and grid enforcement
- Refunding cost: ~33 Mio in 2012 – refinanced by grid tariffs possible

RES electricity production shortfall



Source: monitoring report of German regulator

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Grid development

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Grid development can reduce need for ad hoc measures



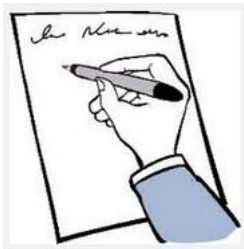
Grid development has potential to

- close the geographical gap between demand and supply
- help to balance variable RES through geographical spread
- reduce need of TSOs to actively curtail power plants
- reduce need for balancing power

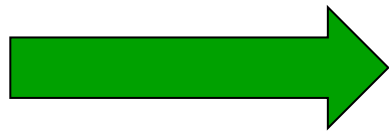
How can we ensure right grid that enables future energy system?



- National grid planning has been introduced in 2011 as part of unbundling process
- Increases transparency and robustness
- Challenges mostly related to uncertainty about future energy system – e.g. forms and geographical spread of generation, availability of technologies, consumption patterns
- Societal effort that needs know-how from different actors, such as generators, DSOs, academia, NGOs



2014

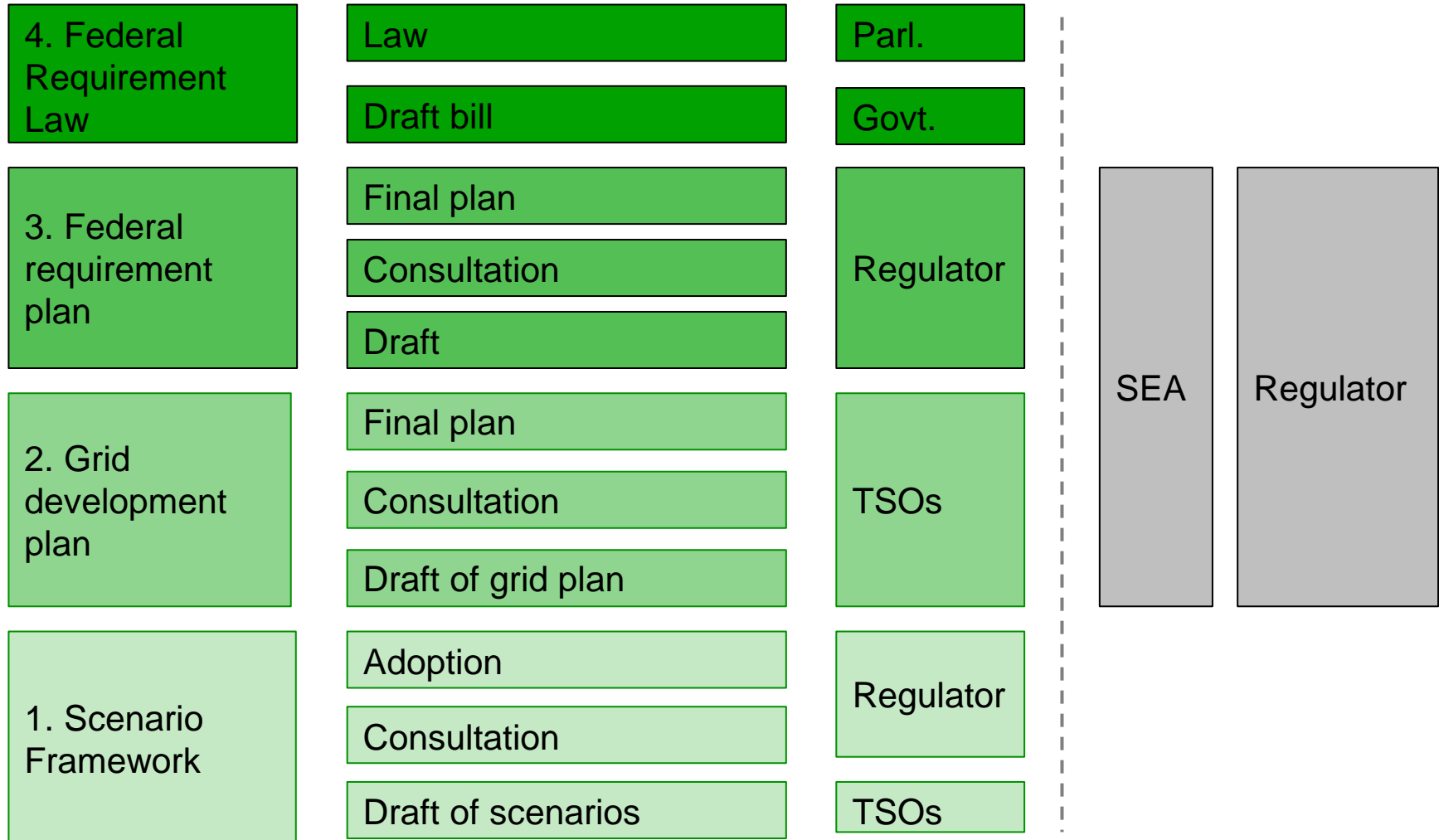


2024

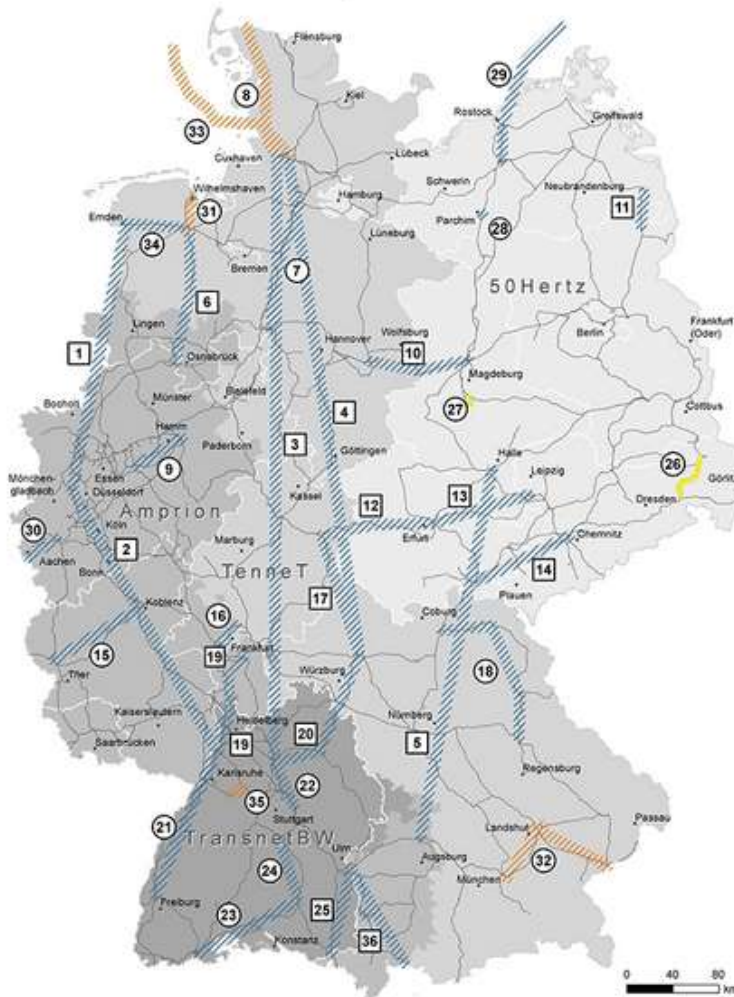





2074+

10-year grid plan for 2024 with expected 40 % RES



First Grid Requirement Act has been adopted in 2013



-  Projects in Federal Requirement Law
-  Projects before/in plan approval procedure
-  Projects with permit/ in construction

Costs: grid tariffs in control area of occurred development project

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Extending the grid over larger regions decreases variability

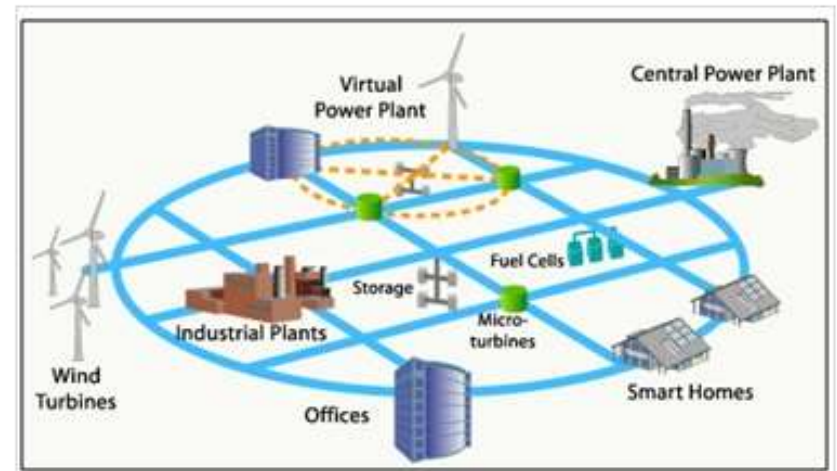
Figure S.5: Example of smoothing effect by geographical dispersion



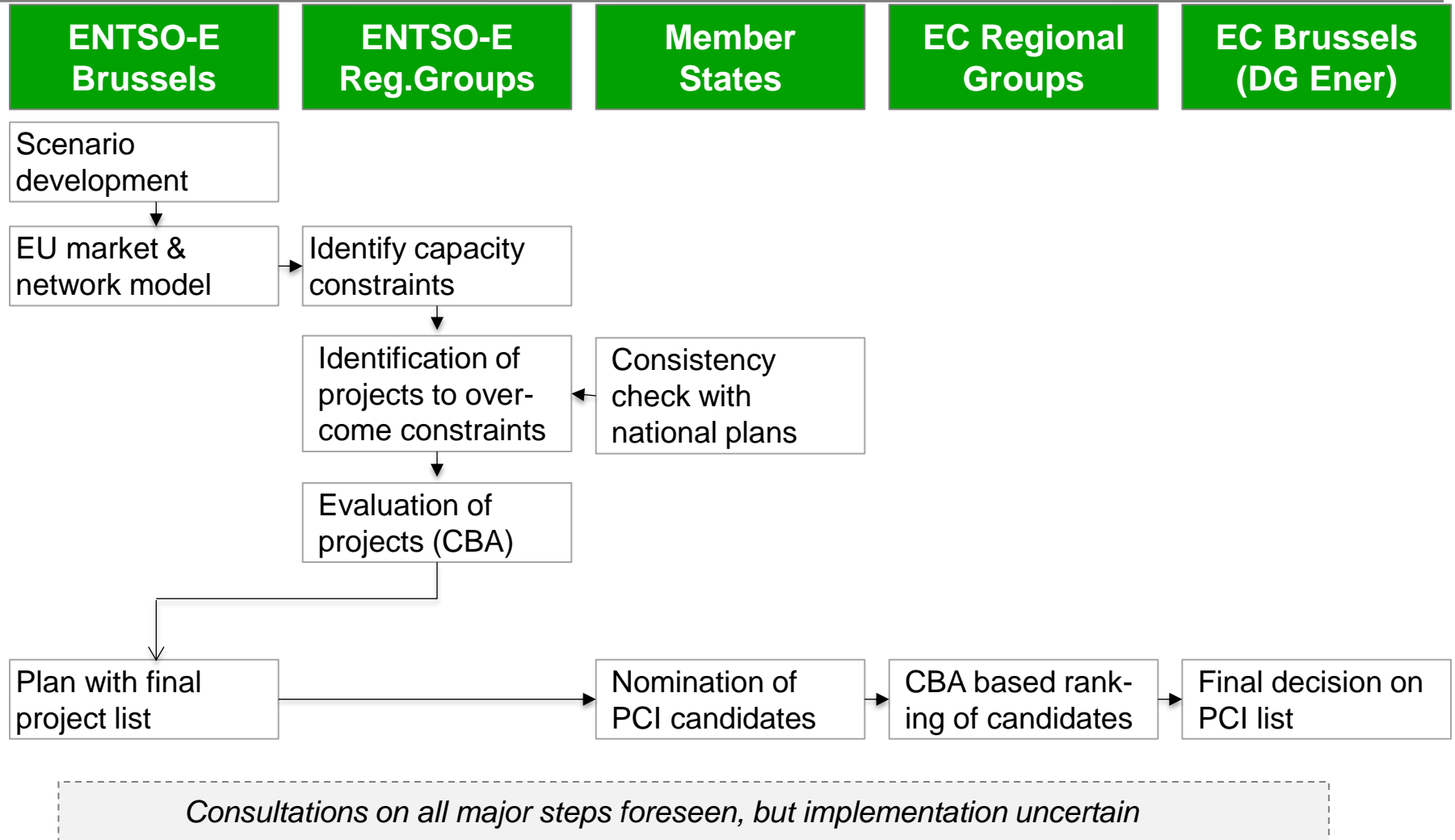
Note: The figure compares the hourly output of wind power capacity in four situations, calculated with simulated wind power. The simulations are based on December 2000 wind speeds and wind power capacity estimated for 2030.

Source: www.trade-wind.eu

Harnessing benefits of geographical spread through the SuperSmart Grid



European Grid Planning helps to identify “Projects of Common European Interest”



Projects of Common Interest benefit of preferential status

- Selected PCIs can benefit from three areas of support
 - Faster, more efficient permit granting procedures (3.5 year time limit)
 - Improved regulatory treatment
 - Possibility to access financial support
- However: local opposition key challenge to receive public support

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RGI right forum to bring together different stakeholders and discuss challenges

“Promoting 100% integration of electricity produced from renewable energy sources into the grid”



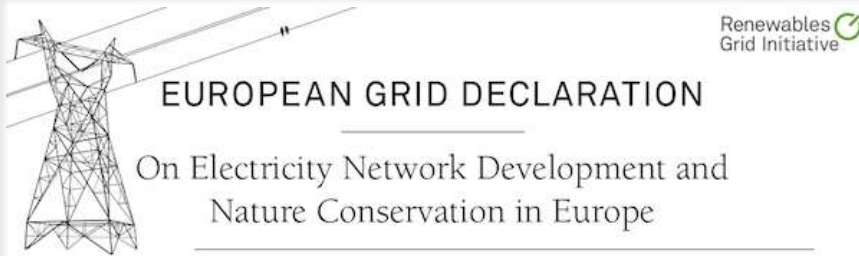
Focus of electricity grid operators:

„We need to build power grids without delay“

Focus of NGOs:

„We need renewable energies – without negative impact on nature and people“

The EGD sets principles for building grid in line with nature and people's concerns



Key content:

1. Commitment to cooperate of NGOs and electricity system operators
2. Set of principles to achieve a timely grid expansion in line with nature conservation

Key political signal:

We will jointly work towards achieving Europe's objectives in both climate change and nature conservation



Key content:

1. Commitment to increase transparency and enabling public participation
2. Set of principles that should underlie initiatives to improve public acceptability

Key political signal:

We will jointly work towards achieving more acceptability of grid expansion projects for the integration of renewables

Thank you!
www.renewables-grid.eu