Leibniz Universität Hannover

Implementing energy transition – A challenge for spatial planning

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Agenda

1. Background - Energy scenarios up to 2050
2. Handling of wind energy allocation in spatial planning
3. Targets and implementation: Lower Saxony and Hannover Region
4. Implementation problems
5. "Energy planning" as a solution?

Background – Energy scenarios up to 2050

- Different methodolgies to calculate nationwide
  → area potentials
  → energy potentials or
  → reduction potentials of greenhouse gas emissions
  (UBA 2014, Öko-Institut 2015, DLR 2012, Prognos 2014…)

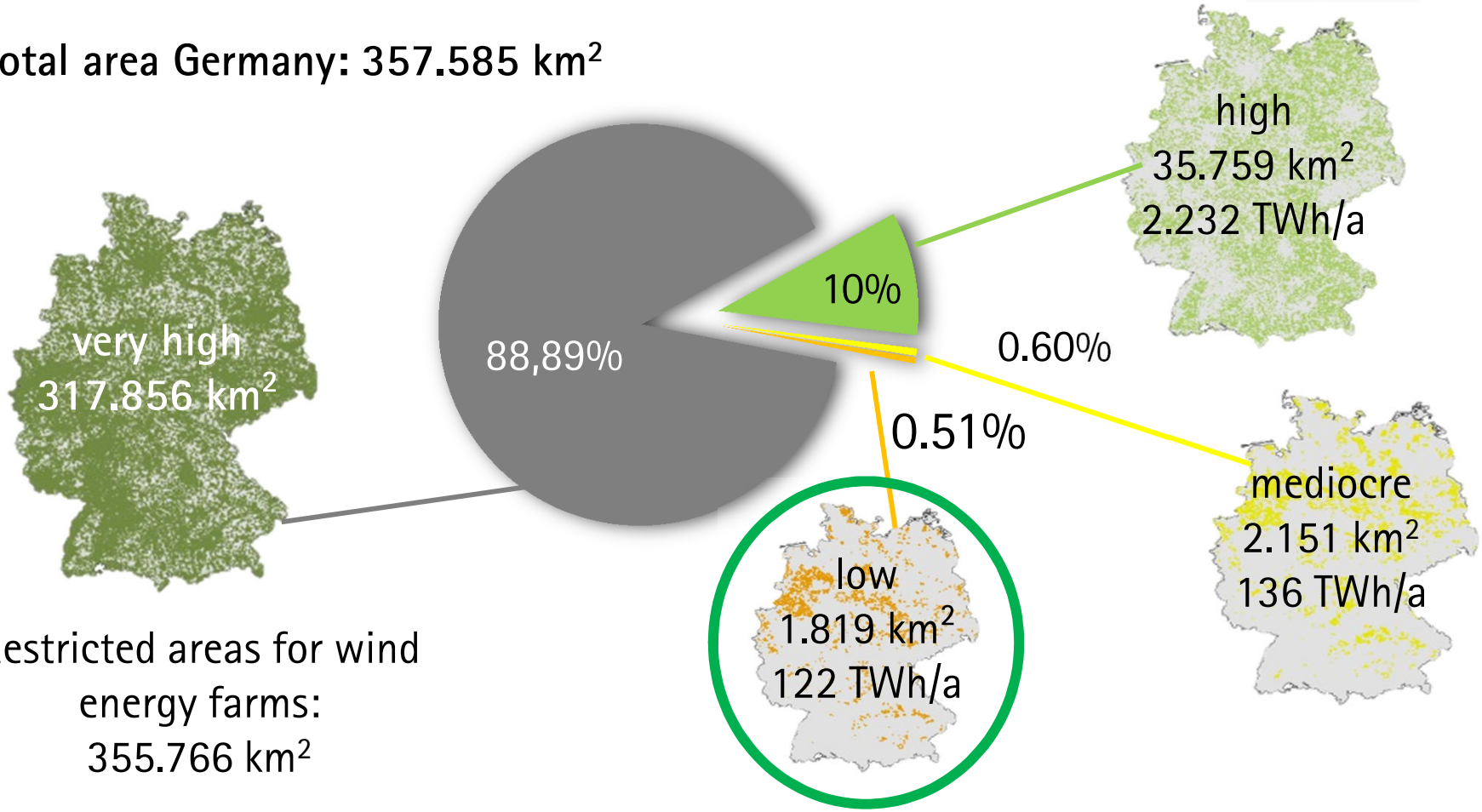
- Study EE100:
  Calculation of area potentials
  Focus on nature-compatibility

Restricted areas for wind turbines

- All nature protected areas
- Areas with sensitive species (birds, bats)
- Areas of high or mediocre landscape aesthetic quality
- Safety distance towards towns and transport systems
- Target areas of the national biodiversity strategy (special approach in EE100)

(WALTER et al. 2018)

Total area Germany: 357.585 km²



Restricted areas for wind energy farms: 355.766 km²

(WALTER et al. 2018)

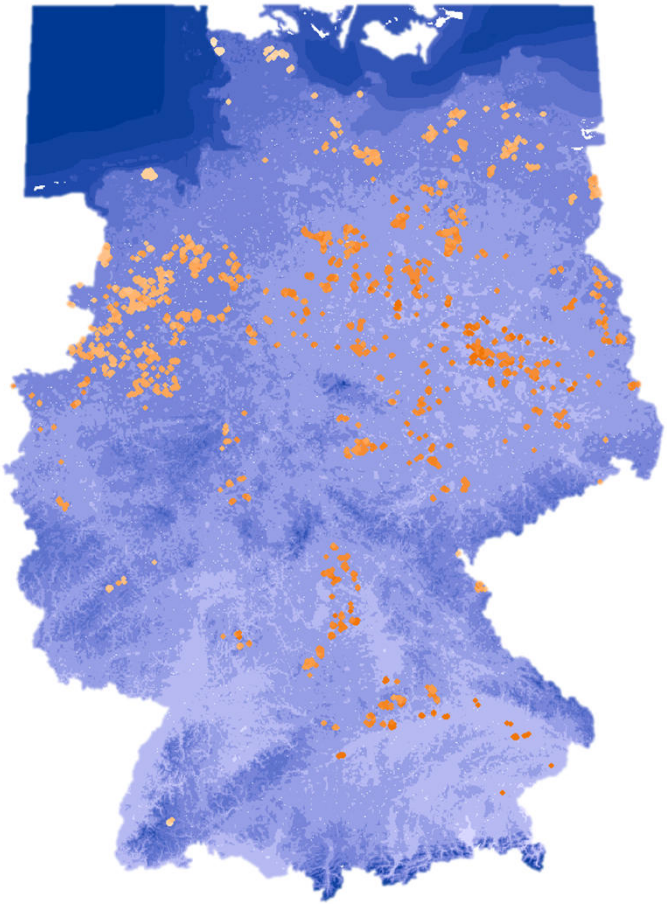
→ How do this information reach the lower planning levels?

Downscaling the EE100 scenario to Lower Saxony and Hannover Region

National level:
241 GW (7.5 MW turbines)

Loxer Saxony:
81 GW

Hannover Region:
4.5 GW



(WALTER et al. 2018)

Wind energy allocation in spatial planning

Bundesraumordnung:
One Principle: cost-effective, safe and environmentally friendly energy supply

Landesraumordnung:
Determination of minimum area shares or yield quantities
currently 14 different wind energy decrees with specific targets and distance regulations

Regional planning:
Designation of suitable and priority areas for wind energy
2014: secured area of 1,620 km^2
(corresponds to 0.45 % of the federal territory)(BBSR 2015)

Official actual targets at the federal level

- By 2050: expansion of renewable energies to a share of at least 80 % of gross electricity consumption
- EEG § 4: annual gross addition of onshore wind turbines with an installed capacity of 2.8 GW in the years 2017 to 2019 and 2.9 GW from 2020
  → increase until 2050 to around 87 GW

- *EE100: ecologically compatible and necessary are 241 GW (7.5 MW turbines)* (WALTER et al. 2018)

Targets and implementation: Lower Saxony and Hannover region

Targets for Lower Saxony Energy Transition Report 2018

- Current onshore capacity of wind energy: around 11 GW
- Increase to at least 20 GW by 2050
- Repowering of 1,500 wind turbines
- *EE100: 81 GW* (WALTER et al. 2018)

Implementation in the state spatial planning programme (LROP 2017)

- Demands for the expansion of local energy sources and renewable energies in regional plans
- Tasks for the regions: securing priority or suitable areas for wind energy in mandatory regional plans
- For certain wind rich regions (10 countys), specifications are given for the capacity to be installed
  → a total of 1.4 GW
- Wind energy decree includes calculation of potential areas and downscales these to the regions
  (What percentage of the potential area of the region should be used?)

Targets for Hannover Region (Masterplan 2016)

- "Climate-neutral Hannover Region 2050" reduction of greenhouse gas emissions by 95 % and reduction of final energy demand by at least 50 % compared to 1990
- Currently total capacity of 342 MW
- Target by 2050: 1.15 GW installed capacity

Implementation in the regional plan (2016)

Designation of 31 priority areas with total area of approx. 3.6 hectares (1.6 % of the region area)

→ approx. 2/3 of the electricity required for the year 2050 from the use of wind energy can be generated

→ *EE100: proposes 4.5 GW (WALTER et al. 2018)*

Implementation problems

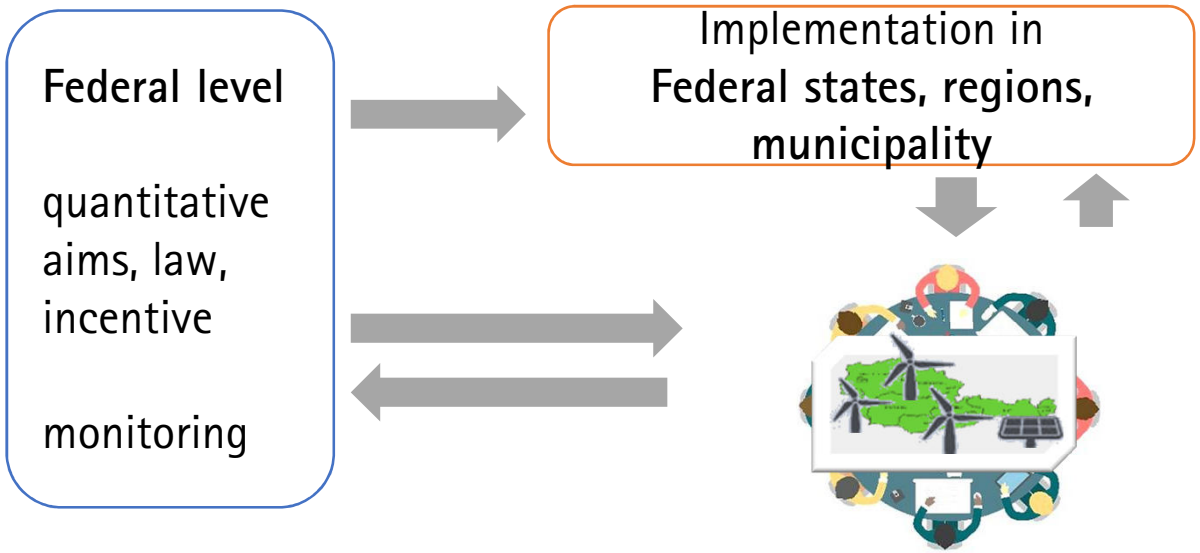
- Non-coordinated targets at all levels
- patchwork of wind energy decrees with various targets and distance regulations
- Regional plans and designated priority areas are sued
  → e.g. Schleswig-Holstein: In 2015, the Higher Administrative Court of Schleswig suspends all regional plans
  (LANDESPORTAL SCHLESWIG-HOLSTEIN 2018)
  → in Hannover Region: 4 municipalities block the designated areas (HAZ 2018)
- Repowering of old turbines necessary
  → In Lower Saxony search for new sites /1,500 turbines (NDS. MU 2018)

"Energy planning" as a solution?

- Forward-looking strategy to mobilize social potential and define the political, legal and financial framework
- Downscale the national energy target to (sustainable) targets for lower political decision-making levels
  → No substitute for state planning, but stronger obligation for the states
- Monitor the summative local achievements
  → Have we achieved the targets?
- Impose a planning obligation on municipalities (concentration zones, suitable areas)
  → avoid installation of isolated wind turbines in unsuitable areas

(WALTER et al. 2018)

Participation on all levels



(WALTER et al. 2018)

To achieve the energy transition, we need

- Transparent communication of the framework conditions (WALTER et al. 2018)
- Control and reflection of municipal decisions in their effect on the achievement of national goals
  What if everyone acted like us? How do we compare with others? (WALTER et al. 2018)
- Bundling of independent municipal advice and exchange between municipalities (DStGB 2012)

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Thank you very much for your attention!

Durchführung eines Planspiels beim NLV (Foto: Dr. D. Kempa, 2013)

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