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ACCELERATION OR STAGNATION OF ENVIRONMENTAL SUSTAINABILITY IN EUROPE: THE ROLE OF PIONEERS

"Canada and Europe: Converging or Diverging Responses to International and Domestic Challenges?", Ottawa, 10-11 March 2016

Dr. Sibyl D. Steuwer

(Sibyl.Steuwer@fu-berlin.de)

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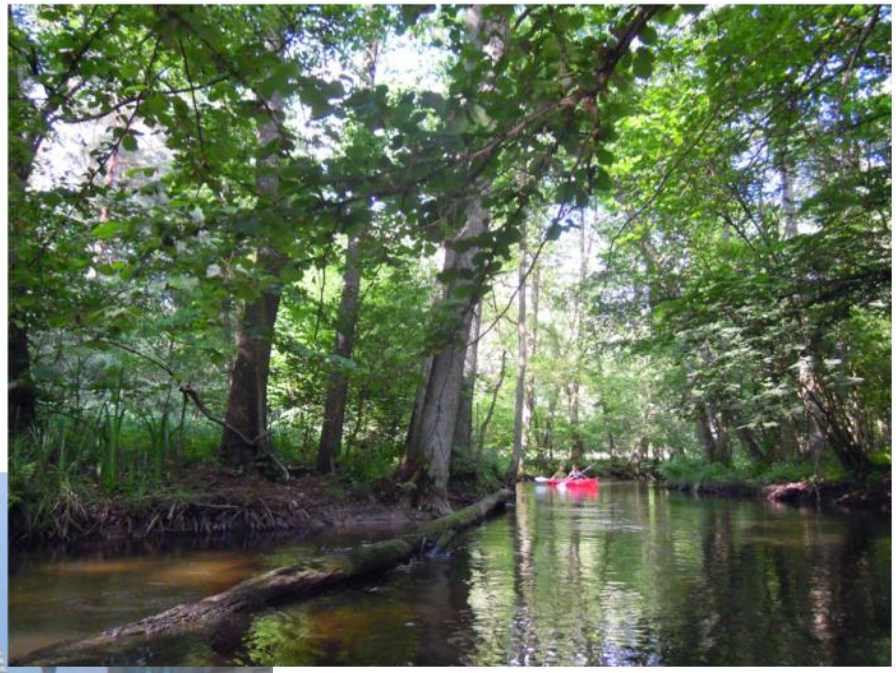
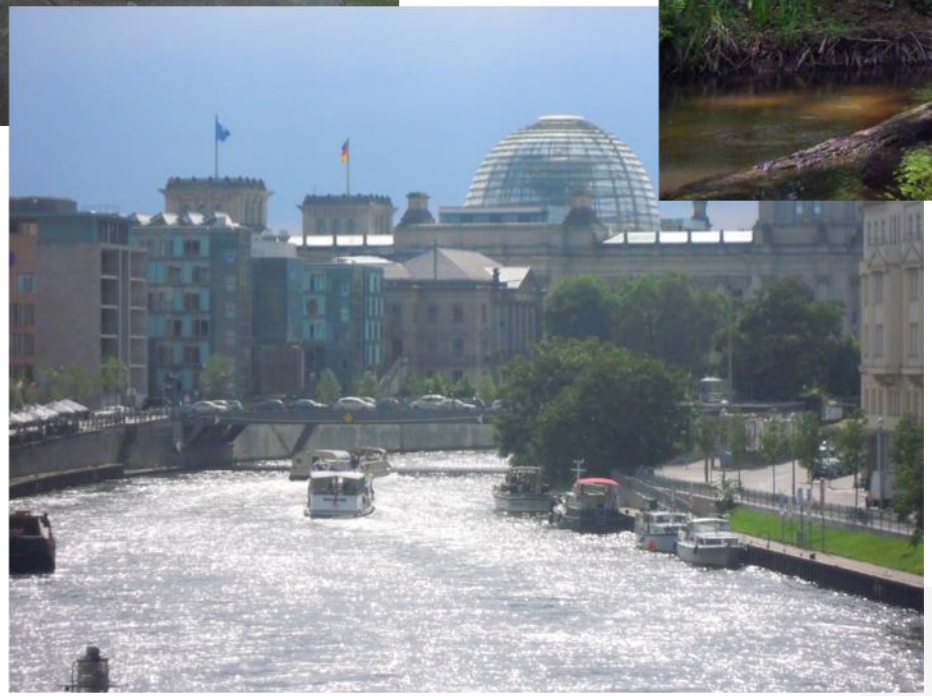
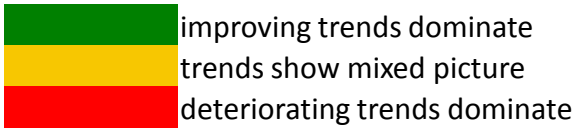
Orange Box





The European Environment – State and Outlook 2015

	5-10 year trend	20+ year outlook
Water quality and nutrient loading		
Air pollution and its ecosystem impacts		
Waste management		
Greenhouse gas emissions and climate change mitigation		
Energy consumption and fossil fuel use		
Industrial pollution to air, soil and water		
Water pollution and related environmental health risks		



Source: own depiction followingEEA, SOER 2015

EU-Opportunity Structure for Environmental Pioneers in the past

- CO_2-tax in Denmark
- High standards in waste water treatment: The Netherlands, Denmark, Germany
- Sweden: pushing air pollution control internationally
- CO_2- floor price UK
- Feed-in-tariff for renewables in Germany

EU Treaties and institutional set-up left room for maneuver allowing for multi-level reinforcement and acceleration in environmental protection

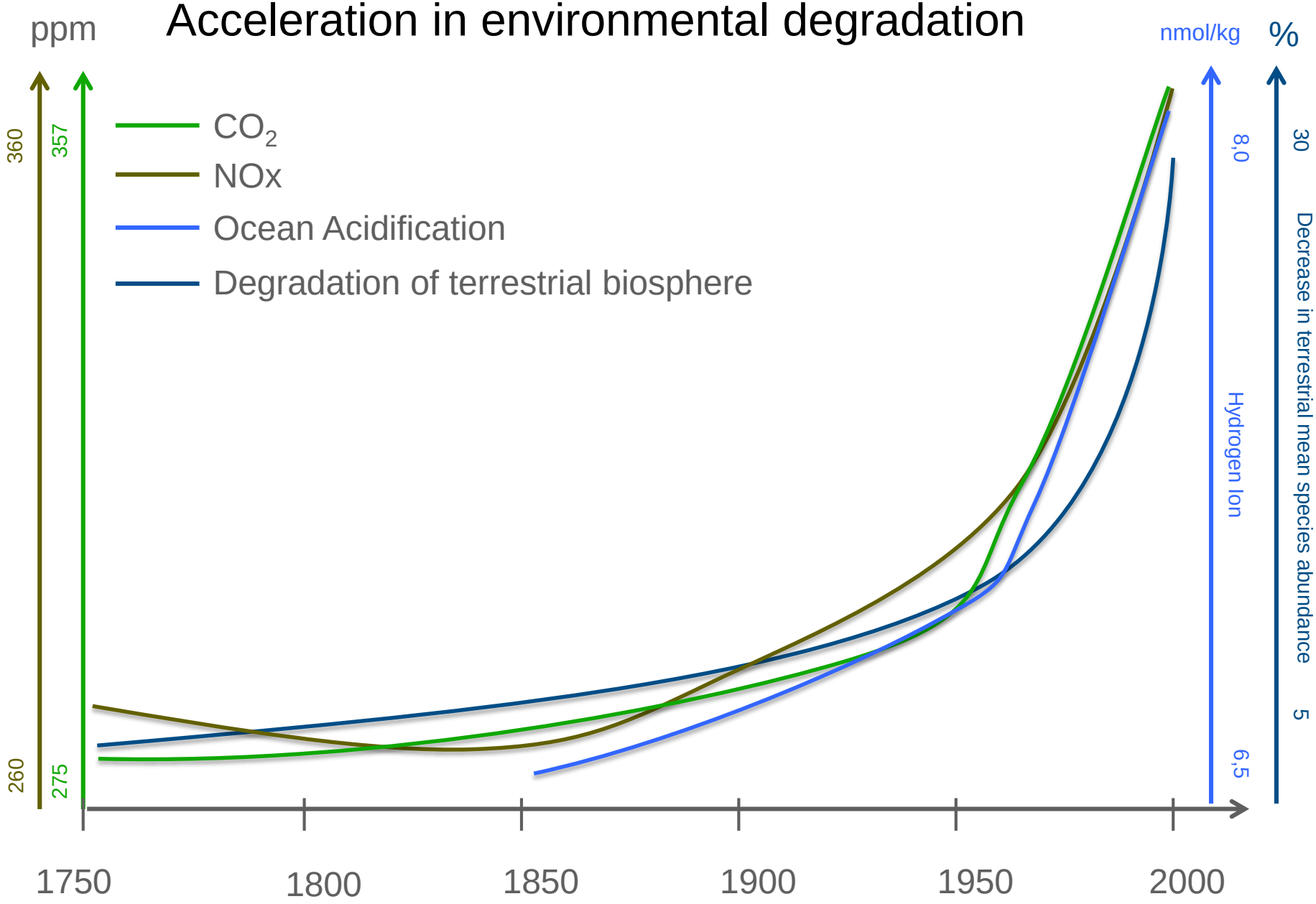
The European Environment – State and Outlook 2015

	5-10 year trend	20+ year outlook
Terrestrial and freshwater biodiversity		
Land use and soil functions		
Material resource efficiency and material use		
Water use and water quantity stress		
Climate change and related environmental health risks		

improving trends dominate
trends show mixed picture
deteriorating trends dominate

Source: own depiction following EEA, SOER 2015

Acceleration in environmental degradation



Source: own depiction following Steffen *et al.* The trajectory of the Anthropocene: The Great Acceleration (*Anthropocene Review)* 16 January 2015.

7th Environmental Action of the EU: Long-term vision

„In 2050, we live well, within the **planet's ecological limits**. Our prosperity and healthy environment stem from an innovative, **circular economy** where nothing is wasted and where natural resources are managed sustainably, and **biodiversity** is protected, valued and restored in ways that enhance our **society's resilience**. Our **low-carbon growth** has long been decoupled from resource use, setting the pace for a safe and sustainable global society."

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ENERGY POLICY – SUSTAINABLE TRANSITION PROCESSES ON ROUTE

Environmental Policy Research Centre, Sibyl Steuwer

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Energy Transition at the European Level

- 2020 to 2030 Energy Strategy: From 20-20-20 to 40-27-27
- 2050 Energy Strategy: reducing greenhouse gas emissions by 80-95% compared to 1990 levels by 2050
- But how? – Competing models in EU Member States
- Harmonization attempts  renationalisation trends

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ENERGY TRANSITION IN GERMANY

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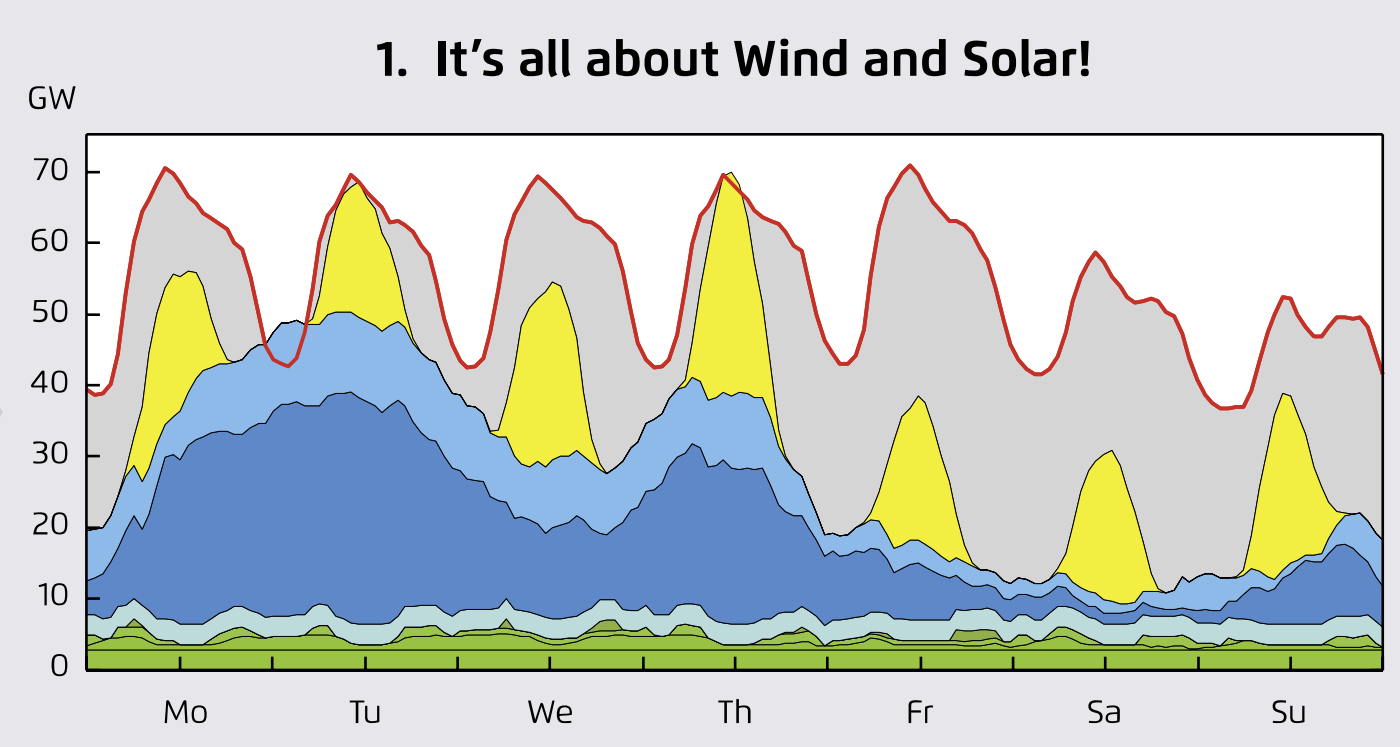
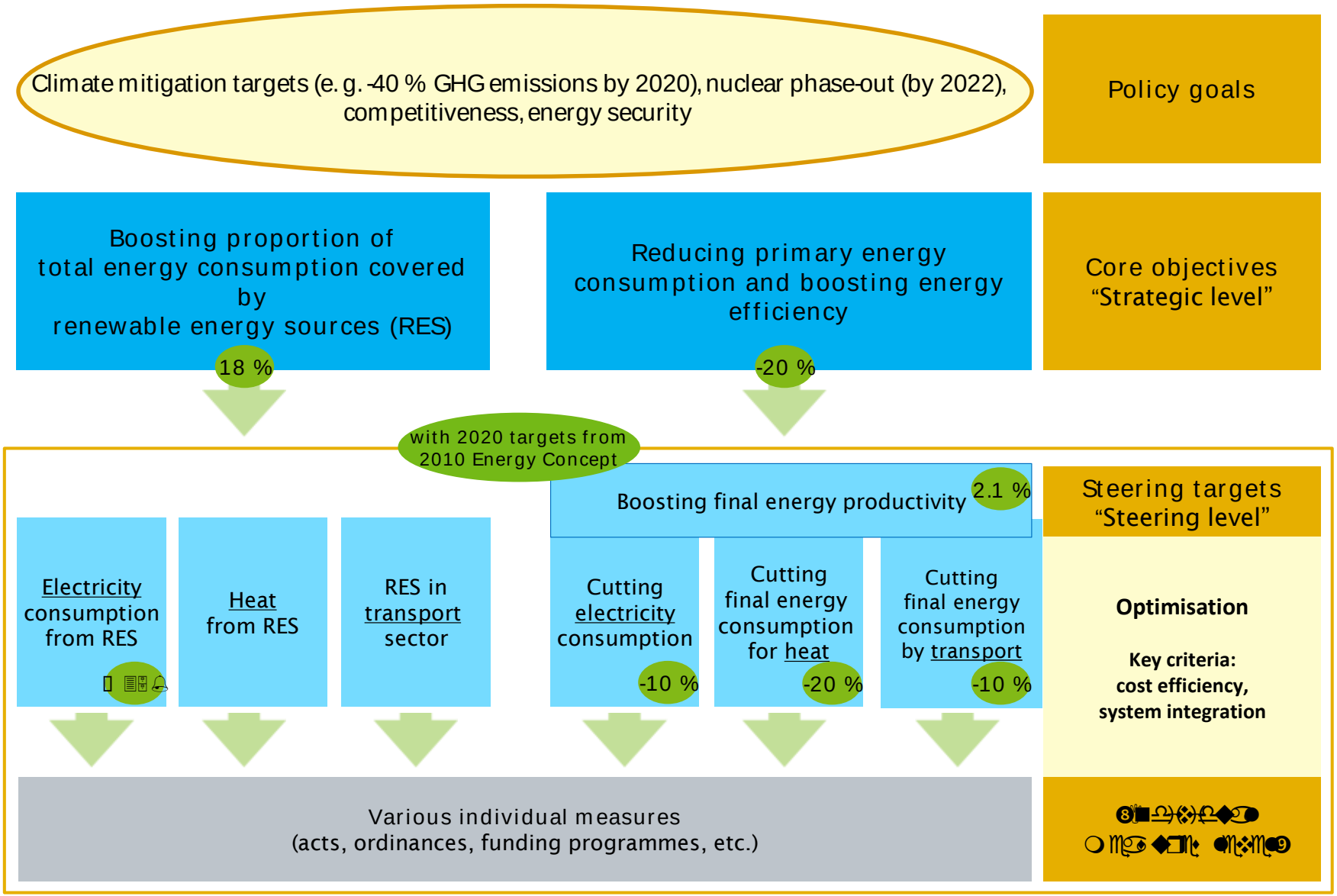
Electricity Demand and Generation in a Renewable Future (approximately 2022)

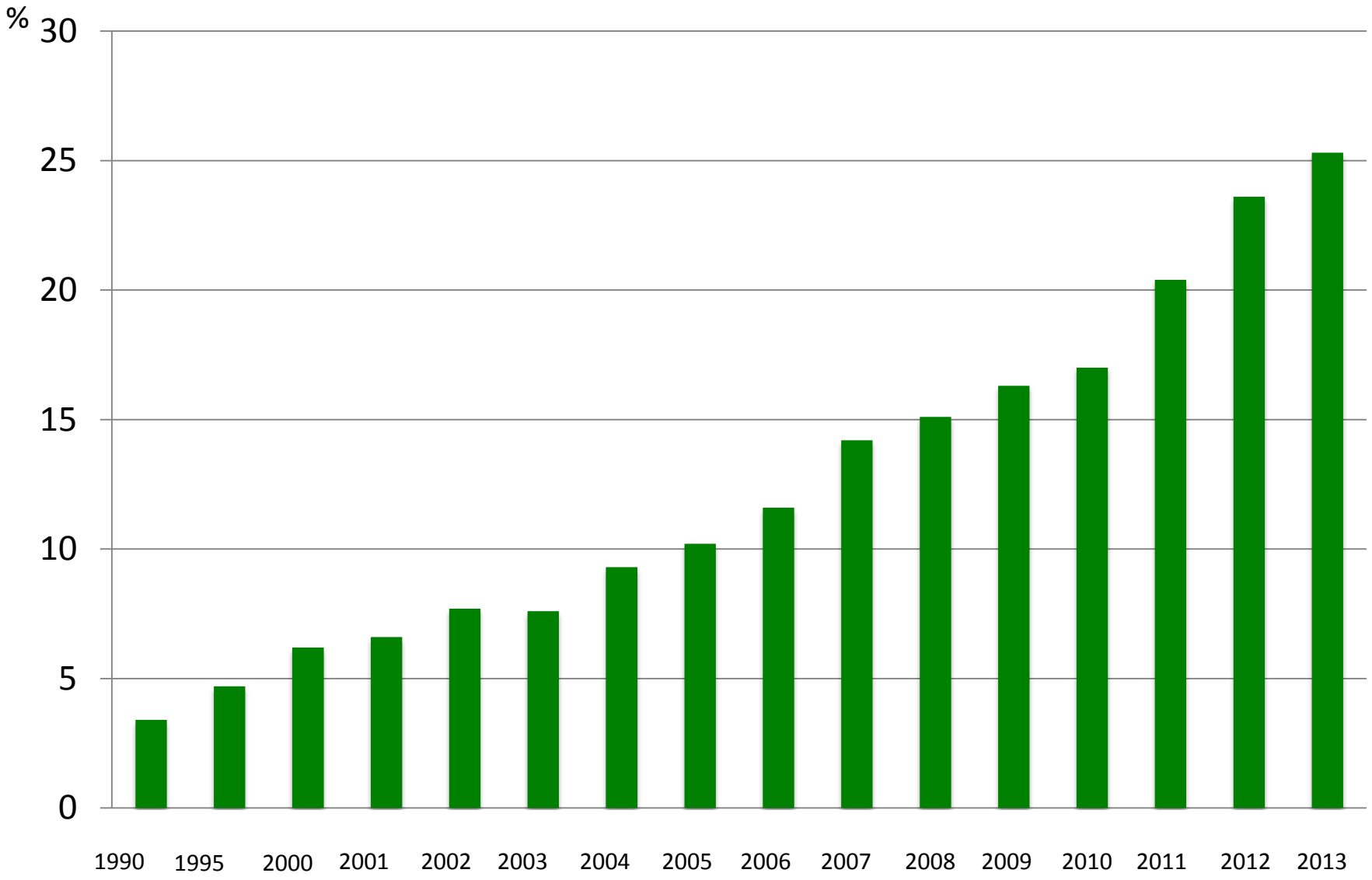


Source: http://www.agora-energiewende.org/fileadmin/downloads/publikationen/Impulse/12_Thesen/Agora_12_Insights_on_Germanys_Energiewende_web.pdf



Source: http://www.bmwi.de/English/Redaktion/Pdf/strukturierung-der-ziele-des-energiekonzeptes,property=pdf,bereich=bmwi2012,sprache=en,rwb=true.pdf

Share of renewable electricity in the overall elextricity Mix



Source: BMWi, own depiction

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Important Milestone: German Feed-in tariff

- Fixed tarifs for electricity from renewable energy (Wind, PV, Biomass) over 20-years
- prior feed-in of electricity from renewables
- Guaranteed grid access
- Cost recovered via grid charge collected from most customers
- Pioneer in terms of policy diffusion

Competition between „Länder“ – who is the pioneer?

Federal state		target
Baden-Württemberg	GEG	38% by 2020
Bavaria	GEC	50% by 2021
Berlin	GEG	17,8 by 2020
Brandenburg	GEC	90% by 2020
Bremen	ns	100% by 2050
Hamburg	EG	17% by 2020
Hesse	FEC	100% by 2050
Lower-Saxony	GEG	90% by 2020
Mecklenburg-West Pomerania	GEG	100% by 2050
North Rhine-Westphalia	GEG	15% by 2020
Rhineland-Palatinate	GEC	100% by 2030
Saarland	GEC	20-40% by 2020
Saxony	GEC	28% by 2020
Saxony-Anhalt	GEG	35% by 2020
Schleswig-Holstein	GEC	300-400% by 2020
Thuringia	NEC	45% by 2020
National target	**GEC**	**35% by 2020**

GEG: gross electricity generation;
GEC: gross electricty consumption;
EG: electricity generation;
FEC: final energy consumption;
NEC: net electricity consumption:
ns: not specified

Source: Ohlhorst, 2014; foederal-erneuerbar.de; energy strategies of federal states; own depiction

Competition between „Länder“ – who is the pioneer?

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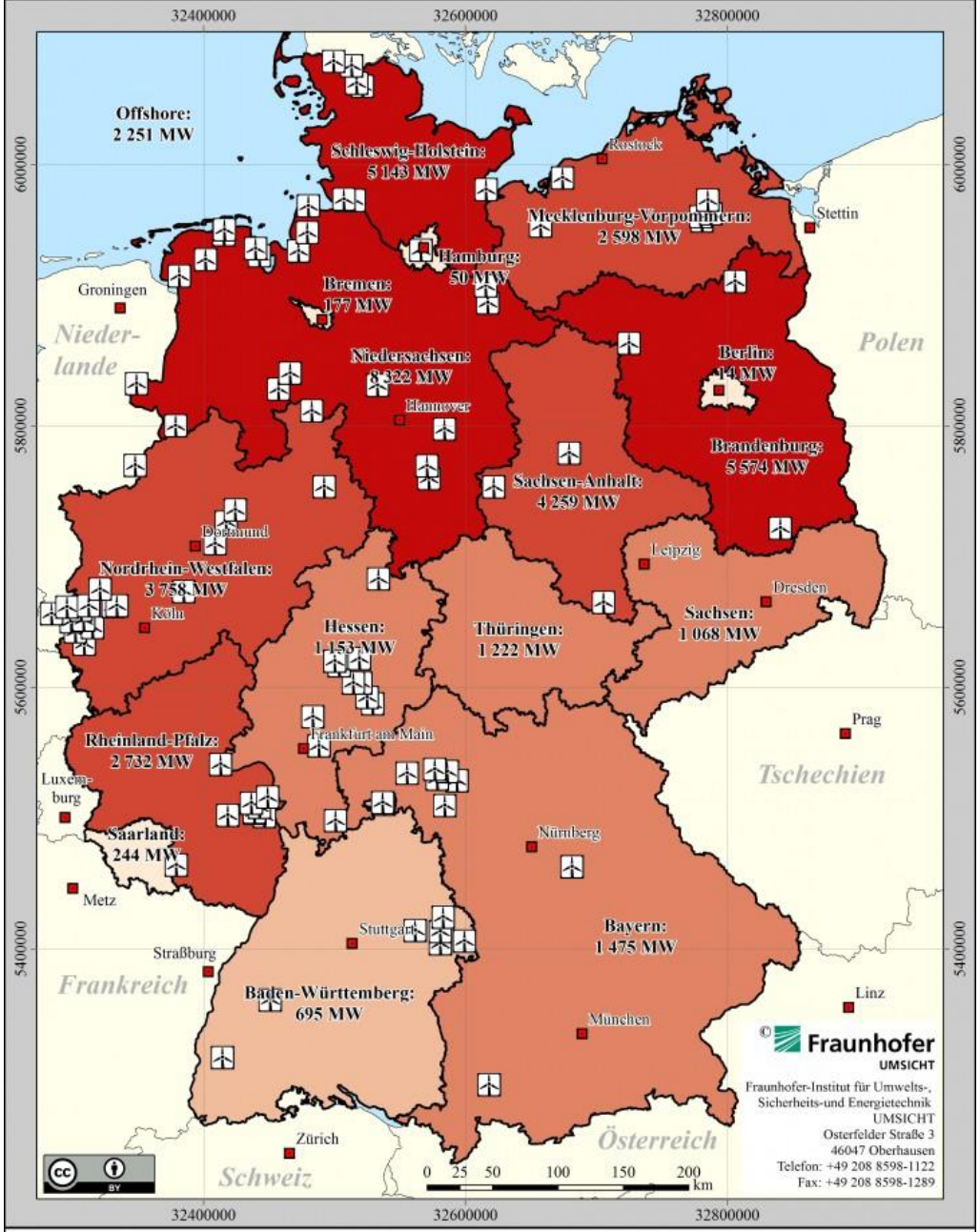

Windenergie: Leistung installierter Anlagen [MW] in Deutschland

0 | < 500 | > 500 | > 1 000 | > 2 500 | > 5 000

Leistungsstärkste Anlagen oder Anlagenparks (>= 5 MW)

Installierte Gesamtleistung: **40 734 MW** (inkl. Offshore-Anlagen)

Sachdaten EEG-Anlagenregister der Übertragungsnetzbetreiber 03/2015	**Geodaten** © GeoBasis-DE / BKG 2015
Kontakt boris.dresen@umsicht.fraunhofer.de	**Maßstab (DINA3)** 1:2 500 000

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Solarenergie: Leistung installierter Anlagen [MW] in Deutschland

0 | < 1 000 | > 1 000 | > 2 000 | > 3 000 | > 5 000

Leistungsstärkste Anlagen oder Anlagenparks (>= 10 MW)

Installierte Gesamtleistung: 37 127 MW

Sachdaten EEG-Anlagenregister der Übertragungsnetzbetreiber 03/2015	**Geodaten** © GeoBasis-DE / BKG 2015
Kontakt boris.dresen@umsicht.fraunhofer.de	**Maßstab (DINA3)** 1:2 500 000

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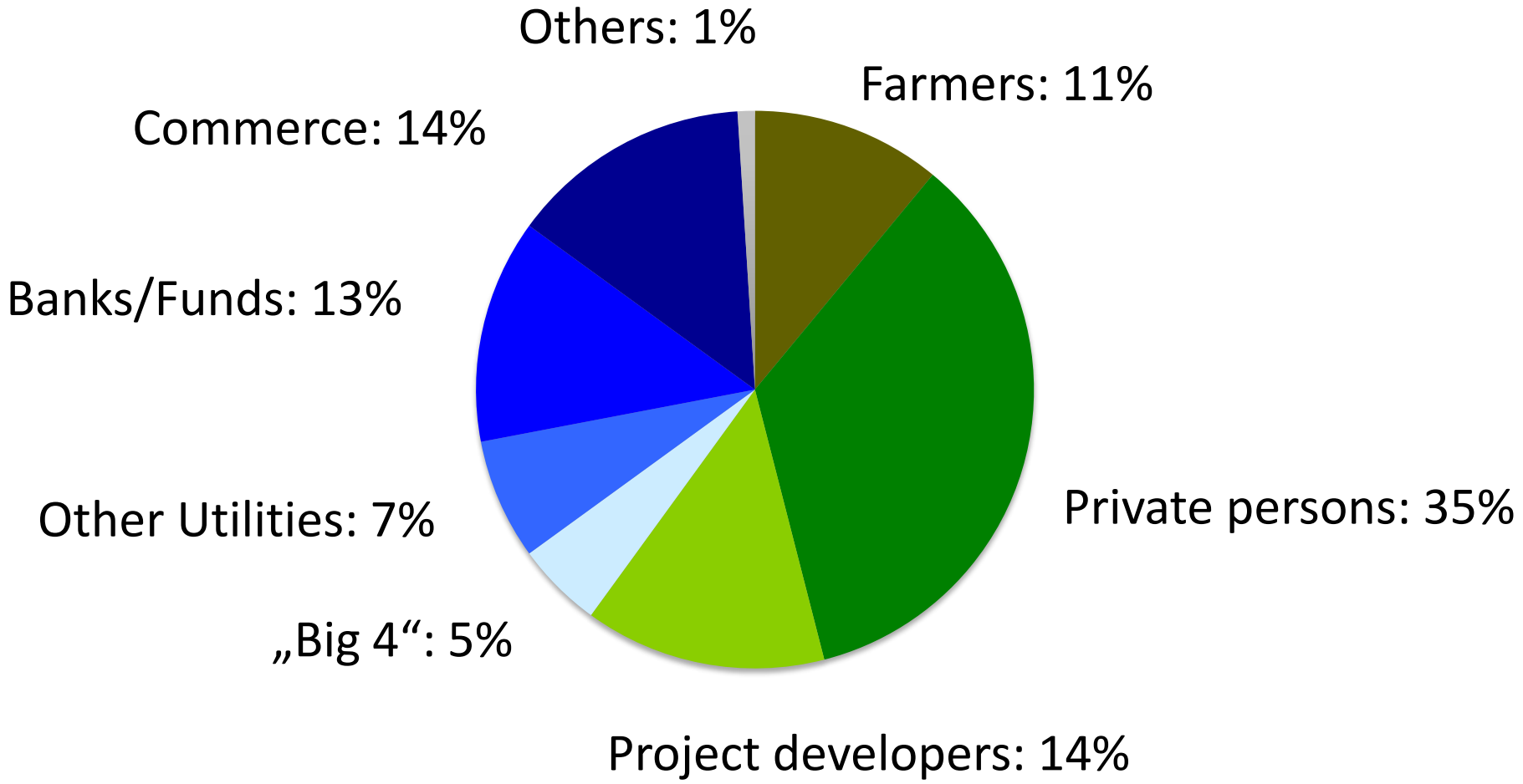
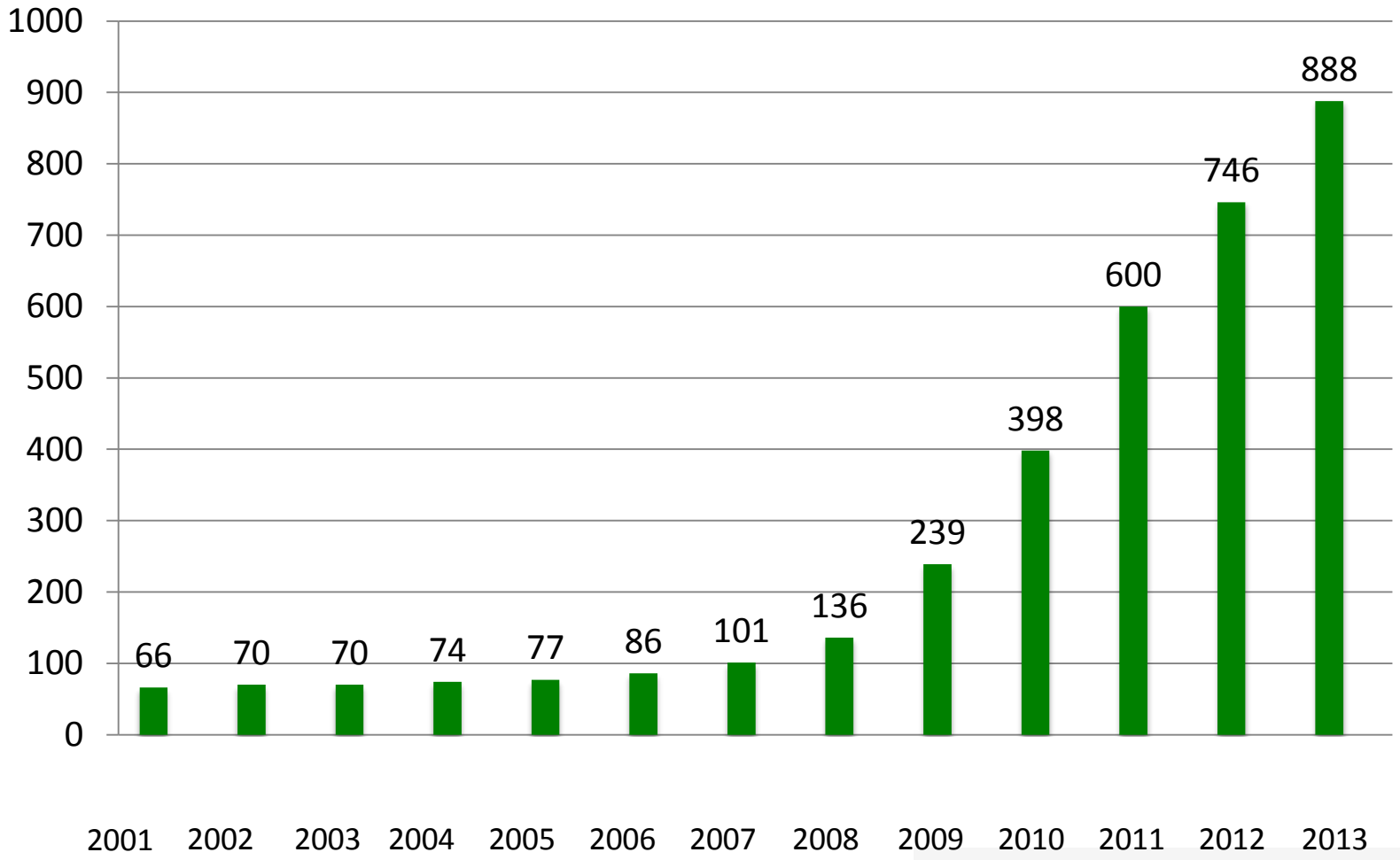
Distribution of Ownership of Renewable Installed Capacity

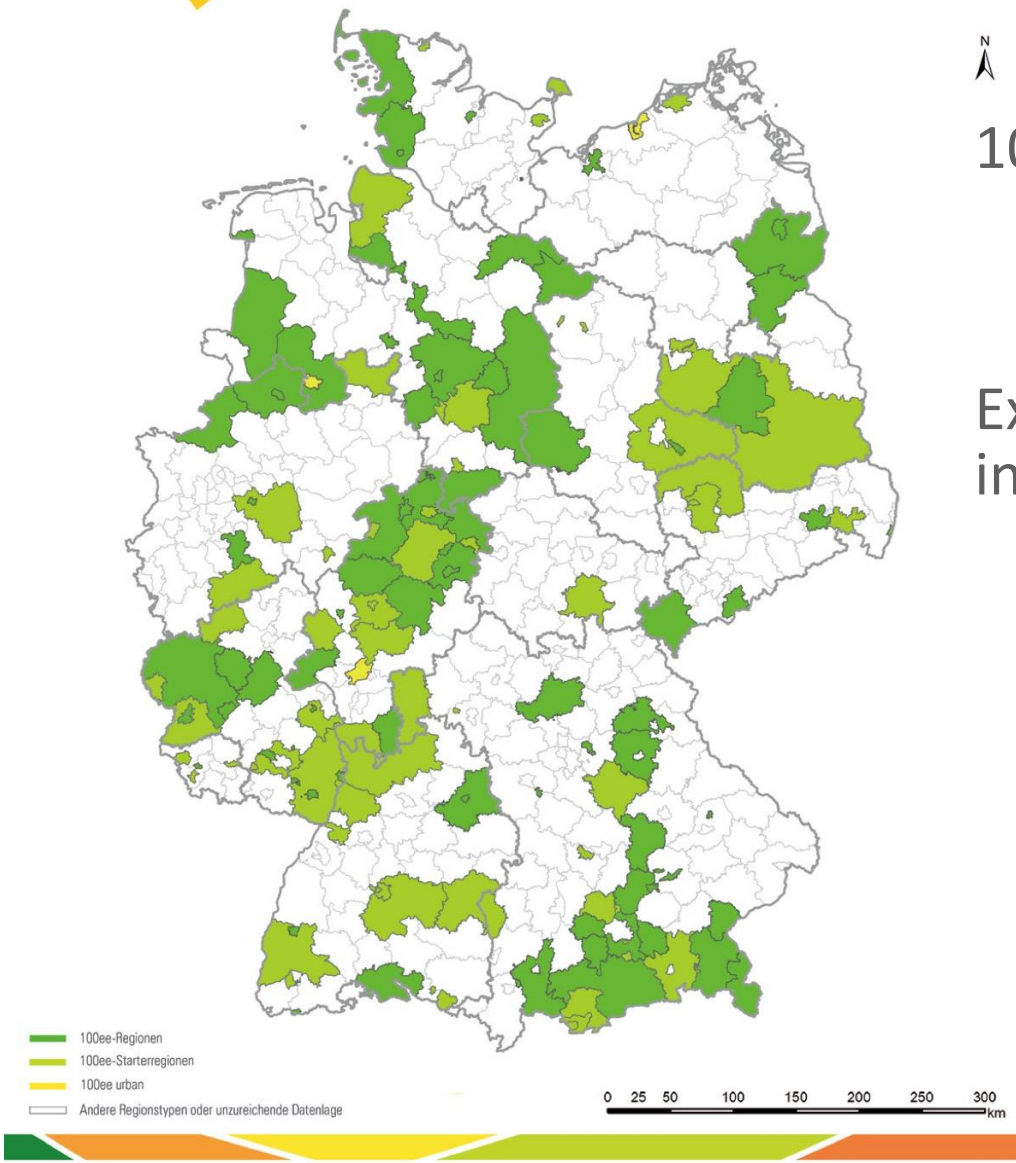


Source: trend:research, Leuphana University, 2013; own depiction

Development of Energy Cooperatives in absolute numbers



Source: Klaus Novy Institut, 1/2014; own depiction



100%-Renewable-Energy-Regions

Expansion to a Europe-wide initiative in 2012

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RESULTING CHALLENGES

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How to best re-organize other energy-system components?

- Role of conventional energy
- Grid infrastructure, storage, transport
- Impact of structural changes in regions
- Maintaining a stable energy supply
- Energy price signals? EU-wide and national

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Call for centralization of energy policy making?

→ Pioneers are even more important

Reforms to the Renewable Energy Act (effective Aug 2014; EEG Reform 2016 underway)

- Caps amount of renewables eligible for FIT (2.5GW/year for on-shore wind, solar; 1GW/yr for biomass, 6.5GW for off-shore wind to 2020)

- Mandatory direct marketing of renewable energy plants (starting with those with 500 kW capacity as of Aug 2014; and with 250kW capacity as of 2016, and 100 kW capacity as of 2017)

- Switch to auction schemes

- First tender results: pilot auction for ground-mounted PV installations; cooperation with Denmark?

First tender results: pilot auction for ground-mounted PV installations

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Number of winning bids

< **500 kW**	**0**
500-1.000 kW	1
1.000-2.000 kW	2
2.000-5.000 kW	7
5.000-10.000 kW	15

- Limited diversity:
  - in total, 40% of successful bids belong to one company
  - No cooperative or natural person was among the winning bids in first pilot
  - Similar results in second pilot; 1 cooperative was among the winning bids

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First tender results: pilot auction for ground-mounted PV installations

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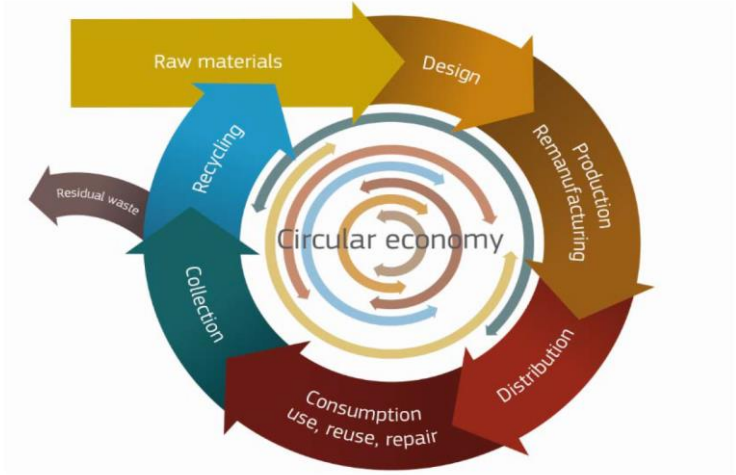
→ Ministry initiated working group on actor diversity

What about other transitions?

Photo: Alexander Blum (www.alexanderblum.de)



Graph: EU COM *(2014) 398 final*

Photo: Jon Sullivan
*(*http://pdphoto.org/PictureDetail.php?mat=pdef&pg=8202)

Pioneers And Multi-level Reinforcment under more difficult Conditions

- Alliances for the environment
- Take risks in transition periods
- regulatory competition as bottom-up dynamic to legitimize national pioneers within EU

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THANK YOU !

Sibyl.Steuwer@fu-berlin.de

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