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# Energy Transition in Germany – The Way to a 100% Renewable Electricity Supply

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Washington DC



## Objectives for a Sustainable Energy Supply



## Energy Transition in Germany

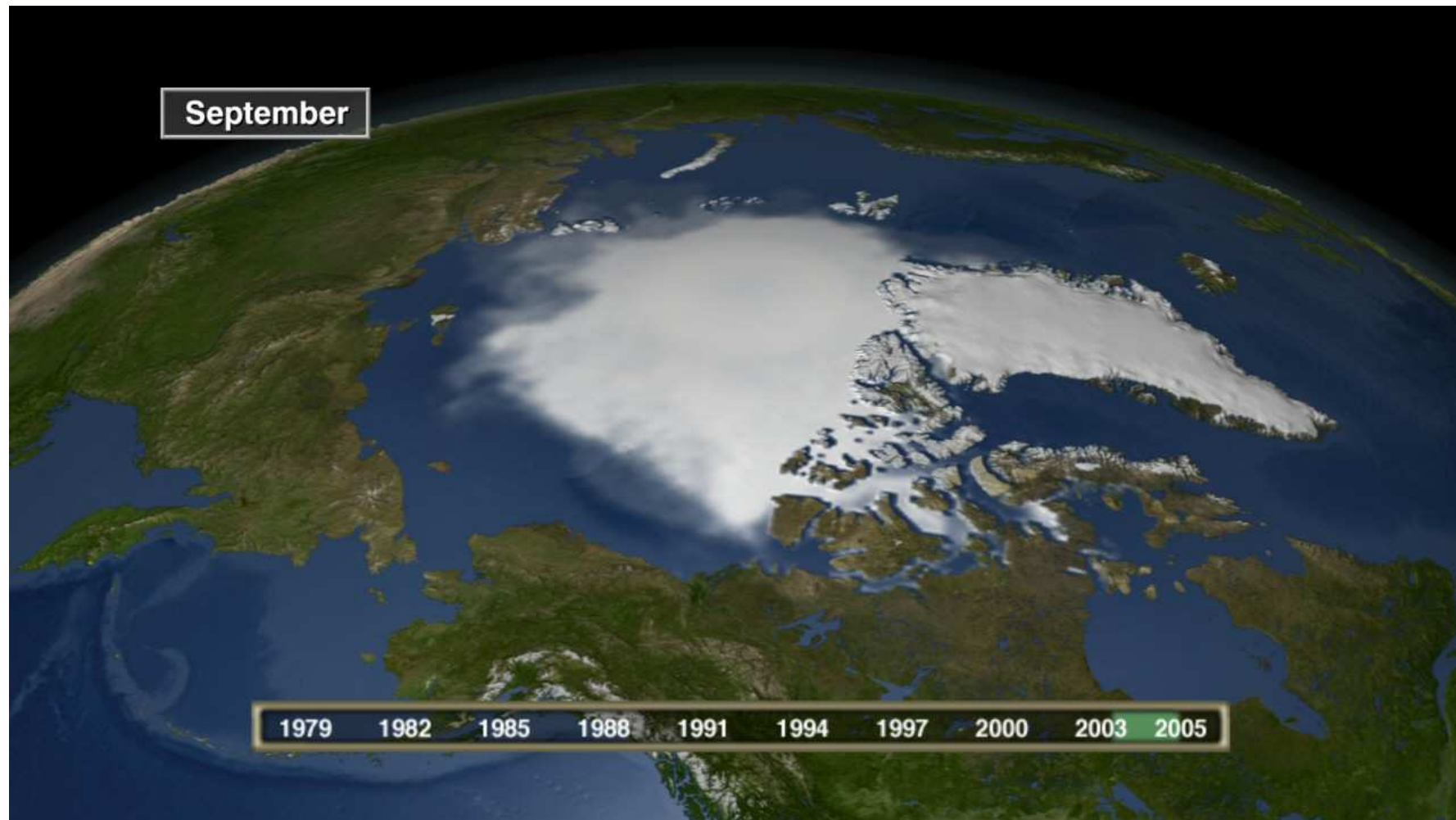


## The Solar Revolution

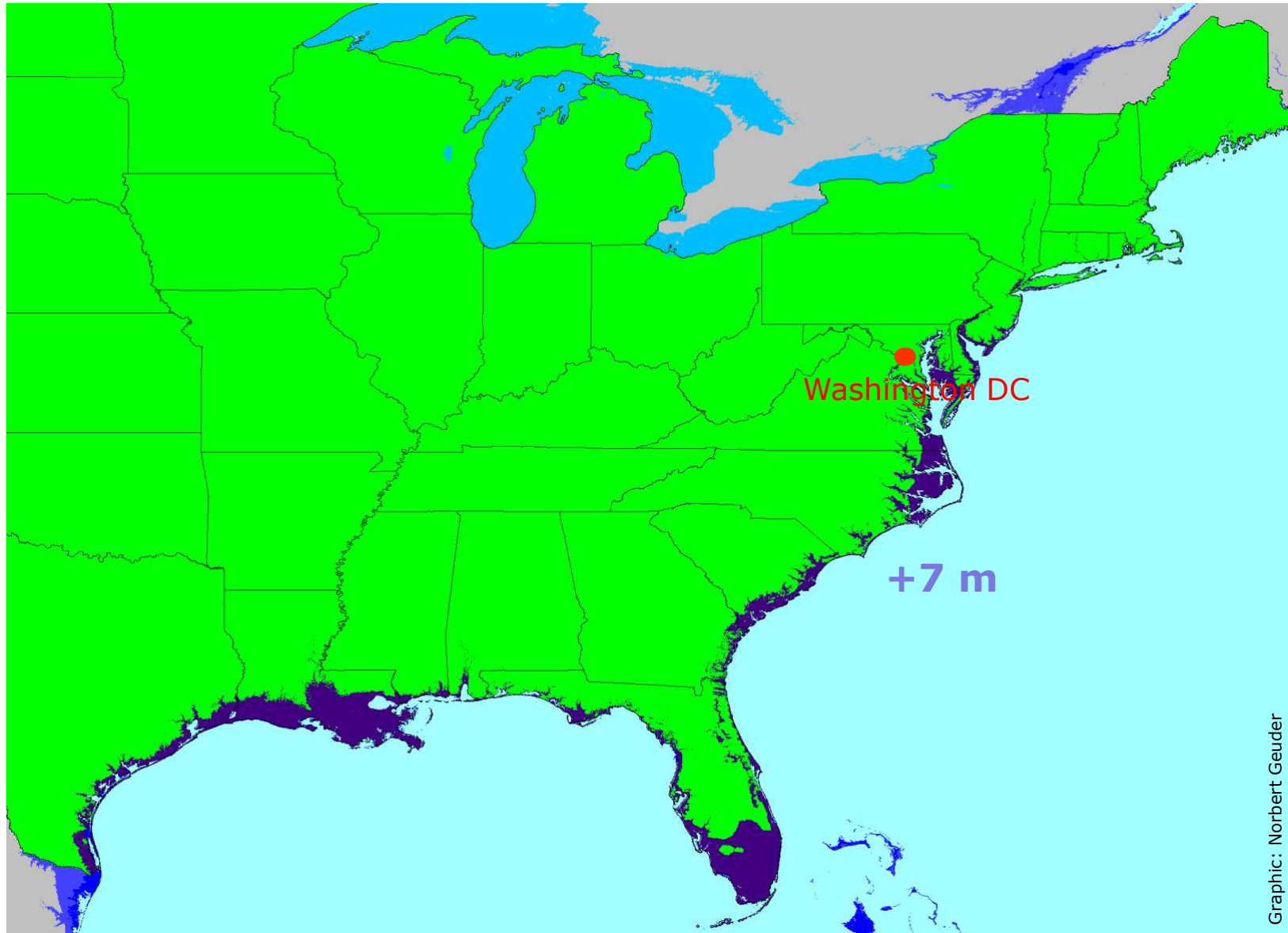




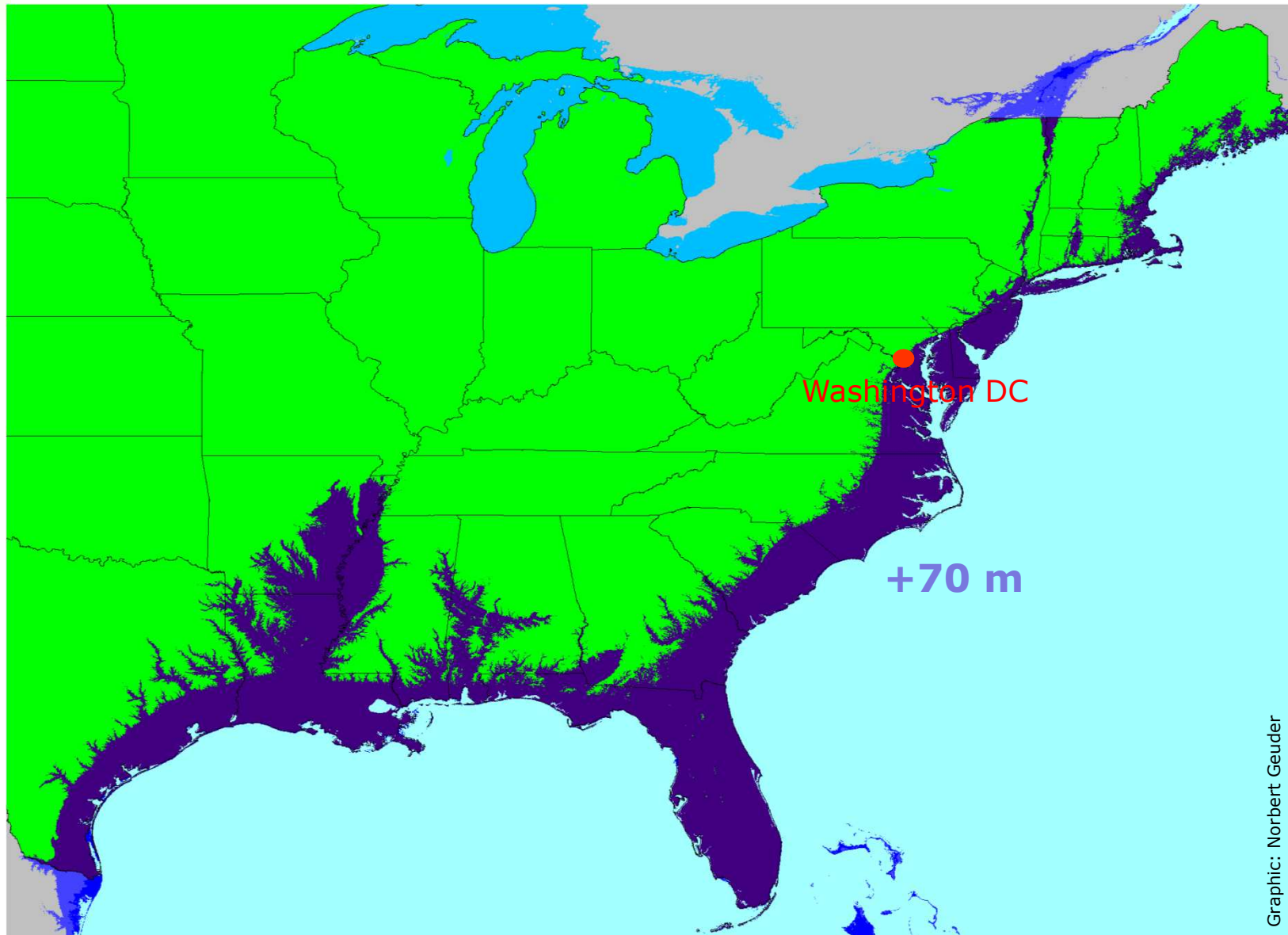
Source: NASA

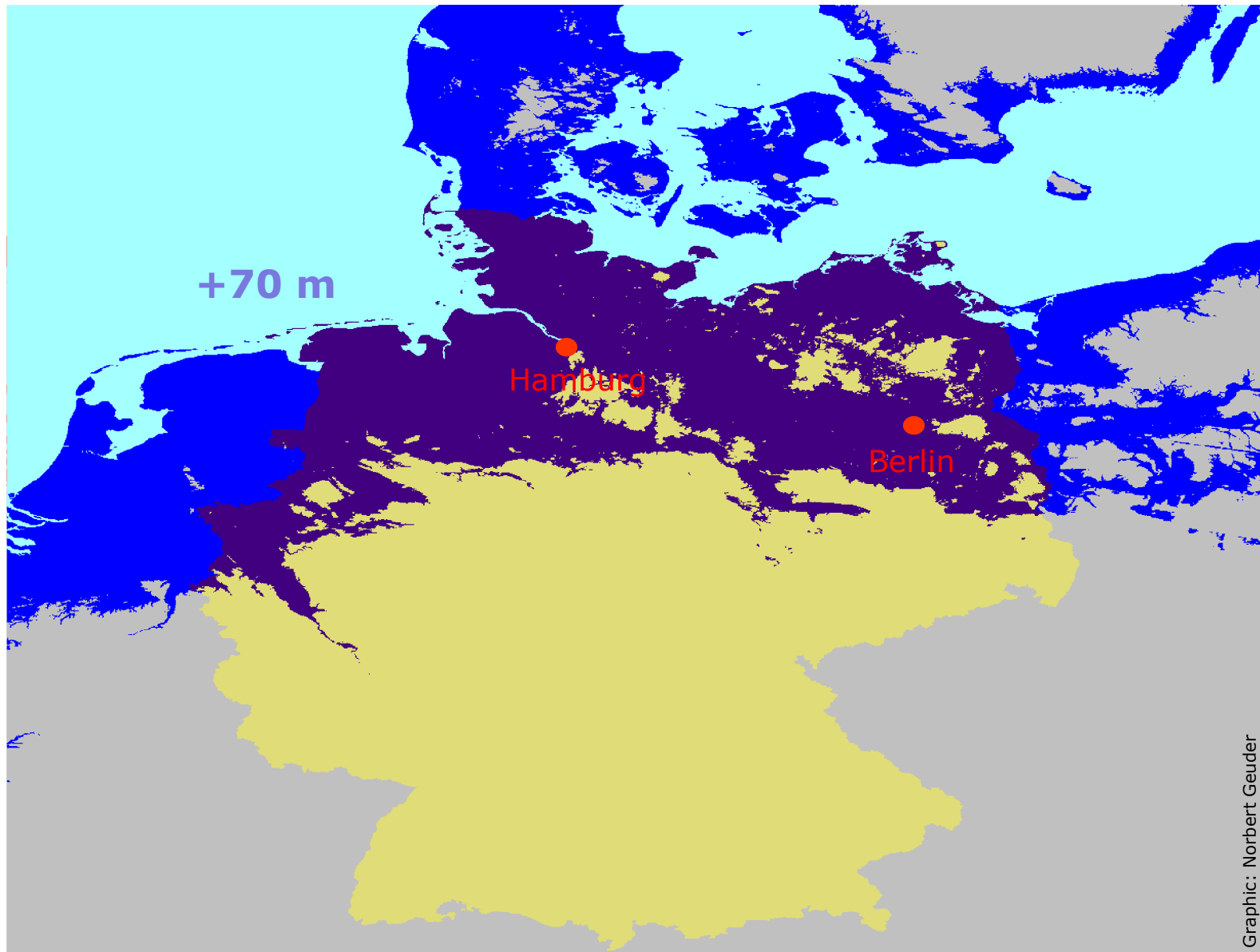


Source: NASA



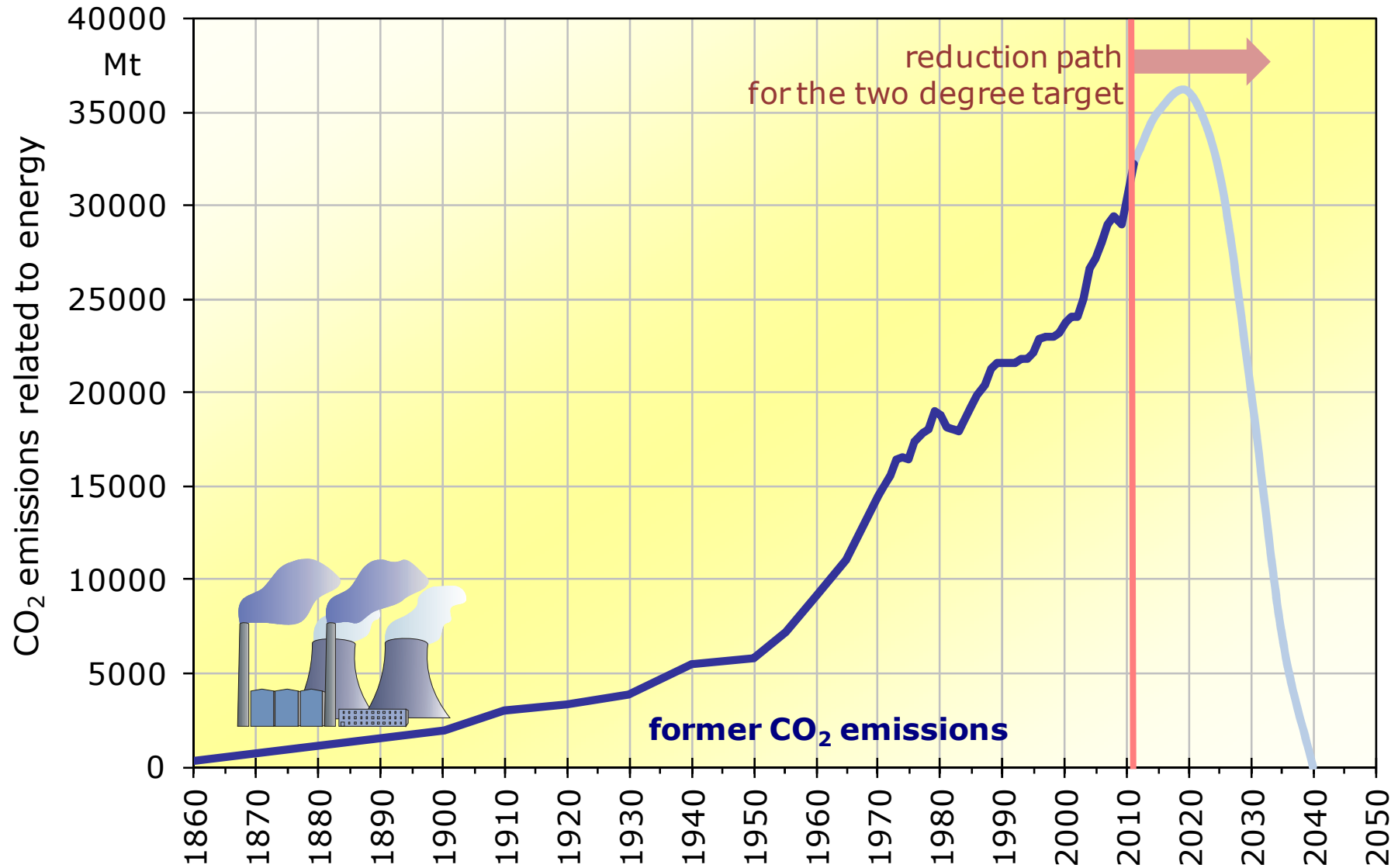
Graphic: Norbert Geuder



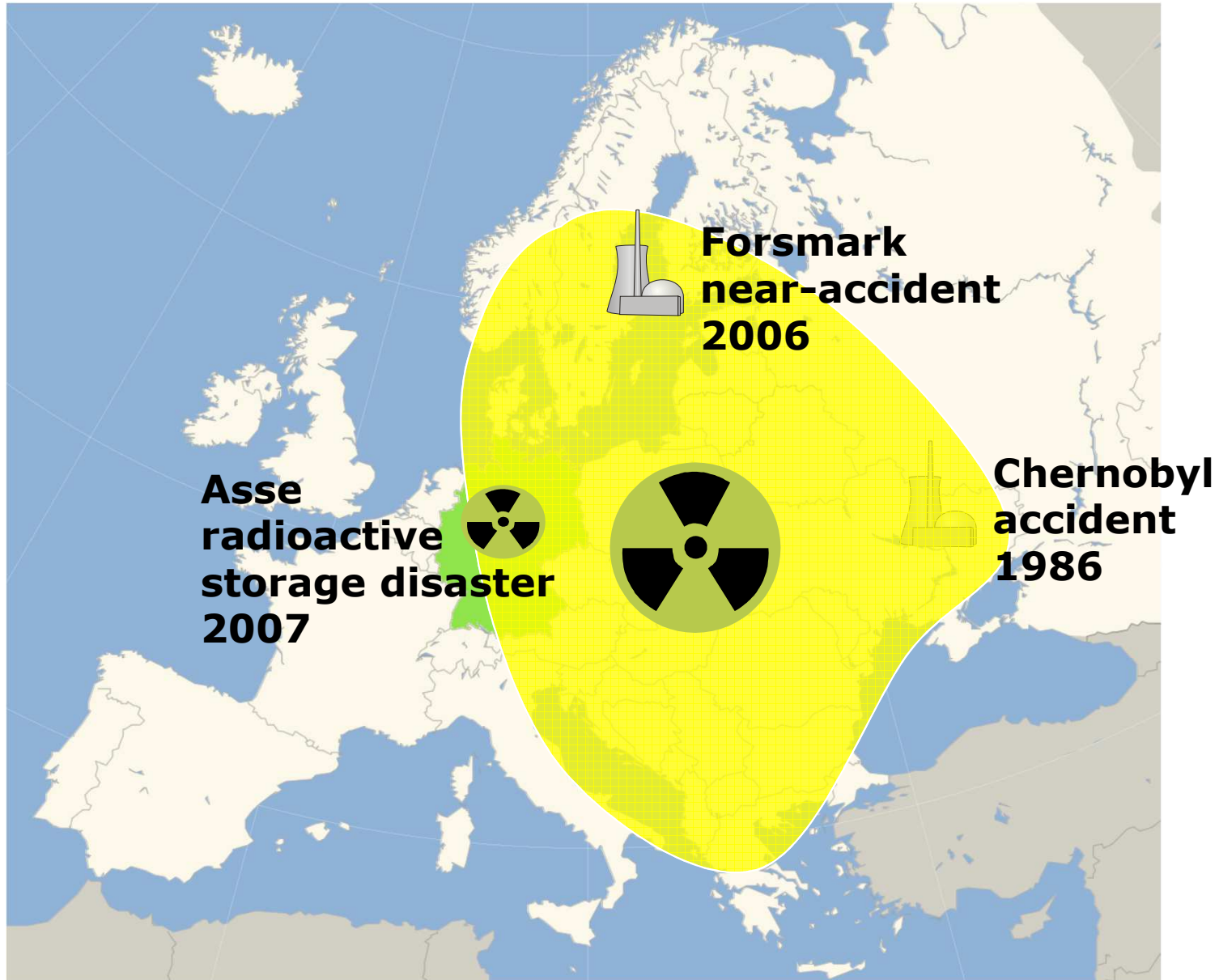


Graphic: Norbert Geuder





data: WRI, IEA, PIK-Potsdam





nuclear power



„CO<sub>2</sub>-free“ fossil power stations



energy conservation

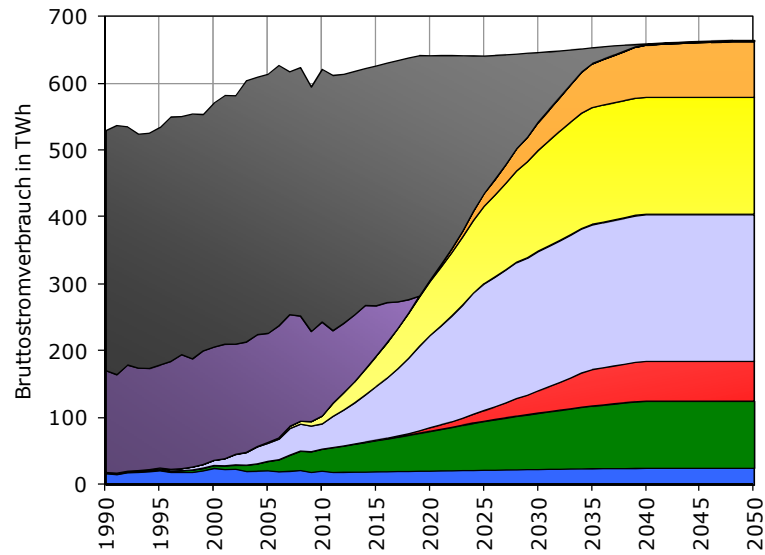


renewable energies

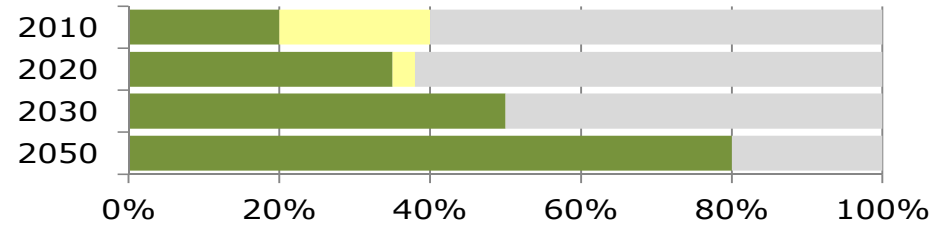
For a sustainable energy supply we have to become **carbon dioxide free until 2040**.

Otherwise we risk to sink our costal cities. In the longer term we risk a sea level rise of up to 70 meters.

The current **installation rates for renewable power** even in Germany **are to low** for an effective climate protection.

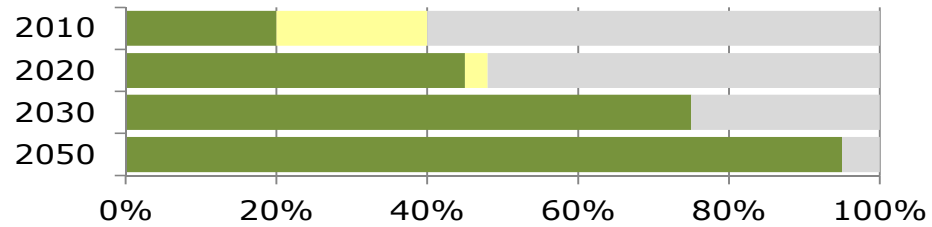


## Federal Government

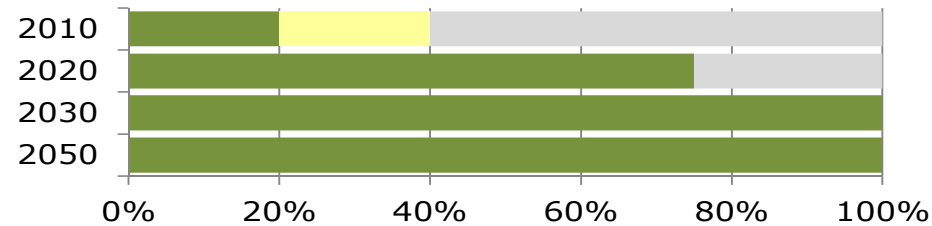


shutdown of nuclear power until 2022  
>80% renewables until 2050

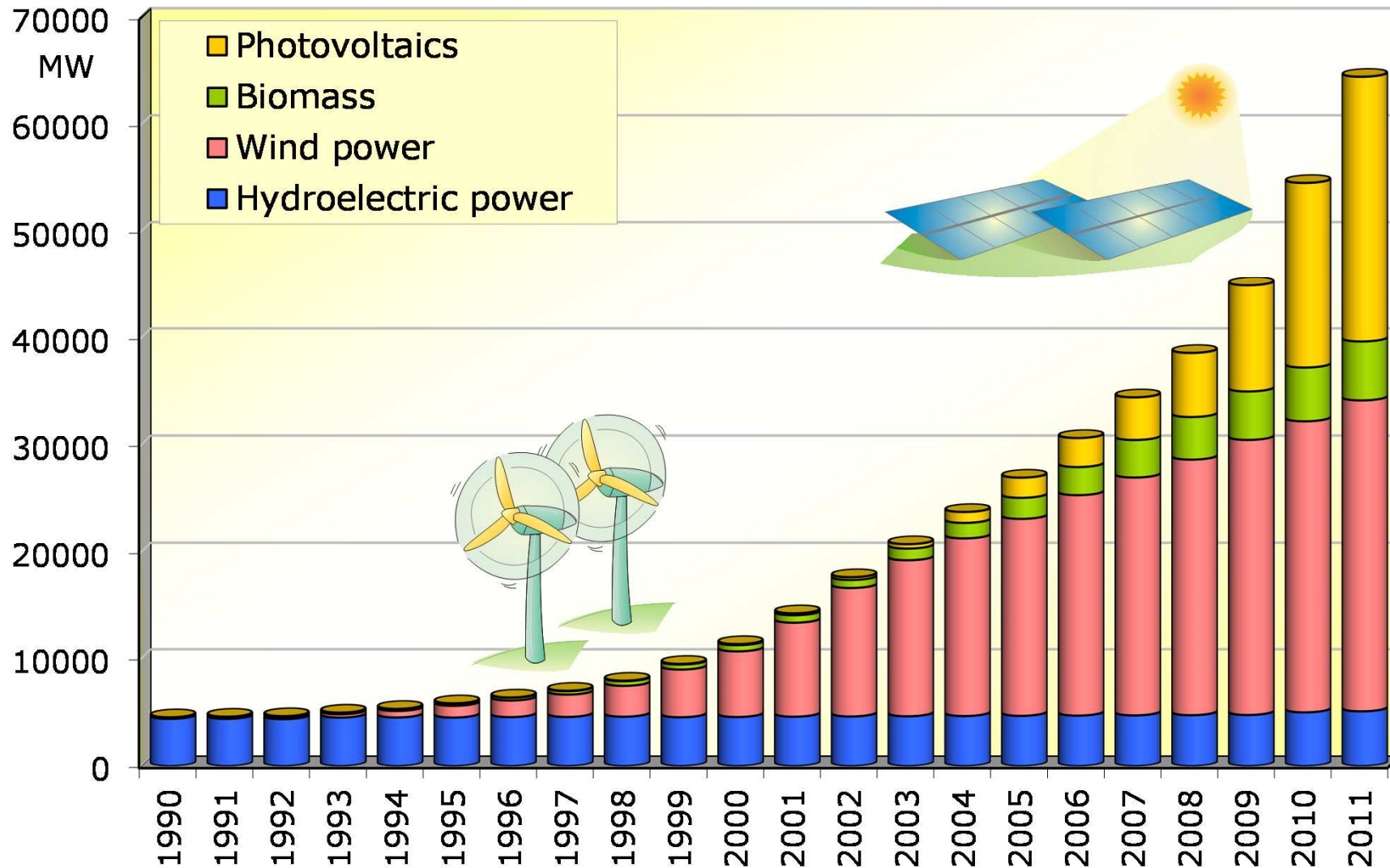
## Opposition

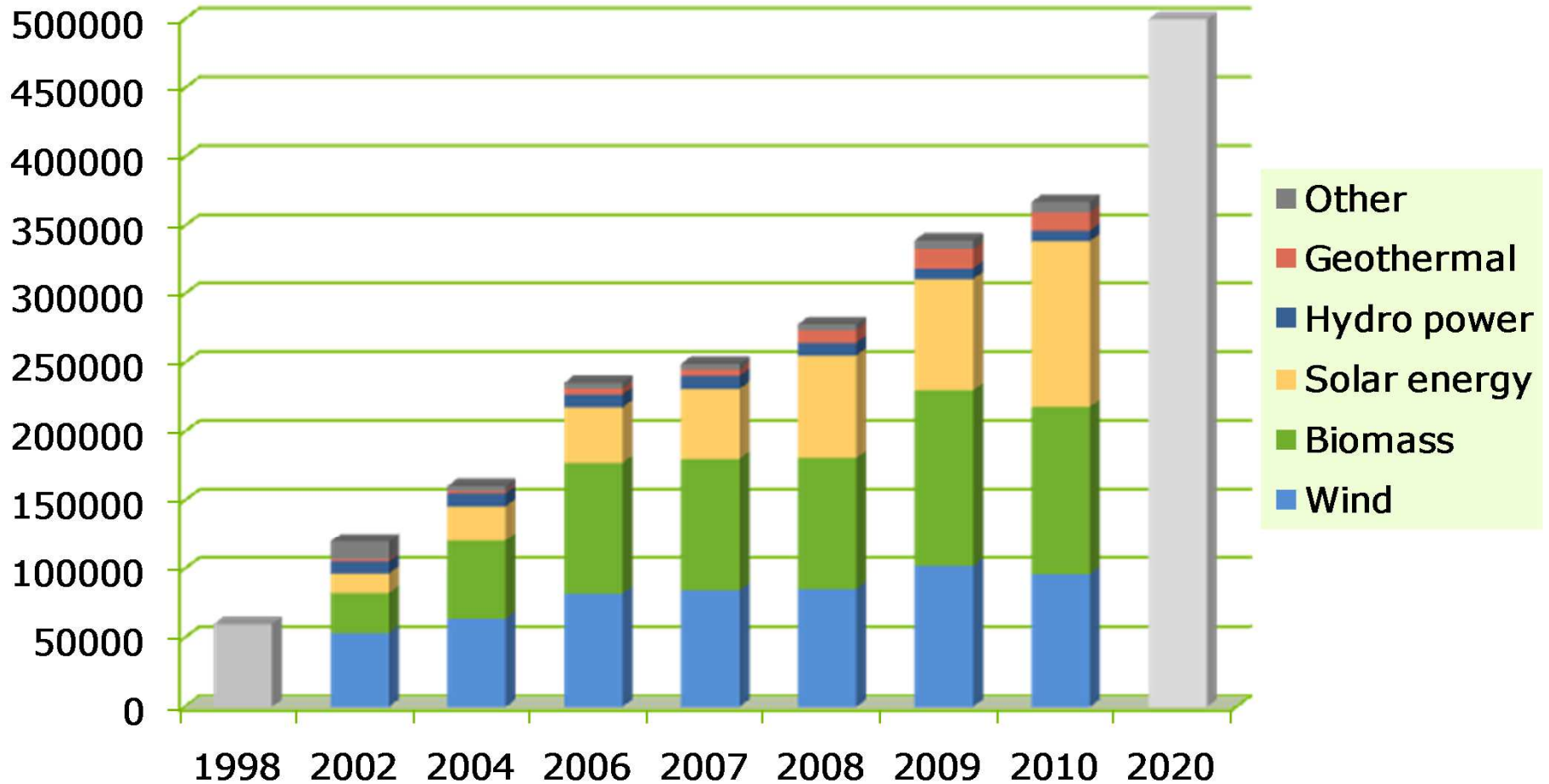


75% renewables until 2030



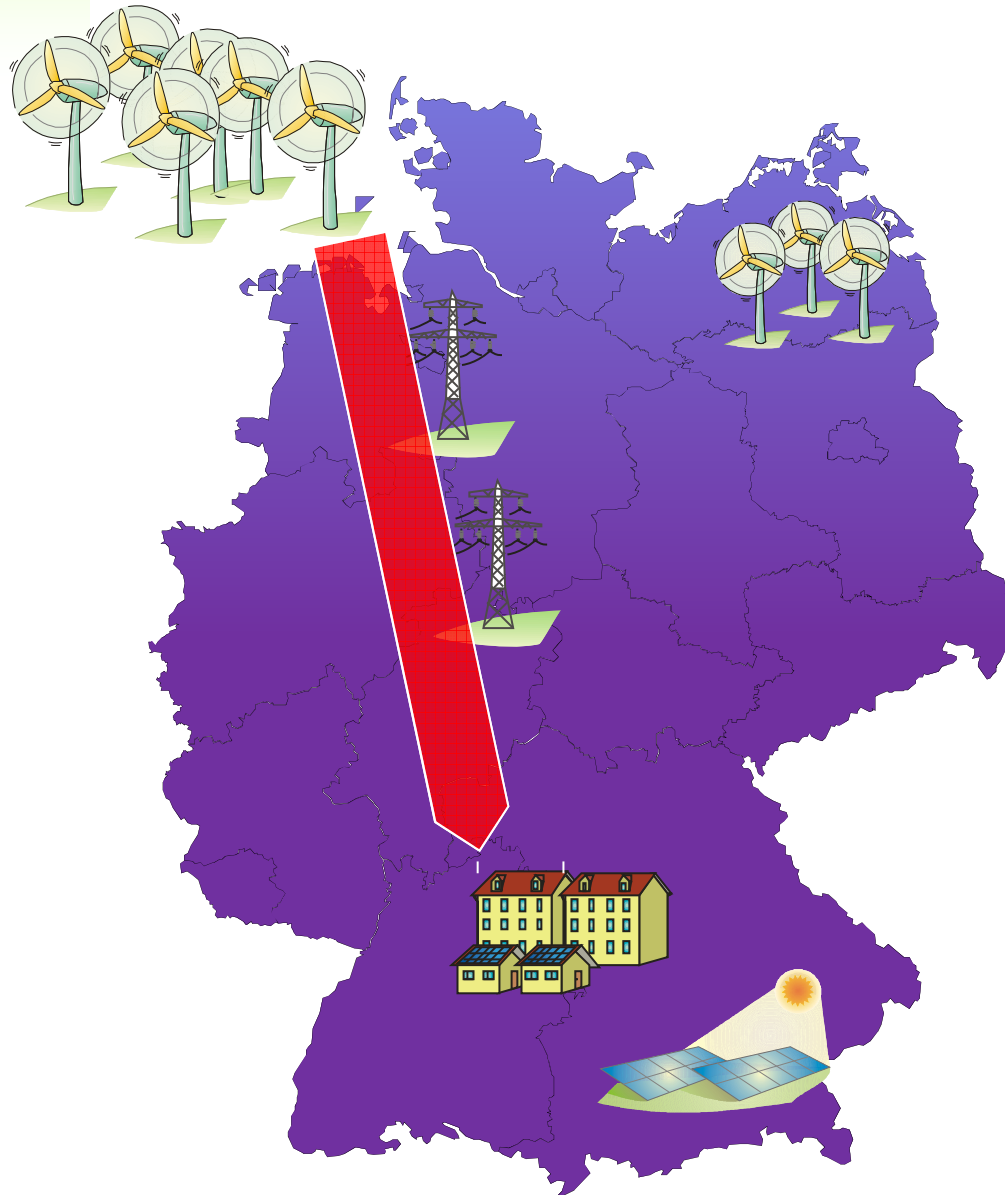
100% renewables until 2030



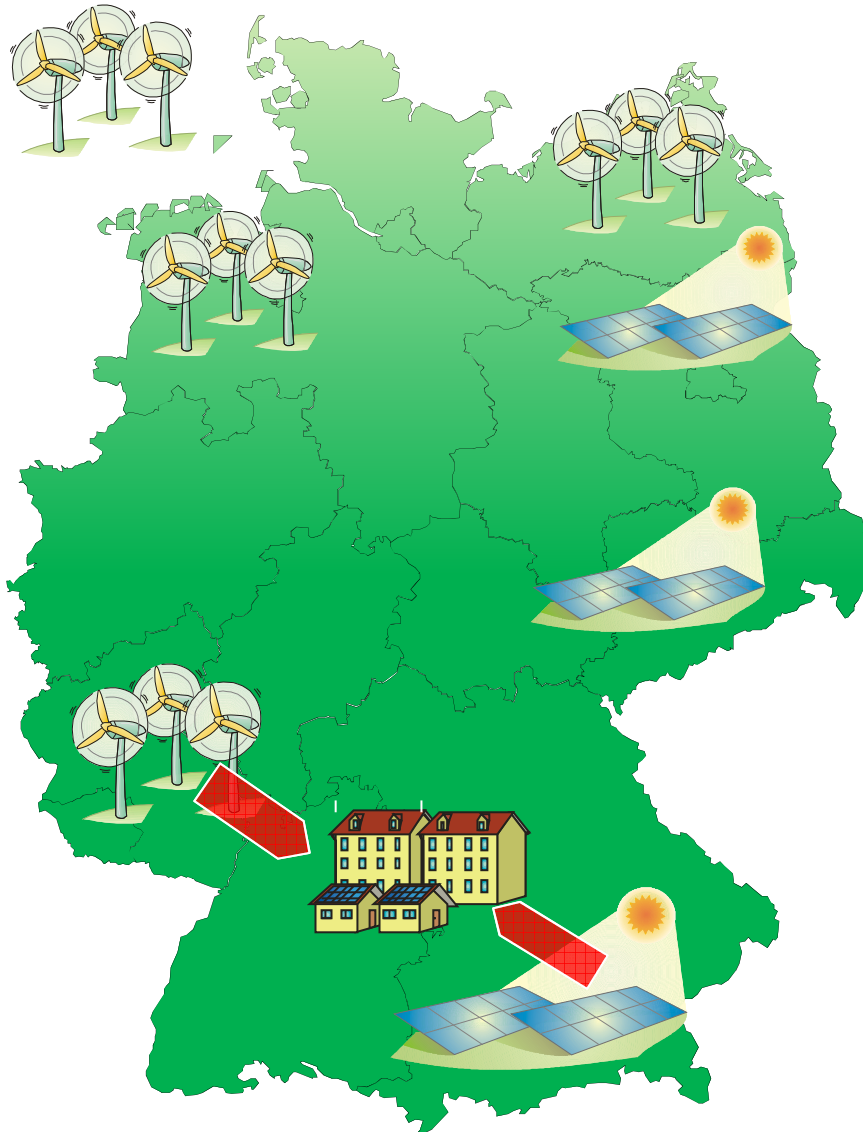


Data: BMU



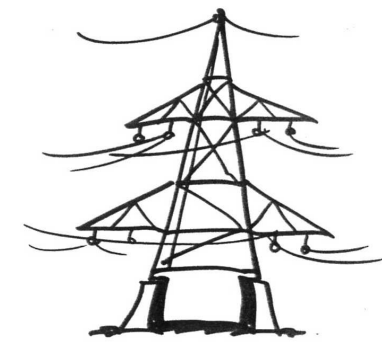
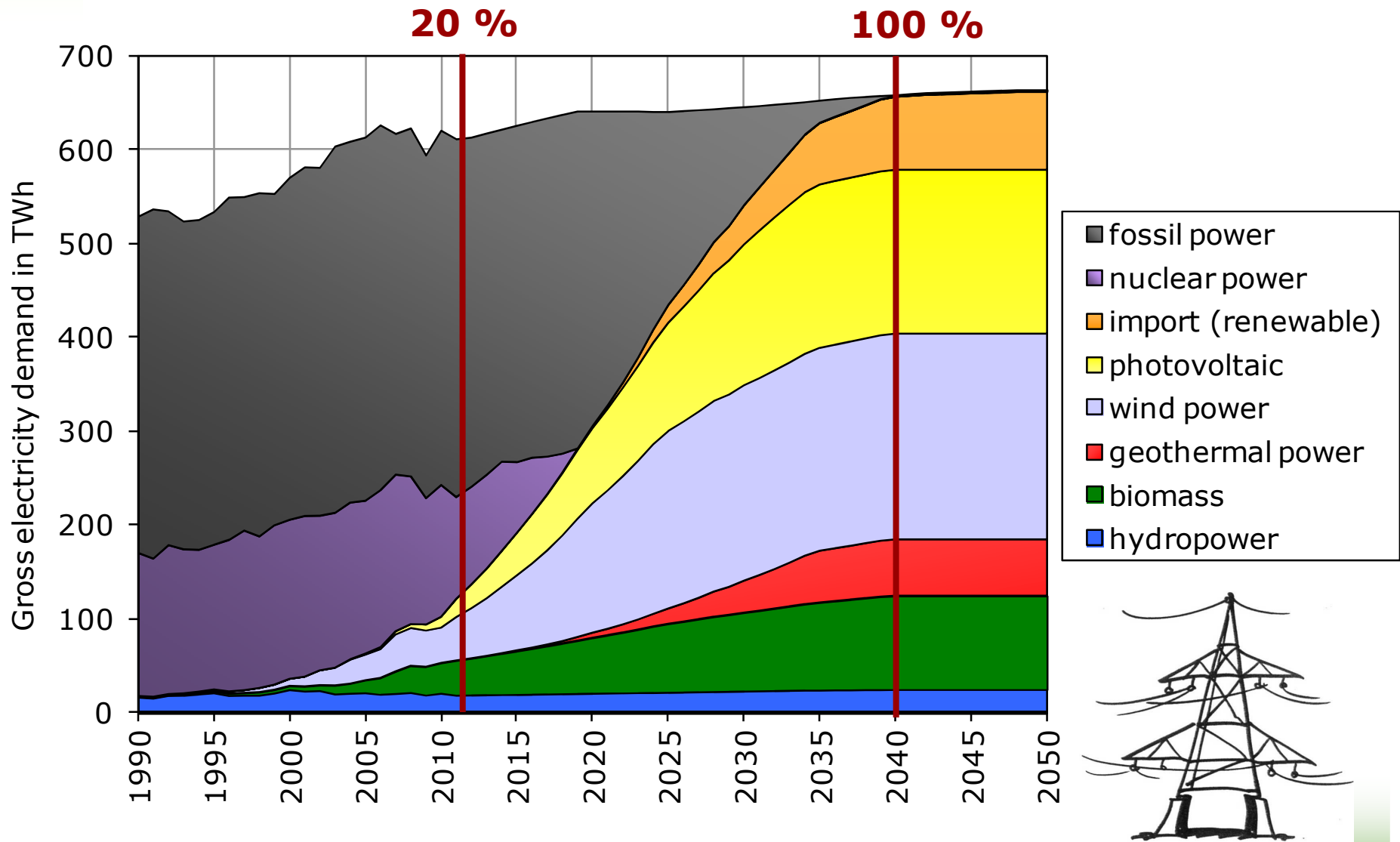


- Continuing supply oligopoly
- Many new power lines necessary
- Energy transition not realizable fast enough

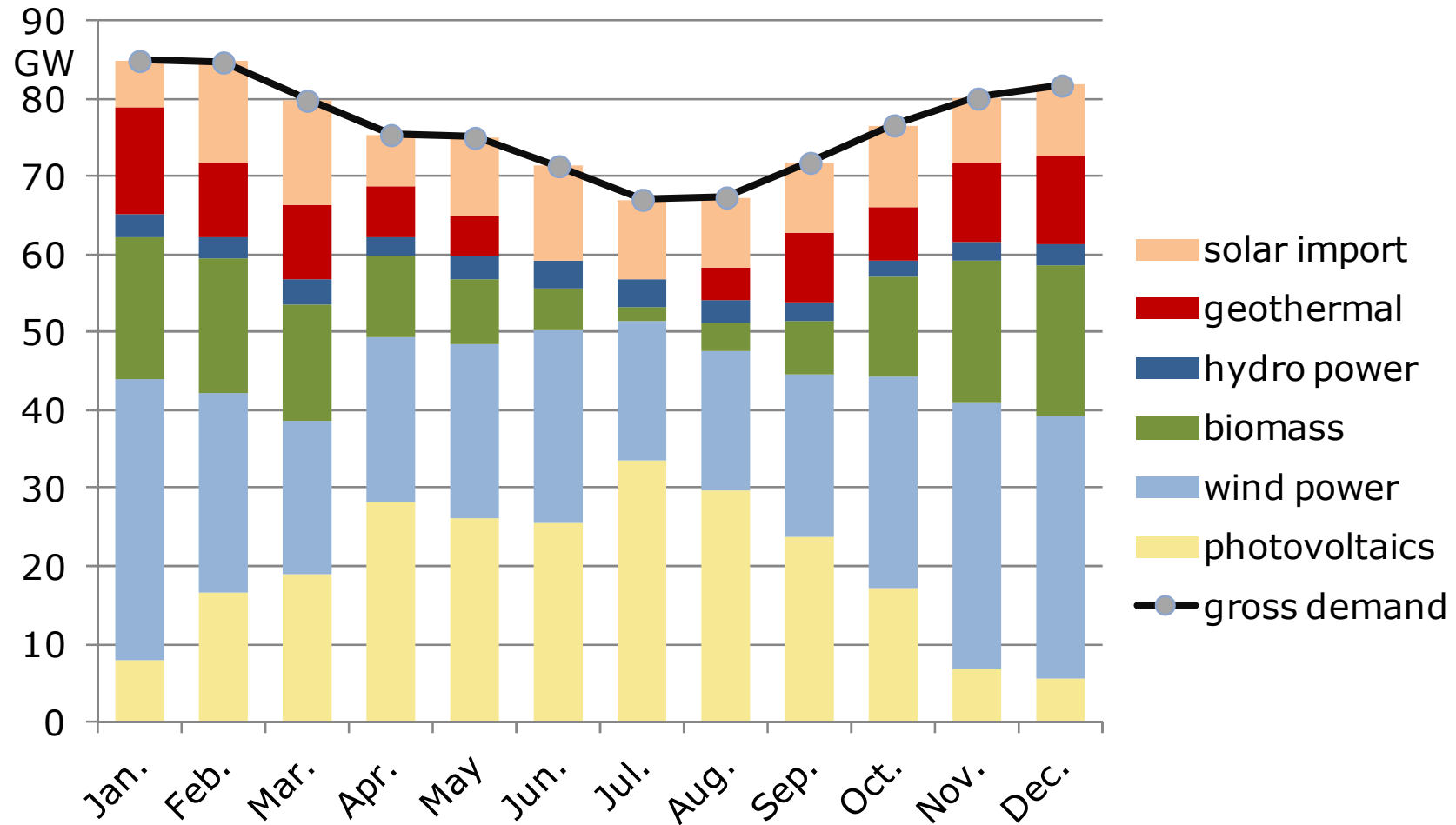


- ⊕ more competition and cost effectiveness
- ⊕ less new power lines but more decentralized storage are needed
- ⊕ energy transition is realizable in any speed we want

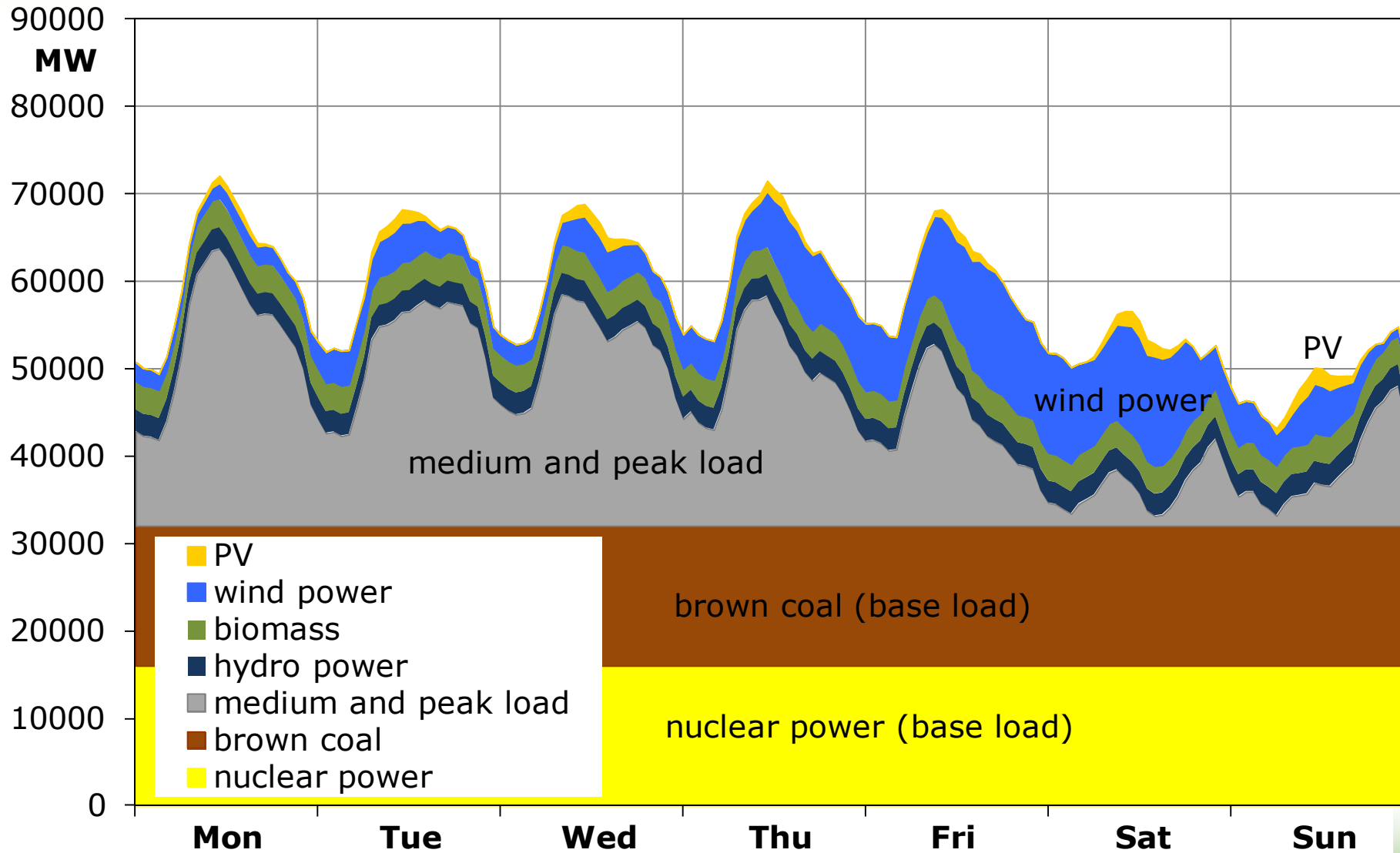
HTW scenario: climate protection and sustainable development



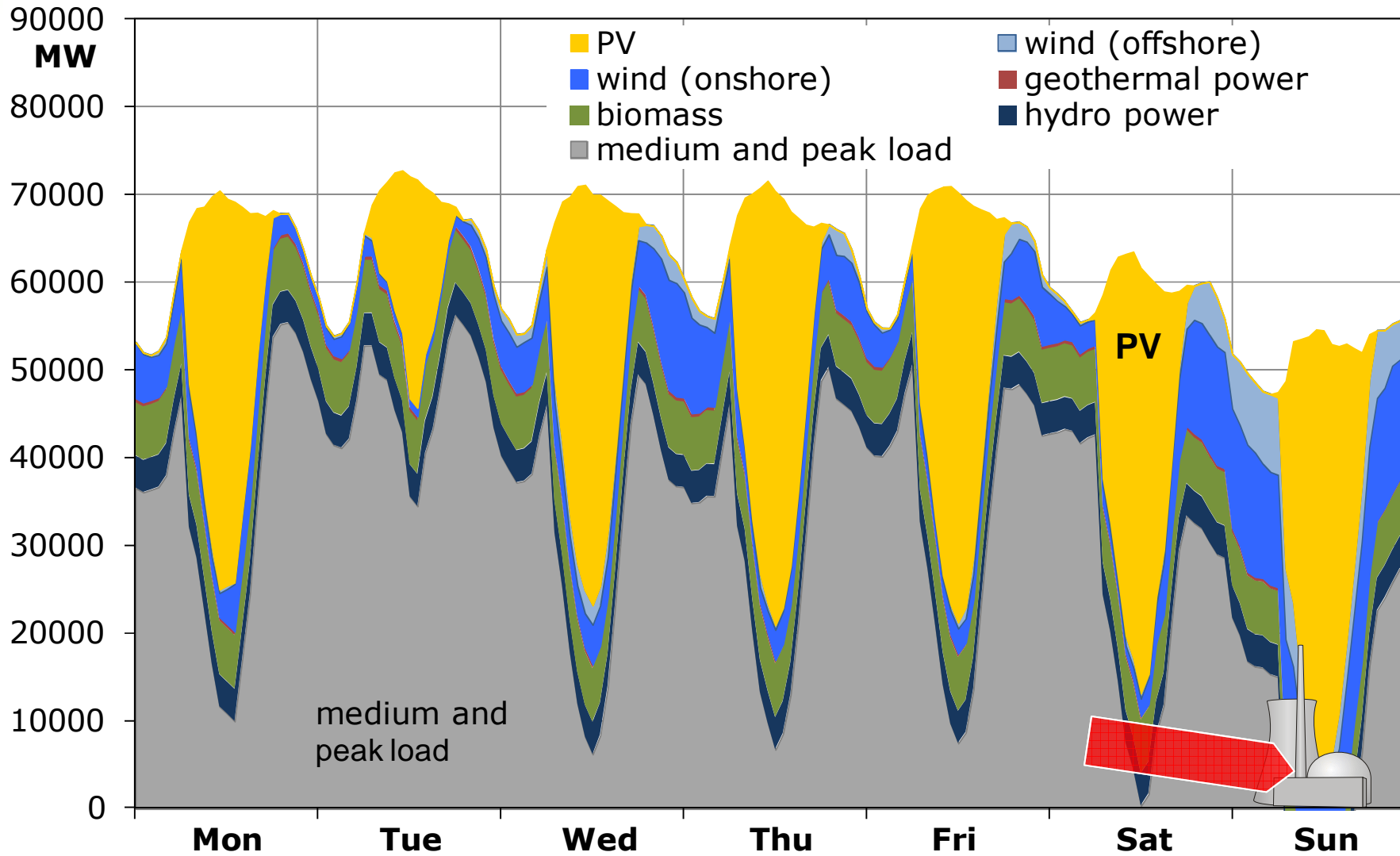
## mean monthly power generation and demand

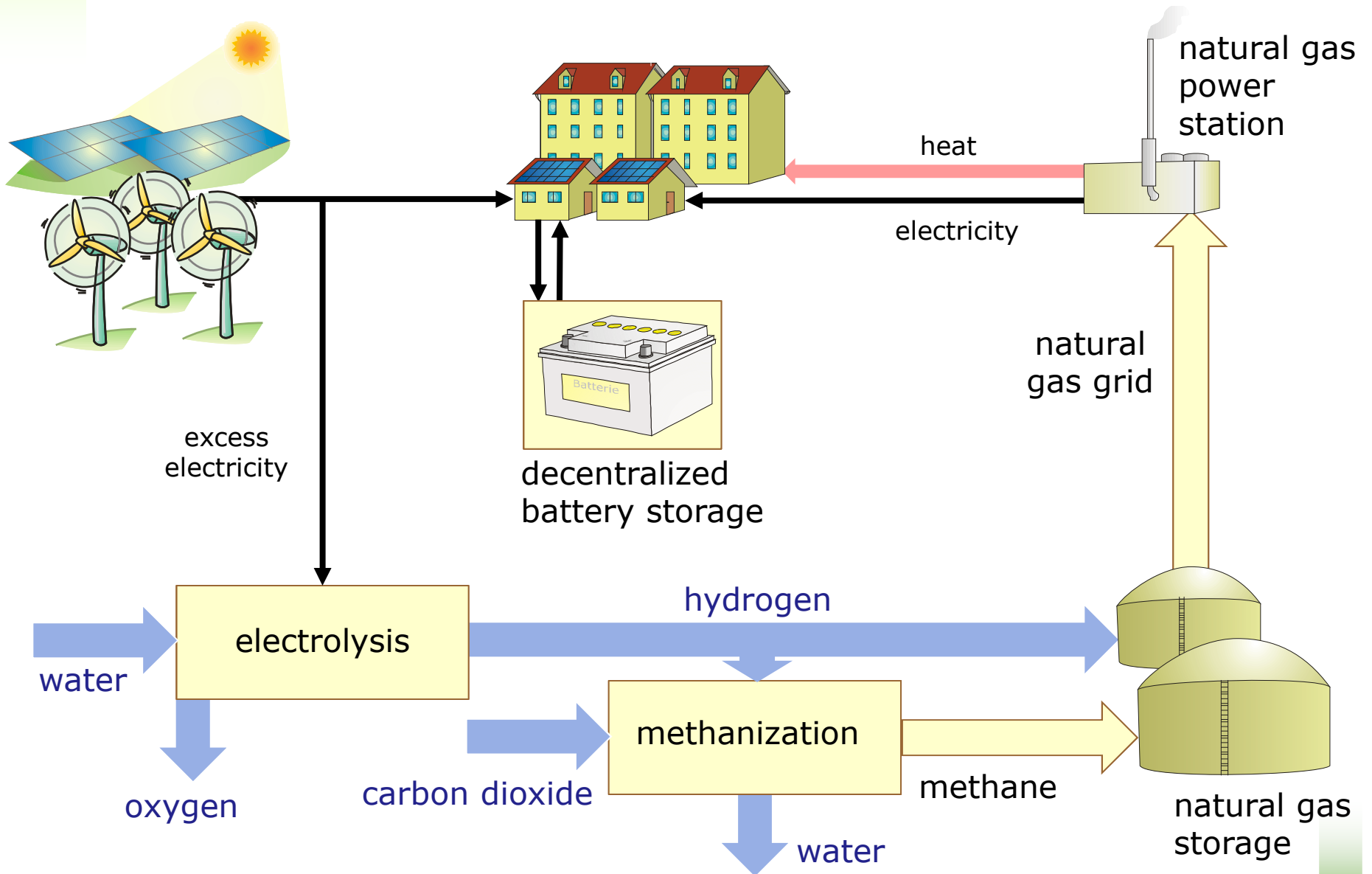


spring week in 2008



possible generation during a spring week 2020





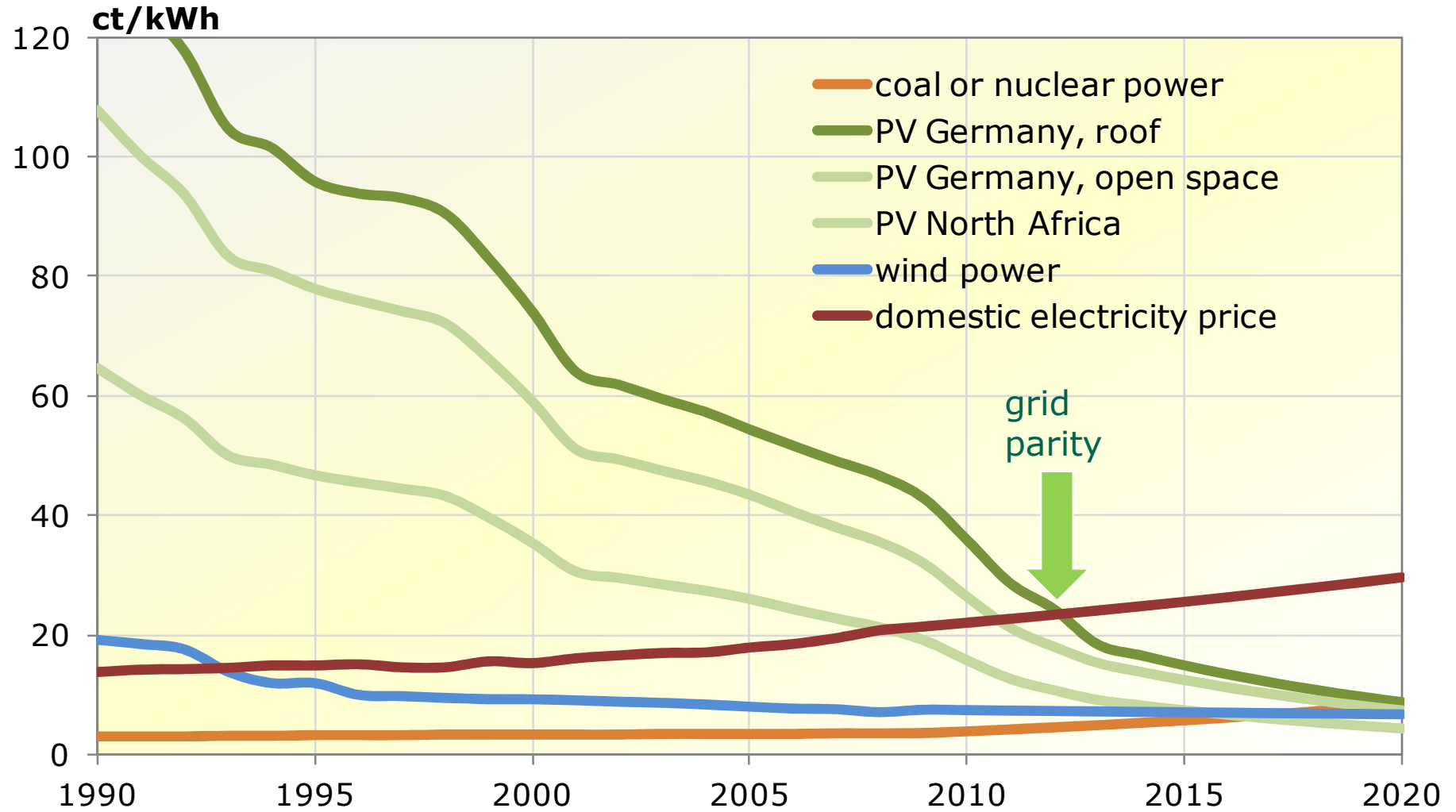
If we keep the high installation rates for renewable power for the next 10 years **we do not need base load power stations anymore.**

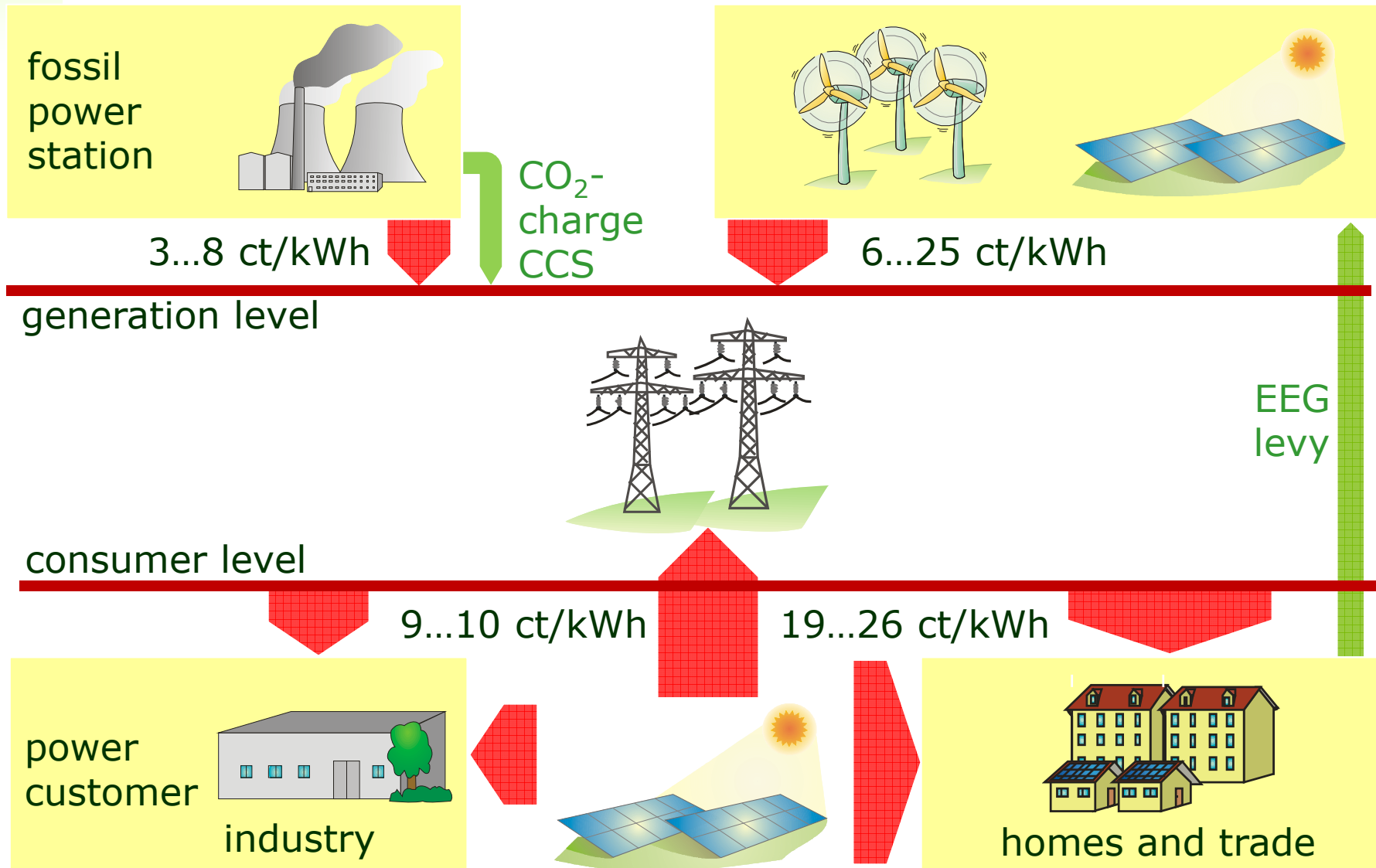
Then, it will be **impossible to run nuclear or brown coal** power stations economically.

This is why the **big power companies** and some politicians now **want to reduce** new **renewable installations** significantly.

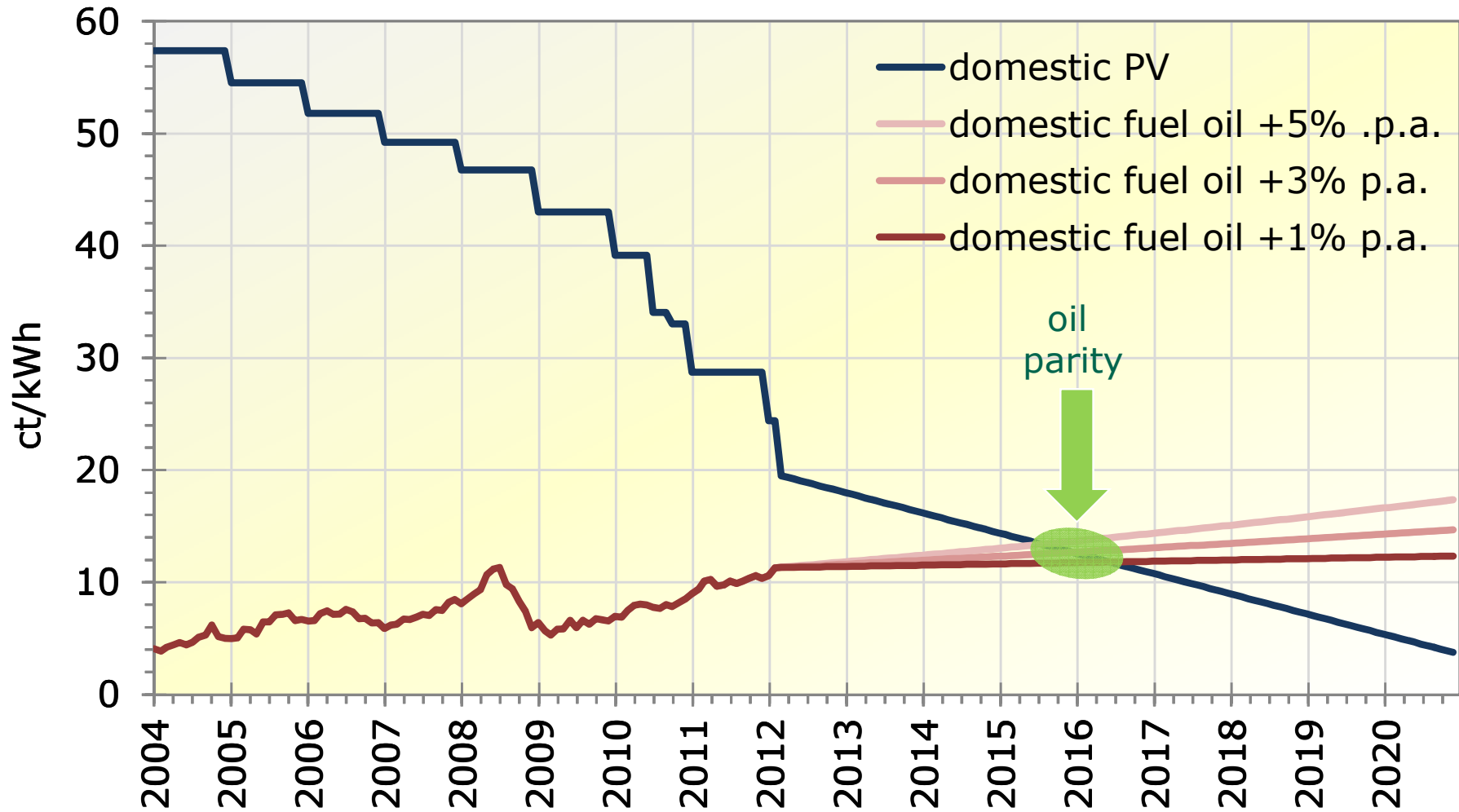






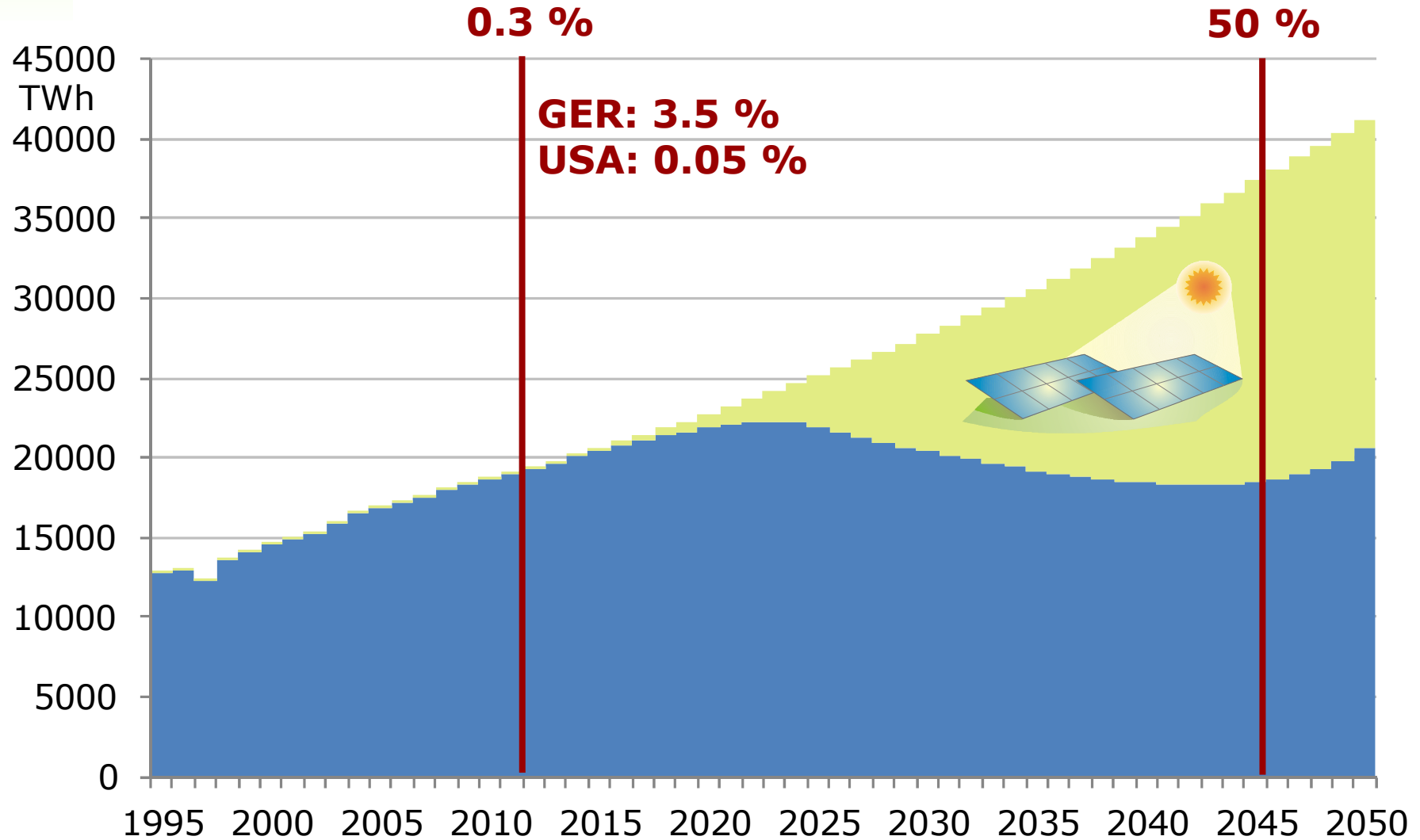


Assumptions: Boiler efficiency 80%, calorific value of fuel oil 10.5 kWh/l



# Expected Share of PV for the Global Electricity Supply

Assumptions: 30% market growth per year until 2025, then 550 GW p.a.

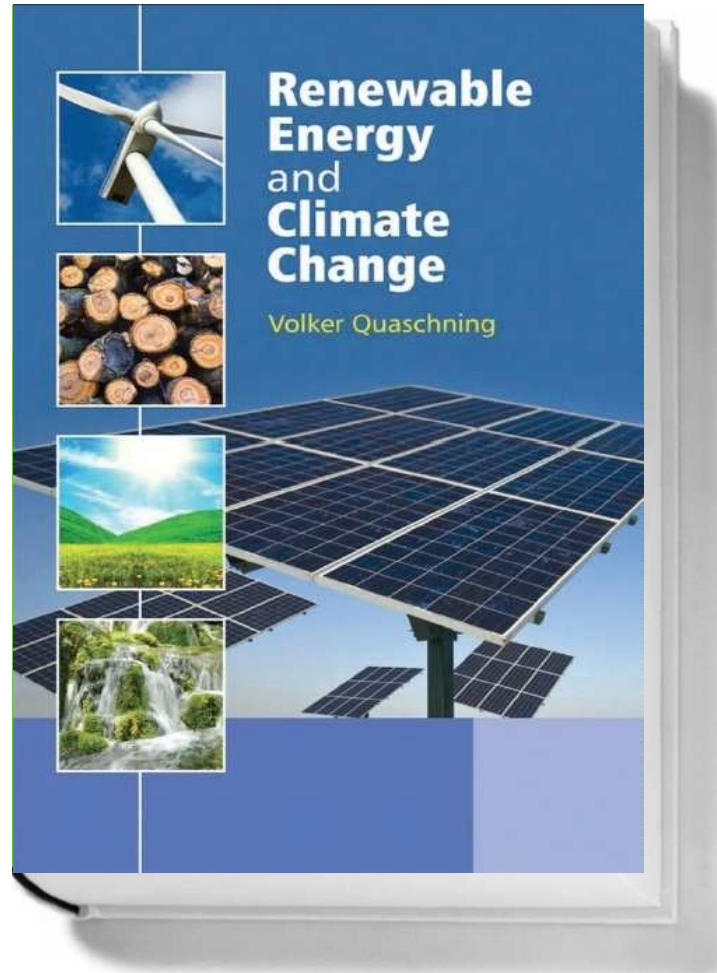


**Photovoltaic systems** must not compete to utility operated power stations because they **can be installed directly at the consumer.**

The immense price reduction of photovoltaic systems will start a **revolution in the energy sector** within **this decade.**

PV will be **fully competitive** very soon and is one major **hope for climate protection** and global access to electricity.

For further reading...



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