

A composite image featuring wind turbines in the upper half against a sunset sky, and a field of yellow wildflowers in the lower half. A semi-transparent white box containing text is overlaid on the right side of the image.

Global Sustainable Energy: Current trends and Future Prospects

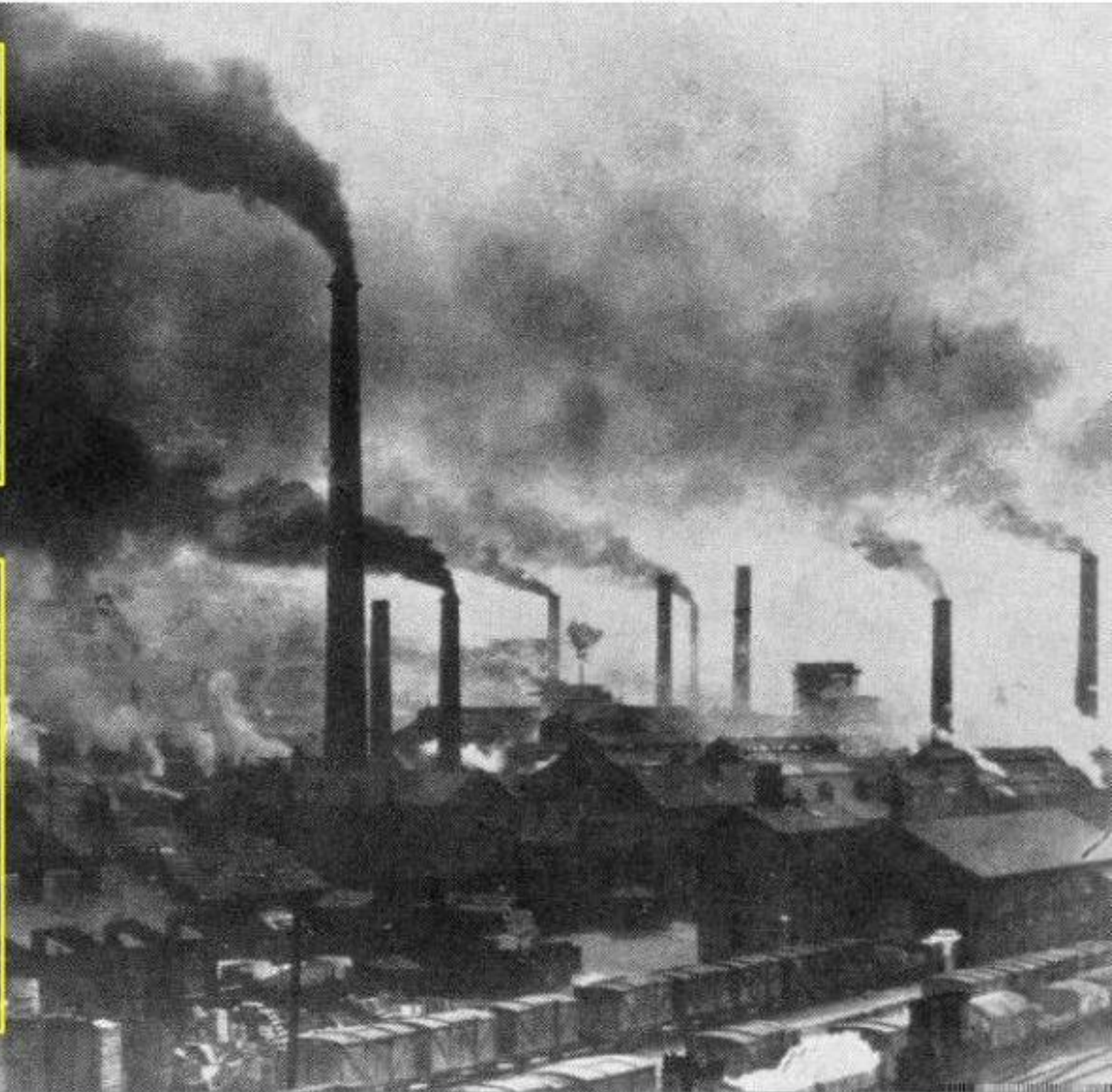
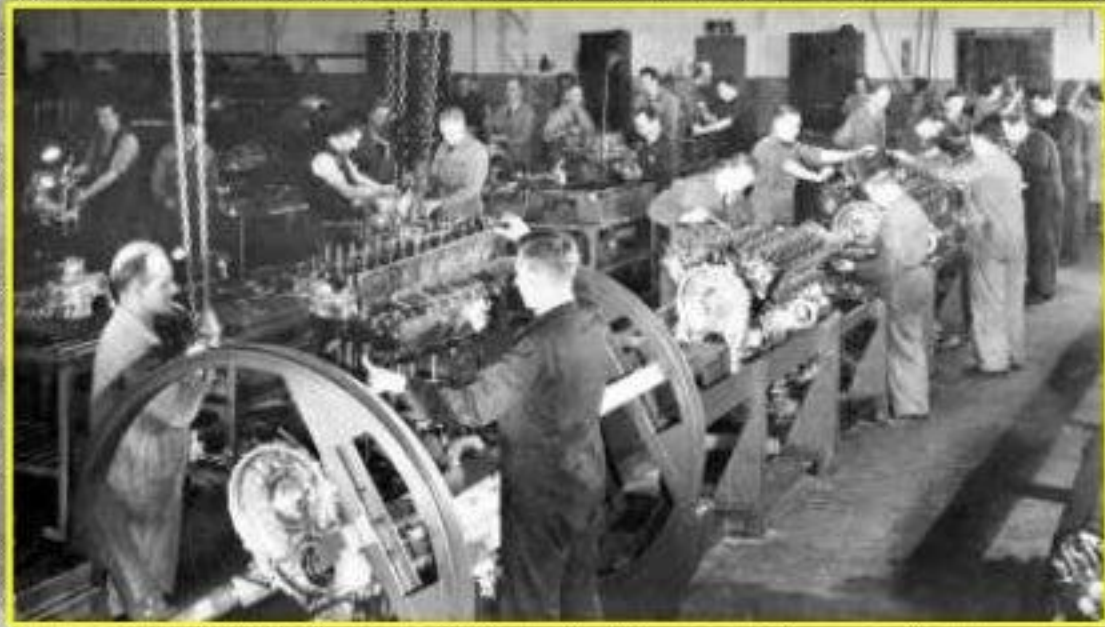
Hashem AL-ghaili
Jacobs University Bremen

Exploiting natural resources



400,000-year-old shelter from Terra Amata, France

Industrial revolution 1700



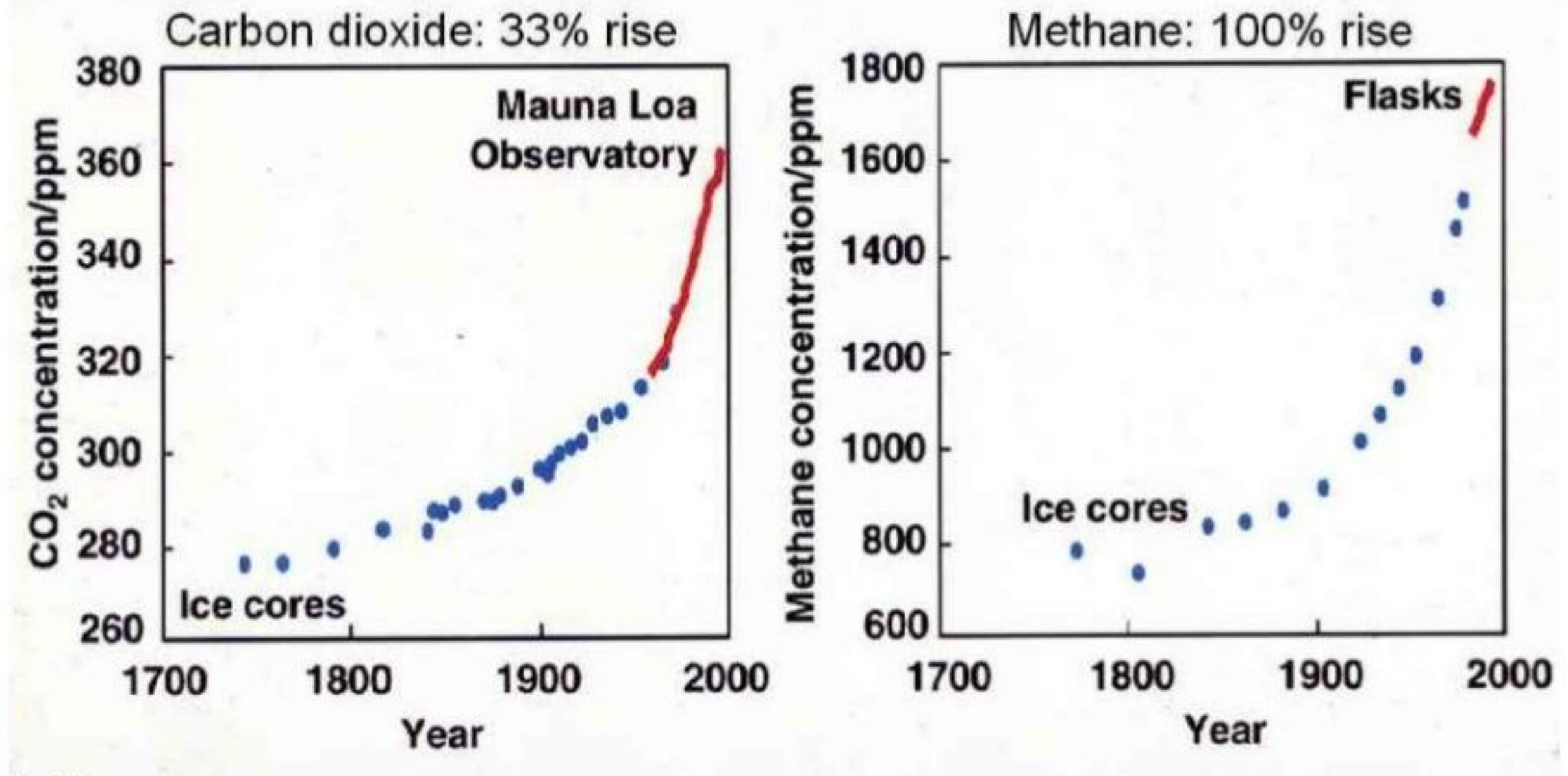
Technological explosion



Current technological revolution



The impact of industrial revolution on our climate



By the year 2100, carbon dioxide concentrations will rise to 600 - 700 parts per million.

Switching towards clean energy



General overview

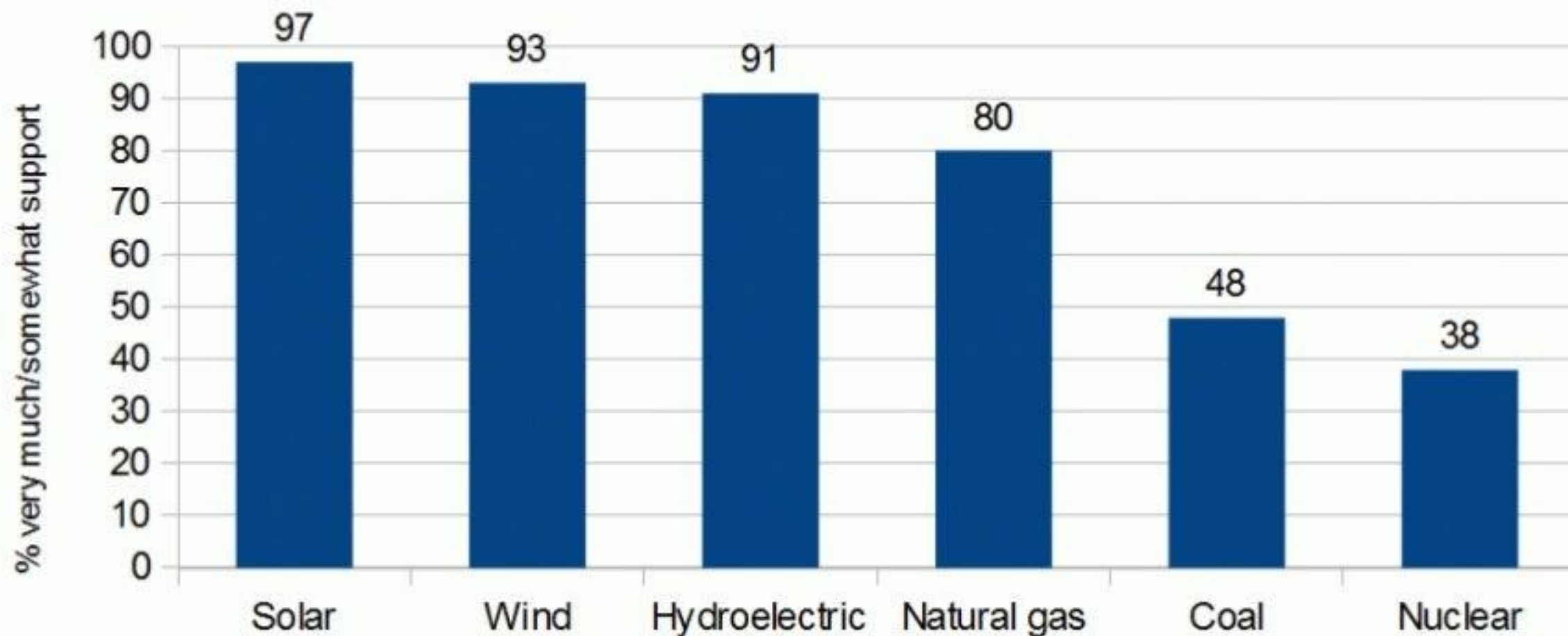


Switching towards clean energy



Global public support for energy sources

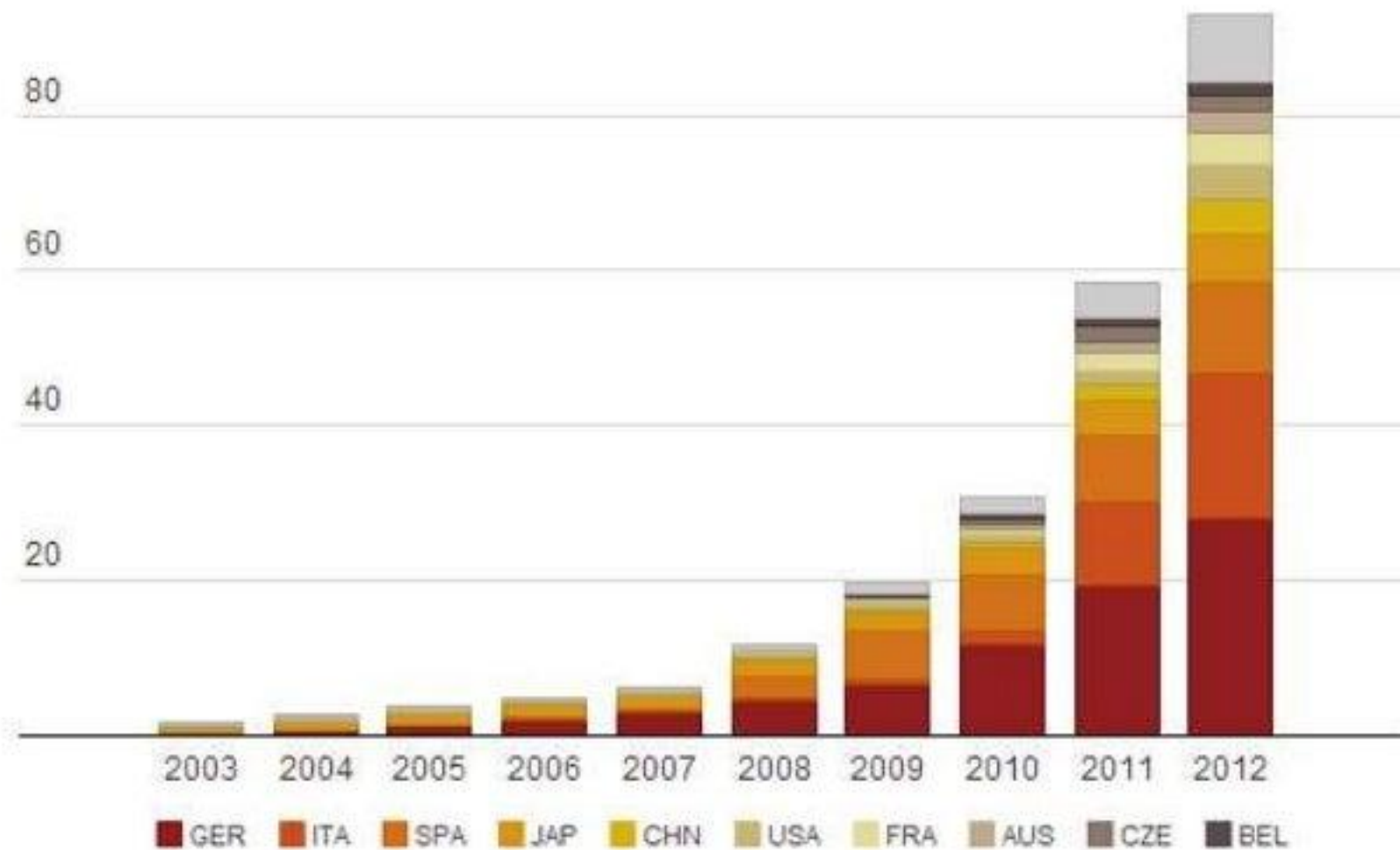
"Please indicate whether you strongly support, somewhat support, somewhat oppose, or strongly oppose each way of producing energy"



Source: Ipsos, May 2011

Global status with solar power

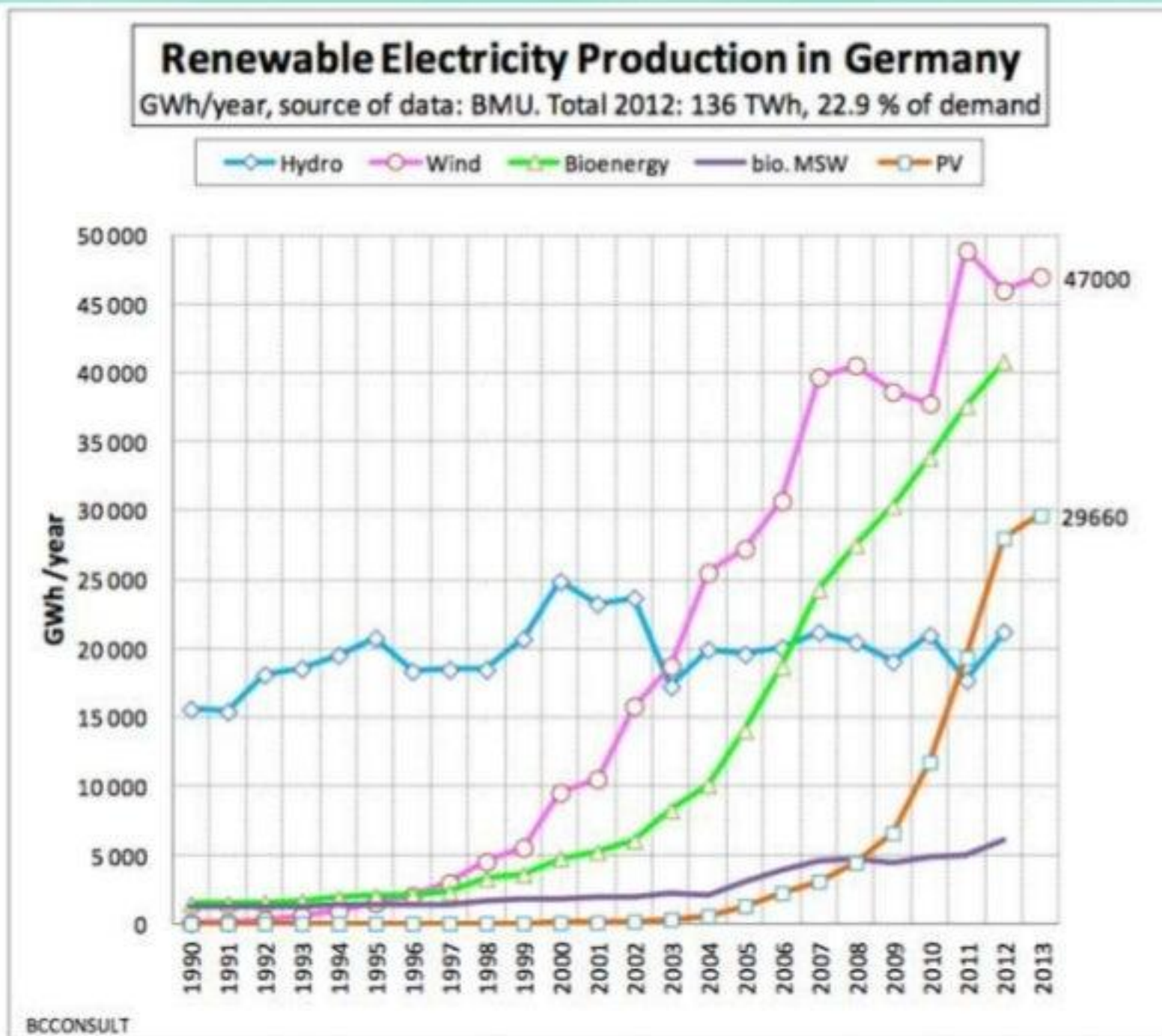
Global Solar Generation: 2003-2012 (TWh)



Source: BP Energy Outlook 2012

shrinkthatfootprint.com

Status of Germany



Germany has a goal of producing 100% of electricity from renewable sources by 2050.

Status of Germany with solar power

June 6th (1pm and 2pm)

June 9th (National holiday)

24.24 GWh of electricity



A worker at a solar farm in Frankfurt (Oder) Photo: DPA

Germany produces half of energy with solar

Published: 19 Jun 2014 14:54 GMT+02:00

Updated: 19 Jun 2014 14:54 GMT+02:00



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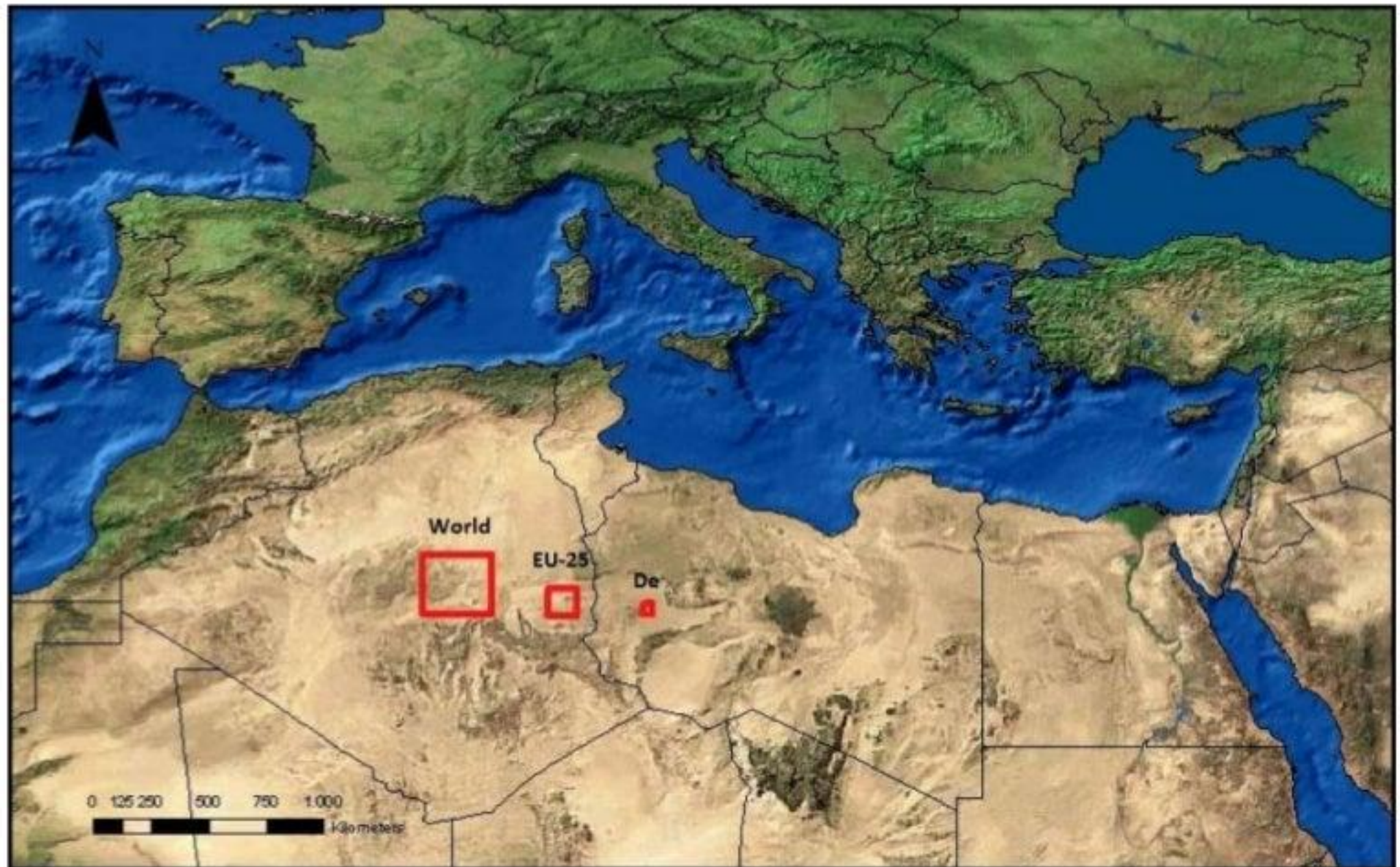
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Germany produced a record 50 percent of its electricity needs through solar panel at the start of June, breaking a huge milestone on its march to renewable energy.

The potential of solar power



Europe (EU-25)
Germany (De)

Total surface area required to fuel the world with solar power

Data provided by the German Aerospace Centre (DLR)

The potential of solar energy in reducing CO₂ emissions

California, United States



Ivanpah Solar Power Facility
Capacity: 354 MWh
CO₂ Reduction: 400,000 tons

Arizona, United States



The Agua Caliente Solar Project
Capacity: 290 MWh
CO₂ Reduction: 324,000 tons

Sanlúcar la Mayor, Spain



Solnova Solar Power Station
Capacity: 200 MWh
CO₂ Reduction: 185,000 tons

Neemuch, India



Welspun Solar MP Project
Capacity: 150 MWh
CO₂ Reduction: 216,372 tons

Abu Dhabi, UAE



Shams Solar Power Station
Capacity: 100 MWh
CO₂ Reduction: 175,000 tons

California, United States



Genesis Solar Energy Project
Capacity: 250 MWh
CO₂ Reduction: 393,000 tons

Ivanpah Solar Power Facility, U.S.



- **Ivanpah Solar Power Facility**
- **Location: California, United States**
- **Commission date: Feb, 2014**
- **Capacity: 354 megawatts (MWh)**
- **Generates power for 140,000 homes**

The Ivanpah installation reduces carbon dioxide emissions by over 400,000 tons annually.

Canal Solar Power Project, India



A touch of innovation



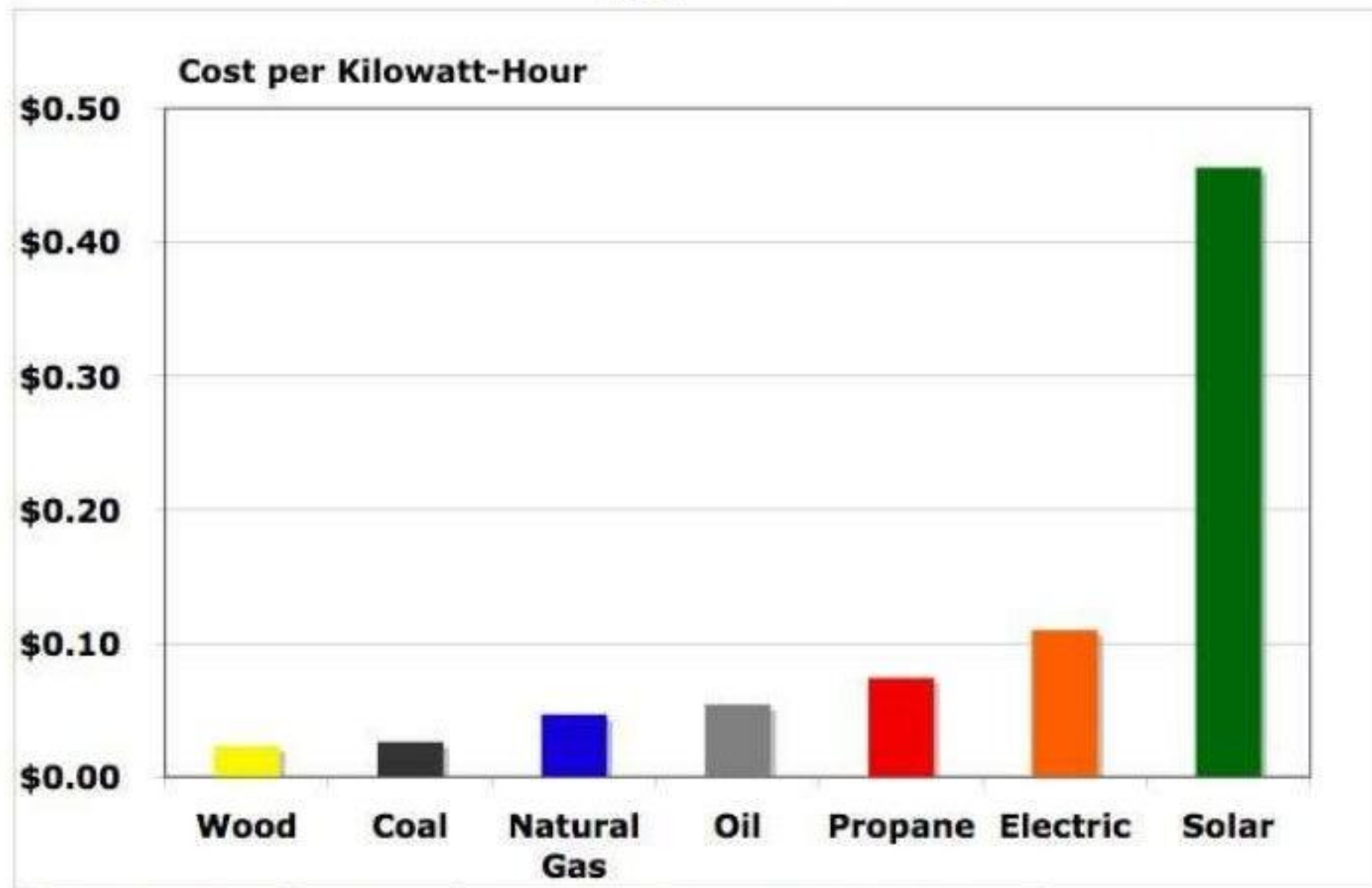
Solar energy trends over the past 3 years

- More efficient.
- Minimized environmental risks.
- Cheaper.
- Smaller.
- Flexible.
- Transparent.



Cost problem

Energy Costs



Source: Energy Information Administration, Green Econometrics research