

Second Giessen Workshop
on Solar Energy Partnership between Africa and Europe

Electricity Import from the desert

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Electricity import from the desert

▶ Greenpeace Energy:

- ▶ Nationwide electricity supplier in Germany
- ▶ Clean electricity from renewable energy sources
- ▶ Acting according to the quality rules for clean energy as set by Greenpeace
- ▶ Contributing to the buildup of new renewable capacities
- ▶ Building renewable power plants ourselves
- ▶ Low profit cooperative, independent from the big energy companies
- ▶ 91,000 customers, 17,000 cooperative members
- ▶ Founded 1999 as result of a Greenpeace campaign for cleaner energy

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- ▶ Greenpeace Energy mission:
 - ▶ Taking part in the buildup of a clean energy system in Germany
 - ▶ Acting as a role model by showing that – and how – a energy revolution is possible

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- ▶ Global energy future – double challenge:
 - ▶ Buildup of sustainable energy systems where there's no adequate power supply yet.
 - ▶ Conversion of existing power supplies into sustainable energy systems.

- ▶ What's wrong with the conventional way of producing power?
 - ▶ Fuels are becoming scarce and will end in a some decades
 - ▶ Energy costs are already high (if you internalize external costs), will increase dramatically
 - ▶ Damage to our planet – climate change and risks of nuclear radiation

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Renewable energies are a massive success story

Figure 1.
Wind Power, Existing World Capacity, 1996-2008

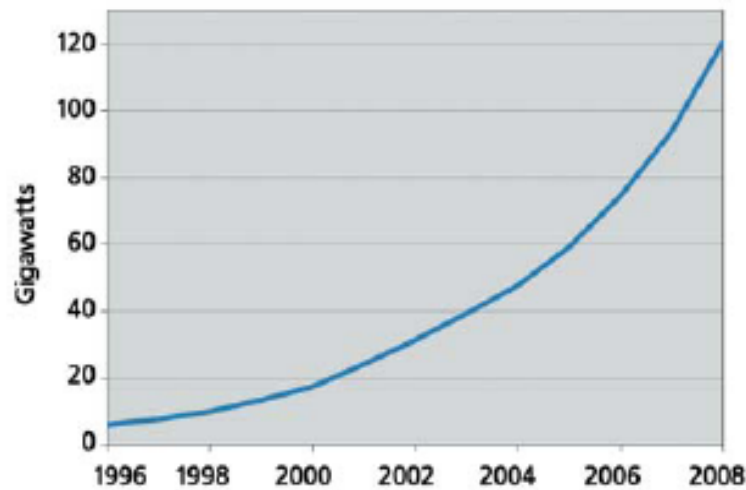
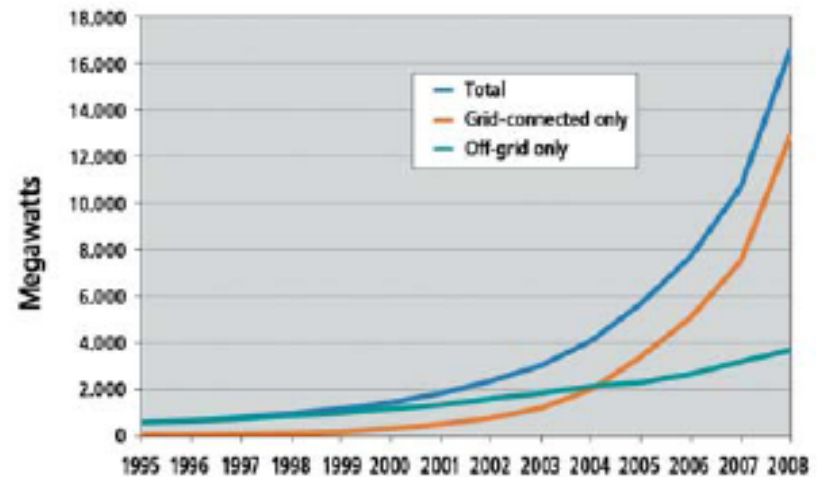


Figure 3.
Solar PV, Existing World Capacity, 1995-2008



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- ▶ Share of renewable energies in Germany (electricity)
 - ▶ 2000: 4 %
 - ▶ 2010: 20 %
 - ▶ 2020: 30-50 %
 - ▶ 2050: 70-100 %

- ▶ Rising conflict between renewable and conventional power plants
 - ▶ Renewables will be the backbone future energy system
 - ▶ Flexible power plants needed as back-up for reserve power
 - ▶ Coal plants and especially nuclear plants can't adopt their power output flexibly enough
 - ▶ More and more often, renewables alone will meet electricity demand
 - ▶ Conventional power plants are in the risk of ending up as stranded investments

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▶ De-centralized energy approach:

- ▶ Small inter-connected power producers, using renewable energy
- ▶ Power used for domestic consumption, surplus fed into the public grid



▶ Advantages:

- ▶ Independent from big power companies, often owned by citizens
- ▶ Clean, self-determined and partly self-sufficient
with 30 m² of solar panels an average German family can meet its electricity demand

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► Disadvantages of the de-centralized energy approach:

► There are some customers who need a bit more than the average family's 3,000 kWh/a

► Aurubis copper producing plant in Hamburg:

630,000,000 kWh/a

► 7 km² of solar panels needed to produce the electricity for only this one factory

► Plus: Stand-by power generation capacity for reserve power

► To meet the energy needs of an industrialized nation only with

de-centralized energy is not impossible but causes high costs.

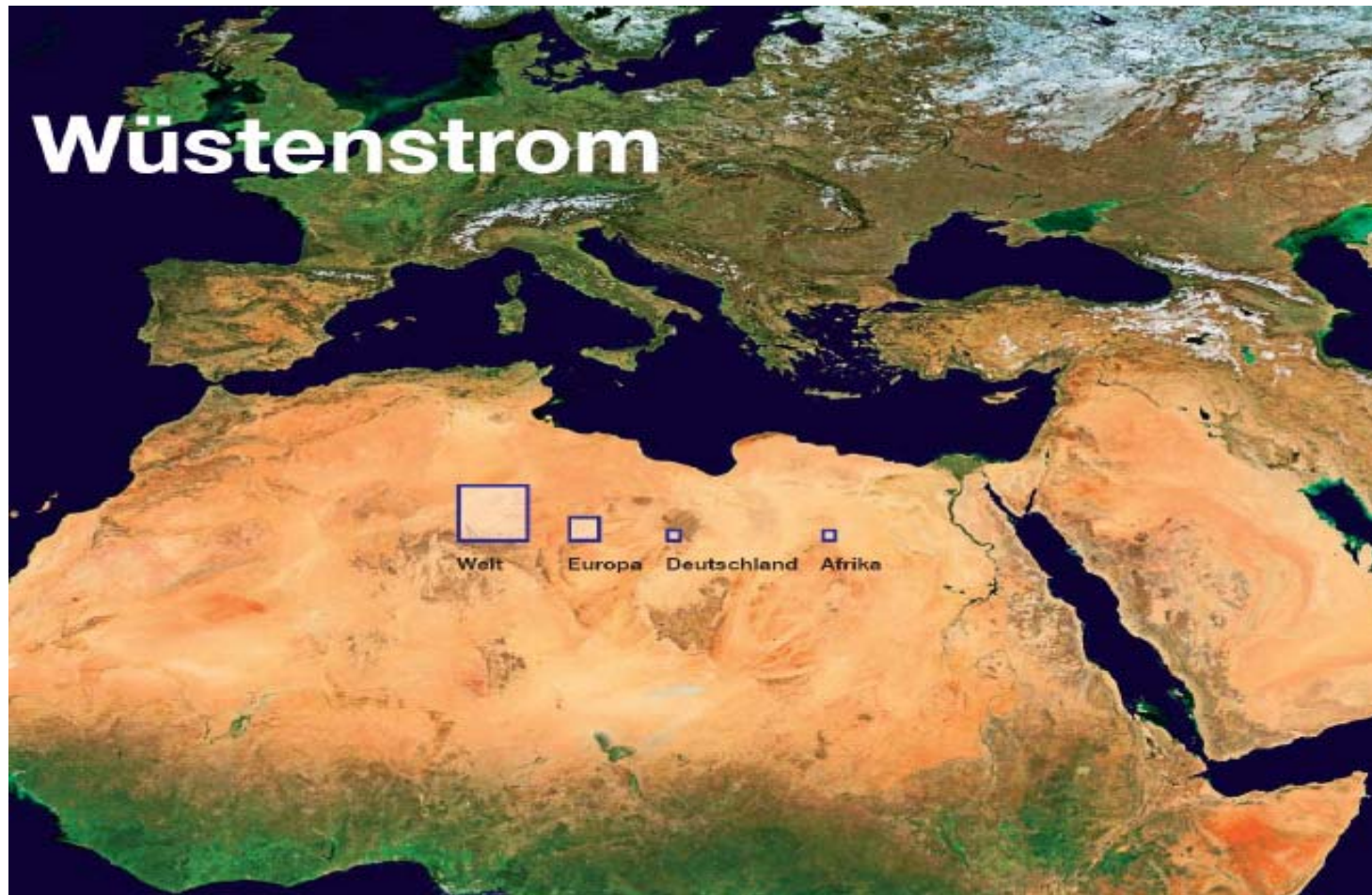


▶ Electricity import from the desert

- ▶ The de-centralized approach is still correct, but needs to be complemented with an additional component:
 - ▶ Powerful
 - ▶ Reliable
 - ▶ Cheap
 - ▶ Clean

- ▶ Electricity import from the desert / Wüstenstrom

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► Wüstenstrom is meant as a system of various renewable energy sources

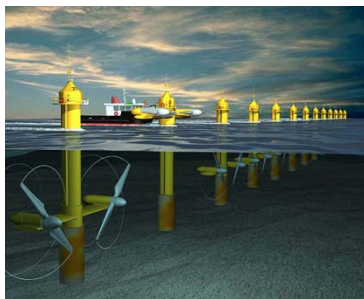
Hydro



Concentrated Solar Power (CSP)



Wind



Tides



Geothermal

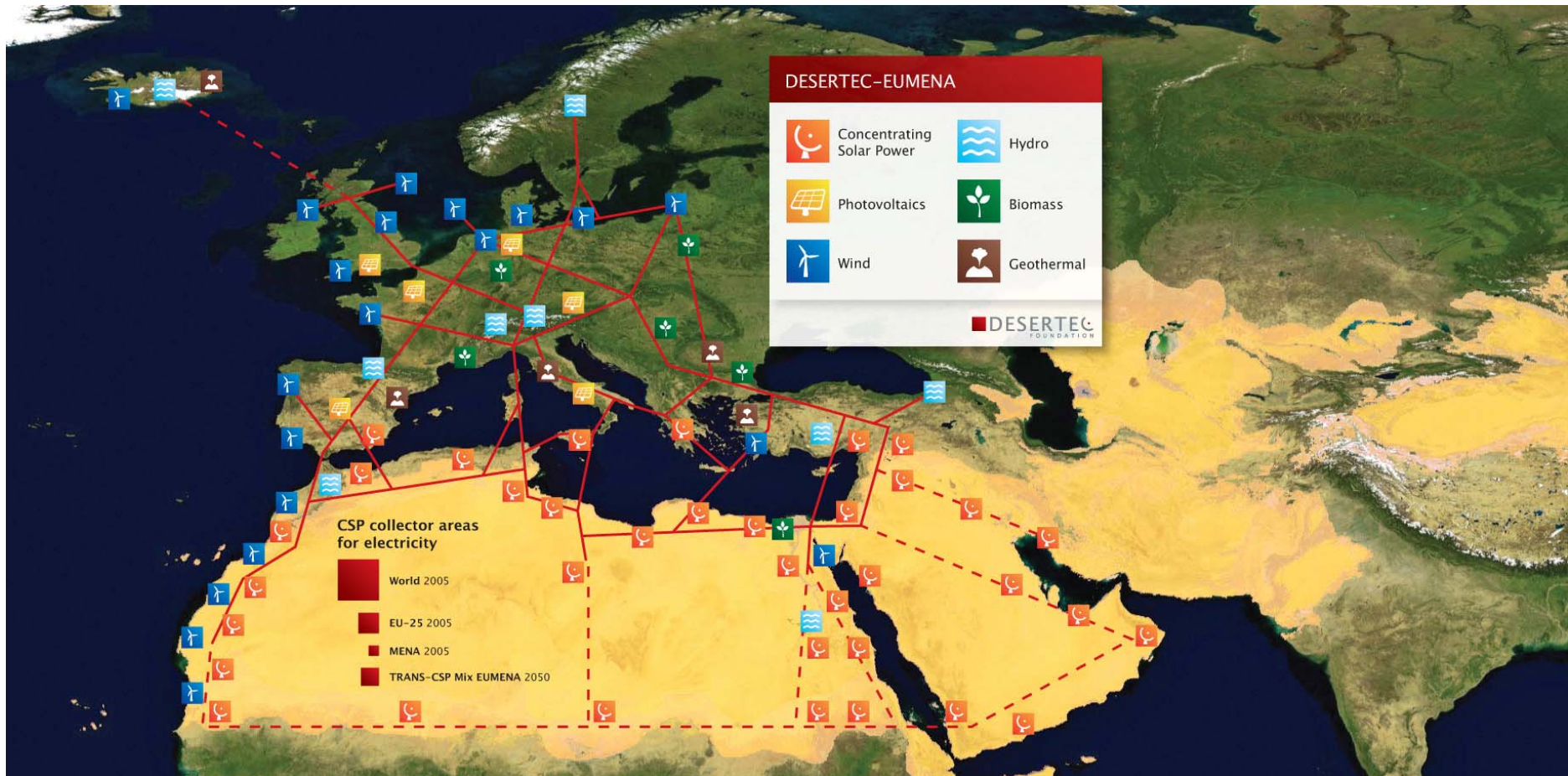


Photovoltaic



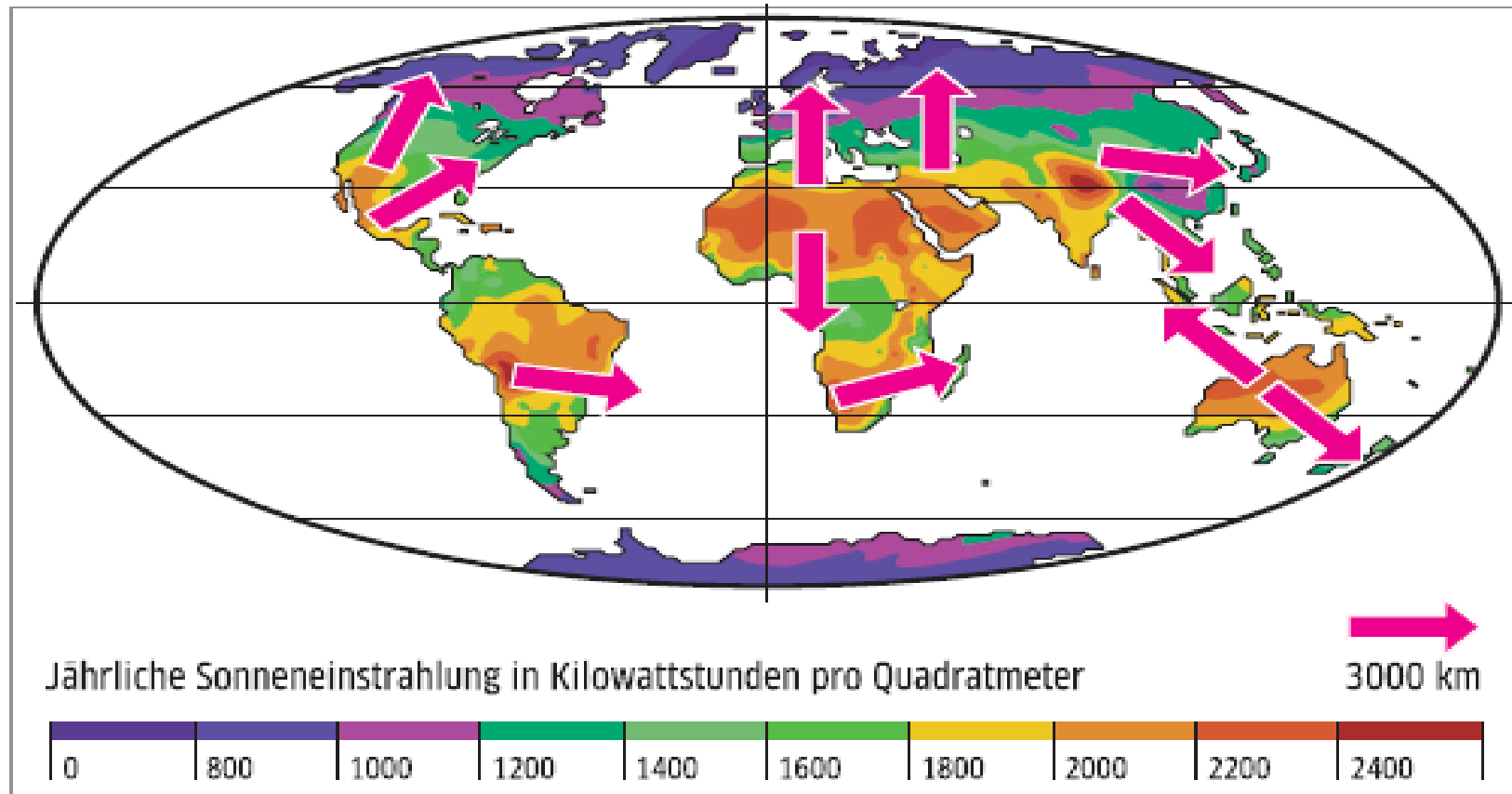
Waves

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► A global solution:



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▶ „Global Outlook on the Development of Concentrated Solar Power“

Greenpeace Study 2009 (www.greenpeace.de):

▶ By 2050, CSP can meet the energy demands

- ▶ Middle East/North Africa (Mena) region: 100 %
- ▶ Europe 25 %
- ▶ Germany 15 %
- ▶ World 25 %

▶ Annually avoided CO₂ emissions of 148 million tons in 2020 and 2,1 billion tons in 2050

▶ 2,1 million additional jobs

▶ Annual global investments of 35 - 40 billion Euro till 2020, rising to 100 – 170 billion Euro

▶ Costs of CSP power generation will decrease from 15 ct/kWh today to 8 ct ct/kWh in 2020

▶ Cheaper than coal in five to ten years

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- ▶ What's in for Africa?
 - ▶ Clean, cheap, reliable power supply
 - ▶ Technology transfer
 - ▶ Jobs
 - ▶ Longterm income from energy exports

- ▶ What's in for Europe?
 - ▶ Clean, cheap, reliable power supply
 - ▶ Technological leadership in a core technology
 - ▶ Jobs
 - ▶ Selling CSP plants and components to the world

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► To do:

- Kyoto-instruments must include CSP
- Feed-in laws for CSP on the national and European level, and within MENA region
- International taskforce sets up road-map for CSP
- Increase means for CSP research and development in Germany from 8 million Euro/year to 130 million Euro/year (amount of r&d means for nuclear fusion)
- Implement solar plan of „Mediterranean Union“ within EU





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► Thank you.