

*A new Dawn in global  
Renewable Energies*

*Inauguration Bellstech-Wecass*

Ota, Nigeria 24th February 2014

Hans-Josef Fell  
Former Member of German  
Parliament

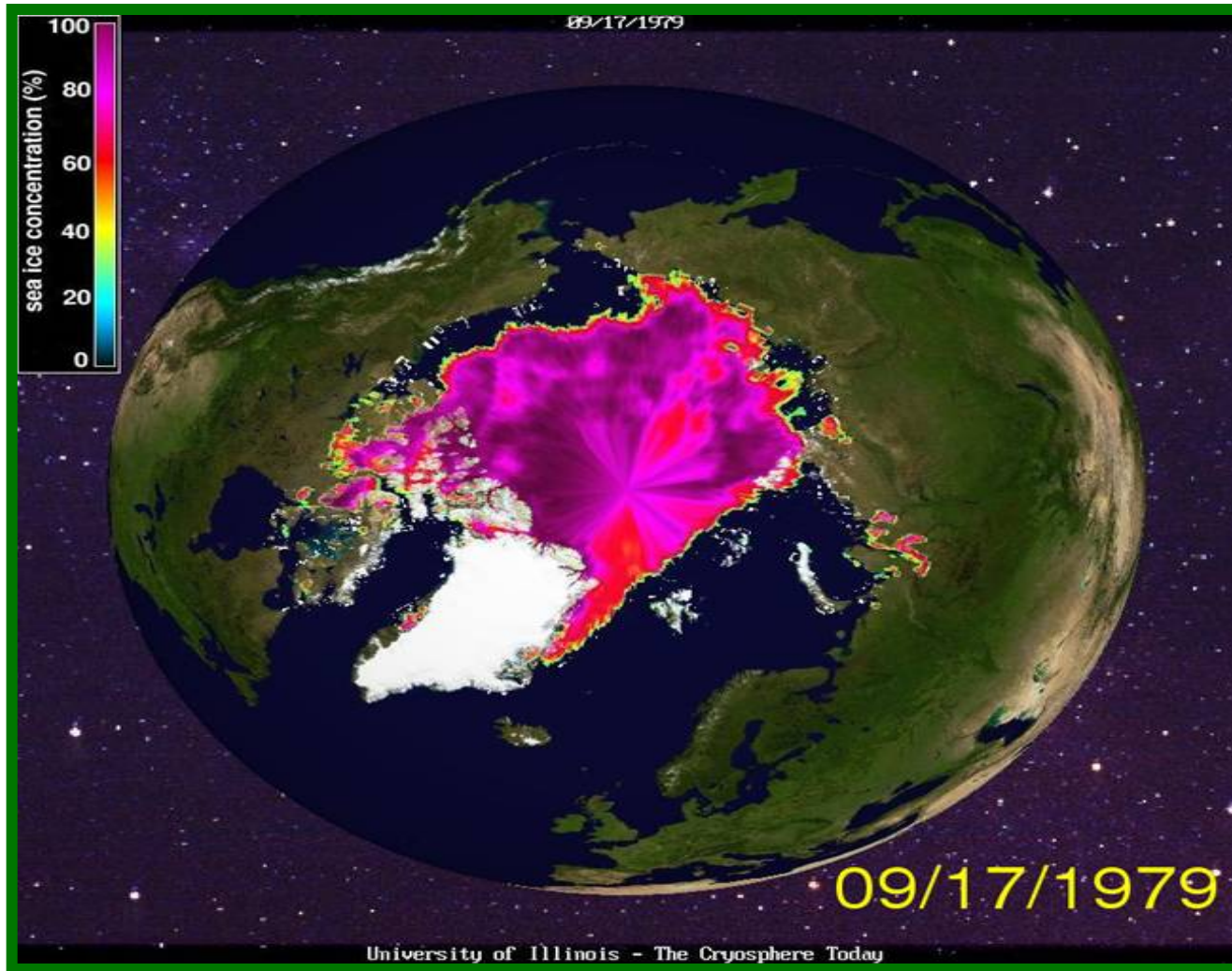
# Political challenges

- Climate warming, loss of biodiversity
- peak oil, energy security
- nuclear and environmental disasters
- oil wars, poverty, economic crises

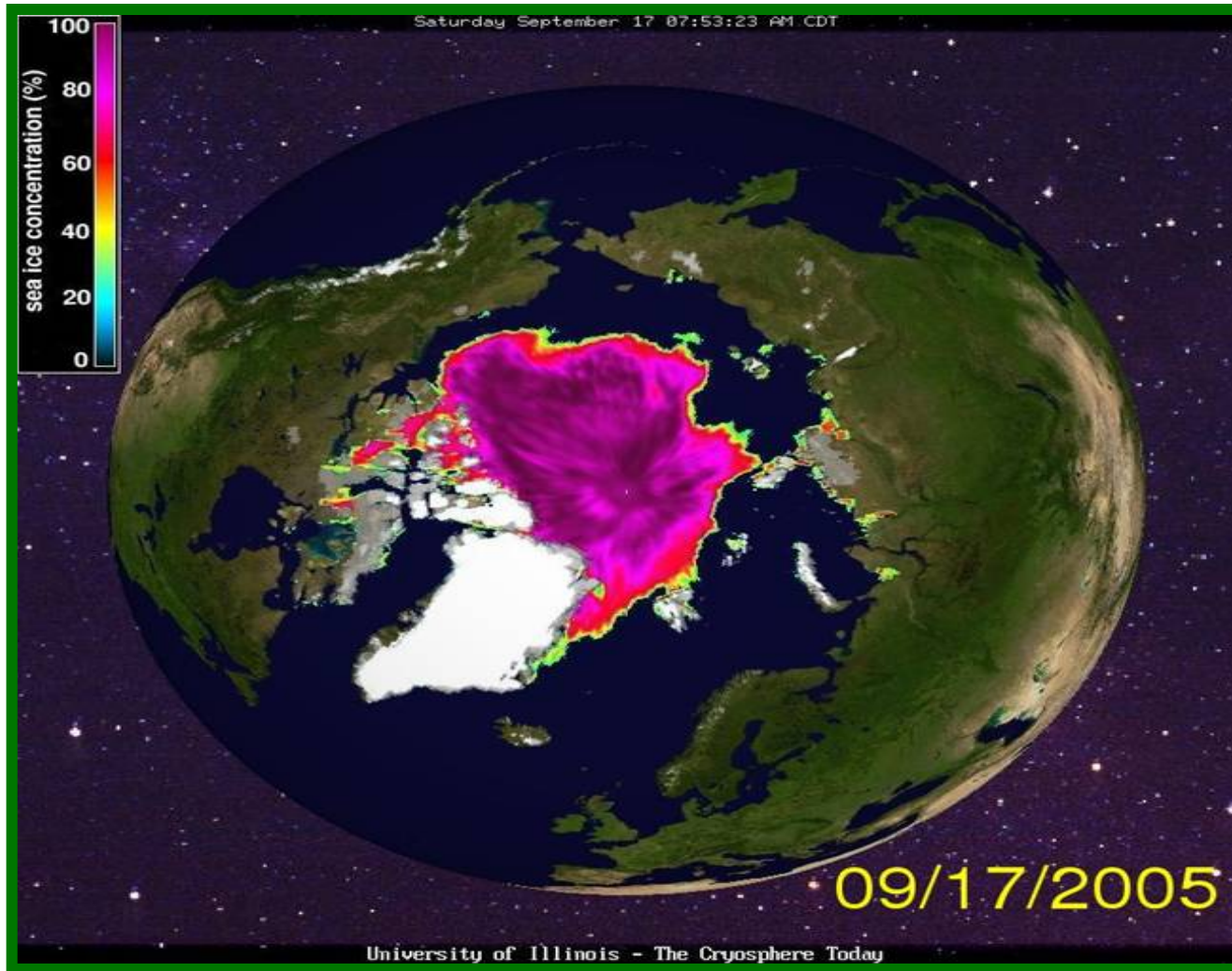
All these challenges are connected with fossil and nuclear Energies

**Renewables will solve these problems**

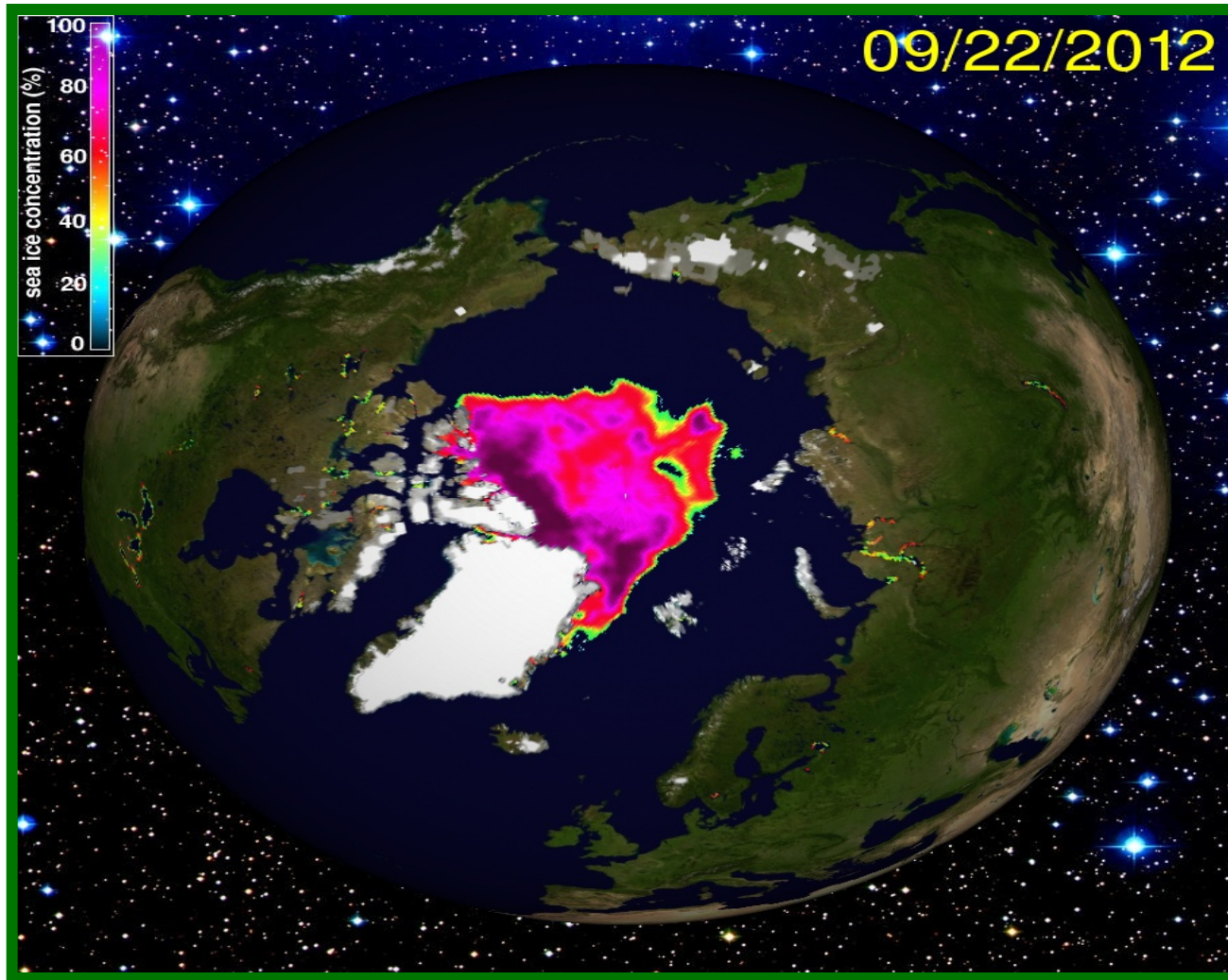
# Arctic Sea Ice - 1979



# Arktisches Meereis - 2005



# Arktisches Meereis - 2012



# Global Warming Oftener and more powerfull: aridity and forest fires, floods and storms



Damage Hurricane Sandy: 100 Billion US \$

# Oil, Gas and Coal are the Main Causes of Damage to the Climate

- Burning of oil, gas, coal emits  $\sim 80\%$  of all greenhouse gases worldwide
- Real climate protection is only possible by ending the use of oil, gas, coal; this means using exclusively renewable energy and renewable chemistry
- Energy saving is very helpful; but energy saving alone will not solve the climate problems

# Fukushima March 2011



Until 2012 the costs of the reactor disaster amount  
100 bn. €

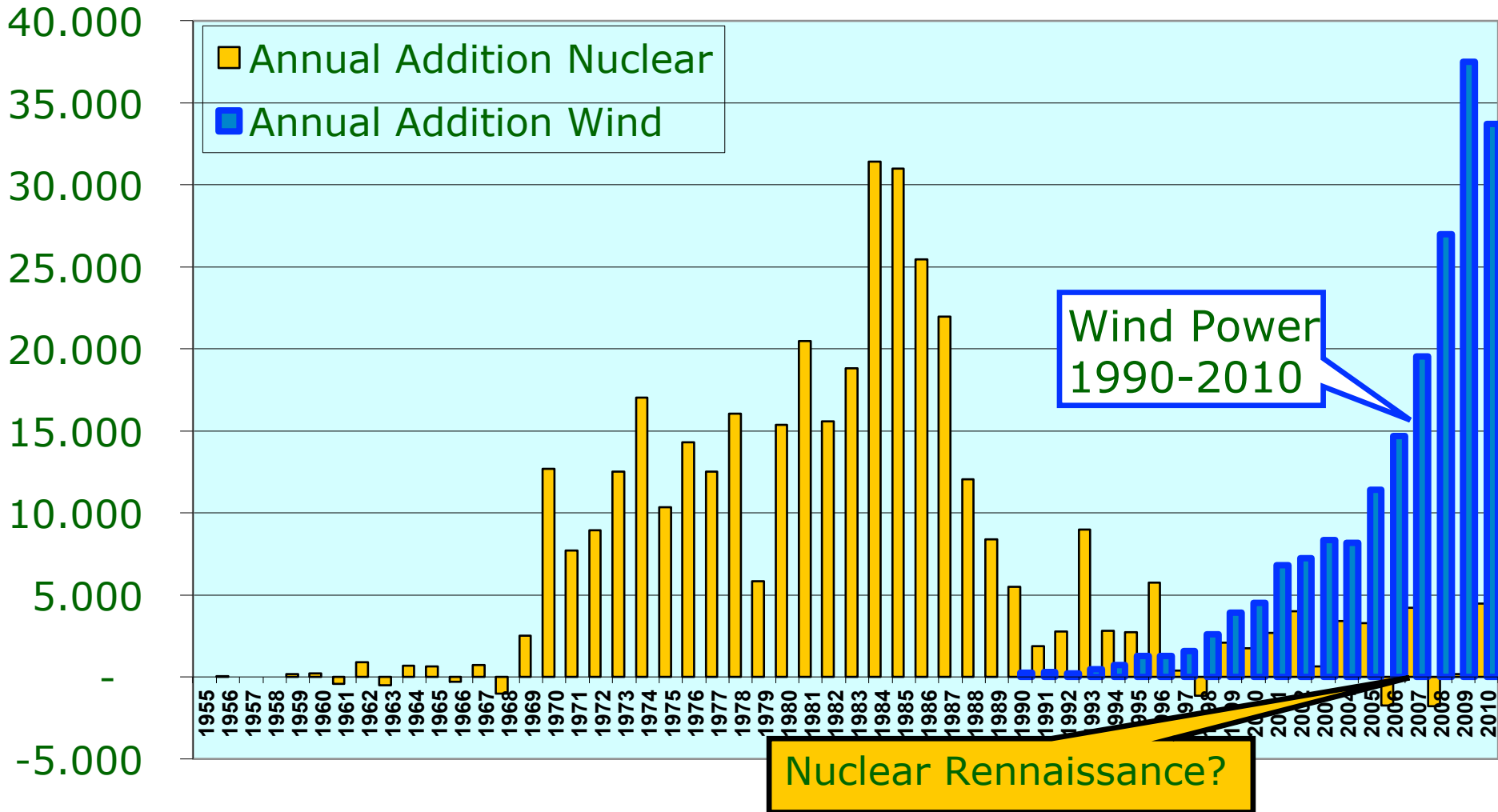


# Nuclear Renaissance?

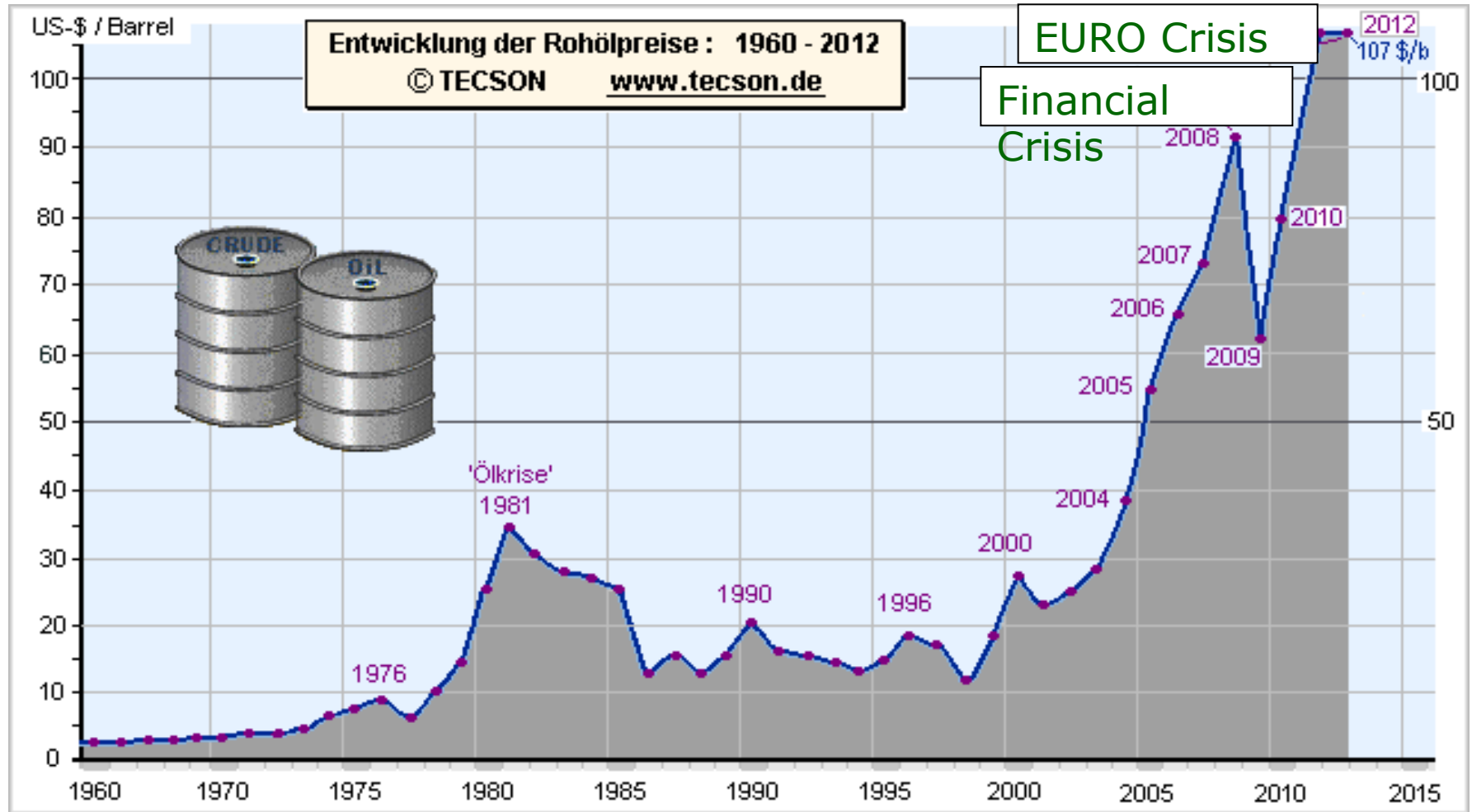
Only very few new started.  
All are overbudget and late

- Olkiluoto (Finland):  
build start 2005; forecast cost 3 bn. €, 4 years;  
2012: >6 years late, >100% overbudget
- Flamanville (France):  
start 2007; forecast cost 3.3 bn. €, 5 years;  
2012: >2016 ready (9 years), >costs 8.5 bn. €
- Taishan (China):  
start 2009; no independent costs & time  
information

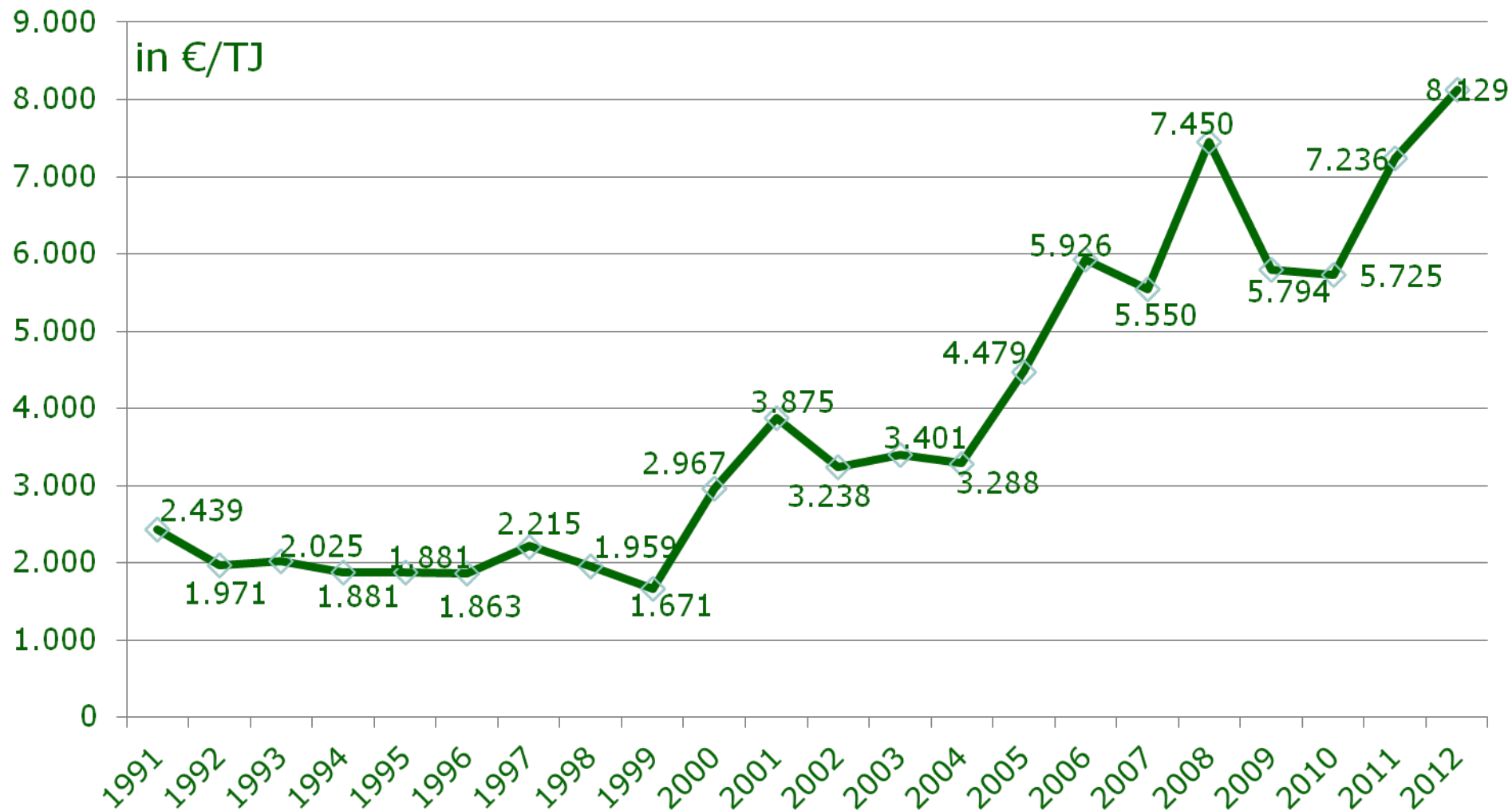
# Annual Additions of Nuclear and Wind Capacities in Megawatts



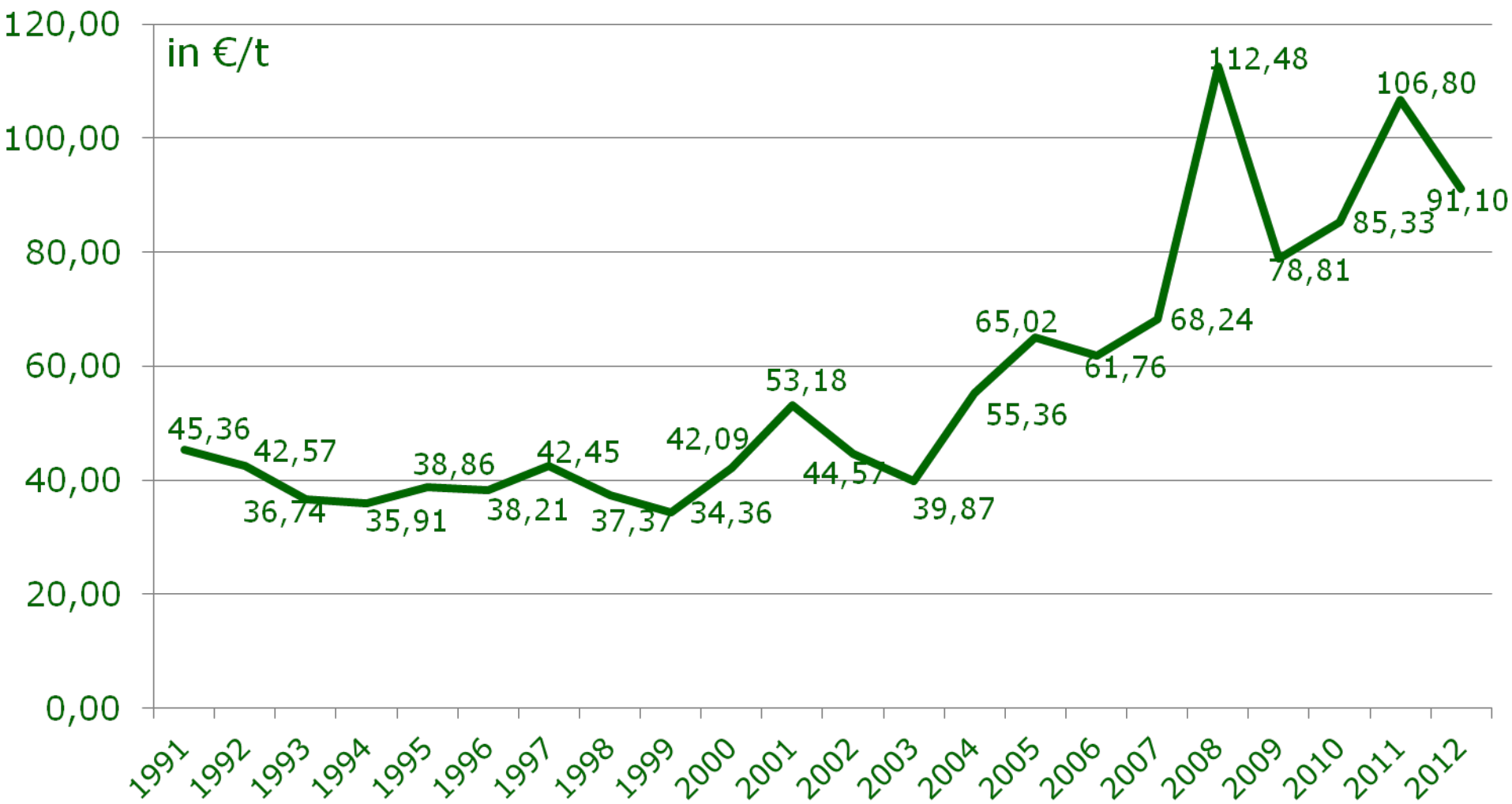
# Development of Crude Oil Prices 1960-2012



# Price of Natural Gas in Europe



# Price of imported Hard Coal in Germany

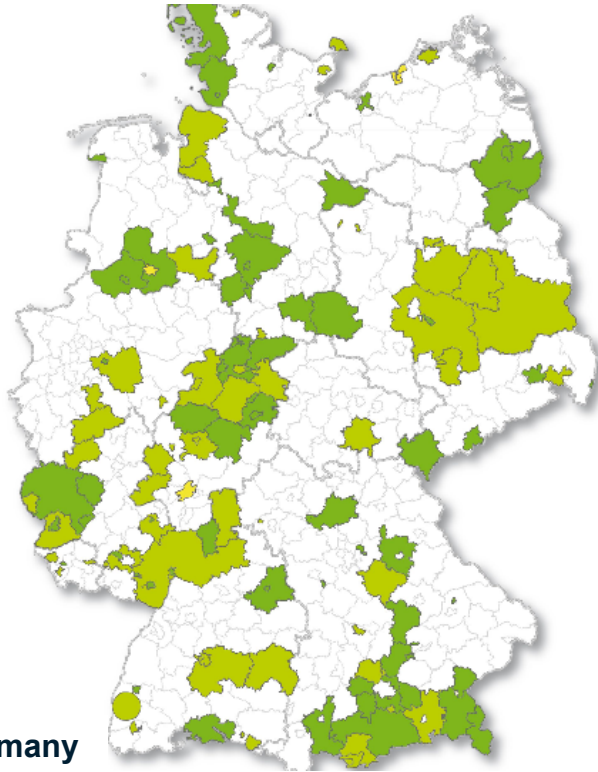


# The Euro Crisis is also an Oil Crisis

EU-27 in 2011:

- Foreign Trade Deficit:  
-196,20 Bn. €
- Imports of Energy Resources:  
488,476 Bn. €

# 100% RE is already reality today



**Countries with a 100% RE target**  
*Denmark; Costa Rica; Island;  
Scotland; Upper Austria*

**Cities with 100% RE target**  
*Barcelona, Spain; Masdar City UAE;  
Munich, Germany; Msheireb Downtown  
Doha, Qatar; San Francisco, USA*

**Small Island States with 100%  
RE target**  
*Islands of Tuvalu; Maledives; Cook  
Islands*

The world trend is clear:  
Renewable will fast increase;  
fossil and nuclear will decrease

- Energy consumer countries will go out of fossil fuels because of rising prices and climate protection
- Energy producer countries must now this trend
  - When they are too late to go to renewables they will face great economic disasters in the coming decades



# A Path to 100% sustainable energy by 2030

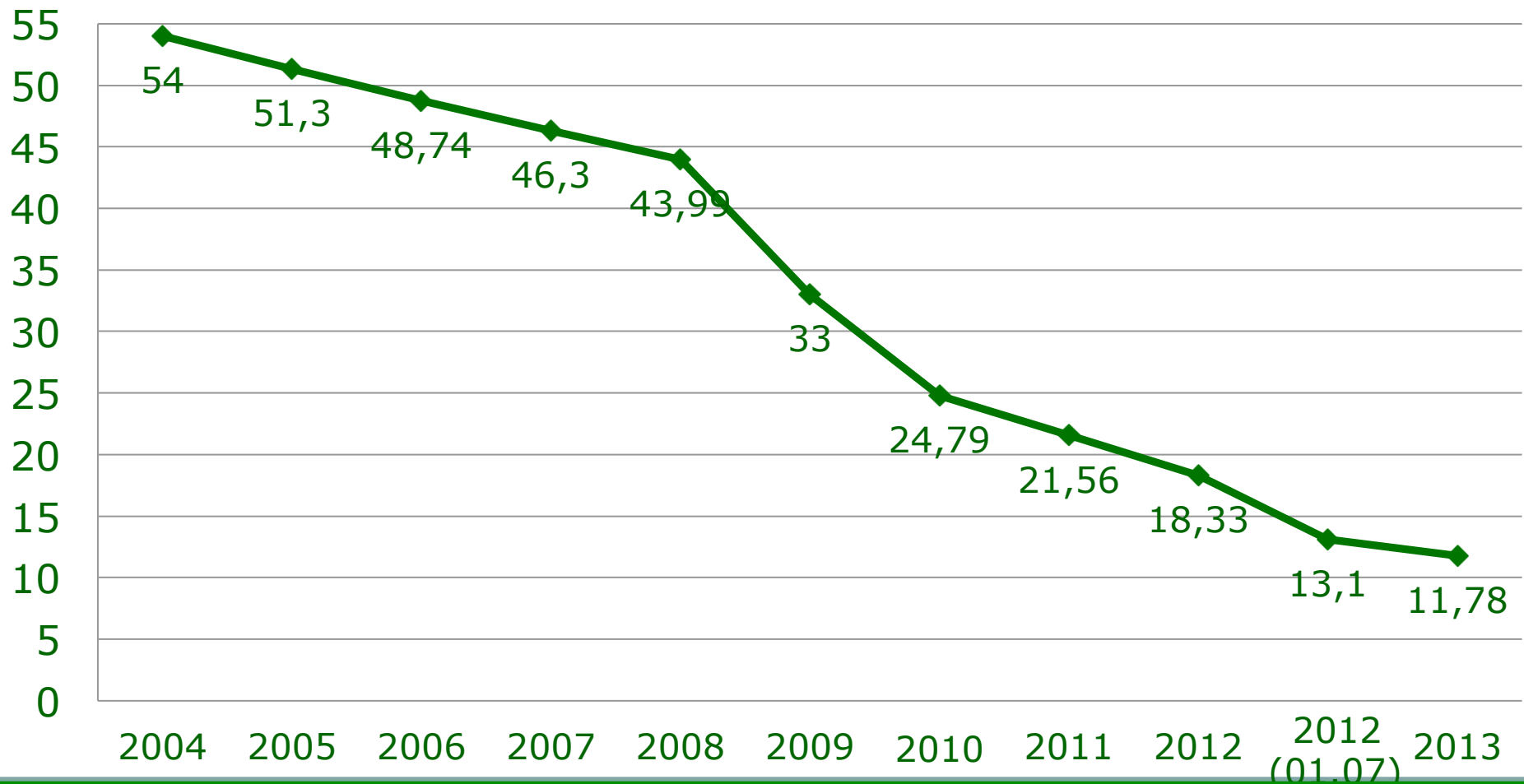


'Wind, water and solar technologies can provide 100 percent of the world's energy, eliminating all fossil fuels.'

*(Mark Z. Jacobson & Mark A. Delucchi)*

# Development of Feed-in Tariffs for photovoltaic roof systems above 1 MW

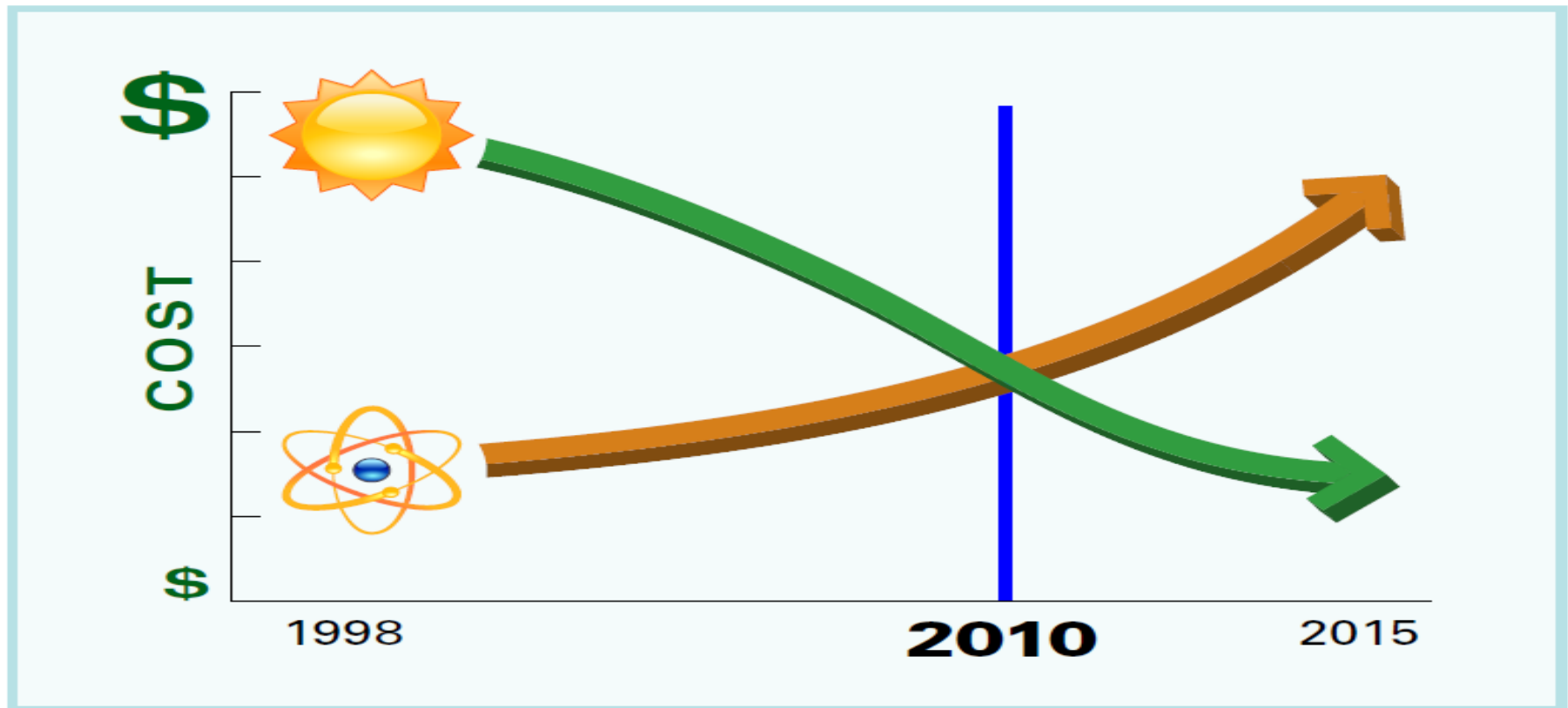
in €Cent



Quellen: EEG 2004, EEG 2009, EEG 2013

# Solar and Nuclear Costs – The Historic Crossover

Solar Energy is Now the Better Buy



# Unsubsidised Renewables now cheaper than coal and gas power

Bloomberg Study 2013:

- New build Windfarm: 80 AUD/MWh
- New buildt coal power: 143 AUD/MWh
- New buildt gas power: 116 AUD/MWh

Renewables are now cheaper, even in a country like Australia with very cheap coal resources

# China: Now world leader in REN

- 2013

more investment in renewable power than in coal and nuclear

- 57 GW Renewables,

- 12 GW Solarpower

- 16 GW Windpower

- 29 GW Hydropower

- 2 GW Nuclear

- 40 GW Coal

# My advice for Nigeria

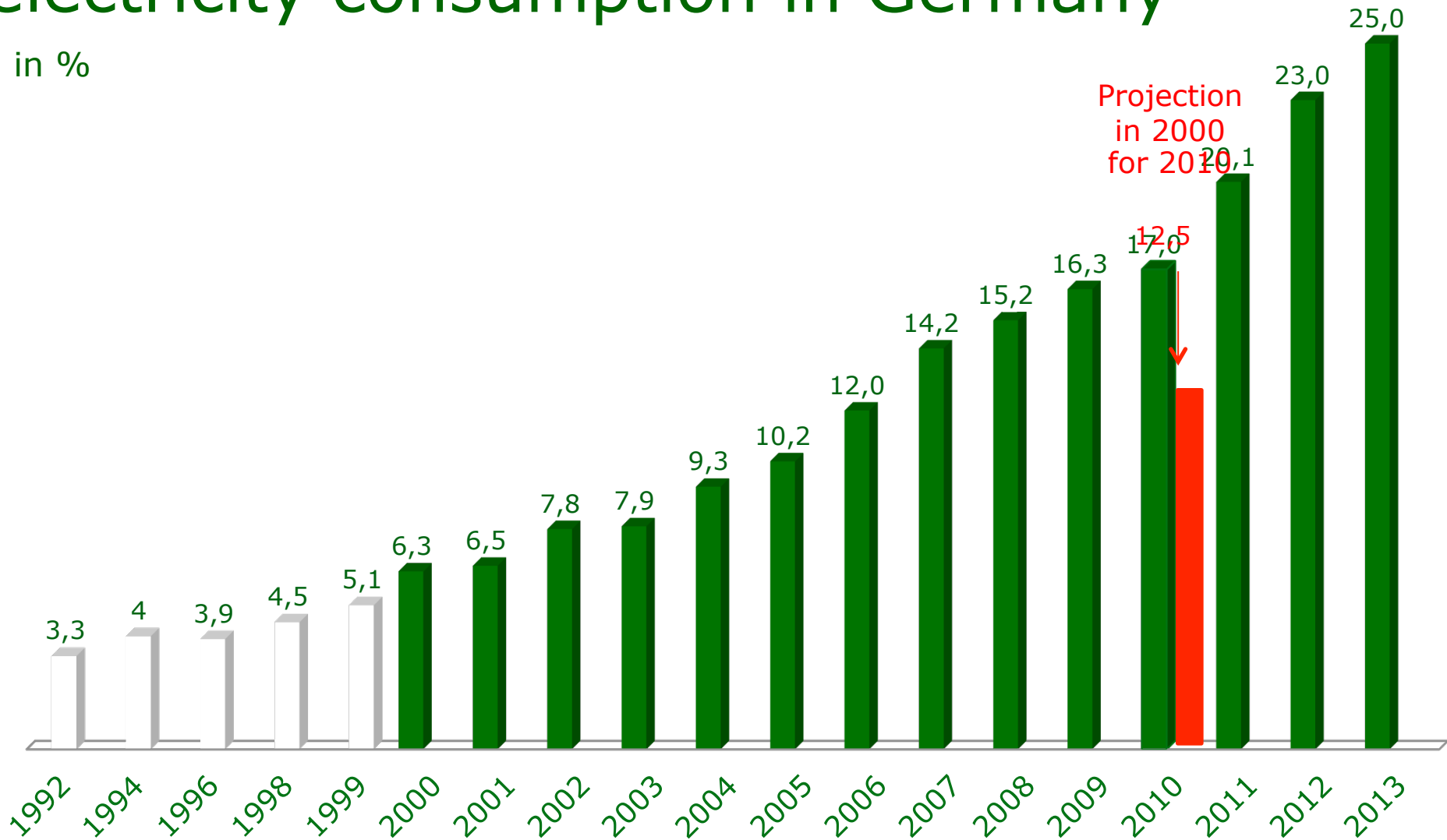
- Fast development of renewable sector in Nigeria
  - Wind, Solar, Geothermal, Hydro, Waves
  - Bioenergy also for export:
    - Biofuels from sustainable farms (no Rainwood cutting)
    - Biocoal from agriculture and municipal waste
    - Redesertification
- Otherwise Nigeria will loose the main business of oil without any compensation

# First Steps for Renewable Strategy for Nigeria

- Replace Diesel generators by PV
  - First Projects with joint ventures from abroad
  - Obligation: all Pilotprojects must educate Nigerian engineers
  - This new nigerian engineers will found new smal and medium Companies
  - Support BELLSTECH-WECASS
- Invest in big grid connected PV- and Windfarms

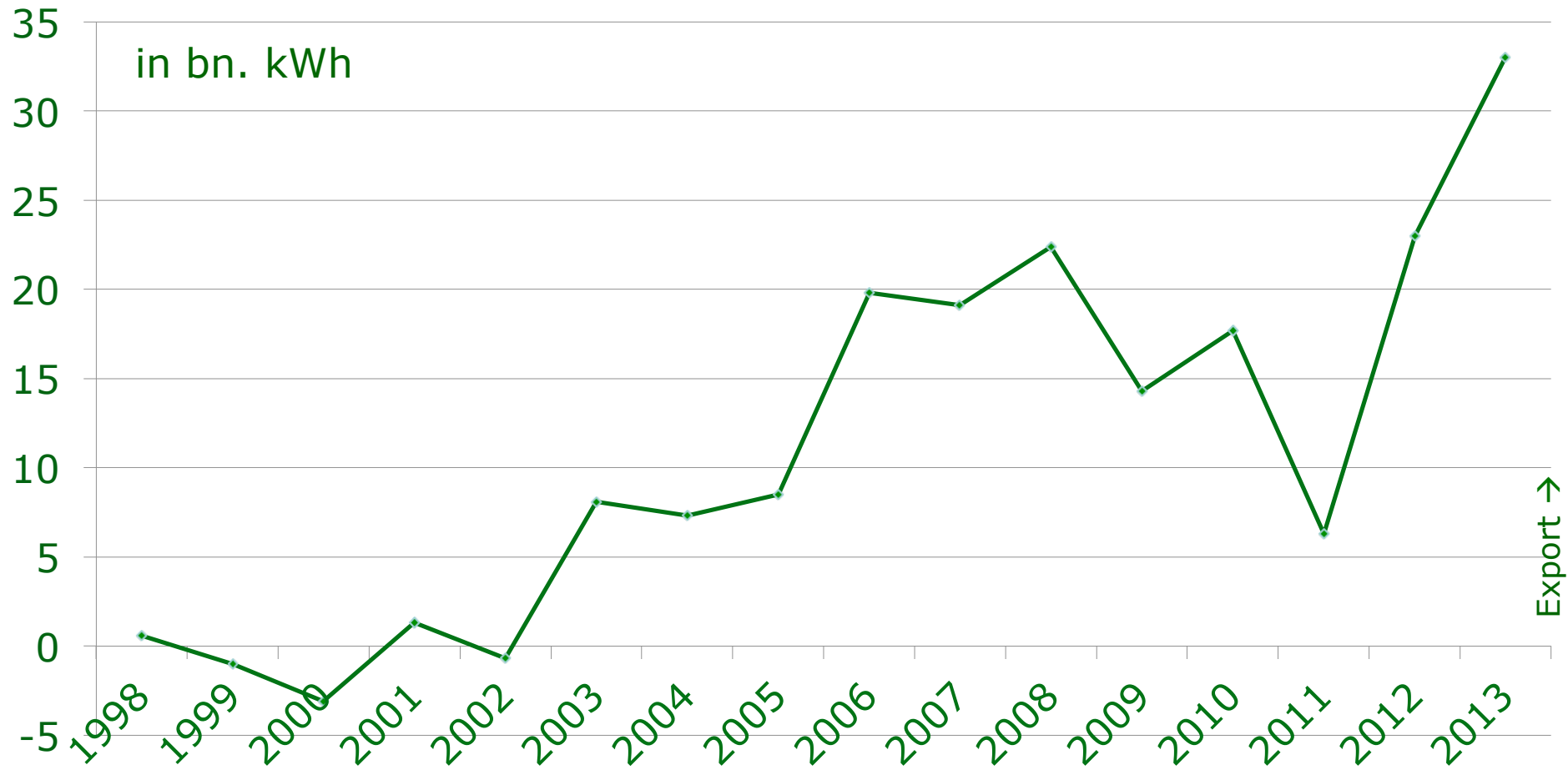
# Share of renewables in the gross electricity consumption in Germany

in %





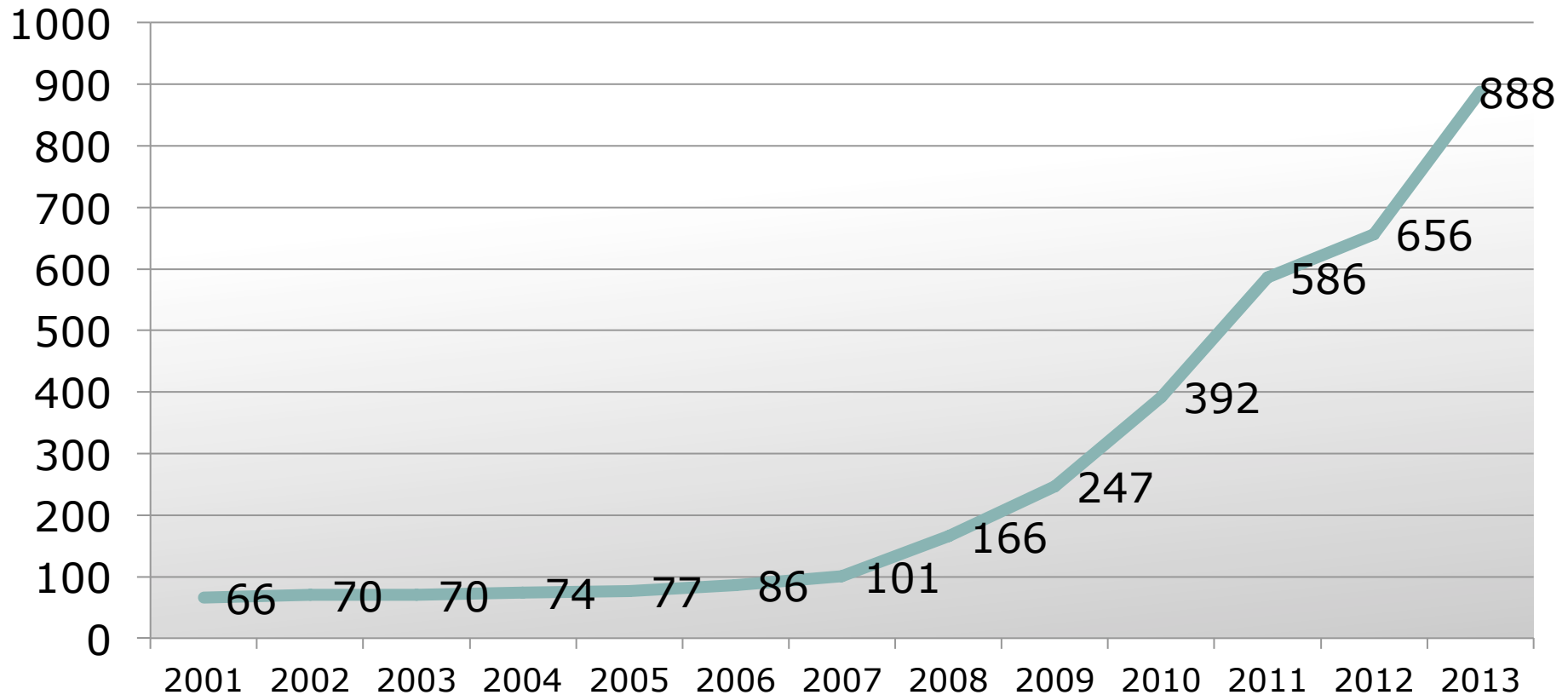
# German electricity export: after phasing out 8 nuclear reactors record export in 2013



Quelle: statista,de 2012; AGEB, 2013

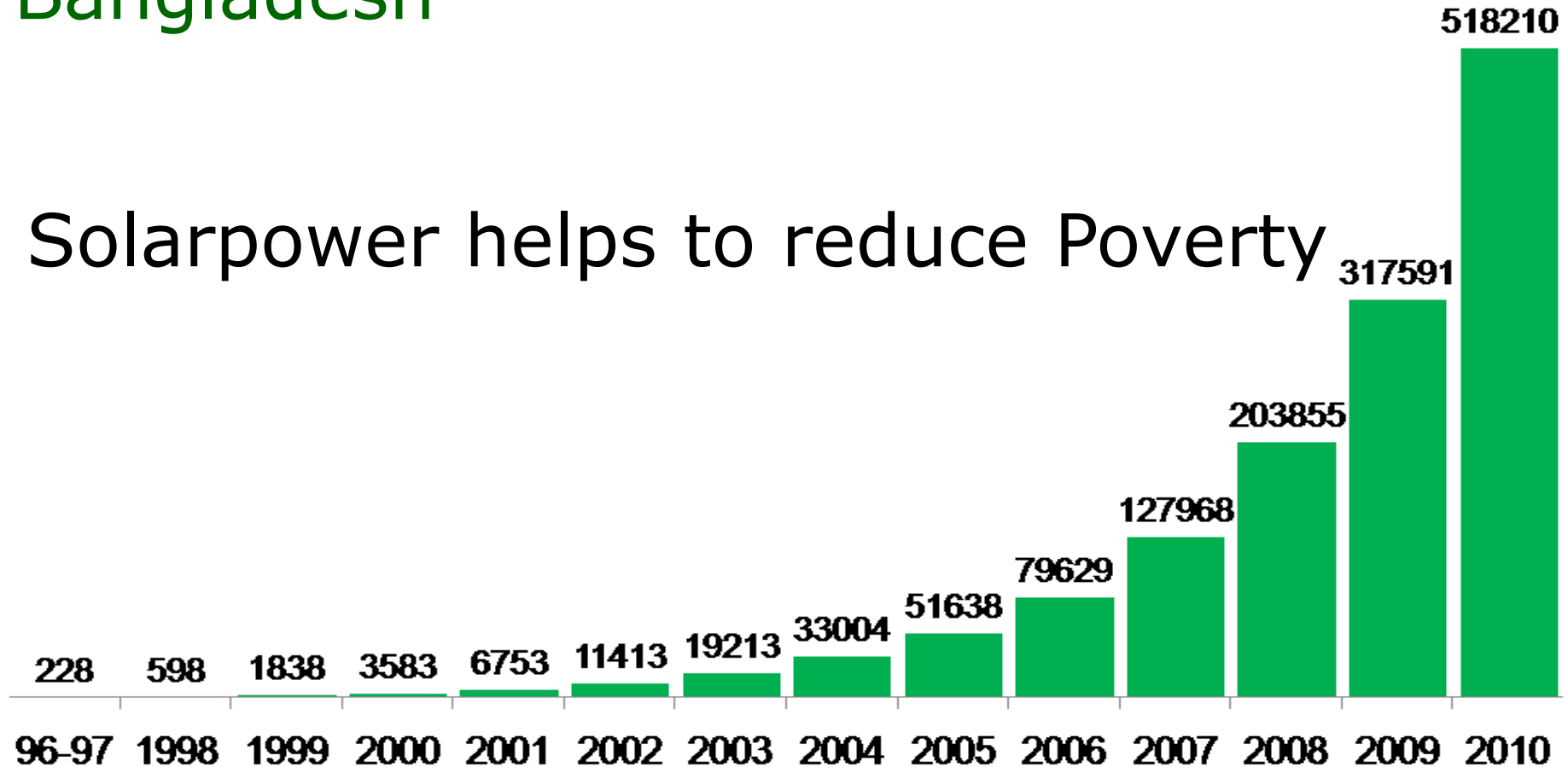
# Civic cooperatives increase in Germany

In the last three years the amount of cooperatives quadruplucated in Germany



# Amount of the installed solar home systems by the Grameen Bank in Bangladesh

Solarpower helps to reduce Poverty



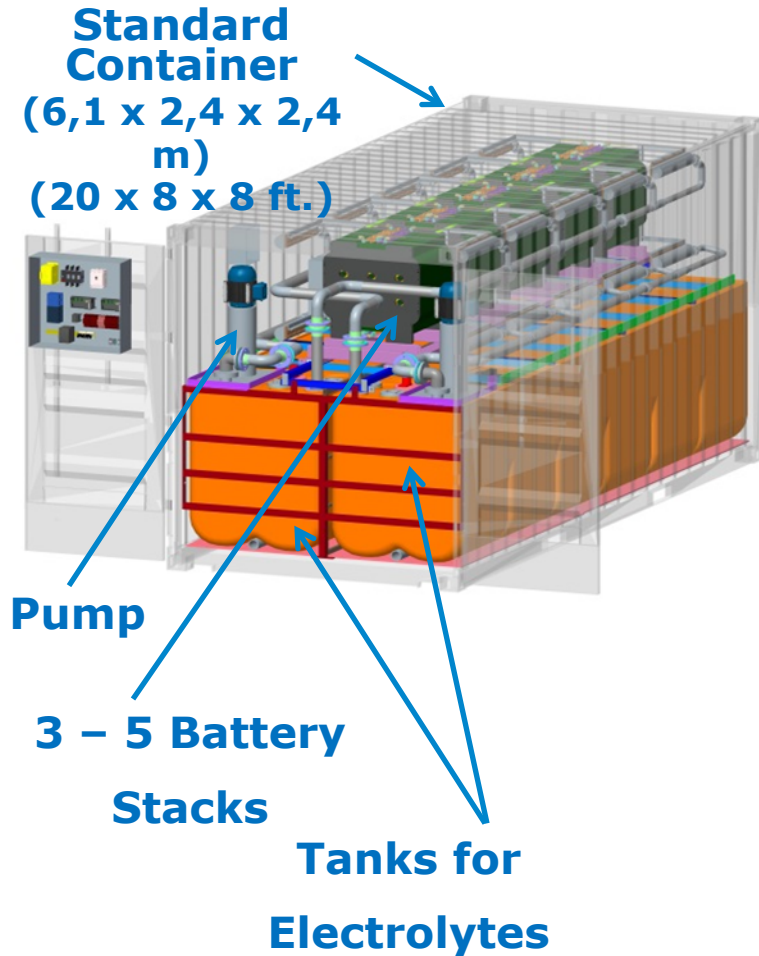
# Photovoltaic rooftop instead of Diesel Generator is cheaper



# 3 MW Solar power plant Belectric



## Z20 – Energy-/Electrical Power Storage from BlueSky Energy



- ✓ **Technology:** Zinc-Iron Redox-Flow-Battery
- ✓ **Application:** PV-systems and wind parks
- ✓ **Green Technology:** contaminant-free, non-toxic, non-flammable, non-explosive
- ✓ **Sustainability:** Raw material worldwide „unlimited“ and inexpensive available
- ✓ **Scalability:** One Battery (container) contains 48 – 80 kW power → 120 – 160 kWh energy; scalable up to multiple MWh
- ✓ **Cost effectiveness:** most cost-effective and safest technology of all large energy storage systems. Cost per kWh: currently 0,10 €/kWh; with decreasing tendency. ROI approx. 7 years
- ✓ **Life time:** 20+ year life at 7000 cycles

# Hydrothermal Carbonisation (HTC)



## Process:

Input: Plants, Agriculture and Municipal Waste;

Output: Biocoal;

## Usage of biocoal:

- Fuel: 8 €/MWh (Mineral Coal 22 €/MWh)
- Chemical base (oil substitute)
- Fertiliser (carbon binding in soil)

# With biochar rapid greening for eroded and degraded areas

July 2010

August 2011



For 60 years it looked like this

Now it looks like this

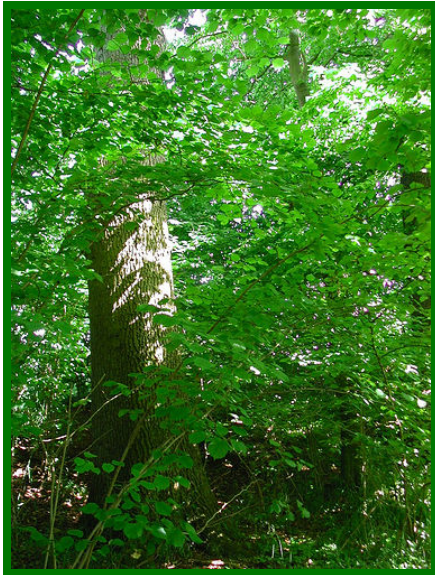
## Slag heap of a US coal mine



# Afforestation by sowing forest seeds



- forest seeds are much cheaper than plantation (500 US\$/ha)
- in the tropics an 10 years rate of return of up to 10.000 US\$/ha can be achieved
- in a temperate zone an 10 years rate of return at least 5.000 US\$/ha

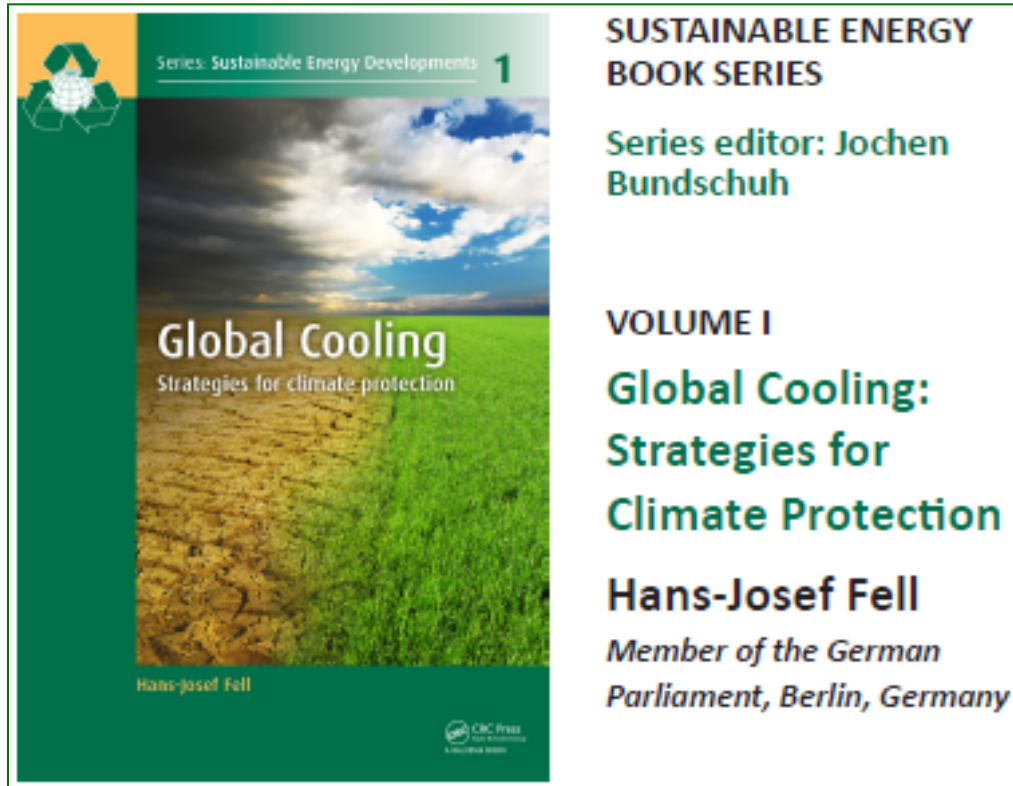


# Greening the Desert



Egyptian desert near Luxor

# New Book about Global Cooling



**SUSTAINABLE ENERGY  
BOOK SERIES**

Series editor: Jochen  
Bundschuh

**VOLUME I**

**Global Cooling:  
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Climate Protection**

**Hans-Josef Fell**

*Member of the German  
Parliament, Berlin, Germany*

published in summer  
2012.

paperback edition for  
19 €.

[www.globalcooling-climateprotection.net](http://www.globalcooling-climateprotection.net)

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