

*Global Energy Transition
Renewable energies
take over
global energy markets*

Hans-Josef Fell
President of Energy Watch Group
Member of German Parliament 1998-2013

Moscow, October 27, 2015

Political challenges

- Climate warming
- Peak oil, peak coal, energy security
- Nuclear and environmental disasters
- Oil wars, poverty, refugees, economic crises

All these challenges are connected with fossil and nuclear energies

Renewables will solve these problems

Global Warming

More often and more powerful:
aridity and forest fires, floods and storms



Damage Hurricane Sandy: 100 Billion US \$

Crises of climate warming and peak oil can only be solved by two parallel strategies:

1. Stop greenhouse gas emission

(not only a reduction of emissions)

- switch to 100% renewables
- completely stop the use of fossil and nuclear energies in energy, chemistry, transport, agriculture

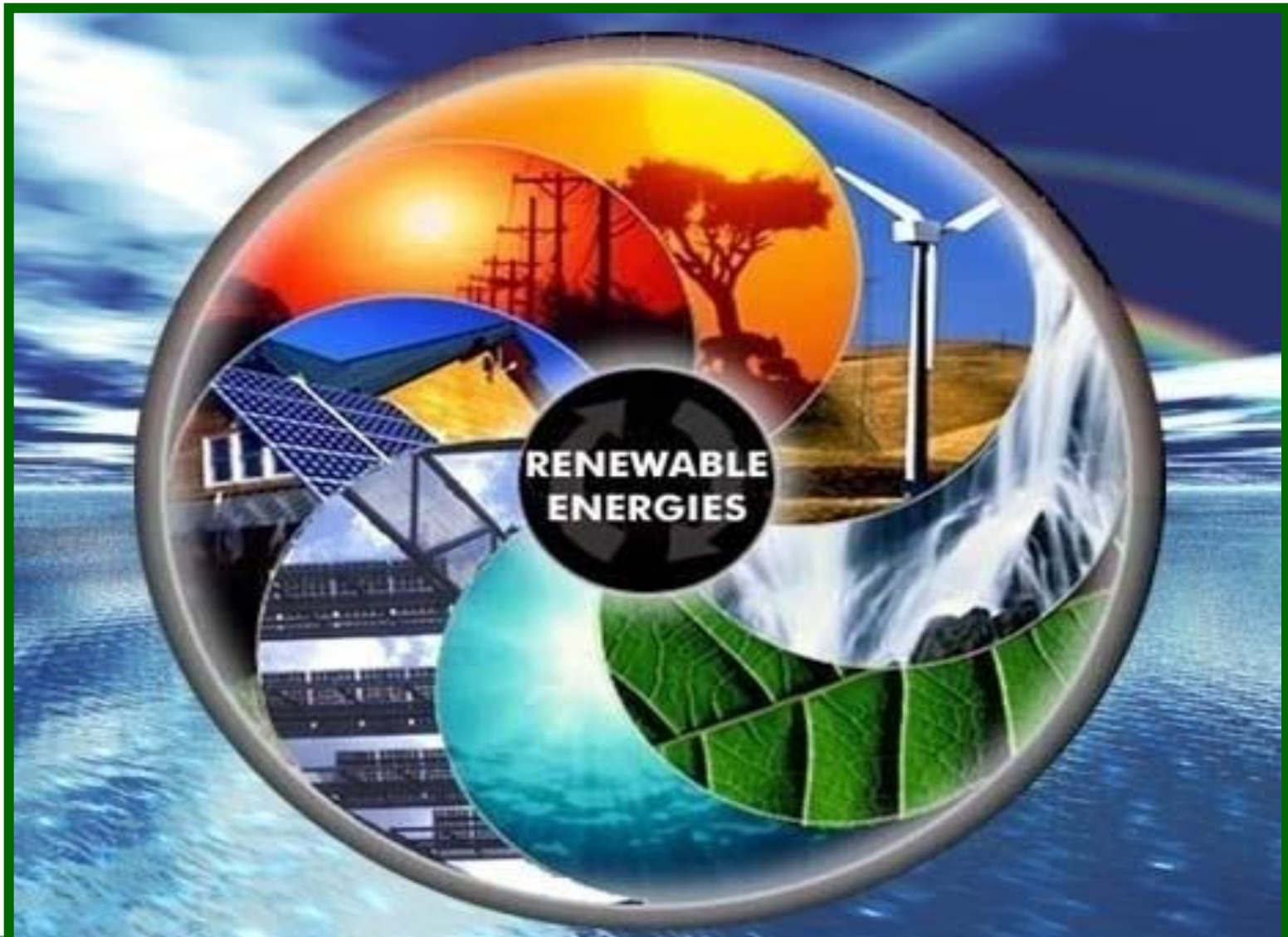
2. Take out carbon from atmosphere

- convert plants to humus soil (biocoal)
- reforesting big areas, greening the deserts
- Organic agriculture

The Target must be 330 ppm CO₂

This leads to global cooling, instead of global warming

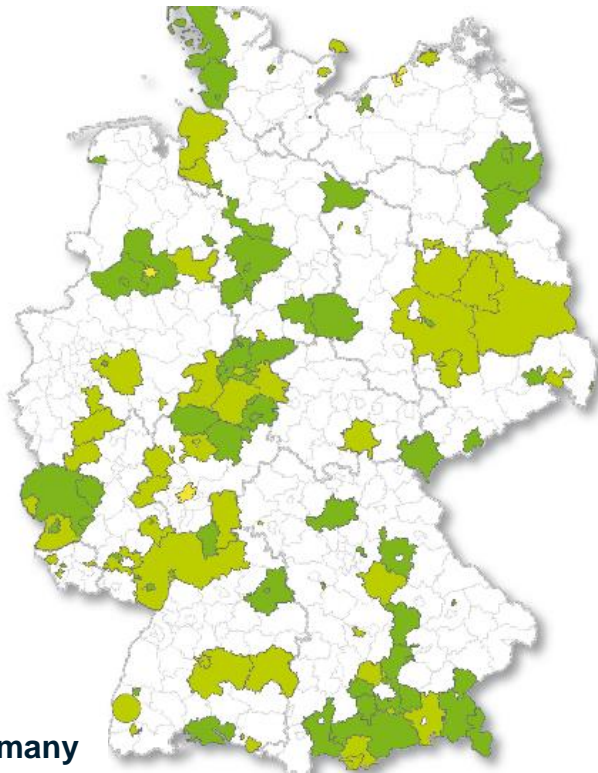
Tomorrow's Energy Production



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100% RENEWABLES

www.go100re.net



Germany

Countries with a 100% RE target

*Denmark; Sweden; Costa Rica;
Island; Scotland; Upper Austria*

Cities with 100% RE target

*Barcelona; Masdar City; Munich;
Msheireb Downtown Doha; Vancouver;
San Francisco; Copenhagen; Sydney;*

Small Island States with 100% RE target

*Islands of Tuvalu; Maldives; Cook
Islands*

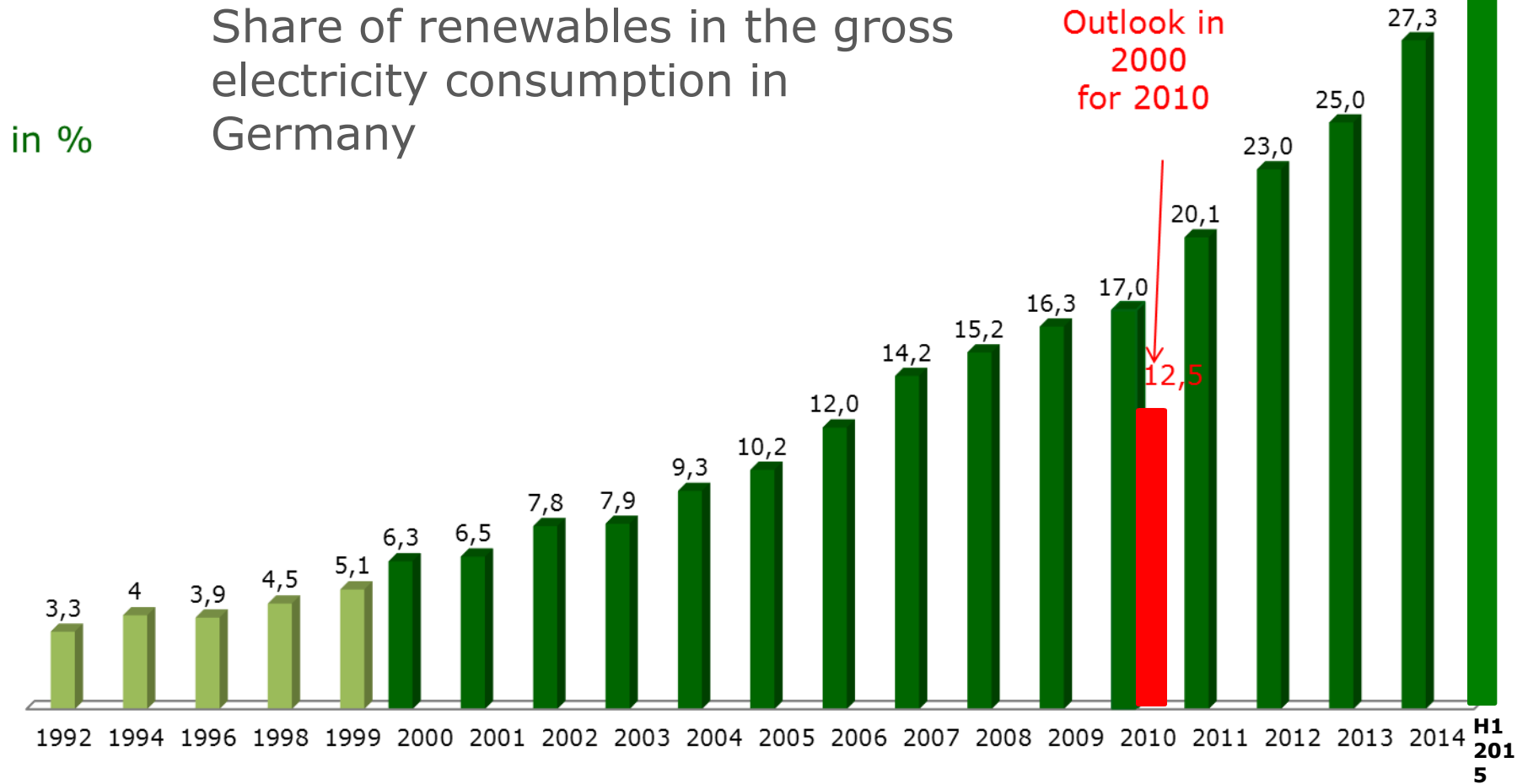
Renewables conquer German Energy

In the background:
**nuclear power plant
Grafenrheinfeld
shut off in June 2015**

In the foreground:
**Windpower named
„Hans-Josef Fell“
PV and
biogas farmland**

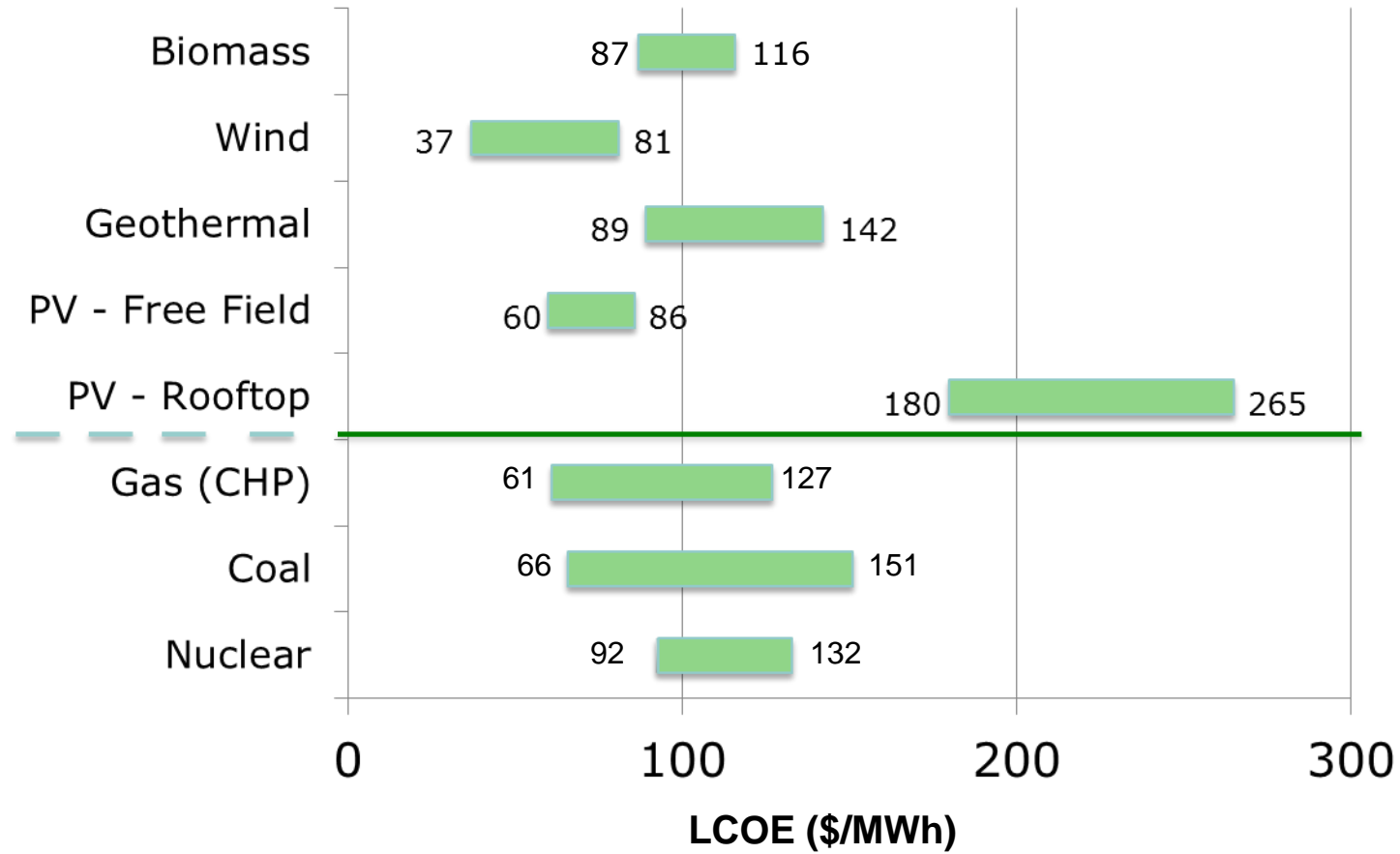


With political support renewable energy grows very fast



Levelized Cost of Energy Comparison

US Minimum and Maximum Price in March 2014



Batterie Storage Tinningstedt



First wind park in Germany with Vanadium Redoxflow storage. Wind power surplus is used in times of lacking wind. Technical Management by Plan 8 GmbH.

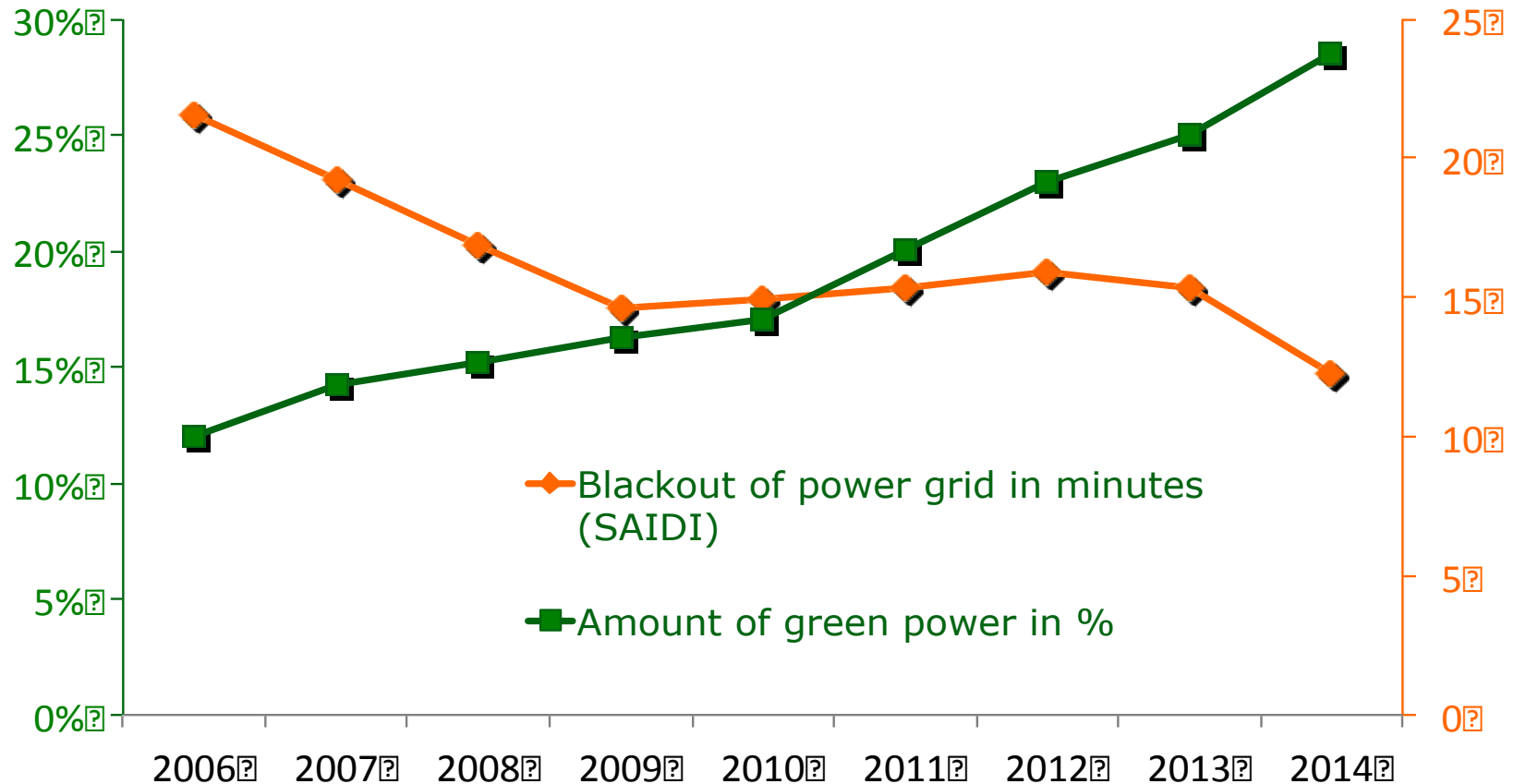
www.plan-8.de

MW Solar Power Plant Belectric

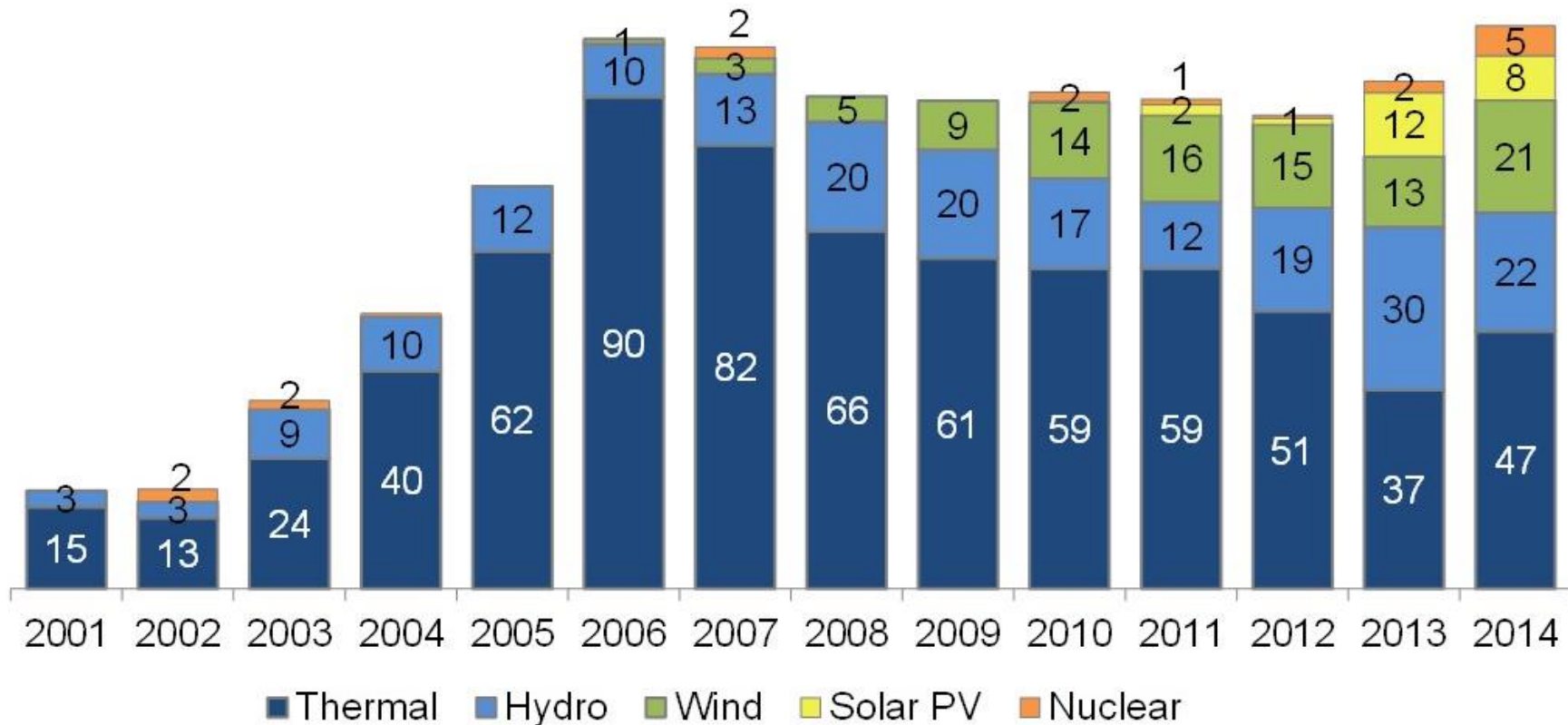
Produces: Solar electricity, blind current, frequency and voltage stability



German reality: expansion of green power improves grid stability



China Annual Power Grid Capacity Additions (GW)



Note: Thermal figures are mostly coal but also include a small amount of gas and biomass-fired power plants; Source: China Electricity Council, Global Wind Energy Council

Apple and Google Invest in Renewable Energy

Apple Investment: 850 Mill. US \$;
160 MW PV, California



The world trend is clear:

The share of renewable energy will grow rapidly;
the share of fossil/nuclear energy will decrease

- Energy-consuming countries will go out of fossil fuels because of falling renewable prices and climate protection
 - Countries that are too late will face big economic problems
- Energy-producing countries must be aware of this trend
 - When they are too late to shift to renewables they will face a great economic disaster in the coming decades

Double pitfall for fossil/nuclear business

- Rising oil/gas/coal/uranium prices
 - Energy consumers switch to renewables
- Declining oil/gas/coal/uranium prices
 - Financers stop financing
 - State budget on the way to bankruptcy

Both leads to economic pressure for fossil/nuclear companies

Climate protection, peak oil, nuclear accidents will accelerate these processes

Divestment from Fossil Fuel is Booming

- The global shift away from investment in fossil fuels has grown 50-fold over the past year
- \$2.6 trillion fossil fuel assets are flagged for divestment by 436 institutions and 2,040 individuals from 43 countries
- Large pension funds and private companies are divesting

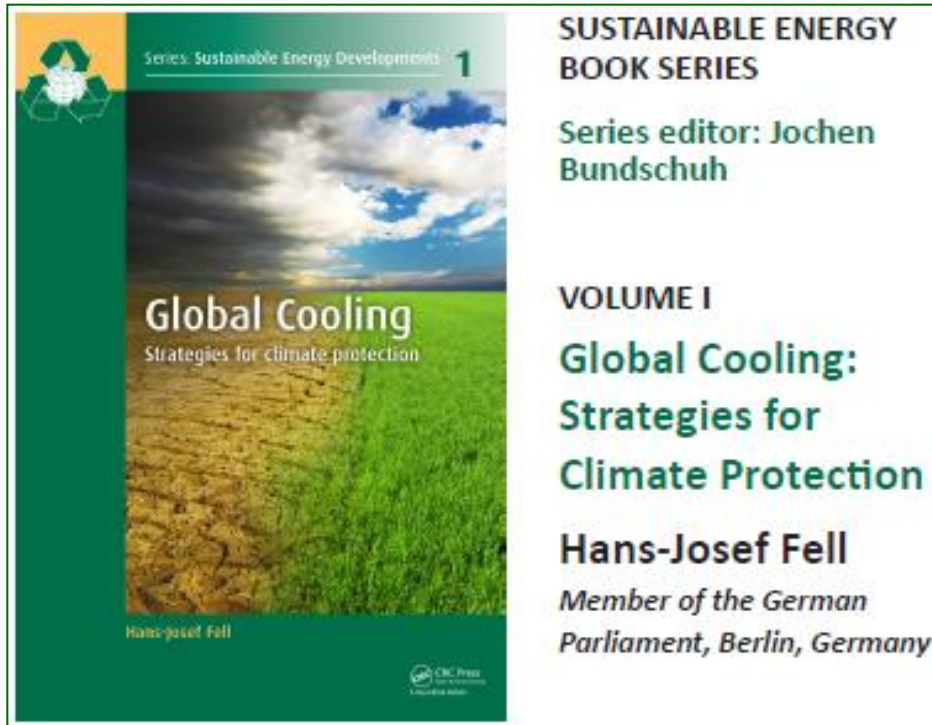
Russian-German Modernization Partnership

- Economic cooperation
 - Renewable Energy, Energy efficiency
 - Organic Agriculture, Biogas, Forestry
 - Infrastructure, IT, Chemicals, Construction
 - Transport, Electromobility, Biofuels
- Know-how, Research and Education cooperation
- Business cooperation
 - Networks (e.g. RUBIN)

Positive signs of Climate and Energy Modernization policy in Russia

- Russian Environment Minister Sergej Donskoj: modernization of energy sector to cut Emissions
- Gazprom and Lukoil take part in Carbon Disclosure Project
- EU-Russia climate cooperation has been recently renewed

Global Cooling



**SUSTAINABLE ENERGY
BOOK SERIES**

Series editor: Jochen
Bundschuh

VOLUME I

**Global Cooling:
Strategies for
Climate Protection**

Hans-Josef Fell

*Member of the German
Parliament, Berlin, Germany*

Published in summer 2012

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www.globalcooling-climateprotection.net

***Thank You Very
Much for Your
Attention!***

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