

Electricity: a status report

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International Energy Agency

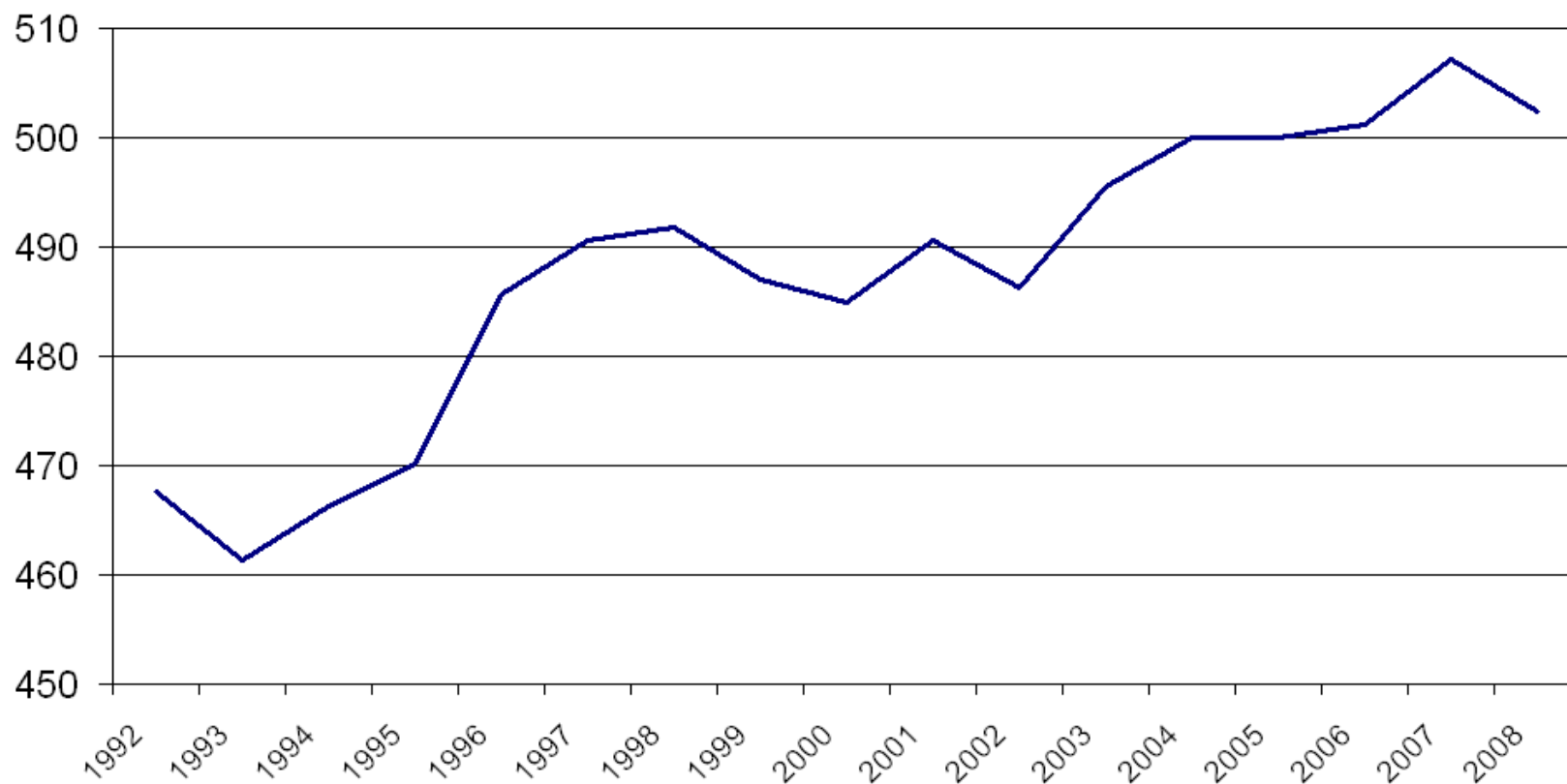


Electricity

- Is not going out of fashion
- Is the key battleground of climate policy
- Has been getting more, rather than less, carbon-intensive globally
- Is the key driver for gas and coal demand
- Has a transformative efficiency potential in Russia

State of decarbonization: first stop digging

Global average carbon intensity of power generation, kg CO₂/Mwh

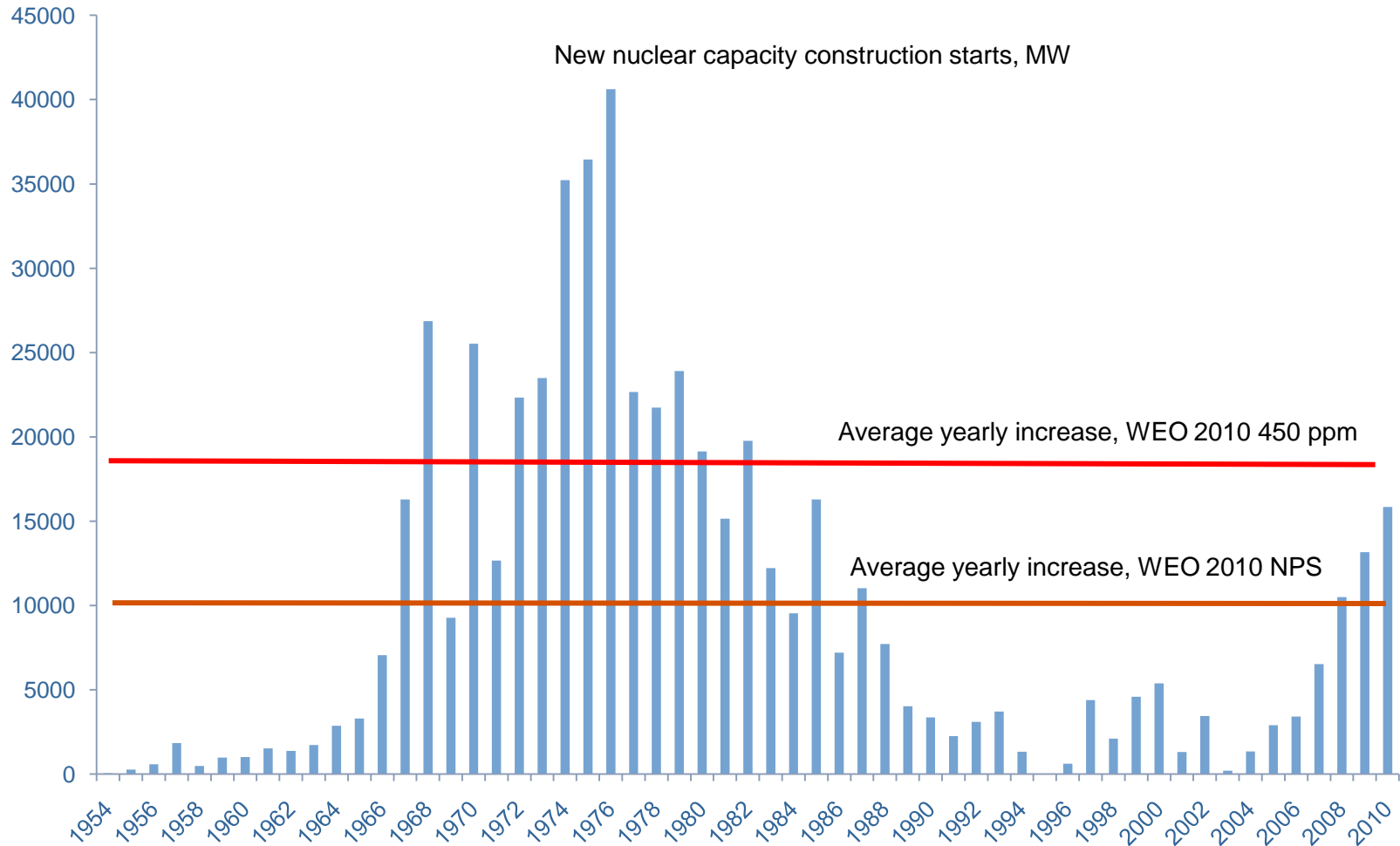


Decarbonization race: a troika with only one horse pulling



Status of low carbon technologies 1

Nuclear: Back to Square 1 after Fukushima?



Status of low carbon technologies 2

CCS: serious risk of delayed deployment

CCS | Netherlands stops Shell's CO₂ storage project in Barendrecht

“The Dutch government said Thursday it will not allow oil giant Shell to store millions of tonnes of carbon dioxide in a depleted gas reservoir under a small town, upholding the fears of townspeople.

E.ON: incentive could have saved Kingsnorth CCS project

Company suggests “low carbon” version of the Renewables Obligation including CCS and nuclear might have kept project in the UK

By Will Nichols

21 Oct 2010



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Storage Concerns Delay Australian CCS Timeline

March 21, 2011

On 27 January 2011, Australia's federal government announced that it would delay and reduce the funding available to support its A\$2 billion carbon capture and storage (CCS) Flagship funding program in order to support Queensland's flood recovery efforts. As part of those efforts, A\$160 million in CCS Flagship funds will be deferred until after 2015, while A\$90 million will be cut from the CCS Flagship budget altogether. Key trends in this On Point include:

Carbon capture approvals behind UAE-BP project delay

Date: 14/04/2011 • Category: Projects & Communities, Projects & Communities - World

ABU DHABI (Reuters) - Delays in winning approvals on pricing and scheduling of a carbon capture and storage (CCS) project are holding up a \$2.5 billion hydrogen power venture by BP and an Abu Dhabi firm, an official document showed. ...See all stories on this topic »Reuters

<http://www.google.com>

Norway delays CCS project again, angers greens

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By Gwladys Fouche

OSLO | Tue Mar 1, 2011 9:08am EST

(Reuters) - Norway said on Tuesday it would delay again a decision to finance a top carbon capture project, this time to 2016, in a setback for a technology that is seen as key to mitigate climate change.

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Rotterdam offers the location for the construction of a large-scale power station, which has access to the sea for sea ships that can transport the CO₂ and the solid fuel.

■ Updates

Announcement - Feasibility study stopped

After close consultation between Havenbedrijf Rotterdam NV and C. GEN NV it has been decided on October 26, 2010 to stop the feasibility study on the establishment of a hydrogen power plant (Integrated Gasification Combined Cycle) on the Kop van de Beer-site.

The reason is the technical feasibility of this location, coupled with uncertainties regarding regulation and storage of CO₂ in the Netherlands

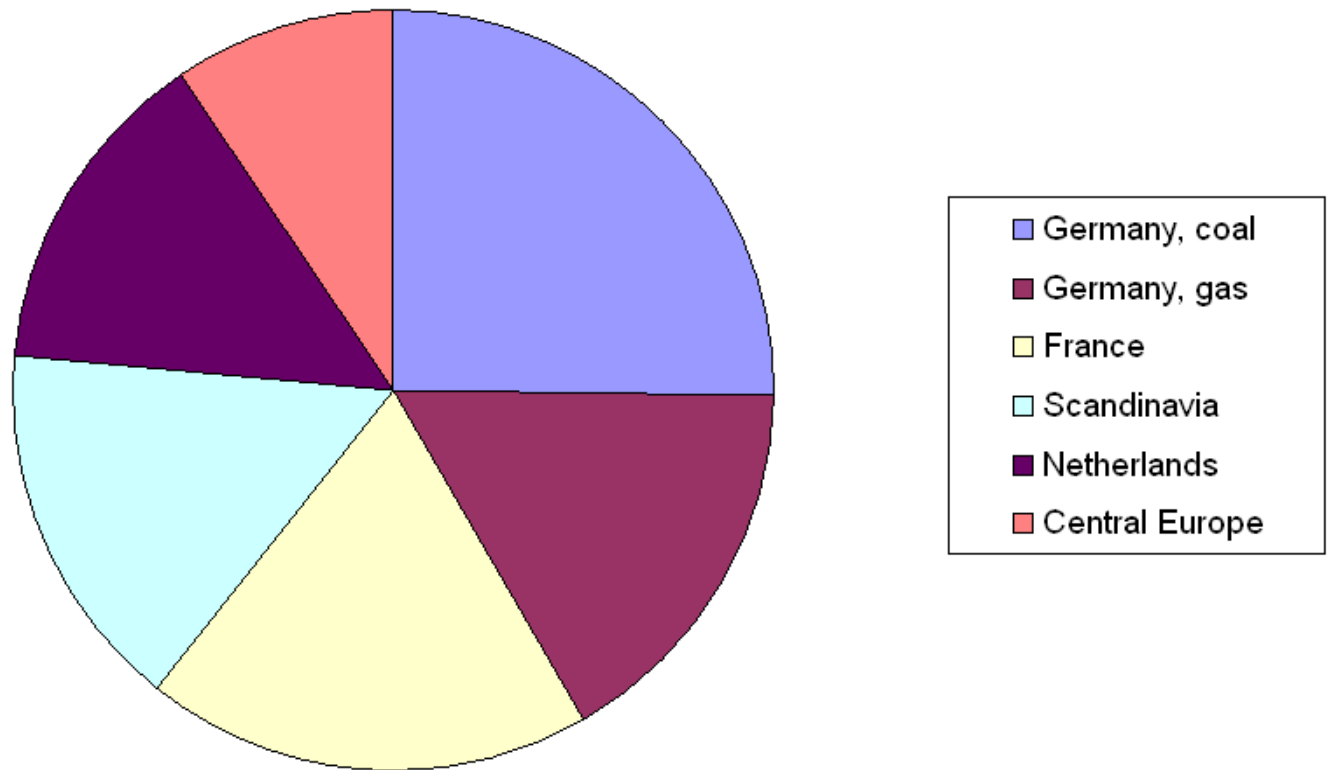
Status of low carbon technologies 3

Renewables: strong growth but not always on the best places



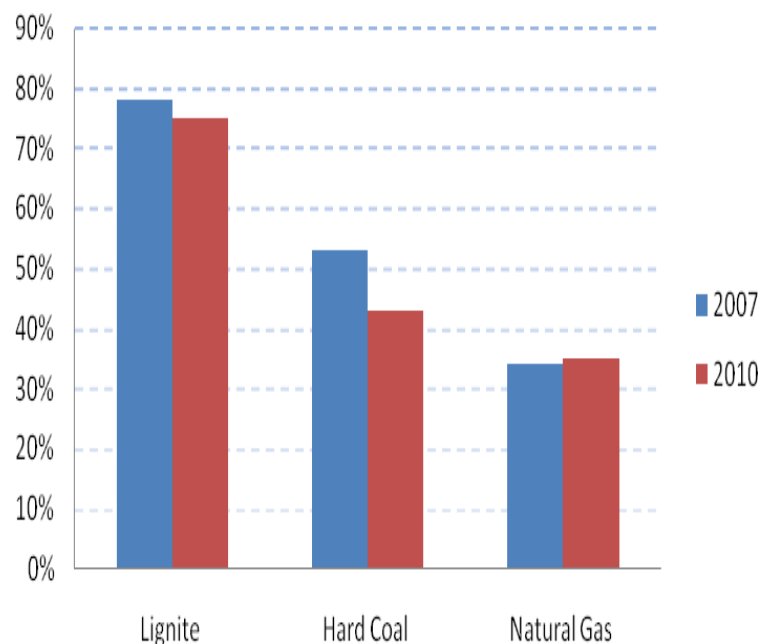
German moratorium: European scale effects

Where the replacement of German nuclear comes from?

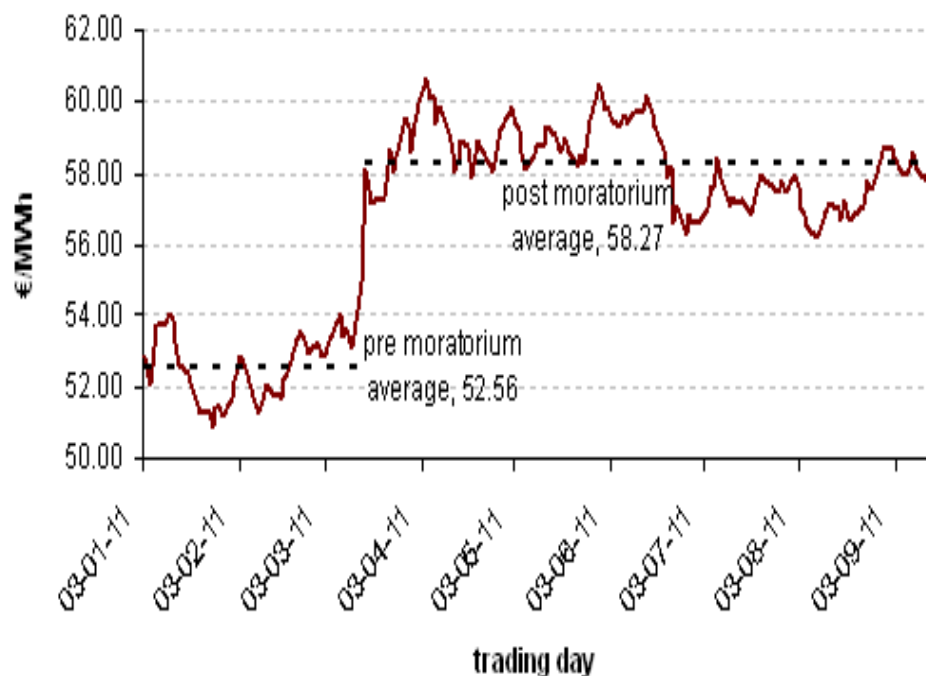


Moderate, 10% price reaction due to excess capacities

Utilisation factors in Germany



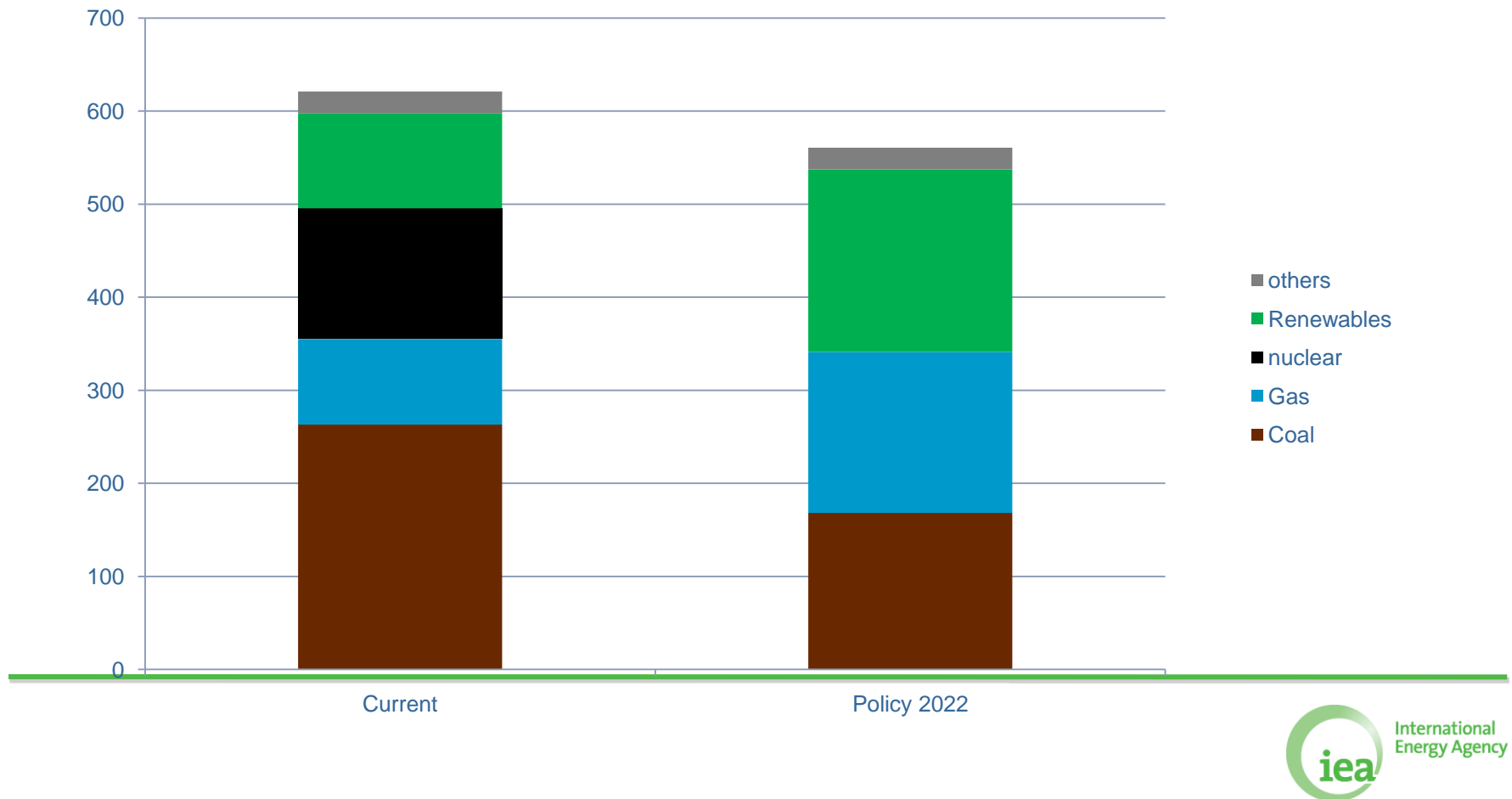
Annual baseload electricity futures in Germany for 2012



EU power prices still below the level that would recover investment in new plant

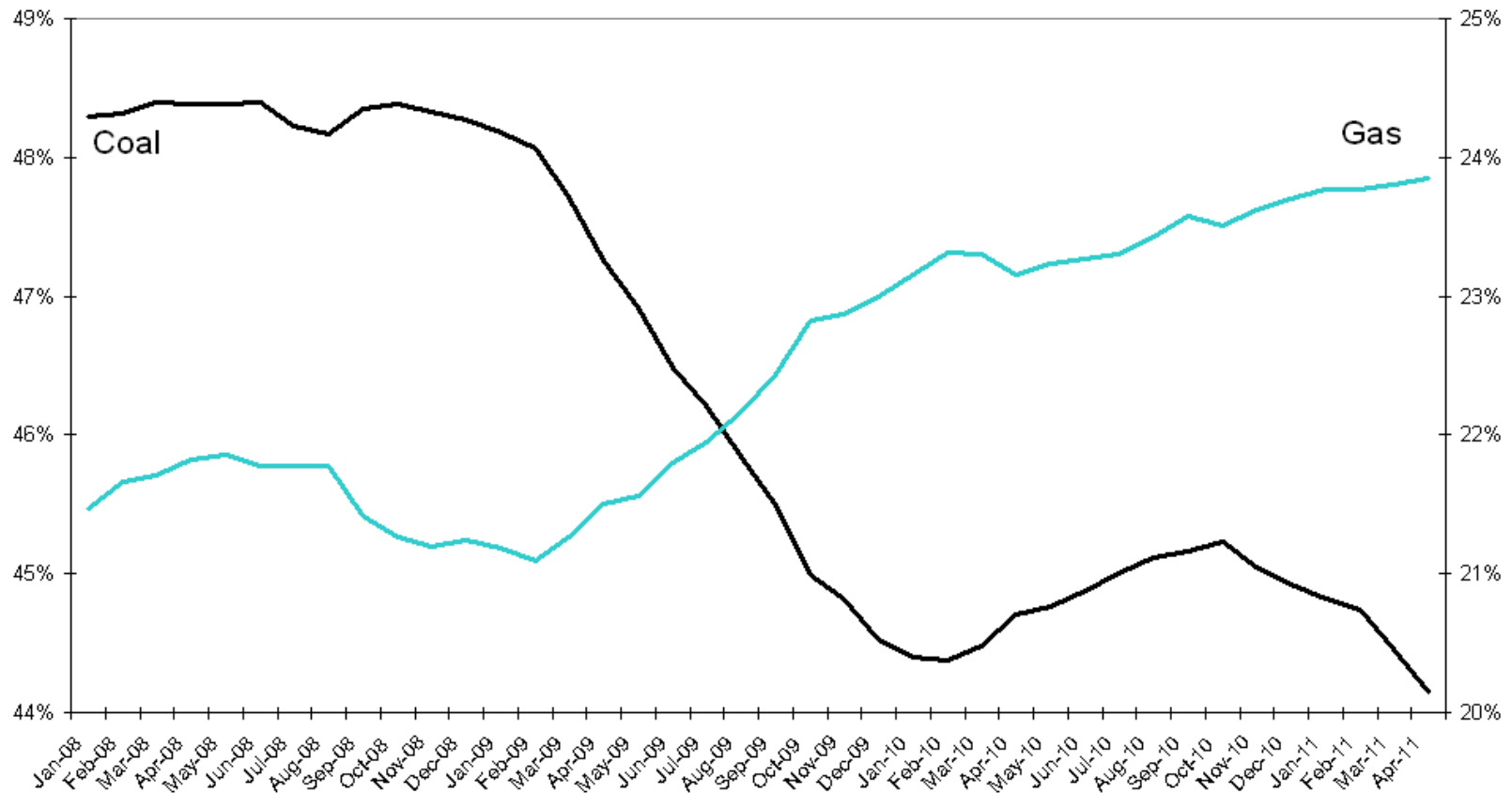
Gas will be needed to deliver CO2 reductions

German electricity mix with 10% demand reduction, no nuclear, 35% renewables and CO2 at the target level



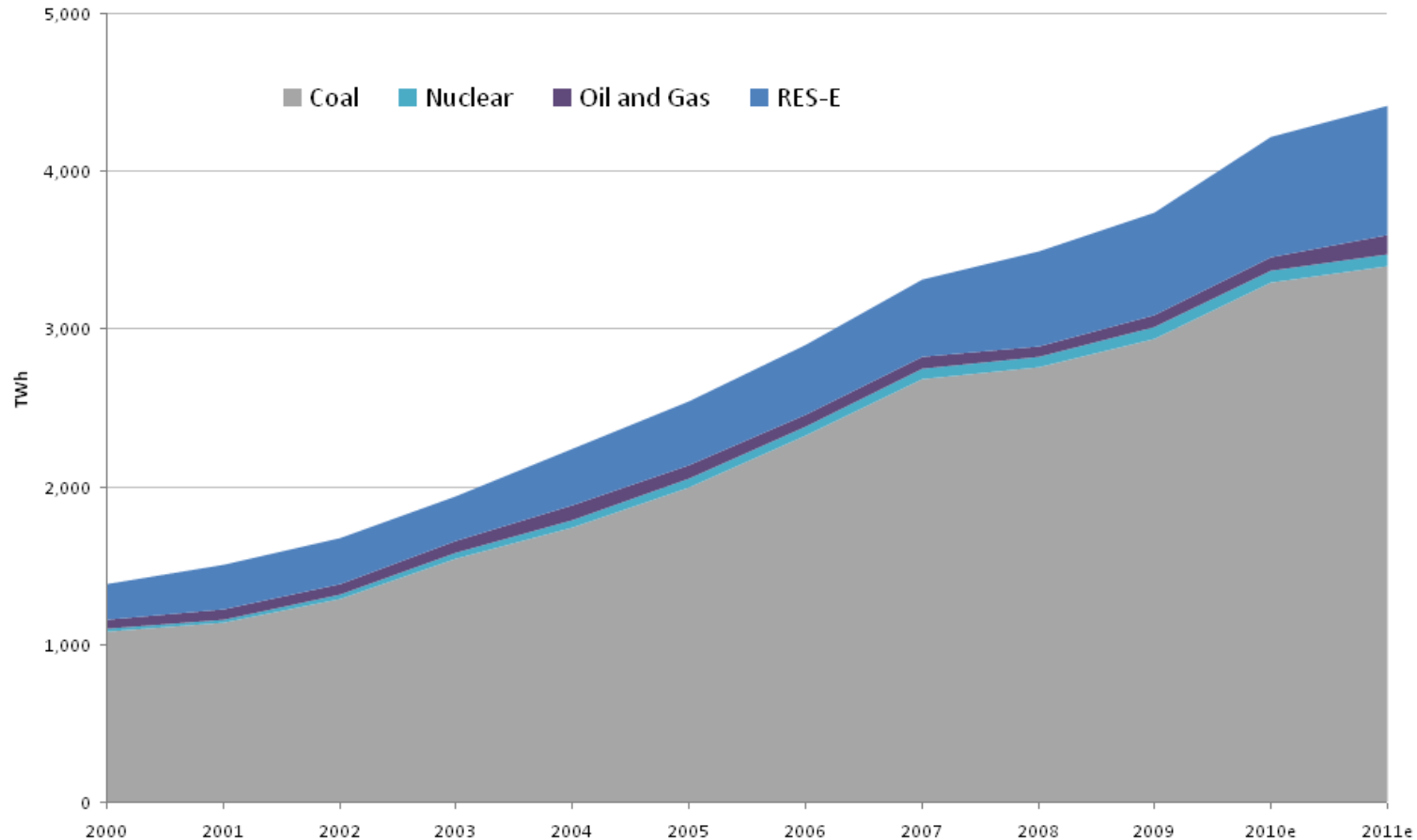
US: the Golden Age of Gas has arrived

Share of coal and gas in US power generation



280 Twh coal to gas switch in 3 years

China: with energy efficiency efforts and the biggest nuclear and renewable program in the world



Coal fired power generation still grows by over 100 twh/year

Russia: (Re)Search to improve power sector



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www.powerplantjobs.com/ppj.nsf/TurbineTypes?OpenForm - [Cached](#) - [Similar](#)

[Alstom Launches Upgraded GT26 :: POWER Magazine](#)

1 Aug 2011 ... Like GE Energy, Siemens, and Mitsubishi Heavy Industries, Alstom has been developing a gas turbine that pushes the 60% efficiency barrier. ...

www.powermag.com/gas/Alstom-Launches-Upgraded-GT26_3872.html - [Cached](#) - [Similar](#)

[High-Efficiency gas turbines add new flexibility | Control Engineering](#)

25 Jul 2011 ... Siemens' H-class gas turbine, the largest machine of its type in ... such as Alstom, GE, Mitsubishi Heavy Industries, and Siemens, offer turbines ...

www.controleng.com/single...gas-turbines-add.../9a6d35a104.html - [Cached](#) - [Similar](#)

[GAS TURBINES IN SIMPLE CYCLE & COMBINED CYCLE ...](#)

Alstom's GT-8C2, 50/60Hz gas turbine with basic specification SGT-600 Industrial Gas Turbine - 25 MW (former designation, Alstom's GT10) (Source: Siemens ... Figure 18

How to make it happen



- Adam Smith 1776:
peace, taxes, justice
- IEA 2011(ongoing
work on Russian power
sector reform):
elimination of gas
subsidies, proper price
signals for gas and
electricity, market
design