

Der europäische Energiemarkt im Einfluss globaler Entwicklungen - Auswirkungen unkoordinierter, regionaler Energiesstrategien

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Wien Energie

Unternehmensentwicklung

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Content

- Motivation and introduction
- Status quo
 - Political framework conditions
 - Regional interests
 - Regional energy resources
- Market linkages and (mutual) interplays
- Conclusions: Attempt of a summary

Different topics on Energy in different regions

- *Climate change*
- *Security of supply*
- *Renewable energy sources* in Europe
 - Volatile output - back up capacities
 - Electricity - infrastructure
- Natural gas in **Russia and Gulf region**
 - Unstable political situations
- Oil in the Gulf region - associated gas
 - Depending on OPEC regulations
- Nuclear (potential phase out in **Japan and Europe**)
- Coal in **North America**
 - Unconventional gas a major game changer

Es ist Zeit für eine Energiekehrtwende ?



Foto: Pappe Schuster

**Georg Waldstein,
Herausgeber des GEWINN**

„Wir brauchen dringend eine marktorientierte subventionsfreie Energiepolitik.“

Egal, von welchen Koalitionen Deutschland und Österreich künftig regiert werden, der nächste Winter kommt bestimmt und er wird mit hoher Wahrscheinlichkeit ein Winter des Missvergnügens: in beiden Ländern ist mit zumindest kurzfristigen Stromausfällen zu rechnen.

Wie das? Beide Länder, Deutschland noch rasanter als Österreich, haben sich derart inbrünstig der sogenannten „Energiewende“ verschrieben, dass auf die vorsorgliche Pflege der konventionellen Infrastruktur weitgehend vergessen wurde. Während die erneuerbaren Energieträger mit Subventionen sonder Zahl zu einer noch immer höchst bescheidenen Energieleistung hochgepäppelt wurden, warten die schon lange überlasteten Stromleitungsnetze vergeblich auf einen dringend nötigen Ausbau. Und wäre das nicht fatal genug, hat die überhastet ausgerufene Energiewende das gewachsene Versorgungssystem so durcheinander gebracht, dass alte Kohlekraftwerke reaktiviert werden mussten.

Seit der Deutschland-Wahl besteht nun allerdings zumindest theoretisch die Chance für eine vernünftige „Energiekehrtwende“, sprich: für eine Energiepolitik, die sich nicht an träumerischen Selbstversorgerphantasien orientiert, sondern an marktwirtschaftlichen Fakten:

- Erstens ist der gutmenschliche Wendedruck zumindest der deutschen Grünen bei den Bundestagswahlen ordentlich zerbröselt, und
- zweitens kommt unverhofft, aber zur rechten Zeit Entwarnung vom UN-Klimabeirat IPCC: Seit 15 Jahren steht die globale Erderwärmung still, das arktische Eis hat sich während der letzten zwölf Monate von 3,41 Millionen Quadratmeter auf 5,12 Millionen vermehrt, und überdies konzidiert der Klimabeirat, dass es auch schon im Mittelalter so warm war wie heute – ganz ohne „Klimasünder“.

Gute Gründe also für Merkel und Kollegen, das Klimawende-Pathos endlich wieder in den (Kühl-)Schrank zu legen und zu einer marktorientierten subventionsfreien Energiepolitik zu finden.

Europe

- **20% renewable** energy sources by 2020
- **20% greenhousegas emission reduction** by 2020
- **20% energy efficiency** measures by 2020
- **Expected continuation** of level of ambition **beyond 2020 and 2030**
- **High import dependence** in coal, oil and gas - **53.5%** of its **energy** in 2011 (83.5 % in oil, 64.2% in natural gas and 22% in coal)
- **Renewable energy potential about 45 to 50%** of expected energy demand in 2030
- **Phase out of nuclear** - significant **infrastructure adaption** required
- **Support scheme design** of renewable energy sources **adjusted** in order to cope with volatile characteristics
- Emission Trading Scheme (ETS) almost out of operation - 3.2 to 5 USD/tCO₂

Arabic Gulf region

- **Strong power demand increase** - 56% in the last decade due to demographic increase
- **Power generation** in the **MENA** region largely depends on **fossil fuels**
- **Subsidized energy prices**
- **Large proven resources of domestic oil and natural gas**
- **Only 40%** of Saudia Arabian's gas resources are **non-associated**
- Expected future **power demand** could **turn Saudi Arabia** to a **net importer of natural gas** within the next 20 years
- **Qatar limits its natural gas export by a national referendum**
- **Both** hold **high** renewable electricity generation (**RES**) potentials, especially for **solar power generation (CSP)**
- **Large proven reserves of unconventional in Saudi Arabia** - 2,000 times the annual natural gas production of 2012

Proved Natural Gas Reserves in the Gulf

Early 2011

Country	Proved Reserves	Associated/ Non-Associated	Of Region's Total	Of World's Total
		% (1)	% (2)	% (2)
• Bahrain		20/80	*	*
• Iran		33/67	39	16
• Iraq		66/34	6	1
• Kuwait		85/15	2	*
• Oman		25/75	*	*
• Qatar		1/99	34	14
• Saudi Arabia		60/40	11	4
• UAE		81/19	8	3
• Yemen		80/20	*	*
• Total	75,100	32/68	-	40

• Less than 1

• 1) Various Sources, Independent Estimates (2) COO of Petroleb (Lebanon)

World Unconventional Gas Potential

Widespread unconventional resource plays exist in Asia Pacific, North and Latin America, Europe and Eurasia, and Middle East/North Africa

Region	Coalbed Methane (Tcf)	Shale Gas (Tcf)	Tight-Sand Gas (Tcf)	Total (Tcf)
North America	3,017	3,842	1,371	8,228
Latin America	39	2,117	1,293	3,448
Western Europe	157	510	353	1,019
Central and Eastern Europe	118	39	78	235
Former Soviet Union	3,957	627	901	5,485
Middle East and North Africa	0	2,548	823	3,370
Sub-Saharan Africa	39	274	784	1,097
Centrally planned Asia and China	1,215	3,528	353	5,094
Pacific (Organization for Economic Cooperation and Development)	470	2,313	705	3,487
Other Asia Pacific	0	314	549	862
South Asia	39	0	196	235
World	9,051	16,112	7,406	32,560

Source: National Petroleum Council Paper on Unconventional Gas, 2010

United States and Asia

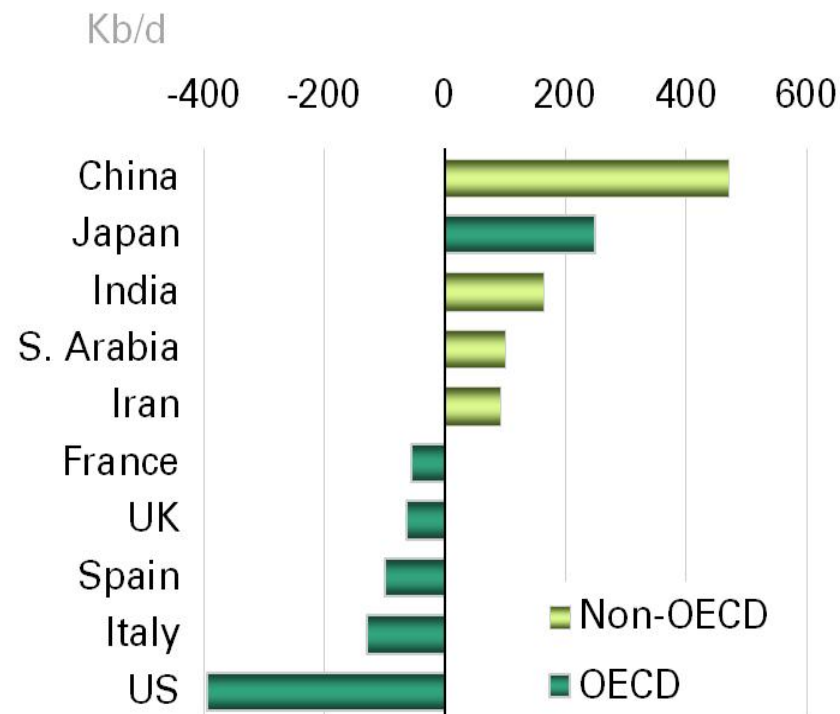
- ***US energy consumption dominated by fossil fuels***
- ***No common agreement on renewable targets*** - national targets
- ***Electricity sector 51.5% of coal in 2000, 44.5% in 2010 -
natural gas 16% in 2000, 24.1% in 2010***
- ***Total US coal production stabilized*** in same period (~1,100 MTS)

- ***Nuclear phase out in Japan*** (postponed)
- ***China significant energy demand increase*** - 50% from 2004 to 2010
- ***Coal dominates electricity sector by 80%*** - only limited coal imports
- ***Gas demand tripled from 2000 to 2008***, at a very low level
- ***China's gas import dependency*** expected to increase to ***62 to 73%*** in 2030
- ***China's shale gas potential equals 70,000 Mtoe (70% of domestic unconventional gas; same amount as US)***

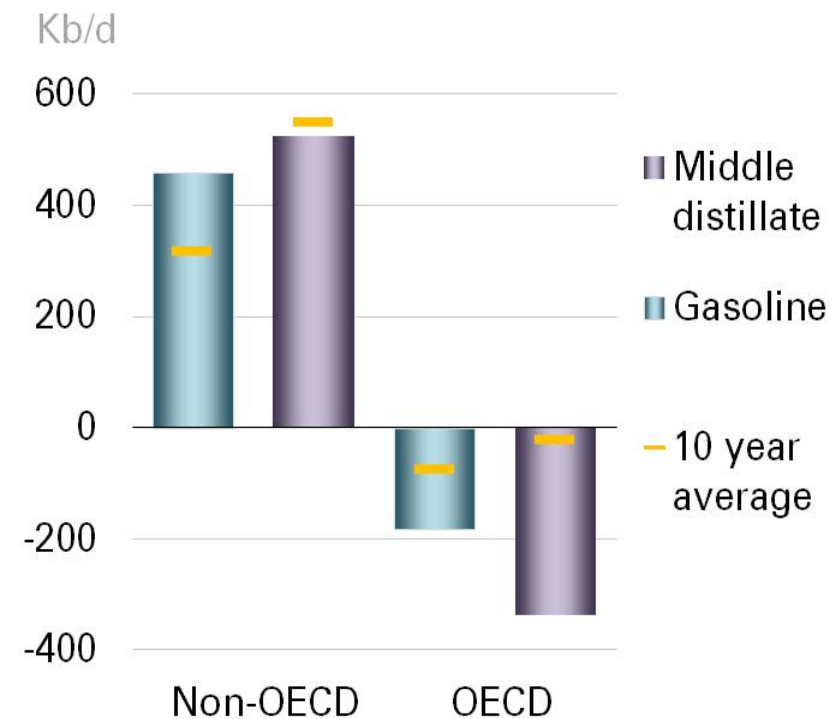


Oil consumption in 2012

Largest changes



Growth by product type

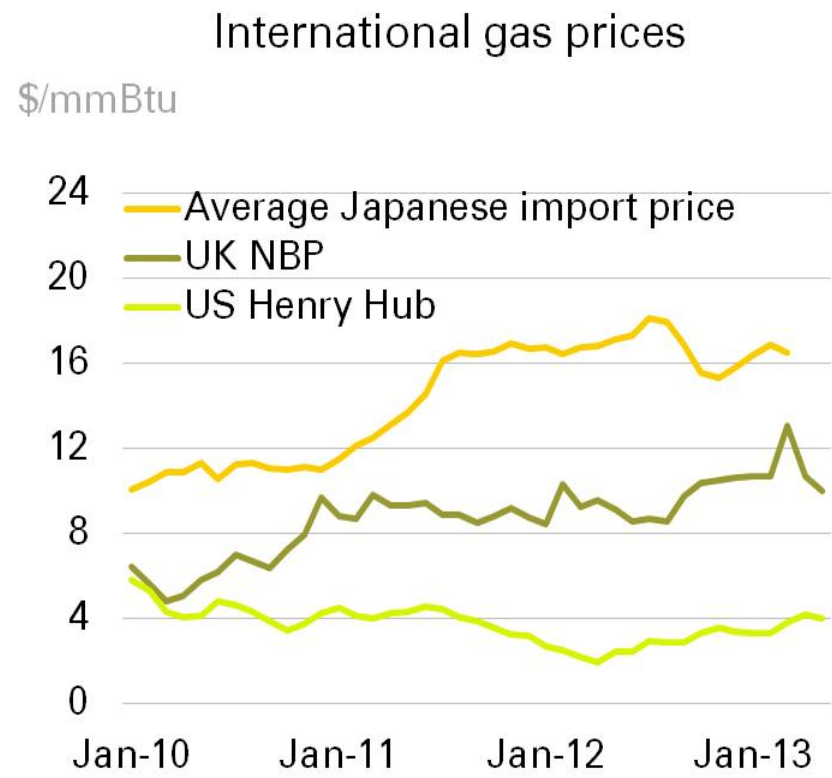
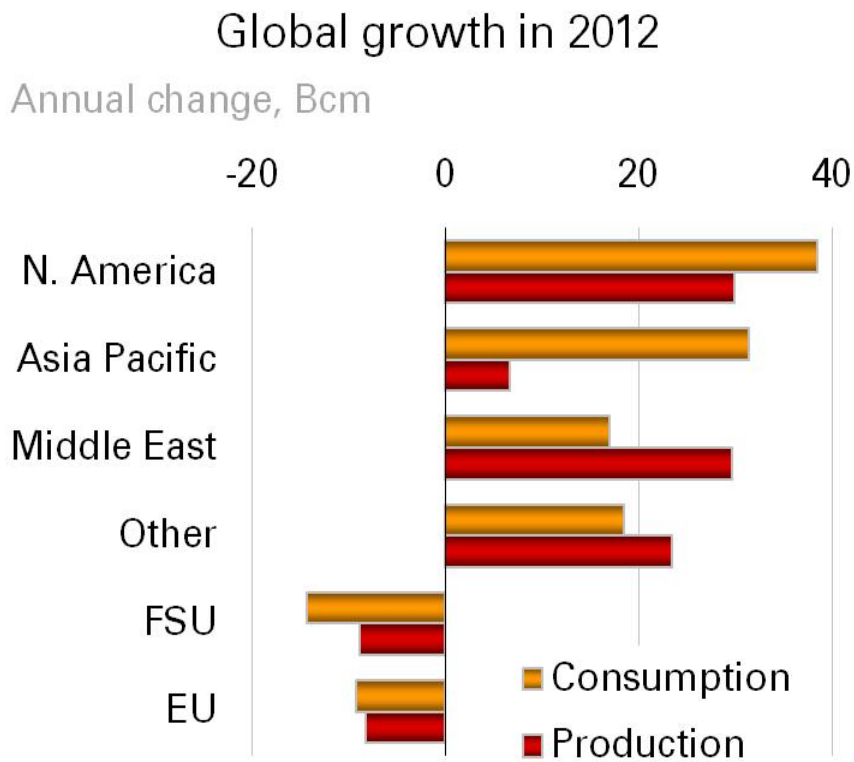


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Global natural gas balance



Source: includes data from ICIS Heren Energy and Energy Intelligence Group

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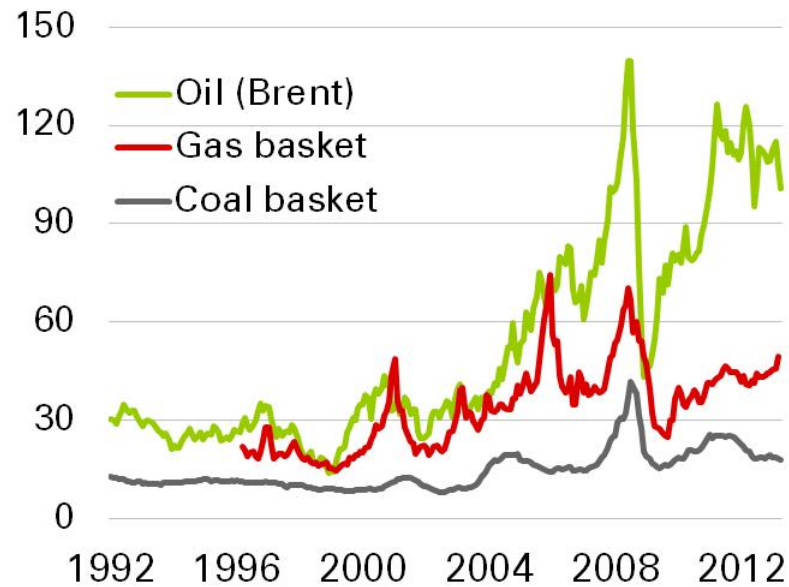
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Energy prices

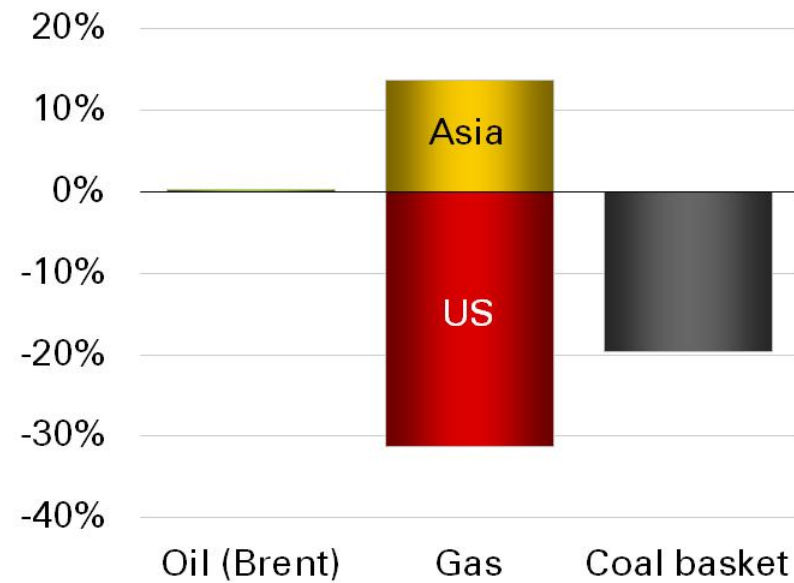
Inflation adjusted prices

\$2012/boe, monthly



2012 price changes

Annual change, %



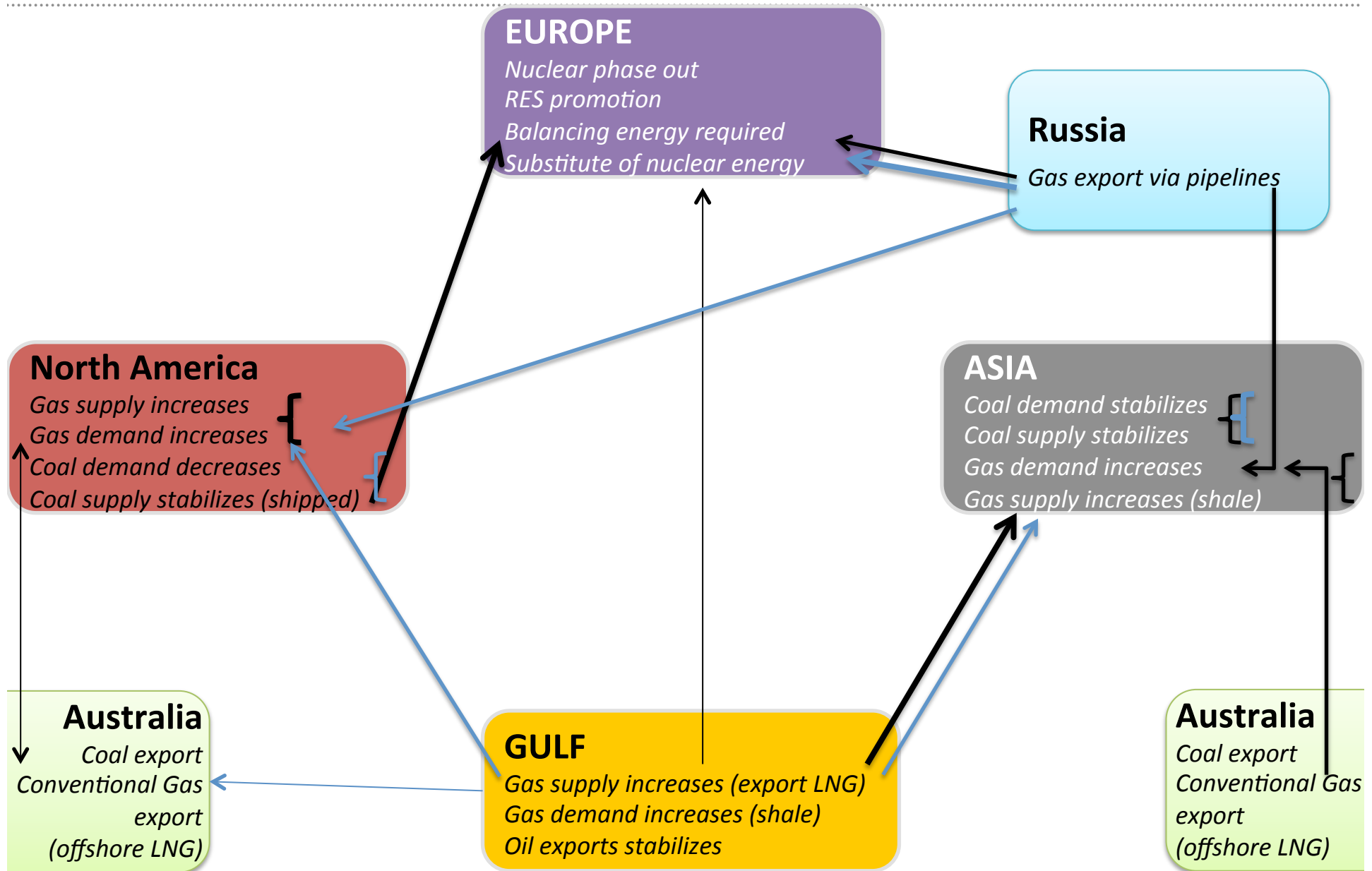
Source: includes data from ICIS Heren Energy and Energy Intelligence Group, McCloskey and Platts

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- **Arabic Gulf**
 - Finance national social welfare systems
 - Keep energy prices at reasonable level
- **Asia**
 - Energy security - secure increasing energy demand
 - Develop national energy resources (coal / unconventional gas)
- **North America**
 - Increase industrial competitiveness
 - Develop energy self sufficiency - technology development (learning)
 - Shareholder interests of energy companies (double-digit dividends)
- **Europe**
 - Combat climate change
 - Diversify supply portfolio

Interplay of global energy markets



Qualitative assessment

- *Cost effective* exploitation of *shale gas* - especially in *North America*
- *Decreasing gas prices* (Henry Hub) - LNG (partly) links national markets
- *No intention to export* large quantities to other markets
(*competitiveness of domestic industry*)
- *Surplus of coal production in US*, previously domestically used
- European energy strategy supported by high *financial incentives*
- Renewable energy (volatile character) requires back-up power
- Large coal investments noticed since coal and CO2 prices are low
- In conflict with CO2 targets - *hardly any reductions* but high expenditures
- Increasing *gas imports in Japan and China* - stabilize demand for GCC and Russia - important income for social welfare system
- *Increasing domestic demand in GCC* unconventional gas in Saudi Arabia

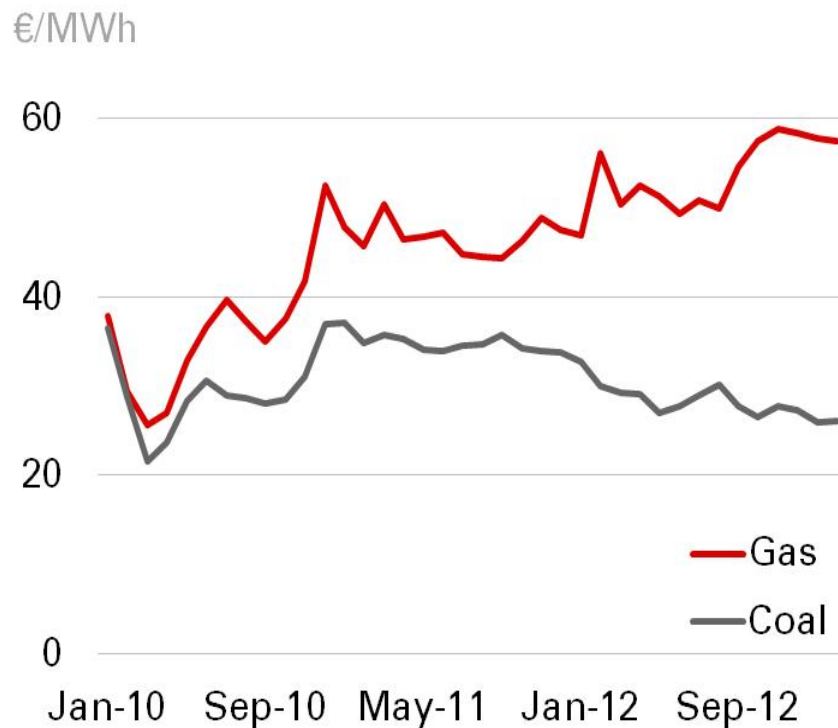
Unconventional gas is a game changer in the energy sector!

- ***LNG terminals ... linking markets***
 - Enabling flexible and spontaneous allocation of gas resources
- ***R&D in unconventional gas development - technology development***
- ***Diversification of gas supply countries***
- ***Reconsideration of (inter)national energy strategies - RES in Europe***
- ***CO2 target / RES target: Not only RES and energy demand impact CO2 targets - switch from coal to gas -> CO2 price decrease / competitiveness!***
- ***Unconventional gas and LNG transport systems impact currently built and planned operation of gas pipelines significantly***
- ***Developing new business models for financing the domestic social welfare systems in case of decreasing fuel prices - GCC countries***
- ***Directing producer rents towards more R&D programs on CCS and unconventional gas combinations***

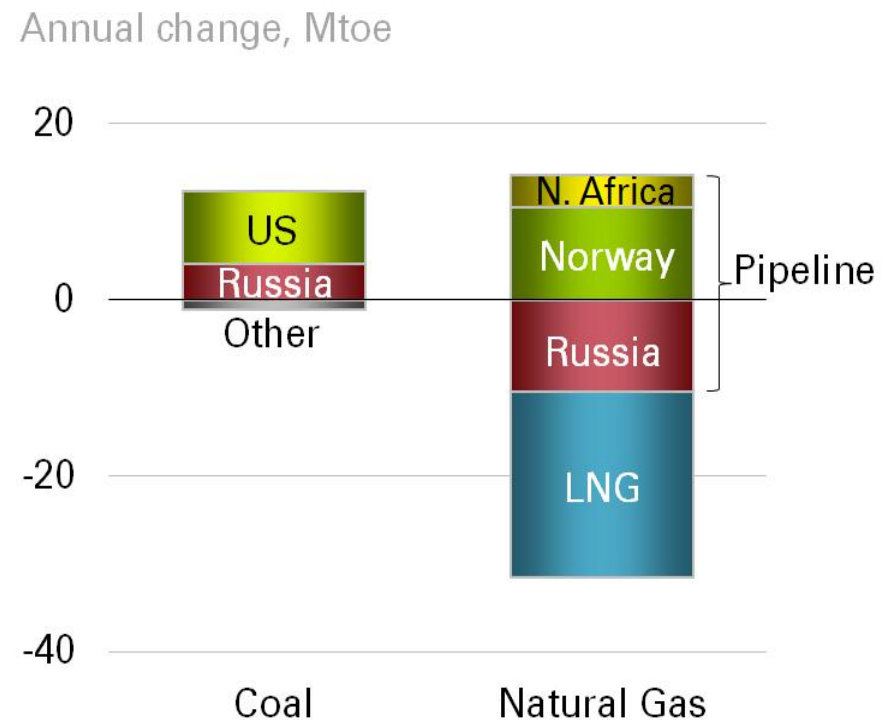


European gas-coal competition

EU power generation cost



2012 changes in EU imports



Source: includes data from Platts, IHS McCloskey and IntercontinentalExchange

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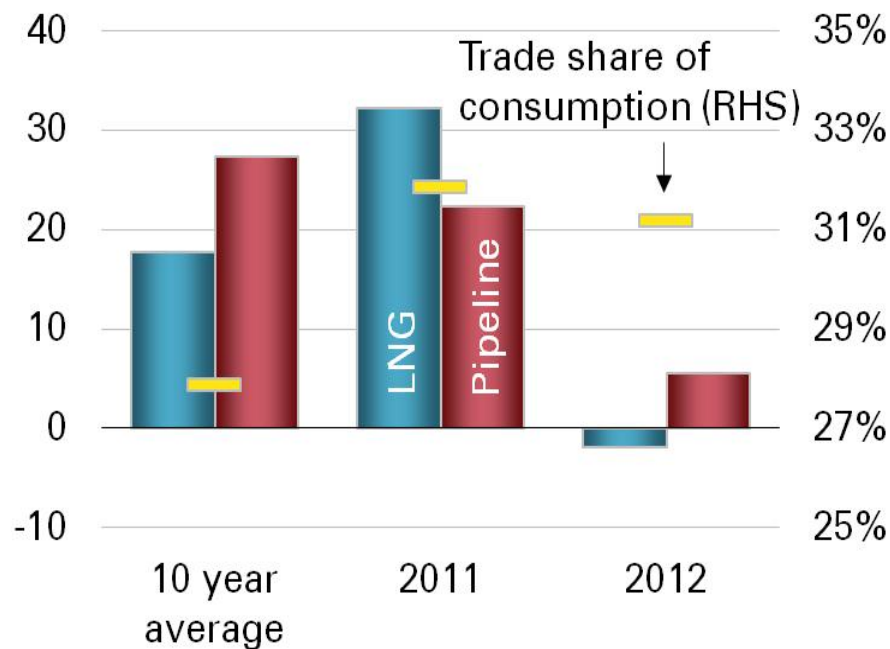
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Natural gas trade

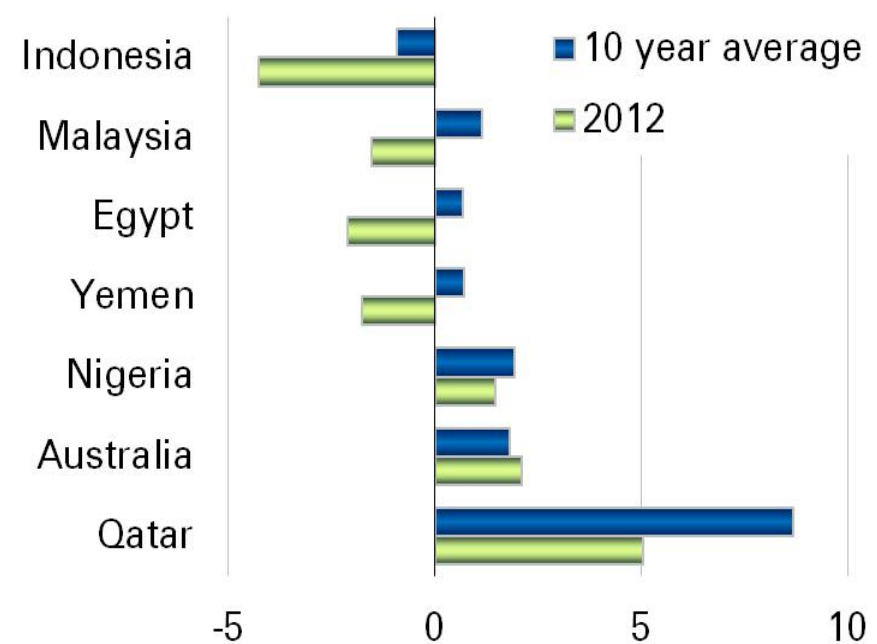
LNG and pipeline trade

Annual change, Bcm



LNG exports

Annual change, Bcm



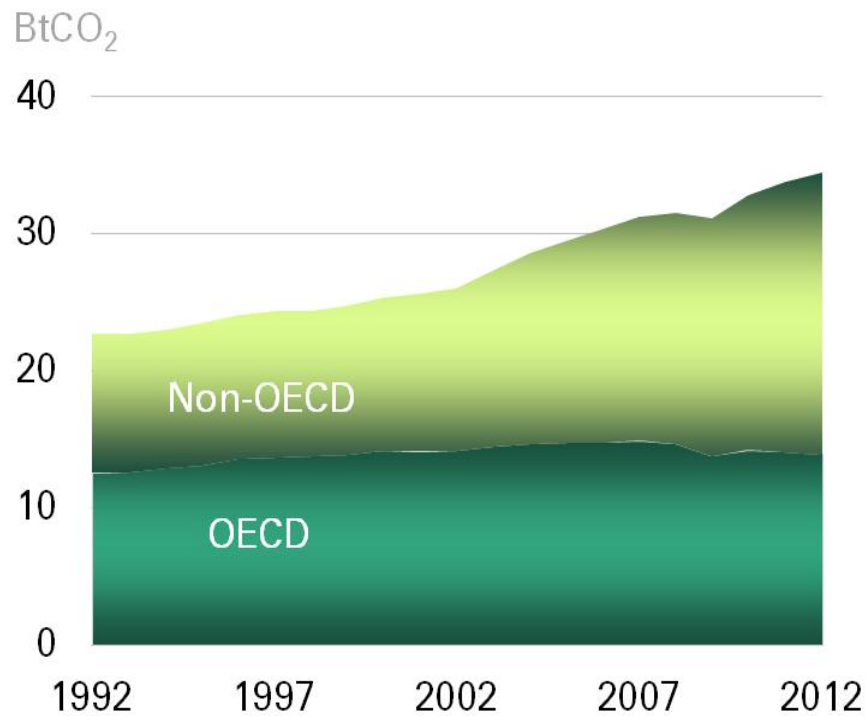
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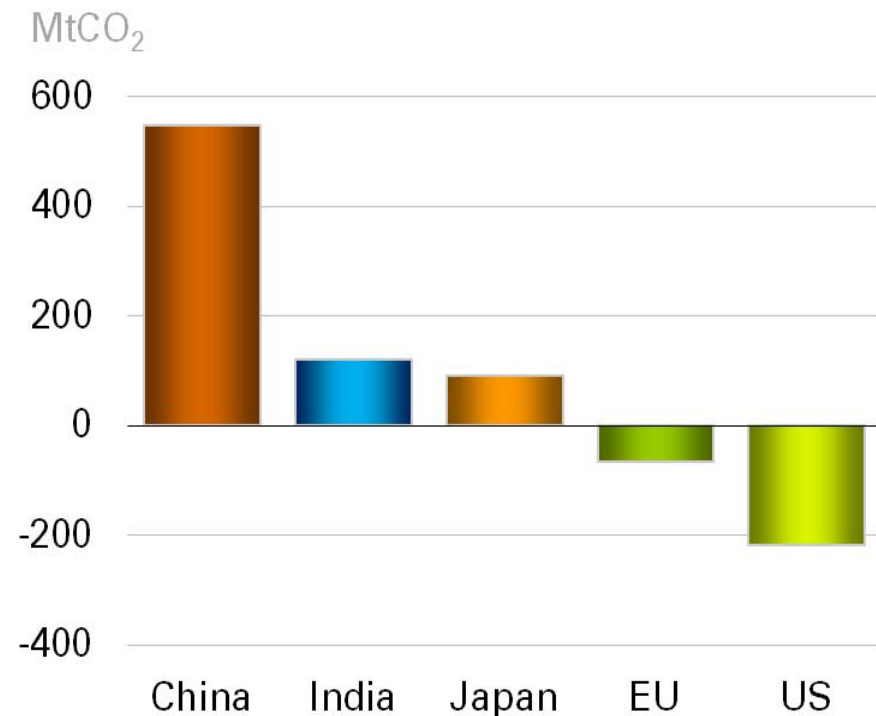


Carbon emissions

Global emissions from energy use



Largest emission changes in 2012

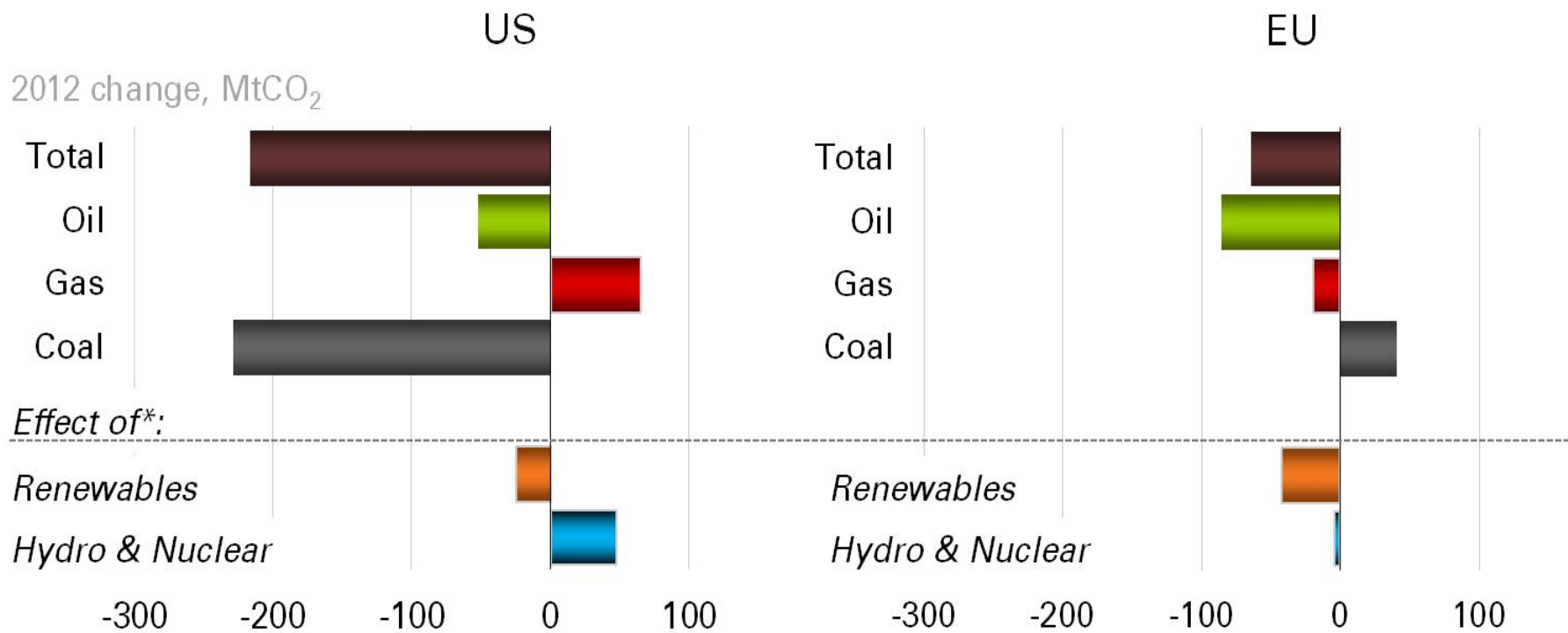


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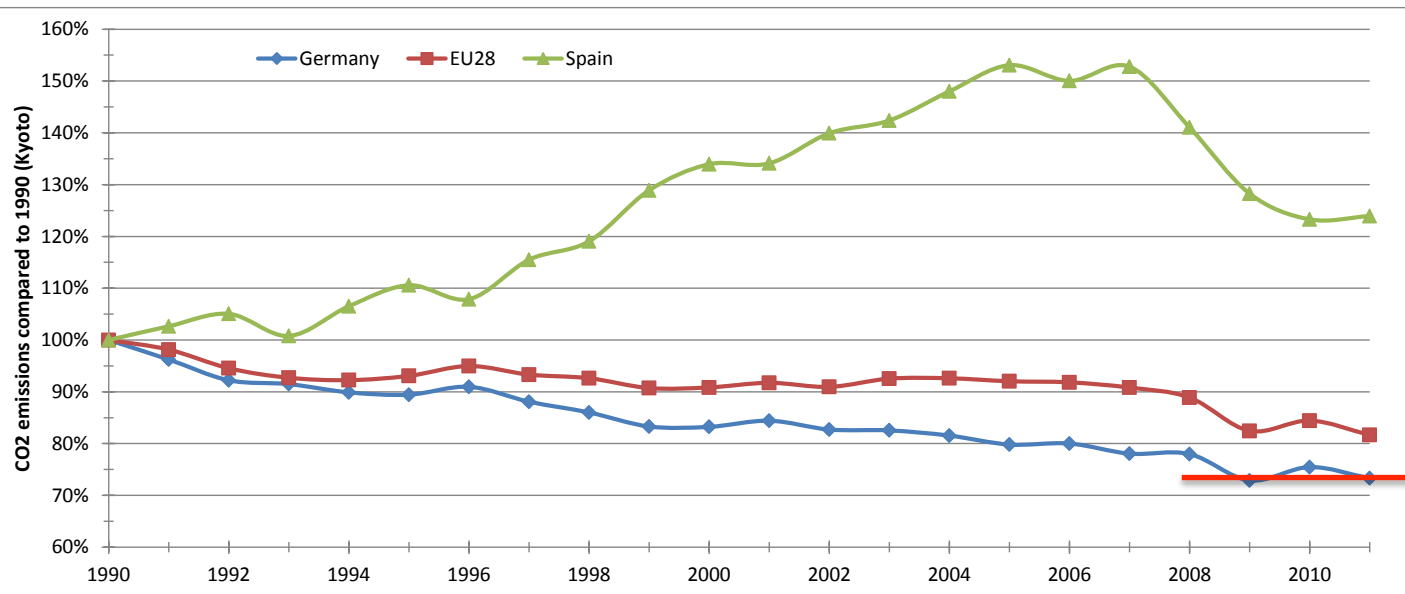


Carbon emissions by fuel: US and EU



* The net effect of changes in non-fossil fuels in power on emissions, based on 2011 shares of fossil fuels in power generation

Selected CO2 emissions in EU28



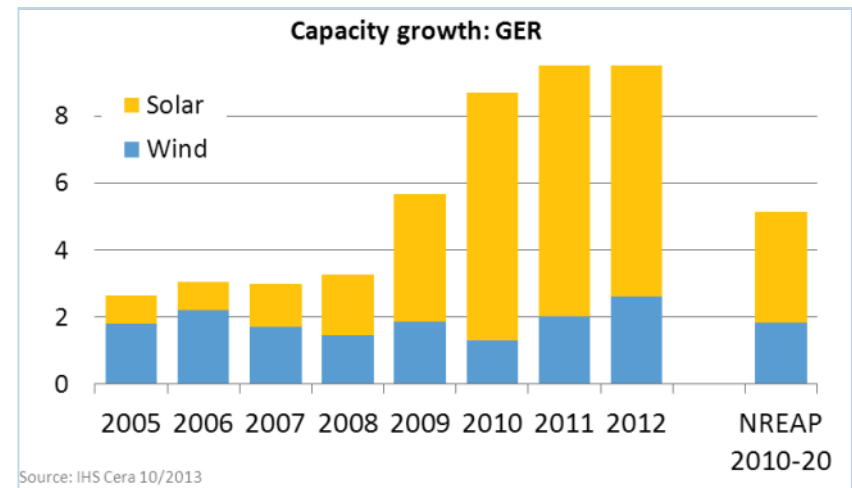
source: EEA (2013) greenhouse gases viewer, accessed on October 1st, 2013

Increase of approximately 45 GW RES decreased CO2 emissions by about 5% (including the economic crises)

Significant RES investments from 2009-2012 did not result in CO2 emission reductions.



Is the primary objective of RES to reduce CO2 emissions?



Thank you for your attention!

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