

Market uncertainties: not a threat but a chance!

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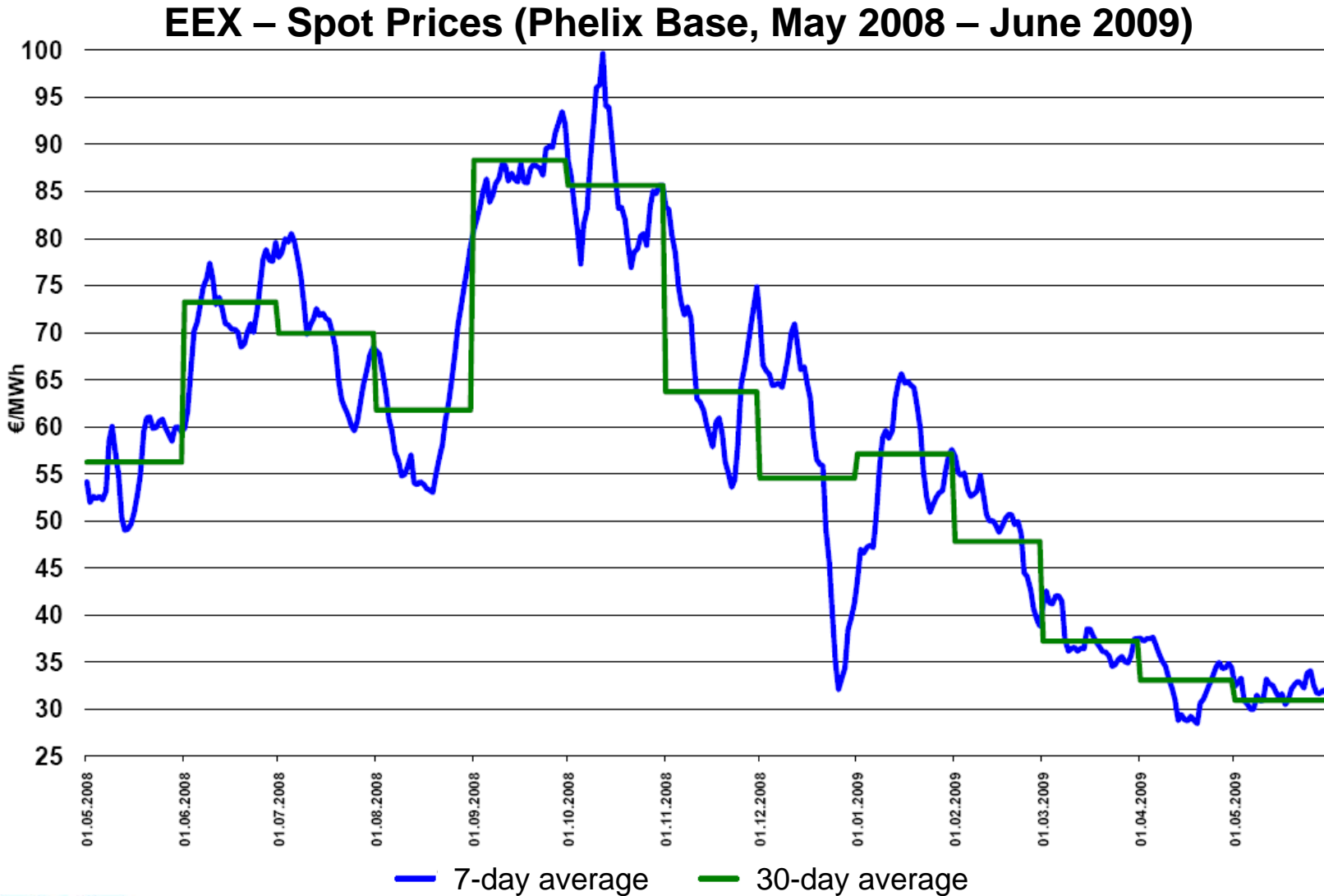


“The future is uncertain... but this uncertainty is at the very heart of human creativity.”

Ilya Prigogine (25 January 1917 – 28 May 2003)*

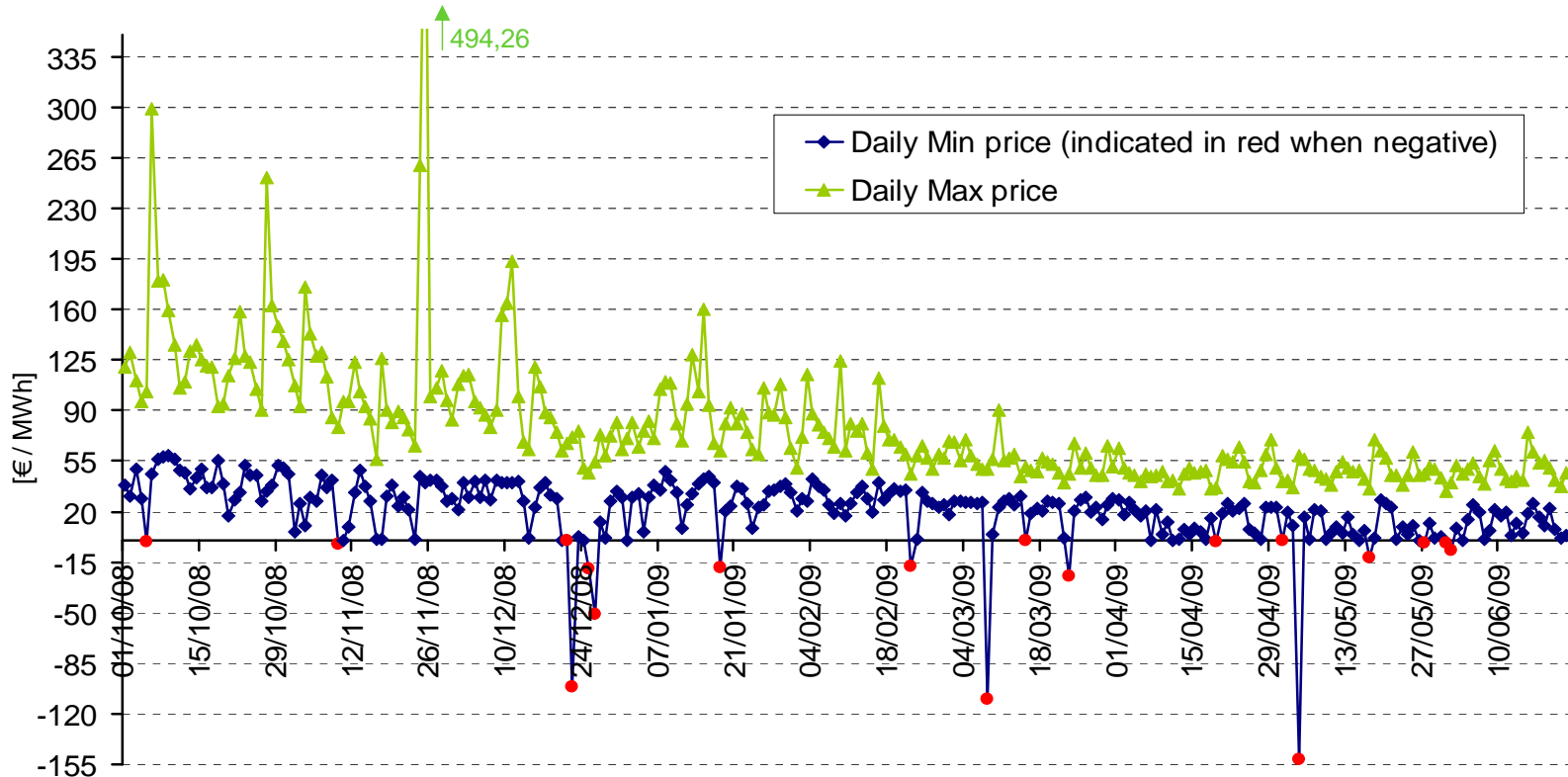
* Ilya Prigogine was a Russian-born Belgian chemist and Nobel Laureate noted for his work on dissipative structures, complex systems and irreversibility

Over the last few months we have seen a significant drop in average spot prices...



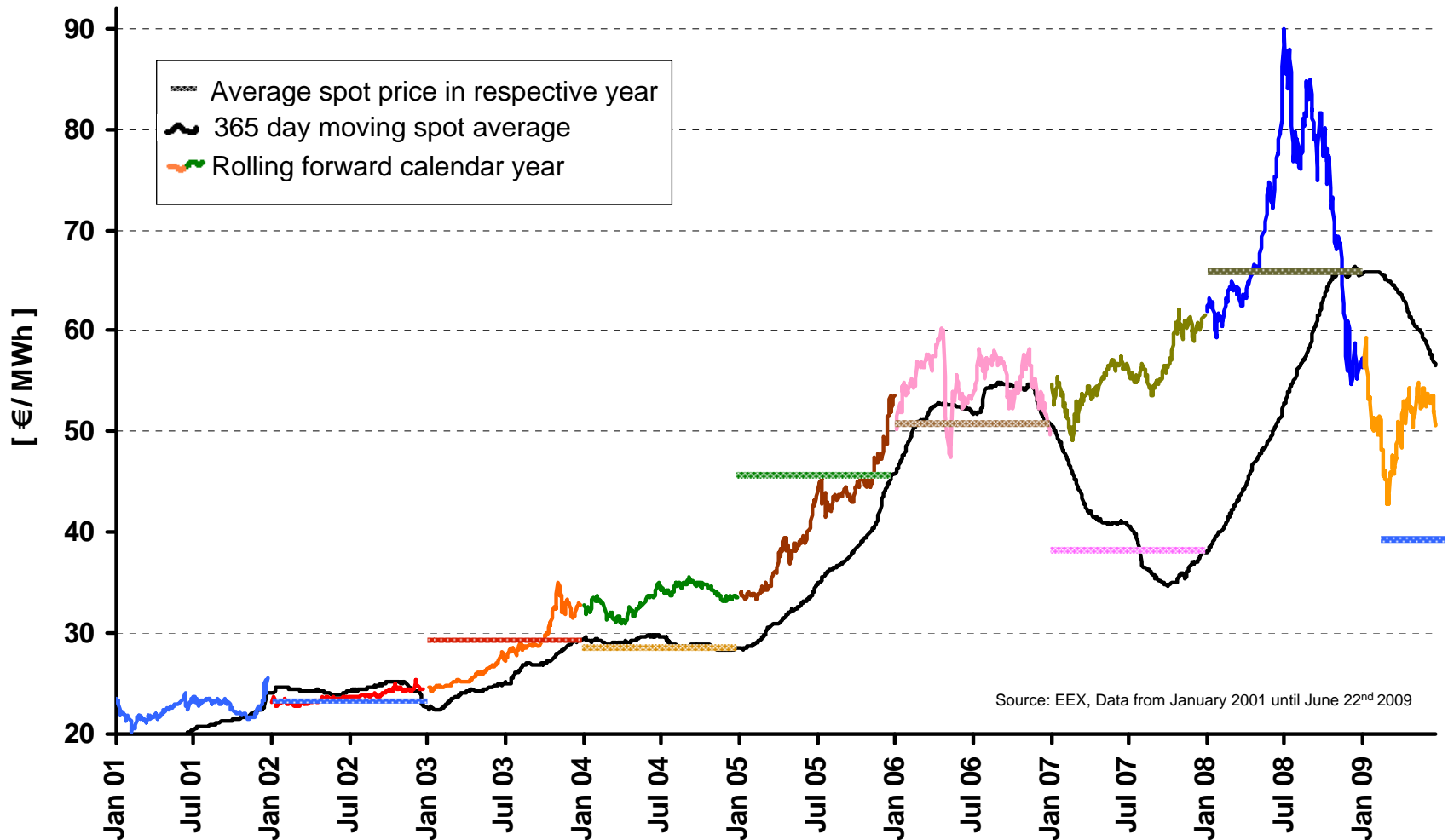
... while prices remained volatile

Between October 2008 and June 22nd 2009 a total 45 hours had negative prices while the highest price almost reached 500 € per MWh.



Higher volatility is also reflected in higher risk premia

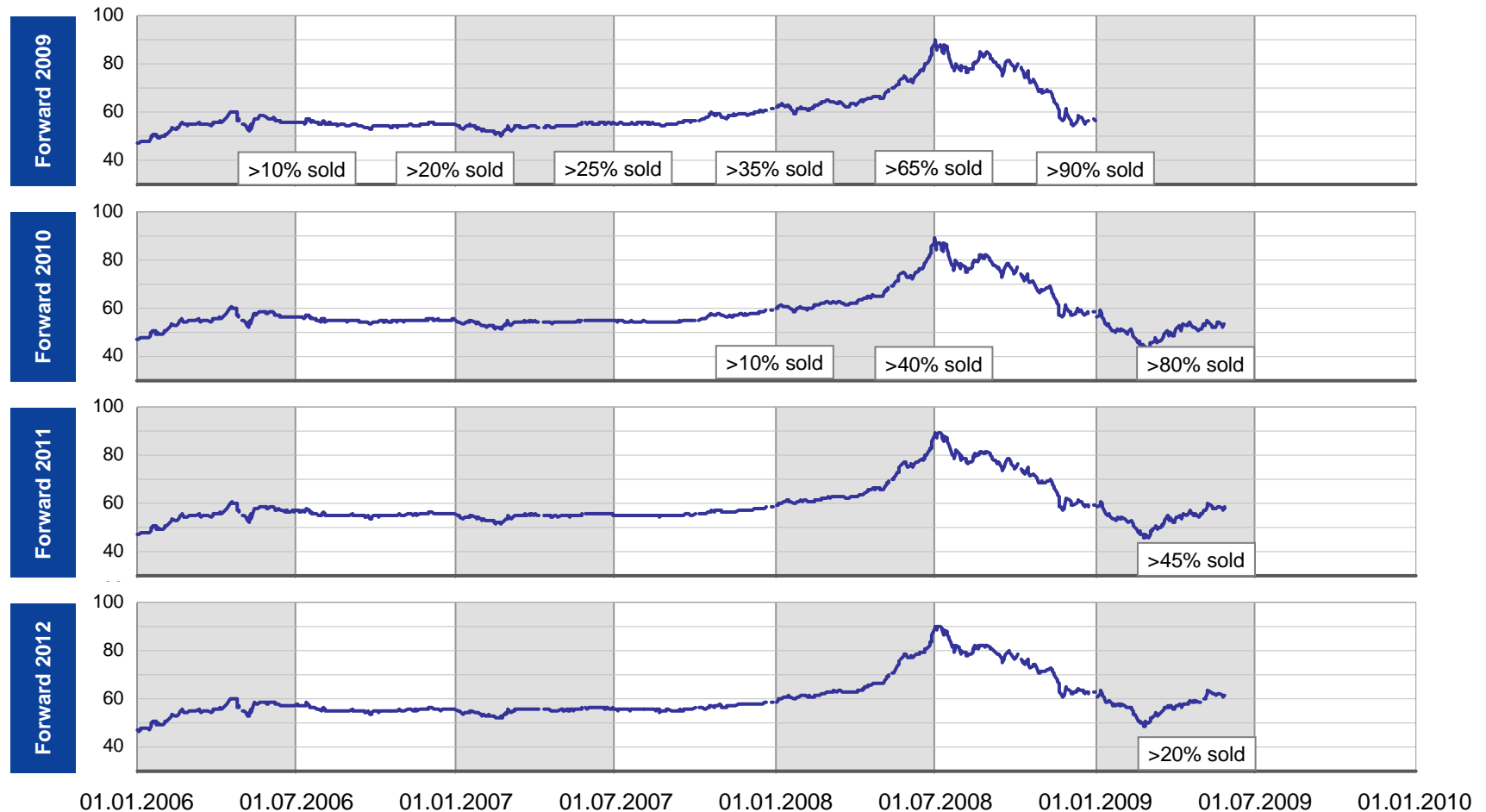
Rolling forward calendar year vs. average of EEX Phelix base load spot price



Source: EEX, Data from January 2001 until June 22nd 2009

RWE's hedging strategy benefits from steep contango

Forward selling of RWE Power in the German market (base-load forwards in €/MWh)



(average realised price for forward 2008: €58/MWh)

¹ Forward selling as of April 30, 2009; price data as of May 28, 2009

RWE's daily make or buy decision: STPM extracts additional value on top of our forward selling

An example

RWE sold forward Q1 2009 power generation from hard coal units in Q2 2008	
Power sold forward at	+ 70 €/MWh
Hard coal costs locked in at	- 40 €/MWh
CO ₂ costs locked in at	- 20 €/MWh
Locked in Clean Dark Spread	+ 10 €/MWh

Now, in Q1 2009 the prices of power and fuels have changed	
Power price	40 €/MWh
Hard coal costs	30 €/MWh
CO ₂ costs	15 €/MWh
possible Clean Dark Spread	- 5 €/MWh
(power plant is out of the money)	

RWE can therefore decide every day whether it's rational to produce the electricity and generate the clean dark spread secured in Q2 2008 or buy the power from the market instead and sell the fuels again.

In this example RWE would opt for „buying instead of making“:

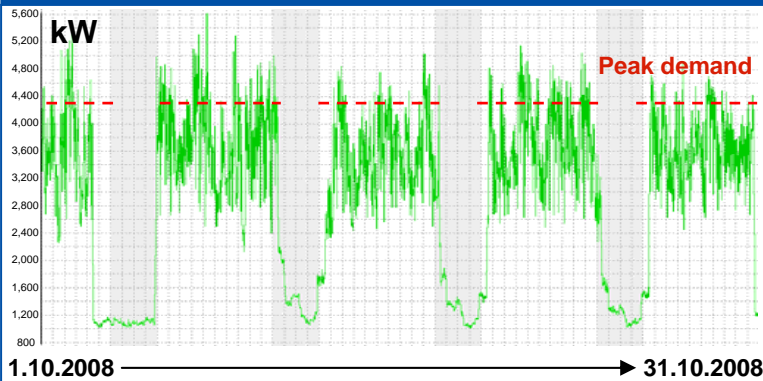
Power sold forward at 70€/MWh is covered by power bought today at 40€/MWh	+ 30 €/MWh profit
Hard Coal bought at 40€/MWh is sold at 30€/MWh	- 10 €/MWh loss
CO ₂ bought at 20€/MWh is sold at 15€/MWh	- 5 €/MWh loss
Total effect	+ 15 €/MWh



RWE doesn't make this decision for each single power plant stand-alone but based on the overall generation and contract portfolio

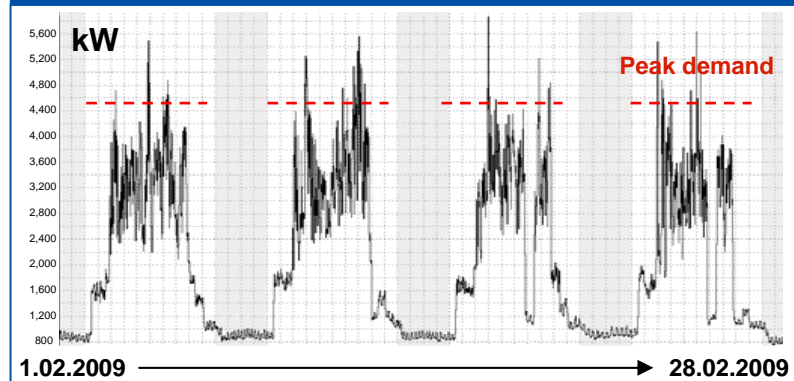
The overall capacity need does not change - even in times of less industrial demand

October 2008: Industrial customer load profile before the economic crisis



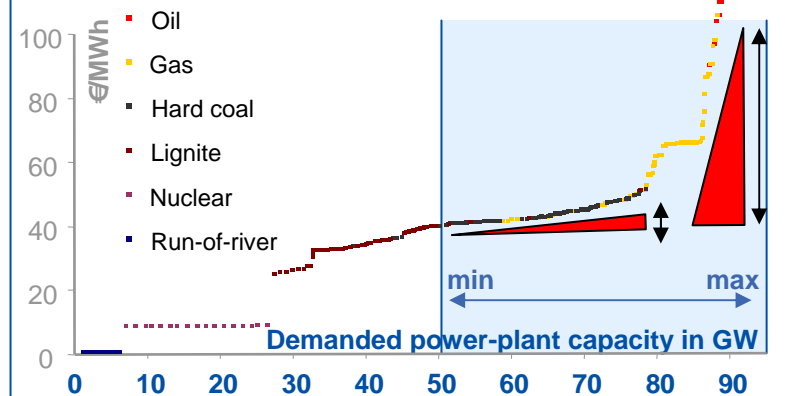
Note: Typical customer in manufacturing industry

February 2009: Customer load profile during the crisis¹



- > Due to the non-linear shape of the merit order (see on the right) the price change in peak-times is much higher than in offpeak times
- > The capacity need is key as the marginal power plant which provides the last necessary KW sets the market clearing price for the others
- > When these capacities are used the prices are high and allow baseload power plants to earn high margins

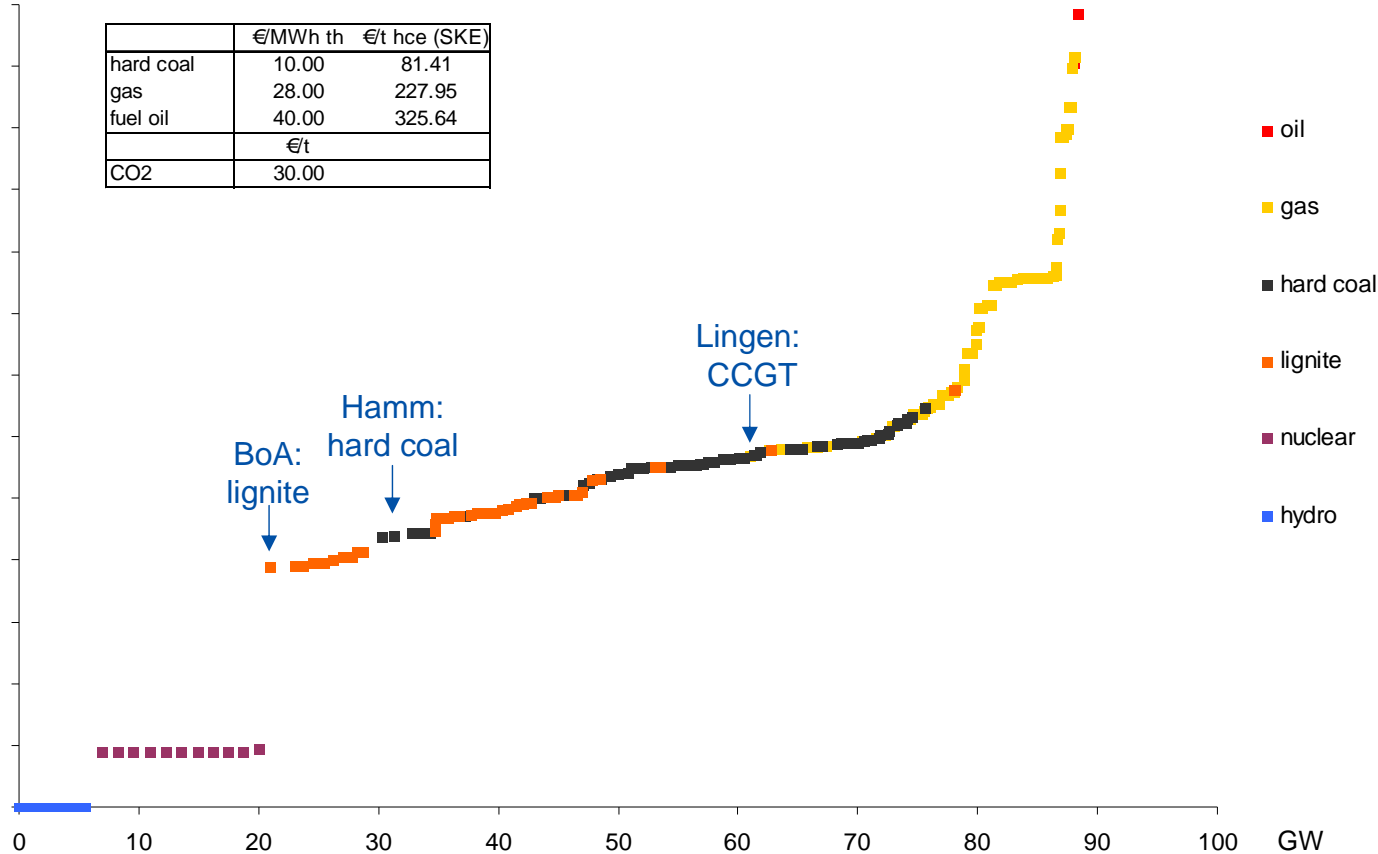
Merit order of German power-plant portfolio 2009



We therefore want to operate the most efficient plant within the respective fuel type...

Variable costs
in €/MWh_{el}

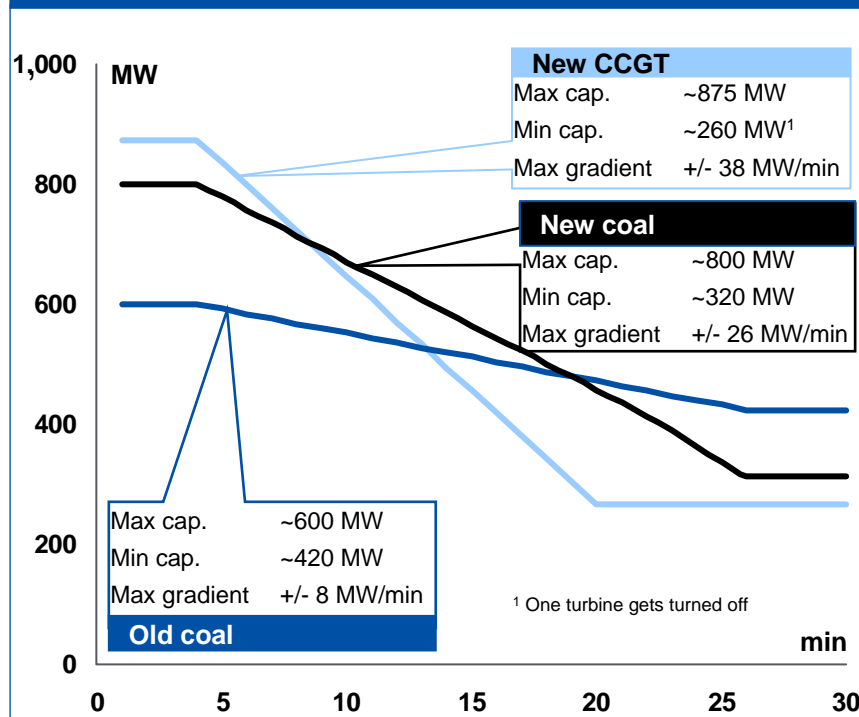
	€/MWh th	€/t hce (SKE)
hard coal	10.00	81.41
gas	28.00	227.95
fuel oil	40.00	325.64
	€/t	
CO2	30.00	



- > Replace “worn out” lignite and hard coal fired plants
- > Plants to the right hand side will therefore remain as peak-load power plants in the curve

While at the same time being as flexible as possible
(because flexibility will fetch increasing premia)

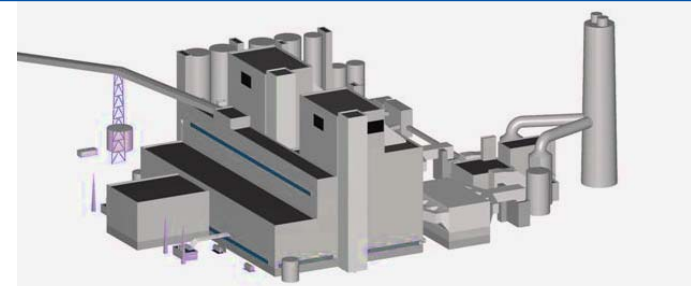
Comparison of ramp capacities
(new CCGT unit and old coal unit)



Lingen: 875 MW highly flexible CCGT plant for all load regimes



Eemshaven: coal fired 1,600 MW plant –2 flexible 800 MW units for mid merit regime



▶ Small and flexible units can be dispatched more quickly to capture extra margin potential along the merit order

Flexibility is also key for our Gas Portfolio Management

Gas Purchase
Contracts

Gas Sales
Contracts

Activities

- > Perform contract optimization (maximize the value against the market)
- > Trade around positions
- > Sales to RWE Energy, RWE Power / STPM, RWE Energy Nederland: serve as their sole or main supplier
- > Manage the Gas Operations: handle nominations
- > Trade underlying commodities: oil, coal etc.

Where:

Germany
(all 12 market areas),
Czech Republic

but also:

Netherlands,
Austria
Slovakia

Gas Storage
Contracts

Gas Transport
Contracts

How Gas Portfolio Management changes with the emergence of a Gas Market

The old days

- > “Distributers” such as Ruhrgas and RWE closed long term purchase contracts:
Safeguard for seller (= producer of Gas) to cover investment cost
- > Buyer would have gas available to sell
- > Buyer needed flexibility, because of weather dependency
- > “Take-or-Pay” of 80 %

New market opportunities

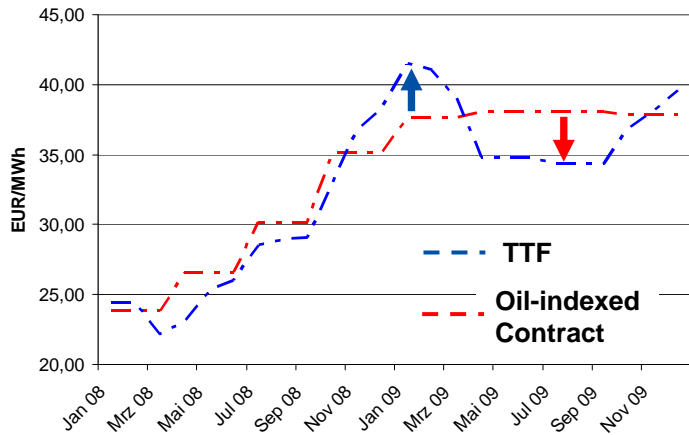
- > Separation of supply and demand theoretically possible (like in power generation):
 - > managing the Gas to Oil Spread from the long term supply contracts
 - > buying all the customer demand short-term
- > Hybrid situation:
 - > Before only long term gas supply contracts, oil-indexed
 - > Today also liquid markets, with fixed price gas trading



All of a sudden, the long term supply contracts and storage contracts have become an asset which can generate money in whole-sale markets and not only in retail markets

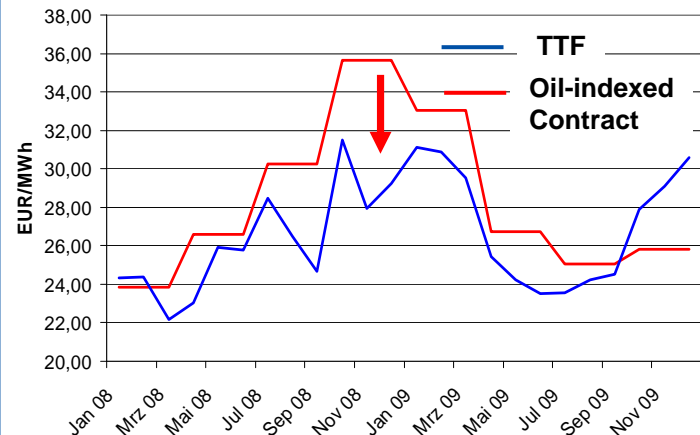
The additional value of optimizing our Gas Asset Portfolio

Normal situation



- > Oil-indexed contract is in-the-money in winter
- > And out-of-the-money in summer

Unusual situation



- > Oil-indexed contract is out-of-the-money in winter



**Provided the demand side didn't change optimizing the portfolio means:
We are long Q4/2008 and short Q3/2009. We sell the Q4/2008 and buy the Q3/2009.
We can deliver the same volume at on average lower prices**

This means...

- > Continuous **monitoring** of spreads
(fixed price gas vs. oil-indexed gas)
- > “**locking in**” **spreads** by selling gas & buying an oil swap
 - > Trading gas and oil products at the same time
- > **Liquidity is the restriction:**
most of the time market depth doesn't allow to do more
- > The same logic can be applied to **storage**
- > We hedge the total of the portfolio
= the positions of all flexible contracts (assets)



The bigger your portfolio the more flexibility you have. And we are on a good way to a 60bcm p.a. gas portfolio¹ by 2012.

While “out there” people question the necessity of additional gas infrastructure ...



... more than 100,000 households in Bosnia's capital Sarajevo and other cities stood without heating in January 2009, due to lack of gas!

... the next crisis could be on the way

Germany warns of renewed Ukraine-Russia gas conflict

Energy Environment News (17 June 2009)

Ukraine Gas Payments: Russia reserves 'the right to act'

Russia Today Business (23 June 2009)

PUTIN SAYS RUSSIA UNABLE TO MAKE GAS PAYMENTS FOR UKRAINE

RIA Novosti (23 June 2009)

No easy solution to Russia-Ukraine gas dispute

Xinhua (09 June 2009)

EU expects for new conflict between Ukraine and Russia in July

MIGnews (19 June 2009)

Gas transit through Ukraine to Europe may be suspended - Mr Putin

SteelGuru (12 June 2009)

Steinmeier calls on Ukraine to avoid another gas crisis

Deutsche Welle (17 June 2009)

RWE prepares for the next crisis – with innovative ideas and with Nabucco

RWE initiative to store gas in the Ukraine

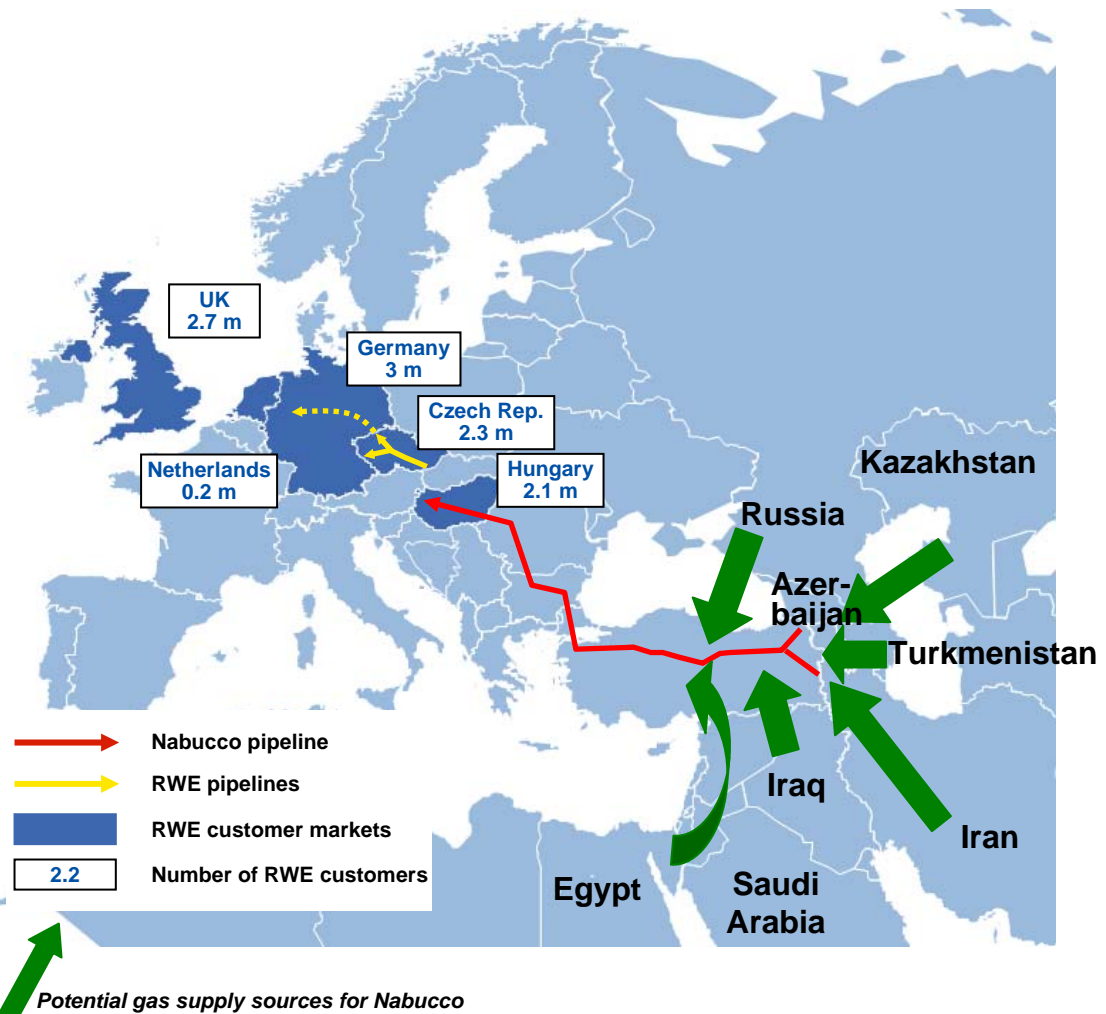
- > Given the fact that the Ukrainians seem to have serious cash problems, another payment default could trigger another crisis with similar delivery curtailments. A renewed gas conflict might threaten Europe's security of supply – especially as the gas storage facilities in Ukraine are not fully utilised
- > RWE proposes to fill these empty storages in summer, making this gas available to the market next winter. A win-win situation: The Ukraine receives income for (otherwise empty) gas storage facilities, Russia exports additional gas this summer and Europe improves its security of gas supply

RWE initiative to diversify Europe's gas supply portfolio

- > Against the background of renewed threat of supply interruptions, Nabucco will offer choice of both supply and transit for at least 150 million EU citizens
- > Thus, the Nabucco pipeline will offer an important infrastructure link between Europe and the world's largest combined gas reserves: the Caspian countries and the Middle East

Through Nabucco Caspian/Middle Eastern gas could reach some 10 million RWE customers

- > RWE serves some 10 million end customers in Europe with gas
- > RWE's gas downstream position is strongest in the Czech Republic, Germany, Hungary and the UK
- > The Nabucco pipeline project links RWE's downstream positions with the Caspian region and other potential gas resources
- > Nabucco will also support RWE's development activities in Turkey and South East Europe

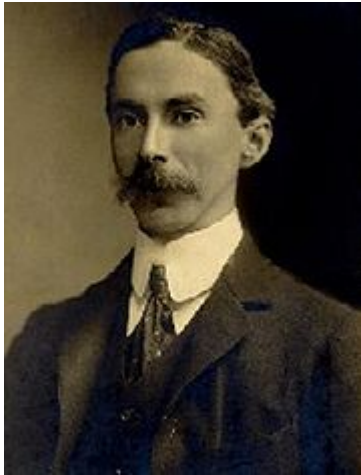


Note: Essent Deal not included

Yes, Nabucco will come!

- > Through the signing of the Prague declaration, the EU and Turkish Government committed to signing the Nabucco **Inter-Governmental Agreement** (“IGA”) **by Summer 2009** – a significant step forward in the realisation of the project. It will provide the legal and regulatory certainty for the building and running of the pipeline – an important requirement for the gas supply countries in the Caspian region and Middle East to begin signing long term gas supply commitments
- > After signing of the IGA the **Open Season** process, involving binding capacity booking, will follow at the end of 2009. The European gas markets are ready for Nabucco: a preliminary market survey undertaken with gas buyers in the summer of 2008 revealed a strong level of interest. Non-binding indications from potential gas buyers far exceeded the planned maximum pipeline capacity of 31 bcm
- > Once the IGA is signed, detailed engineering and environmental work can also begin apace, with the procurement of large construction materials (e.g. steel)
- > Financing discussions are well advanced, and Nabucco has received strong commitments from the EIB, EBRD and other multilateral and export credit agencies. The Final investment decision is expected at the end of 2010
- > Gas is targeted to **start flowing** through Nabucco by 2014. By 2020 at the latest it is anticipated that 31 billion cubic metres of gas per year will be transported via the Nabucco pipeline - stretching from the Eastern border of Turkey to Austria and with access from there to the rest of Western Europe

RWE bears the challenge!



“The greatest challenge to any thinker is stating the problem in a way that will allow a solution.”

Bertrand Russell (18 May 1872 – 2 February 1970)*

* Bertrand Russell, 3rd Earl Russell, was a British philosopher, logician, mathematician, historian, social reformer and pacifist.