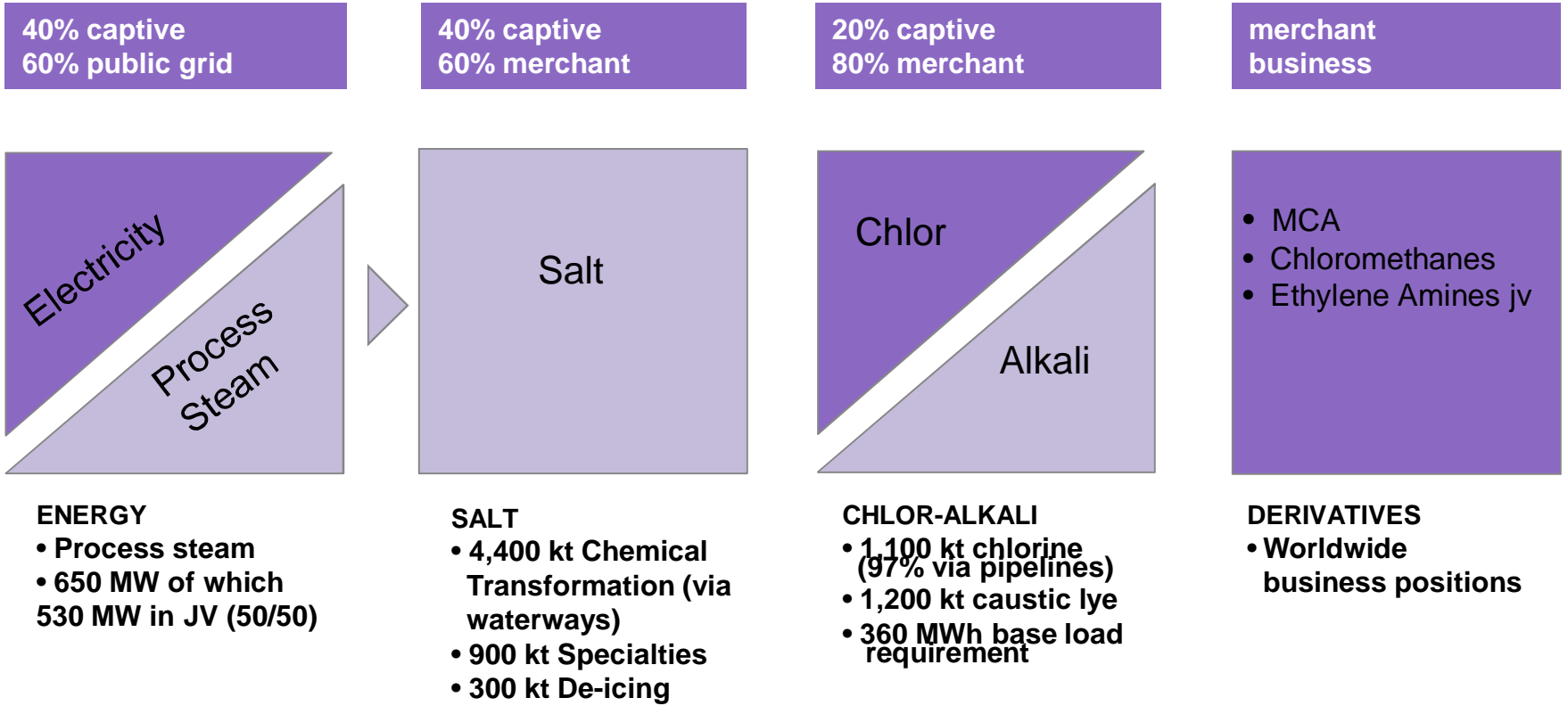




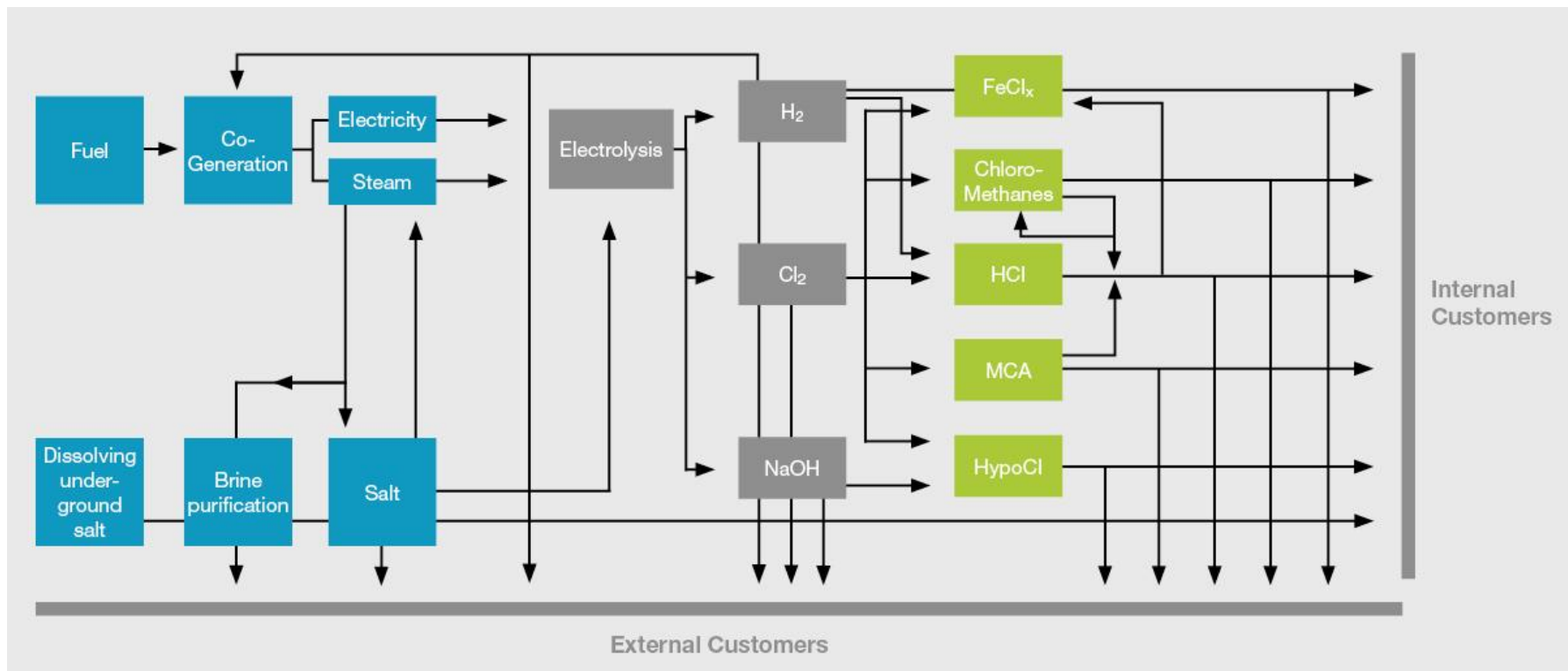
KiviNiria, 4 juni 2012
Martin Risseeuw



Value chain of integrated businesses



Operational Excellence in an Integrated Business Model



“Commodity: beleggingsklasse voor grondstoffen en bulkgoederen.”

- Prijs op basis van vraag en aanbod;
- Standaard specificaties;
- Fysieke levering mogelijk, maar niet noodzakelijk;
- Termijncontracten met leverdatum;
- Contracten zijn FIRM.

➤ Steeds meer beleggers handelen in commodities:

- Gunstig voor risico spreiding: correlatie met aandelen en obligaties is laag.

☐ Agrarische productie

- Graan
- Cacao
- Pinda's....

☐ Metalen:

- Goud
- Zilver
- Koper....

☐ Energie

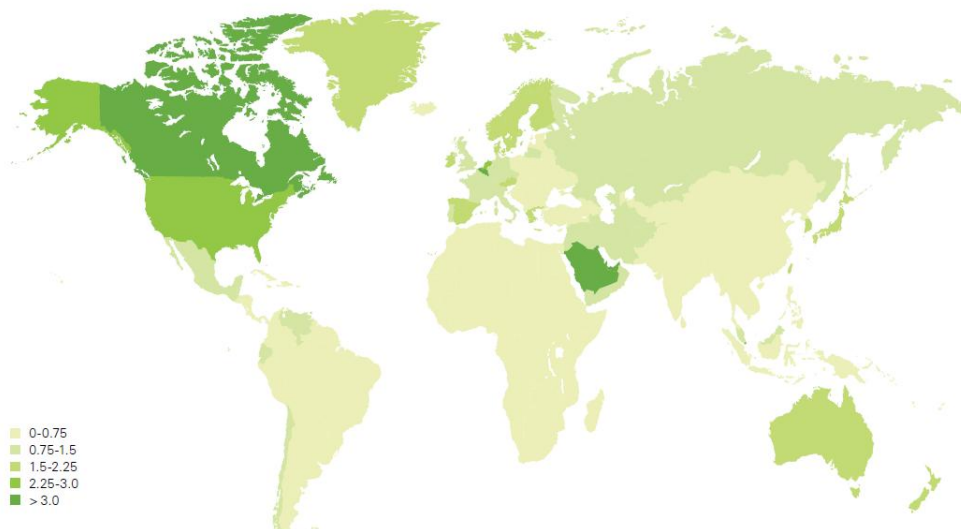
- Olie
- Aardgas
- Steenkool
- Elektriciteit
- CO2



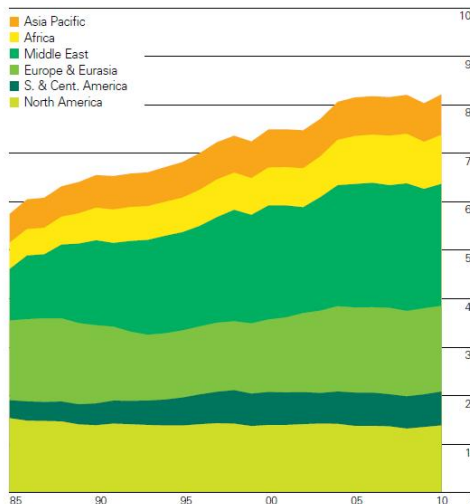
Fuel markets : Oil (Brent)

- Oil is main energy source in the world:
 - Energy
 - Feedstock
- Different qualities
 - Brent
 - WTI (West Texas Intermediate)
 -
- Oil is used as financial investment:
 - Churn > 200

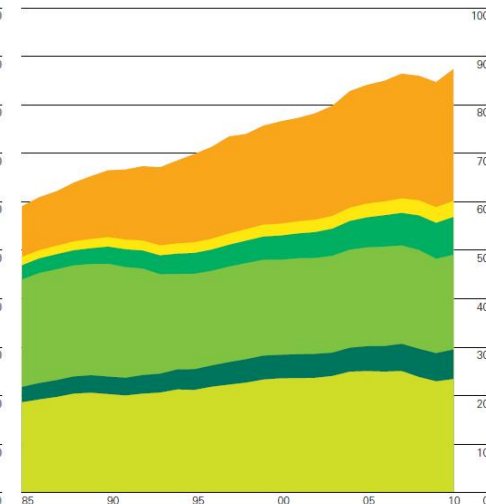
Consumption per capita 2010
Tonnes



Production by region
Million barrels daily



Consumption by region
Million barrels daily



Fuel markets : Coal

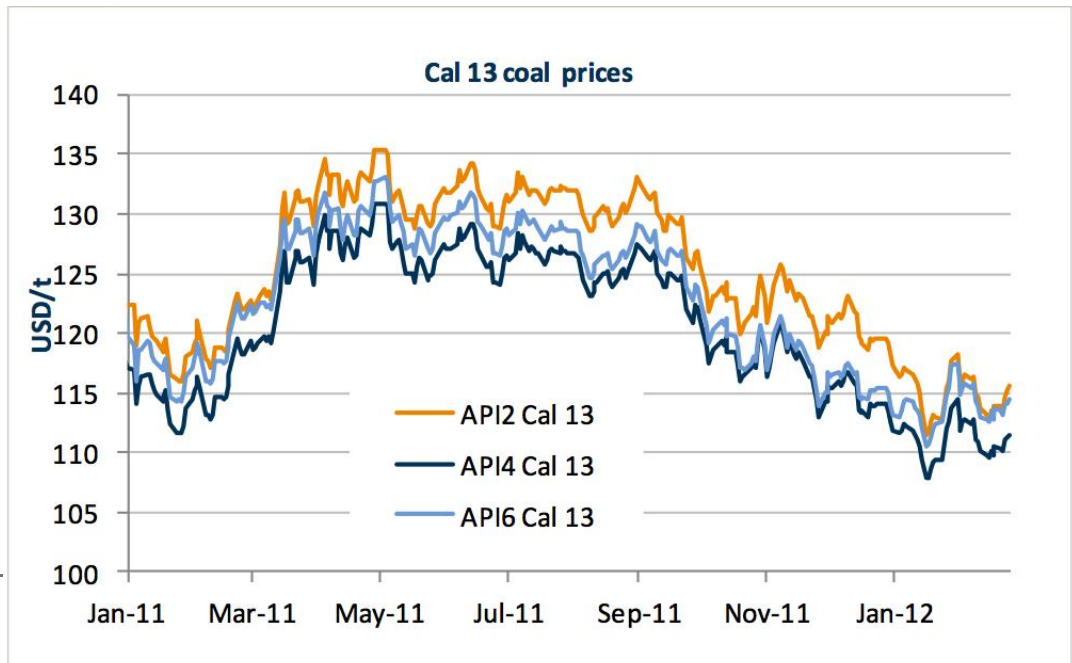


- China fulfills its increasing energy demand mainly with Coal (48% of the global consumption, with a annual growth rate of 10%),
- ...hence despite the poor economic situation in Europe and USA, coal prices are still high.
- China uses only 3% of the global natural gas, but consumption grew by 20% in 2010. Their impact on the gas market is not big at this moment, but rapidly increasing.
- Chinese oil consumption is about 10% of the global demand, with a growth of 10% per year.

Consumption per capita 2010
Tonnes oil equivalent



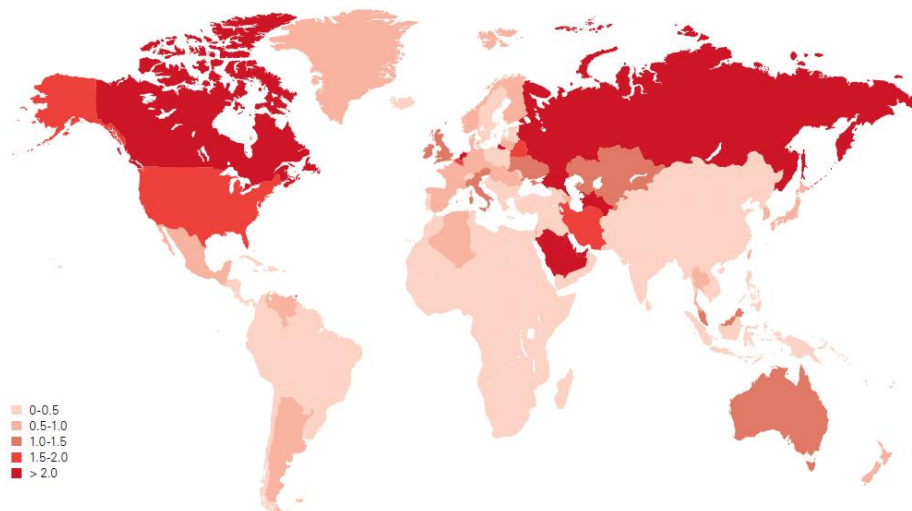
Coal prices – Cal 13



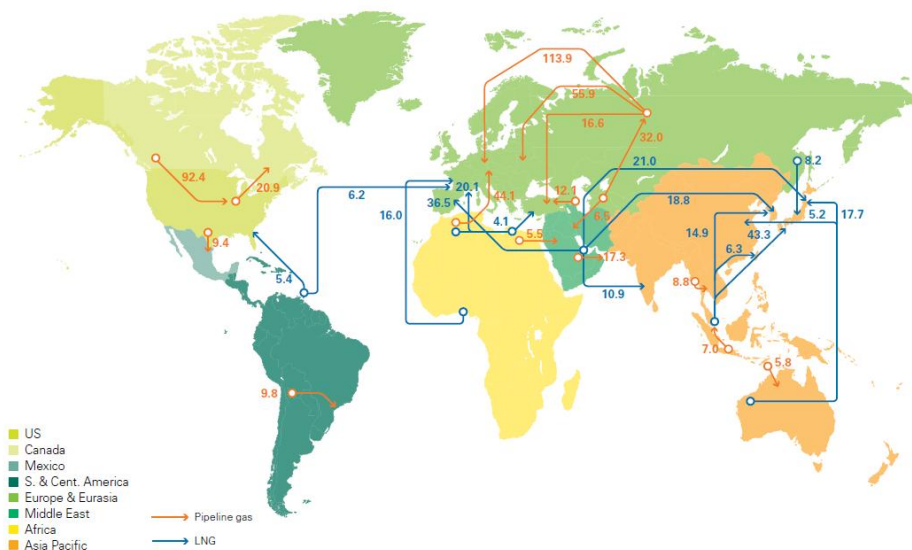
Fuel markets : GAS

- Gas is being traded on hub's, TTF in the Netherlands;
- Title Transfer Facility (TTF) is a virtual market place where GTS offers market parties the opportunity to transfer gas that is already present in the GTS system
- British NBP leading gas hub;
- Markets coupled through pipe lines and LNG terminals;
- Each hub has entry and exit points:
 - Production;
 - Storages;
 - LNG Terminals;
 - Pipelines;
 - Customers.

Consumption per capita 2010
Tonnes oil equivalent



Major trade movements
Trade flows worldwide (billion cubic metres)

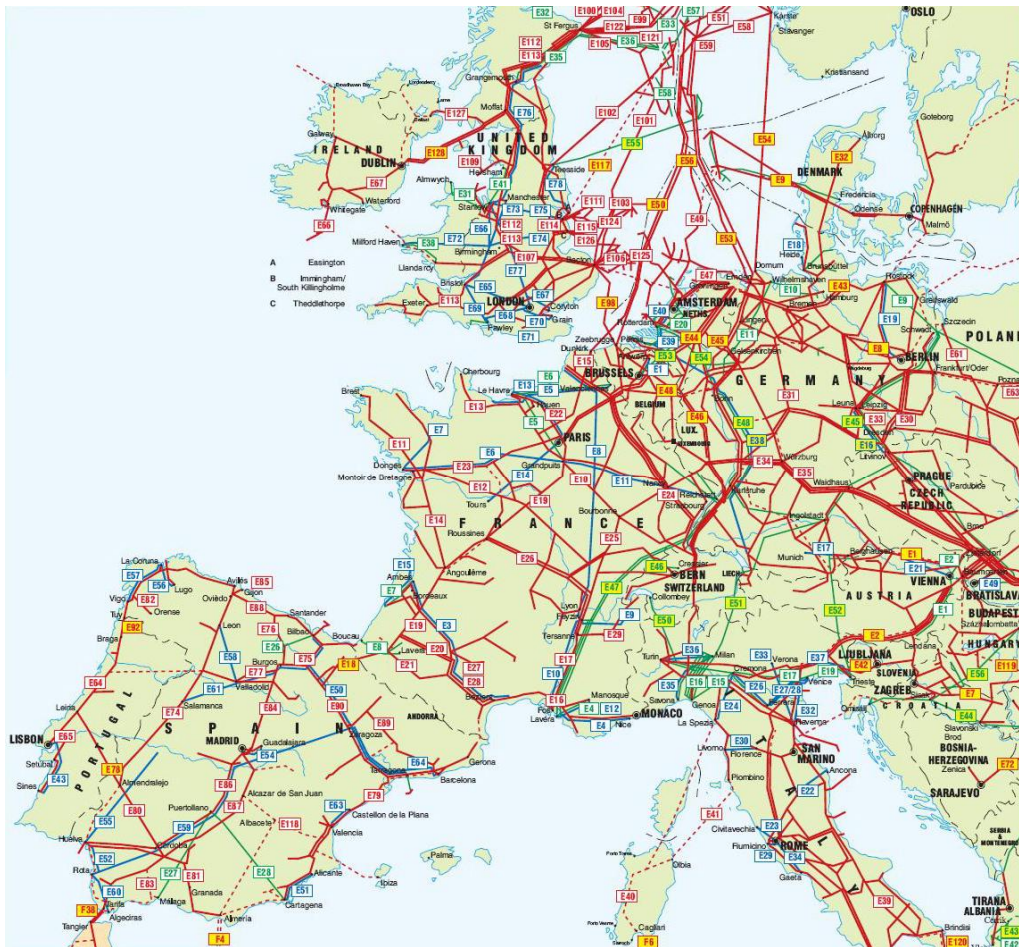


DAILY DATA - WK Tuesday 2012-05-29 / 22 at 6:00am CET

Hub Area	Storage (mcm)	Injection (mcm)	Withdrawal (mcm)	% Full	Trend	Status	DTMTS (mcm)	DTMTI (mcm)	DTMTW (mcm)
Baumgarten	8,430,94	50,63	1,36	49,5882%	▲ 0,2898%	E	17,001,90	162,01	241,64
France	3,841,00	59,00	0,00	30,8291%	▲ 0,4736%	C	12,459,00	125,00	217,00
Germany	12,074,07	76,81	0,00	60,2250%	▲ 0,3831%	E	20,048,28	240,61	444,77
Iberian	1,923,64	6,94	0,00	75,8231%	▲ 0,2735%	E	2,537,01	10,56	19,95
NBP	2,877,00	36,00	0,00	60,4920%	▲ 0,7569%	C	4,756,00	98,32	134,64
PSV	10,130,79	54,02	0,00	64,2246%	▲ 0,3425%	C	15,774,00	133,10	179,00
TTF (Eurohub)	1,358,49	7,70	0,00	69,9170%	▲ 0,3962%	C	1,943,00	17,60	80,00
ZEE	329,44	1,11	0,00	48,4464%	▲ 0,1631%	E	680,00	7,80	16,00
Totals	40,965,36	292,21	1,36	54,48%	▲ 0,39%		75,199,19	795,00	1,333,00



Fuel markets : GAS

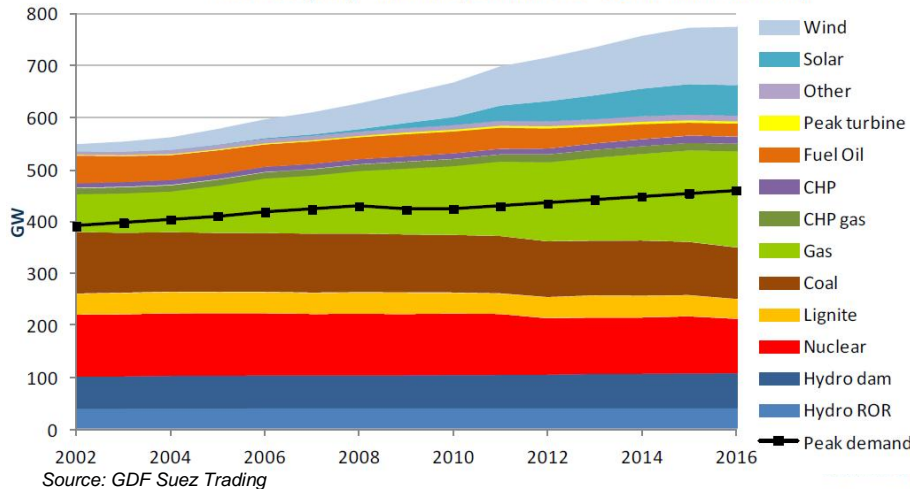


- European import capacity increases,
 - LNG terminals (e.g. Gate terminal Rotterdam);
 - Nord Stream line (coming online 2011-Q4);
 - South Stream line (decision 2012, commercial operation 2016)
- The European reserve margin is now over 10% (was around 1% in 2005).
- Since the introduction of gas trading Hubs like TTF, Gas price has decoupled from Oil price in the last years,
- ...but only to a certain extend. Further on the curve there is still a link.
- European gas market is dominated by three players:
 - Gazprom
 - Qatari
 - Statoil

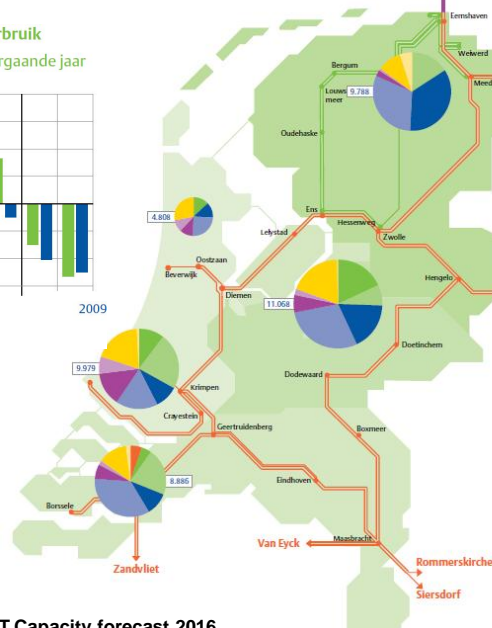
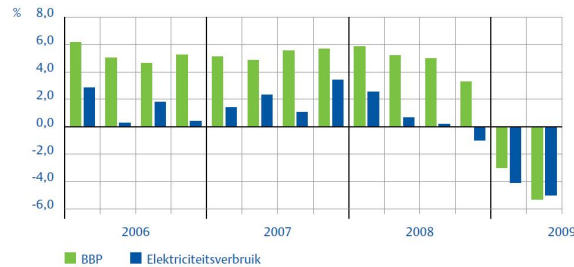


Power Production capacity Netherlands

Installed capacity - Main European countries - 8GW offline in Germany



Gerealiseerde groei van het BBP en het elektriciteitsverbruik
Procentuele wijziging t.o.v. van zelfde kwartaal in het voorgaande jaar



TenneT Capacity forecast 2016



- Before the economic peak in 2008, a lot of investment decisions were taken for new capacity.
- Dutch peak demand will raise from 19 GW (2010) to 22 GW (2016),
- ...while all thermal plants under construction will result in a capacity growth of 8 GW next year.
- It is not foreseen that many older thermal plants will close down in the coming period. It is even expected that life time of older coal plants will be extended due to the current economic situation.
- To meet EU carbon and energy savings targets, the capacity of renewables is expected to increase dramatically as well.
- Peak price will only be made by the gas fired plants in the case there is no wind or solar.
- When there is wind or solar, coal will make the market.

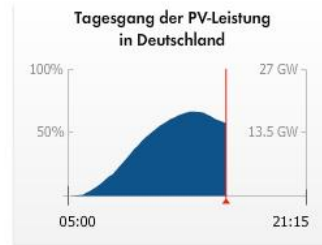
The Dutch power market will face over capacity in the coming years and hence low margins.

Home > Unternehmen > PV Leistung in Deutschland

Das leistet Photovoltaik in Deutschland



Relative Leistung vom 29.05.2012 - 15:57 Uhr



Was leistet PV in Deutschland?

Eine spannende Frage, die Ihnen hier anschaulich und tagesaktuell beantwortet wird. So können Sie hier zu jedem Zeitpunkt die Summe der aktuellen Leistung aller in Deutschland bis zum angegebenen Stichtag installierten PV-Anlagen einsehen.

Durch die zusätzliche Auflösung der Daten nach dem jeweiligen Postleitzahlengebiet haben Sie zudem erstmalig die Möglichkeit, auch einzelne Regionen zu betrachten. Hier wird die regionale

<http://www.sma.de/unternehmen/pv-leistung-in-deutschland.html>



0 GW 27 GW

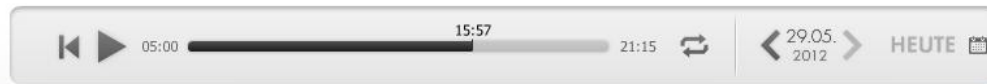
Aktuelle PV Leistung Deutschland*
14.9 GW

*Hochgerechnete Leistung aller lt. Bundesnetzagentur am Stichtag 31.03.2012 installierten PV-Anlagen mit insgesamt 26.63 GW Nennleistung.

Die animierten Grafiken machen deutlich, welchen Beitrag die PV zur Stromerzeugung in Deutschland bereits heute leistet und zeigt, dass Photovoltaikanlagen zu einer Reduzierung der teuren Spitzenleistung zur Mittagszeit beitragen.

[Modellansatz zur Datenberechnung](#)

Zum Vergleich: Der Netto-Stromverbrauch in ganz Deutschland entspricht einer Durchschnittsleistung von rund 60GW (Quelle: AG Energiebilanzen)



Elektriciteitsproductie

Kosten

- Brandstof
 - Gas
 - Kolen
 - Biomassa
- CO₂ emissie rechten
 - Vrije allocatie
 - Kopen in de markt

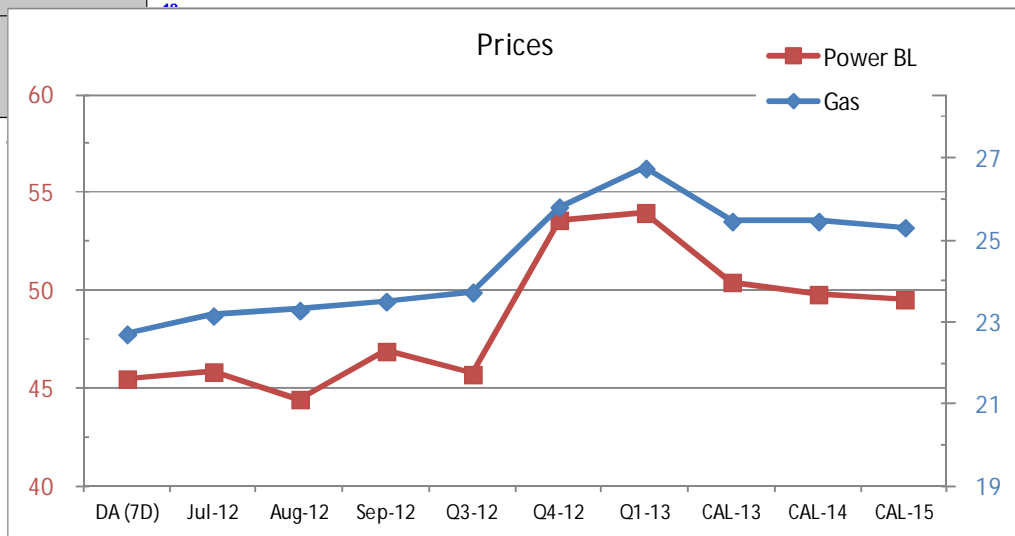
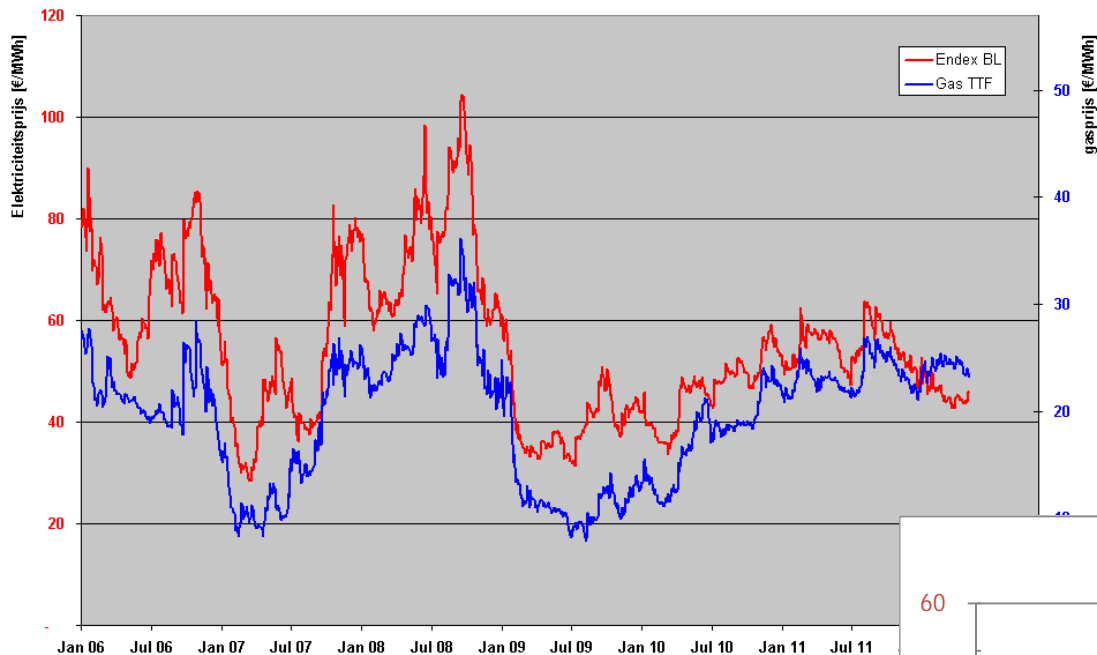
Baten

- Elektriciteit
 - Forward contracten:
 - Jaar, kwartaal, maand
 - Peak / Off Peak
 - Spot
 - APX

Spark Spread = Baten - Kosten

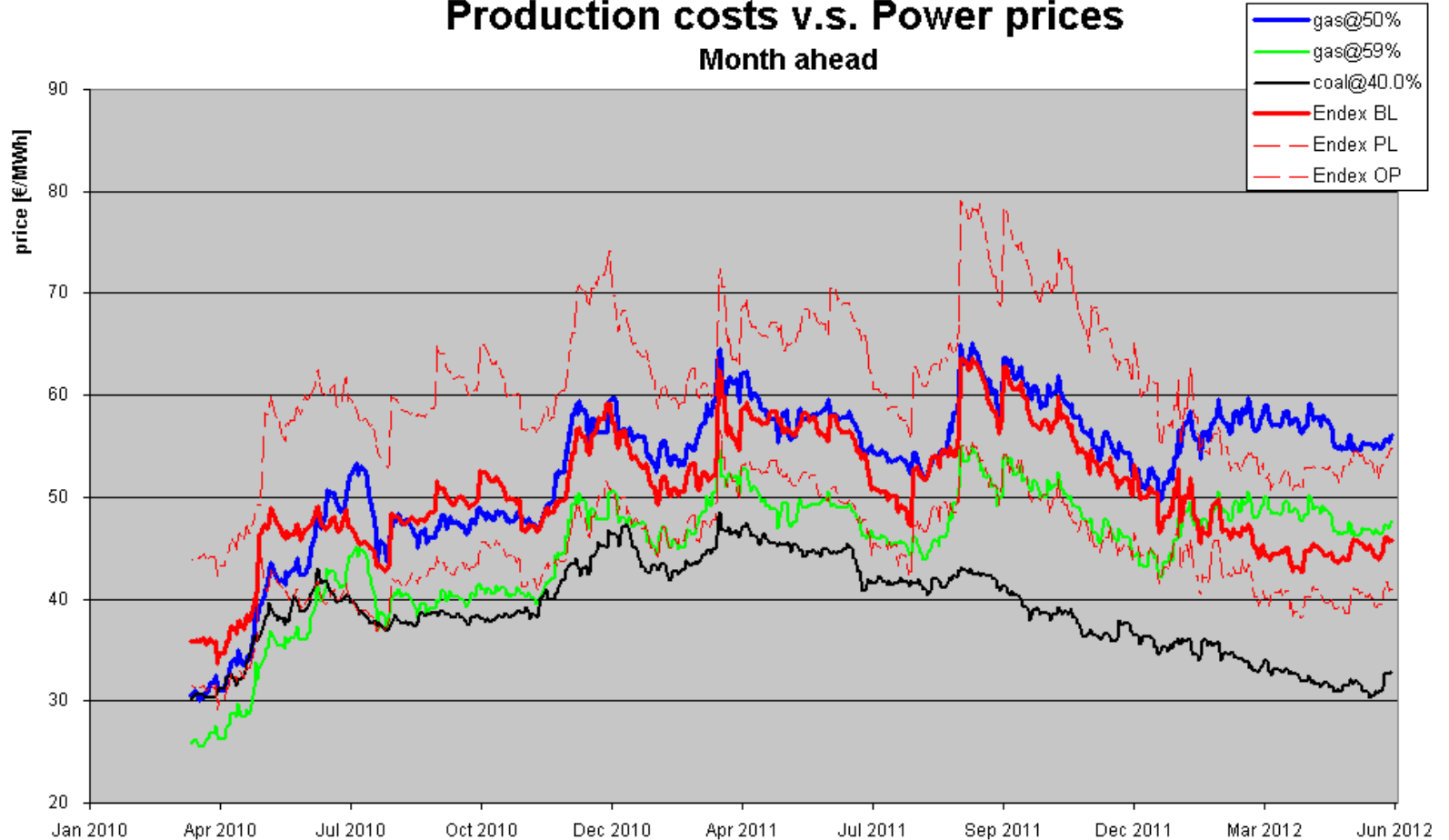


Prijsonthwikkelingen



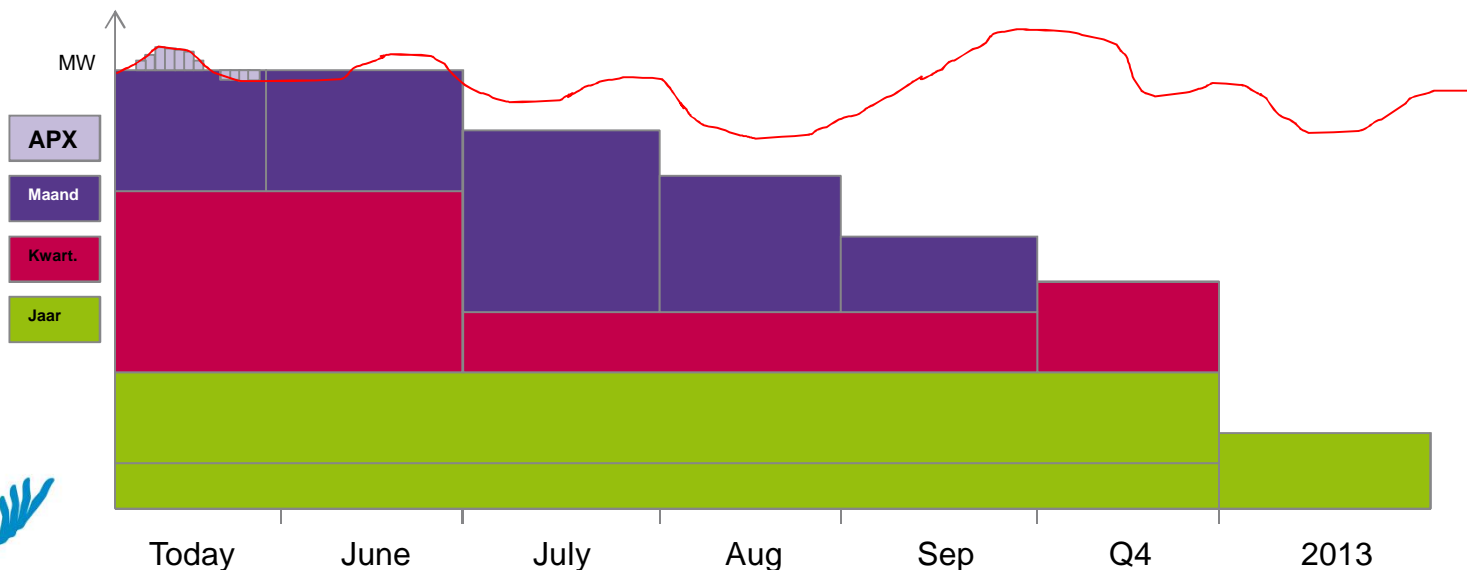
Positie Gas vs Kolen

Production costs v.s. Power prices
Month ahead

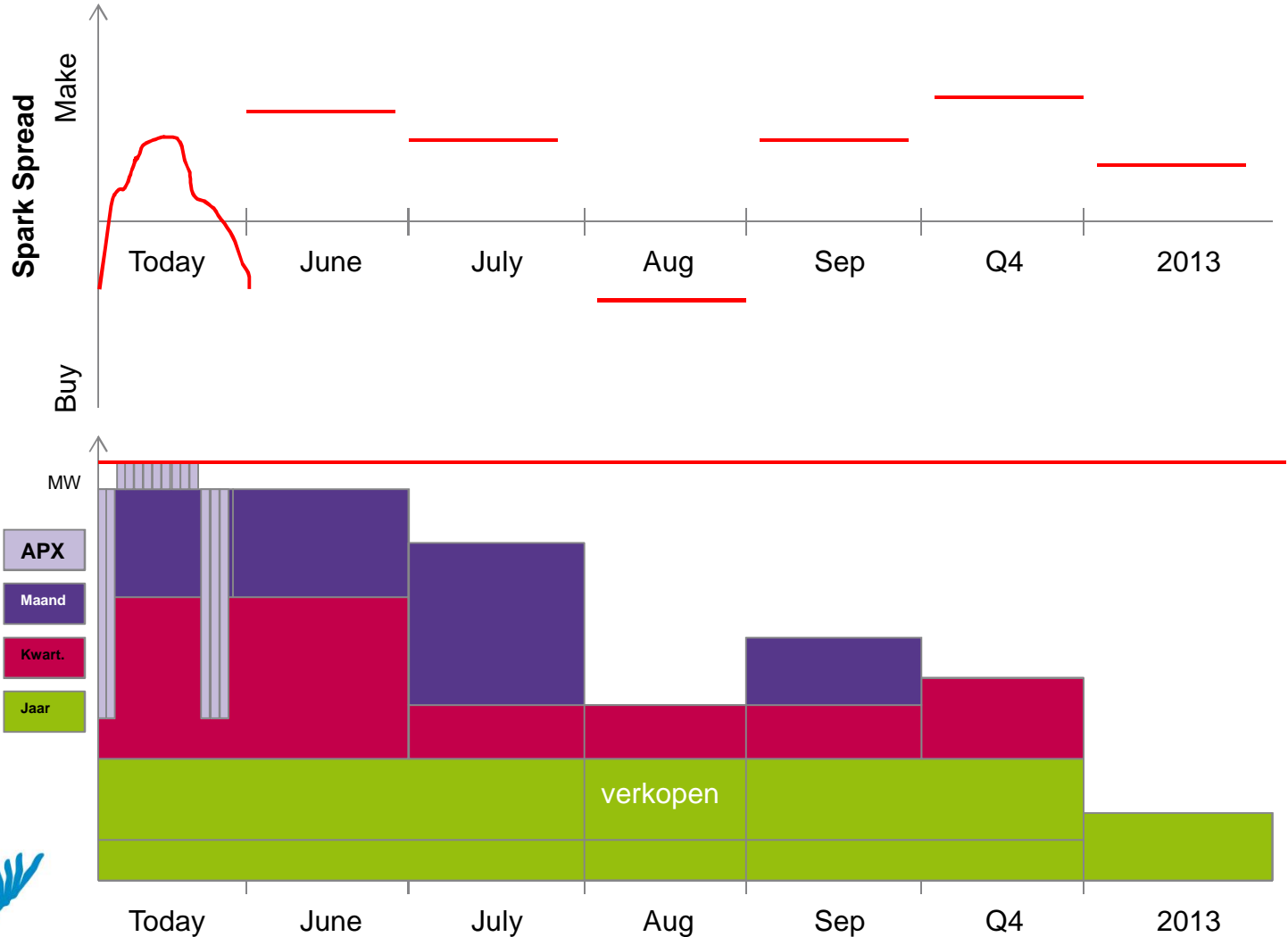


Programma verantwoordelijkheid en balancering

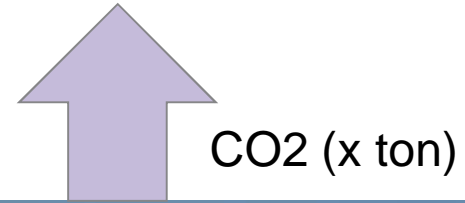
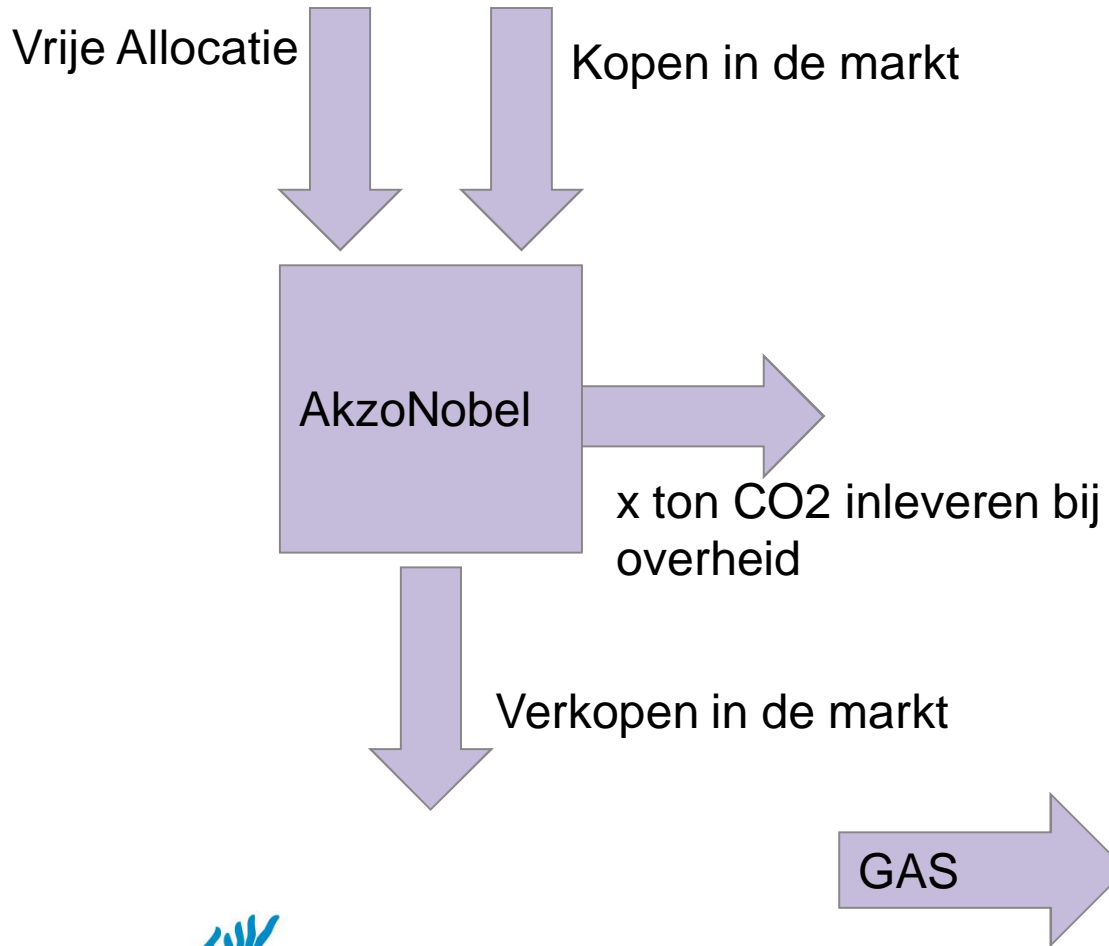
- Alle afspraken zijn FIRM
 - Alle tekorten moeten bijgekocht worden
 - Alle overschotten moeten terugverkocht worden
- Balancering
 - Dag van te voren via APX: per uur
 - Gedurende de dag op 15 minuten basis via onbalansmarkt



Make or Buy beslissingen voor Elektriciteitsproducent

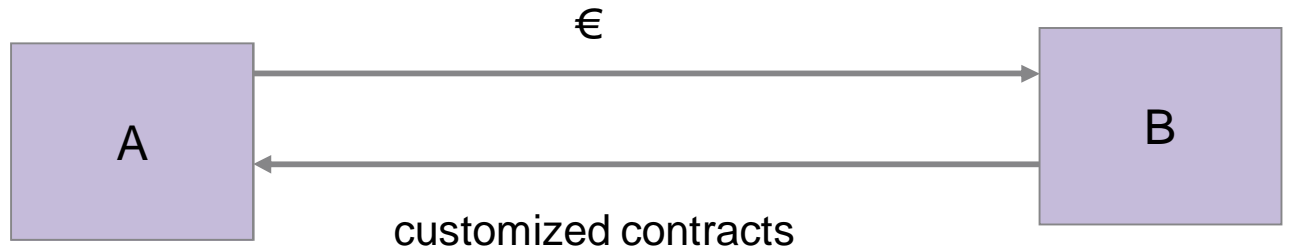


CO2 emissiehandel

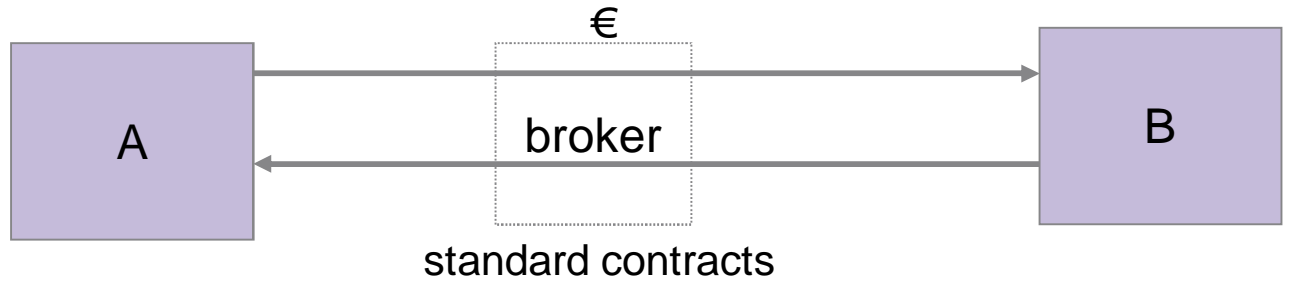


Trading

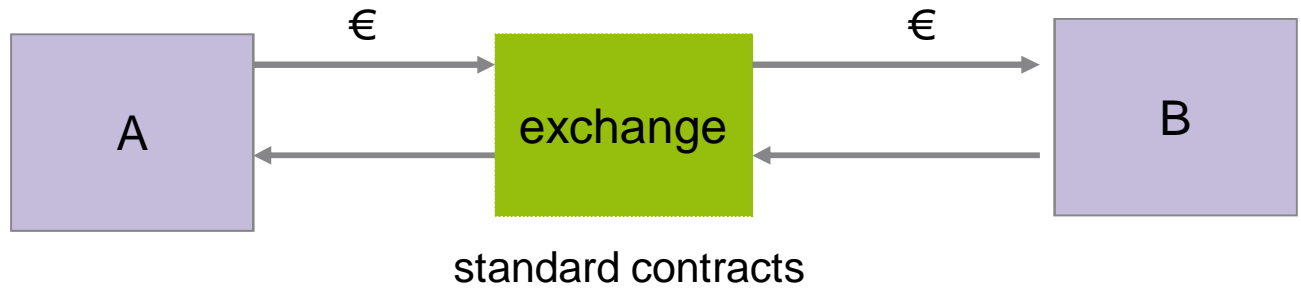
Bilateral



Over The Counter (OTC)



Exchange (clearing house)



<https://www.theice.com/emissions.jhtml>

Products

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OTC

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FREIGHT
ENVIRONMENTAL

Home > Products > Energy: Emissions

EMISSIONS

DELAYED DATA CONTRACT SPECS

PRODUCT	EXCHANGE	MONTH	PRICE (€)	SETTLE (€)	% CHANGE
ECX EUAA	Europe	Dec12	-	6.070	-
ECX ERU	Europe	Dec12	-	3.180	-
ECX CER	Europe	Dec12	3.380	3.380	-
ECX EUA	Europe	Dec12	6.400	6.470	-1.094
ECX CER Daily	Europe	ECX Futures Today	-	3.490	-
ECX EUA Daily	Europe	ECX Futures Today	-	6.690	-

* All prices have a 10 minute delay

SUNDAY 3 JUNE 2012

MARKET RESULTS | CONTACT | HOW TO JOIN

<http://www.endex.nl>



ENDEX resultaten

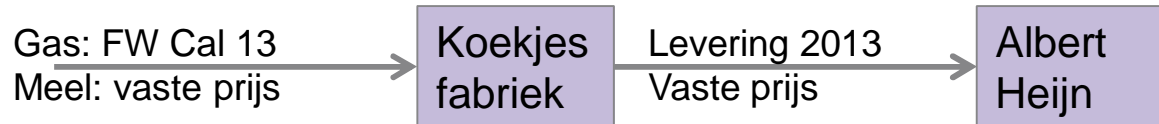
ENDEX Power NL	Base	Peak	16hrs Peak
Wk 24-12	€ 44.88 * +		
Wk 25-12	€ 44.88 * +		
Wk 26-12	€ 44.94 * +		
Wk 27-12	€ 45.06 * +		
Jul-12	€ 45.73 -	€ 54.42 * +	€ 53.11 -
Aug-12	€ 44.31 * -	€ 52.43 * +	€ 51.64 +
Sep-12	€ 46.32 * -	€ 55.61 * +	€ 55.05 +
Oct-12	€ 52.23 * -	€ 63.73 * +	€ 62.47 +
Nov-12	€ 53.99 * -	€ 65.54 * +	€ 62.98 +
Dec-12	€ 53.19 * -	€ 64.82 * +	€ 63.16 +
Q3-12	€ 45.44 -	€ 54.08 * +	€ 53.19 +
Q4-12	€ 53.13 -	€ 64.68 * +	€ 62.85 +
Q1-13	€ 53.93 -	€ 65.45 -	€ 64.15 -
Q2-13	€ 46.28 +	€ 54.60 -	€ 54.54 -
Q3-13	€ 46.98 +	€ 55.90 +	€ 54.98 +
Q4-13	€ 54.38 -	€ 68.10 +	€ 66.05 +
Cal-13	€ 50.38 -	€ 61.00 +	€ 59.94 +
Cal-14	€ 49.90 -	€ 61.05 +	
Cal-15	€ 49.66 -	€ 61.65 +	
Cal-16	€ 51.18 * -	€ 62.12 * -	
Cal-17	€ 54.93 * -	€ 66.35 * -	
BOM Jun-12	€ 44.91 * -	€ 53.58 * -	€ 52.34 * -

Last update: 16:38 - 1st June 2012



Hedges en Swaps om risico's af te dekken

Hedge



Swap

