

# ***Overview of the Gas Market***

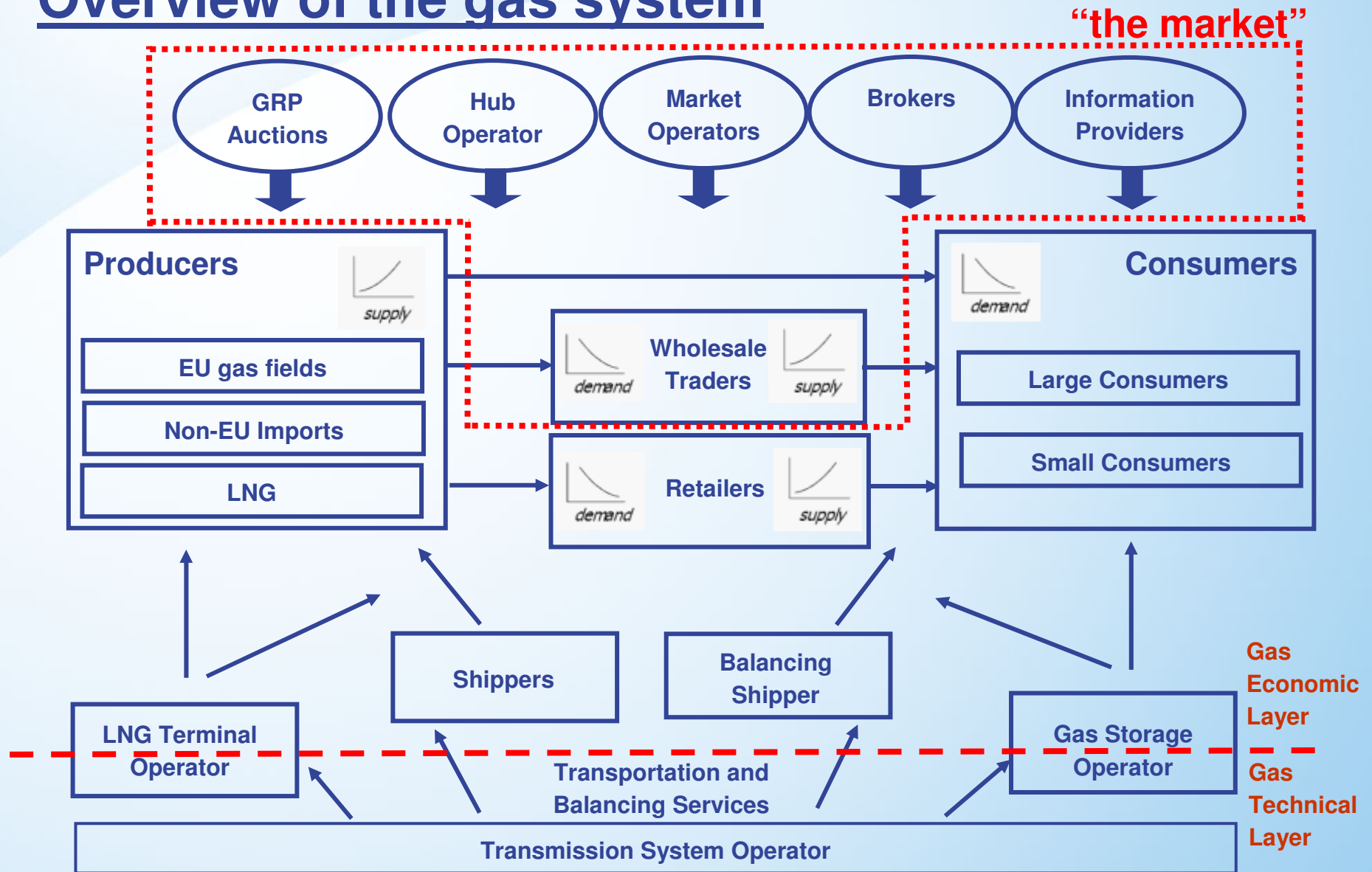
*EU workshop on Wholesale Trading  
organized by EFET, ISDA, FOA*

*Bart Pycke, Head of Trading  
28th of September 2006, 13h-13h45*

# Agenda

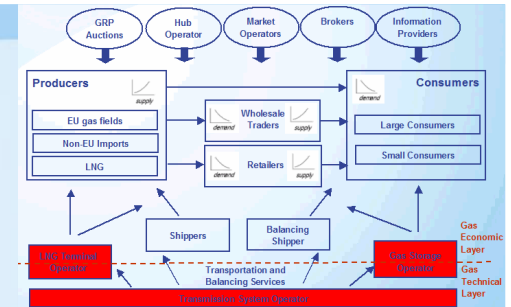
- Overview of the gas system
  - The technical layer
  - The economic layer
  - What is “the market” ?
- Conclusions
- Q&A

# Overview of the gas system



# Gas Infrastructure Layer

*The technical layer of the gas system*



## ■ Industry Association : Gas Infrastructure Europe with 3 divisions

- Gas Transmission Europe
- Gas Storage Europe
- Gas LNG Europe

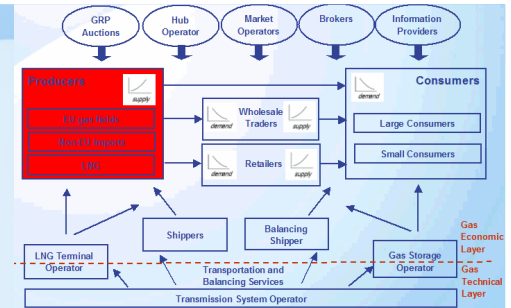


## ■ Key challenges

- Unbundling : the sale of balancing, storage, terminal and transportation services to the players in the economic layer of the gas system on a non-discriminatory basis
- Security of supply: sufficient investment in infrastructure to keep the gas flowing

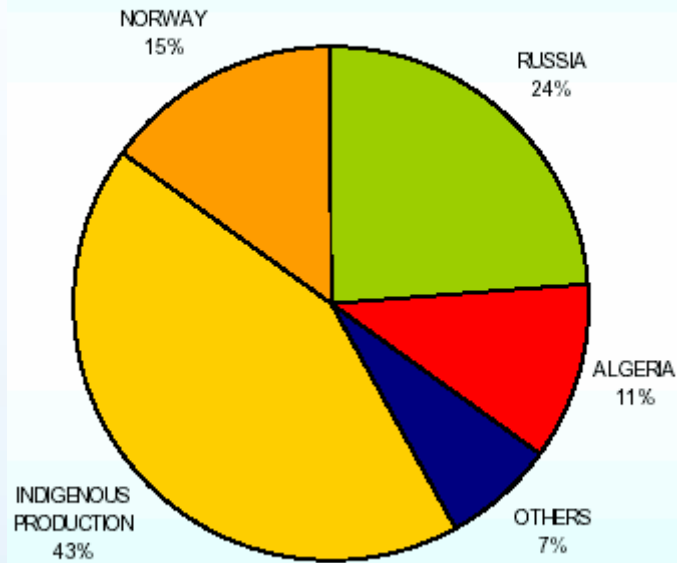
# Gas Producers

*Most gas comes from outside EU*



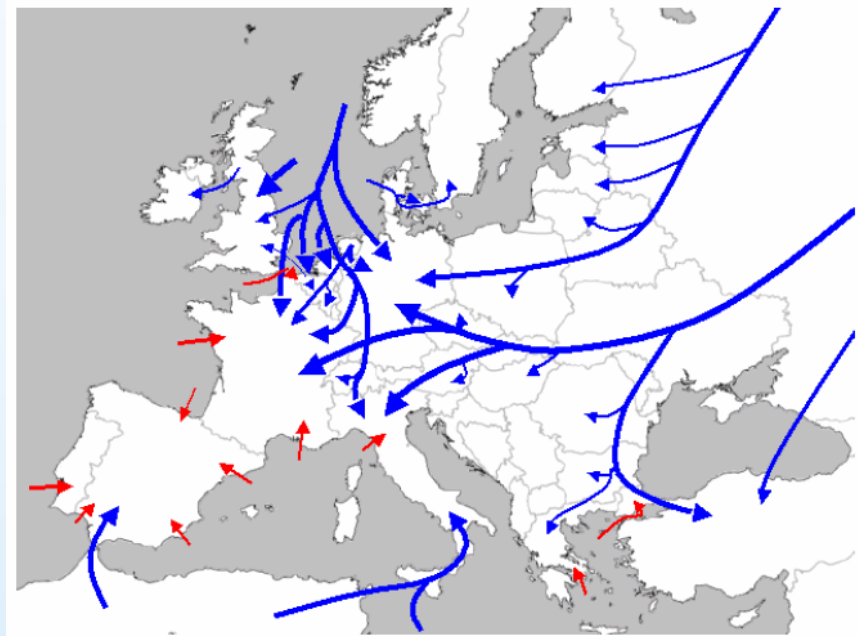
**EU Natural Gas Consumption : 493 Bcm or 4 817 TWh**

**EU25 NATURAL GAS SUPPLIES BY COUNTRY OF ORIGIN (2005)**



Source: Eurogas

**Map 1 Major Gas Flows in Europe, 2005**



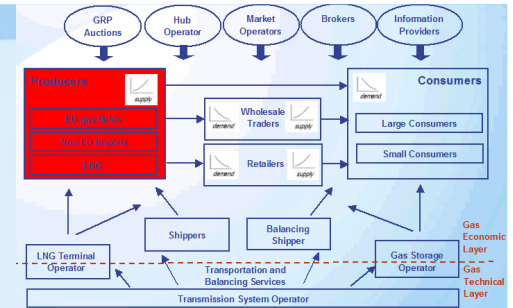
Blue arrows show the sources and destinations of major pipeline gas flows.  
Red arrows show LNG entry points.

Source: Prospex Research

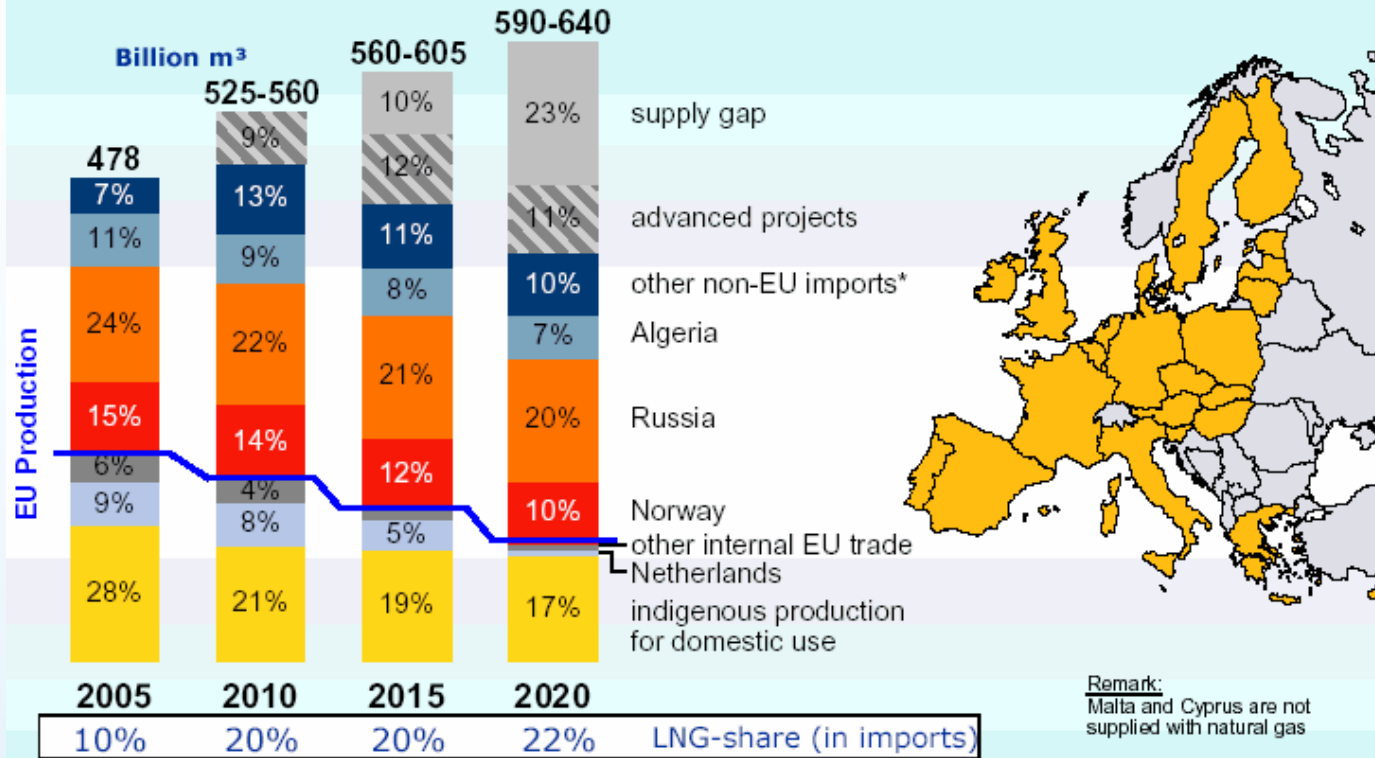
Source: Prospex Research

# Gas Producers

*Increasing dependency in the future*



## Development of Natural Gas Supplies in the EU25



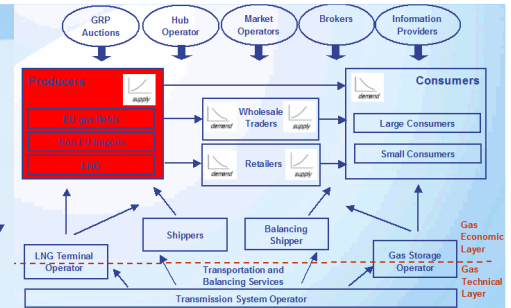
provisional data for 2005  
 \*) of which: Nigeria 3%, Qatar 3%  
 Basis for imports: Contracted volumes and prospective contract prolongations  
 Russia without volumes via North European Gas Pipeline (NEGP) which are included in advanced projects

Source: E.on Ruhrgas

Source: Eurogas

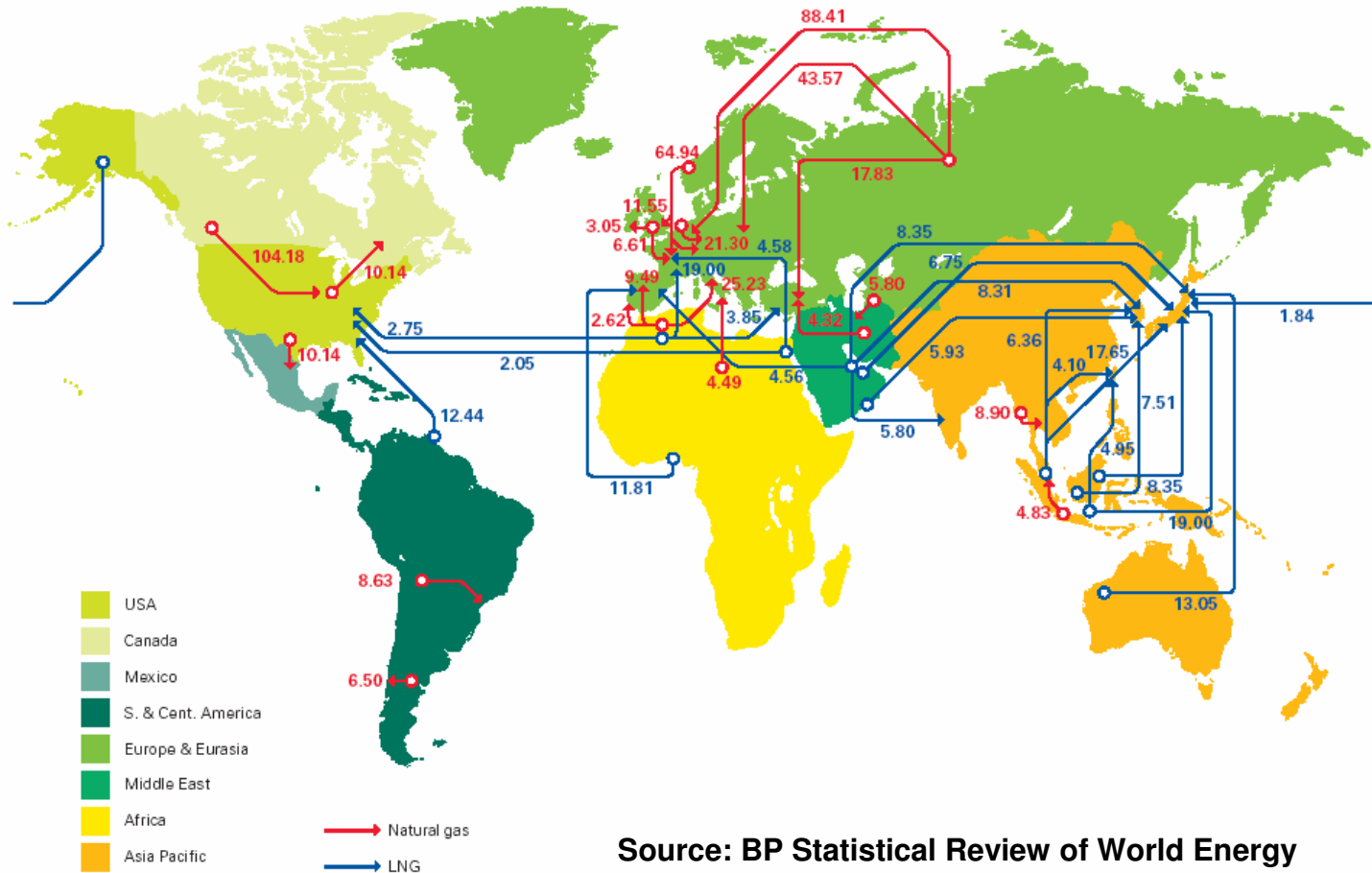
# Gas Producers

*LNG makes gas into a global commodity*



## Major trade movements

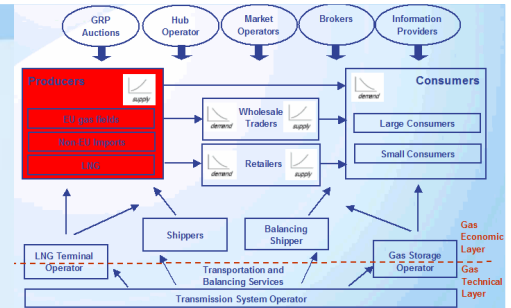
Trade flows worldwide (billion cubic metres)



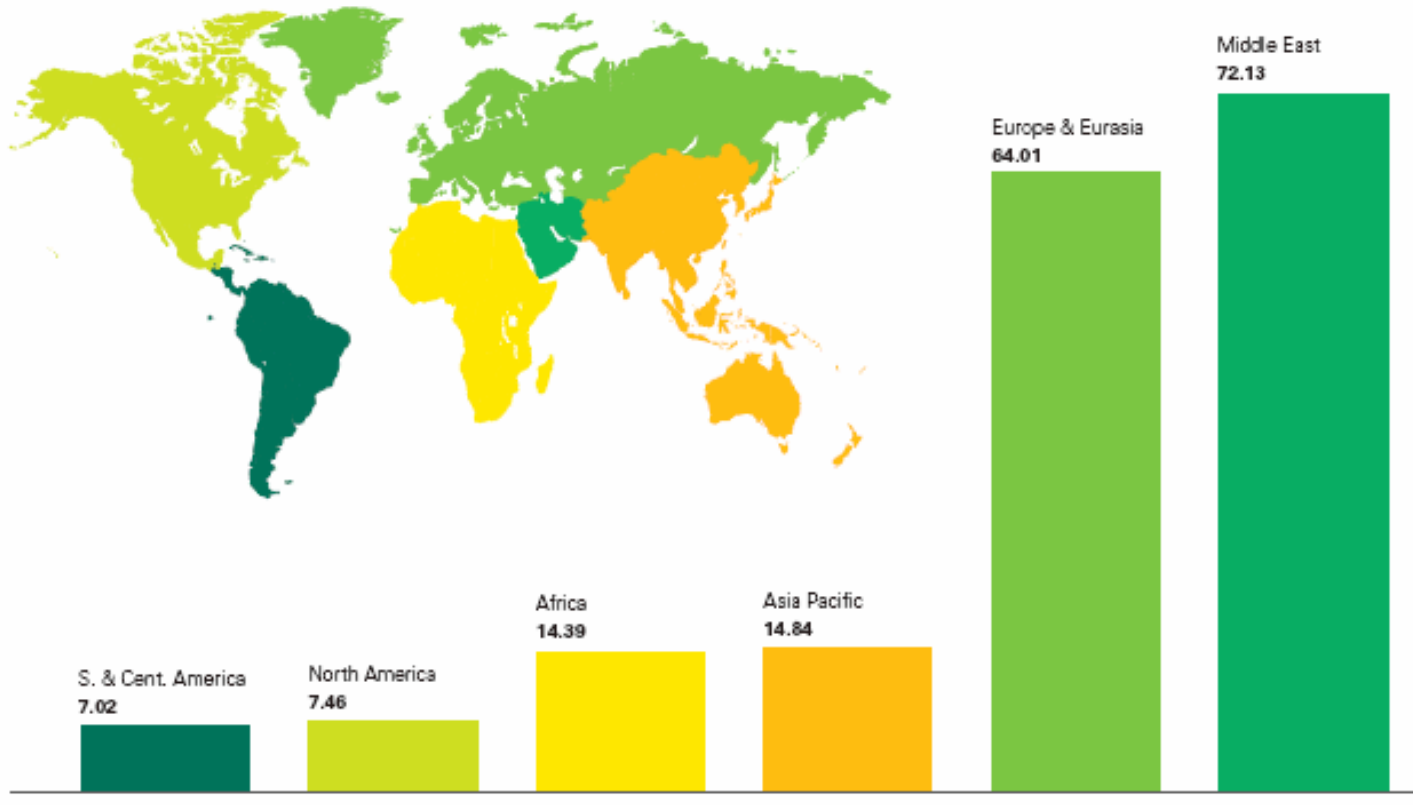
Source: BP Statistical Review of World Energy

# Gas Producers

Most gas reserves in Russia and Middle East



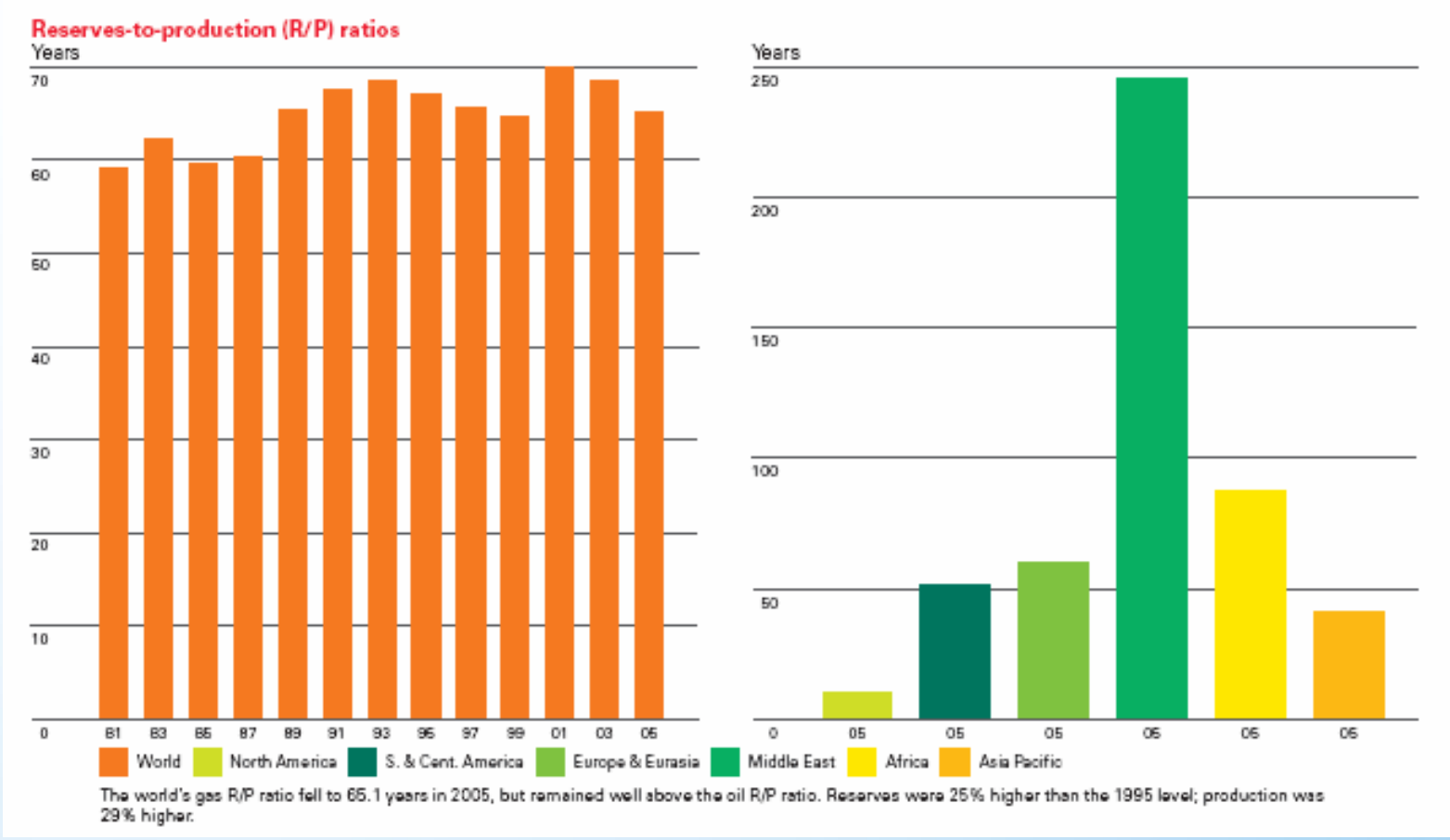
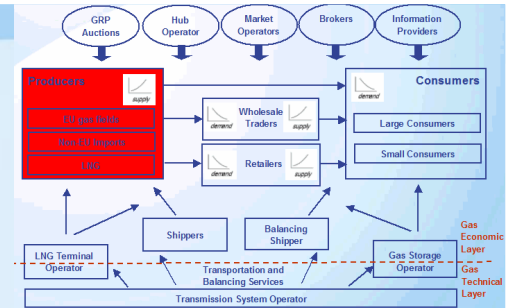
Proved reserves at end 2005  
Trillion cubic metres



Source: BP Statistical Review of World Energy

# Gas Producers

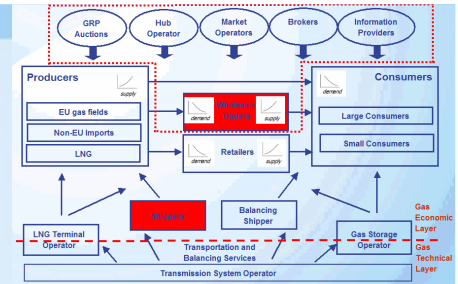
Reserves-to-production ratio estimated at 67 years



Source: BP Statistical Review of World Energy

# Gas Shippers and Traders

## Activities of Electrabel Trading



### UK Market

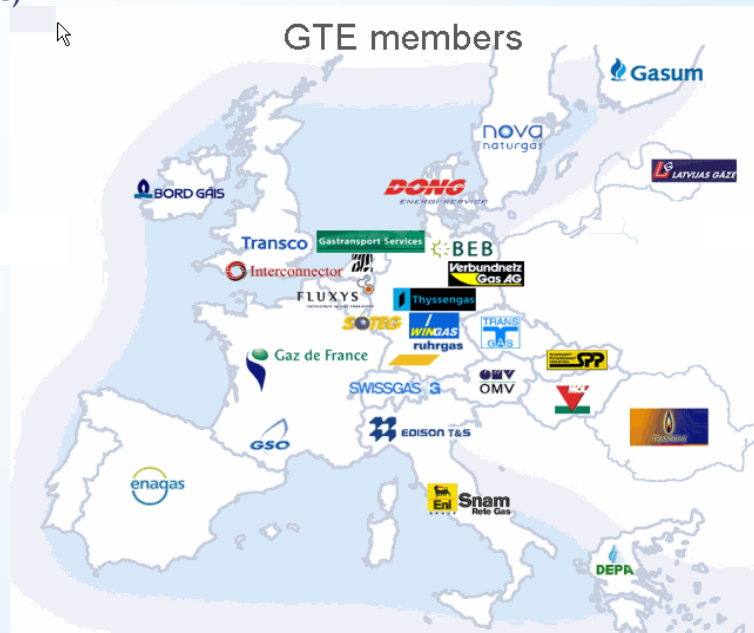
- ❑ OTC Trading on NBP (National Balancing Point)
- ❑ Gas Futures (ICE)

### Belgian Market

- ❑ Zeebrugge Hub Trading
- ❑ Contributor to the ZIG Index (Dow Jones)
- ❑ Wheeling from UK to Germany and Netherlands

### French Market

- ❑ Price discovery on PEG (Point d'Echange de Gaz)
- ❑ GRP Total and GdF



### Dutch Market

- ❑ OTC Trading on TTF (Title Transfer Facility)
- ❑ Procurement and Trading at Emden

### German Market

- ❑ Price discovery on BEB and ERT Hubs
- ❑ Procurement and Trading at Emden and Eynatten

### Italian Market

- ❑ Wheeling from various sources into Italy
- ❑ Balancing on the PSV (Punto di Scambio Virtuale)

# Gas Shippers and Traders

## *Power and Gas Trading Volumes*

**Tendencies in liquidity: Most markets see increased trading activities**

The UK power market is the only one with decreased volumes

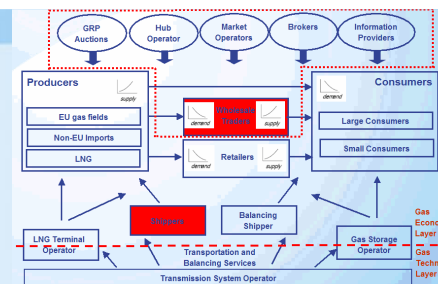
Market	Volumes 2004	Volumes 2005	Change	Tendency
UK Gas [TWh @NBP]	1,991	3,181	+ 60 %	↑
Continental Gas [TWh]	193	458	+ 237 %	↑
UK Power [MWh]	n.a.	872	n.a.	
Continental Power [TWh]	3,714	5,326	+ 43 %	↑
Emissions [EUA = tons CO <sub>2</sub> ]	2,215,000	279,159,000	+ ~ 12,500 %	↑

***Conclusion: The size of the European traded markets has grown to 10,000 TWh or 400 billion EUR*** (Source : RWE)

# Gas shippers and traders

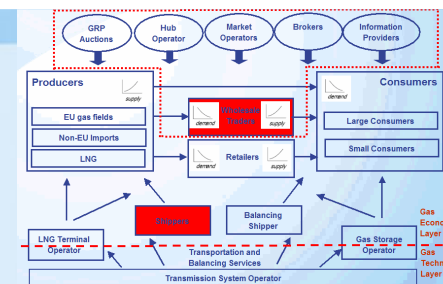
*What does a trader do ?*

- Order execution
- Price Discovery
- Market Making (liquidity providing)
- Cost minimization (block trading)
- Structured products trading (gas swings, indexed supplies...)
- Transportation arbitrage
- Proprietary information



# Gas shippers and traders

## Energy Risk Magazine Yearly Rankings



### UK

#### NBP Prompt

##### Dealers

1	Barclays Capital
2=	BP
2=	Goldman Sachs

##### Brokers

1	ICAP
2	Spectron
3	Prebon

#### NBP curve

##### Dealers

1	Barclays Capital
2	Goldman Sachs
3	RWE

##### Brokers

1	ICAP
2	Spectron
3	Prebon

#### Gas Options

##### Dealers

1	EDF
2	Merrill Lynch
3	Barclays Capital
3=	Goldman Sachs

##### Brokers

1	ICAP
2	Spectron
3	Prebon

### Continent

#### TTF

##### Dealers

1	EDF
2	Electrabel
3	Total

##### Brokers

1	ICAP
2	Spectron
3	Prebon

#### Zeebrugge

##### Dealers

1	EDF
2	Distrigas
3	Centrica (Accord)

##### Brokers

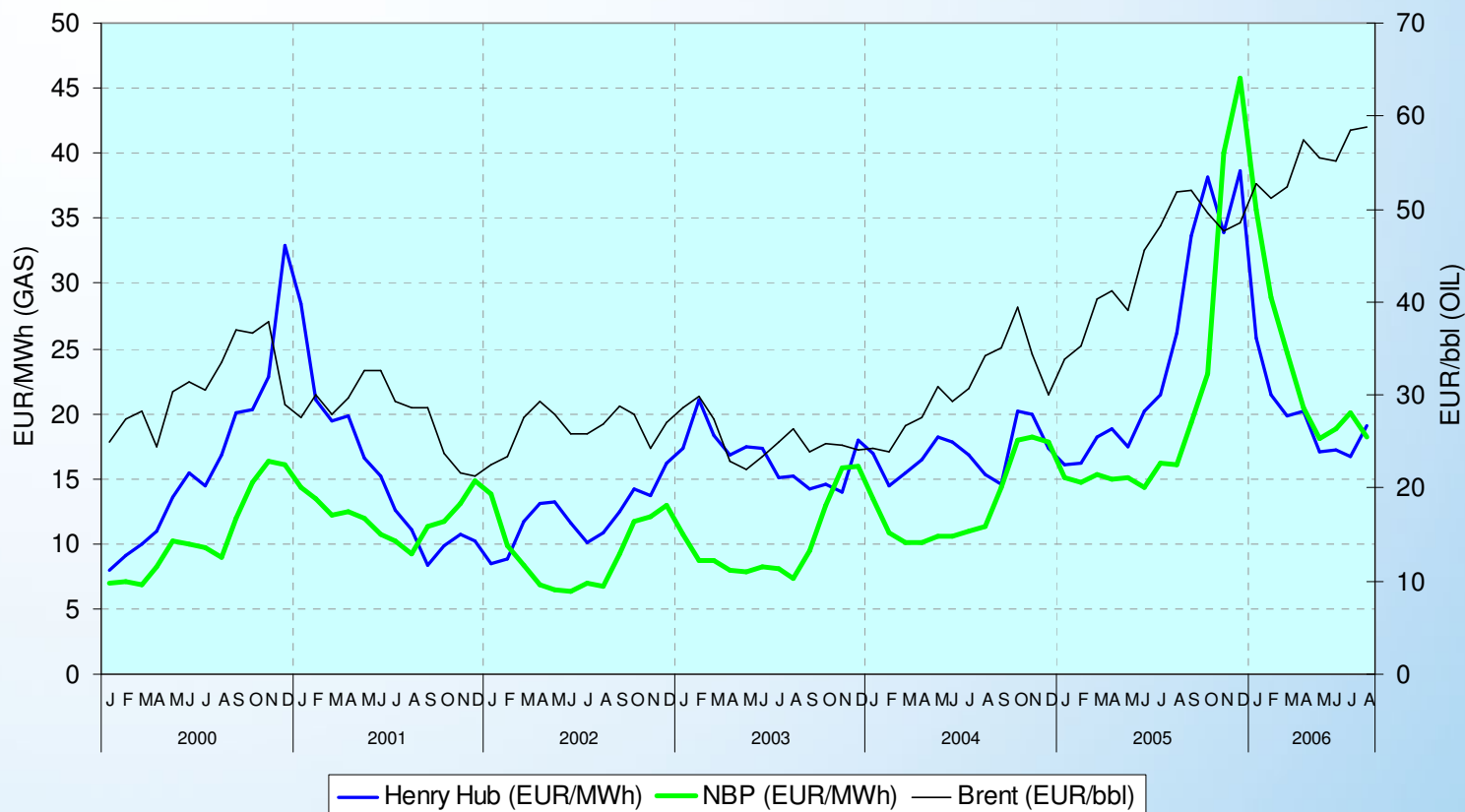
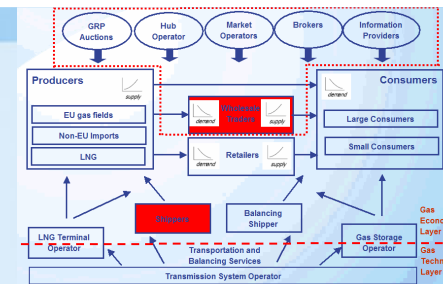
1	ICAP
2	Spectron
3	Prebon



Source : February 2006 issue

# Gas shippers and traders

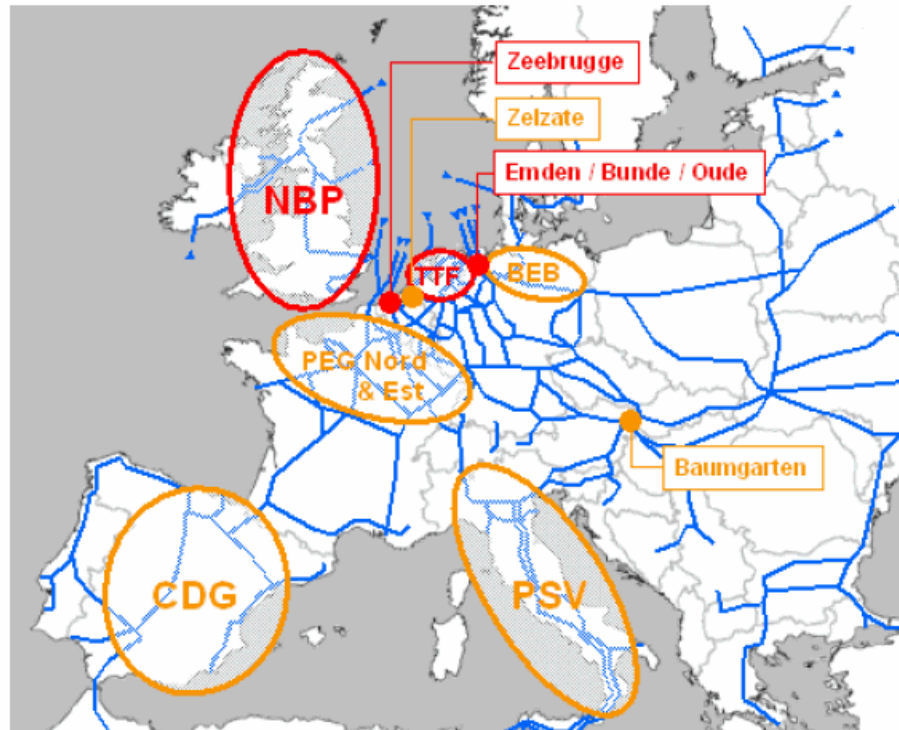
Price of natural gas over past 6 years



# Hubs and Market Operators

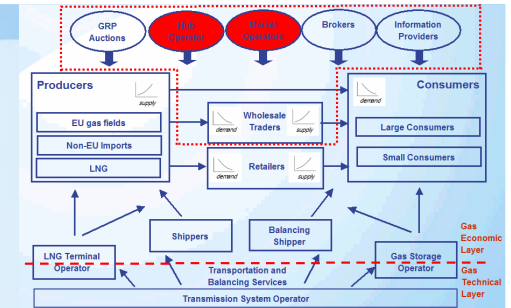
## Gas hubs in Europe

Map 3 European Gas Trading Hubs, 2005



Trading locations shown in red have active, liquid markets. Trading locations shown in amber have sporadic trading.

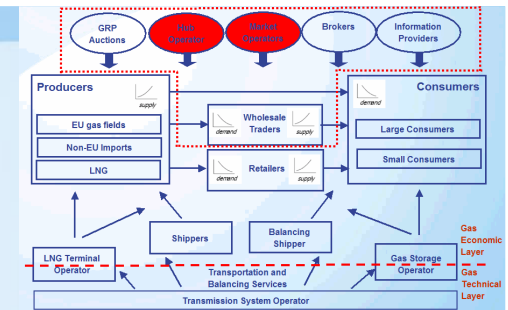
Source: Prospex Research



# Hubs and Market Operators

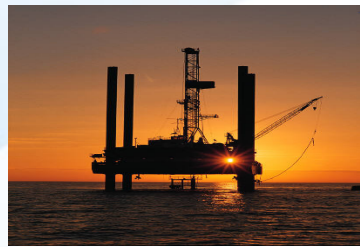
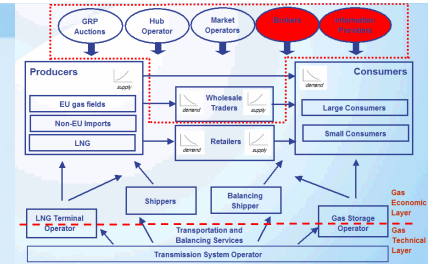
## *What makes a good hub*

- Cheap and efficient title tracking services
- Screens
- Price benchmarks
- An exchange
- Clearing
- Market makers
- Small “basis risk”



# Information Providers and Brokers

The global energy markets



crude



freight



gas pipe capacity



Photo credit: California Energy Commission

crack spread



Photo credit: corbisimages.com

oil products



natural gas



LNG



emission allowances



Photo credit: corbisimages.com

coal



FX



Photo credit: Prof. Cari Lira, Mich. State Univ.

spark spread  
dark spread

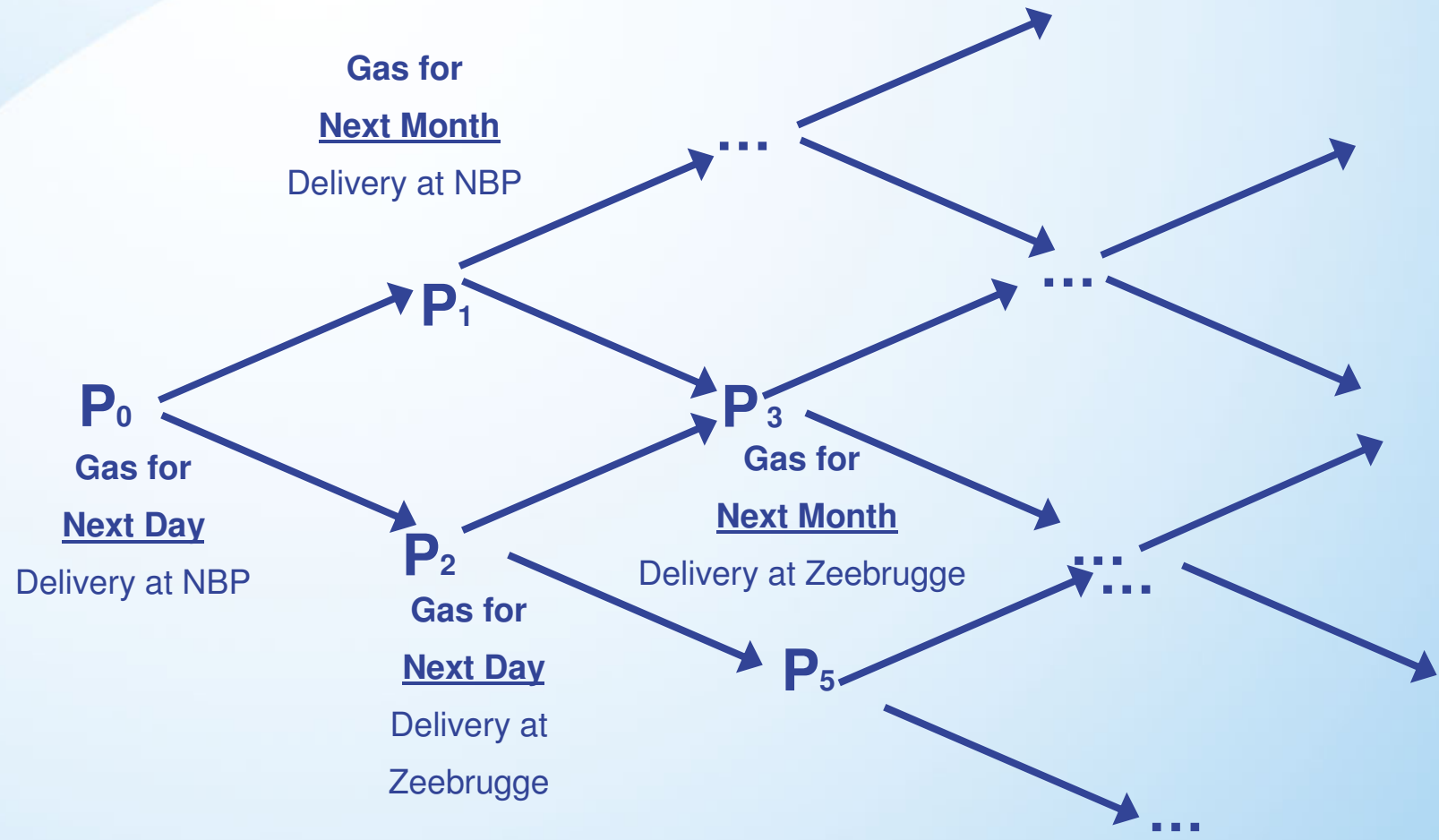
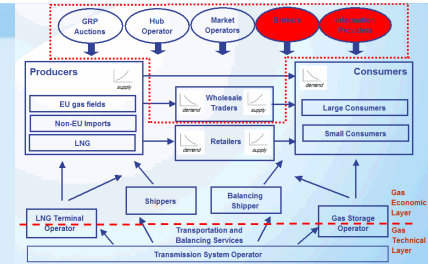


Photo credit: California Energy Commission

cross border capacity

# Information Providers and Brokers

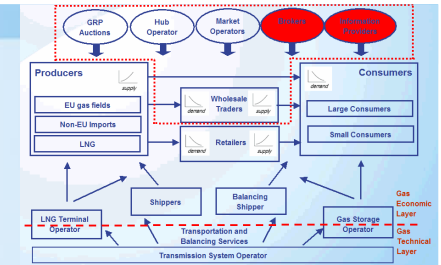
The “web” of gas prices



# Information Providers and Brokers

## Markets reveal information

- Economic organization based on a pricing system in general works better than centralized planning
- The forward price



A standard forward contract is an agreement in which the **buyer** agrees to buy from the **seller** a **fixed quantity** of electricity or gas for a **fixed price** for delivery in the future (**delivery period**), where the terms are initially set so that its present value is zero

Short Term		NBP					
Long Term		Code	Qty	Bid	Ask	Qty	Code
+	WD	ICAP	100	30,75	30,95	250	SPNG
+	DA	ICAP	500	31,05	31,15	100	ICAP
+	BOW	ICAP	100	30,60	30,85	100	SPNG
+	W/END	ICAP	100	29,75	29,90	100	ICAP
+	WK/DY NW	SPNG	50	31,75	31,90	100	SPNG
+	BOM	ICAP	50	31,10	33,00	50	ICAP
+	Oct-06	ICAP	25	41,15	41,275	25	PREB
+	Nov-06	SPNG	50	60,10	60,325	25	PREB
+	Dec-06	ICAP	25	73,80	74,15	25	ICAP
+	Jan-07		25	77,80	78,15	25	SPNG
+	Feb-07	SPNG	25	76,10	76,50	25	ICAP
+	Mar-07	SPNG	25	67,50	67,85	25	ICAP
+	Apr-07	PREB	25	50,85	51,45	25	PREB

100	29,75	29,90	100
50	31,75	31,90	100
50	31,10	33,00	50
25	41,15	41,275	25
50	60,10	60,325	25

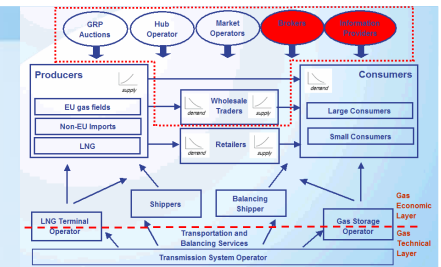
Bid to buy

Offer to sell

# Information Providers and Brokers

## Forward curve

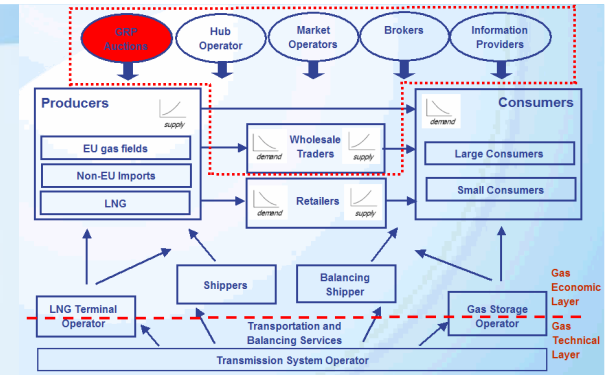
Short Term		+	NBP				
Long Term		Code	Qty	Bid	Ask	Qty	Code
+	WD	ICAP	100	30,75	30,95	250	SPNG
+	DA	ICAP	500	31,05	31,25	150	SPNG
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+	Mar-07	SPNG	25	67,50	67,85	25	ICAP
+	Apr-07	PREB	25	50,85	51,45	25	PREB
+	May-07		25	46,60	47,05	25	ICAP
+	Jun-07	ICAP	25	43,50	43,70	25	ICAP
+	Jul-07	PREB	25	42,50	43,60	25	PREB
+	Aug-07				44,90	25	PREB
+	Sep-07	PREB	25	43,00	44,20	25	PREB
+	Oct-07		25	48,40	50,00	25	ICAP
+	2006 Q4	ICAP	25	58,00			
+	2007 Q1	ICAP	25	73,85	74,90	25	
+	Win 06-07	ICAP	25	65,90	66,25	25	ICAP
+	Sum 07	ICAP	25	45,10	45,40	25	ICAP
+	Win 07-08	SPNG	25	63,20	63,50	25	SPNG
+	Sum 08	PREB	25	43,80	44,35	25	PREB
+	Win 08-09	ICAP	25	55,25	55,75	25	ICAP
+	Sum 09				43,40	25	PREB
+	Win 09-10	PREB	25	52,10	52,75	25	PREB
+	Sum 10						
+	2009 Q2						



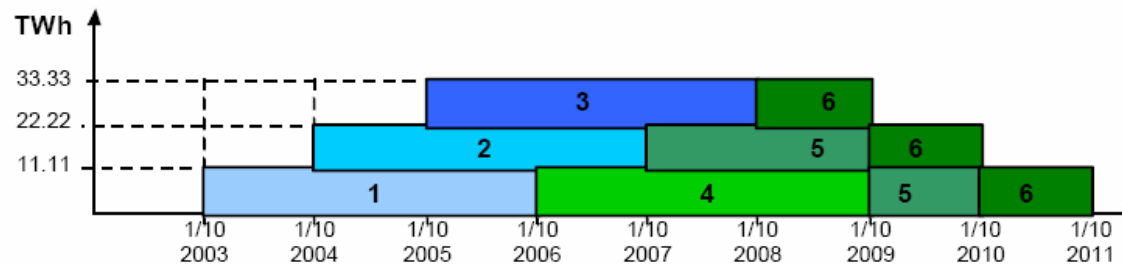
# Gas Release Programs

*Forced dislocations of gas volumes*

For example : E-on Ruhrgas GRP



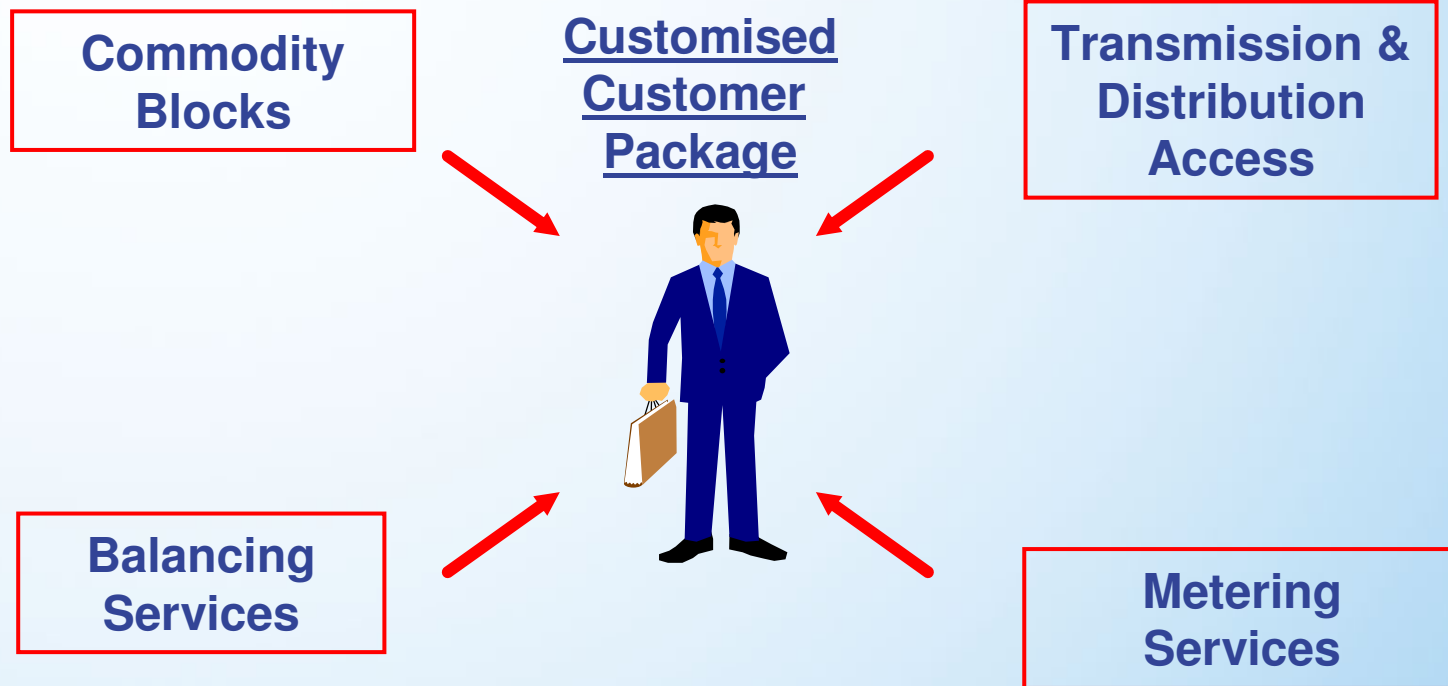
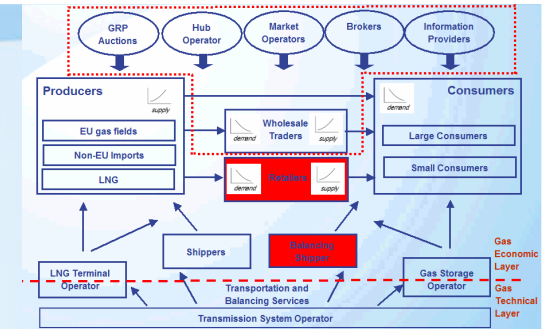
Delivery Profile



- A relatively new regulatory tool to mitigate market power
- Creates opportunities for traders:
  - Entry into a new market
  - Arbitrage with neighbouring markets
  - Establishes a price for block quantities of gas

# Balancing Shippers and Retailers

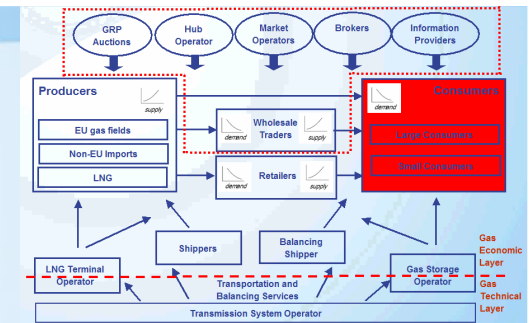
## Packaging of a retail product



# Gas consumers

Choice....at last....

- Why, when I choose to purchase...
  - groceries I can save by using coupons ?
  - travel I can save with a non-refundable ticket ?
  - clothing I can save by waiting for sales ?
  - a mortgage I can save with a variable rate loan ?
  - cable I can save by choosing just basic cable ?
  - I can also just avoid the hassle of savings
- Why wouldn't a consumer be able to purchase electricity and gas in the same way ?



# Conclusions

- The gas system consists of a technical as well as an economic layer
- Security of supply requires investment in the gas infrastructure layer : pipes, storages and LNG terminals
- Increasing dependency on LNG and Russian gas
- Trading is an essential part of the economic layer of the gas system
- Different companies have different reasons to trade
- Wholesale markets are physical in nature
- Customers are free to choose their gas supplier

**You've got the energy.**

**Electrabel** 

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