



Electricity Prices for households in Western Europe

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(IFRI)**

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1 – General trends and comparisons

2 – Price drivers



Foreword on methodology

The survey focuses on the 15 earliest members of the European Union (EU-15). It starts from 1991 and relies on **Eurostat database for domestic consumers**.

A new methodology occurred in **2007 for the Eurostat database**. Interpolations were made for the survey to cover the whole span 1991 – 2010.

The final price includes:

- **Supplied electricity** **Price Excluding Taxes**
including : Generation and Marketing (Energy)
Transmission and Distribution (Grid)
- **Charges** (local taxes, excises...) **Price Excluding VAT**
- **VAT** **Price All Taxes Included (ATI)**

The price is always given by **kWh**, irrespective of the tariff or contract.



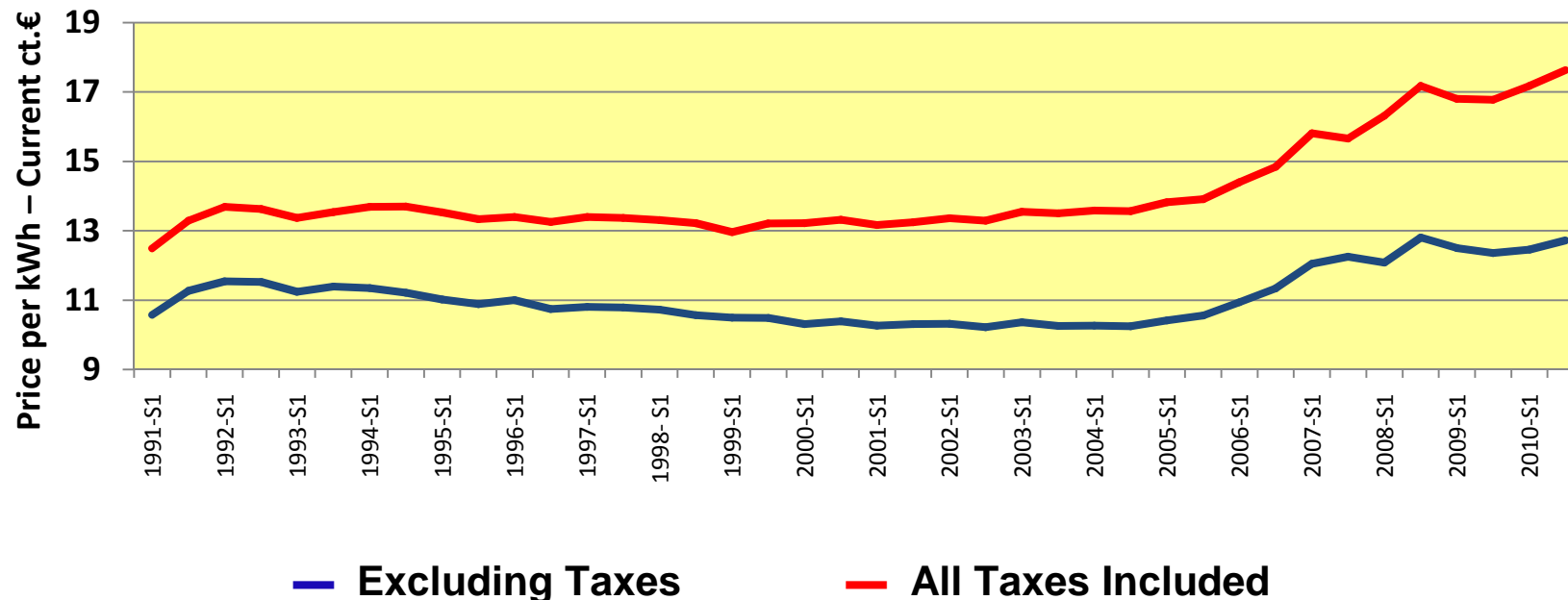
1.1 – Average Price

Two distinct periods can be observed as regards the average price for 1 kWh (All Taxes Included):

- Between 1992 and 2005 it went under minor fluctuations.
- From 2005 on, it increased rapidly (+ 3,8 % p.a. on average).

Moreover, the spread between prices excluding/including taxes has steadily enlarged.

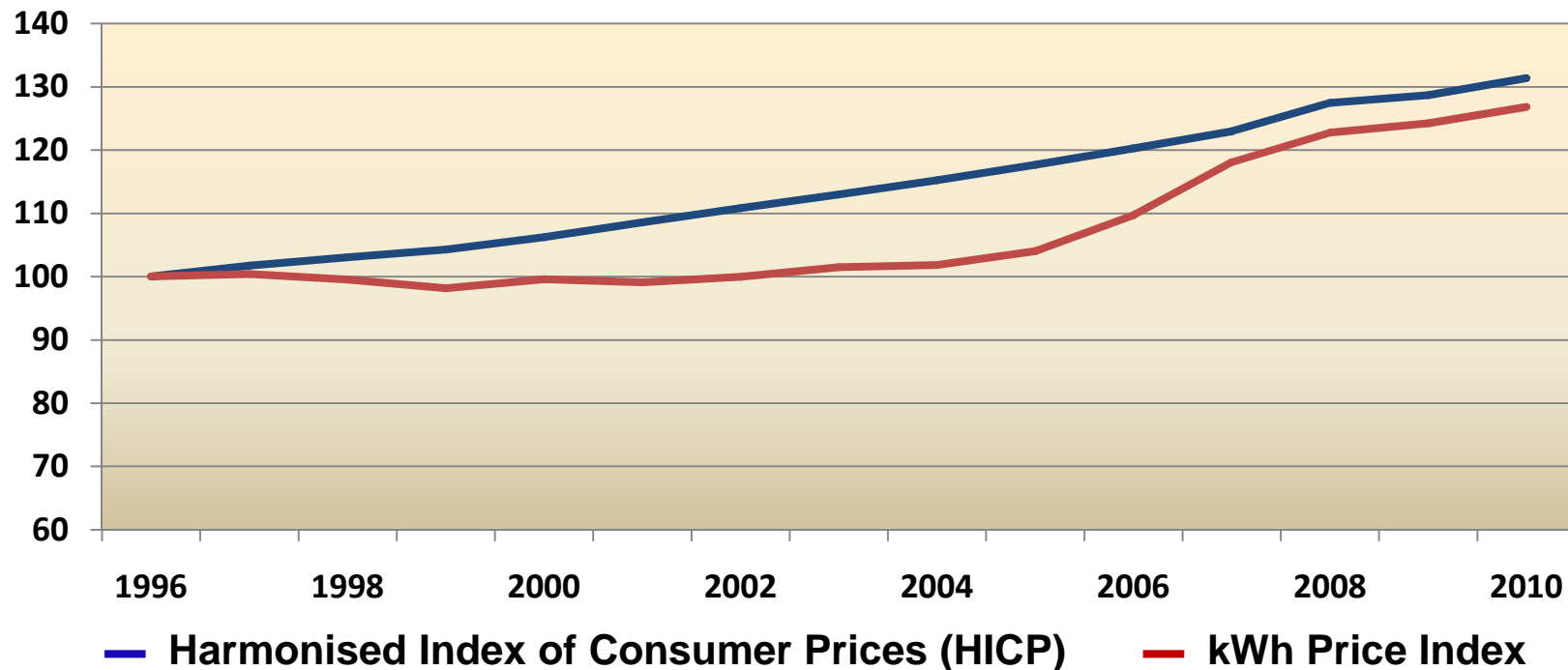
Average price for 1 kWh – Household consumer - EU 15



1.2- Indices

Between 1996 and 2010, the consumer price index increased at an average annual rate of **1,9 %** (EU-15). After a long period of stability, the kWh price index (All Taxes Included) increased sharply between 2005 et 2007 ; since 2008 both indices increase roughly at the same pace (**+ 2,3 %** p.a.).

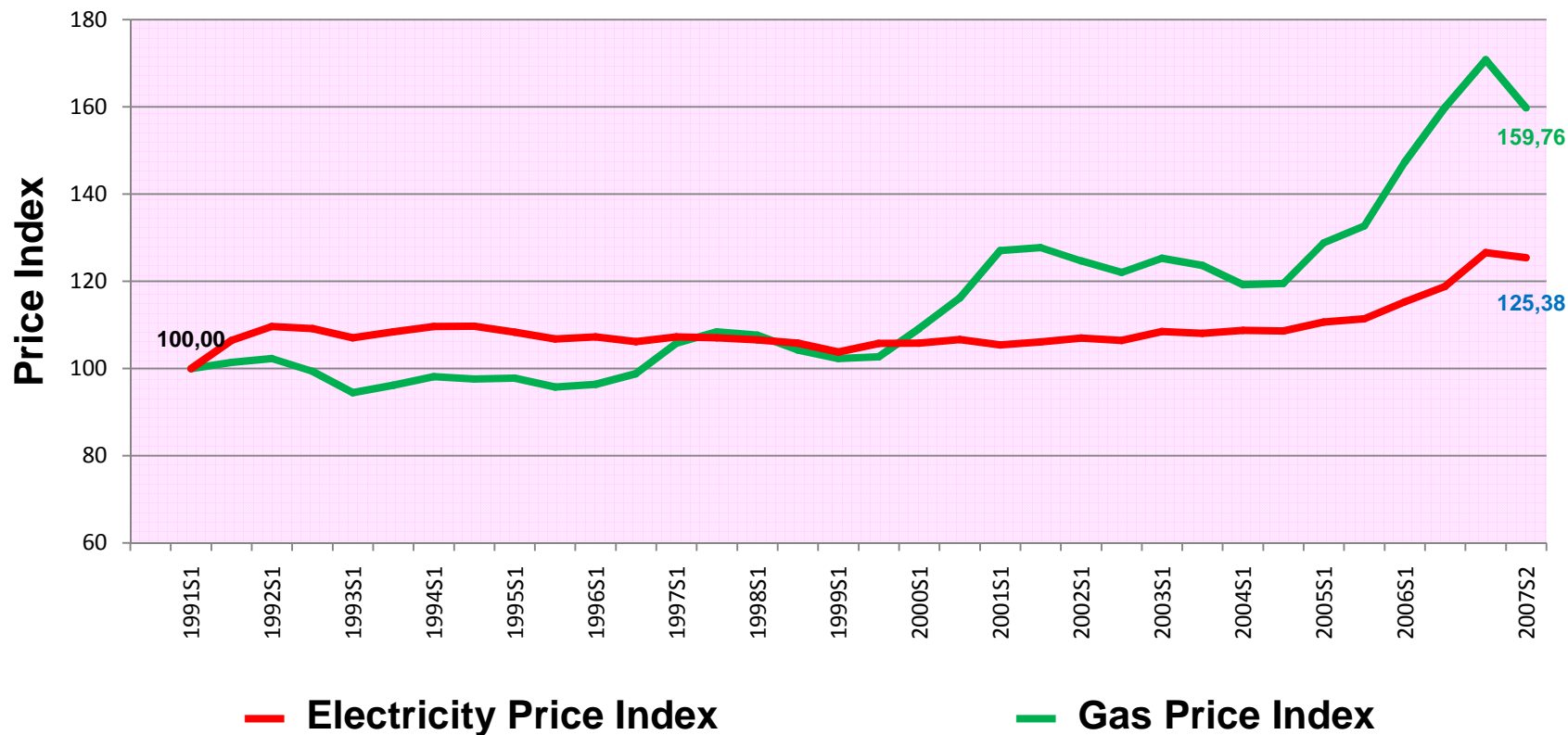
Price indices – Average EU-15



1.3 - Comparison with other energies

Between 1991 and 2007, average gas price for households **increased more rapidly** and was subject to a **higher volatility** than electricity price.

Electricity and gas price indices (All Taxes Included) – EU 15





1.4 – Comparison within EU-15

Large disparities exist among EU 15 Member States as regard electricity prices for households.

Prices All Taxes Included ct. €/kWh 2010 - Semester 2	
Denmark	27,08
Germany	24,38
Belgium	19,74
Sweden	19,58
Austria	19,3
Italy	19,19
Ireland	18,75
Spain	18,51
Luxembourg	17,47
Netherlands	16,96
Portugal	16,66
United Kingdom	14,49
Finland	13,7
France	12,89
Greece	12,11

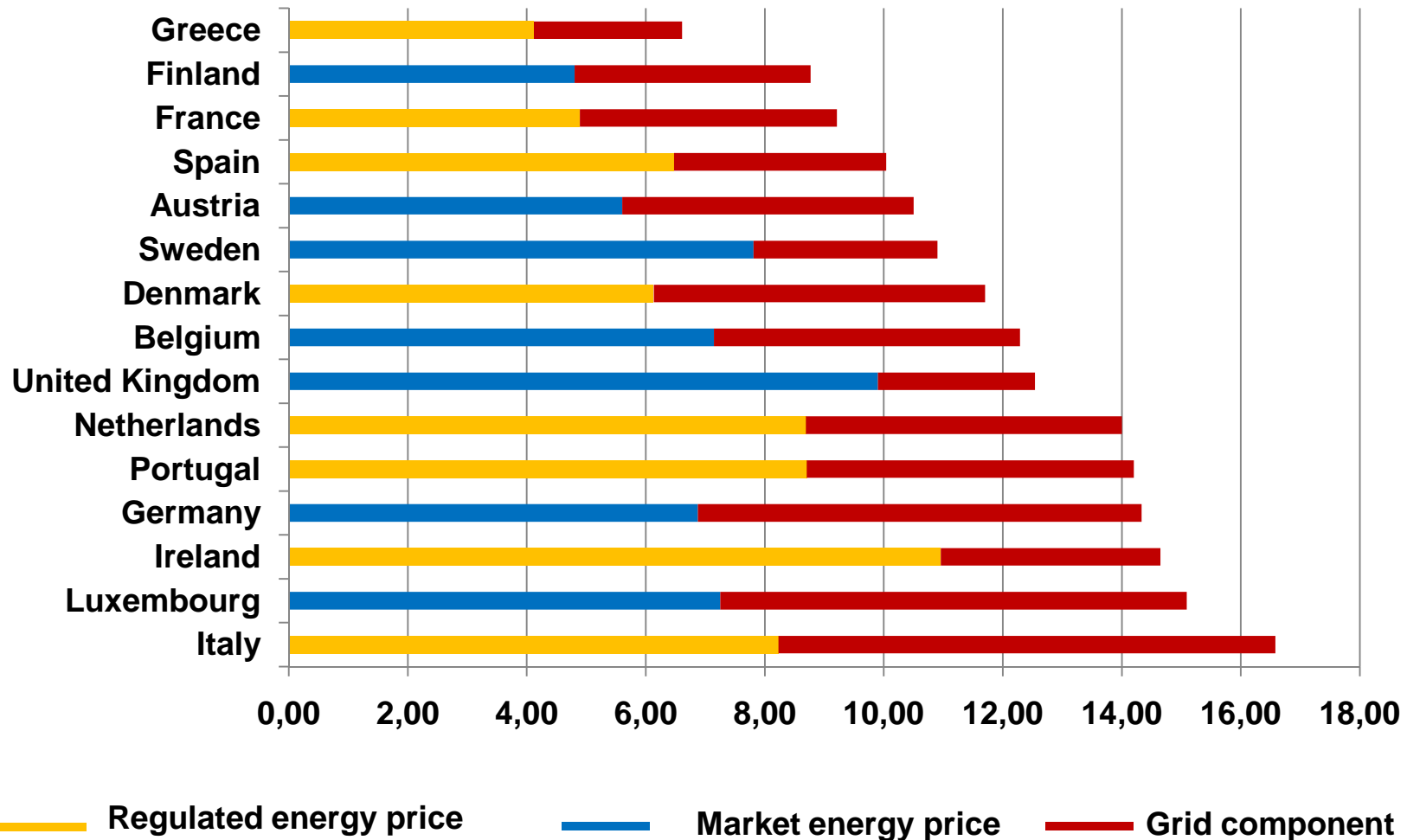
Prices All Taxes Included PPP per kWh 2010 - Semester 2	
Germany	23,11
Portugal	20,27
Spain	19,86
Denmark	19,55
Italy	18,24
Belgium	17,58
Austria	17,45
Ireland	16,73
Netherlands	15,61
Sweden	15,53
Luxembourg	14,71
United Kingdom	14,51
Greece	12,93
Finland	11,52
France	11,29

PPP: Purchasing Power Parity



1.5 – Price Components (Excluding Taxes)

Energy + Grid - ct.€/kWh - 2007



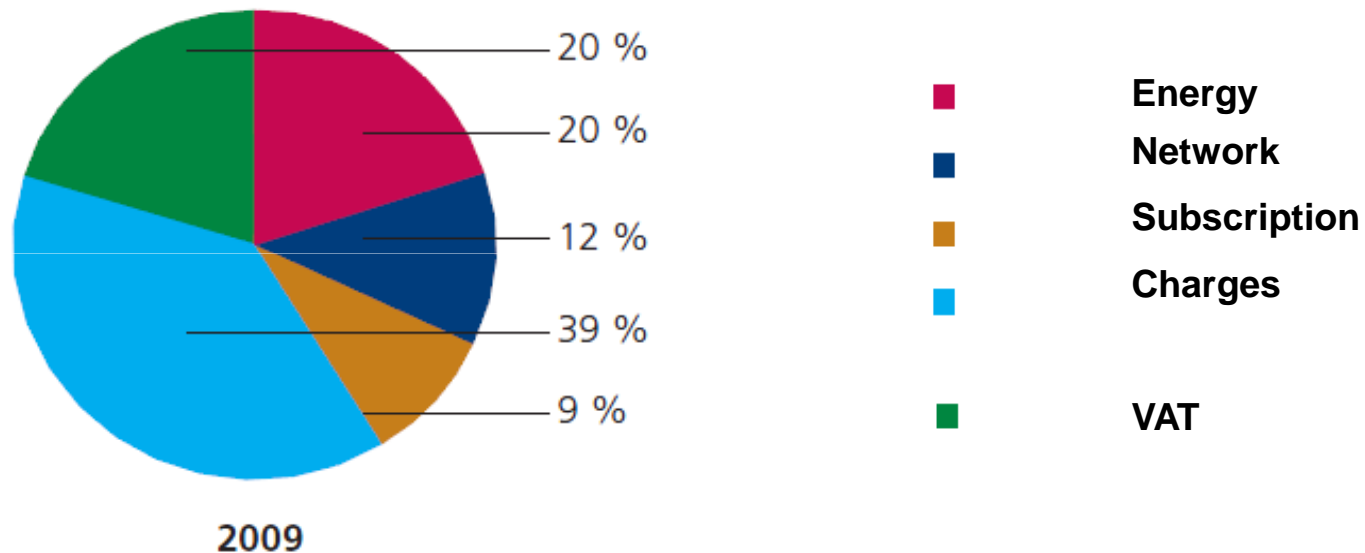
1.6 – Influence of charges and taxes

Charges and taxes deeply influence the final price paid by the consumer.

2010 Semester 2	Charges (average) ct.€/kWh	Share of charges in the price (ATI) en %	VAT rate %	Share of charges & taxes en %
Denmark	9,67	35,7	25,0	60,7
Germany	6,79	27,9	19,0	46,8
Sweden	2,8	14,3	25,5	39,8
Portugal	5,07	30,4	6,3	36,7
Austria	2,12	11,0	20,0	31,0
Belgium	1,71	8,7	21,0	29,7
Finland	0,88	6,4	23,0	29,4
Netherlands	1,66	9,8	19,0	28,8
Italy	3,64	19,0	9,6	28,6
France	1,32	10,2	16,9	27,1
Spain	0,76	4,1	18,0	22,2
Greece	1,32	10,9	11,0	21,9
Luxembourg	2	11,4	5,9	17,4
Ireland	0,23	1,2	13,5	14,7
United Kingdom	0	0,0	5,0	5,0

Denmark: a singular bill

In Denmark, the share of energy amounted to a mere **20 %** of the final bill in 2009.



A market offer with a price **25 %** below the regulated price would only result in a drop in the total price of about **7 %**.



Electricity Prices for households in Western Europe

- 1 – General trends and comparisons**
- 2 – Price drivers:**

Legal framework

Retail market liberalisation

Price of primary sources

Impact of CO₂ pricing



2.1 – Legal framework

From 1996 to 2009, the European power industry was hit by **25 directives**:

- 3 directives on the internal energy market
- 3 directives on the Emissions Trading Scheme
- 6 directives on air protection
- 3 directives on water, sea protection and flood prevention
- 6 directives on industrial activities, relations with stakeholders, environmental liability, energy taxation
- 4 directives on energy policy: 2 on energy efficiency, 1 on cogeneration, 2 on renewable sources, 1 on safety of supply

A frequently changing legal framework **increases uncertainty** for operators.

Uncertainty translates into:

- the request for a **higher rate of return** (hence prices increase)
- the preference for **smaller amount of investments** (gas generation, hence vulnerability to gas price volatility)

The exact impact of changes in the legal framework is however difficult to measure.



2.2.- Retail market liberalisation

2.2.1 - Schedule

The retail electricity market was open to competition between **1996 and 2007**:

1996 : Sweden

1997 : Finland

1998 : Germany

1999 : United Kingdom

2001 : Austria

2003 : Denmark and Spain

2004 : Netherlands

2005 : Ireland

2006 : Portugal

2007 : Belgium (January), France, Greece, Italy and Luxembourg (July)

However, end-user **price regulation still existed in 2010** in several countries:

Denmark, France, Greece, Ireland, Italy, Netherlands, Portugal and Spain.

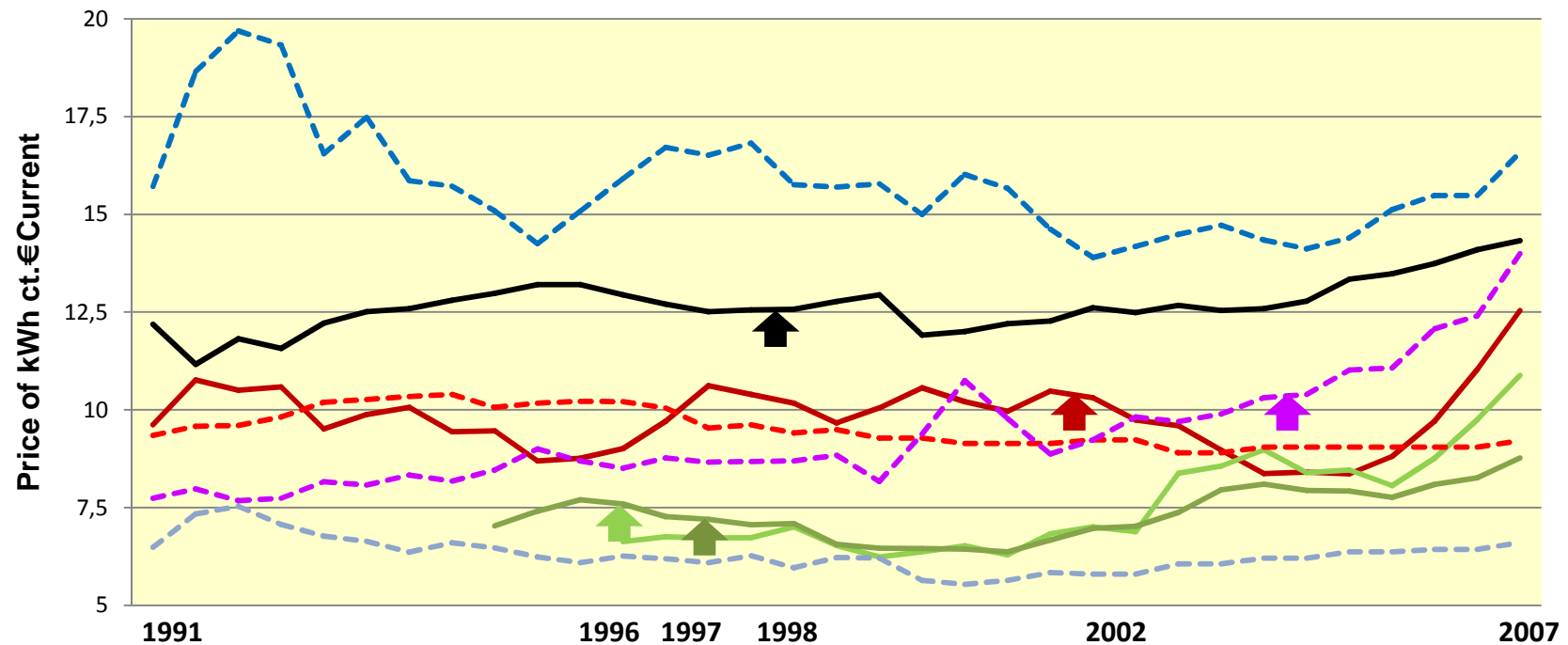


2.2.- Retail market liberalisation

2.2.2 – Impact of liberalisation

Market liberalisation **did not have a major impact** on household electricity prices.

Price development – kWh Excluding Taxes



Early liberalisation: — Uni. Kingdom — Sweden — Finland — Germany
 (The arrow shows the date)

Price regulation: Italy France Greece Netherlands

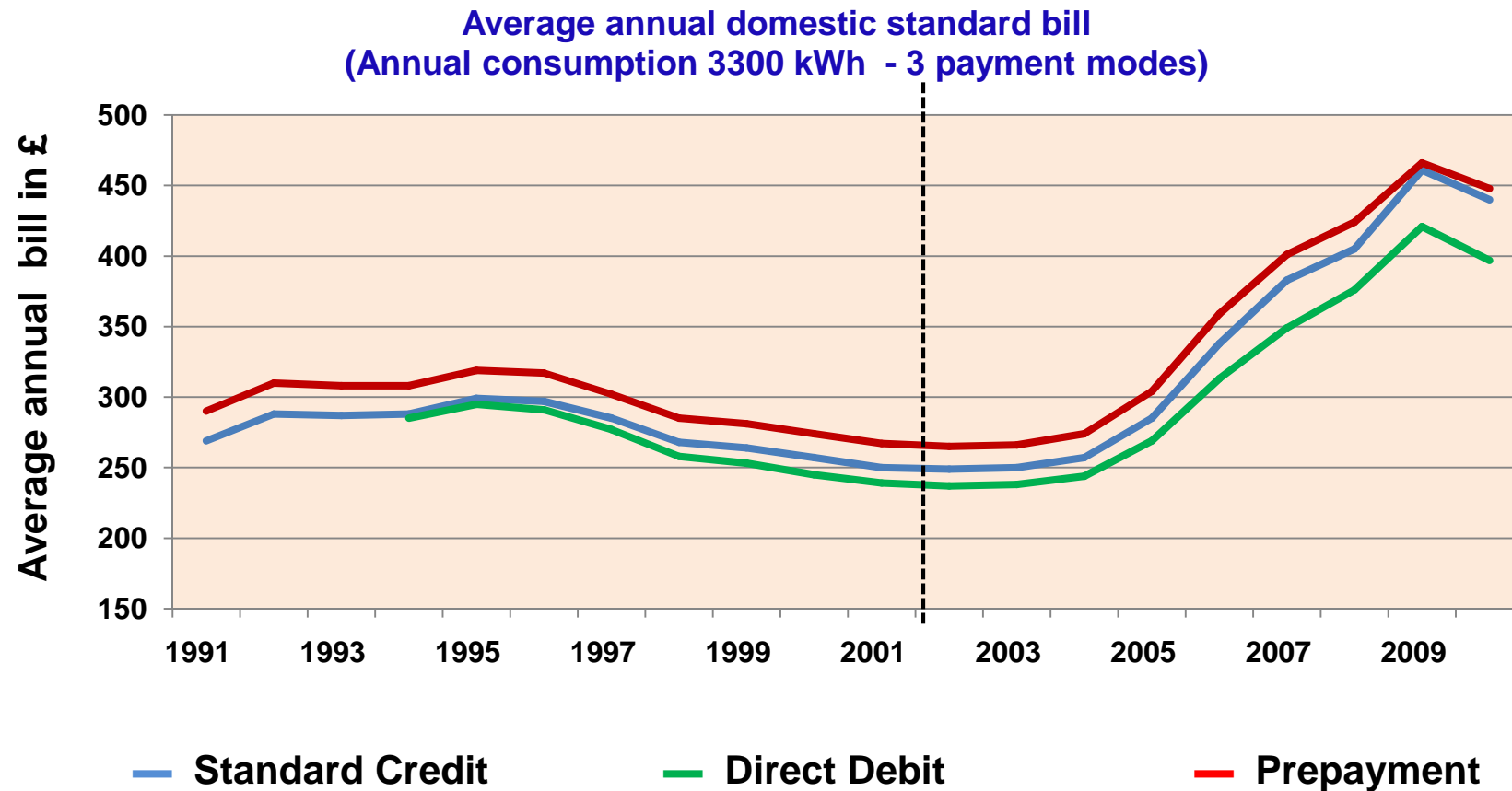


2.2.- Retail market liberalisation

2.2.3 – Price development in United Kingdom

End-user price control was removed in 2002.

Assessed in £, the standard bill increased sharply between 2003 and 2009.





2.2.- Retail market liberalisation

2.2.4 – Competition and Market Share (UK)

The highest **"switching rate"** in EU-15 occurs in United Kingdom. About **16 to 20 %** of domestic consumers change supplier every year.

Nevertheless, the **"Big Six"** market share stays remarkably stable:

2005		2008	
Groupe	Market share (%)	Group	Market share (%)
Centrica	22	Centrica	22
Powergen	21	E.On	18
SSE	15	SSE	19
Npower	15	RWE - Npower	15
EdF Energy	13	EdF Energy	13
Scottish Power	13	Scottish Power	12
Autres	1	Autres	1



2.2.- Retail market liberalisation

2.2.5 – Price Excluding Taxes

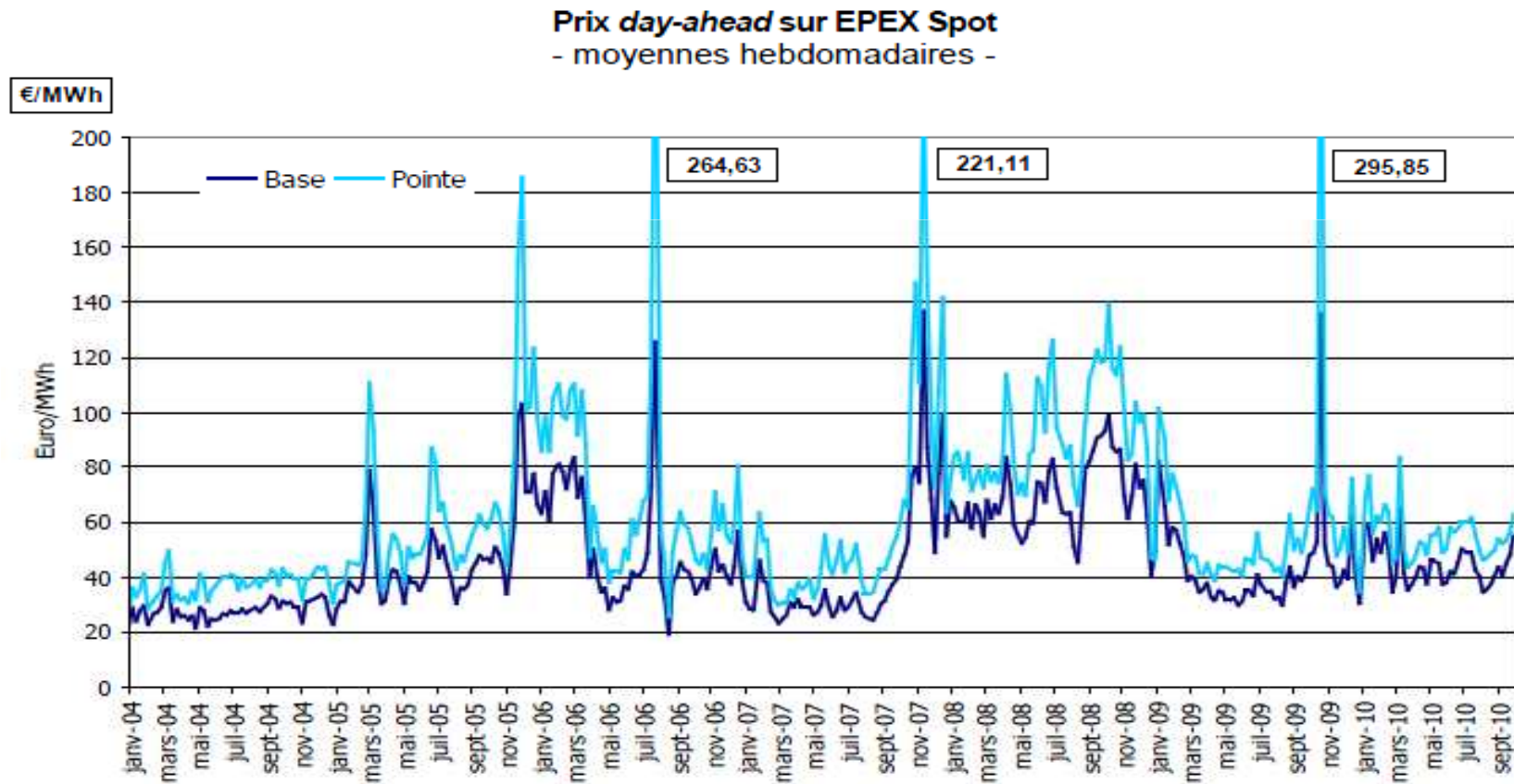
Price Excluding Taxes 2010 - Semester 2 - ct.€/kWh		Share of customers with regulated price
Ireland	16,29	79,8 %
Spain	14,92	91 %
Belgium	14,60	
Luxembourg	14,49	
Austria	13,96	
Italy	13,87	91 %
United Kingdom	13,80	
Germany	13,70	
Sweden	12,80	
Netherlands	12,59	100 %
<i>EU 27</i>	<i>12,39</i>	
Denmark	11,99	94 %
Portugal	10,61	92 %
Finland	10,26	
France	9,71	96 %
Greece	9,59	100 %

By the end of 2010, regulated end-user prices spread from **the highest to the lowest** of the domestic range in UE-15.

2.2.- Retail market liberalisation

2.2.6 – Power Market Prices

In the wake of liberalisation, power markets have developed. The price on the spot market reflects the **marginal generation cost**.



2.2.- Retail market liberalisation

2.2.7 – From wholesale to retail prices

On a liberalised market, **retail prices** show a close relationship to **wholesale prices**. This was established by OFGEM in United Kingdom:



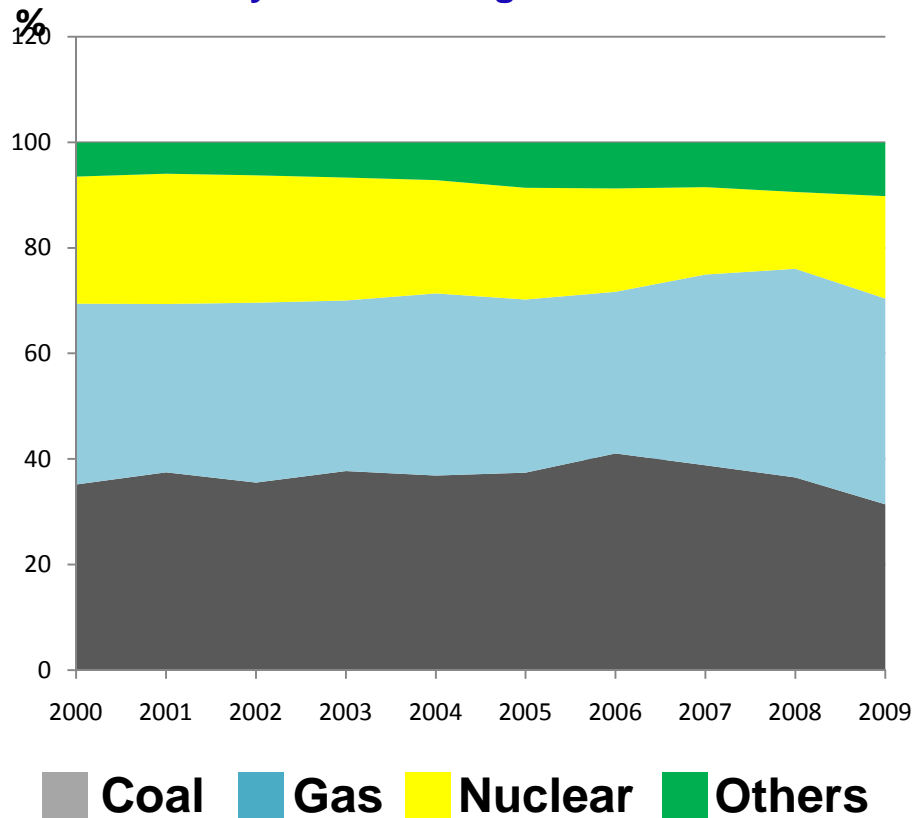


2.3 - Price of primary sources

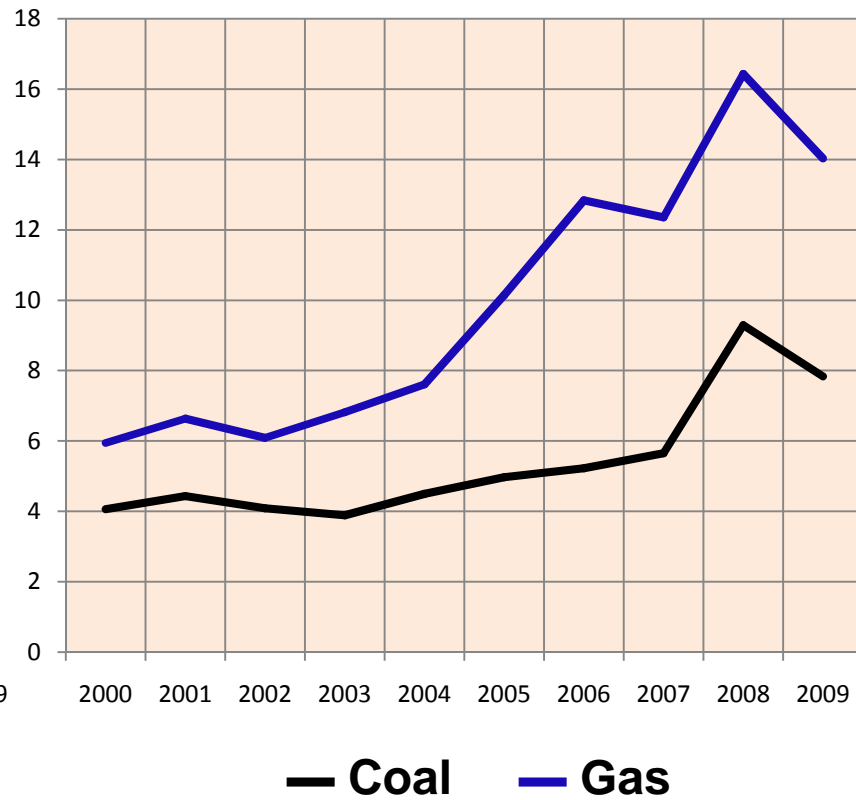
2.3.1 – Influence of primary sources

Generation in the United Kingdom relies largely on **fossil fuels**. Indeed, power prices on wholesale markets show a relationship with fossil fuel prices.

Primary sources for generation in UK



Price of gas and coal in UK (£/MWh)



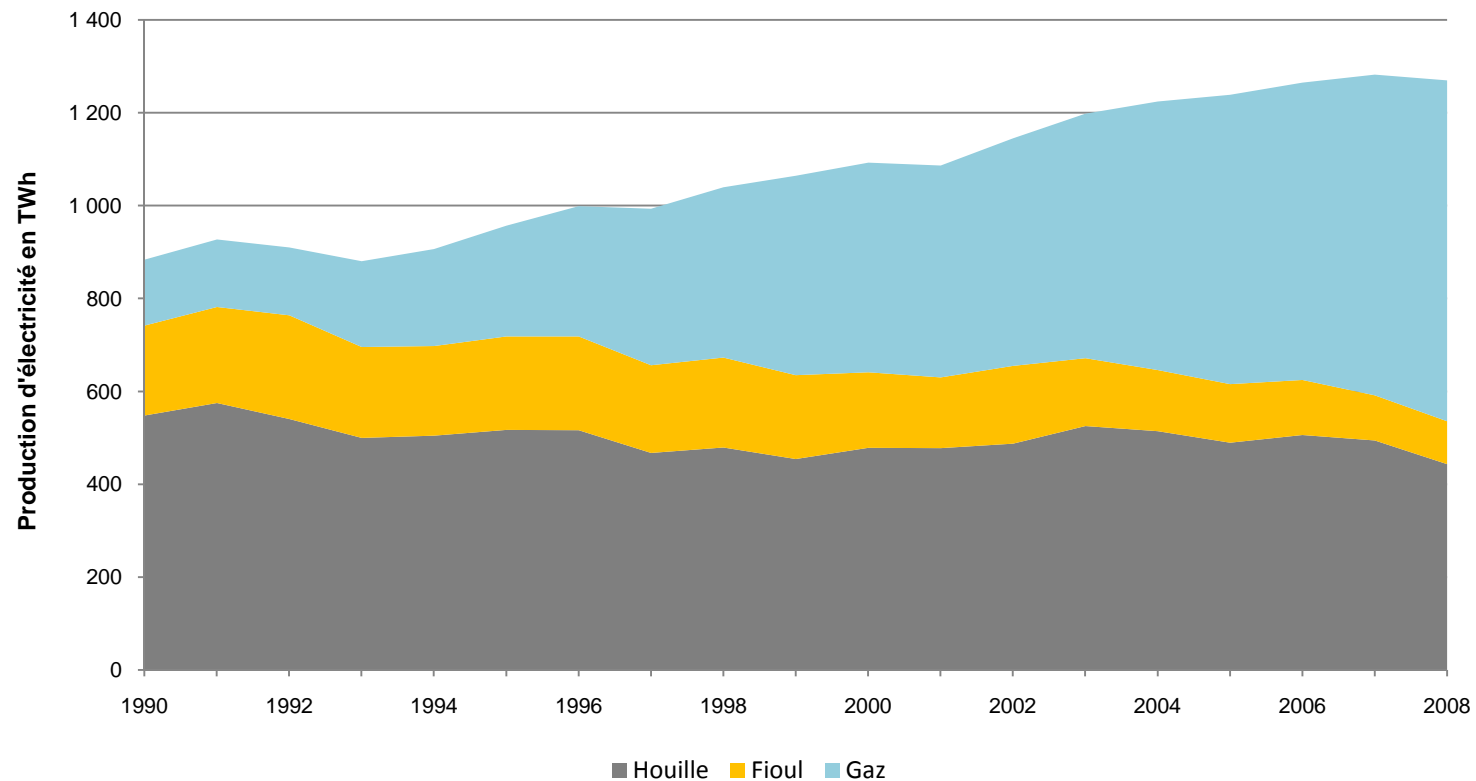


2.3 - Price of primary sources

2.3.2 – Fossil fuels in EU generation

The **share of fossil fuels** as primary energy for power generation in EU-15 was stable between 1991 (42 %) and 2008 (44 %).

Main fossil fuels for thermal generation (EU - 15)

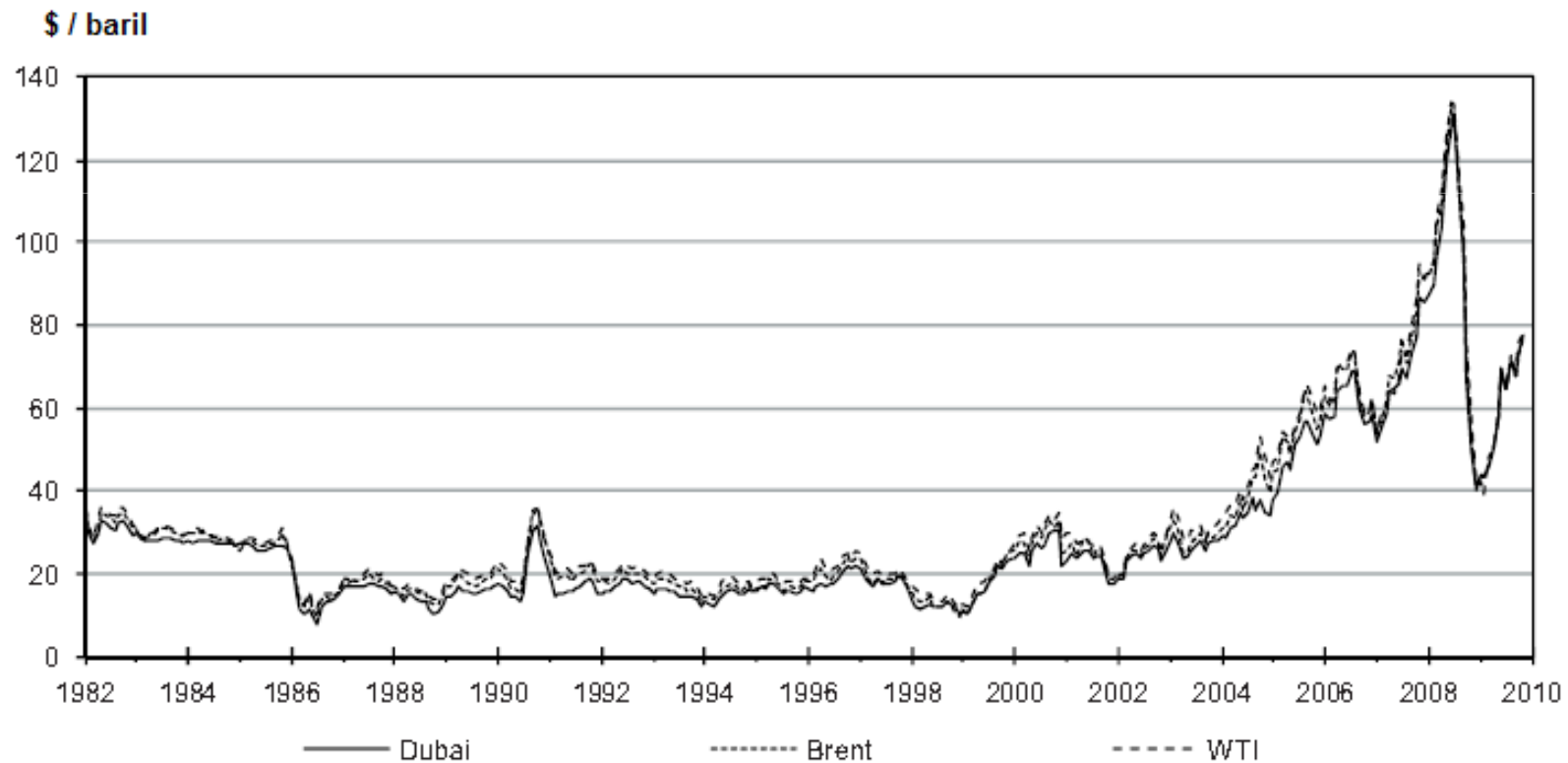




2.3 – Price of primary sources

2.3.3 – Fossil fuels in EU generation

On international markets, fossil fuels are priced according to the price of **crude oil**.





2.4 – Impact of CO₂ pricing

2.4.1 – Mechanism and consequences

Since January 2005, for all power plants from 20 MWth, **every ton of emitted CO₂ has a price**. This price is set by the market.

The introduction of carbon pricing increases the marginal cost for electricity producers and thus increases electricity prices. Due to the specific price-setting mechanism in electricity markets, when the marginal plant emits CO₂ the **price of all kWh increases** by the CO₂ cost, even kWh generated by non-emitting plants. The burden for the consumer is then higher than:

$$\text{Number of t CO}_2 \times \text{Price of 1 t CO}_2$$

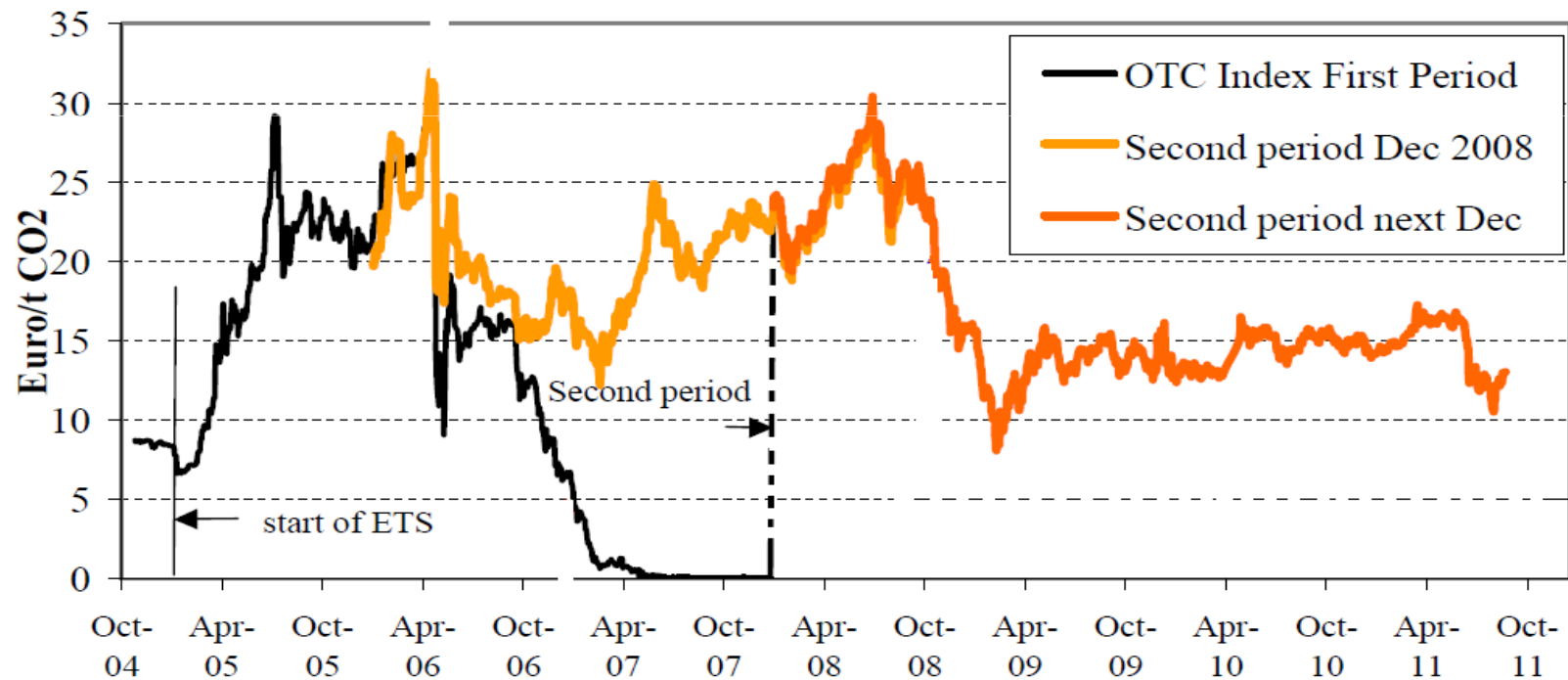
Non-emitting producers gain **additional infra-marginal rents** to the extent that their variable costs are below the new marginal price.

2.4 – Impact of CO₂ pricing

2.4.2 – Volatility

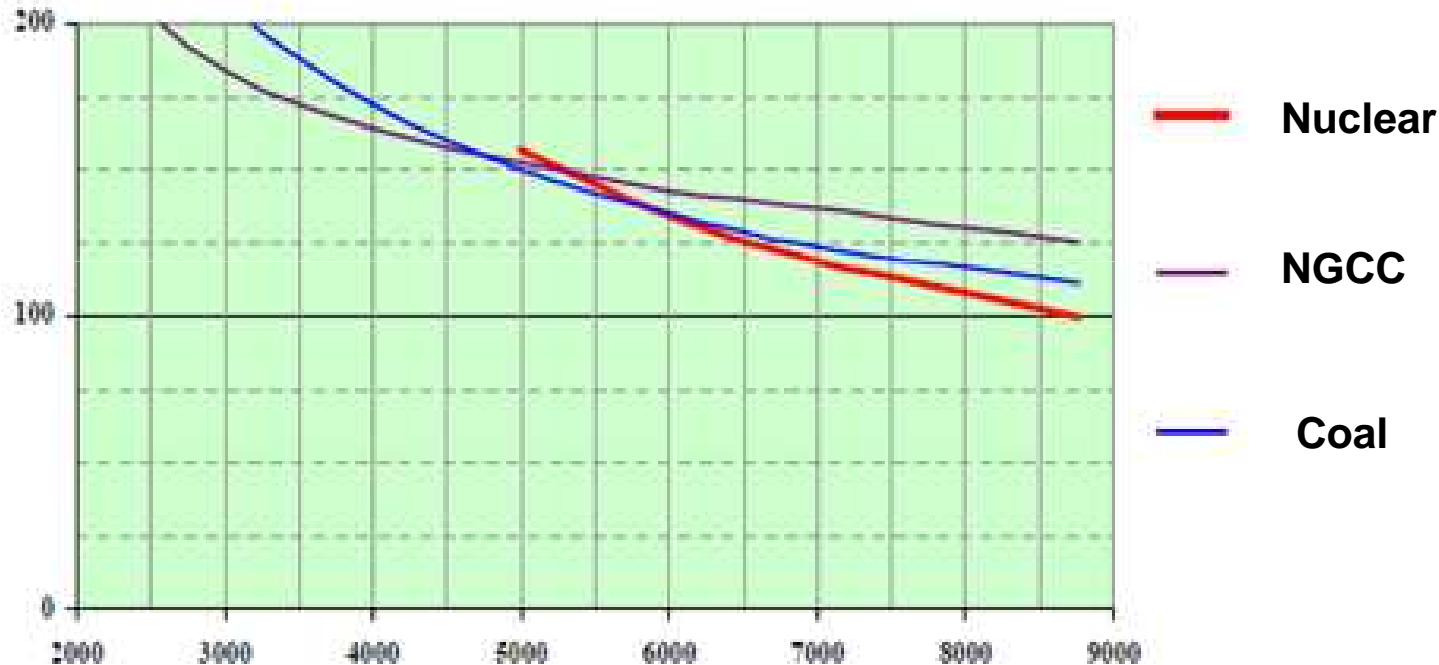
CO₂ price **volatility**, due to meteorology, economic situation and change in policy, adds **new uncertainty** for investors.

EU ETS - CO₂ price



Comment: Market price & Fleet optimization

Due to poor interconnection with neighbouring countries, **optimization** of the fleet of power plants was sought separately by each Member State.

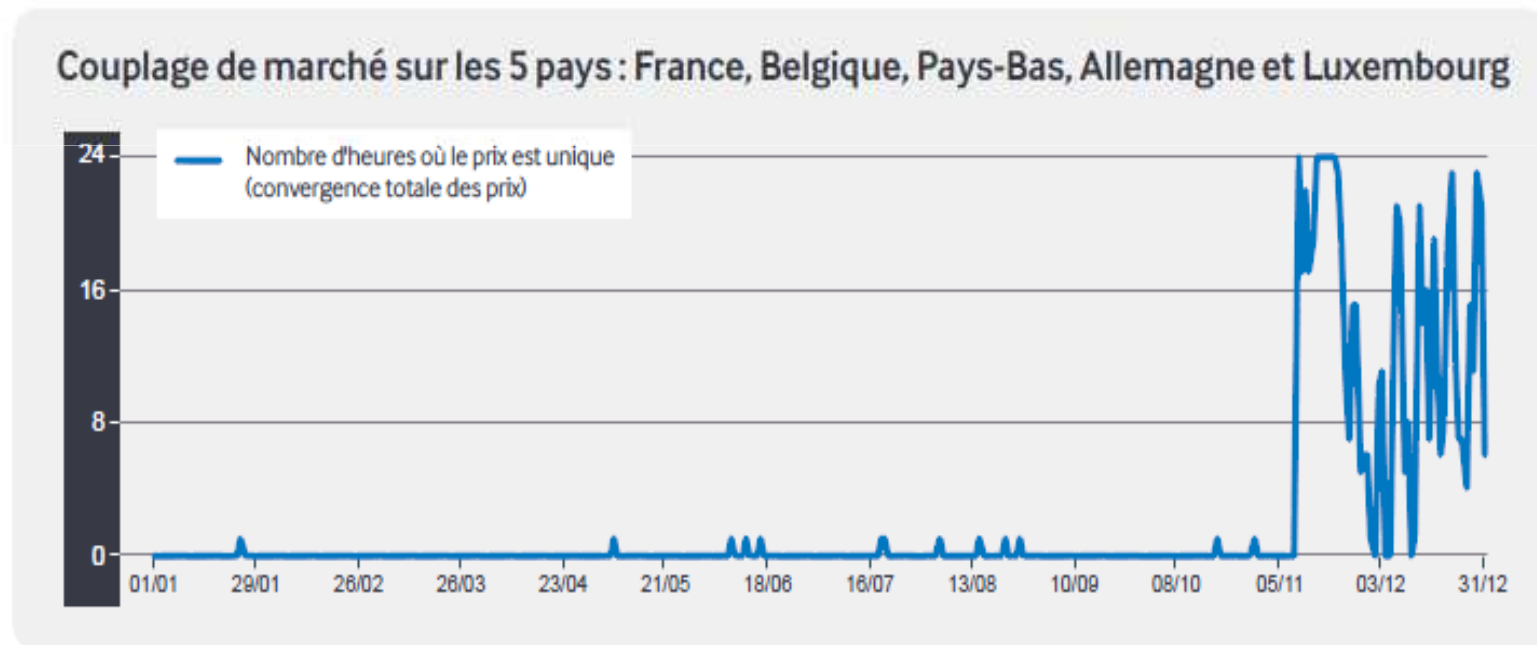


In the above example, nuclear capacity do not exceed the capacity requested more than 6000 h per year; coal capacity 6000 to 4500 h; gas provides for capacity requested less than 4500 h.



Comment: Market price & Fleet optimization

With **market coupling**, a single price for 5 countries occurs roughly 60 % of the year. This common price reflects the marginal cost of a generation fleet without optimization at the size of the market.



Market coupling started on 9 November 2010 for "Centre West Europe" (CWE).



Conclusion

The first draft directive on the **internal market of electricity** was adopted by the European Commission in January 1992. Twenty years later, available data show that electricity prices for households depend mainly on external factors and national policy.

Among external factors, the **rapid increase of fossil fuels prices** since the middle of the decade 2000-2010 played a major role. It was amplified by the European policy aimed at reducing CO₂ emissions, also set in 2005.

As regards national policy, **support to electricity generation from renewable sources** has translated in charges of growing weight.

Some Member States have applied a **regulation on end-user prices** ending in their disconnection with real costs.



Merci pour votre attention

**To download the survey:
<http://www.ifri.org>**

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Sources (1/2)

Slide 1.1: Eurostat: nrg_pc_204_h Electricity-DC

Slide 1.2: Eurostat: prc_hicp_aind-IPCH

Slide 1.3: Eurostat: nrg_pc_202_h-Gas –Domestic consumers

Slide 1.4: Eurostat: nrg_pc_204_h Electricity-DC

Slide 1.5: ERGEG: Annual Reports from National Regulatory Authorities 2007

Slide 1.6: Eurostat: nrg_pc_204_h Electricity-DC

Slide 1.7: DERA, Results and challenges 2009, page 12

Slide 2.2.1: ERGEG - Status Review of End-User Price Regulation as of 1 January 2010, pages 15 et 22

Slide 2.2.2: Eurostat: nrg_pc_204_h Electricity-DC

Slide 2.2.3: Department of Energy and Climate Change - Domestic Energy Prices Statistics - Table 2.2.1 Average annual domestic standard electricity bills by home and non-home supplier - Table 2.2.1 (St)

Slide 2.2.4: OFGEM, Report to the European Commission 2005, page 41 and Report to the European Commission 2009, page 28



Sources (2/2)

Slide 2.2.5: Eurostat: nrg_pc_204_h Electricity-DC and ERGEG - Status Review of End-User Price Regulation as of 1 January 2010, page 22

Slide 2.2.6: France, Commission de Régulation de l'Energie, Observatoire des marchés de l'électricité et du gaz T3 2010, page 21

Slide 2.2.7: OFGEM - Energy Supply Probe - Octobre 2008, page 76

Slide 2.3.1: Left: Department of Energy and Climate Change - Domestic Energy Prices Statistics - Table 5.4 Fuel used in generation

Right: Department of Energy and Climate Change - Domestic Energy Prices Statistics - Table 3.2.1 Average prices of fuels purchased by the major UK power producers - Annual

Slide 2.3.2: Eurostat -nrg_105a

Slide 2.3.3: IEA: Prices and Taxes - Quarterly Statistics - 4th Quarter 2009 - Page XXV

Slide 2.4.2: David Newbery, University of Cambridge, Conférence donnée pour l'Association des Economistes de l'Energie le 12 Septembre 2011, Paris, Ecole des Mines

Slide Comment 1: France : Rapport au Parlement sur la Programmation pluriannuelle des investissements de production d'électricité 2009 - 2020 - page 21

Slide Comment 2: France – RTE - Le bilan électrique français 2010 - page 19