



Electricity Tariff Structure: The Spanish case

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National Energy Commission

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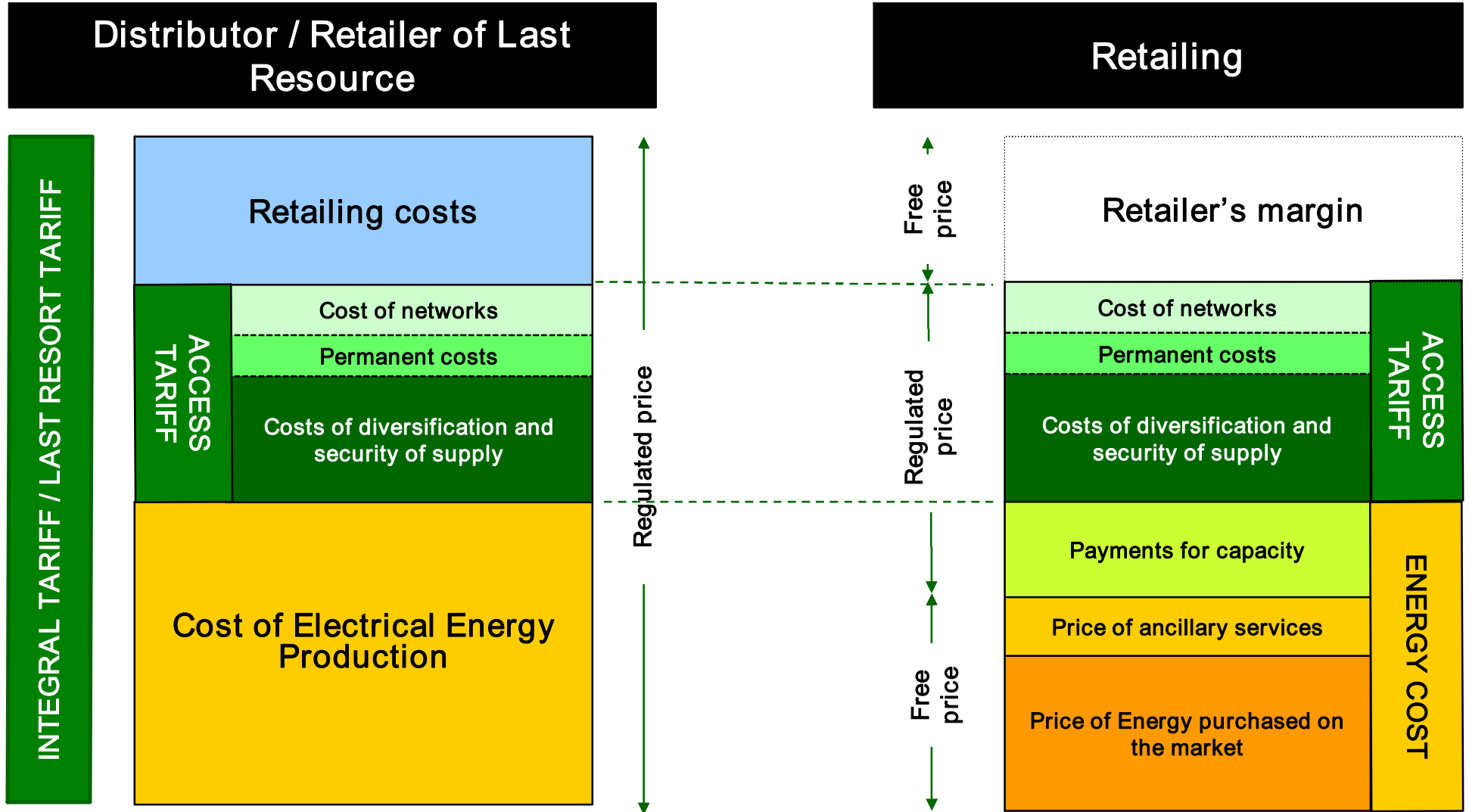
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Regulatory framework

- Directive 2003/54/EC of the European Parliament and of the Council concerning the common rules for the internal market in electricity
- Law 54/1997, of 27 November, on the Electricity Sector
- Royal Decree 1164/2001, of 26 October, which establishes tariffs for access to electrical energy transmission and distribution networks
- Annexe to the Order of 12 January 1995
- Order ITC/3801/2008, of 26 December, revising electricity tariffs as from 1 January 2009.
- Royal Decree 485/2009, of 3 April, the provision of last resort supply in the electrical energy sector is regulated.
- Royal Decree-Law 6/2009, of 3 April, to adopt certain measures in the electricity sector and approve social welfare bonus.

The Spanish tariff structure



The Spanish tariff structure. Access tariffs

- Characteristics

- ▶ *All customers have to pay tariffs to access the transmission and distribution networks*
- ▶ *Common throughout Spain*
- ▶ *Multi-part*
 - ⇒ Capacity charge
 - ⇒ Energy charge
 - ⇒ Reactive energy charge
- ▶ *Its structure includes:*
 - ⇒ Cost of networks
 - ⇒ Cost of third party access management
 - ⇒ Permanent costs
 - ⇒ Costs of diversification and Security of Supply
 - ⇒ Loss in revenue from regulated activities
- ▶ *Annual Update*

The Spanish tariff structure. Access tariffs

- Structure of access tariffs

- ▶ Low voltage (< 1 kV) :

- ⇒ 2.0A – 1 tariff period
- ⇒ 2.0DHA – 2 tariff periods
- ⇒ 3.0 A – 3 tariff periods

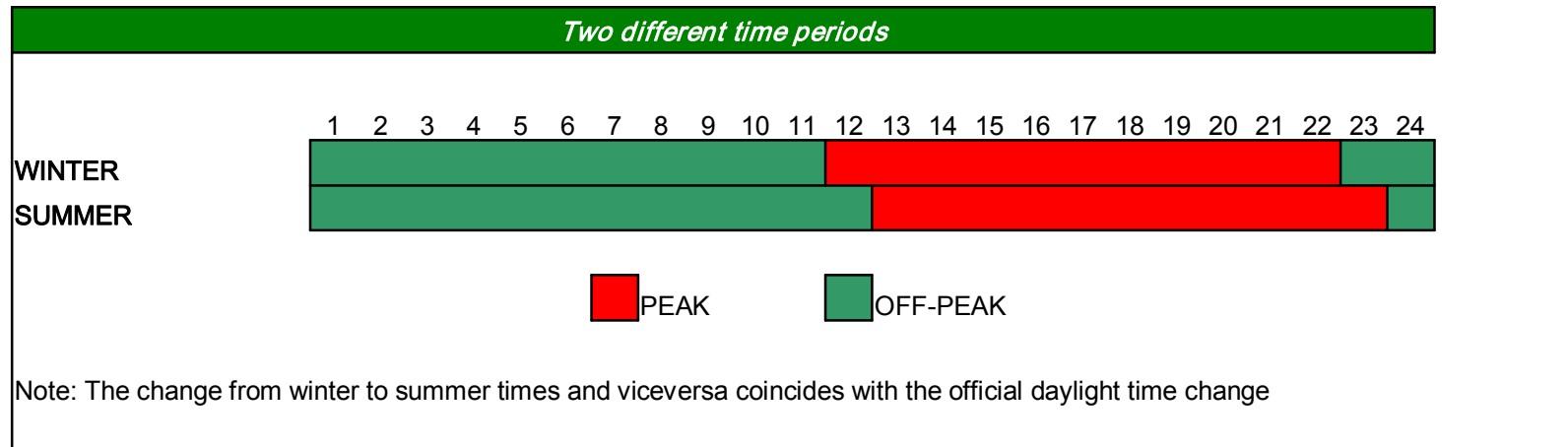
- ▶ High voltage (≥ 1 kV) :

- ⇒ 3.1A 1 – 36 kV (3 tariff periods)
 - ⇒ 6.1 1 – 36 kV (6 tariff periods)
-
- ⇒ 6.2 36 – 72.5 kV (6 tariff periods)
 - ⇒ 6.3 72.5 – 145 kV (6 tariff periods)
 - ⇒ 6.4 ≥ 145 kV (6 tariff periods)
-
- ⇒ 6.5 International connections

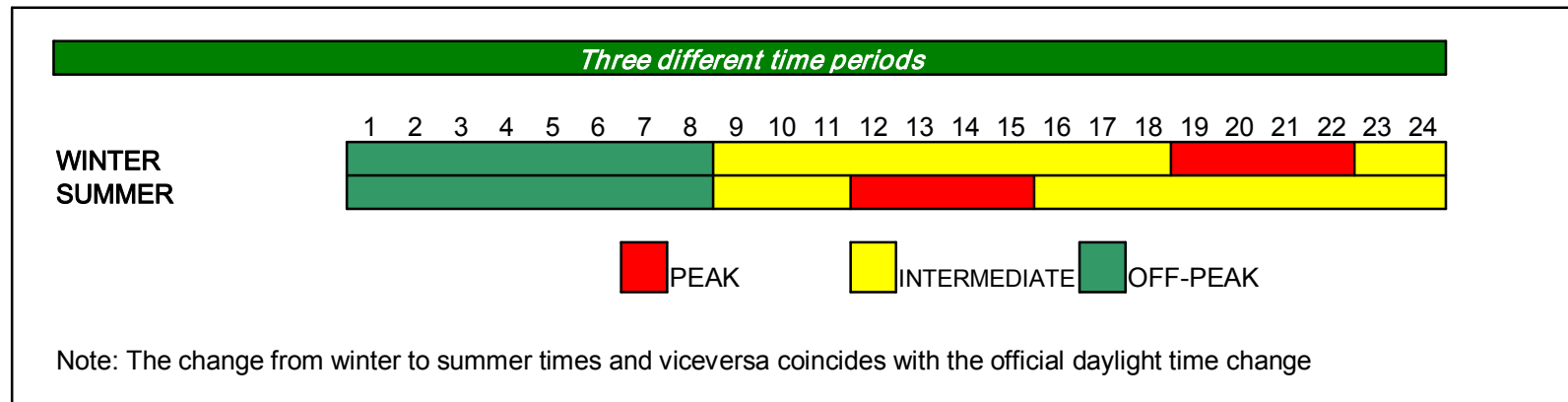
The Spanish tariff structure. Access tariffs

- Time periods

- ▶ *Two different time periods*

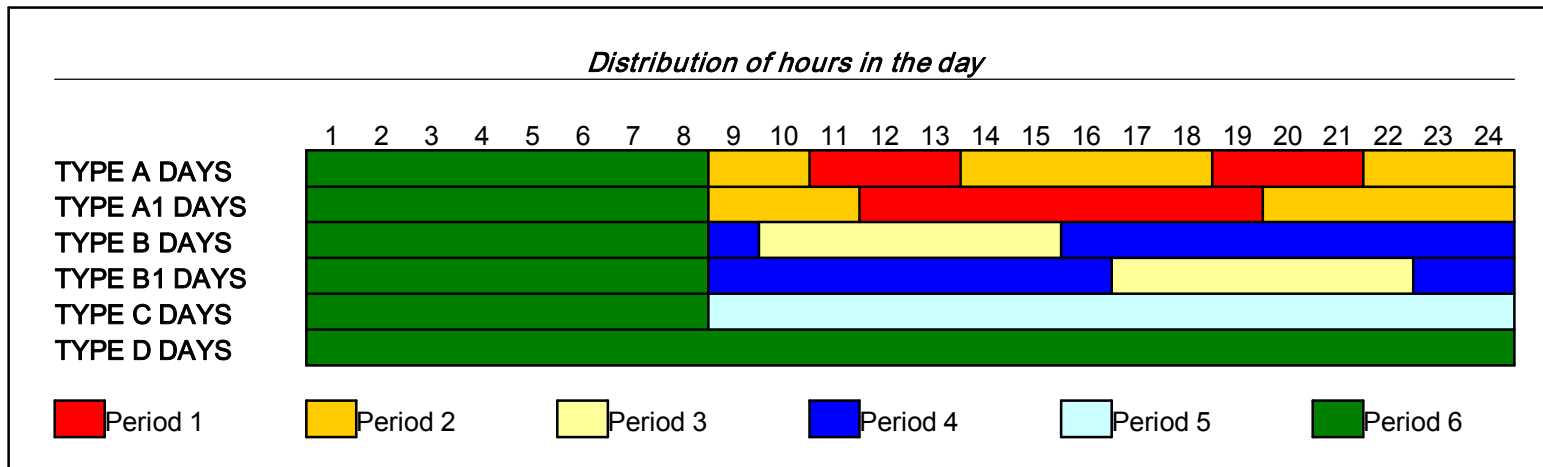
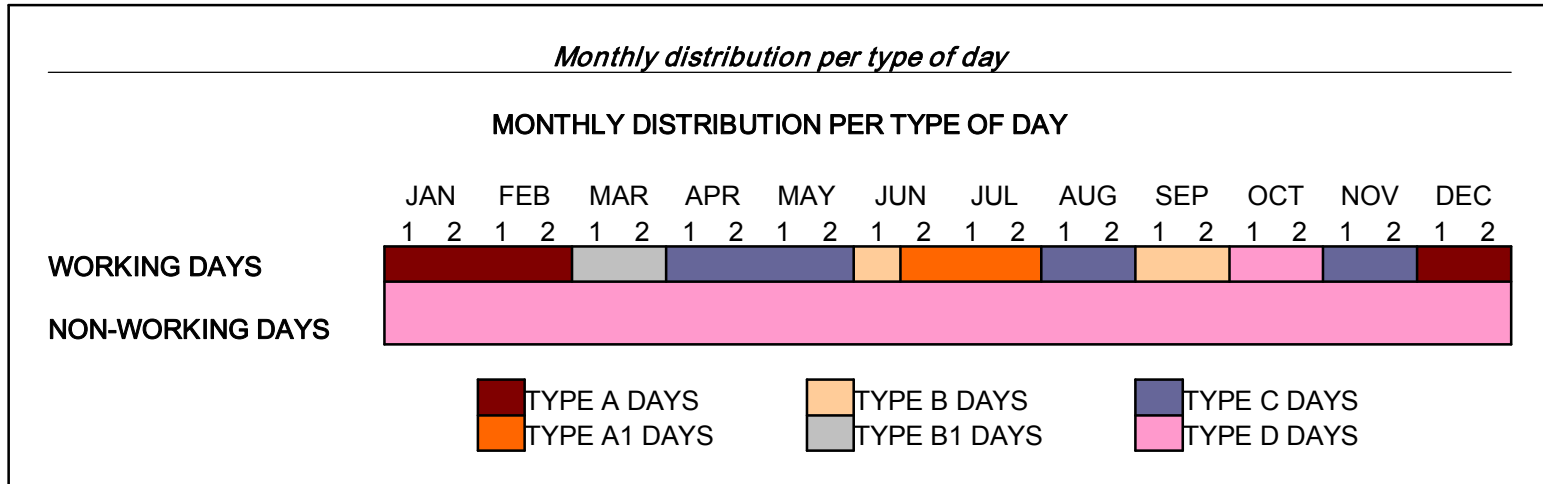


- ▶ *Three different time periods*



The Spanish tariff structure. Access tariffs

► *Six different time periods*



The Spanish tariff structure. Access tariffs

- Components in electricity bills

- ▶ *Energy charge (€/kWh)*

- ▶ *Capacity charge (€/kW year)*

- ⇒ Excess capacity

Per tariff period

- ▶ *Reactive energy charge (€/kVA rh)*

- ⇒ $0.95 > \cos \varphi \leq 0.90$: 0.000010 €/kVA rh

- ⇒ $0.90 > \cos \varphi \leq 0.85$: 0.012673 €/kVA rh

- ⇒ $0.85 > \cos \varphi \leq 0.80$: 0.025346 €/kVA rh

- ⇒ $\cos \varphi < 0.80$: 0.038019 €/kVA rh

The Spanish tariff structure. Access tariffs

- Costs of access to electricity networks. 2008

ACCESS COSTS (in thousands of €)	Order ITC/3860/2007	% of total access
<i>Transmission</i>	<i>1.175.860</i>	<i>10,1%</i>
<i>Distribution</i>	<i>4.421.077</i>	<i>37,9%</i>
<i>TPA management</i>	<i>312.639</i>	<i>2,7%</i>
<i>Costs of diversification and security of supply</i>	<i>2.814.317</i>	<i>24,1%</i>
Nuclear moratorium	2.451	0,0%
2nd part of nuclear fuel cycle	60.920	0,5%
Market interruptibility system	394.800	3,4%
Special Regime Premium	2.356.146	20,2%
<i>Permanent costs</i>	<i>1.383.344</i>	<i>11,8%</i>
Extra-peninsular compensation	1.151.620	9,9%
System operator	36.781	0,3%
Market operator	10.753	0,1%
National Energy Commission	15.540	0,1%
Other permanent costs	168.650	1,4%
<i>Deficit of regulated activities</i>	<i>1.571.706</i>	<i>13,5%</i>
Total access costs	11.678.944	100,0%

The Spanish tariff structure. Access tariffs

- Average access bill for customers on the market. 2008

	Number of clients (1)	Consumption (GWh)	Average invoicing of access (€/MWh)
Low tension	2.086.498	19.280	40,20
<i>Contracted Power < 15 kW</i>	<i>1.907.007</i>	<i>6.897</i>	
Non-Discrimination	1.906.133	6.887	43,03
Discrimination	874	10	29,23
<i>Contracted Power > 15 kW</i>	<i>179.491</i>	<i>12.383</i>	<i>38,62</i>
Medium tension (1 kV < VL (2) ≤ 36 kV)	70.731	59.320	17,73
P < 450 kW	55.246	10.190	24,66
P > 450 kW	15.485	49.130	16,33
High tension (VL > 36 kV)	1.550	29.769	7,25
36 kV < VL ≤ 72,5 kV	1.075	12.464	8,21
72,5 kV < VL ≤ 145 kV	258	5.014	6,56
VL > 145 kV	217	12.292	6,19
Total clients	2.158.779	108.369	19,14

(1) Number of customers at 31 December 2008

(2) VL: Voltage Level

The Spanish tariff structure. Integral tariffs

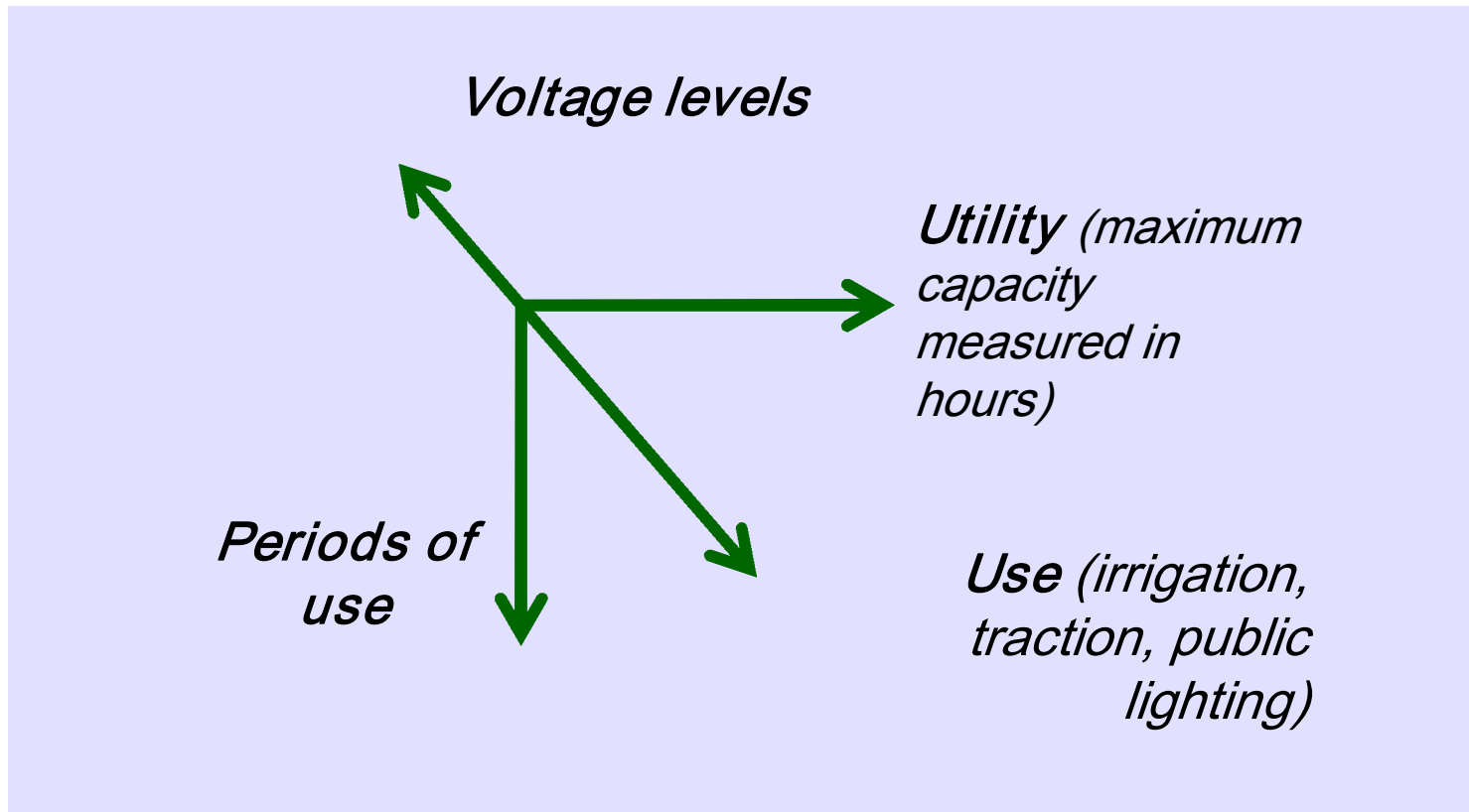
- Characteristics

- ▶ *Paid by electricity customers, except those purchasing their supply directly on the market or through a retailer*
- ▶ *Same throughout Spain*
- ▶ *Multi-part*
 - ⇒ Capacity charge
 - ⇒ Energy charge
 - ⇒ Reactive energy charge
- ▶ *Its structure includes:*
 - ⇒ Energy cost
 - ⇒ Cost of access to the networks
- ▶ *Updated every quarter*

The Spanish tariff structure. Integral tariffs

(scheme in force until 1 July 2008)

- There were a lot of different tariff categories that varied according to:

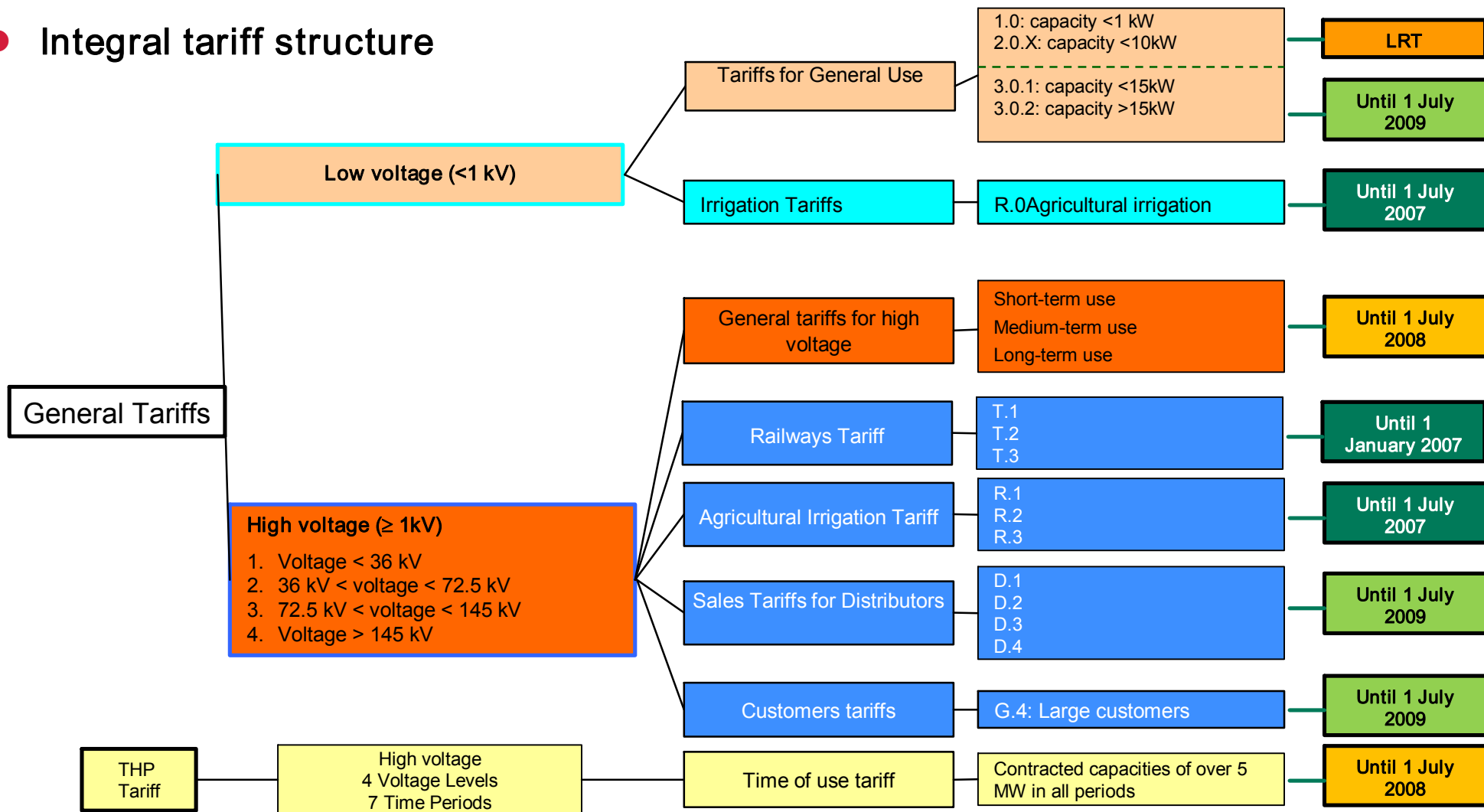


The Spanish tariff structure. Integral tariffs

(scheme in force until 1 July 2008)



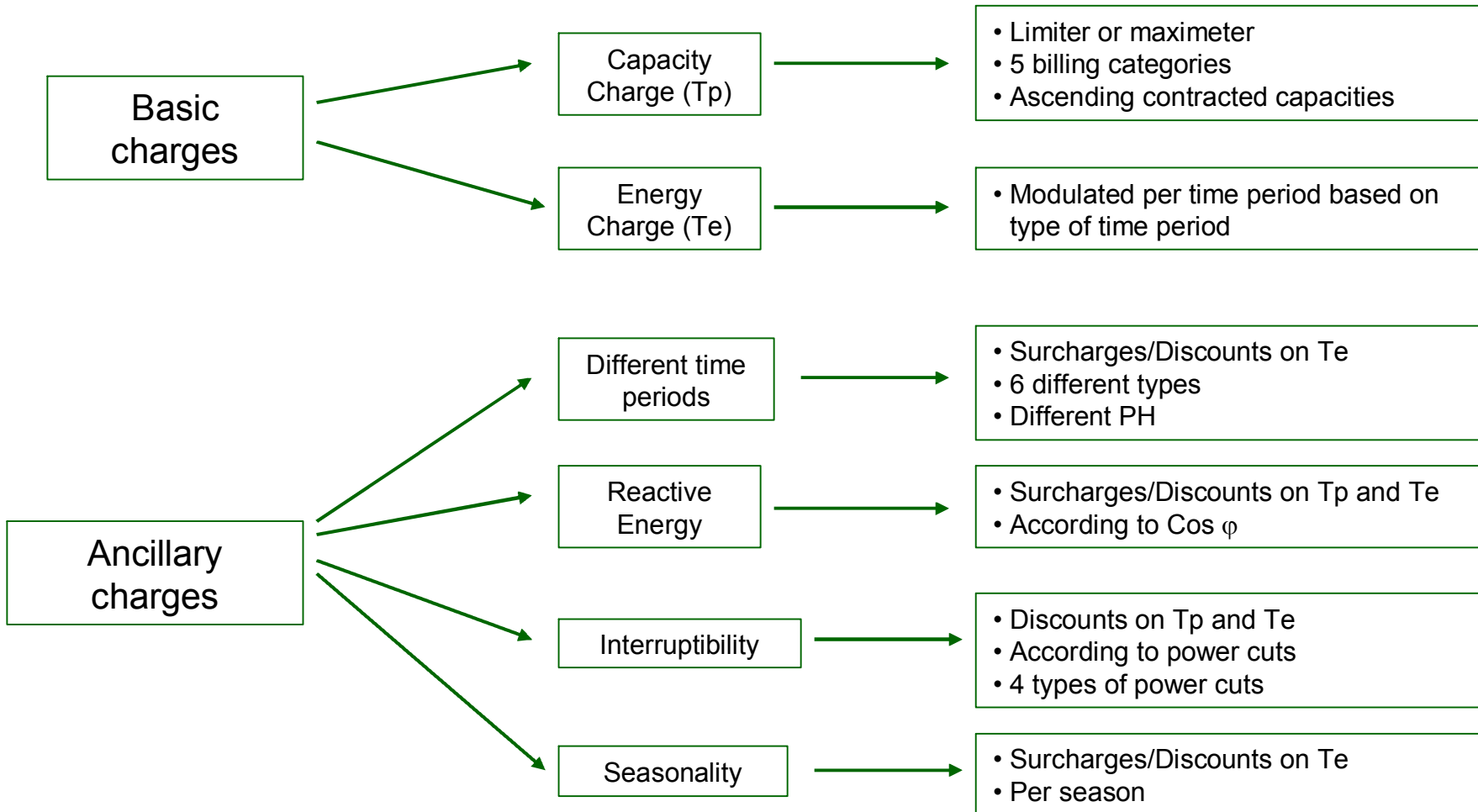
● Integral tariff structure



The Spanish tariff structure. Integral tariffs

(scheme in force until 1 July 2008)

● Components in bills



The Spanish tariff structure. Integral tariffs

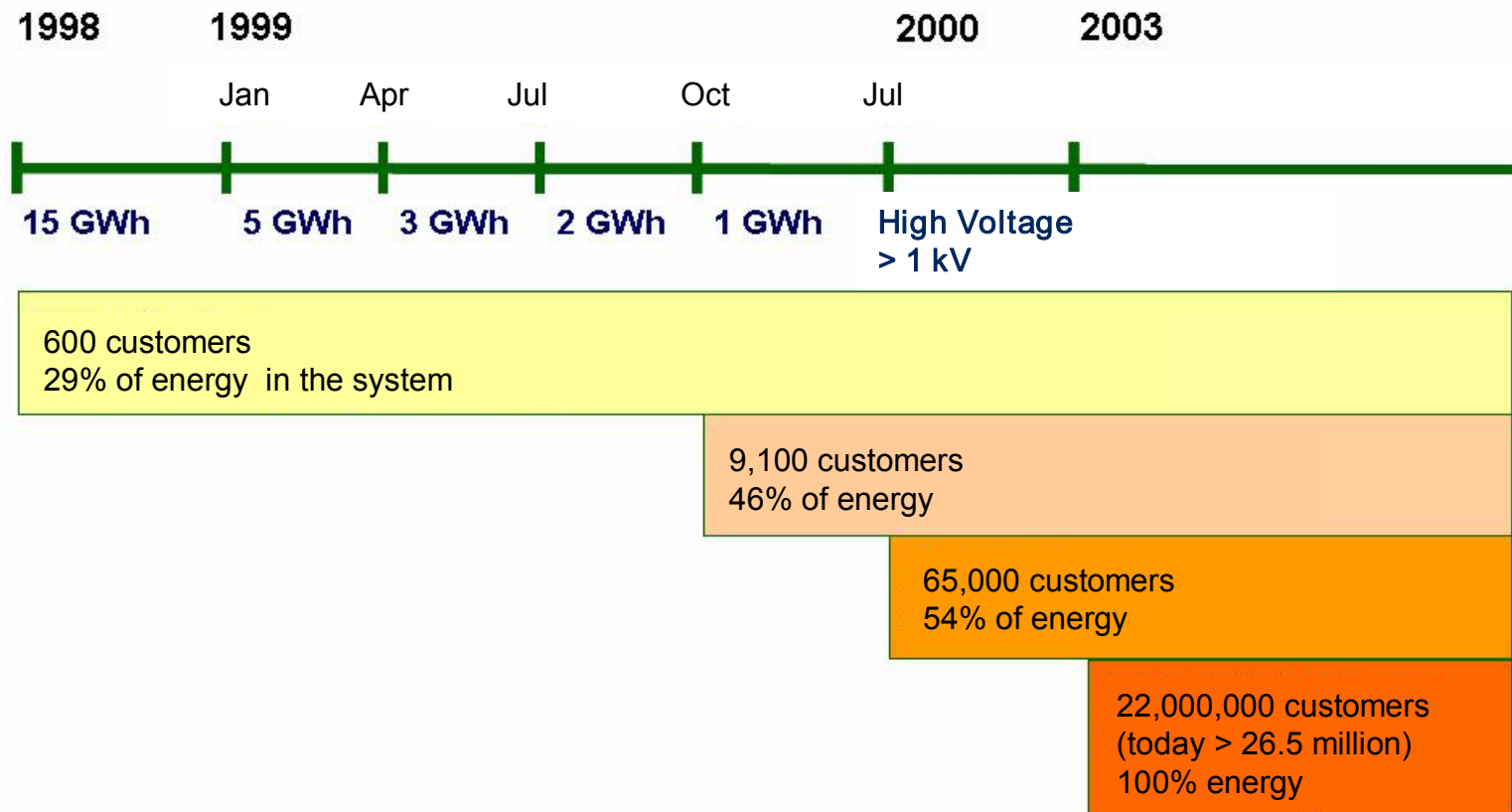
- Average bills for customers on integral tariffs. 2008

	Number of clients (1)	Consumption (GWh)	Average invoicing of access (€/MWh)
<i>Low tension ((NT) < 1 kV) (1)</i>	<i>24.385.979</i>	<i>104.365</i>	<i>123,68</i>
<i>Contracted Power < 15 kW</i>	<i>23.861.785</i>	<i>78.492</i>	<i>123,29</i>
Non-Discrimination	22.725.796	67.325	129,66
Discrimination	1.135.989	11.167	87,17
<i>Contracted Power > 15 kW</i>	<i>524.194</i>	<i>25.872</i>	<i>99,36</i>

(1) Number of customers at 31 December 2008

The liberalisation process in the electricity sector

- Presence of both integral and access tariffs: high voltage integral tariffs were eliminated on 1 July 2008 and low voltage integral tariffs will be eliminated on 1 July 2009.



The liberalisation process in the electricity sector

- The presence of both integral and access tariffs

- ▶ *Different structures for integral and access tariffs*

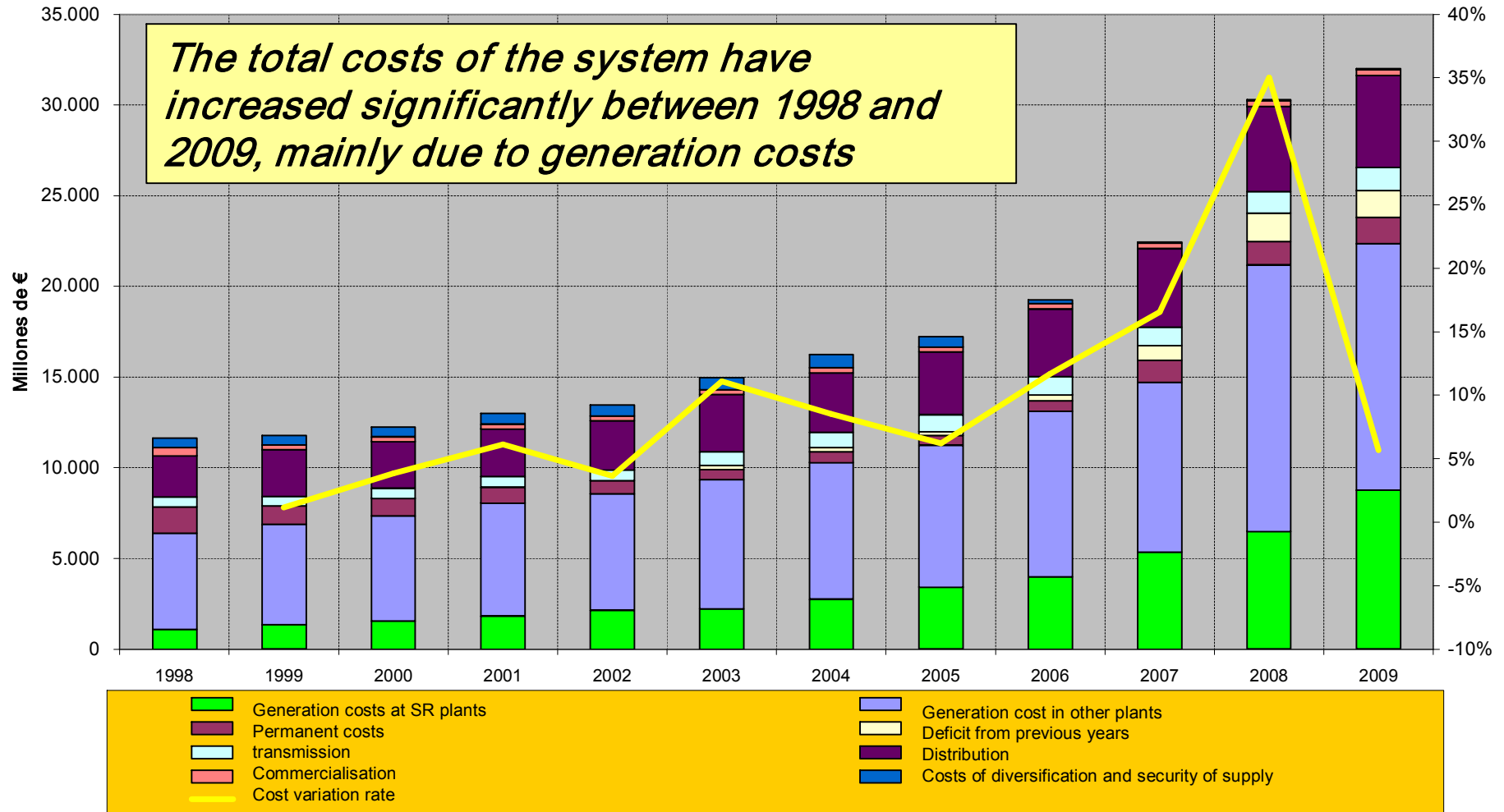
- ▶ *Customers can opt for continuing with the integral tariff or for buying their energy on the market*

- ▶ *Gradual transition process \Rightarrow customers adaptation to the market*

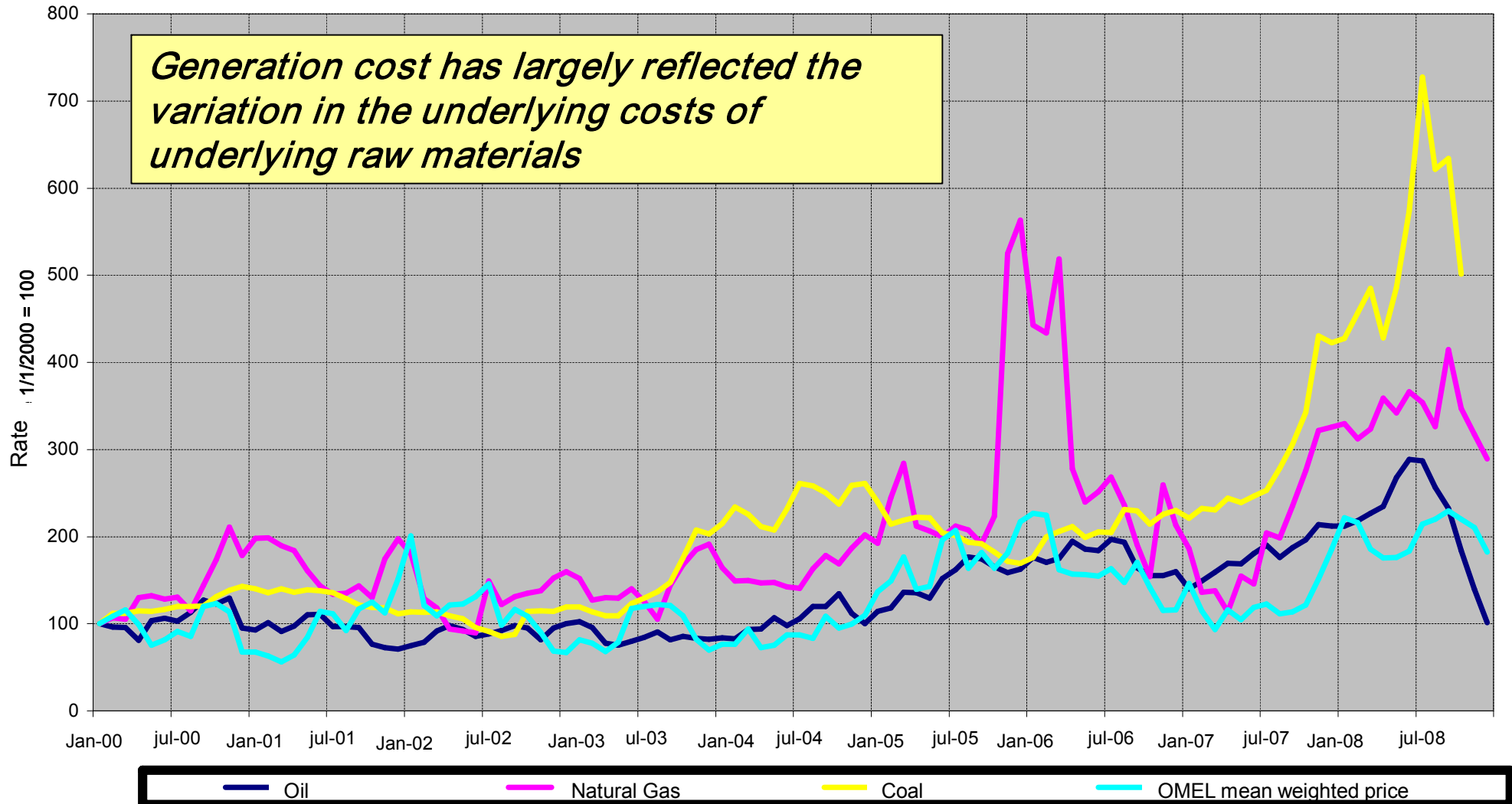
- ▶ *Risk of deficit*

The liberalisation process in the electricity sector

● Evolution of costs and tariffs

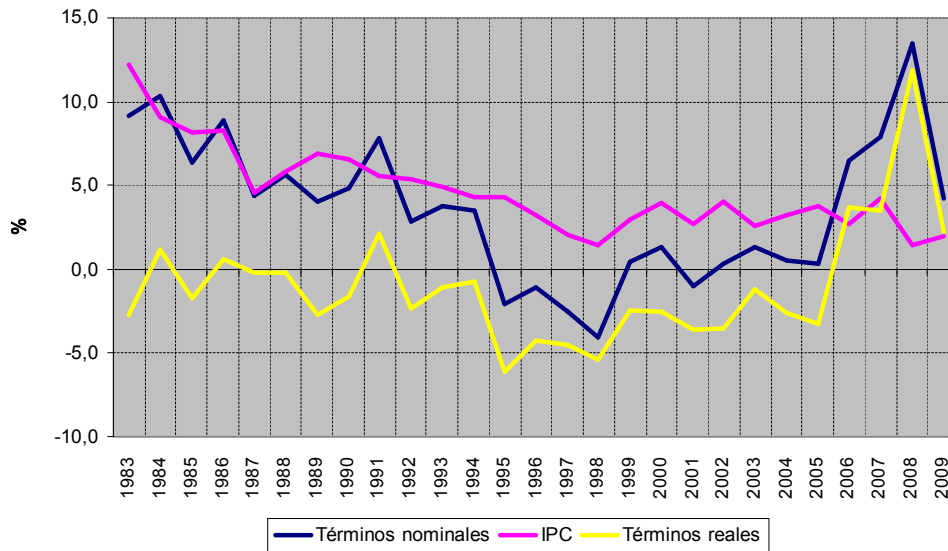


The liberalisation process in the electricity sector

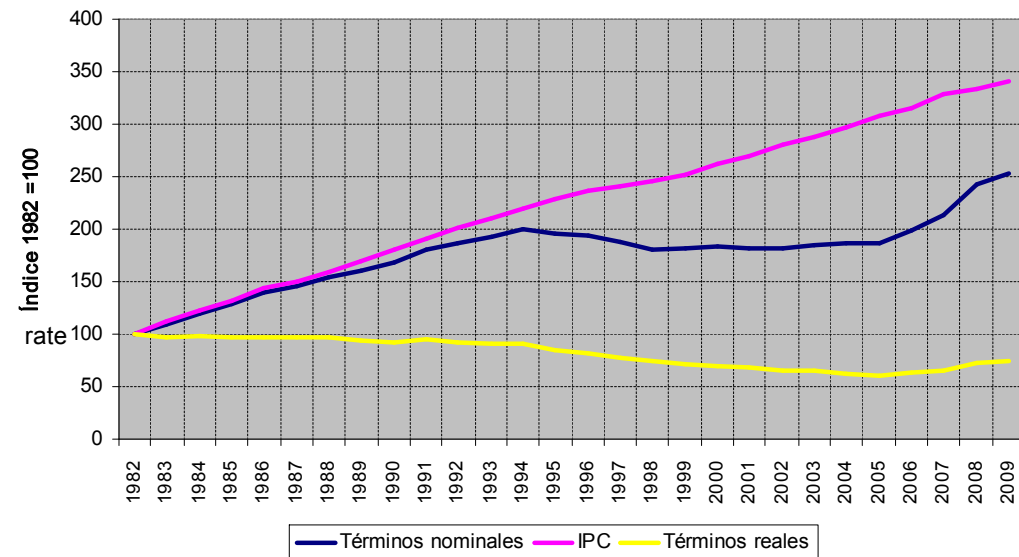


The liberalisation process in the electricity sector

Annual variation in the electricity tariff in nominal and real terms (1983-2008)



Accumulated variation in the electricity tariff in nominal and real terms (1983 = 100)

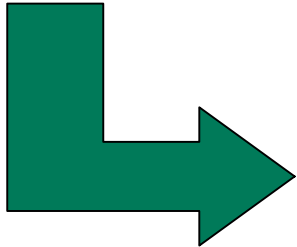


The accumulated variation in the electricity tariff in real terms between 1983 and 2008 was – 25.56%. The growth in electricity tariffs has not reflected the increase in costs and it has been negative in real terms

The tariff deficit

- The tariff calculation requires forecasts:

- ▶ *The cost of regulated activities*
- ▶ *Generation cost*
- ▶ *Expected demand, market participation, ...*

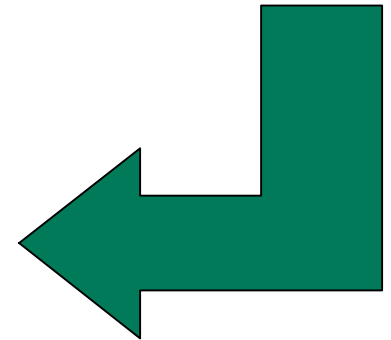


- Deviations occur when:

- ▶ *Real costs are more than expected costs*
- ▶ *There are deviations in demand and the composition of demand*
- Real income is lower than expected income*

- Deviations must be repaired to guarantee recovery of acknowledged costs

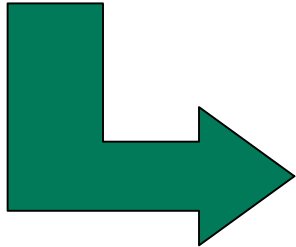
- ▶ *Costs are recovered in one/two years*



The tariff deficit

- **Deficit in regulated activities**

- ▶ *This is a deviation that is typically a consequence of an error in estimating generation costs*
- ▶ *Its high cost means that it cannot be recovered in a single year. The increase is not viable for political and social reasons*
- ▶ *If the increased costs for companies were not acknowledged, there would be regulatory insecurity, endangering future investments and therefore future security of supply*



- **Solution: Tariff Deficit**

- ▶ *Recovery of the deficit over several years, adding the corresponding financial costs.*
- ▶ *This permits:*
 - ➔ *Acknowledgement of real supply costs*
 - ➔ *Tariff increases that are politically and socially viable*
- ▶ *Tariff deficit can be considered as a second-best solution to tackle an important, transient increase in underlying costs*

The tariff deficit

- *Ex post deficit*

- ▶ Deficit of regulated activities generated between 1 January 2000 and 31 December 2002
- ▶ Deficit of regulated activities generated between 1 January 2005 and 31 December 2005.
- ▶ Deficit of regulated activities generated between 1 January 2006 and 31 December 2006.

- **Main reason for tariff deficit**

- ▶ *The average purchase price of distributors on the market is much higher than the expected price included in the tariff.*
 - ➔ This situation occurred in 2001, 2002, 2005 and 2006
 - ➔ e.g., in 2005 the distributors' purchase price was 68% higher than that planned in Royal Decree 2392/2004 that established the electricity tariff for 2005

- **Problems:**

- ▶ *Retailers cannot compete with the regulated tariff*
- ▶ *Customers return to the regulated market*

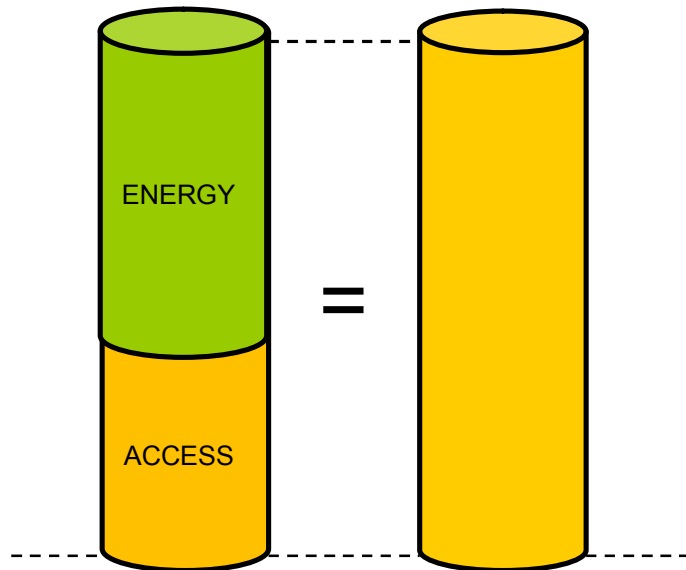
The tariff deficit

- **Ex ante deficit**

- ▶ Is one that recognizes, ex ante, an income deficit in regulated activities, establishing **access tariffs that are lower than access costs**.
- ▶ The objective is to increase the margins in retailing activity and thus encourage customers to return to the liberalised market after the reduced participation in the latter following the ex post deficits generated in 2005 and 2006.
 - ➔ *Ex ante deficit of regulated activities generated between 1 January 2007 and 31 December 2007.*
 - ➔ *Ex ante deficit of regulated activities generated between 1 January 2008 and 31 October 2008.*
- ▶ It is financed through a deficit auction

The tariff deficit

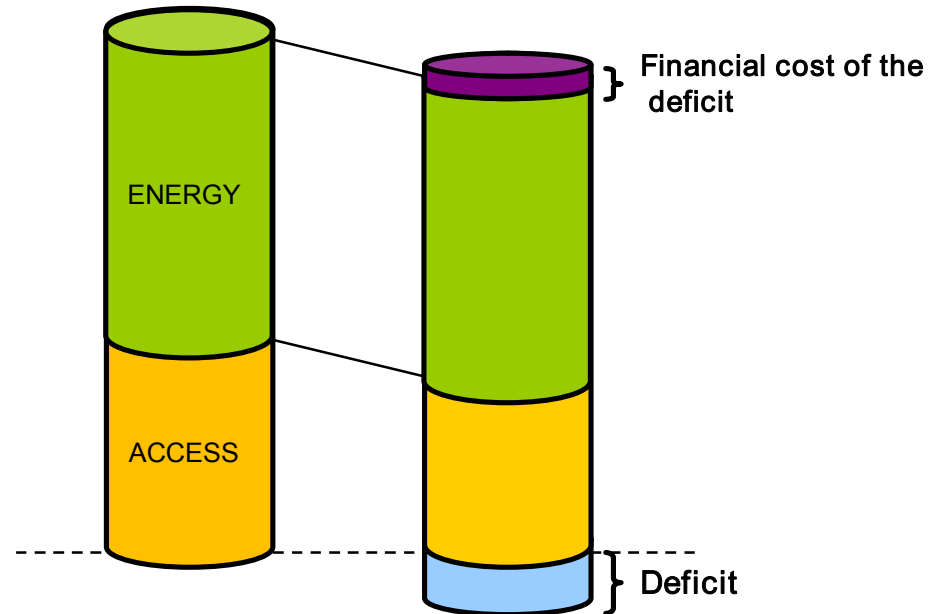
Additive scenario



Total Costs

Total Income

Real scenario

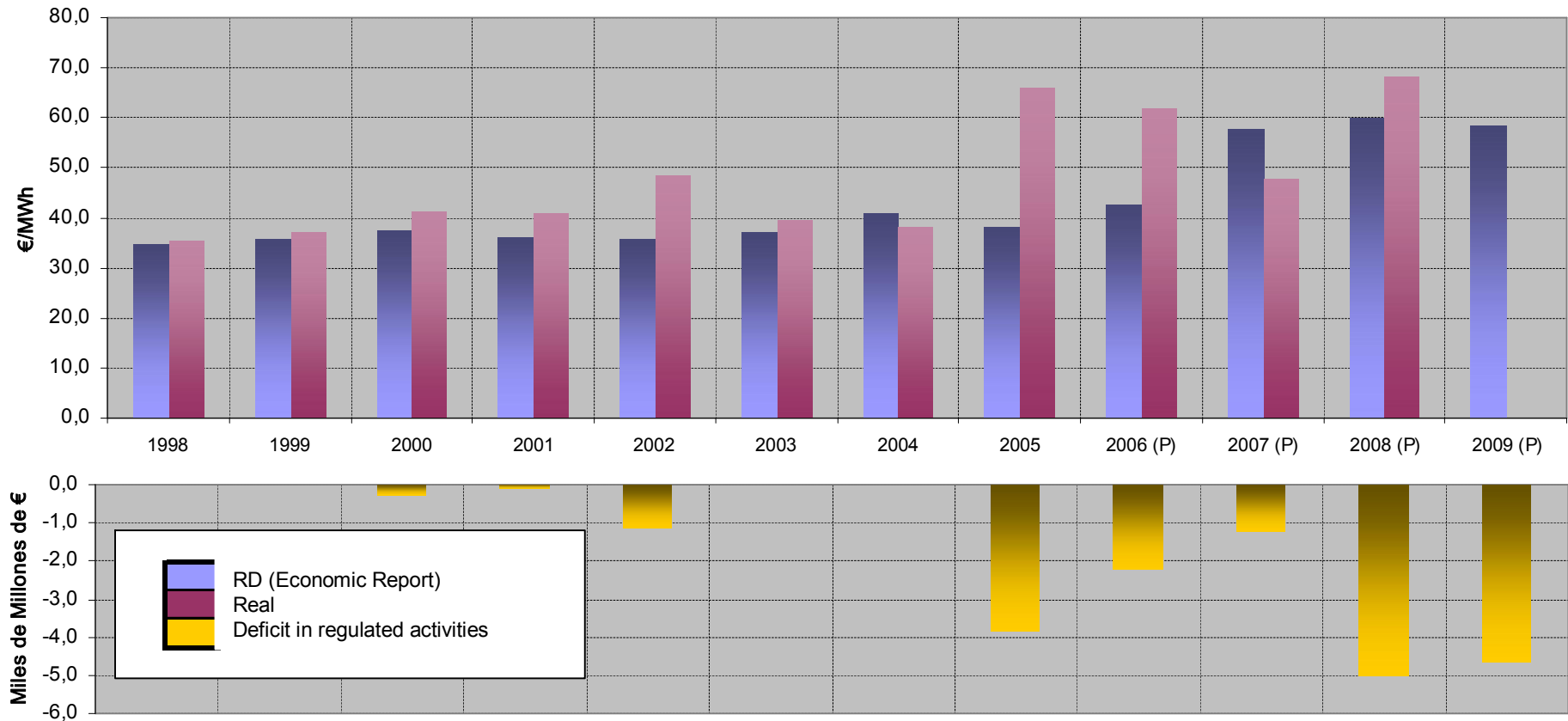


Total Costs

Total Income + Deficit

The tariff deficit

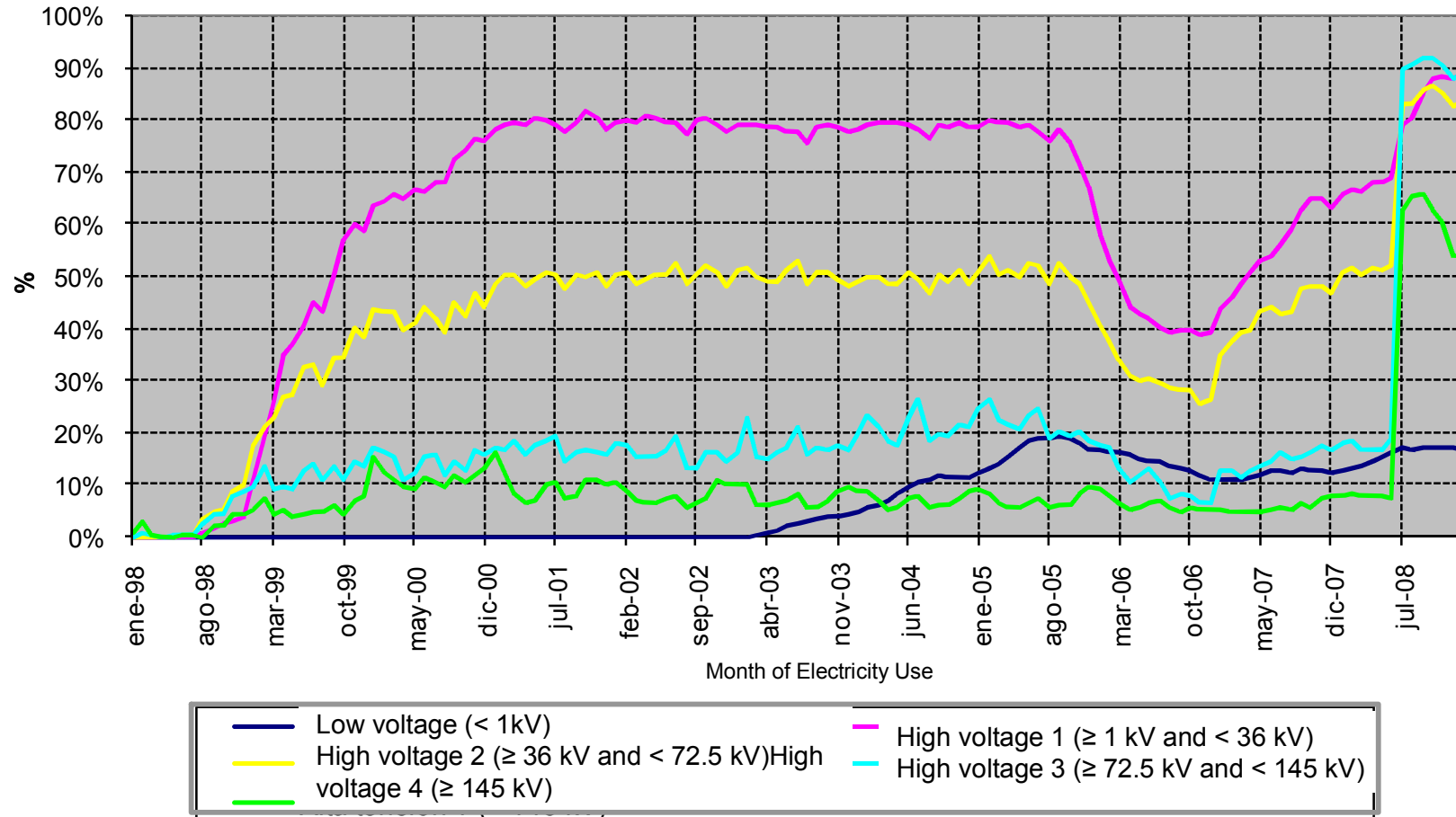
● Average distributors' price: Estimated vs Real. Years 1998-2009



Note: (P) Provisional

Evolution of the retail market

● Evolution of the retail market



Towards a new supply model. Last resort supply

- Directive 2003/54/EC, of 26 June 2003, concerning common rules for the internal market in electricity
 - ▶ *“Member States should ensure that household customers and, where Member States deem it appropriate, small enterprises, enjoy the right to be supplied with electricity of a specified quality at clearly comparable, transparent and reasonable prices”*
 - ➔ Small enterprises: Employeeing less than 50 persons, and an annual turnover not exceeding 10 million euros
 - ▶ *Member States may appoint a supplier of last resort. This supplier may be the sales division of a vertically integrated undertaking, that also performs the functions of distribution, provided that it meets the unbundling requirements of this Directive*

Towards a new supply model. Last resort supply

- Transposition of the Directive

- ▶ *Last resort tariff*

- ➔ Maximum and minimum prices that last resort retailers can charge customers who are subject to these tariffs in accordance with the current regulations for these tariffs.
- ➔ From 1 July 2009 : Low tension small customers, with less than 10 kW

- ▶ *Social Welfare*

- ➔ Customers with a contracted capacity of less than 3 kW in their main home
- ➔ Pensioners
- ➔ Families in which all members are unemployed
- ➔ Large families

- ▶ *Last Resort Retailers*

- ➔ In Spain the last resort supply obligation has been assumed by retailers which belong to the same business group to which the customer is connected.

Towards a new supply model. Last resort supply from 1 July 2009

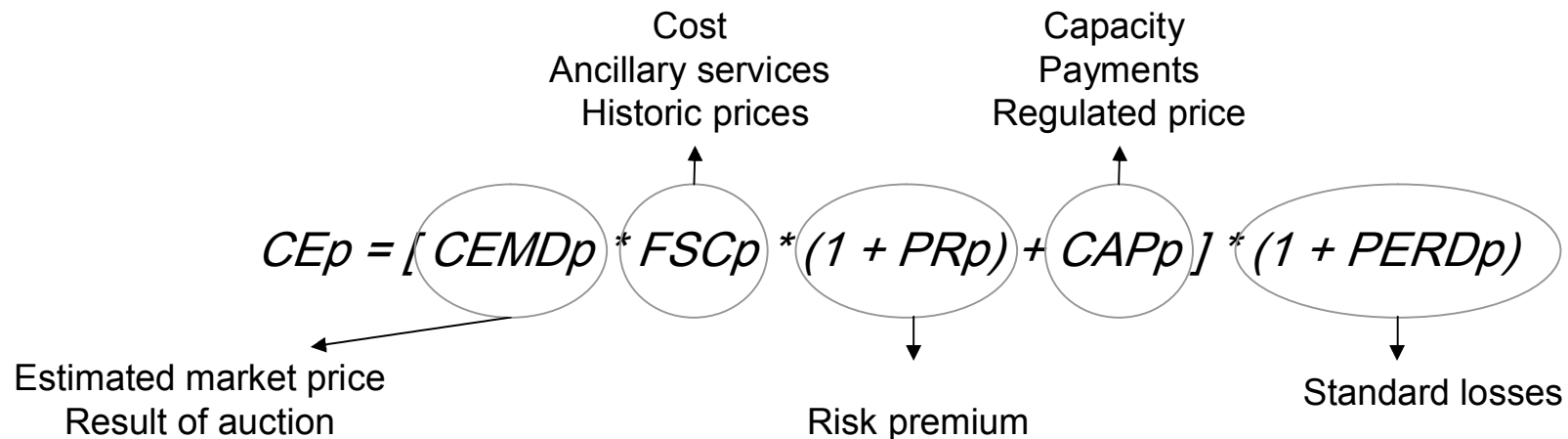
- Scope of application. 2008

	Customers on integral tariff		Customers on the market		Total	
Range of contracted capacity (P)	No. of customers (1)	Electricity used (MWh)	No. of customers (1)	Electricity used (MWh)	No. of customers (1)	Electricity used (MWh)
<i>P ≤ 10 kW</i>	<i>23.107.148</i>	<i>67.323.508</i>	<i>1.869.850</i>	<i>6.385.055</i>	<i>24.976.998</i>	<i>73.708.563</i>
Single time period	22.145.617	60.589.034	1.869.558	6.382.531	24.015.175	66.971.565
Different time periods	961.531	6.734.474	291	2.524	961.822	6.736.998
<i>10 kW < P ≤ 15 kW</i>	<i>754.637</i>	<i>11.168.550</i>	<i>37.157</i>	<i>512.287</i>	<i>791.794</i>	<i>11.680.837</i>
Single time period	580.179	6.736.239	36.575	504.812	616.754	7.241.051
Different time periods	174.458	4.432.311	583	7.475	175.041	4.439.785
<i>P > 15 kW</i>	<i>524.194</i>	<i>25.872.498</i>	<i>179.491</i>	<i>12.383.016</i>	<i>703.685</i>	<i>38.255.514</i>
<i>Low voltage total</i>	<i>24.385.979</i>	<i>104.364.557</i>	<i>2.086.498</i>	<i>19.280.357</i>	<i>26.472.477</i>	<i>123.644.914</i>
<i>High voltage total</i>	<i>28.647</i>	<i>46.018.478</i>	<i>72.281</i>	<i>89.089.008</i>	<i>100.928</i>	<i>135.107.486</i>
<i>System Total</i>	<i>24.414.626</i>	<i>150.383.034</i>	<i>2.158.779</i>	<i>108.369.365</i>	<i>26.573.405</i>	<i>258.752.399</i>
<i>Customers with a right to LRT</i>	<i>23.107.148</i>	<i>67.323.508</i>	<i>1.869.850</i>	<i>6.385.055</i>	<i>24.976.998</i>	<i>73.708.563</i>
<i>% of total LV</i>	<i>94,8%</i>	<i>64,5%</i>	<i>89,6%</i>	<i>33,1%</i>	<i>94,4%</i>	<i>59,6%</i>
<i>% of system total</i>	<i>94,6%</i>	<i>44,8%</i>	<i>86,6%</i>	<i>5,9%</i>	<i>94,0%</i>	<i>28,5%</i>

(1) Number of customers at 31 December 2008

Last resort tariff: Mechanism to determine the LRT

- ▶ *The LRT is the result of adding together access fees, retail margin and the estimated cost of energy*
- ▶ *The cost of energy is constructed from an estimation of the different components that make up its cost for a future period*



- ▶ *Retail margin is calculated as a fixed payment according to the contracted capacity*

Towards a new supply model. Last resort supply

- Implications of the new supply model

- ▶ *For consumers*

- ➔ Change in contractual relations
- ➔ Information campaigns for customers
- ➔ 1.3 million customers connected to low voltage will have to find a retailer

- ▶ *For the last resort retailer*

- ➔ Retail companies that belong to the same group as the distributor
- ➔ Obligation to supply customers with a right to LRT and those who temporarily do not have a retailer
- ➔ Information about customers who will be transferred to them
- ➔ Energy cost will be determined ex ante from the result of the base and peak load product auctions
- ➔ Customers without clock metres ⇔ Settlement using estimated profiles

- ▶ *For the distributor*

- ➔ Network and supply activities will be unbundled
- ➔ Supply information to last resort retailers about customers who will be automatically transferred.

Towards a new supply model. Last resort supply

- Implications of the new supply model

- ▶ *For the CNE*

- ➔ Implementation of information campaigns for customers
- ➔ Analysis of the effects of vertical integration on the new supply model
- ➔ Reinforcement of supervisory activities
 - Supervision of the market
 - Supervision of energy auctions
- ➔ Consumer defence office

- ▶ *Creation of Offices for switching suppliers*

- ➔ Function to supervise switches in suppliers in order to ensure transparency, objectivity and non-discrimination in procedures
- ➔ Need to develop procedures for switching suppliers.

The procedure for fixing the regulated prices

- Procedure for fixing the regulated prices

- ▶ *Directive 2003/54/EC of the European Parliament and of the Council concerning common rules for the internal market in electricity*
 - ➔ Regulatory authorities should fix or approve methodologies for calculating access tariffs
 - ➔ They may entrust the relevant body to develop such methodologies
- ▶ *Law 54/1997, of 7 November, of the Electricity Sector in the transposition into Law 17/2007, of 4 July.*
 - ➔ The Government shall decide upon the methodology for fixing prices
- ▶ *RD 485/2009, of 3 April, which governs the launching of the last resort supply in the electrical energy sector*
 - ➔ Methodology for calculating and revising last resort tariffs

The procedure for fixing the prices

- Functions of the CNE in relation to tariff calculations

- ▶ *Law 34/1998 on the Hydrocarbon Sector*

- ➔ First function. Government consultancy body
- ➔ Second function. To participate through proposals or reports in the process of drawing up the general regulations that affect the energy markets, and in particular the regulatory development of the Law.
- ➔ Fourth function. To participate through proposals or reports in the process of drawing up projects to determine tariffs and payment of activities in the sector.

- ▶ *RD 871/2007, of 29 June, which adjusts electricity tariffs from 1 July 2007*

- ➔ Quarterly revision of electrical tariffs for gas and electricity
- ➔ Annual revision of access tariffs

- ▶ *RD 485/2009, of 3 April,*

- ➔ The CNE will draw up a specific proposal on last resort tariffs

The procedure for fixing the prices

- CNE methodology for establishing tariffs

- ▶ *General principles*

- ➔ **Sufficiency:** Regulated prices must be sufficient to cover costs
- ➔ **Consistency:** Customers must pay coherently for the same services, regardless of whether they are on the regulated or liberalised market.
- ➔ **Efficiency:** Regulated prices must reflect the costs that the system incurs from supplies
- ➔ **Additive tariffs:** Tariffs must be the result of adding all costs incurred (cost of energy, access tariff, etc.)

- ▶ *Initial restrictions*

- ➔ Tariffs are common throughout Spain
- ➔ Cost assignment methodology
- ➔ Tariffs paid by customers

The procedure for fixing the prices

- CNE methodology for establishing tariffs

- ▶ *Assignment of access costs*

- ▶ Transmission and Distribution costs

- The cost is assigned in accordance with a network model
- It is assigned according to the design power

- ▶ Cost of distributors' TPA management

- These are assigned as a fixed payment per customer

- ▶ Costs paid by instalment

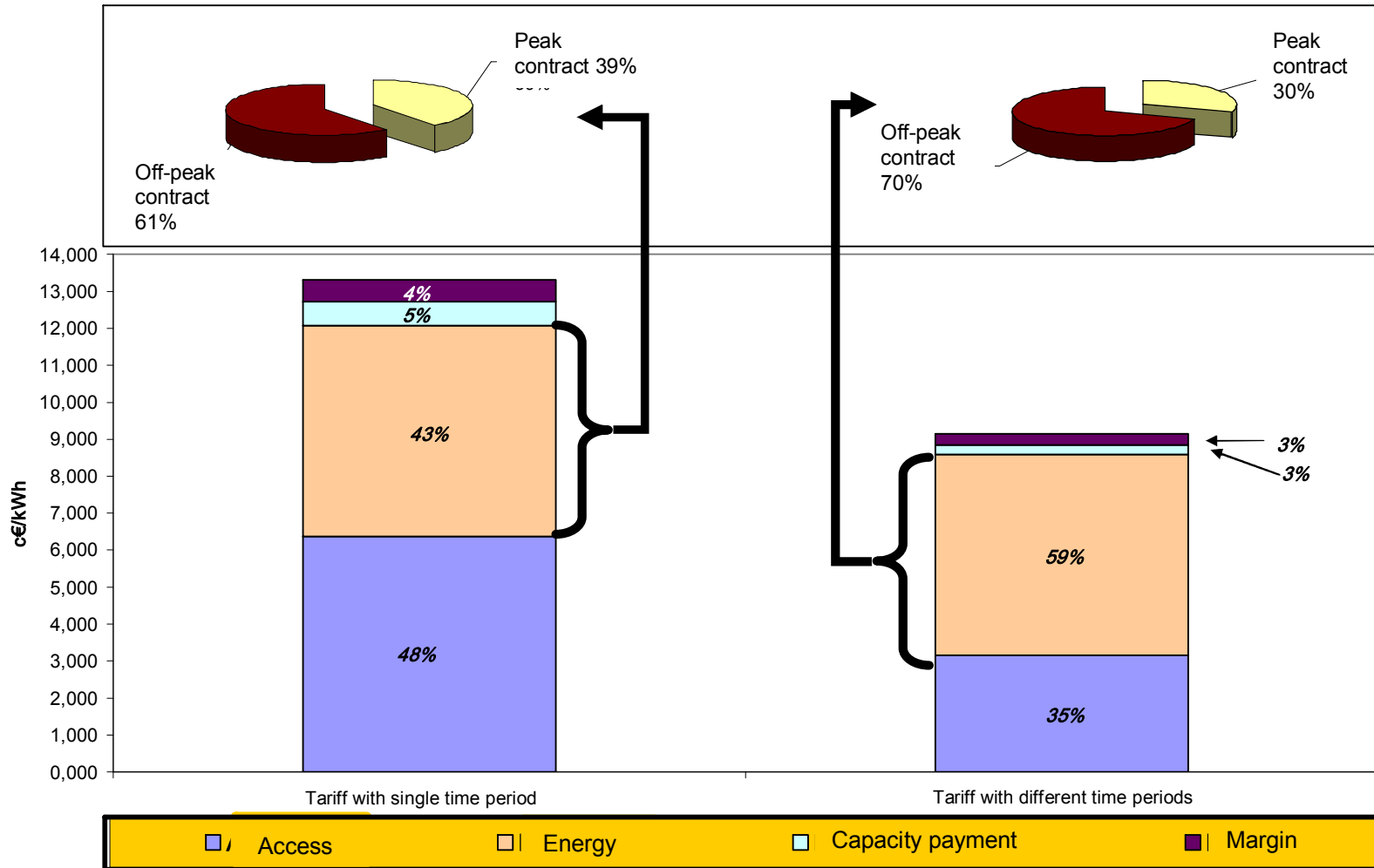
- These are assigned as a percentage of the fees for transmission and distribution

- ▶ Other costs

- These are assigned using the Ramsey rule (inversely proportional to the elasticity of demand in comparison with price)
- The elasticity is calculated from the coefficient of simultaneity at peak

Mechanism for determining the LRT (estimate)

- Assumption: LRT components for a standard customer, considering current fees, basic price of 40.50 €/MWh, peak price of 42.5 €/MWh in auctions and initial profiles



Perspectives

- Last resort supply implies an in-depth change in the supply model for customers.
- The success of the new supply model will depend on the following aspects
 - ▶ *Implementation of information campaigns for customers*
 - ▶ *Development of tools to permit customers to compare prices*
 - ▶ *Development of procedures for switching suppliers*
 - ▶ *Methodology for establishing access tariffs*
 - ▶ *Implantation of clock meters*