RED ELÉCTRICA DE ESPAÑA

Workshop on Demand Side Management

Ankara,
22-23 November 2007

RED ELÉCTRICA DE ESPAÑA

The Spanish case: experiences on DSM & implementation of European Directives

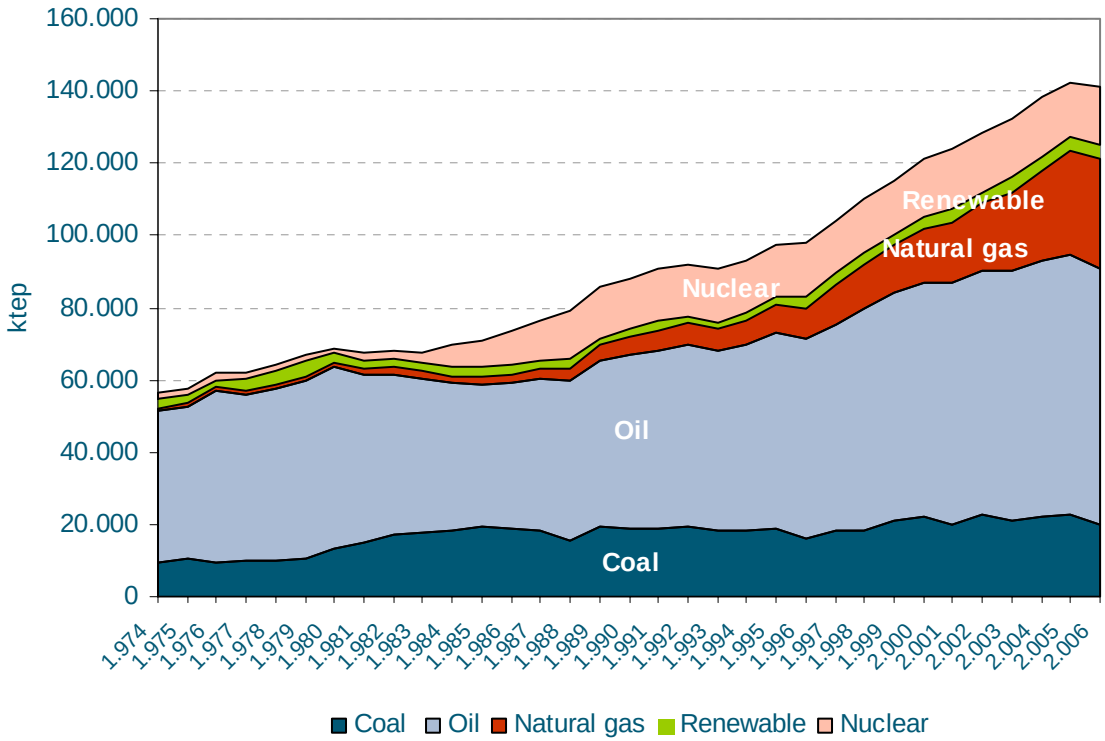
Ankara, 23 November 2007

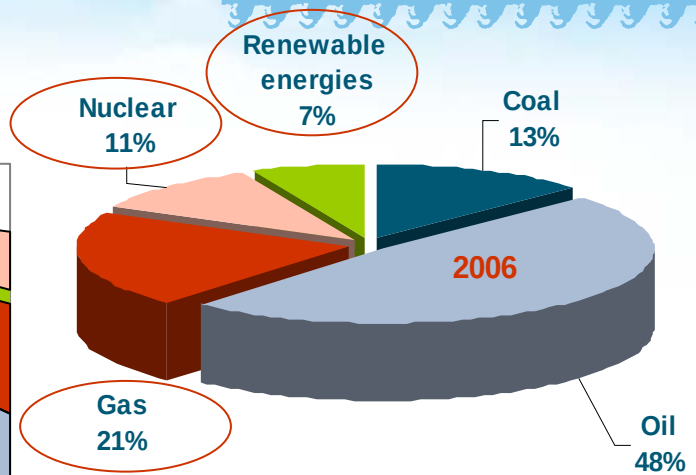
Beatriz Gómez Elvira, Demand Side Management Dept.

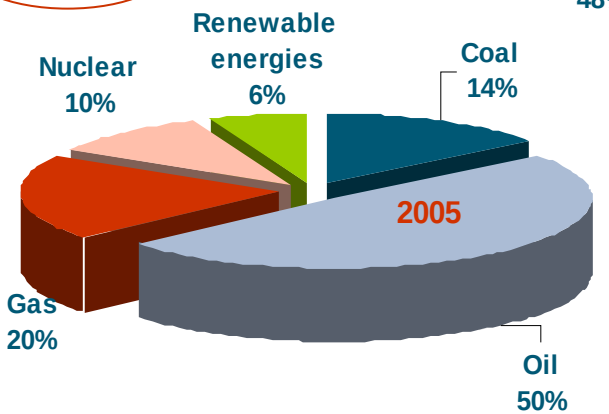
Summary

1. Energy consumption in Spain
2. Electricity consumption in Spain
3. DSM initiatives

Primary energy consumption



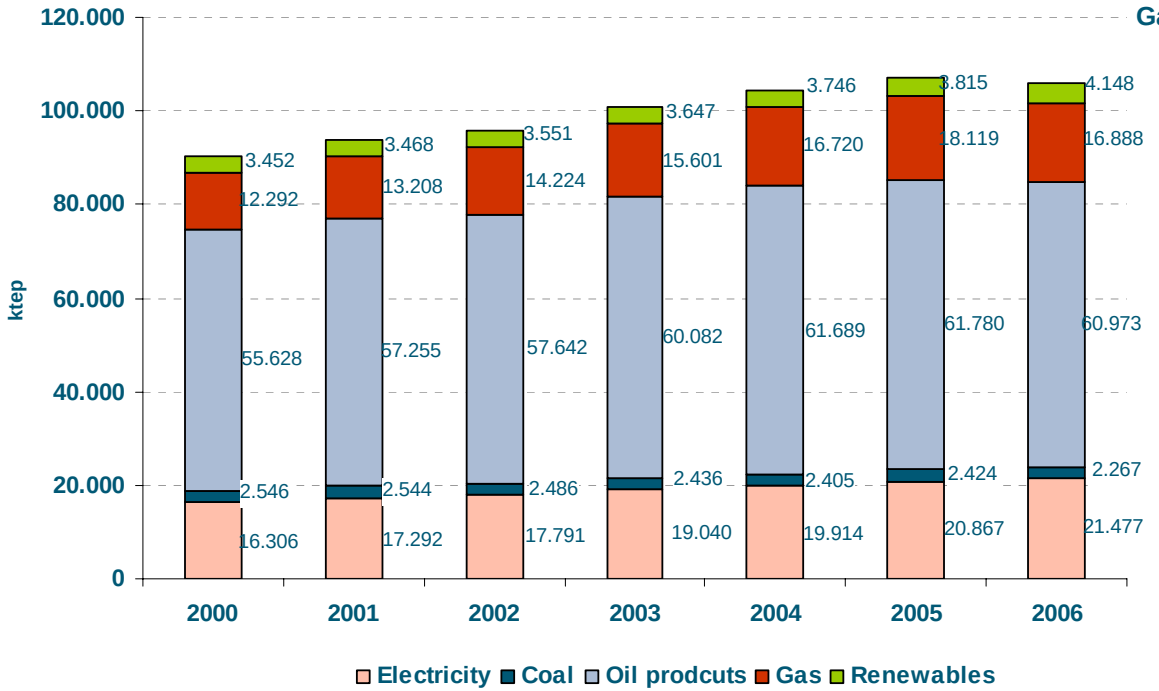


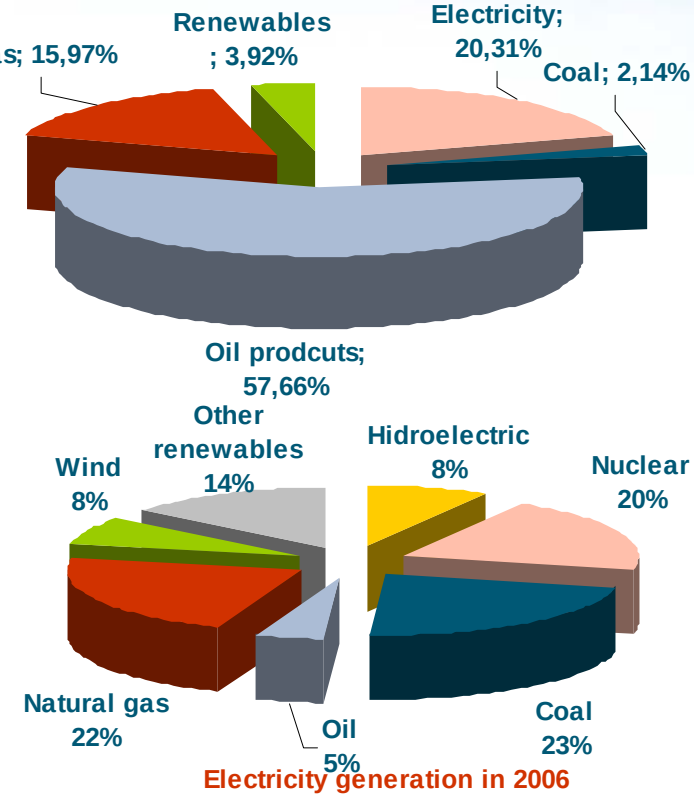


- High and increasing dependency on oil and gas (71,7%) representing more than 80% of external dependency, higher than the European average (50%)
- Slight decrease in 2006

Source: Boletín coyuntura energética y La energía en España 2006

Final energy consumption: generation side



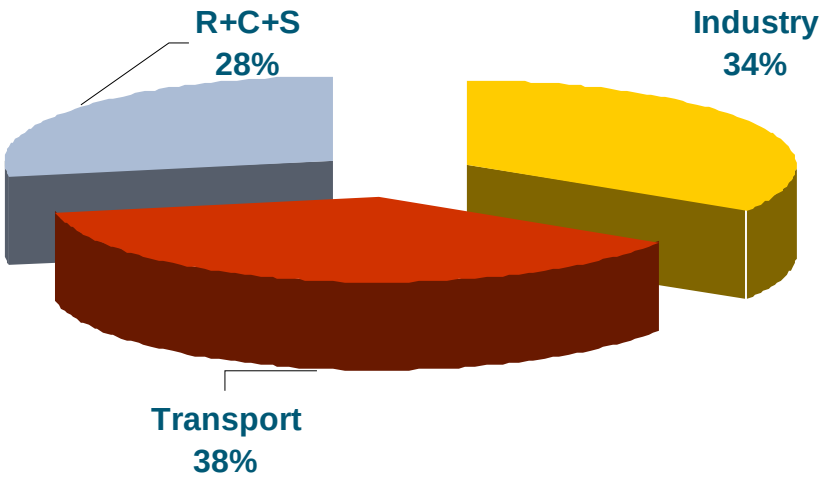


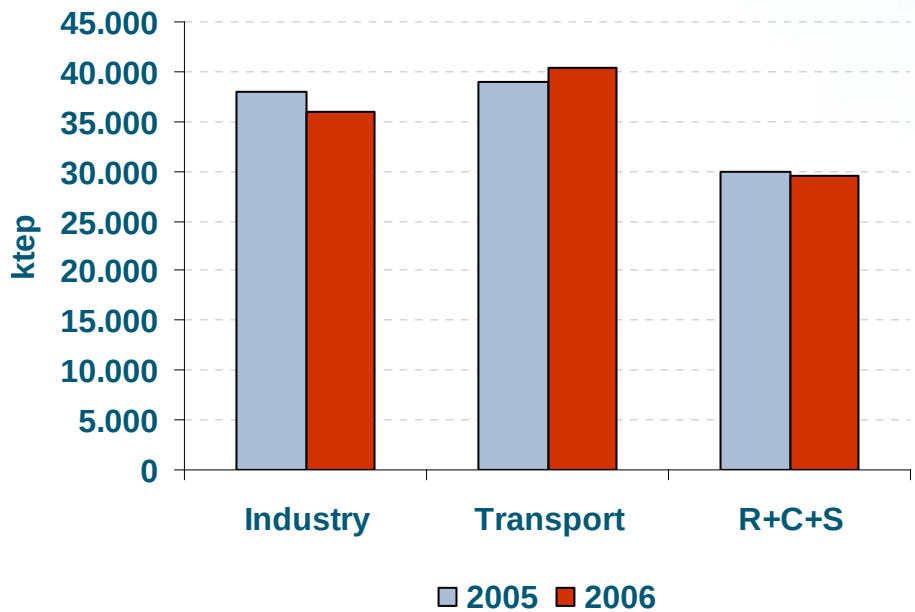
- Final energy consumption: Oil represents almost 60%
- 20% electricity share in final energy consumption
- Slight decrease in 2006: increase in energy efficiency

Source: La energía en España en 2006 (MITyC) y Boletín Octubre 2006 IDAE

Final energy consumption: demand side

Final energy consumption by sector in 2006

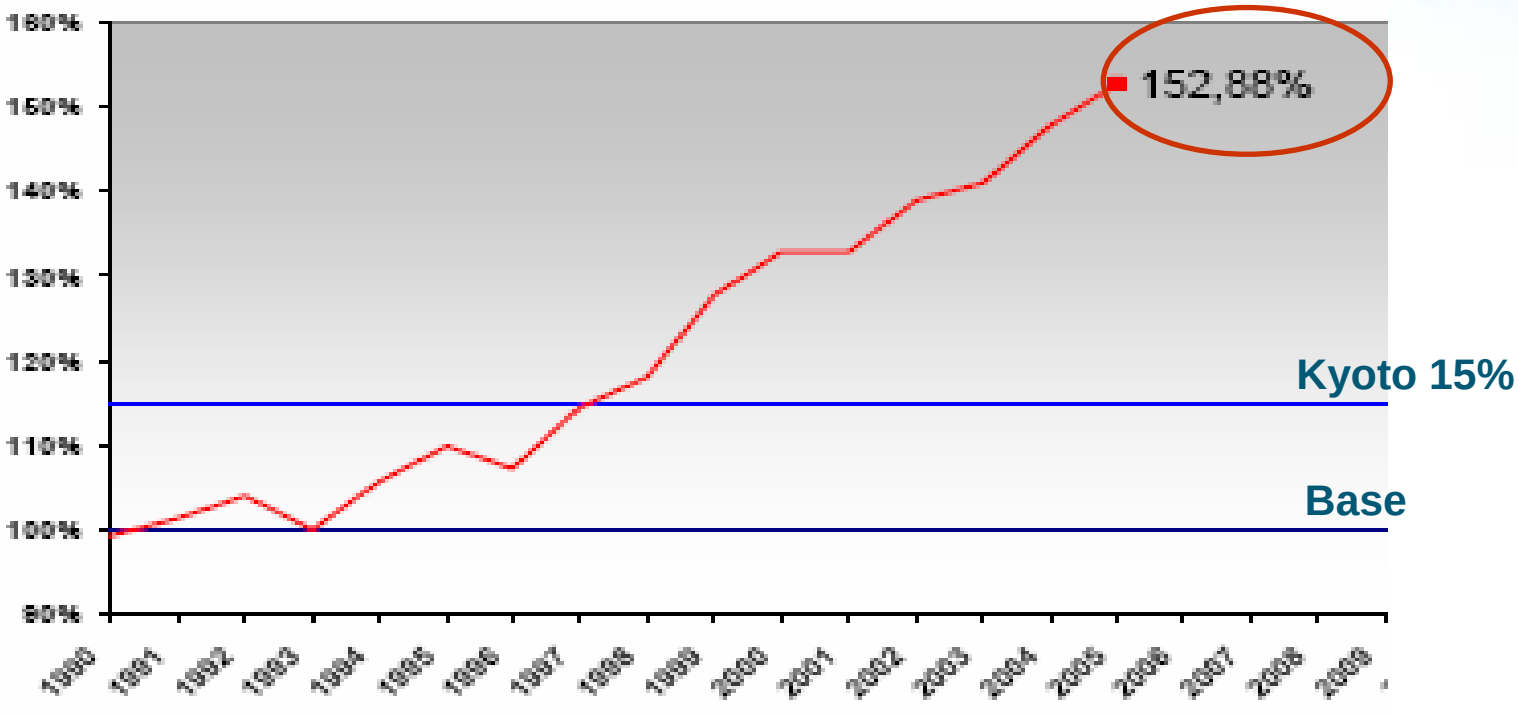




- Transport is the main sector in energy consumption (oil)
- Electricity is consumed mainly by industries and residential, commercial and services

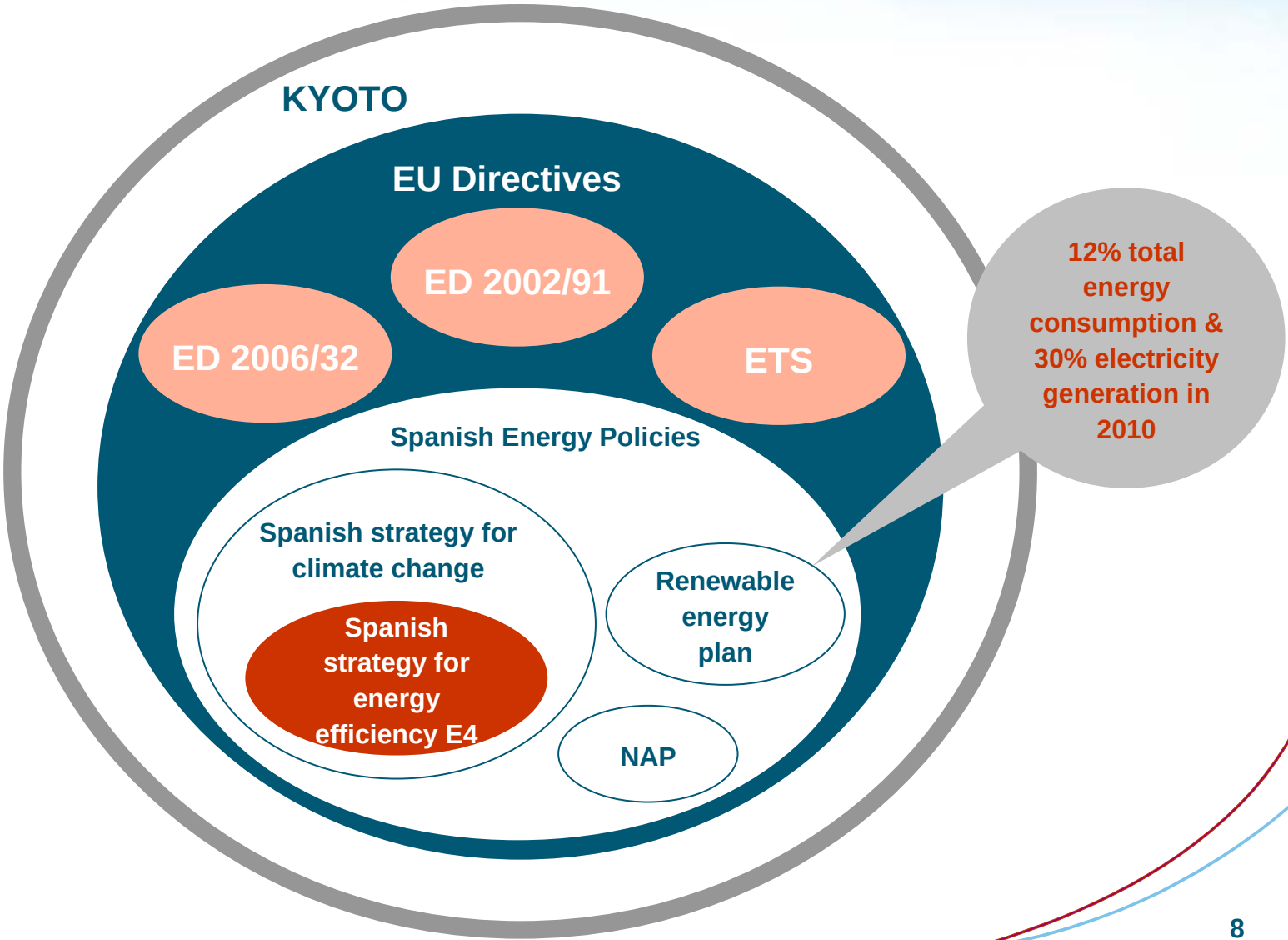
Source: La energía en España en 2006 (MITyC) y Boletín Octubre 2006 IDAE

Greenhouse gas emissions



- Over 52% higher than the base year in 2005
- Kyoto commitment was to keep emissions below 15%
- Government target for 2008-2012 period: 37%

Energy Efficiency framework



Spanish strategy for energy efficiency (E4)

2004

Priority measures aimed to reducing growth rates in consumption and energy intensity indicators and to highlight the path for the present plan.

Coordination of local authorities and central government

More than 24 measures

Top-down methodology

2007

11% energy saving in 2012

59 measures

Bottom-up methodology

Energy Efficiency initiatives: E4

	ENERGY SAVING 2008-2012		AVOIDED EMISSIONS (ktCO2) 2008-2012
	FINAL	PRIMARY	
Industry	17.364	24.750	59.165
Transports	30.332	33.471	107.479
Buildings	7.936	15.283	35.540
Residential & offices	1.729	4.350	9.288
Agriculture	1.402	1.634	5.112
Public sector	691	1.739	3.712
Energy transformation	0	6.707	17.834
Dissemination	0	0	0
TOTAL	59.454	87.934	238.130

Energy Efficiency initiatives: E4

	Help to investment	Promotion	Training	Total	Regulation
Agriculture and fishing	5	2		7	1
Buildings	4			4	1
Residential and offices	2			2	
Industry	2	1		3	1
Public Services	3		1	4	1
Transports	12		3	15	12
Energy transformation	7			7	1
Total	36	3	4	42	17

Energy Efficiency initiatives

Some energy efficiency urgent measures…

RESIDENTIAL, COMMERCIAL & INSTITUTIONS

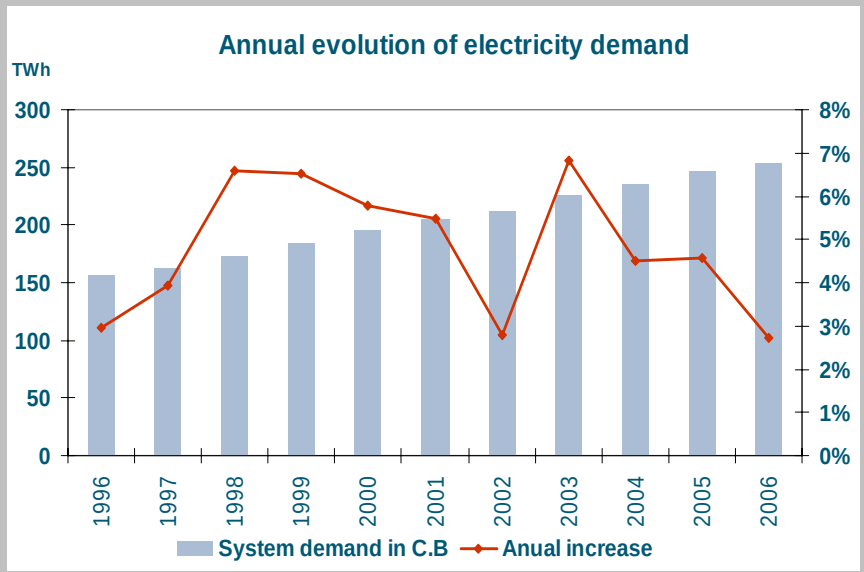
- **Regulations for thermal installation in buildings**
- **Incandescence bulbs substitution**
- **Strategy for energy efficiency in buildings**
- **Saving and energy efficiency and renewable energies in public buildings**
- **Public lighting**
- **Dissemination campaign for energy efficiency and labeling**
- ***Electricity meters***

Summary

1. Energy consumption in Spain
2. Electricity consumption in Spain
3. DSM initiatives

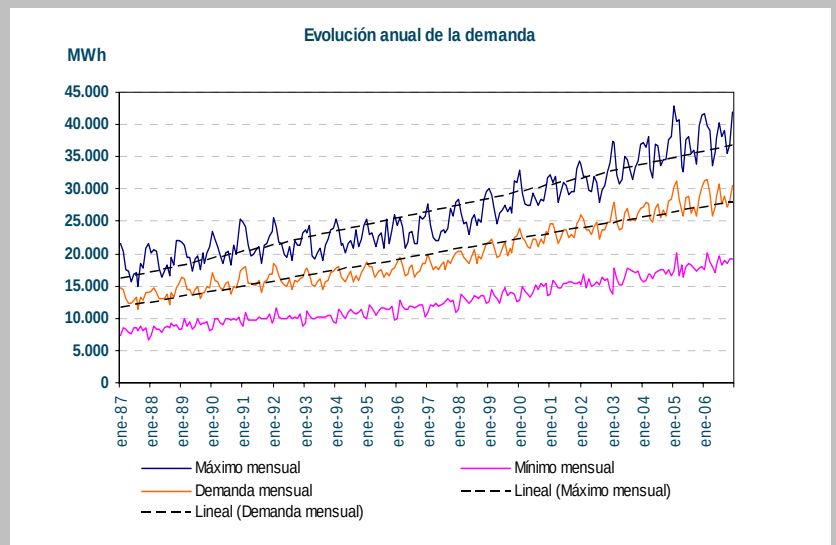
Load Demand in Spain

1 High increase



5% Average Interannual increase since 1996

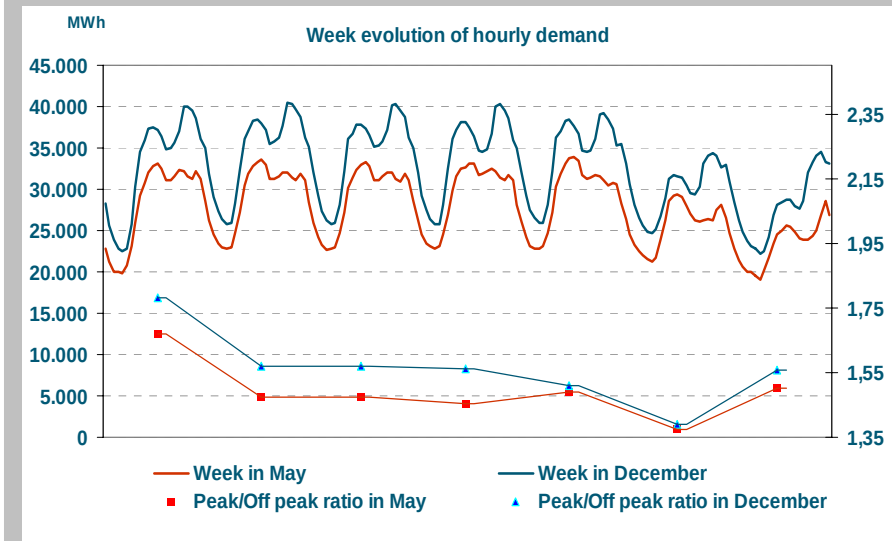
2 Interannual increase of peak load



Higher peak load increase than energy increase

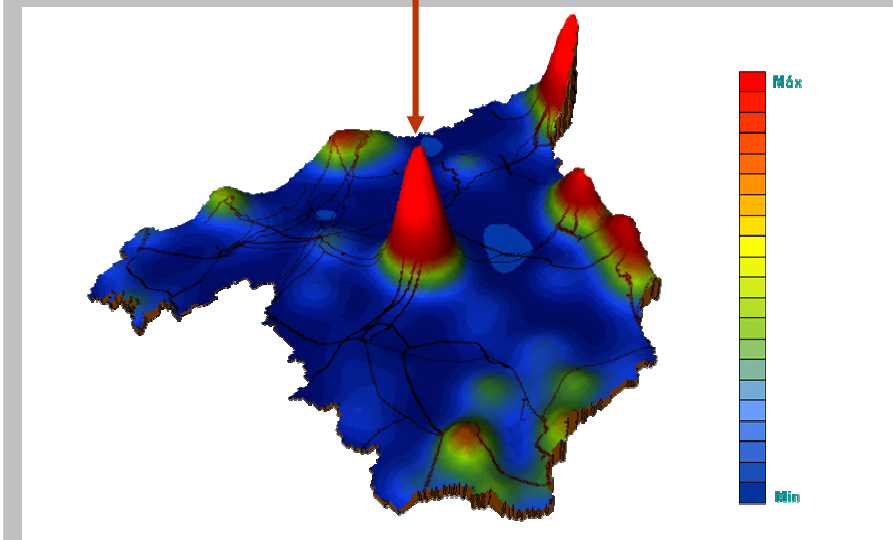
Load Demand in Spain

3 Big variations in daily demand



Peak/off peak ratio between 1,35 and 1,75

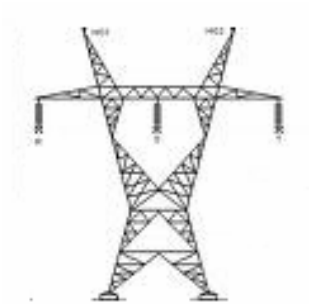
4 High demand concentrated in specific areas



Concentrated around city areas

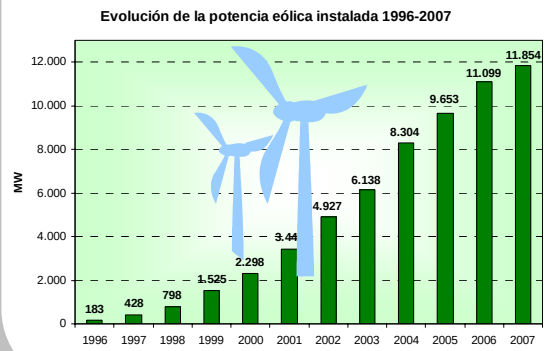
Challenges

Need of network reinforcement



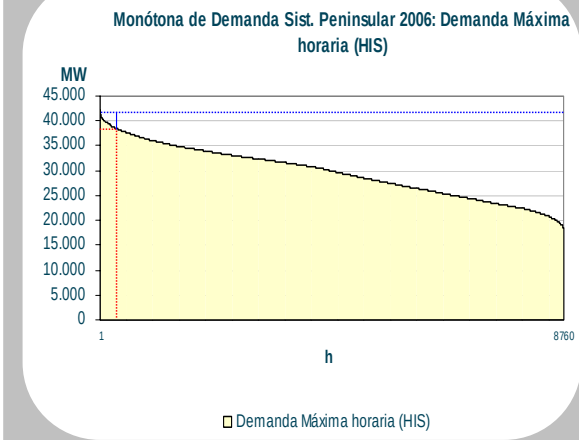
Big difficulties for developing new infrastructures

Difficult to integrate renewable energies



22.000 MW of Wind power installed in 2.010

Over capacity to cover peak load



3.700 MW needed to cover 300 hours of maximum demand

Summary

1. Energy consumption in Spain
2. Electricity consumption in Spain
3. DSM initiatives

DSM legal framework in Spain under regulated tariffs

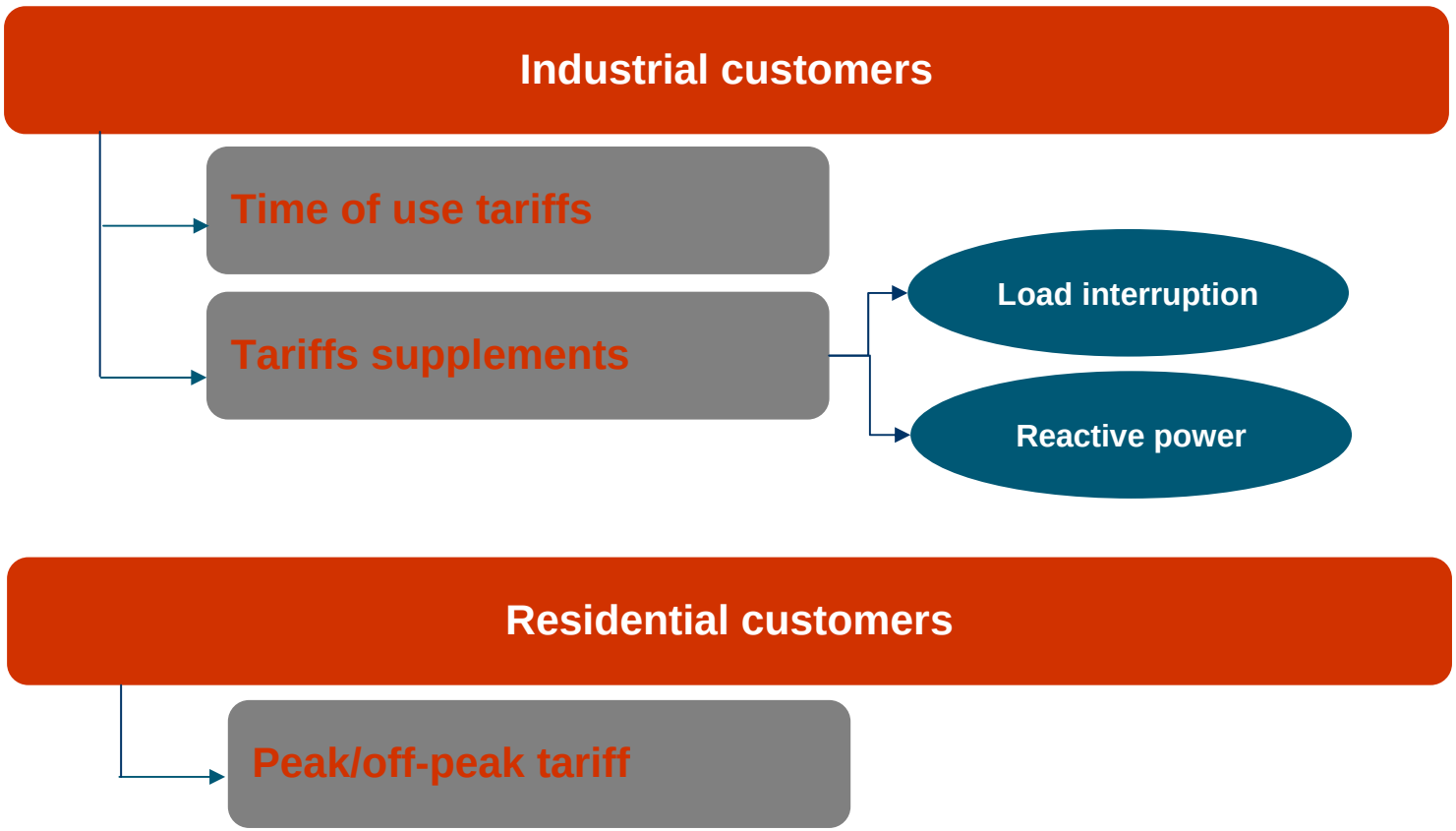
1997, Electricity sector Act

Public finance for DSM pilot projects and public call for installation of hourly meters in residential sector

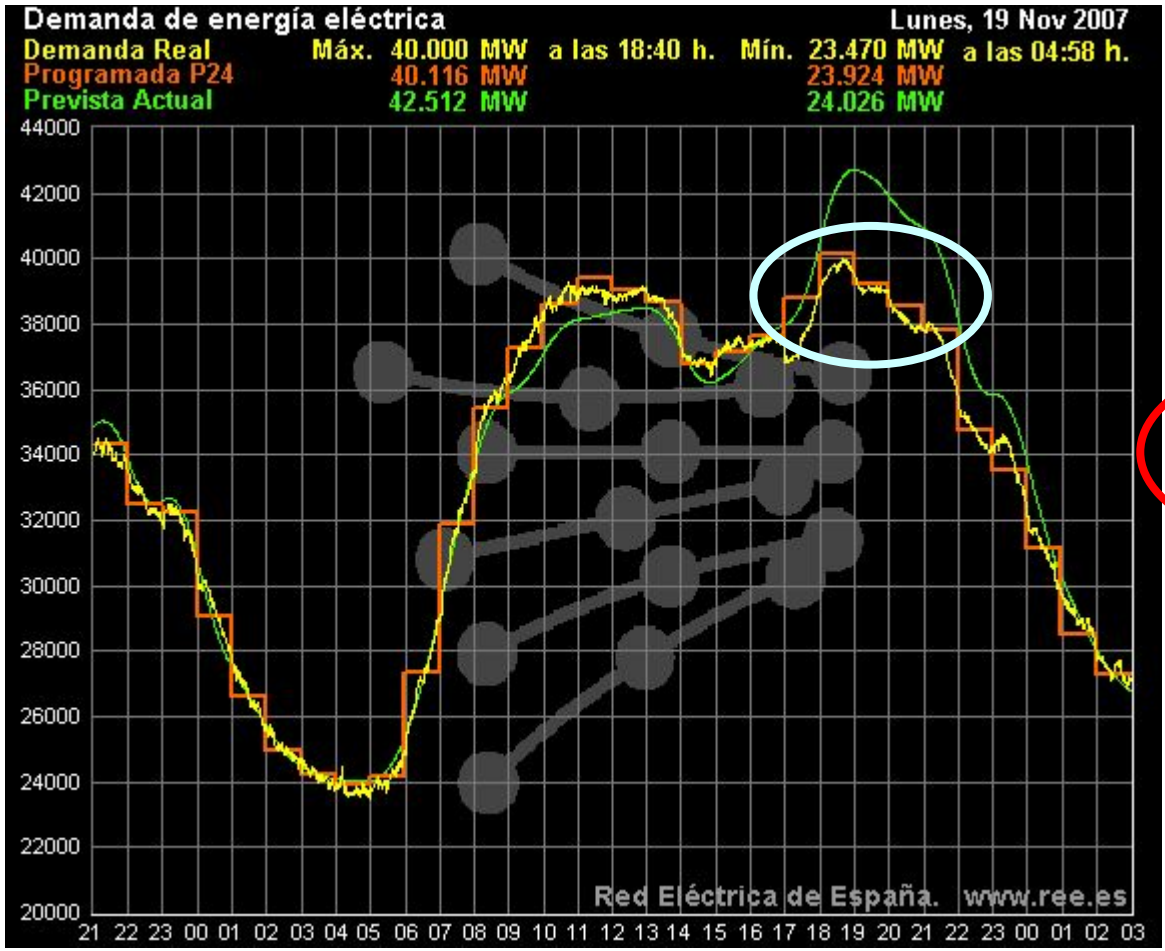
2007, Electricity Sector Act Revision

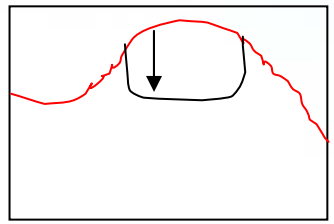
ED 2003/54

DSM initiatives under regulated tariffs



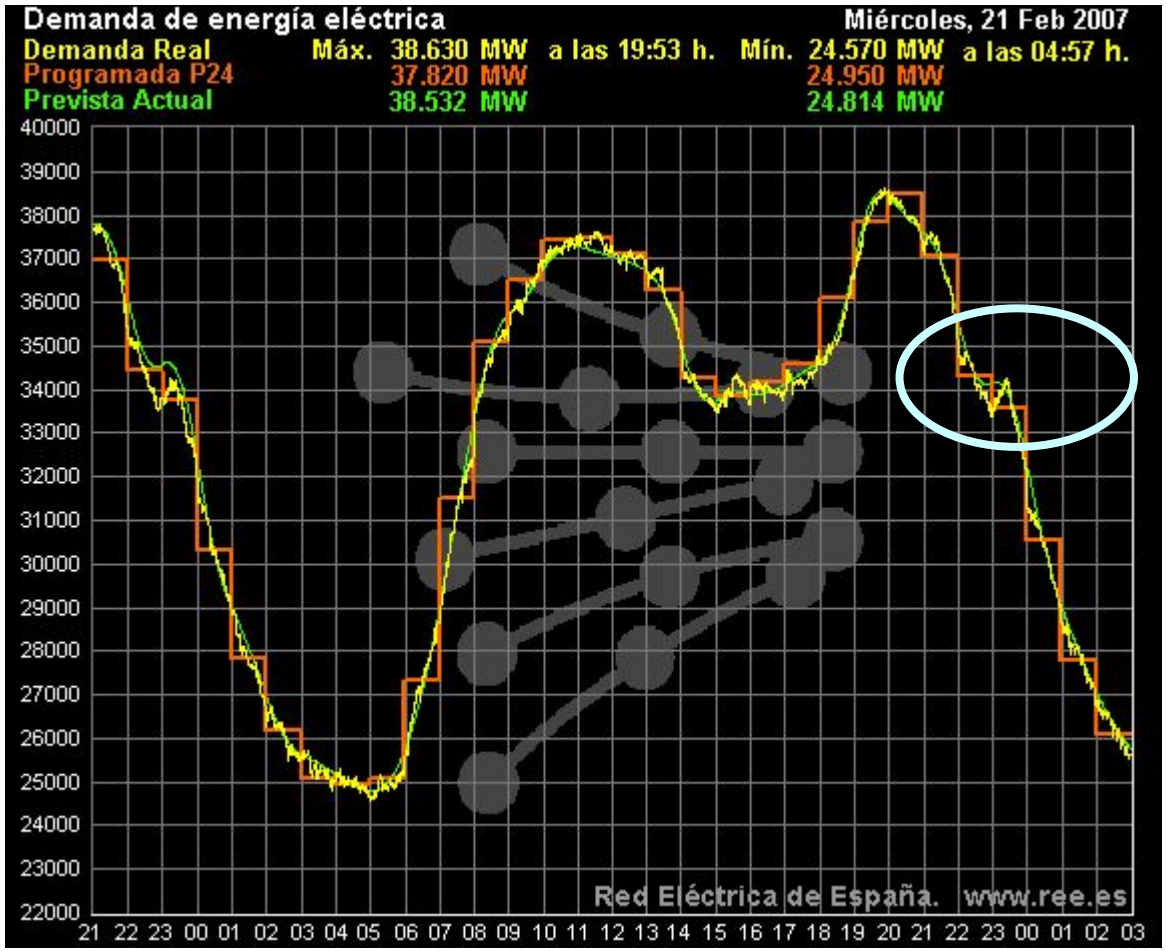
Demand response in Spain

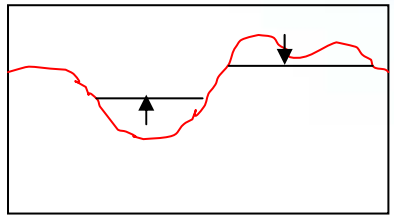




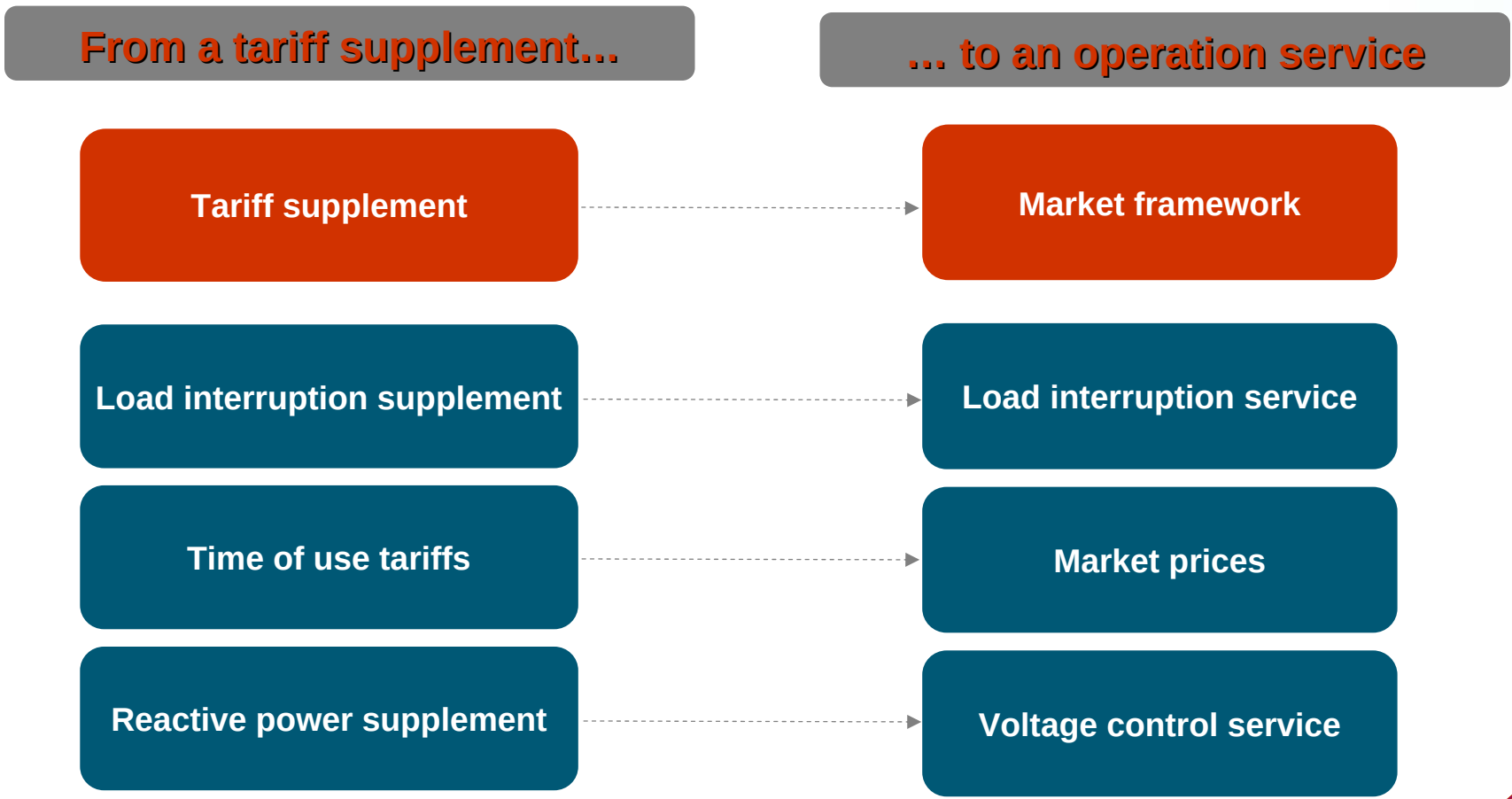
✓Load interruption order between 17:40 and 22:00

Peak/off-peak residential tariff

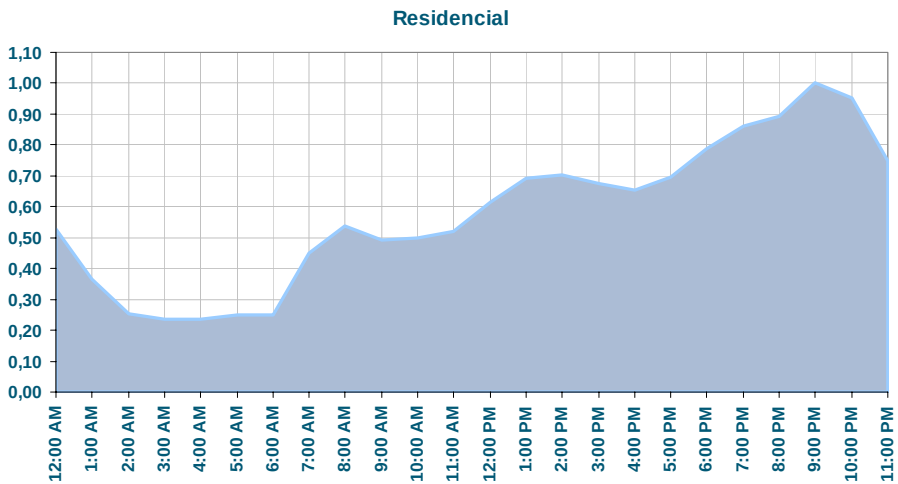


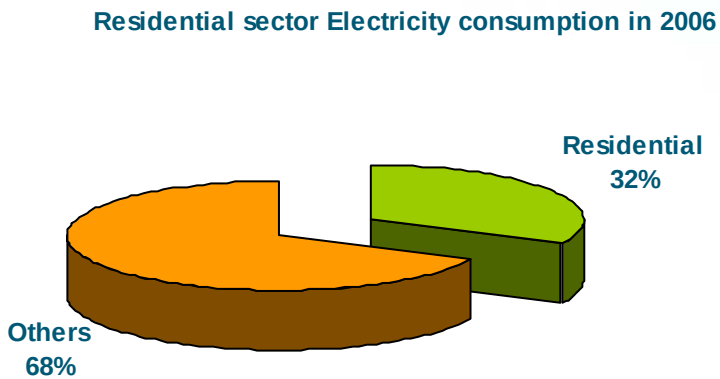


DSM in the market



Expectations and future trends: Residential sector





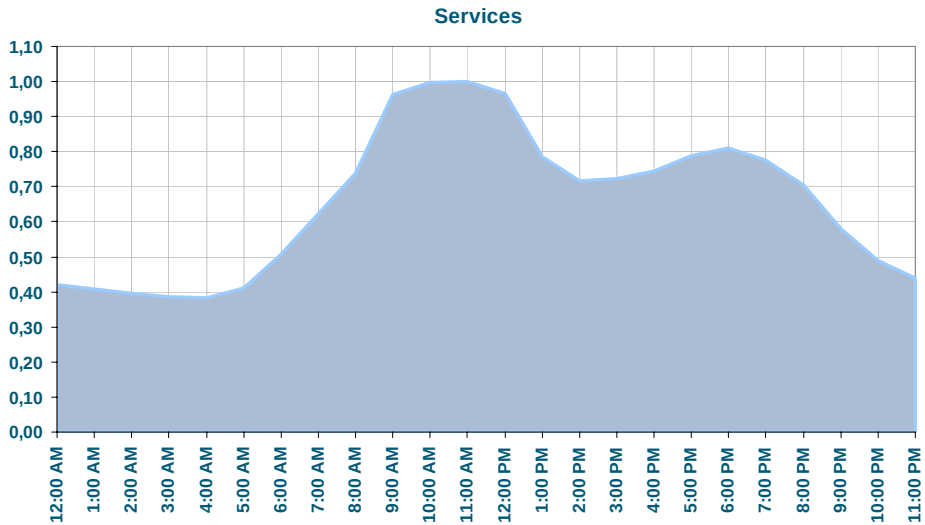
- **Improvement of metering and operation equipment *[ED 2006/32 (Art.13)]:***

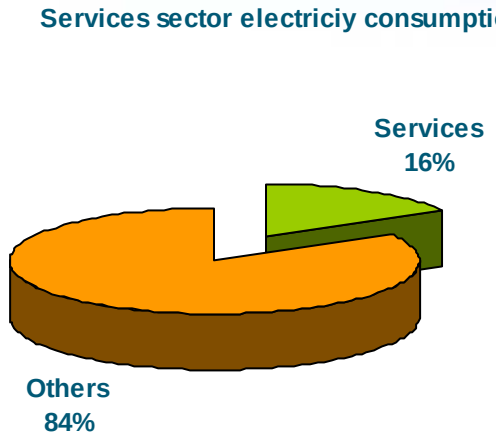
  Regulation contemplates providing residential customers with metering appliances integrated in a system with demand management capacity aimed at reducing load under critical circumstances.

- **Feed-back on consumption:**

  Development of ED 2006/32 (Art.13): Final customers should get information about their energy consumption in order to allow them regulate their own energy consumption.

Expectations and future trends: Services





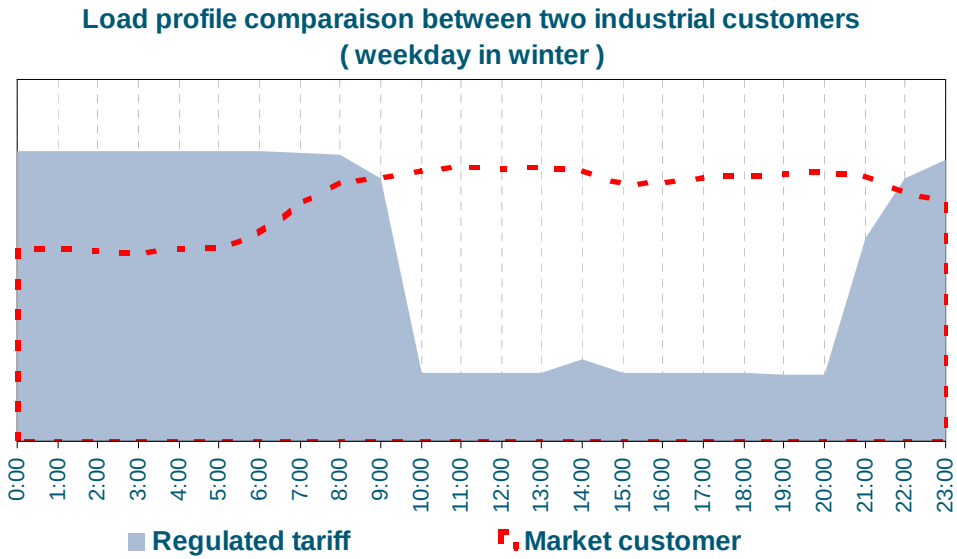
- **Energy saving:**

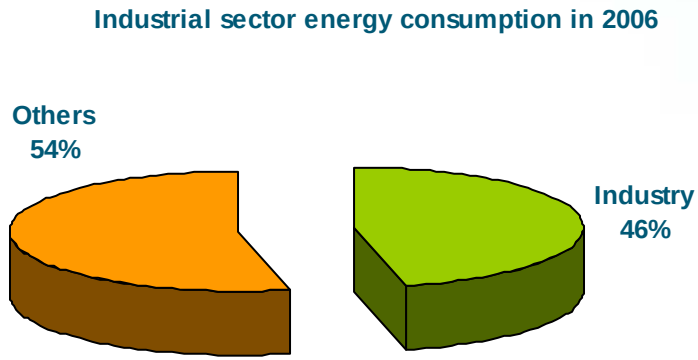
  Energy saving requirements based on: limitation of electricity demand, performance of thermal installation, efficient lighting systems, solar minimum contribution to hot water and PV minimum contribution to electric energy.

- **Energy efficiency certificates:**

  Energy efficiency certificates for new buildings: Methodology taking into account final hourly energy consumption that will provide information of final use profiles.

Expectations and future trends: Industrial sector





- **Disappearance of regulated tariffs for high voltage customers in 1/07/2008:**

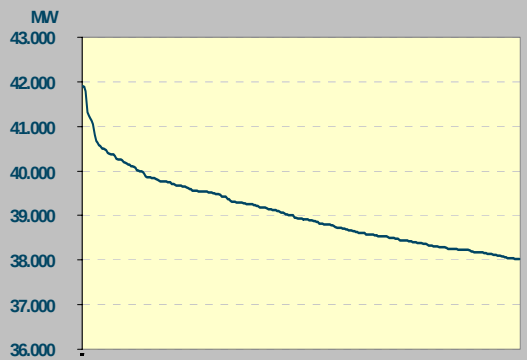
  It may lead to the lost of modulation for the whole sector due to the lost of incentives introduced by tariff supplements (time of use tariffs).

- **Energy Audits *[ED 2006/32 (Art.12)]*:**

  They will allow detecting potential in saving and best practices in the industrial sector.

Conclusions

Deferring of the need of network augmentation



Maximum integration of renewable energies into the network

CO2 emissions reduction

Deferring investment in network infrastructures, integration of renewable energies and CO2 emissions reduction contribute to electricity system sustainability.

RED ELÉCTRICA
DE ESPAÑA

www.ree.es

Beatriz Gómez Elvira

bgomez@ree.es