Renewable Energy in Spain: The Payment for the Electric Production Activity from Solar Photovoltaic Technology

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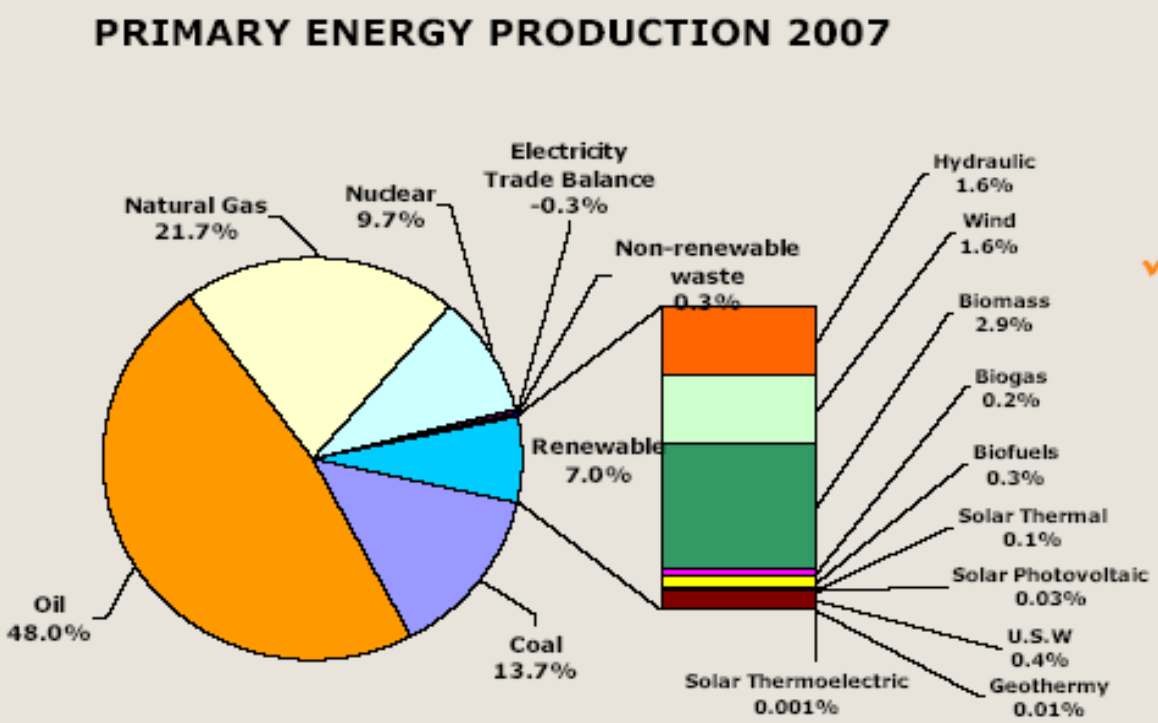
Why Spain for Renewable Energies?

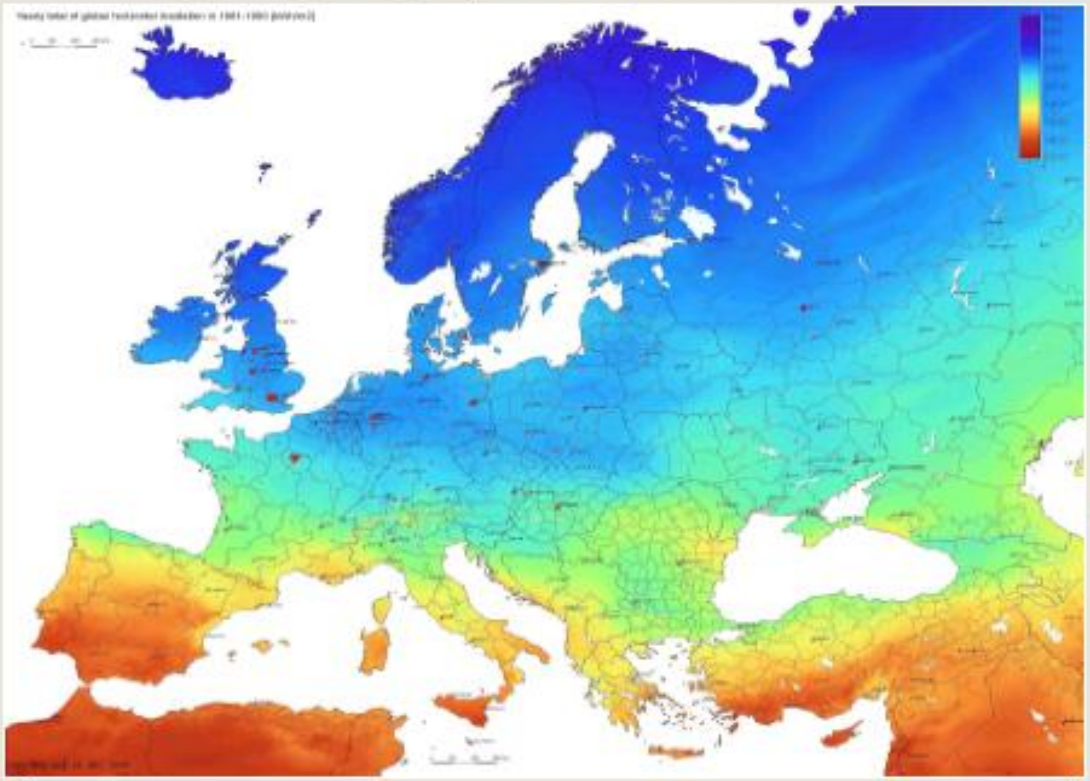


Source: MITYC/idae, 2007

- ✓ Spain is far more energy dependant than other European countries
- ✓ By 2010, Renewable Energy Sources should account for:
  - **12.1% of total energy consumption**
  - **30.3% of electricity production**
  - **Biofuels will represent 5.83% of diesel and petrol consumption in the transport sector**

RE Drivers: Natural Resources

Privileged geographic situation and climatic conditions



FUENTE: Šúri M., Huld T.A., Dunlop E.D. (2005). PV-GIS: a web-based solar radiation database for the calculation of PV potential in Europe. International Journal of Sustainable Energy, 24, 2, 55-67

- Favourable conditions for development of both on-shore and off-shore wind energy :
  - 2,200 hours
  - Off-shore potential:1 GW
- Solar Resource: Spain enjoys best irradiance levels in Europe

RE Drivers: Legal Framework

Fuente: INM .Generado a partir de isolíneas de radiación solar global anual sobre superficie horizontal.

CLIMATIC ZONES:

Zone 1: H < 3.8

Zone 2: 3.8 ≤ H <4.2

Zone 3: 4.2 ≤ H < 4.6

Zone 4: 4.6 ≤ H<5.0

Zone 5: H ≥ 5.0

H: kWh/m^2·día

- Technical Building Code

✓ Section HE-4: regulates solar thermal energy use:

All new and **refurbished houses** will include solar thermal installations to cover a minimum percentage of the domestic hot water. This **percentage** varies (30%-70%) depending on:

the climate area
buildings demand of hot water (litres/day)
Type of fuel to substitute

✓ Sección HE5 regulates the PV installations on buildings depending on: size, use (industrial, commercial or logistic) and the climatic area.

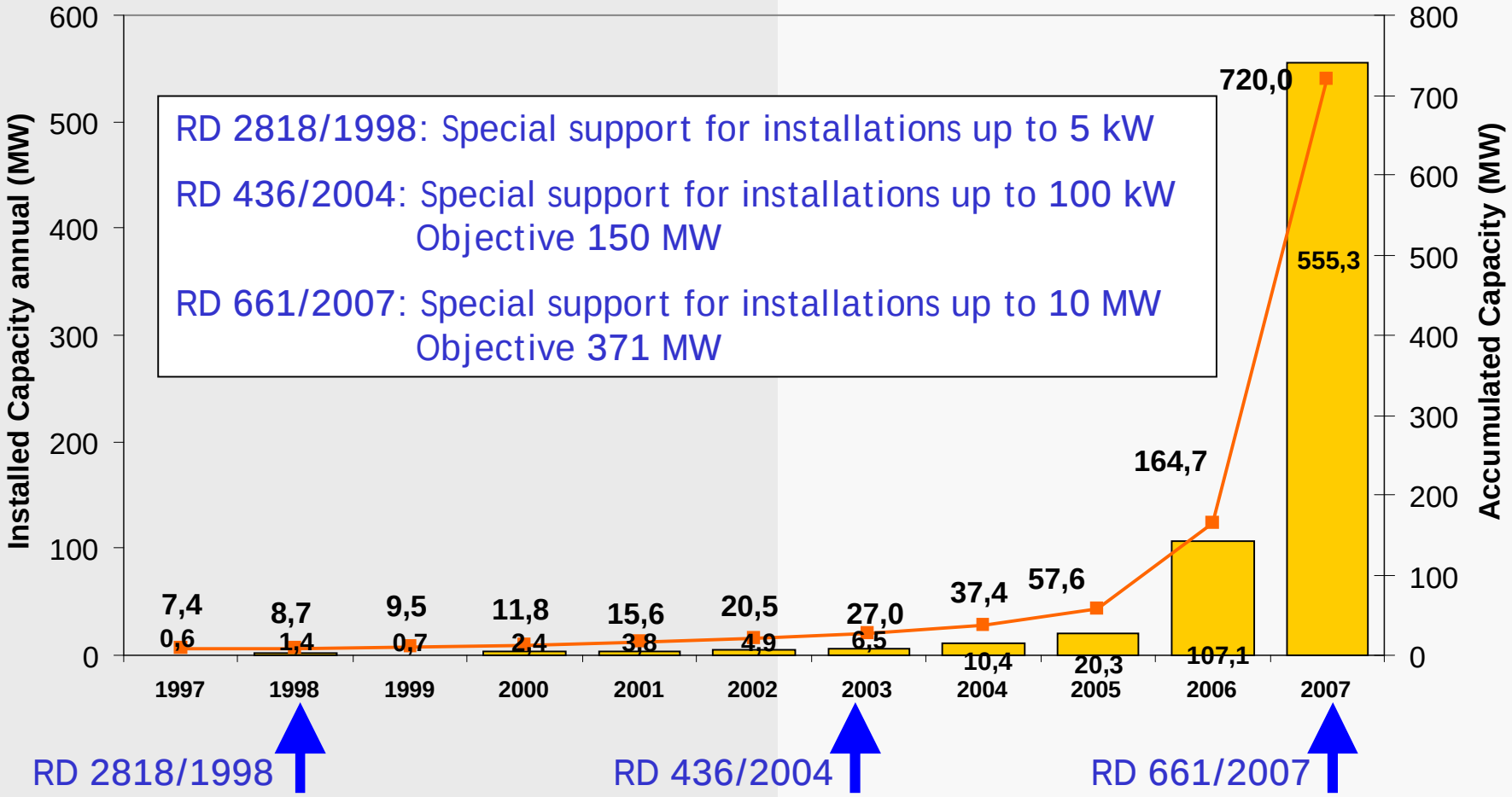
- Municipal Solar Bylaws

RE Drivers: Legal Framework

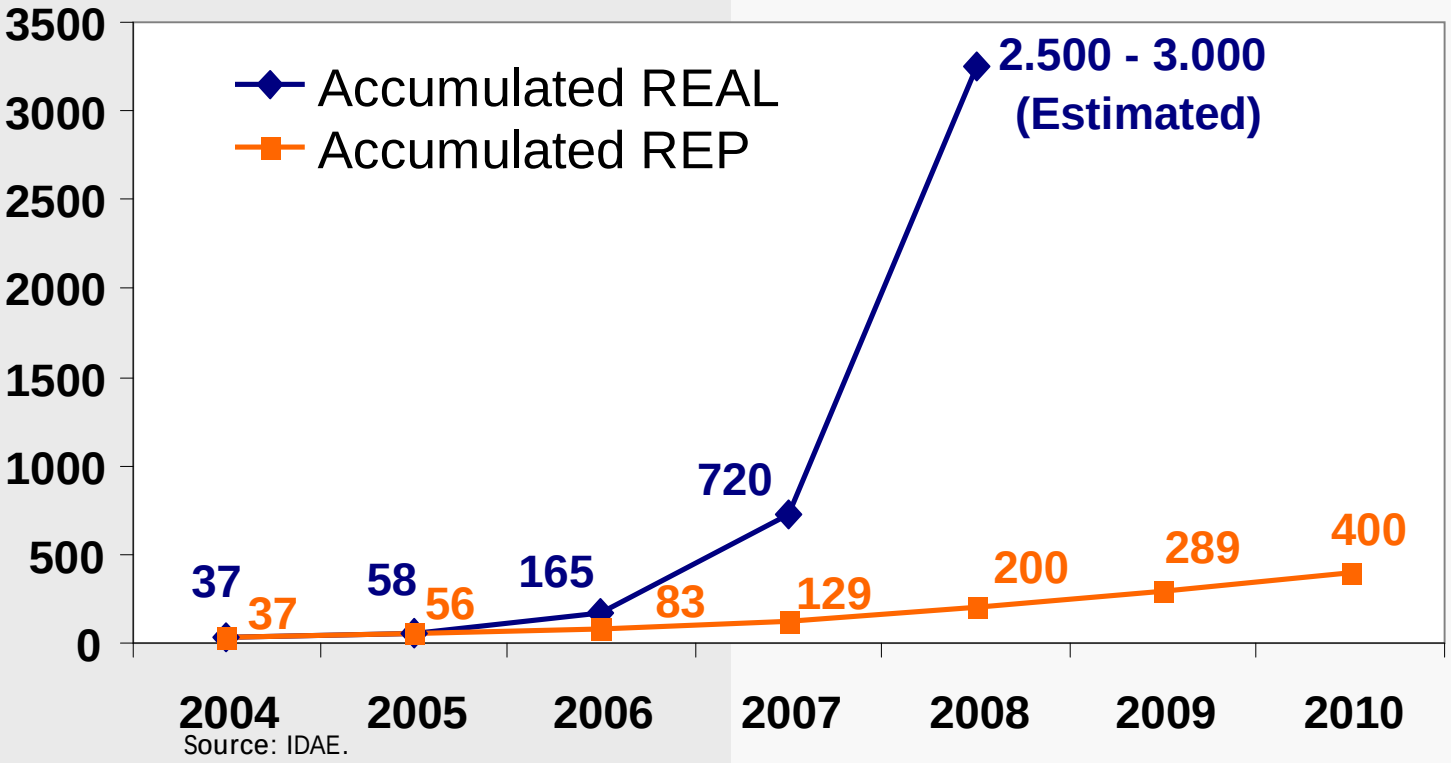
- RD 661/2007: Special Regime for the production of electricity from renewable energies sources
  - ✓ Premium system guaranteed
  - ✓ Guarantee: 500€/kw.

RES	Tariff (Eu cents/kWh)
Wind energy	7.32 (20 years), 6.12 (after)
Thermoelectric	26.94 (25 years), 21.55 (after)
Geothermal, waves, tides, sea current,...	6.89 (20 years), 6.51 (after)
Agriculture and forest biomass	Between 15.88 and 10.75 (15 years) Between 12.34 and 8.06 (after)
Biogas	Between 13.07 and 5.36 (15 years) Between 6.51 and 5.36 (after)
Industrial biomass	Between 12.57 and 6.51 (15 years) Between 8.47 and 6.51 (after)
Solar Photovoltaics	**45.51 (25 years), 36.41(after)**

REGULATION VS INSTALLED CAPACITY



PLANNED REP vs. REAL



Source: IDAE.

The goal for the PV sector defined in the REP 2005-2010 has been reached in 2007 with 3 years of anticipation.

RD 1578/2008 MAIN ASPECTS

- Two groups: in buildings & in land.
- Unique tariff for in land, no capacity steps for the in land installations.
- Higher support to architectural integration:
  - Higher quota & higher tariff.
- Pre-assignment of remuneration is established.
- Decreasing tariffs, for new facilities.
- Increasing quotas, as tariffs decrease.
- 500 MW every year, with increases of 10 % per year.
- More than 4.000 MW accumulated is foreseen in 2010.

RE Drivers: Legal Framework: RD 1578/208

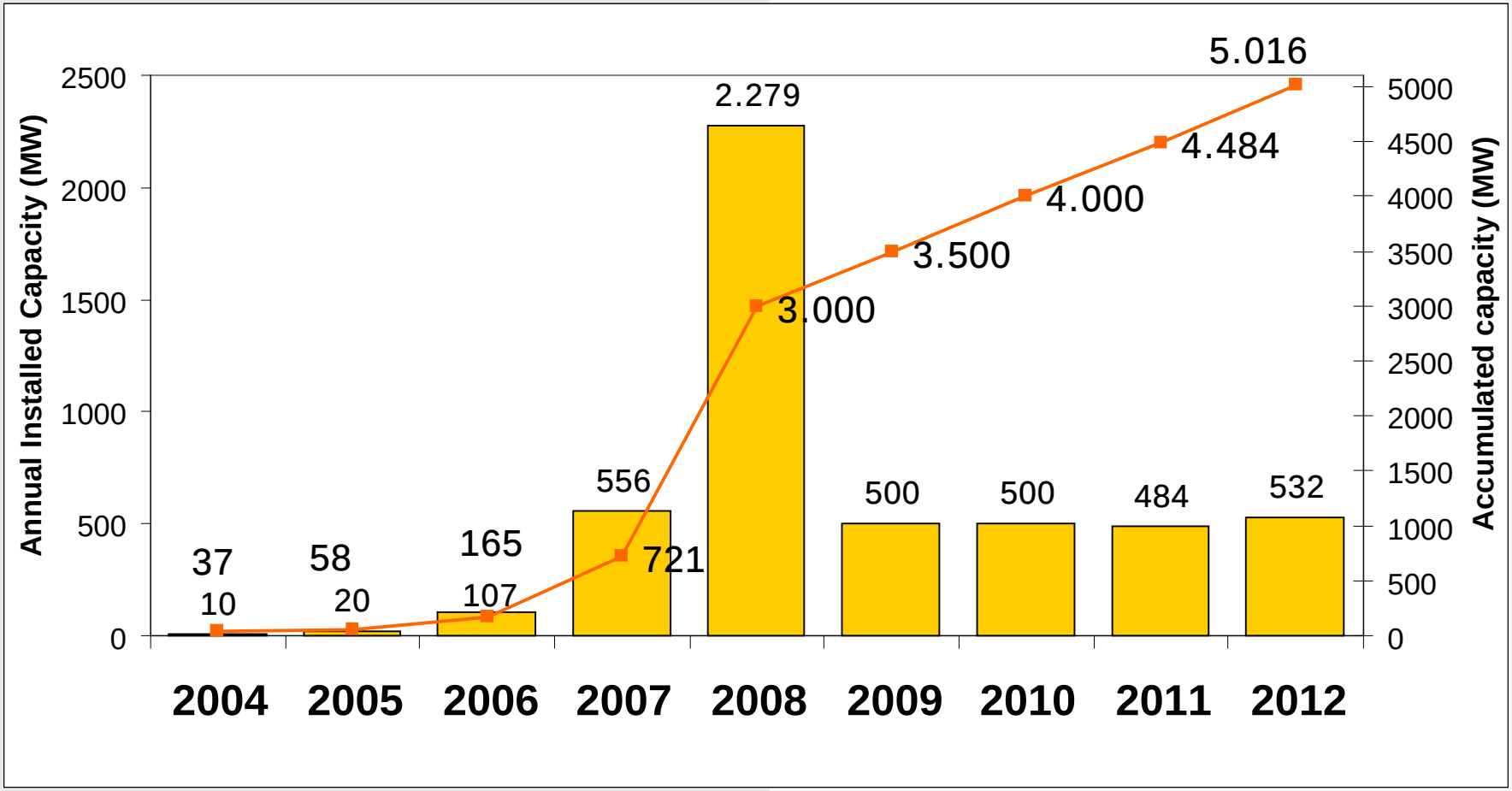
- **Royal Decree 1578/2008**

Tariff Scheme for grid-connected PV

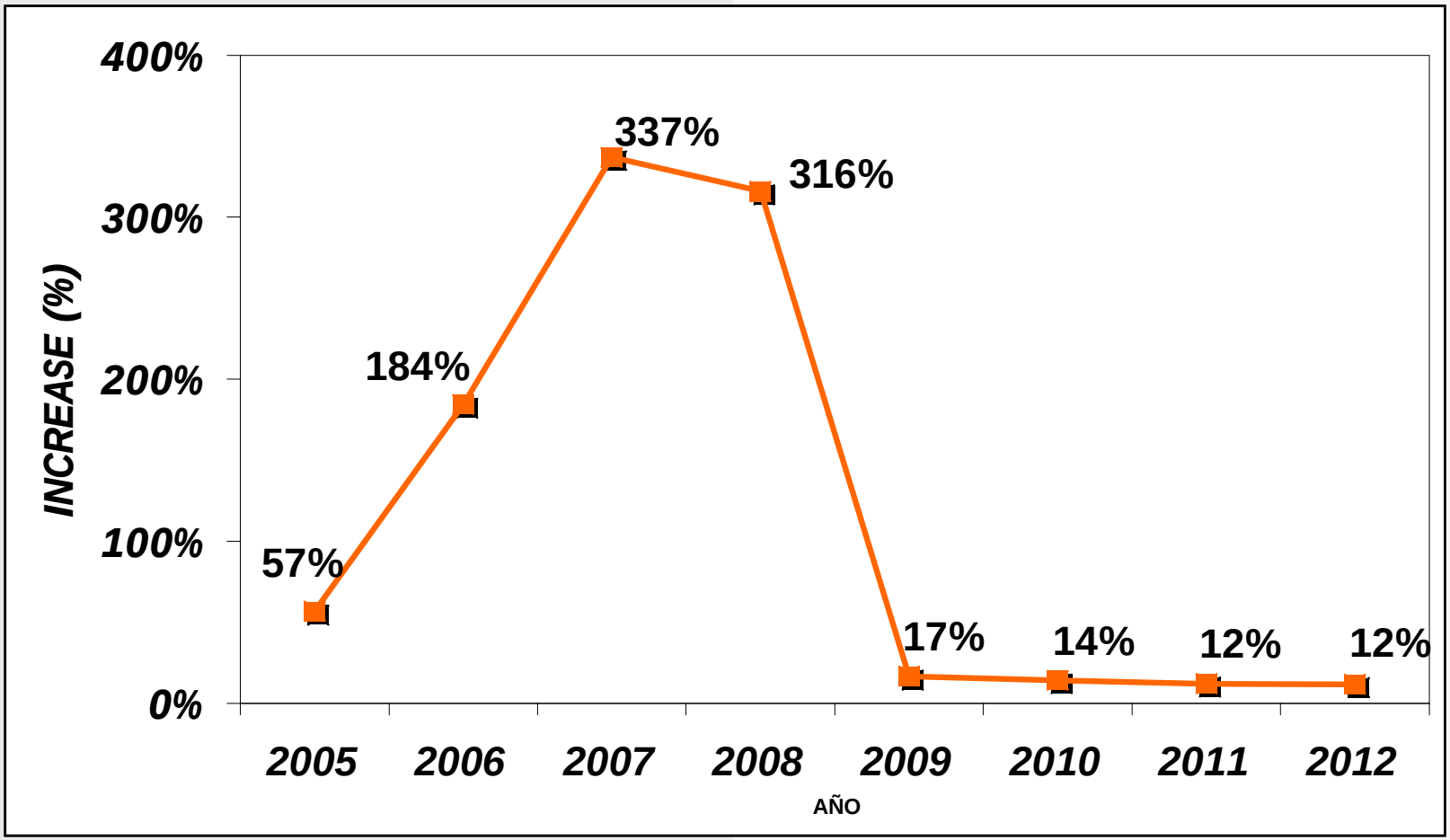
CATEGORIES			Regulated Tariff 2008 (c Eu/kWh)
Category I: installations on roofs and facades	I.1.	P ≤ 20 kW	0.34 €/kwh
	I.2.	P ≤ 20 kW ≤ 20 MW	0.32 €/kwh
Category II: ground-mounted	II.	P ≤ 10 MW	0.32 €/kwh

Tariffs are annually updated with the Consumer Price Index (CPI) minus 0.25% until 2012 and with RPI minus 0.50% from 2012 on.

EVOLUTION OF THE INSTALLED CAPACITY



INCREASE OF THE ACCUMULATED CAPACITY



RD 1578/2008 SUMMARY

The need to redesign the PV feed–in tariffs is based in:

- To optimize the FIT to guarantee a profitability more adapted for a regulated activity.
- To give a longer term perspective.
- To better control the cost of the FIT.
- To design a tariff systems that internalizes the reduction cost due to technological development
- To encourage the decrease of the cost of the installations, increasing competitiveness in the sector.
- To encourage the installation on roof to profit from distributed generation.

Thank you for your attention