



UNIVERSIDAD DE CASTILLA LA MANCHA

ESCUELA TÉCNICA SUPERIOR DE INGENIEROS INDUSTRIALES

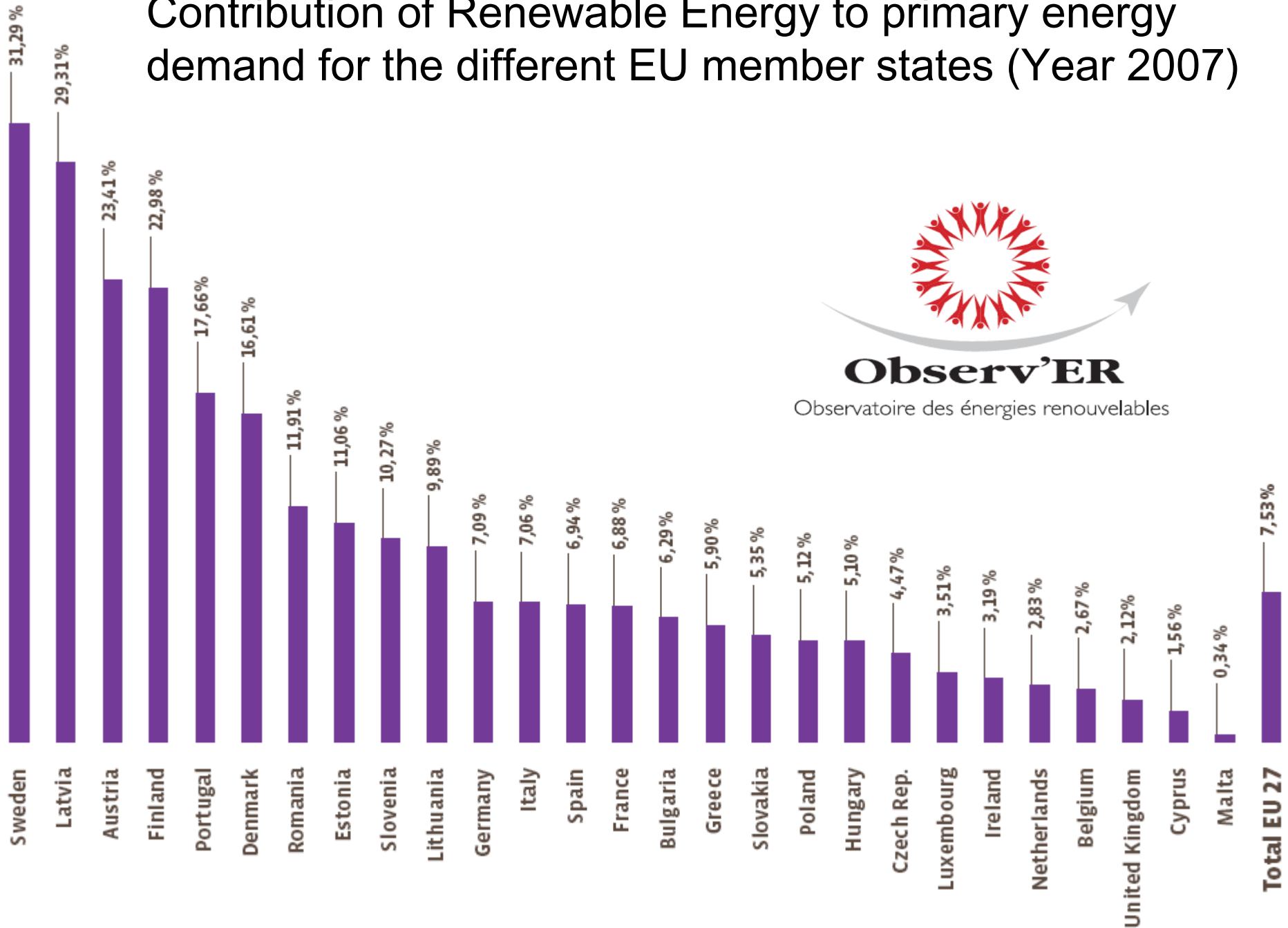
MESA REDONDA: "LA ENERGÍA A DEBATE"
E.T.S. de Ingenieros Industriales
Ciudad Real, 16 de abril de 2009

Energías Renovables



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Director Adjunto
IMDEA ENERGIA

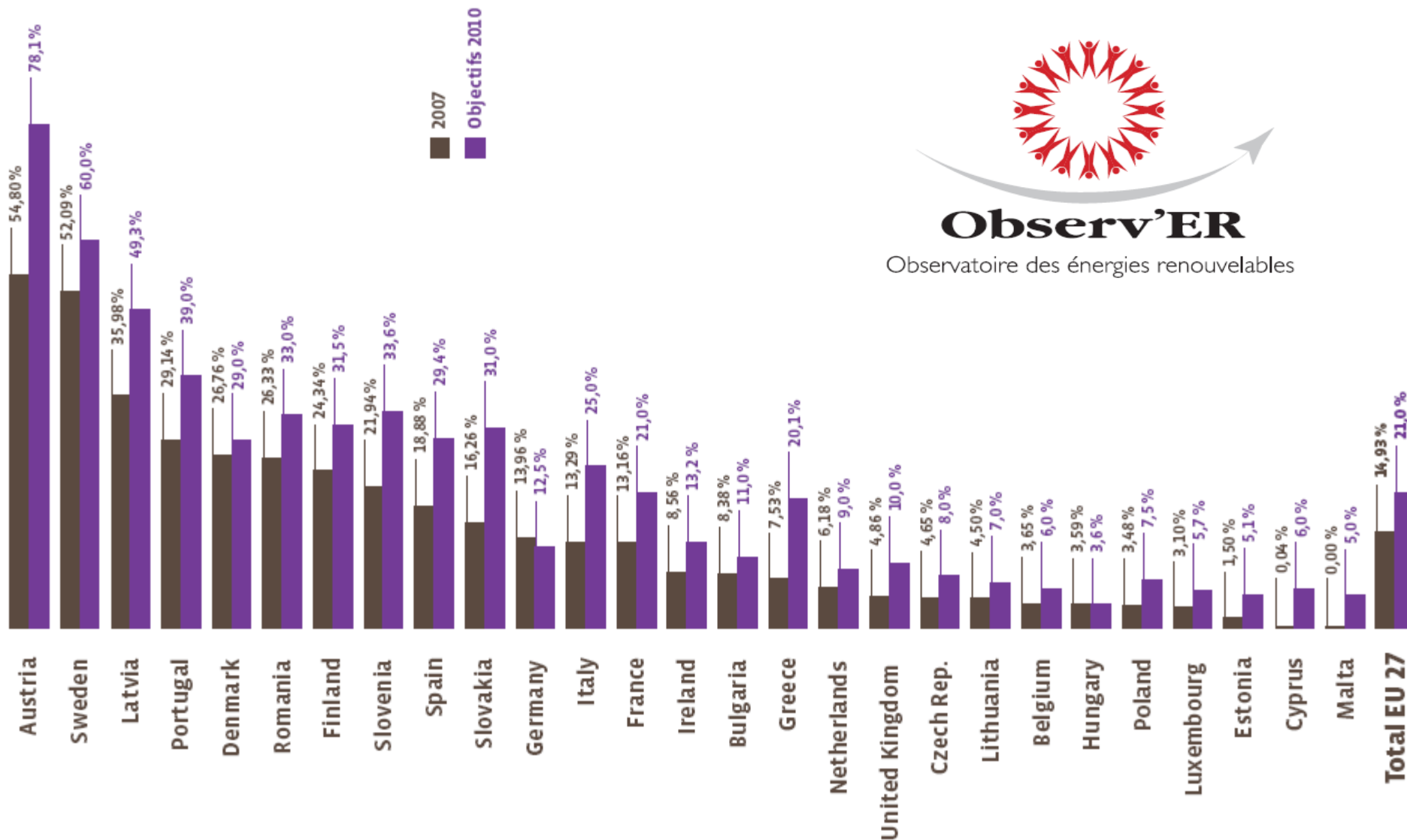
Contribution of Renewable Energy to primary energy demand for the different EU member states (Year 2007)



Observ'ER

Observatoire des énergies renouvelables

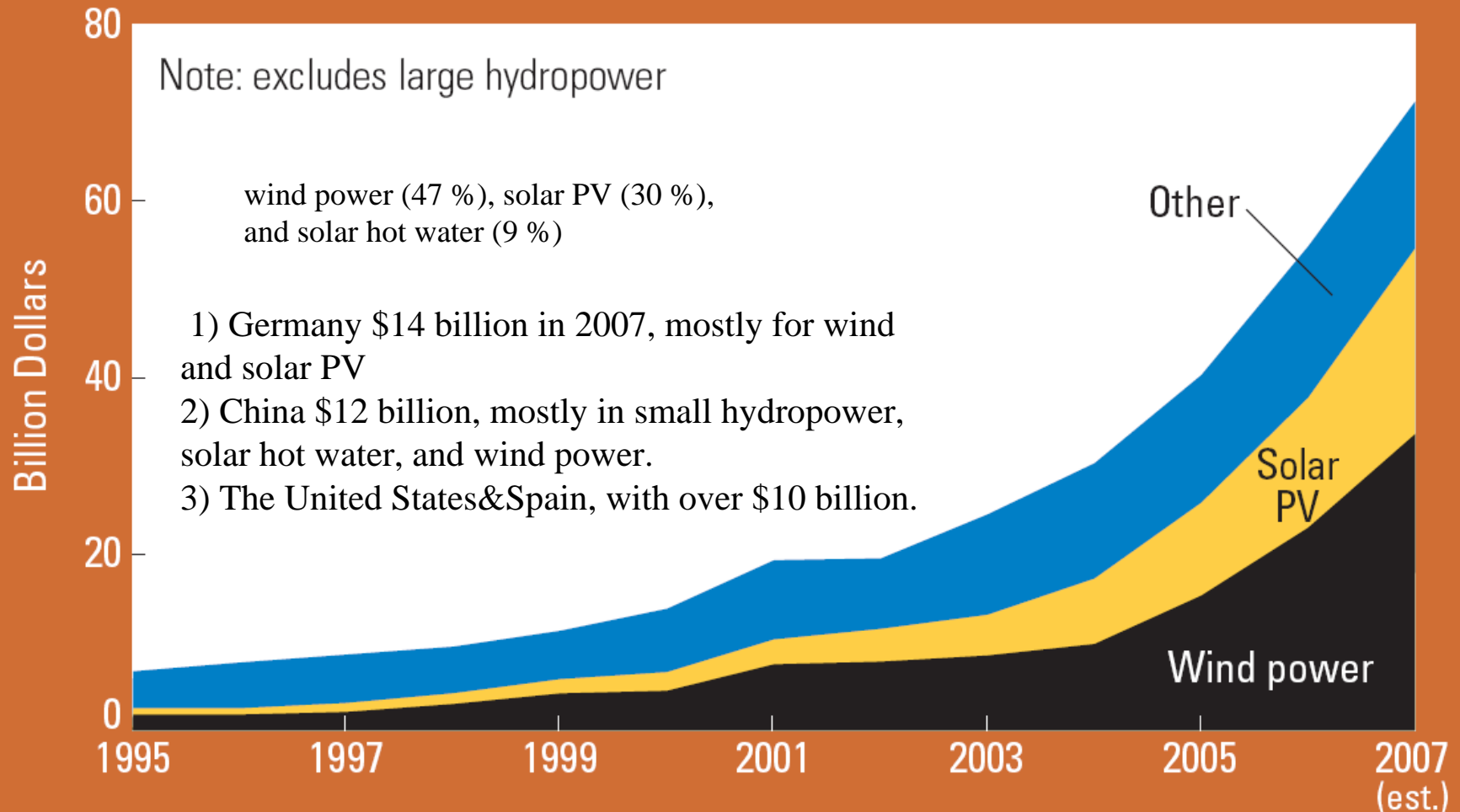
Contribution of Renewable Energy to electricity production (Year 2007) and objectives for 2010 in different EU countries.



Inversión mundial en EERR (1995-2007)



Annual Investment in New Renewable Energy Capacity, 1995–2007

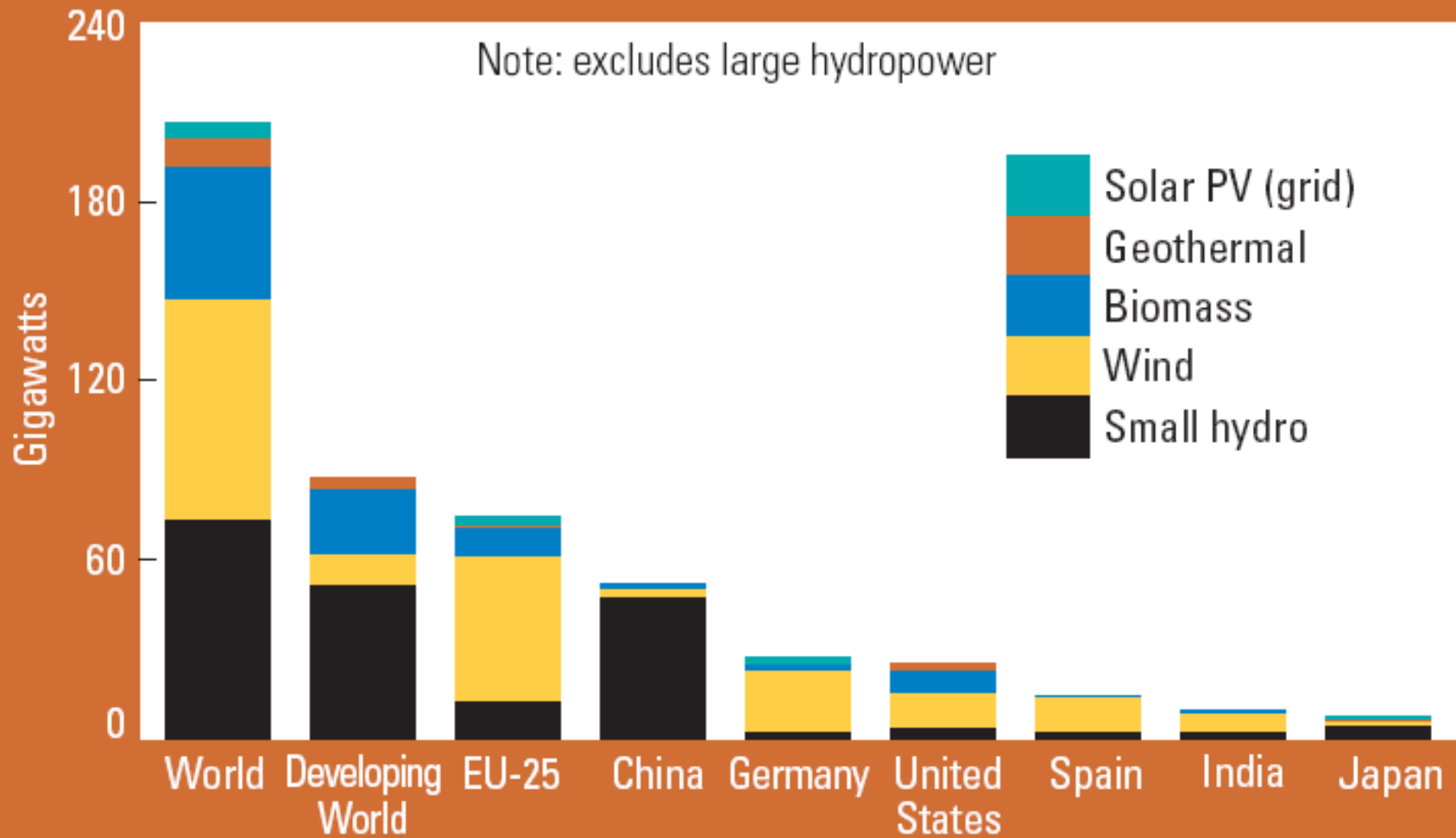


Las EERR en el mercado mundial a finales de 2006

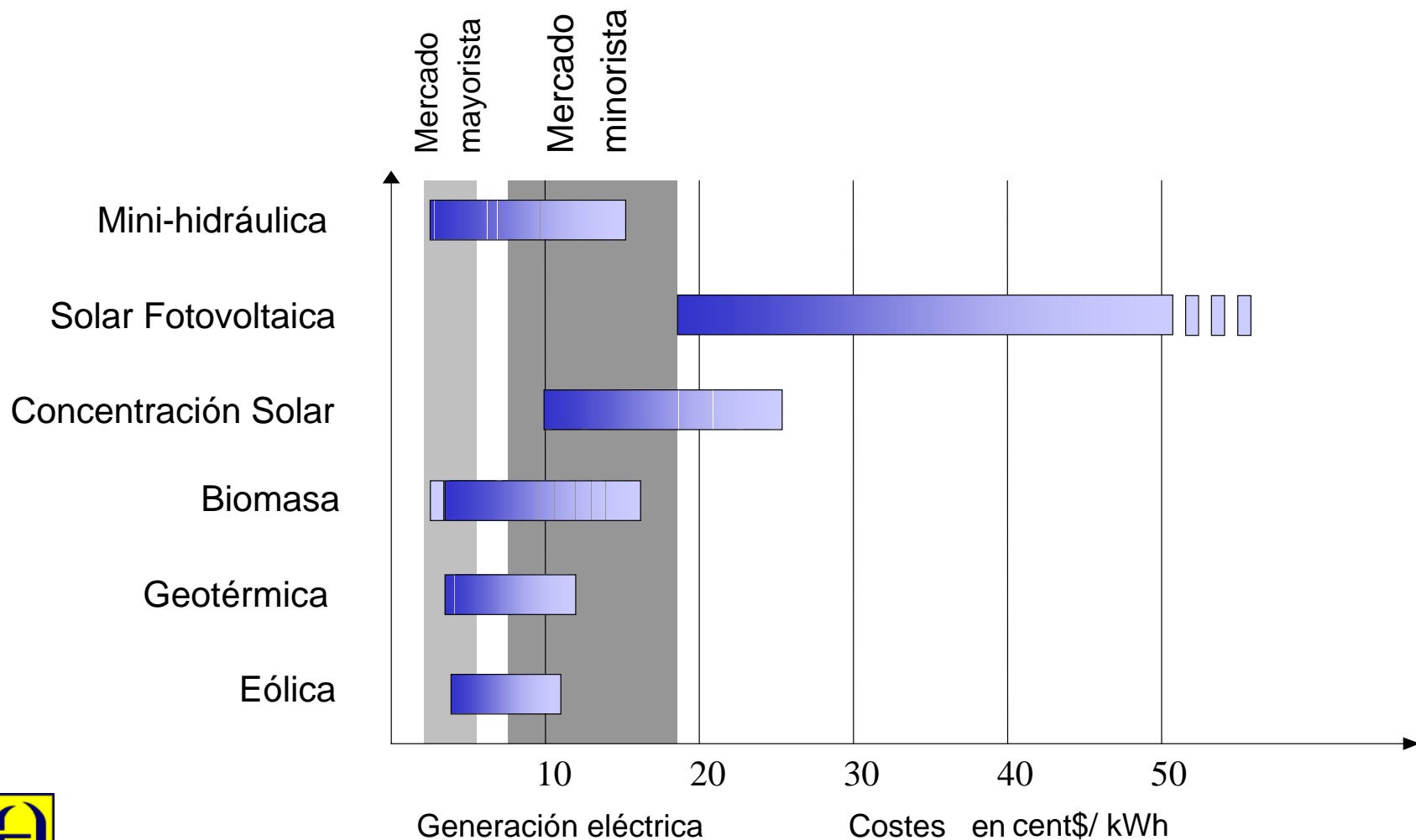


Top Five Countries	#1	#2	#3	#4	#5
Annual amounts for 2006					
New capacity investment	Germany	China	United States	Spain	Japan
Wind power added	United States	Germany	India	Spain	China
Solar PV added (grid-tied)	Germany	Japan	United States	Spain	South Korea
Solar hot water added	China	Germany	Turkey	India	Austria
Ethanol production	United States	Brazil	China	Germany	Spain
Biodiesel production	Germany	United States	France	Italy	Czech Republic
Existing capacity as of 2006					
Renewables power capacity	China	Germany	United States	Spain	India
Small hydro	China	Japan	United States	Italy	Brazil
Wind power	Germany	Spain/United States		India	Denmark
Biomass power	United States	Brazil	Philippines	Germany/Sweden/Finland	
Geothermal power	United States	Philippines	Mexico	Indonesia/Italy	
Solar PV (grid-connected)	Germany	Japan	United States	Spain	Netherlands/Italy
Solar hot water	China	Turkey	Germany	Japan	Israel

Renewable Power Capacities, Developing World, EU, and Top Six Countries, 2006

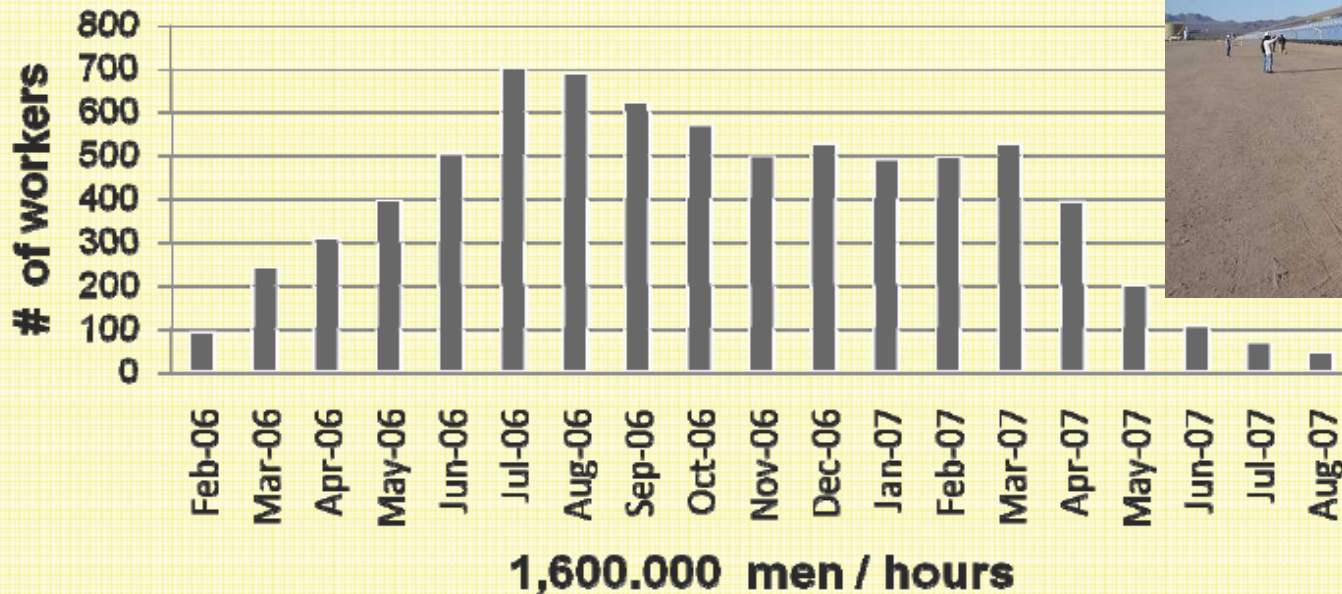


¿Son competitivas las EERR?

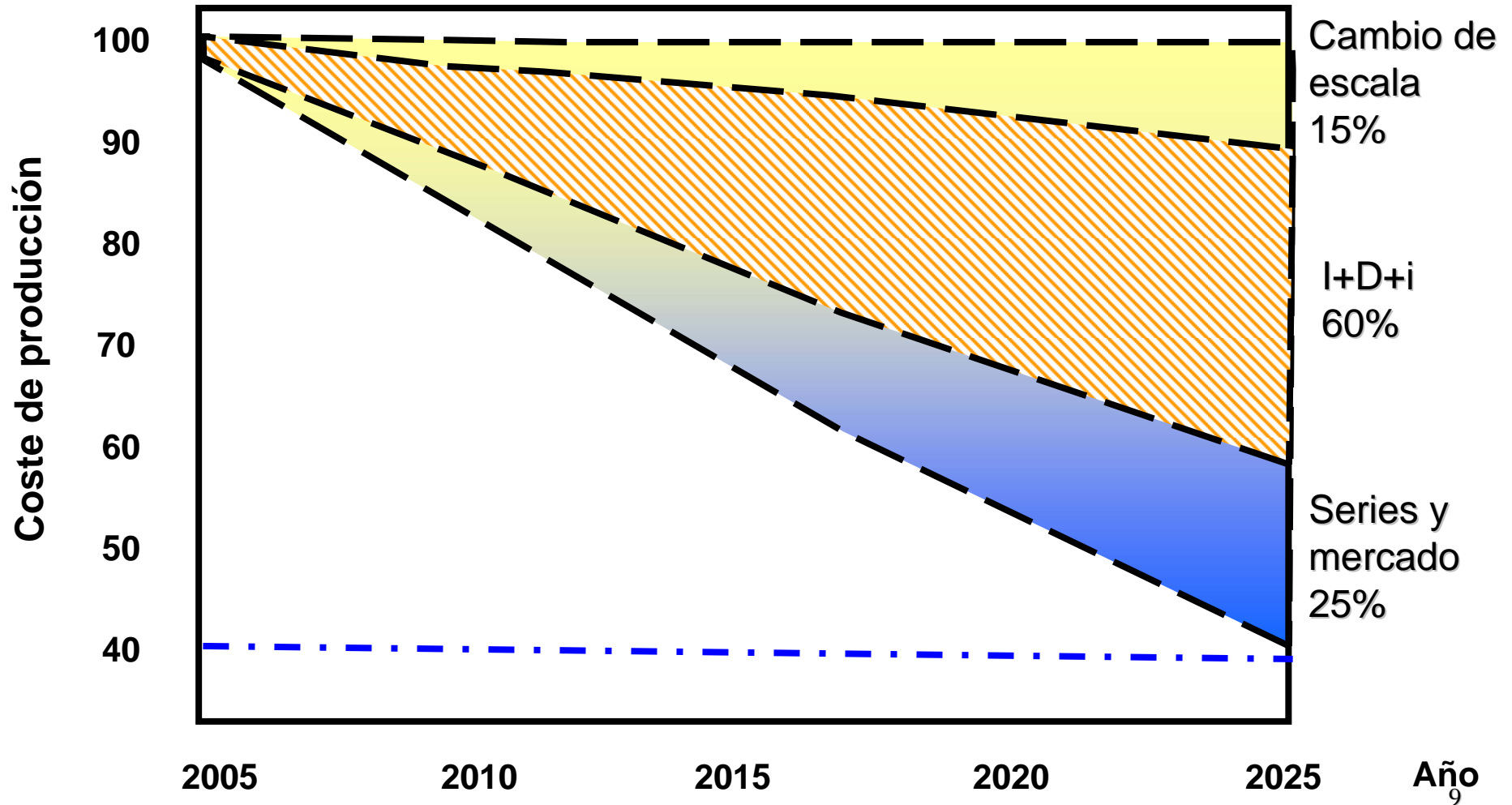


- ✓ Construction completed in Less than 18 months
- ✓ 1,600.000 men hours (An average of 400 jobs created for 18 months + 28 jobs for 20 + years for O&M)
- ✓ Excellent safety record

NSO Construction Manpower



Impacto de la innovación en la reducción de costes



Escenarios EREC y EUREC: Prioridades según madurez tecnológica

TECNOLOGÍAS EMERGENTES CON RÁPIDO CRECIMIENTO

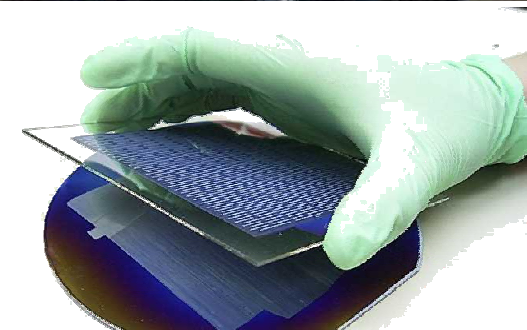
Objetivo: Asegurar el desarrollo de sistemas a gran escala

- **Eólica**

- Aceleración del desarrollo de grandes turbinas, grandes sistemas, eólica marina, terrenos complejos y ambientes extremos.

- **Fotovoltaica**

- Reducción importante de costes mediante I+D en materiales para células y procesos, diseño y producción de módulos, componentes y sistemas. Concentración fotovoltaica. Seguidores.



Escenario EREC y EUREC: Prioridades según madurez tecnológica

TECNOLOGÍAS DISPONIBLES CON GRAN POTENCIAL SIN DESARROLLAR

**Objetivo: Potenciar el desarrollo de mercados
y el incremento de la velocidad de desarrollo**

. Solar térmica

- Desarrollar aplicaciones en calor y frío solar.
- Innovación tecnológica y primeros proyectos comerciales en energía solar termoeléctrica.

.Biomasa

- Producción de biocombustibles – desarrollo de la cadena de suministro, separación y pre-tratamiento. Procesos de conversión fiables y competitivos – combustión, gasificación, pirólisis, fermentación, etc.





Context

AN ENERGY POLICY FOR EUROPE

● **By 2020 – the three 20s:**

- **20% reduction in greenhouse gas emissions compared to 1990 levels (30% if global agreement)**
 - **20% reduction in global primary energy use (through energy efficiency)**
 - **20% of renewable energy in the EU's overall mix (minimum target for biofuels of 10% of vehicle fuel)**
- **By 2050 : indicative 60 to 80% reduction in GHG**

ENERGY POLICY FOR EUROPE → SET PLAN

SET Plan: Key EU technology challenges for the next 10 years to meet the 2020 targets

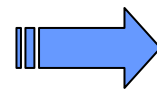
- Make **second generation biofuels** competitive alternatives to fossil fuels, while respecting the sustainability of their production;
- Enable commercial use of technologies for **CO2 capture, transport and storage** through demonstration at industrial scale, including whole system efficiency and advanced research;
- Double the power generation capacity of the **largest wind turbines, with off-shore wind** as the lead application;
- Demonstrate commercial readiness of **large-scale Photovoltaic (PV) and concentrated Solar Power**;
- Enable a single, **smart European electricity grid** able to accommodate the massive integration of renewable and decentralised energy sources;
- Bring to mass market more **efficient energy conversion and end-use devices** and systems, in buildings, transport and industry, such as poly-generation and fuel cells;
- Maintain **competitiveness in fission technologies**, together with long-term waste management solutions;

Innovación tecnológica

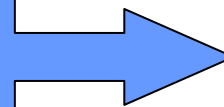


Investigación
fundamental

(10%)



INNOVACIÓN



Desarrollo
industrial

(90%)



EUROPEAN
COMMISSION

Community research

Effective implementation (1)

European Industrial Initiatives:

- **European Wind Initiative**
- **Solar Europe Initiative**
- **Bio-energy Europe Initiative**
- **European Electricity Grid Initiative**
- **European CO₂ capture, transport and storage initiative** (Communication in Jan. 2008)
- **Sustainable fission initiative (Gen IV)**
- **Fuel cells and hydrogen (JTI on-going)**
- **Fusion (ITER on-going)**

