

Wind Power in the Future European Energy Market

Glasgow
10 October 2006

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Chief Executive
European Wind Energy Association



European Wind Energy Association - The voice of the wind industry

- ✓ **EWEA is the voice of the wind industry – actively promoting the utilisation of wind power in Europe and worldwide - working on behalf of member organisations**
- ✓ **Resources are focussed on lobbying, communication and policy activities, and responding to enquiries from our member organisations**
- ✓ **280 EWEA members from over 40 countries**

EWEA members include the following leading companies



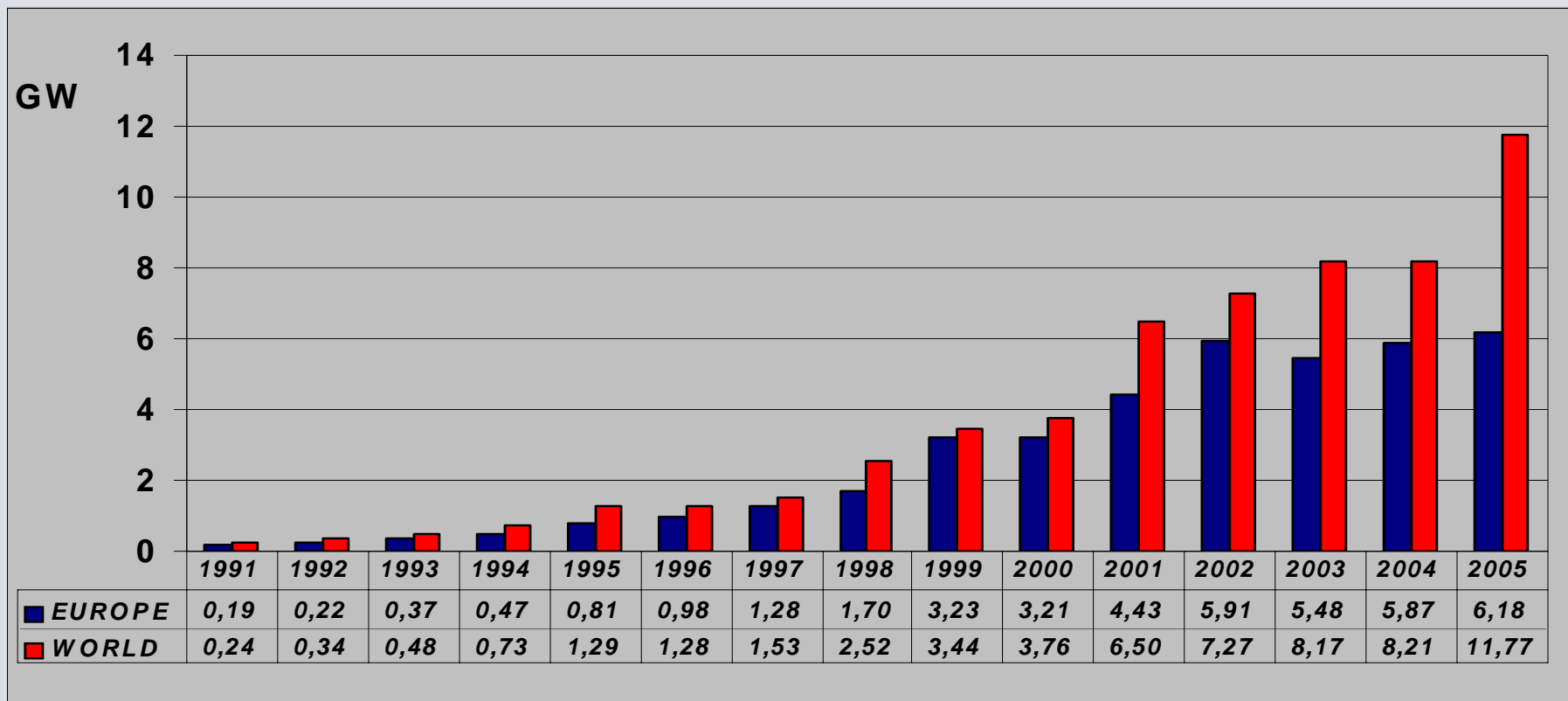
GE Energy



SIEMENS



Global wind power market growth 2005: 43%



Average Annual
Growth Rates

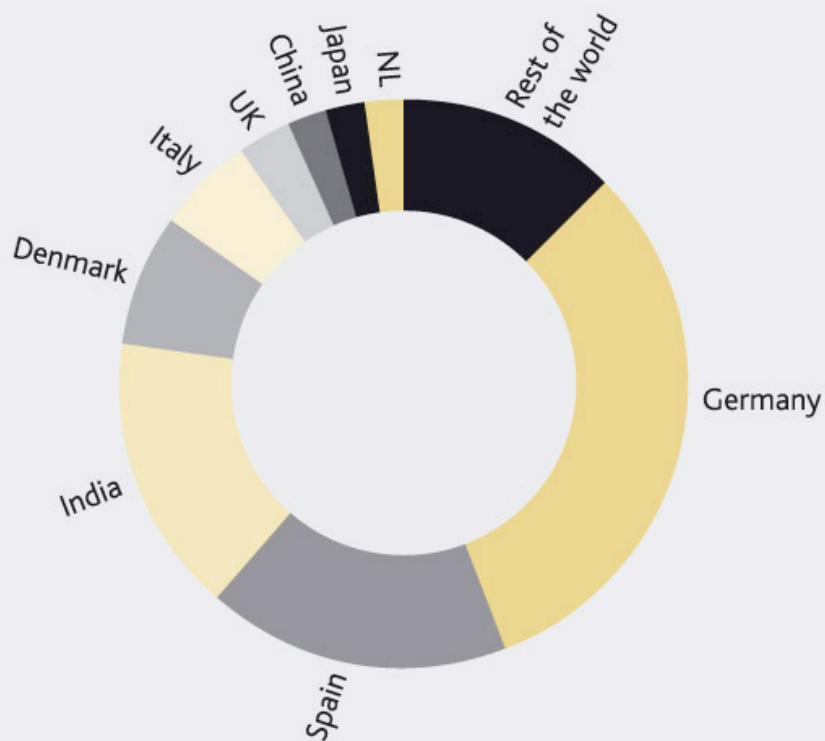
Europe
1995-2000 31.7%,
2000-2005 14.0%

World
1995-2000 23.8%,
2000-2005 25.6%

Source: EWEA, GWEC

Top 10 cumulative installed capacity

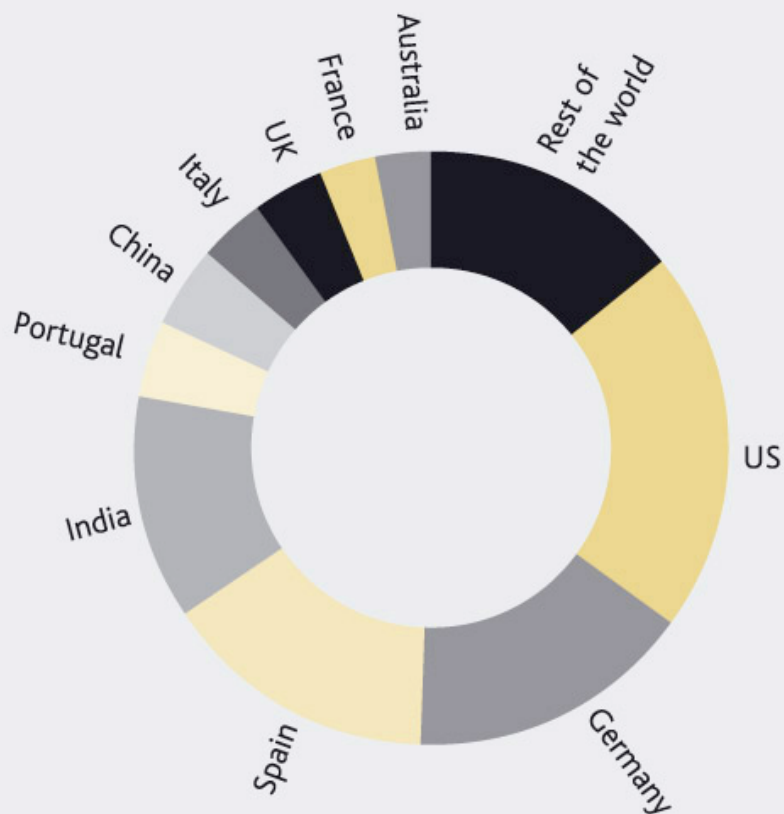
TOP 10 CUMULATIVE INSTALLED CAPACITY (DEC. 2005)



Total capacity	MW	%
Germany	18,428	31.2
Spain	10,027	17.0
US	9,149	15.5
India	4,430	7.5
Denmark	3,122	5.3
Italy	1,717	2.9
UK	1,353	2.3
China	1,260	2.1
NL	1,219	2.1
Japan	1,078	1.8
Top 10 – Total	51,783	87.6
Rest of the world	7,301	12.4
World total	59,084	100

Top 10 new installed capacity in 2005

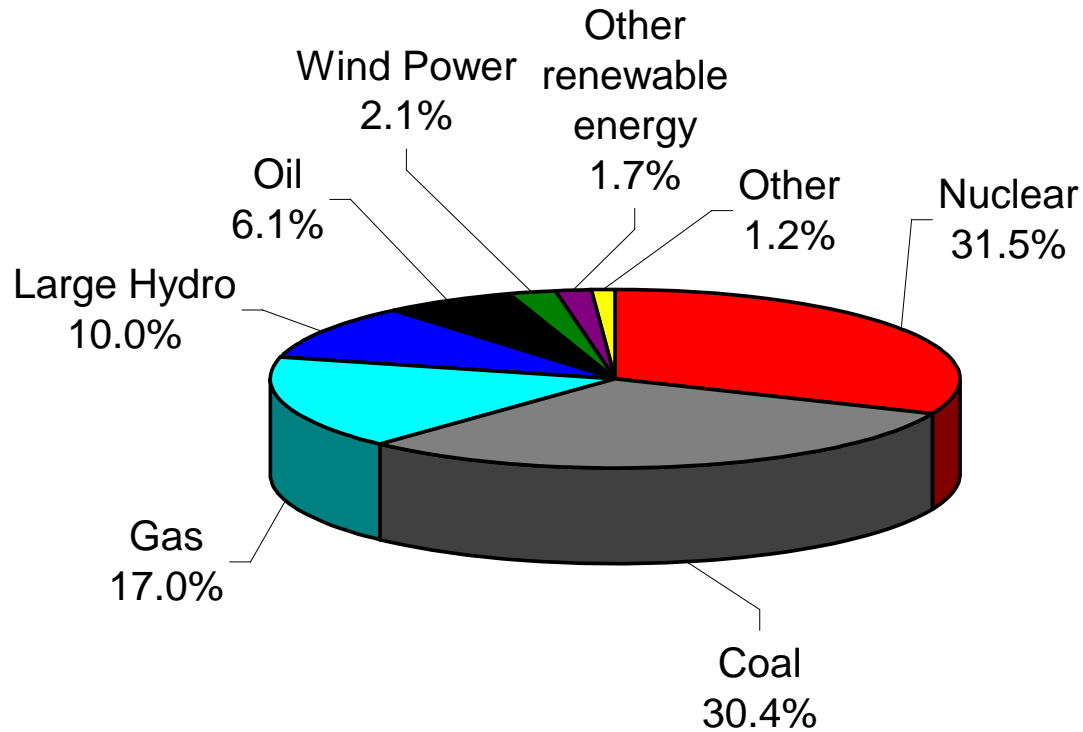
TOP 10 NEW INSTALLED CAPACITY (JAN.-DEC. 2005)



New capacity	MW	%
US	2,431	21.1
Germany	1,808	15.7
Spain	1,764	15.3
India	1,430	12.4
Portugal	500	4.3
China	498	4.3
Italy	452	3.9
UK	446	3.9
France	367	3.2
Australia	328	2.8
Top 10 – Total	10,024	86.9
Rest of the world	1,507	13.1
World total	11,531	100.0

Wind meets 2.8% of EU power demand

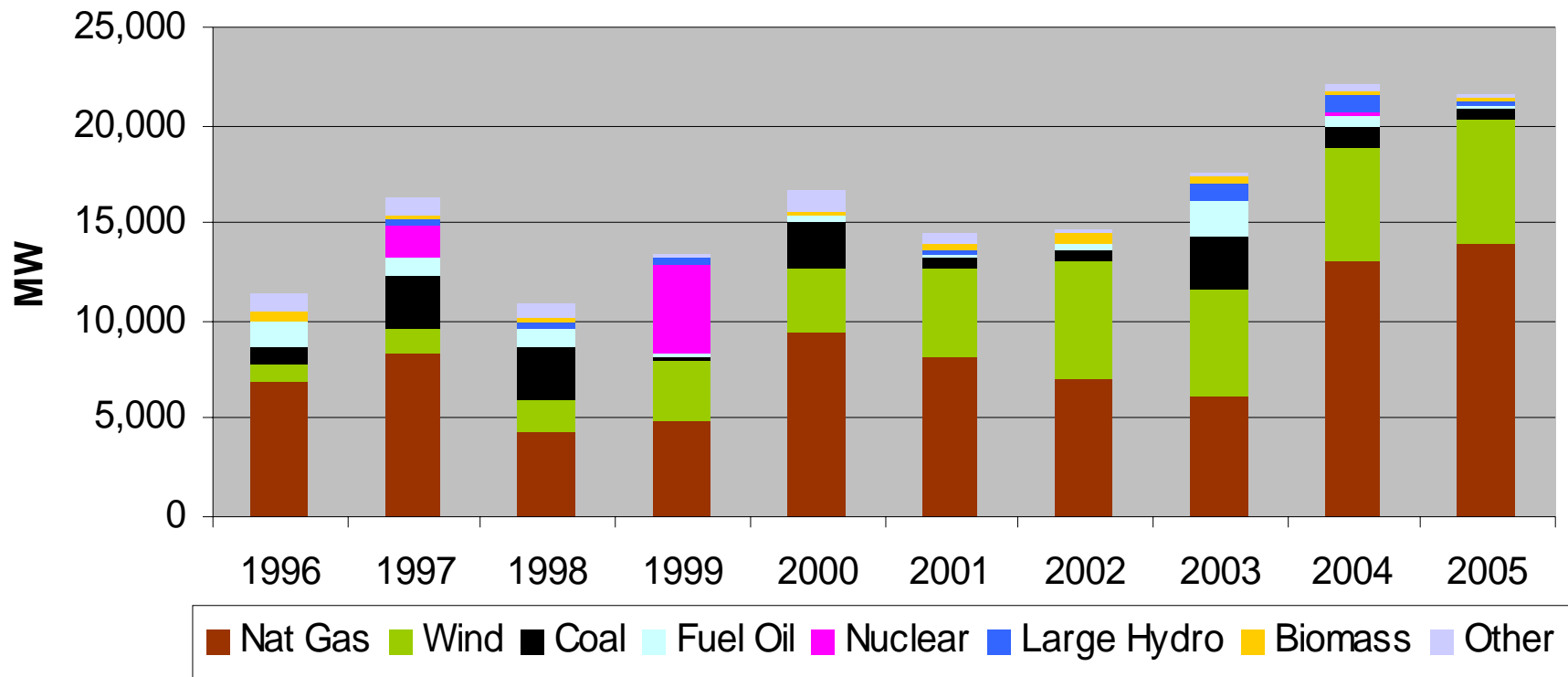
EU-25 Power Production Mix 2003



EU-25 wind power share 2005: 2.8%

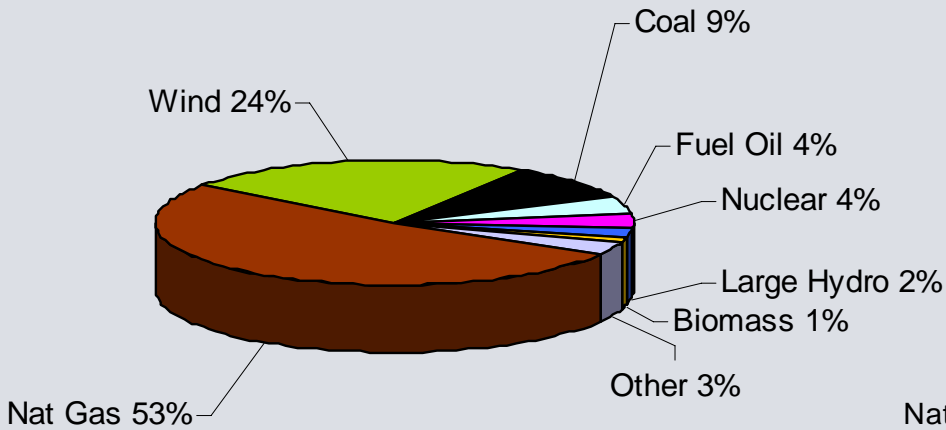
Wind energy – A Small Scale Technology?

New installed capacity EU-15 1996-2005

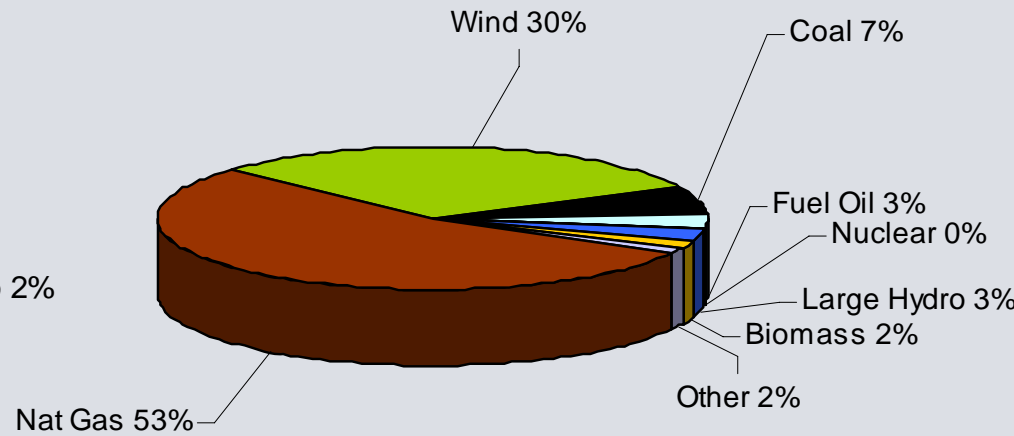


Wind: 24% of installed power capacity last 10 years

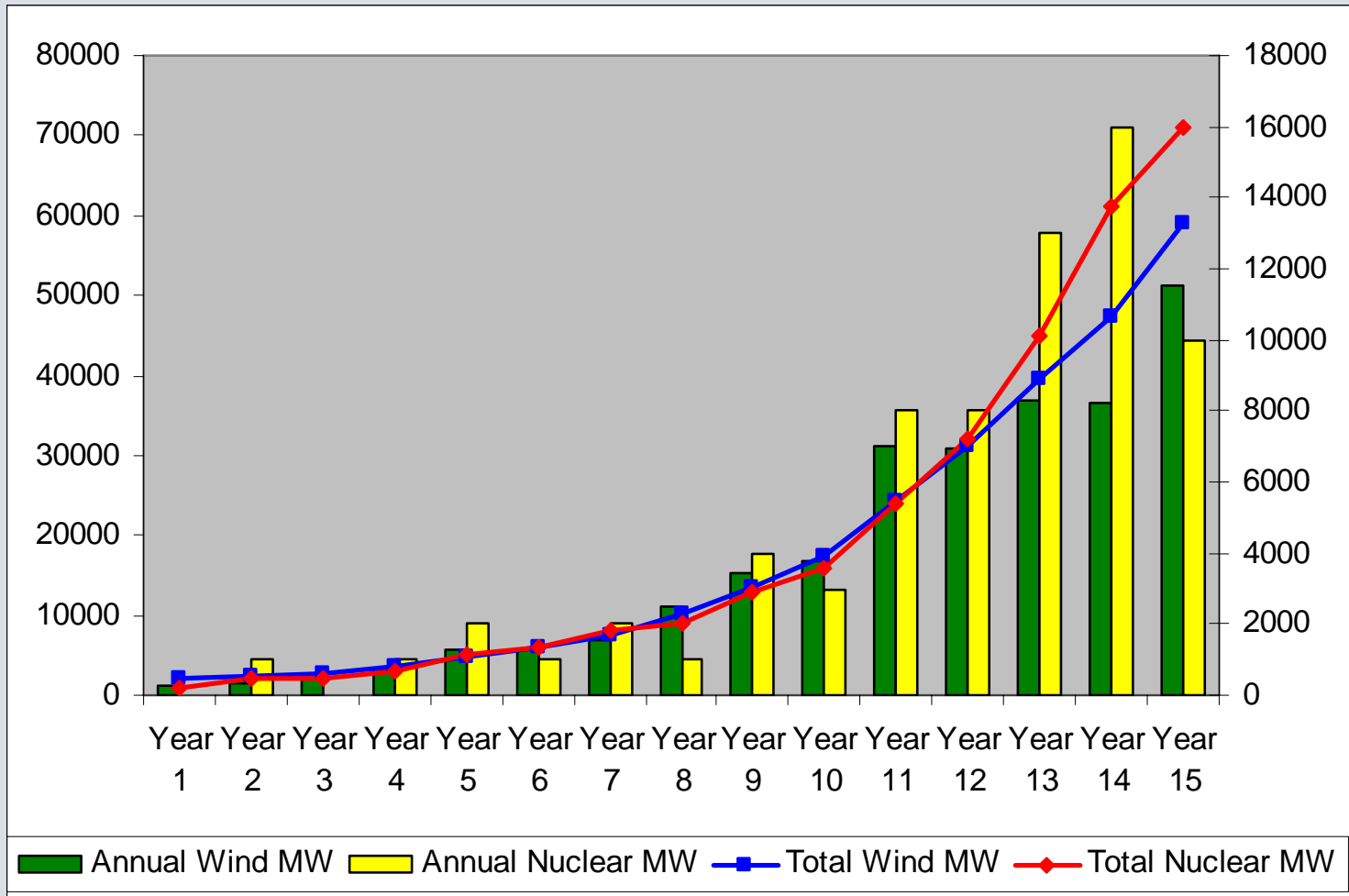
New installed capacity EU-15 1996-2005



New installed capacity EU-15 2001-2005



Global nuclear (1961-1975) and wind capacity (1991-2005)



Next 5 years: A historic turning point

Until today:

We have spent 25 years selling electricity to a market that did not need more electricity

Now:

Spare capacity is at a historic low. 365 GW of electricity generating capacity will be retired in Europe and an additional 400 GW will be needed to satisfy the growing power demand.

... what is “tomorrow”?

Wind will no longer be judged against the cost of shuffling more fuel into an existing power plant that has already been depreciated and paid for by tax payers or consumers.

We will increasingly be judged against what it cost to plan, finance, insure, build, fuel, operate, maintain and eventually decommission a new conventional power plant

March 2003: Is the UK leading Europe



2003

March 2003: Is the UK leading Europe



Installed during 2002



87 MW

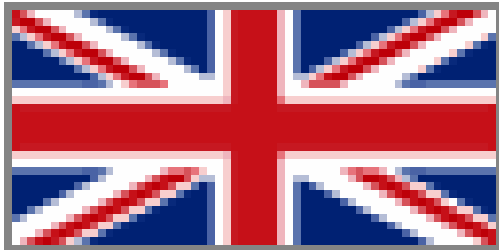
2003



3,247 MW

October 2005: Will the UK lead Europe?

Installed during 2005



446 MW



1,808 MW

2006

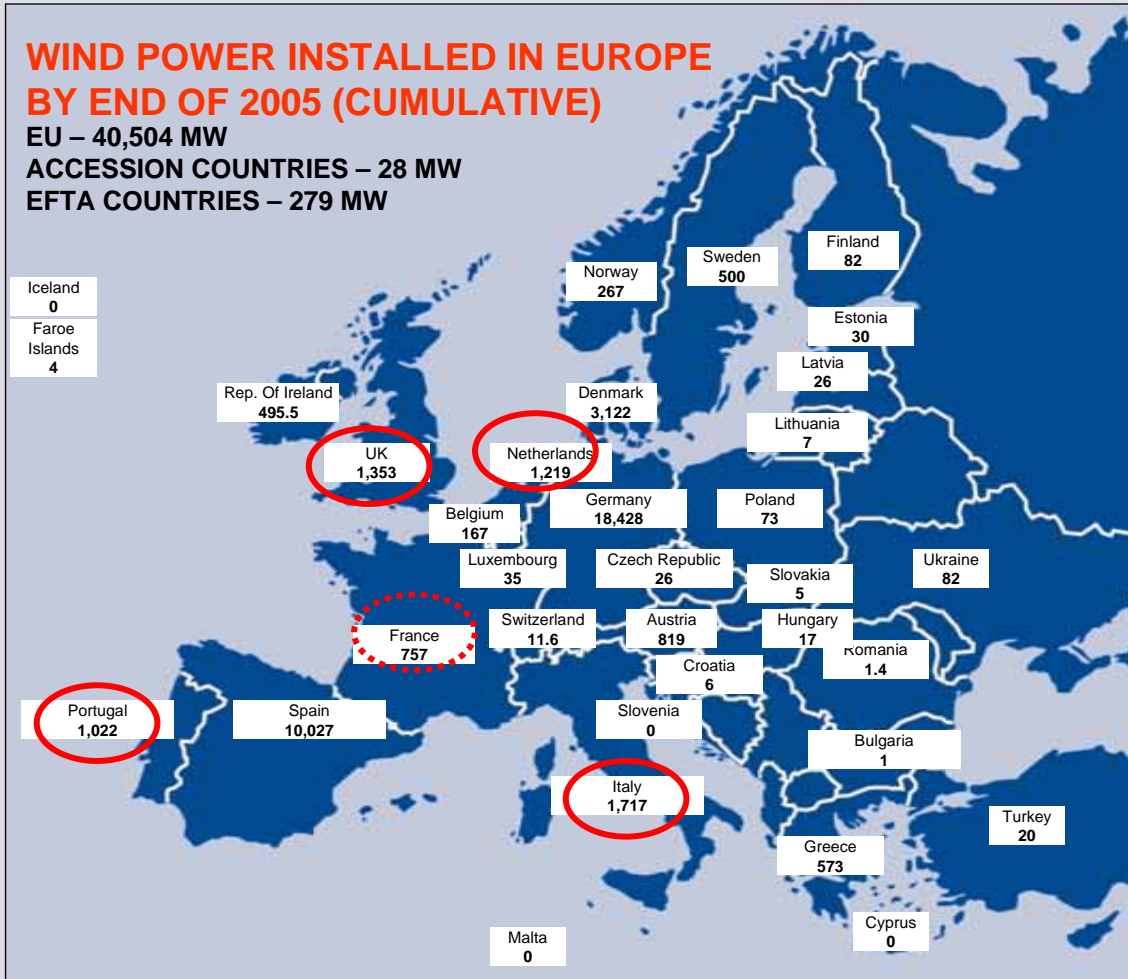
Design Matters!



European Commission, December 2005:

“The three quota systems in Belgium, Italy and the **UK**, currently have a higher support level than the feed-in tariff systems. The reason for this higher support level, as reflected in currently observed green certificate prices, can be found in the **higher risk premium** requested by investors, the administrative costs and the **still immature green certificate market**. The question is how the price level will develop in the medium and long term. “

The Second Wave



Source: EWEA

Europe has :

- 80% global manufacturing share
- 70% annual and cumulative market
- Annual market value of ~ €7bn
- 72% capacity in 2 countries
- 75,000 jobs
- Generates 2.8% EU electricity

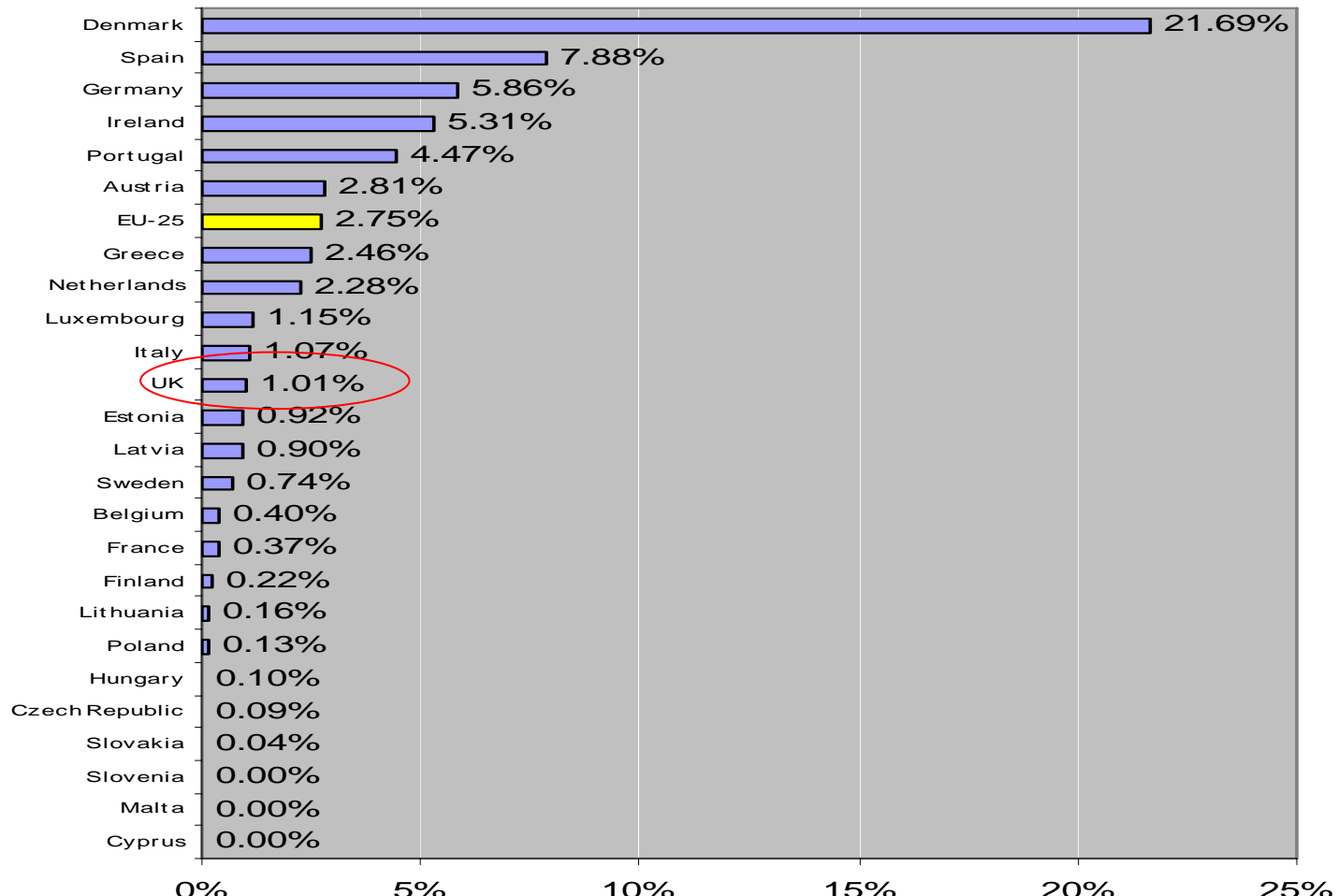
By 2010 wind is predicted to;

- Annual electricity generation of 167 TWh, equivalent to 5.5% of European electricity demand, (=34m people)
- 28% of all new installed generation capacity
- 10.6% of overall generation capacity
- Deliver 50% of the Renewable Directive target
- Meet >30% of the EU Kyoto Protocol commitment
- Cumulative CO2 savings of 523m
- Avoid €13 billion imported fuel costs,
- Avoid €10-25 billion external costs

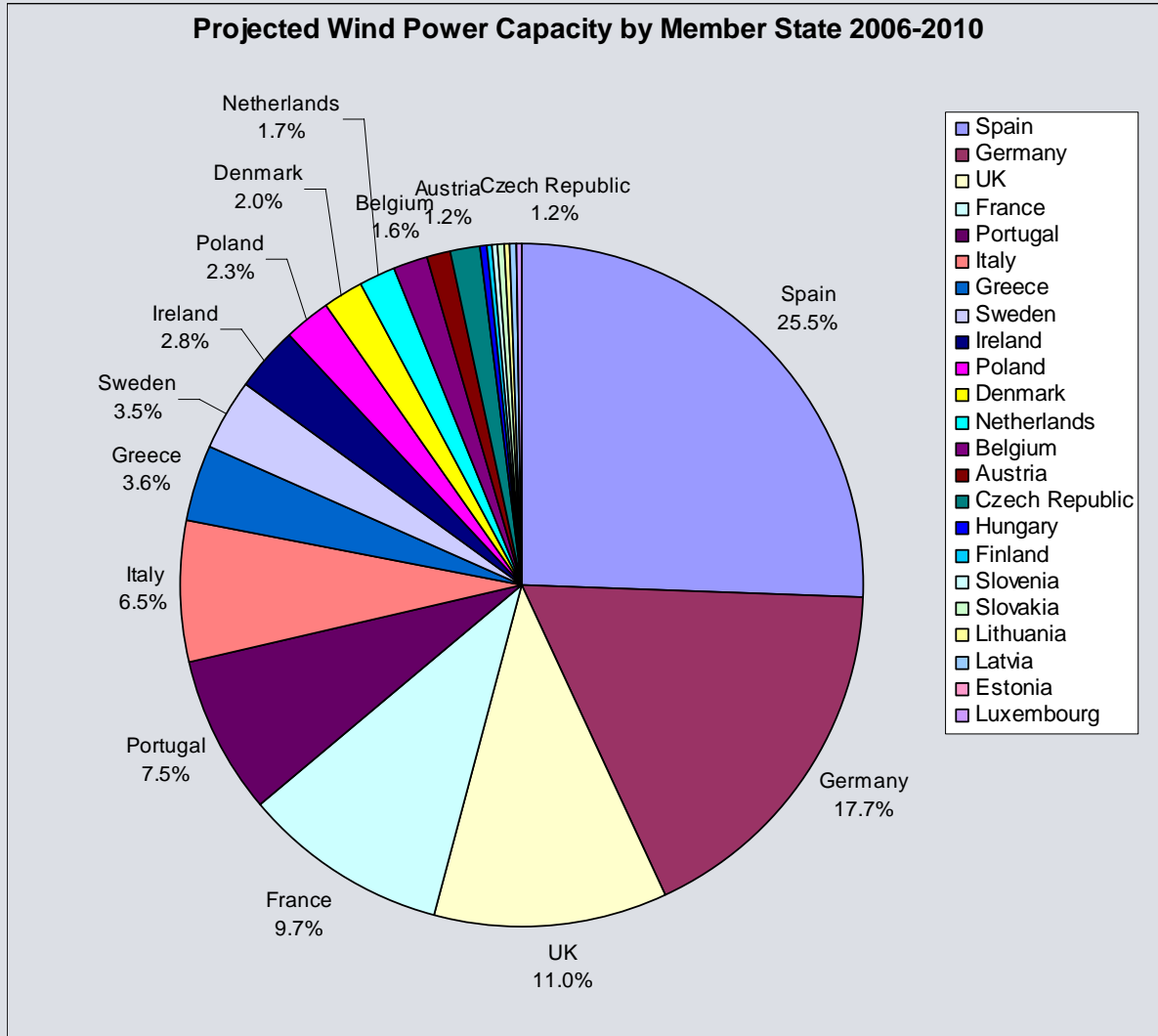
Data for 2001-2010

Wind's share of electricity demand EU-25

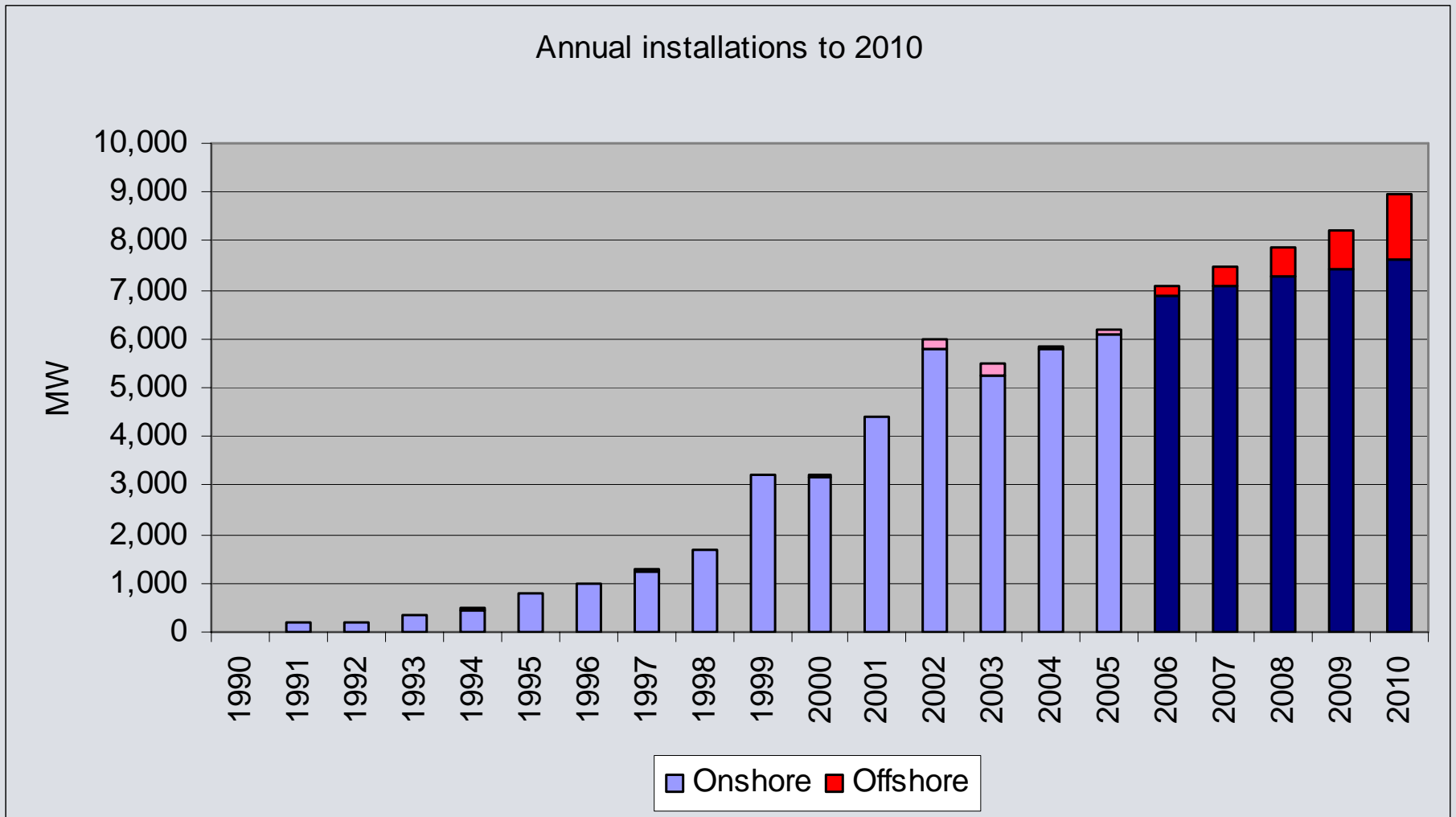
Wind power's share of electricity demand



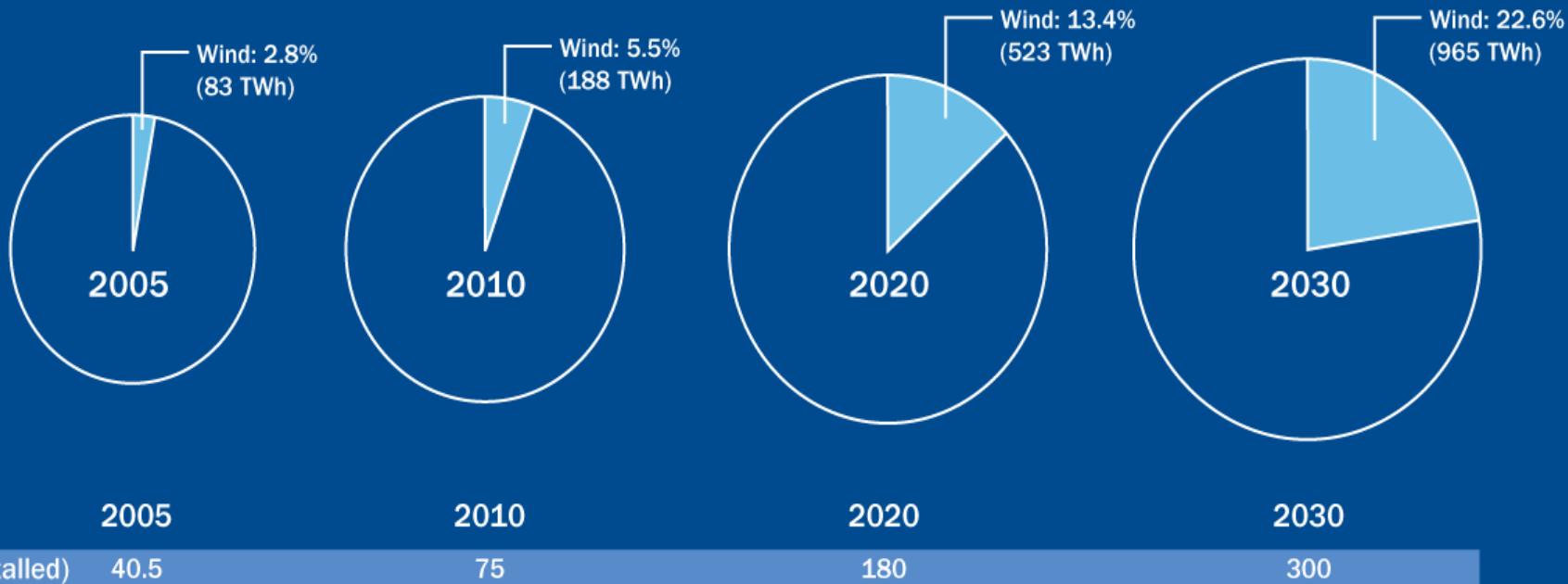
Installations (MW) 2006-2010 for EU-25



Installations (MW) 2006-2010 for EU-25



Contribution of Wind Power (TWh) to Electricity Generation 2005-2030, EU



Wind energy – an expensive technology?

Investment required between 2005 and 2020 to reach 180 GW in 2020 or 13.4% of EU electricity consumption will require: **€215 billion**

Combined 2005 profits of Exxon Mobil, Shell, BP and Chevron: **€78 billion**

The economic cost of the Iraq war*:

- Conservative scenario: **€630 billion**
- Moderate scenario: **€997 billion**

*Source: Blimes and Stiglitz, 2006 “The economic costs of the Iraq war”

Wind energy – a heavily subsidised technology?

Cost of energy subsidies 1995-1998 per year*:

Fossil fuels and nuclear:	\$215 billion
Renewables and efficiency:	\$9 billion

UNDP 2004:

“At present, subsidies to conventional energy are on the order of \$250 billion per year, while sales of “new” renewables are on the order of \$20 billion per year.” *

Wind energy - a visual intrusion?



In practice, wind farms occupy about 1% of the land surface area, so the actual land use needed for wind farms and roads, other services is in the region of a few hundred square kilometres.



Wind energy – a large scale technology?

Europe today:

47,000

turbines generate

83 TWh meeting 2.8% of European power demand

1.9 x more turbines

11.6 x more electricity generated

8.2 x more power needs for Europe

Europe in 2030:

90,000

turbines could generate

965 TWh

meeting

23%

of European power demand

Towards a European Energy Policy

The Root of the Energy Problem for the EU

- ✓ **We are going to import an ever growing share of our energy at unpredictable (but most likely higher) prices in competition with the rest of the world and at unbelievable environmental cost.**
- ✓ **Regardless of whether we are successful in energy diplomacy or not, we have no idea about the future cost of energy we will be paying to maintain current supply**
- ✓ **The economic future of Europe can be planned on the basis of known and predictable cost of electricity, derived from an indigenous energy source free of all the security, political, economic and environmental disadvantages associated with the current energy supply structure**

The barriers

There is an **urgent need to address inefficiencies, distortions and historically determined institutional and legal issues** related to the overall structure, functioning and development of the broader European electricity markets.

The Commission points out **four key reasons for the lack of success** in achieving a competitive market:

- ✓ Lack of cross-border transmission links
- ✓ Existence of dominant, integrated power companies
- ✓ Biased grid operators, and
- ✓ Low liquidity in wholesale electricity markets

The four main barriers outlined above are not only barriers to creating effective competition in European power markets, they are also the main institutional and structural deficiencies preventing new technologies such as wind power to enter the market.

Renewable Energy Road Map - Mandatory Targets

- EWEA recommends that the current national targets for renewables are made mandatory and that national targets are adopted for 2020, in line with the recommendation of the European Parliament.
- This overall target must be translated into **sectorial targets** for electricity (e.g. 35% by 2020), heating (e.g. 25% by 2020) and biofuels (e.g. 12% by 2020)
- The targets for 2020 should be ambitious, at least 20%, and **mandatory**. Although targets themselves do not guarantee development they act as important catalysts for development of the necessary frameworks for renewable energy investments.
- The setting of targets encourages investors to commit, enables stable technological development and cost reductions, and encourages research investments.

Renewable Energy Road Map

- **A renewable energy offshore policy for Europe, including offshore infrastructure (wind, tidal, wave)**
- **Grid extensions and upgrades paid by – ownership unbundled – TSOs (grids are natural monopolies)**
- **Removal of administrative barriers (one-stop-shop approach)**
- **Removal of grid access barriers including excessive technical requirements**
- **Dramatic refocus of R&D spending, taking into account historic levels of funding**
- **Renewable energy export strategy**

Renewable Energy Road Map

- Related policies

- **Immediate adoption GHG reduction targets for 2020 (30%) and 2050 (80%)**
- **Move from free allocation to 100% auctioning in EU emissions trading scheme – Art. 174 (polluter pays principle)**
- **We need a European Energy Regulator**
- **Removing unproductive subsidies**
- **Refocus EIB lending towards RE**
- **Reorientation of structural funds and farm subsidies towards RE**
- **Full ownership unbundling – separation of transmission and production**
- **Euratom**

Scope of an EU policy

An EU Energy Policy should only address those issues where:

- **There is a broad consensus among Member States**
- **There is a large degree of public acceptance**

EU: Past - and future? - policies

EU Energy Policy Focus

- Efficiency
- Large-scale renewables
- Indigenous sources
- Distributed generation
- Infrastructure
- Competitive markets
- Energy diplomacy





- no** geo-political risk
- no** external energy dependence
- no** energy imports
- no** fuel costs
- no** fuel price risk
- no** exploration
- no** extraction
- no** refining
- no** pipelines
- no** resource constraints
- no** CO₂ emissions

**Thank
you**

Europe is wealthy in wind resources – enough wind blows across Europe to power the entire continent. Today, tomorrow and forever. Wind energy can meet more than one fifth of Europe's power demand by 2030, even with a predicted 50% increase in consumption.

Europe is facing an energy crisis. Wind energy can serve as a leading solution – to security of supply, energy independence, rising demand, and mitigation of climate change.

Can you say no to that?



To find out more contact the EWEA Info@Europe energy website the Fuel Solution team www-41.eia.org or email eu.fuel@eia.org

