short term has no future

DEXIA

# A few notes on Offshore Wind

Jérôme Guillet

ASPO 7 / Barcelona / 21 October 2008

# Risks are well understood

*...and no project has ever defaulted as of today*

- **Regulatory risk**
  - Stable framework in most European countries
  - Proven political commitment over the years
  - Long term feed-in tariffs protect against regulatory changes

- **Price & volume risk**
  - No price risk in countries with feed-in tariffs (largest markets)
  - PPAs from utilities or other acceptable counterparties provide volume risk protection in all transactions, if there is no regulatory offtake obligation
  - Residual merchant risk accepted in some markets (Australia, UK, USA, Italy) under prudent assumptions

# Risks are well understood

*...and no project has ever defaulted as of today*

## Wind Construction risk

- Wind farm construction is a relatively simple task
- Very few cases of delays or cost overruns
- The project finance market takes the risk as a matter of course
- Many technical advisors available for due diligence

## Wind Technology risk

- Wind turbine generators are a well-understood technology
- Large scale turbines (>500kW) now have 15+year track record
- Several highly reliable manufacturers (Enercon, Siemens, Repower, Vestas, GE, Gamesa) compete with a number of other smaller (Nordex) or local manufacturers (Suzlon).

# Financing Offshore Wind

*An introduction*

- **Renewable energy:** a fast growing sector
- **Political support** is stable
- **Wind power:** a competitive power source
- **Project finance** is vital to the sector
- **Risks** are well understood

# Risks are well understood

*...and no project has ever defaulted as of today*

## Long term wind operations & maintenance risk

- Wind farm O&M is now an established industry
- It is a source of stable long term revenues for manufacturers
- Competition from independent operators in larger markets ensure that no monopoly positions can be claimed

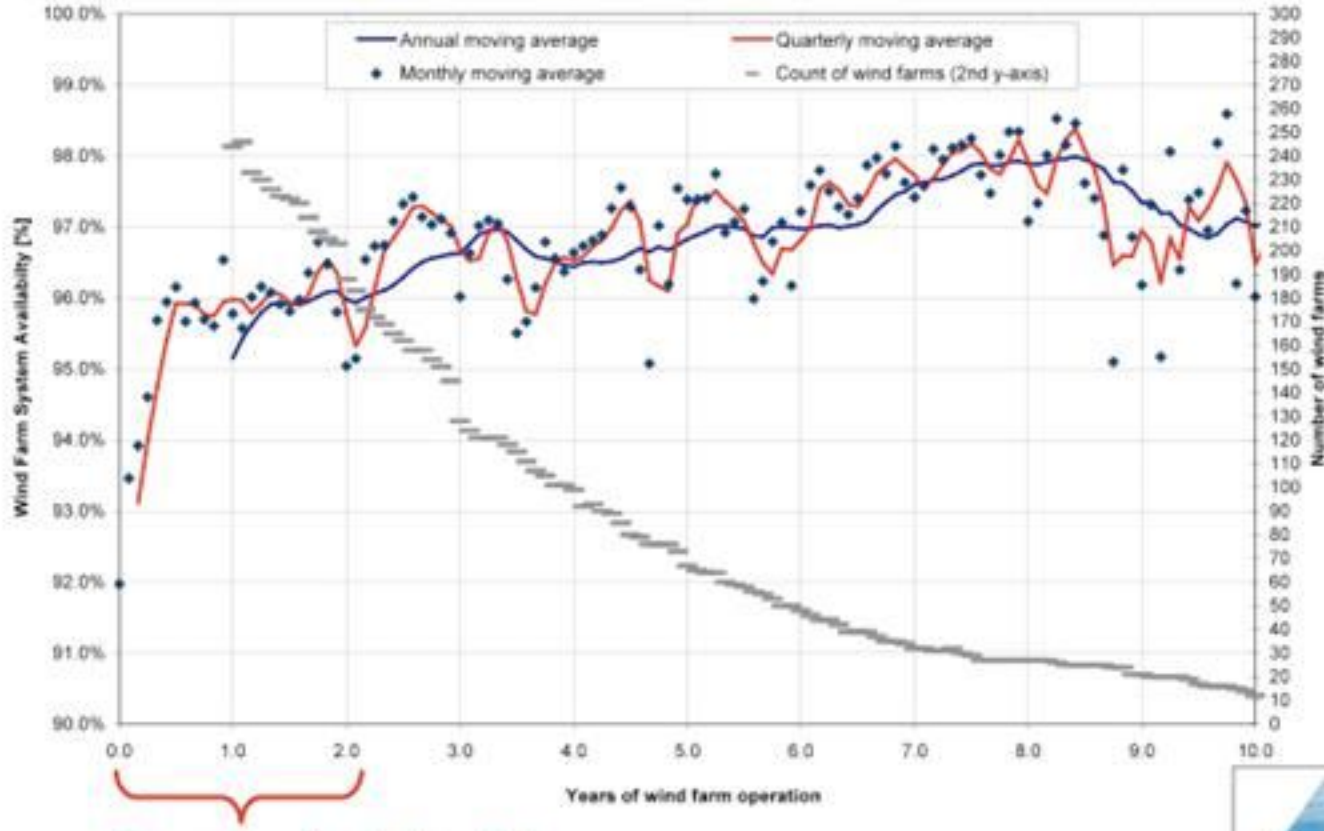
- Industry performance track record is excellent (see next slide)
- Many technical advisors available for due diligence

- This is the core risk borne by the banks

# Risks are well understood

*…and no project has ever defaulted as of today*

## Availability vs. Time




GARRAD HASSAN

## Wind farm availability has improved over time

(source: Availability Trends Observed at Operating Wind Farms, Keir Harman, Garrad Hassan, EWEC 2008)



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# Offshore wind

*...brings new challenges*

## Construction management and coordination

- Two industries not used to working together
- Projects are more complex than onshore and require management and planning skills absent in the wind industry
- Projects very large compared to size of sponsors (other than utilities) and manufacturers
- Weather uncertainty creates additional risk

✓ Nothing that cannot be solved by engineers!

# Offshore wind

*...brings new challenges*

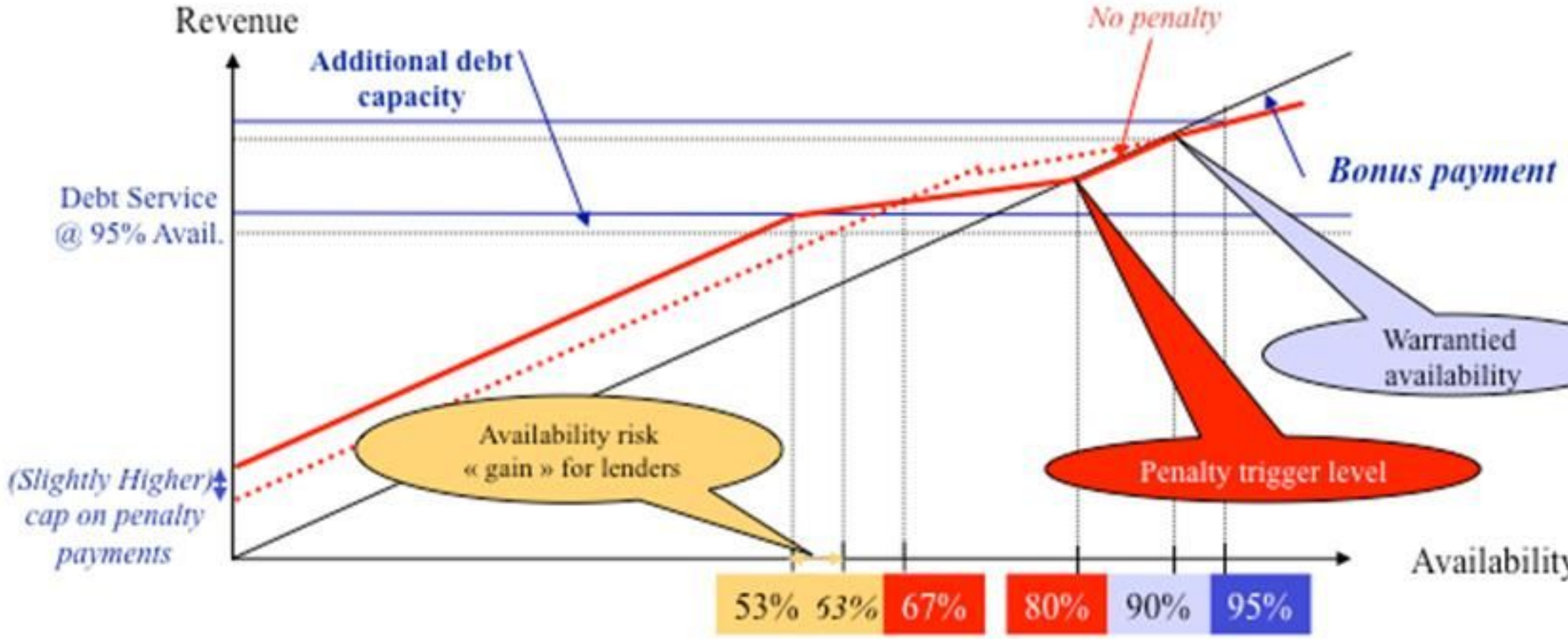
## Long term O&M is still unknown

- Combination of miore aggressive environment, higher loads and much more challenging access ot turbines
- Very little experience as of today
- No established procedures or industrial base
- Access is most difficult when turbines would be most productive -> production losses can pile up

✓ Conservative planning and budgets add to cost

# What has been done

*2 offshore wind farms financed on a non-recourse basis*




- Original financial structures are required to deal with current risks, incuding 3-way negotiations.



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# The banking crisis

*…creates new uncertainty*

## Underwriting and syndication risk

- Until the recent crisis, renewable energy project finance was a deep, mature market with many experienced arrangers and a large pool of participants
- The syndications market crisis has driven the market towards club deals in 2008, and it is likely to restart on that basis once the short term liquidity crisis is over

- Many transactions are relatively small (EUR 40-200 M) and can easily be arranged by groups of 1-4 banks
- Larger transactions (portfolios and offshore wind) are likely to be delayed until market conditions improve significantly

# Banks are still scarce

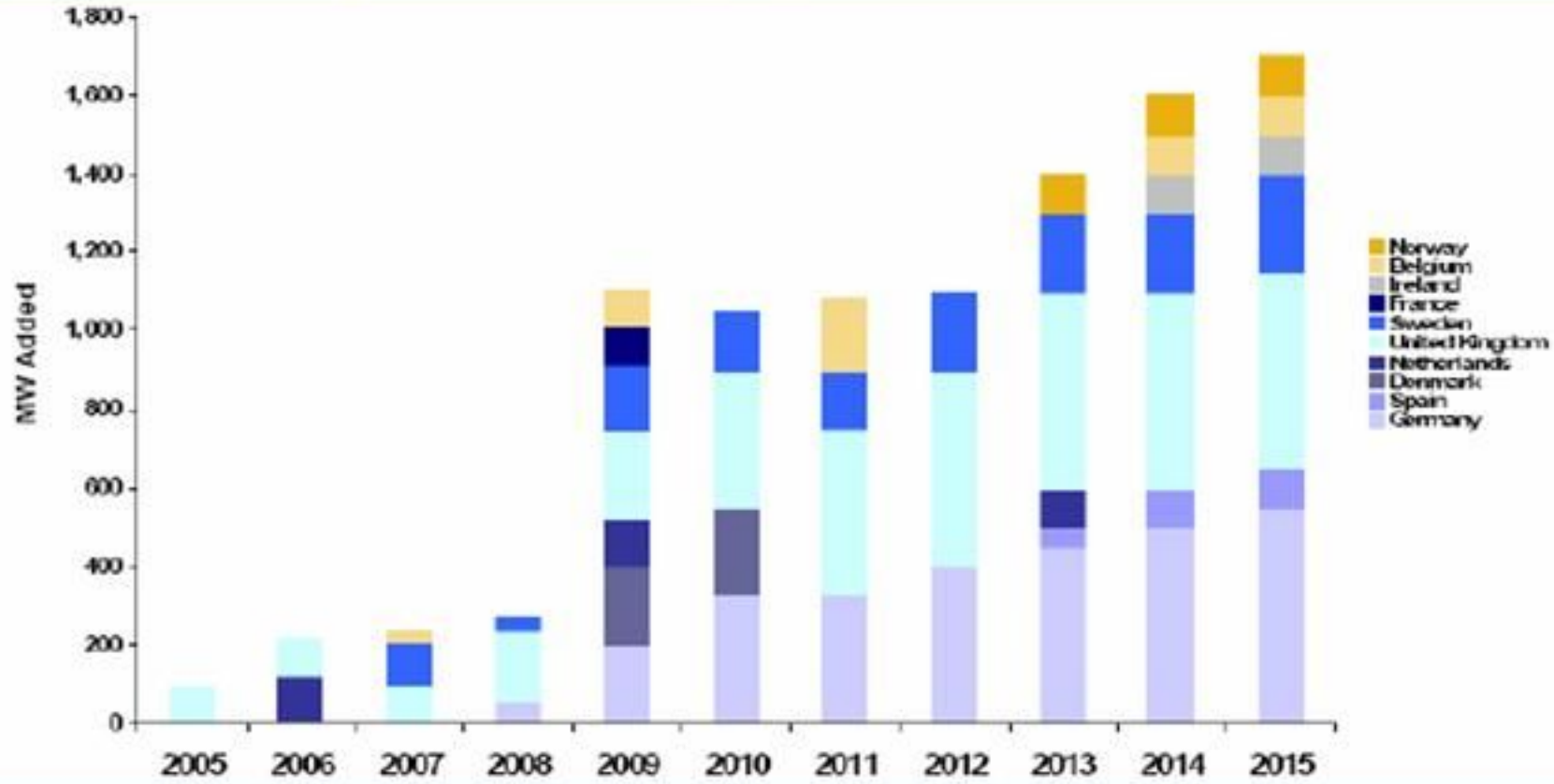
*Actual experience of offshore limited recourse finance is rare*

| | | | | |
|---|---|---|---|---|
| **Dexia** | Arranger | Lender | Advisor | Ongoing Mandate |
| **Rabobank** | Arranger | Lender | | Ongoing Mandate |
| **BNPP** | Arranger | Lender | | |
| **BoTM** | | Lender | Advisor | Ongoing Mandate |
| **HSH** | | Lender | Advisor | Ongoing Mandate |
| **KfW** | | | Advisor | Ongoing Mandate |
| **RBC** | | | Advisor | Ongoing Mandate |
| **SocGen** | | Lender | | Ongoing Mandate |
| **NIBC** | | Lender | | Ongoing Mandate |
| **HVB/Unicredit** | | | | Ongoing Mandate |
| **KBC** | | Lender | | |
| **Investec** | | | | Ongoing Mandate |
| **Nord LB** | | | | Ongoing Mandate |

# Offshore wind

*...is ready to boom*

**Graph. 16: European Offshore Wind Capacity Added, 2005-2015**




Source(s): Emerging Energy Research

- The industrialisation of the industry in underway
- Germany and the UK are expected to be the main markets

# What has been done

*2 offshore wind farms financed on a non-recourse basis*

**Q7 (The Netherlands)**
Closed 25/10/2006
Rabobank, Dexia, EKF
EUR 219 M LT debt
EUR 160 M ST debt

- 120 MW project (60 **Vestas** V-80 turbines)
- EUR 383 M investment
- 2 separate construction contracts (Vestas & Van Oord)
- Revenues from sale of electricity (PPA) plus green certificates @97 EUR/MWh for 10 years under Dutch law)
- Long term O&M by Vestas
- Sponsors ENECO (50%) and Econcern/EIH (50%)
- Construction complete, project now operational

**C-Power (Belgium)**
Closed 23/05/2007
Dexia (& Rabo for mezz)
EUR 126 M LT debt
EUR 62 M ST debt

- 30 MW project (6 **Repower** 5MW turbines)
- EUR 152 M investment
- 3 separate construction contracts (Repower, Dredging /Fabricom, ABB cable)
- Revenues from sale of electricity (PPA) plus green certificates @107 EUR/MWh min. for 20 years by law.
- Long term O&M by Repower
- Sponsors EDF EN, Dredging & regional investors
- Construction underway, scheduled in late 2008.

# What has been done

*2 offshore wind farms financed on a non-recourse basis*

**Q7 (The Netherlands)**

*EKF participates as a "normal" lender and guarantees 47 M of the TLF and 20 M of the CF*

***Syndicated*** *(BNP Paribas as MLA, BoTM, HSH, NIBC)*

- EUR 189 M Term Loan Facility (9.5y after completion)
- EUR 30 M Contingent Facility

***Not Syndicated***

- EUR 17 M Mezzanine Facility (provided by Rabobank)
- EUR 160 M L/C facilities for the contractors

**C-Power (Belgium)**

***Syndicated*** *(KBC, Rabobank, SocGen)*

- EUR 90 M Term Loan Facility (15y after completion)
- EUR 5 M Working Capital Facility
- EUR 11 M Contingent Facility

***Not Syndicated***

- EUR 20 M Mezzanine Facility (provided by Rabobank)
- EUR 21 M L/C facilities for the contractors
- EUR 25 M Grid Subsidy Facility
- EUR 16 M Equity Bridge Facility

# Dexia leads the way in offshore wind

*A 100% market share*

**Q7**
**Offshore_wind farm**

**The Netherlands**

**EUR 218 M**
**Mandated**
**Lead Arranger**

**2006**

**C-Power**
**Offshore wind farm**

**Belgium**

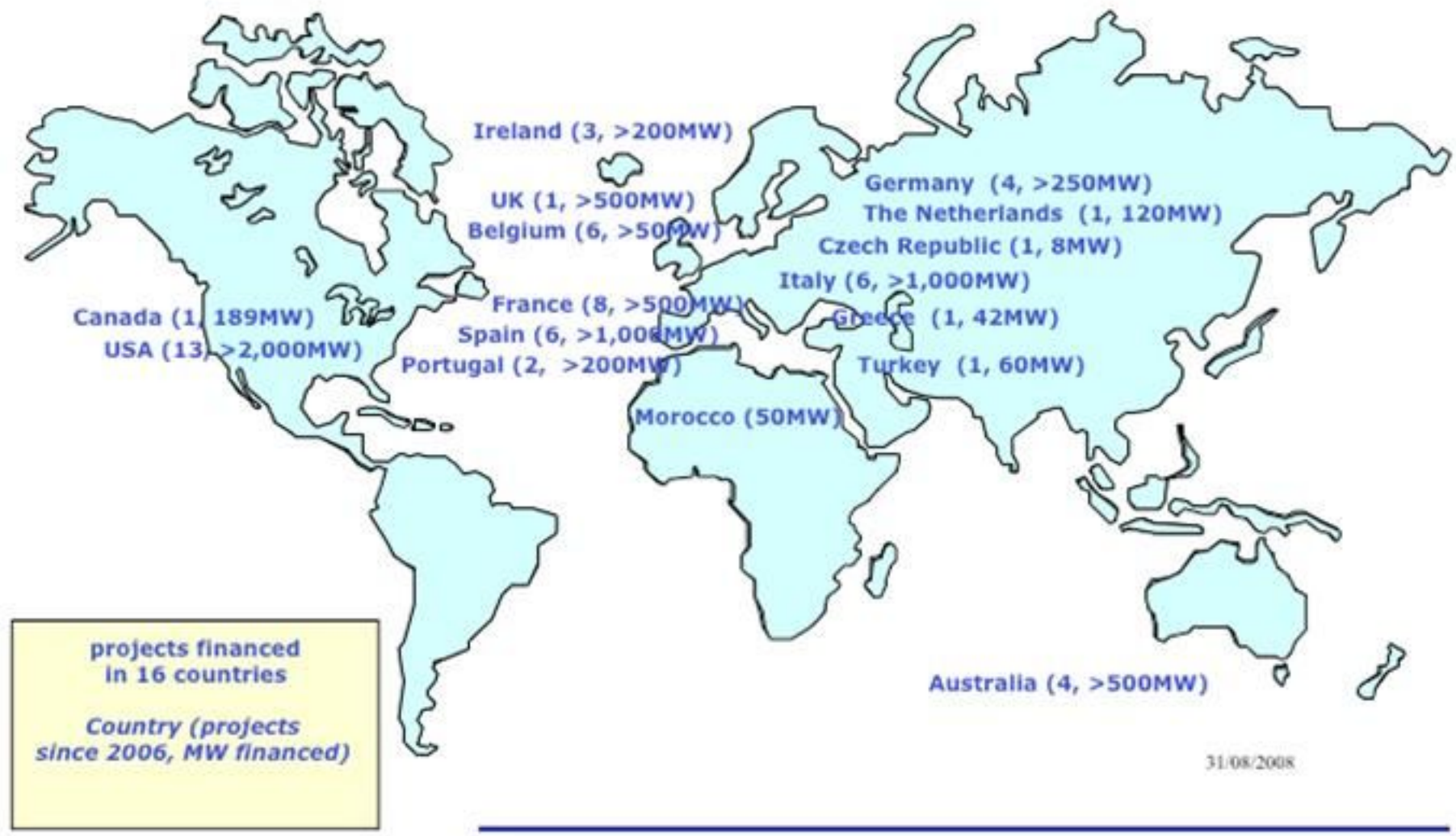
**EUR 106 M**
**Mandated**
**Lead Arranger**

**2007**

# Dexia is a market leader

*…with a wide geographic diversification*

- Dexia has the most diversified wind portfolio of any bank in the sector, spanning 16 countries on 5 continents




projects financed
in 16 countries

*Country (projects since 2006, MW financed)*

# Dexia leads the way in offshore wind

*A 100% market share*

Q7 inauguration,
June 2008

# Dexia leads the way in offshore wind

*A 100% market share*


C-Power construction, August 2008

short term has no future

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# Dexia is a market leader

...worldwide

- Over 90 transactions in 16 countries

- 50 arranging mandates in the wind sector over the past 6 years, and 15 in the solar sector over the past 2 years.

- The only arranger of offshore wind financings as of today

- EUR 2.5 billion exposure to the wind sector
- EUR 0.5 billion exposure to the solar sector

- Amongst the top 3 arrangers and lenders

# Political & regulatory risk

*Is understood and limited*

"How much do you favor or oppose a large increase in the number of wind farms in [the UK, France, Germany, Italy, Spain, the U.S.]?"

Base: All EU adults in five countries and US adults

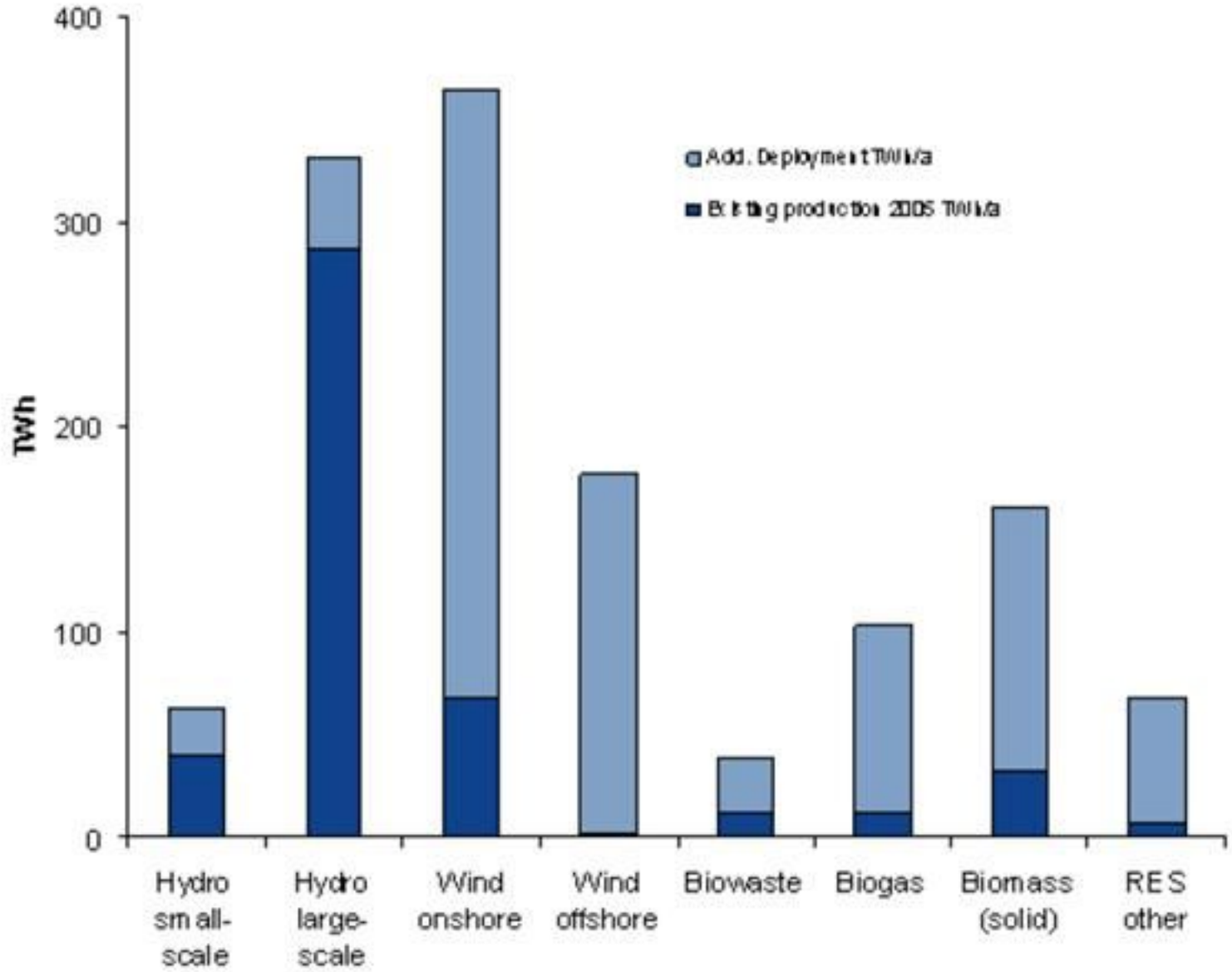
| | Great Britain | France | Italy | Spain | Germany | United States |
|---|---|---|---|---|---|---|
| | % | % | % | % | % | % |
| Unweighted base | 1087 | 1076 | 1045 | 1109 | 1111 | 1020 |
| | | | | | | |
| **FAVOR (NET)** | **87** | **89** | **91** | **90** | **79** | **92** |
| Strongly favor | 48 | 49 | 64 | 55 | 34 | 61 |
| Favor more than oppose | 39 | 40 | 27 | 35 | 45 | 31 |
| **OPPOSE (NET)** | **13** | **11** | **9** | **10** | **21** | **8** |
| Oppose more than favor | 9 | 8 | 8 | 7 | 14 | 7 |
| Strongly oppose | 4 | 3 | 2 | 3 | 7 | 1 |

- The regulatory framework in Europe is stable, well understood and benefits from strong popular and political support.

(poll source: Harris Interactive, February 2008)

# A fast growing sector

*…now reaching macro-economic significance*

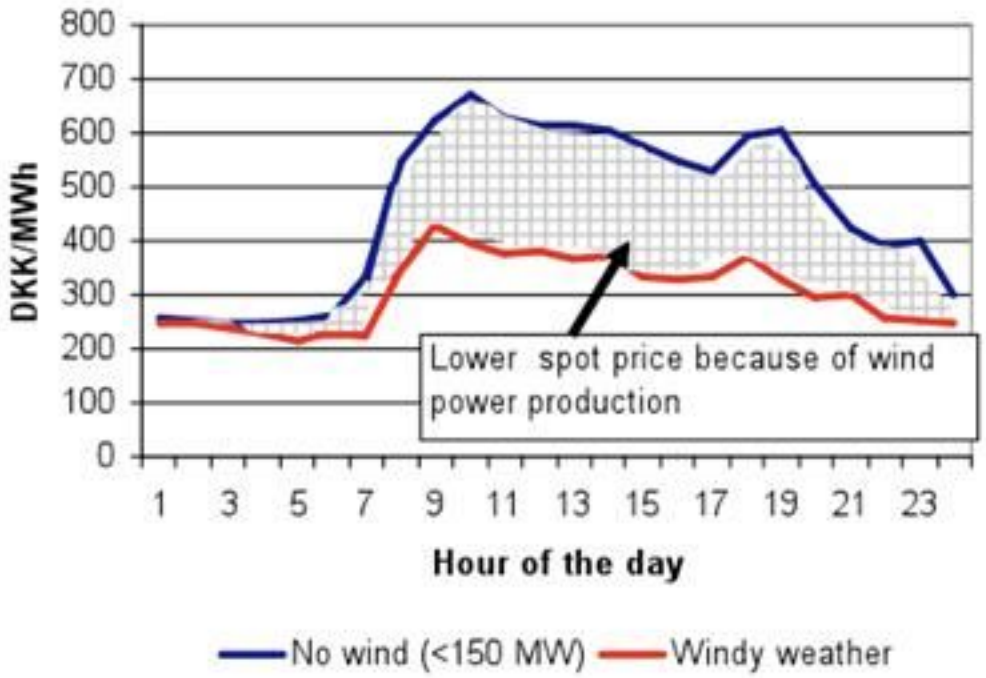


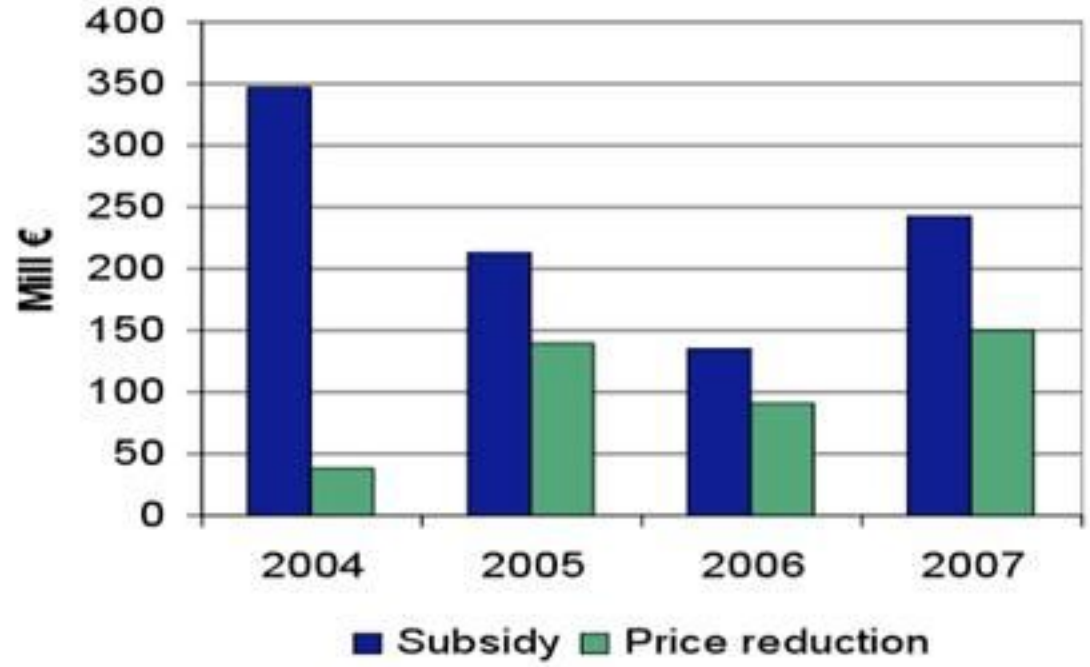

Wind will be the major contributor to the EU's goal of reaching 20% of electricity generation from renewable sources.

Implication of Large-Scale Wind Power in Northern Europe, Klaus Skytte, Econ Poyry, presentation to EWEC 2008

# Political & regulatory risk

*Is understood and limited (2)*



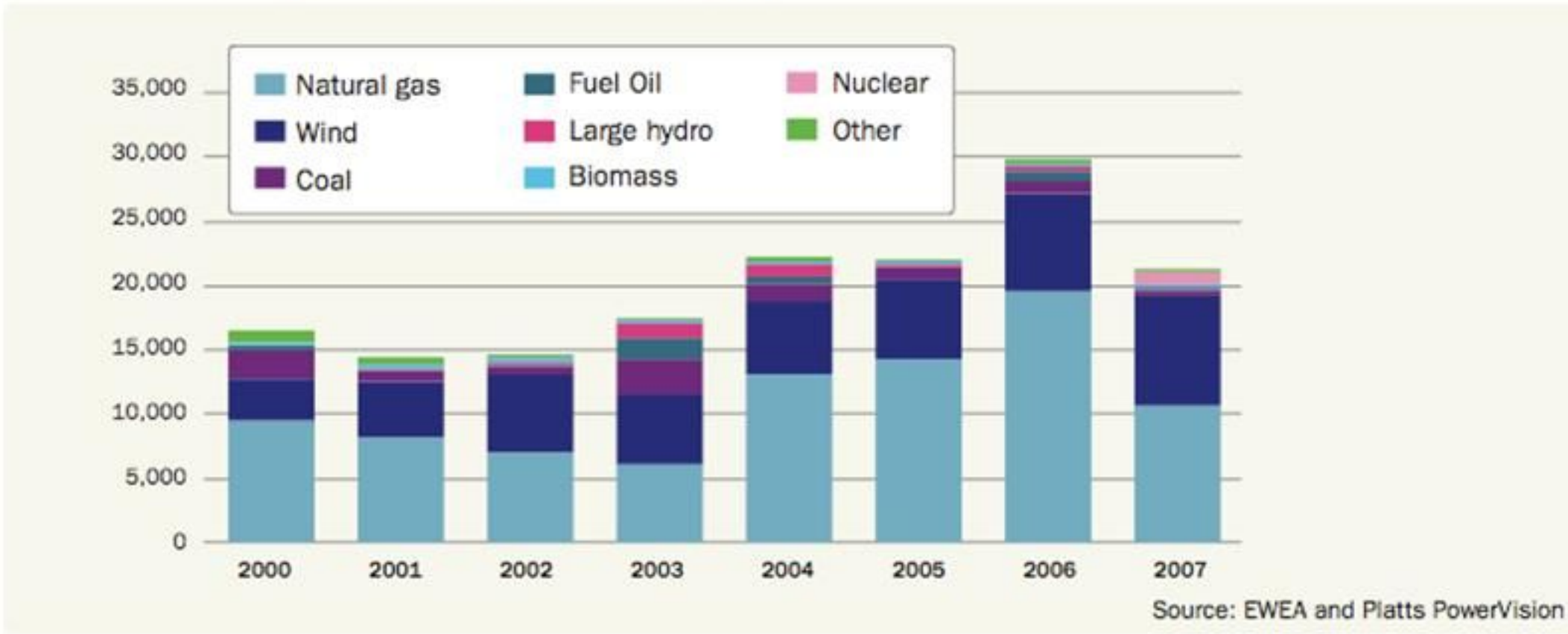

- Under market price setting mechanisms, wind power (which has zero marginal cost) brings wholesale prices down when it is available
- The overall effect (price reduction multiplied by the relevant volume) now brings savings to consumers in Denmark that are equivalent to the gross cost of feed-in tariffs, and significantly higher than the net subsidy.

(source: The effect of wind power on spot market prices, Rune Moesgaard , Poul Erik Morthorst, EWEC 2008)

# A fast growing sector

*…now reaching macro-economic significance*

FIG 1.6: **New power capacity EU 2000-2007 (in MW)**




Source: EWEA and Platts PowerVision

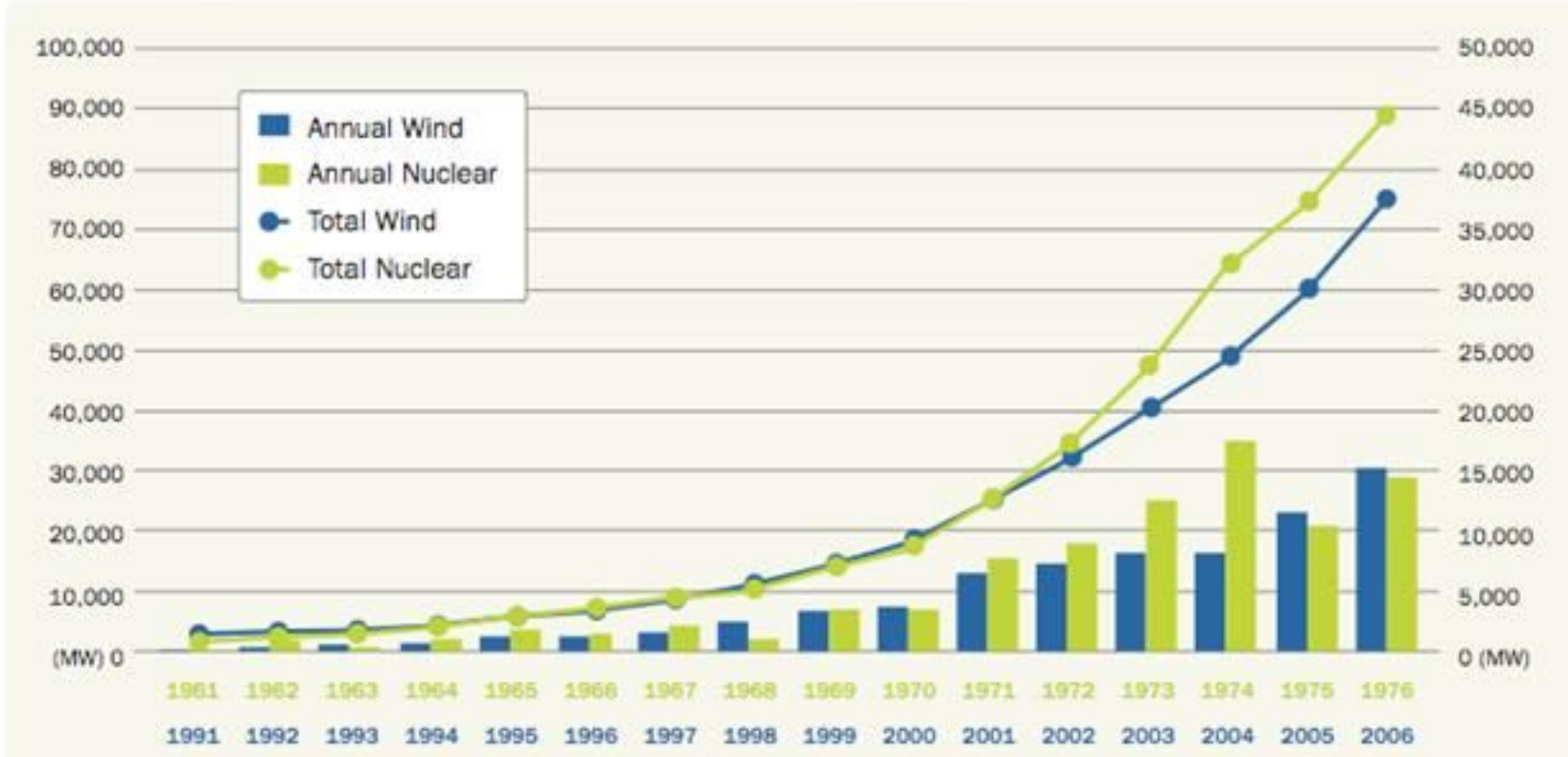
Wind has represented close to 40% of new installed power generation capacity (in MW) in Europe since 2000, and more than half of the investment.

(source: Pure Power, EWEA)

# A fast growing sector

*…now reaching macro-economic significance*

FIG 0.1: **16 years of global wind energy development (1991-2006) compared to the first 16 years of nuclear development (1961-1976)**

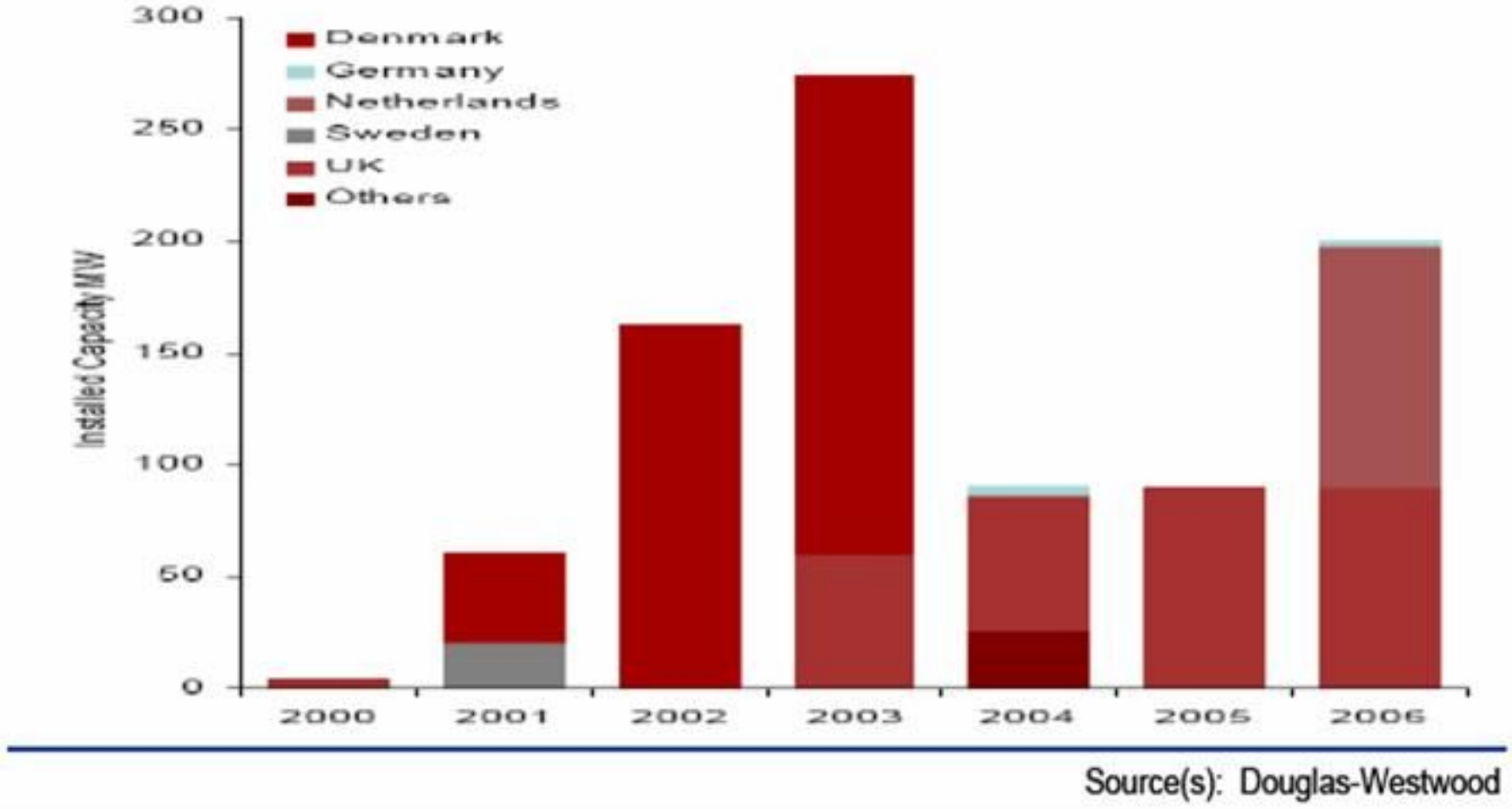



- Wind has grown as fast as the nuclear industry did 30 years before, and is now reaching visible penetration levels
- Investment in renewable energy is expected to exceed USD 100 bn per year

(source: Pure Power, EWEA)

# Offshore wind

*...still in its infancy*




Source(s): Douglas-Westwood

- Offshore wind is still at the « pilot project » phase
- A few scattered projects

# Political & regulatory risk

*Is understood and limited (3)*

## 3. Results for the merit-order effect: Annual analysis

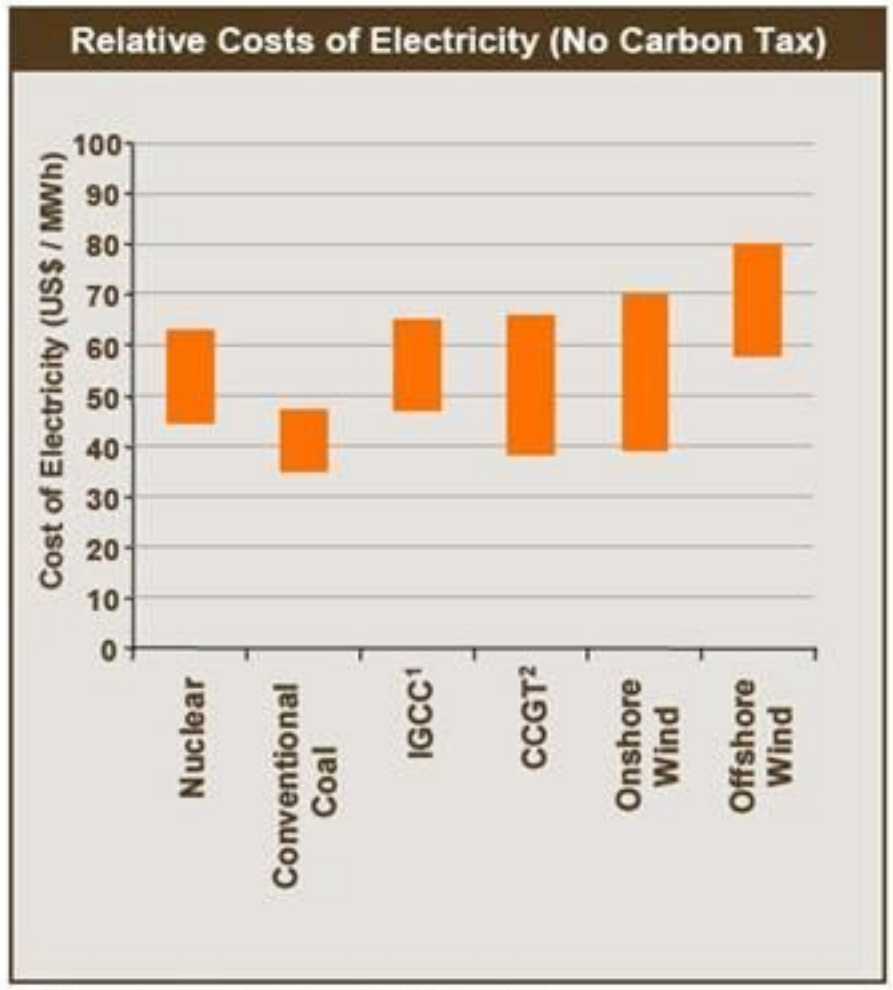
| | Simulated renewable generation | Average price reduction | Volume merit-order effect | Merit-order effect per Renewable MWh | Average feed-in tariff |
|---|---|---|---|---|---|
| | TWh | Euro/MWh | Billion Euro | Euro/MWh | Euro/MWh |
| 2001 | 24.3 | 1.7 | 1.07 | 44 | 86.9 |
| 2004 | 41.5 | 2.5 | 1.65 | 40 | 92.9 |
| 2005 | 45.5 | 4.25 | 2.78 | 61 | 99.5 |
| 2006 | 52.2 | 7.83 | 4.98 | 95 | 103 |

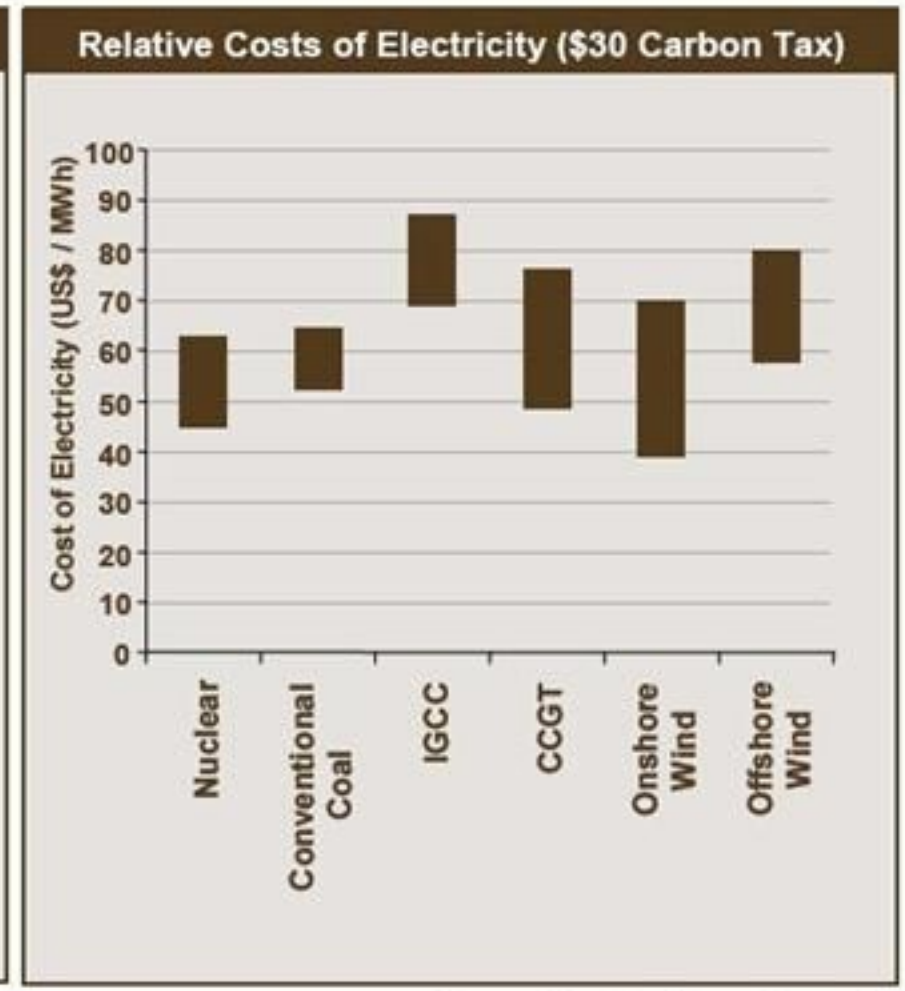
- Germany (11% of electricity coming from wind) shows similar results.
- This will help ensure that support for wind power is not seen as an « unaffordable luxury » if economic conditions continue to worsen

(source: Assessment of the impact of renewable electricity generation on the German electricity sector, Mario Ragwitz, Frank Sensfuss, Fraunhofer Institute , EWEC 2008)

# Wind power is competitive

*...against traditional power generation*




(1) Integrated Gasification Combined Cycle

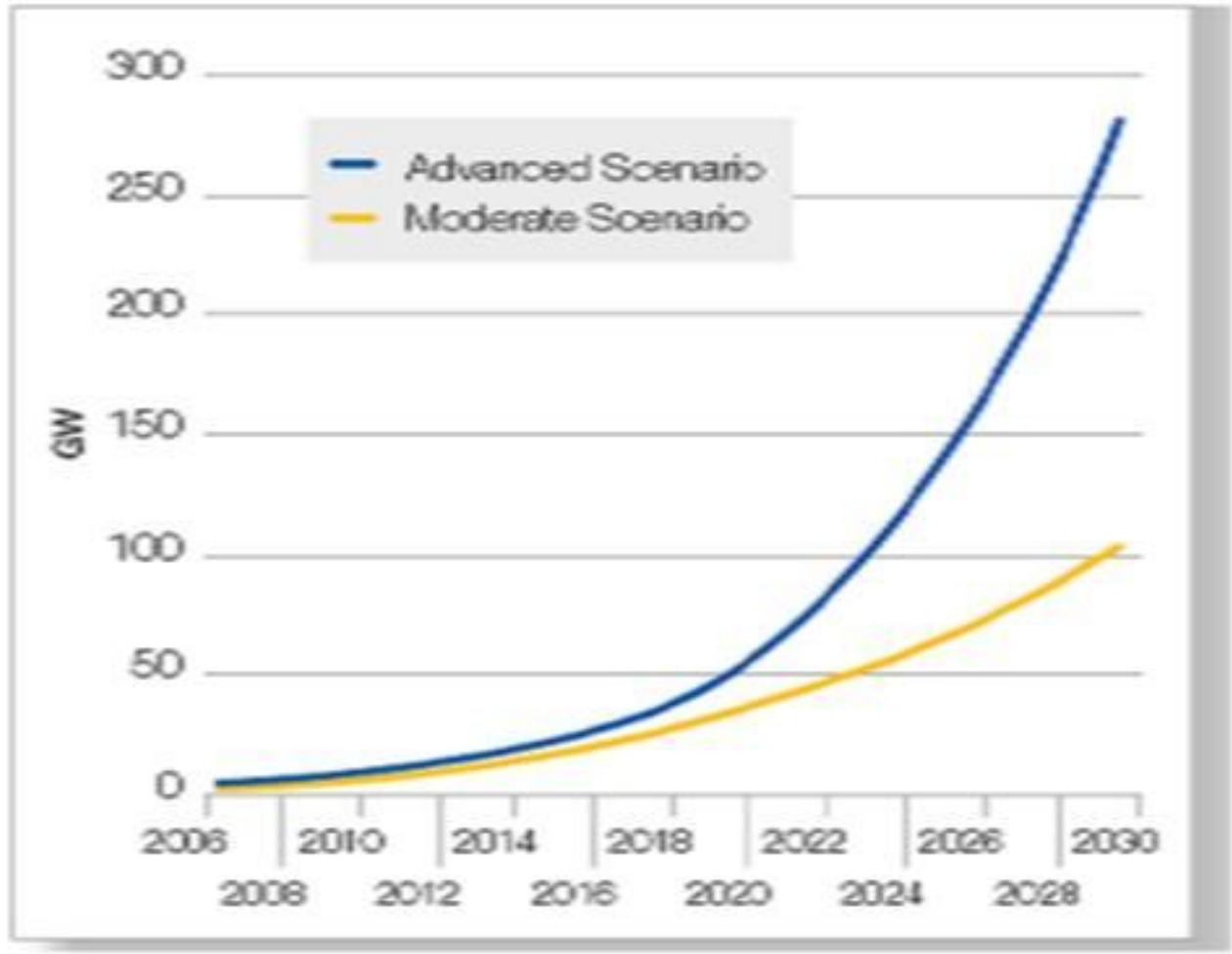
(2) Combined Cycle Gas Turbine

Source: Emerging Energy Research

Wind power is now a competitive, utility-scale, proven technology.

# Solar power is booming

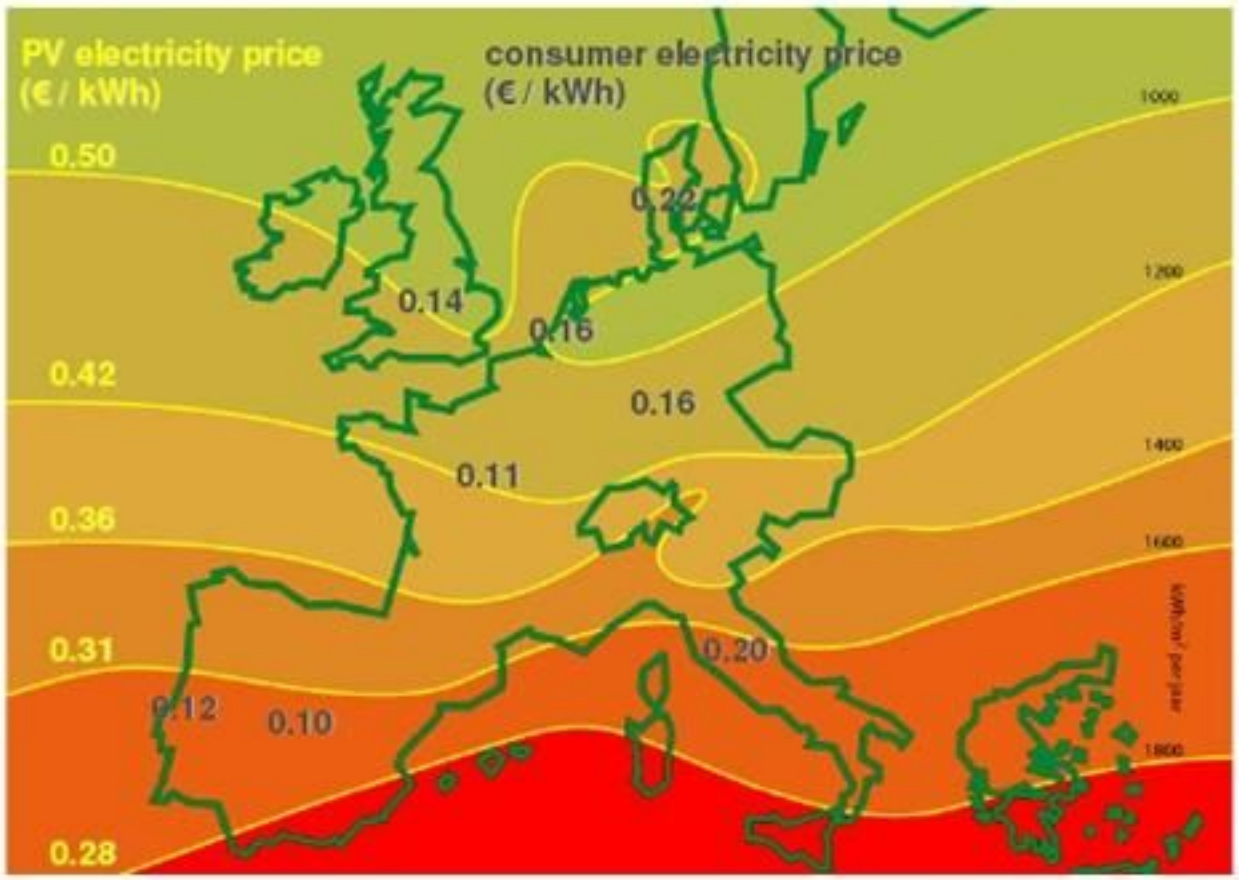
*...if from a low base*

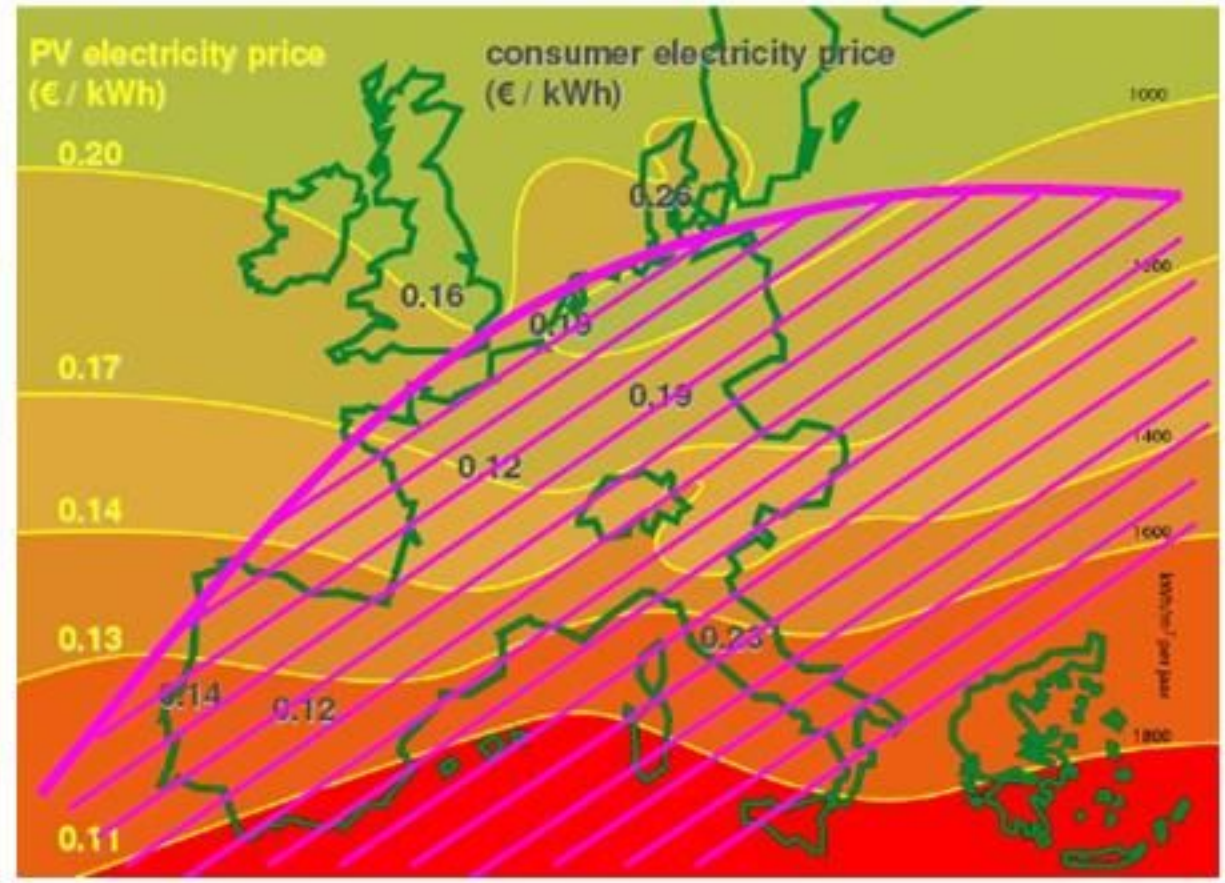



- Solar power is expected to grow from almost nothing (2,500MW of photovoltaic) to a large installed base (30GW of concentrated thermal and 200 GW of PV) by 2020

# Solar power is the future

*…with grid parity expected in the next 15 years*




**2005** **2020**

- While solar is still significantly more expensive today, costs are coming down thanks to rapid technology progresss.
- In the meantime, solid regulatory framework are encouraging investment in the US, Spain, France, Italy or Germany.

# Project finance is vital

*...for the development of renewable energies*

- All types of sponsors use project finance:
  - Small developers need the funds
  - Financial investors need the leverage
  - Utilities use it to reduce balance sheet commitments

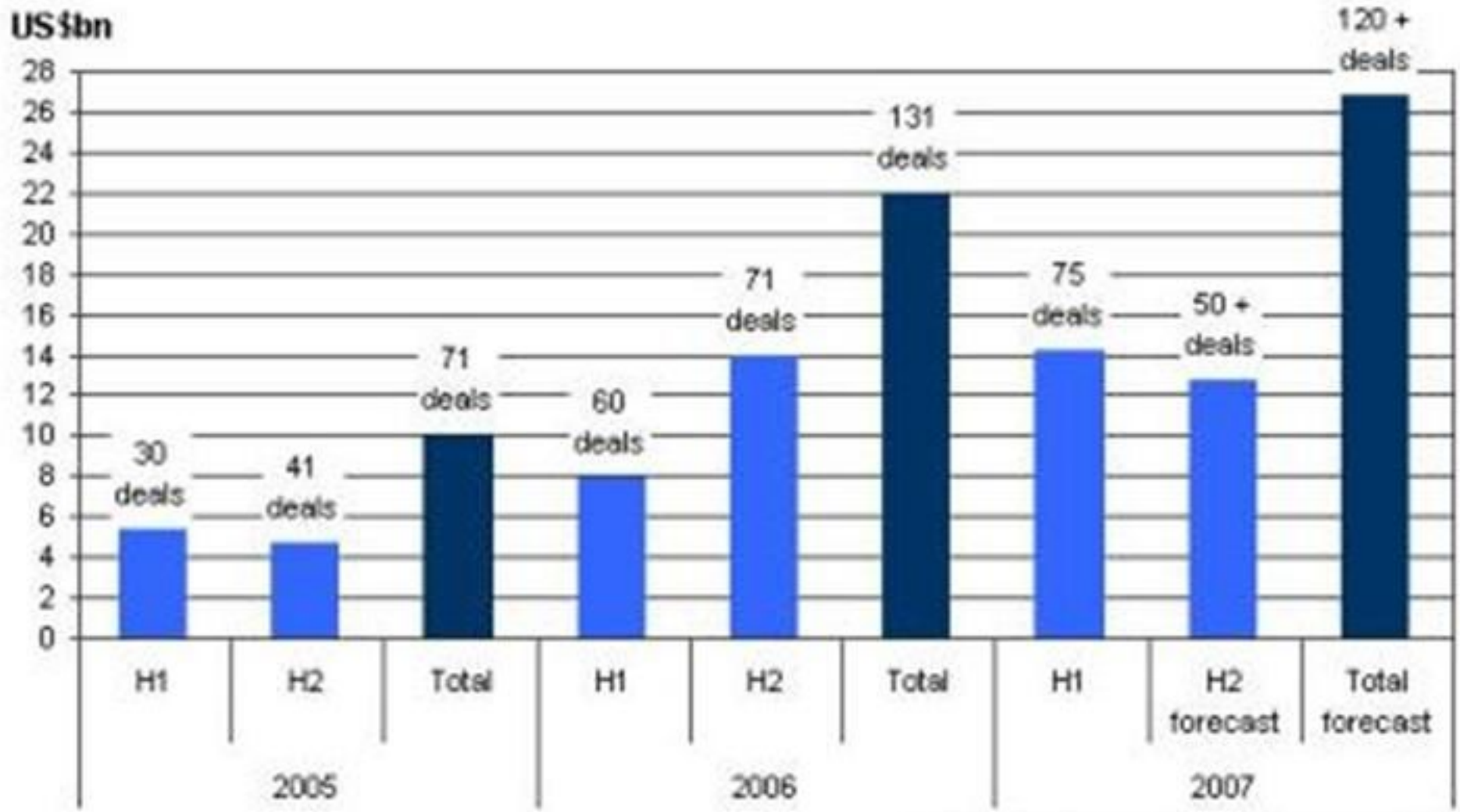
- Non recourse financing is a proven tool

- USD 30 billion worth of renewable energy projects were financed in 2007 (IJ Online) out of roughly USD 50 bn of investment.

# Project finance is vital

*...for the development of renewable energies*

**Global Reneawables Project Finance 2006-2007**




**Source: Infrastructure Journal R&A**