



# Efficient Support of Renewable Energies

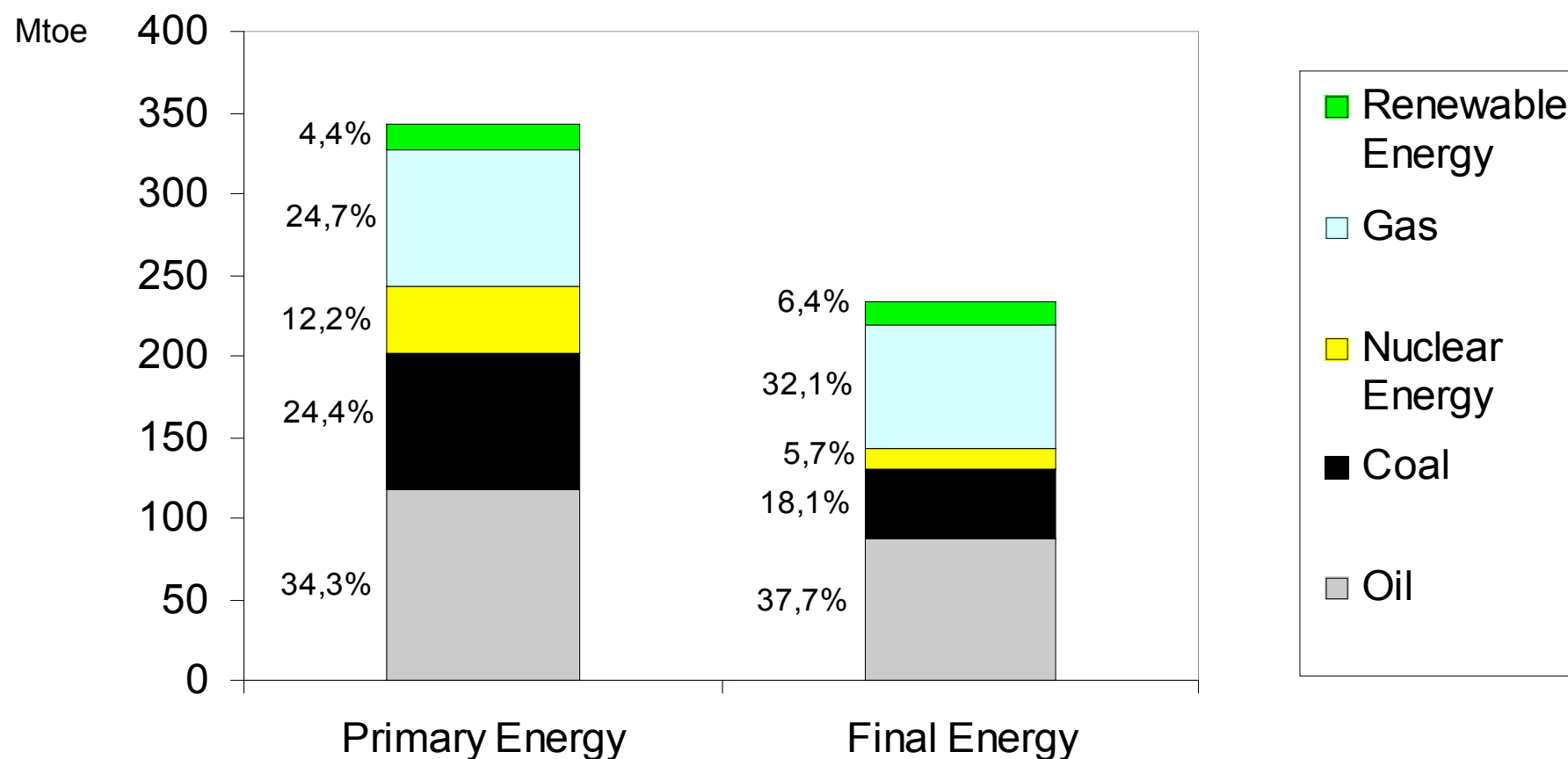
**Dipl.-Ing. Johannes Lackmann**

**President**

German Renewable Energy Federation (BEE)

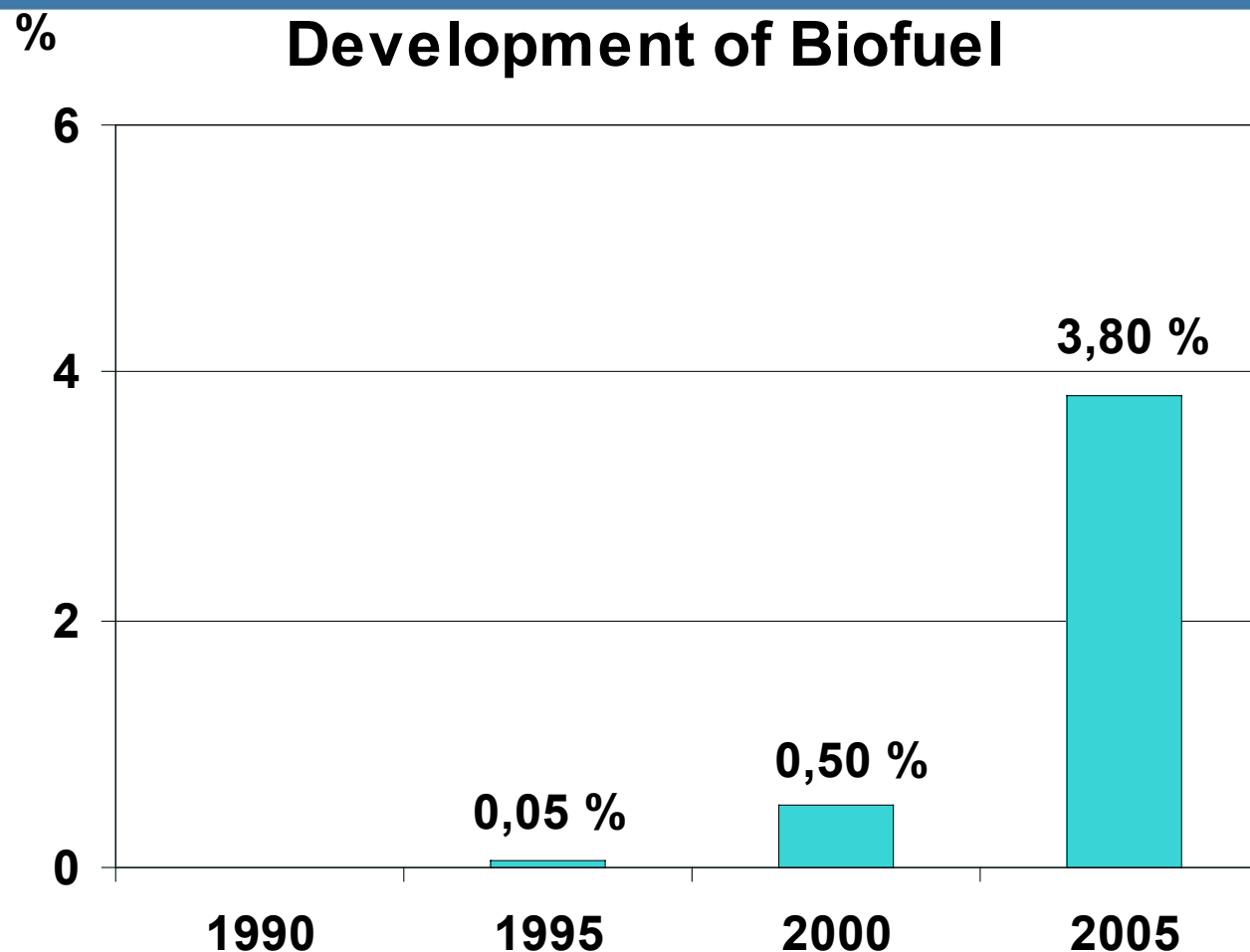


# Energy Consumption - Germany



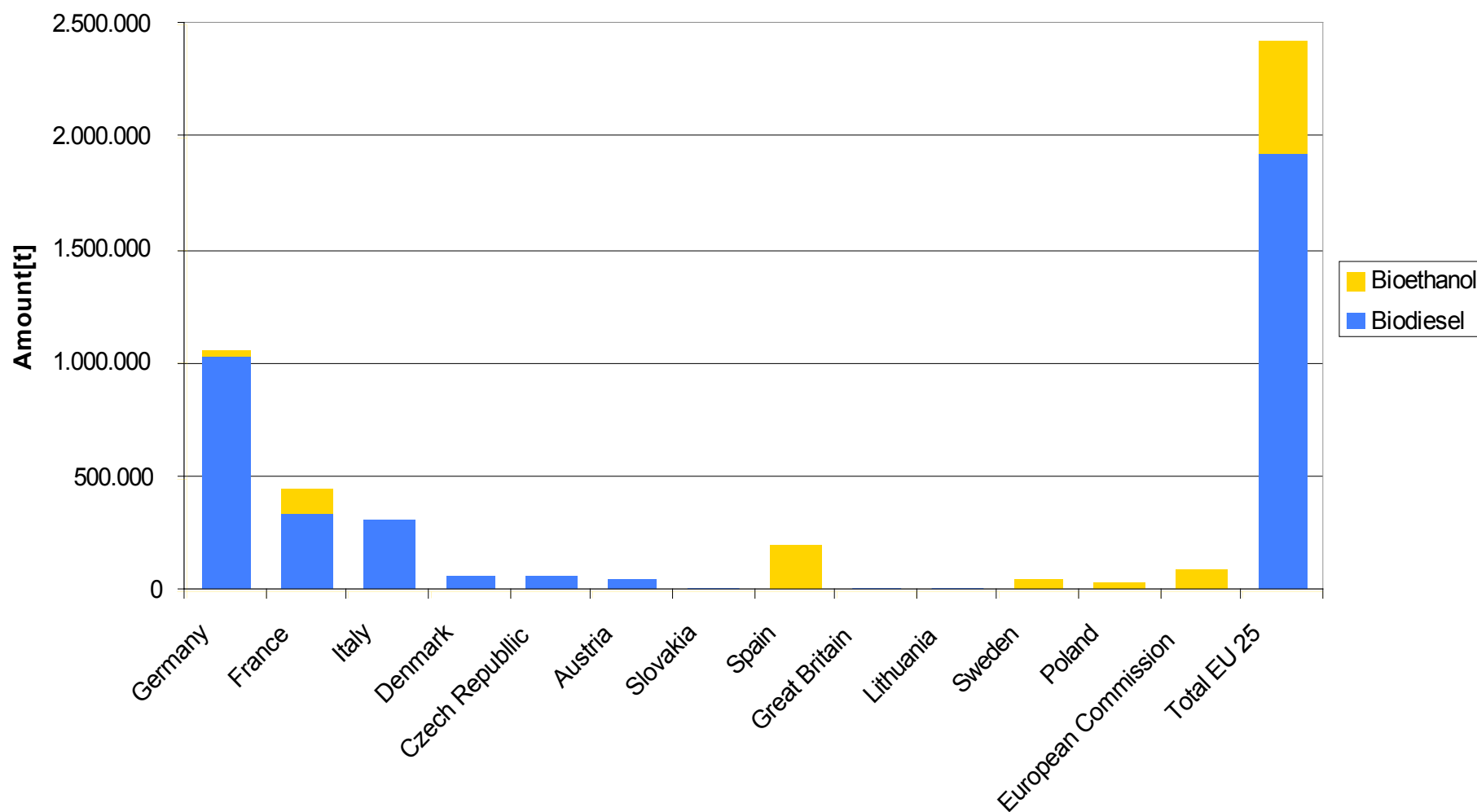
2005

# Share of Renewable Energy on German Fuel Consumption (mainly based on domestic production capacities)



Sources: Association of German Biofuel Industry (VDB), Working Group on Renewable Energies Statistics (AGEE-Stat)

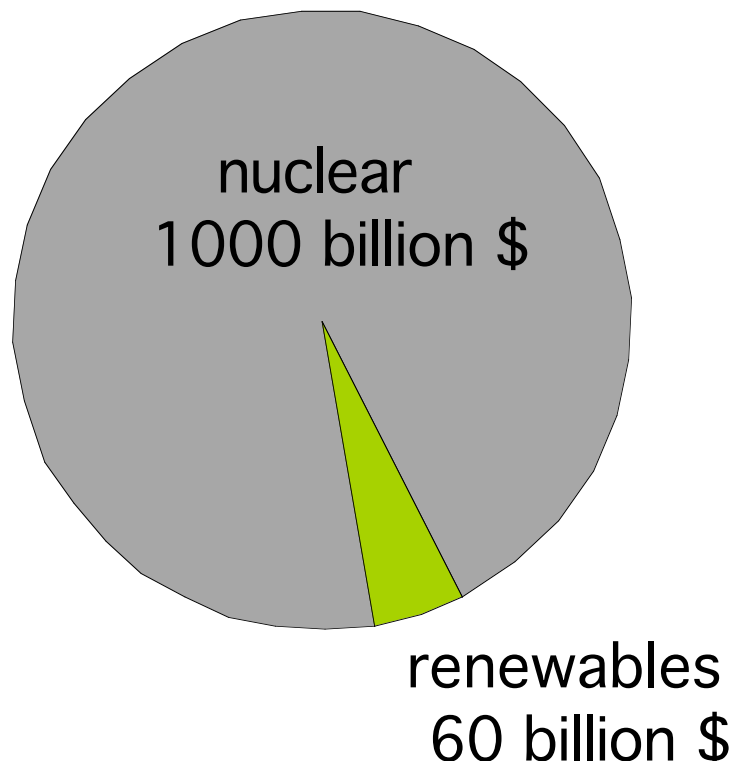
# Production Biofuels EU 2004



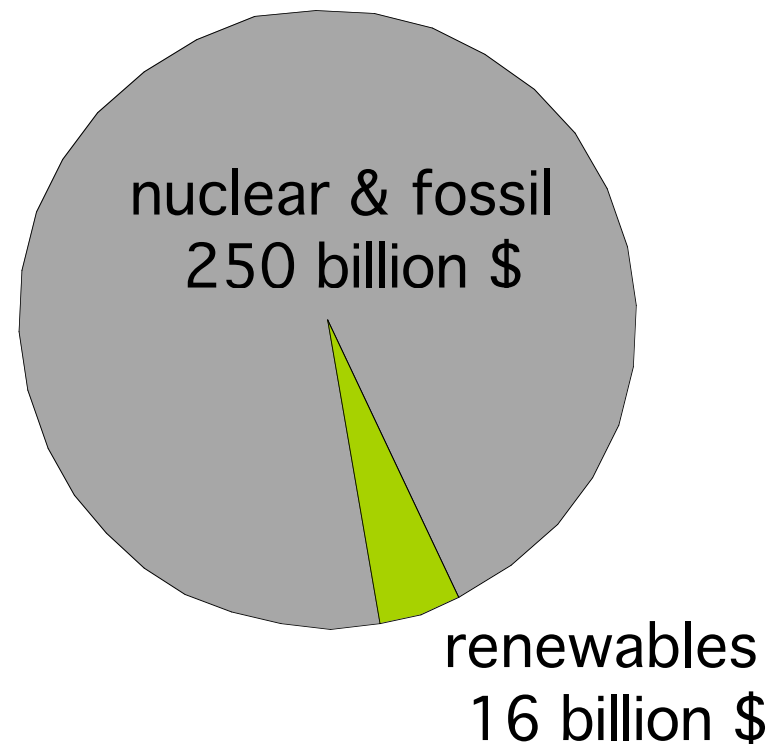
## Obstacles for renewable energies - Subsidies for fossil and nuclear energies

The market conditions are distorted because of tremendous subsidies for fossil and nuclear energy and not internalized external costs.

### **Subsidies worldwide up till now**



### **Subsidies in Germany up till now**



# Obstacles for renewable energies

## Not internalized external costs

### **Aggregated external costs of electricity production in the EU (Billion EUR/year).**

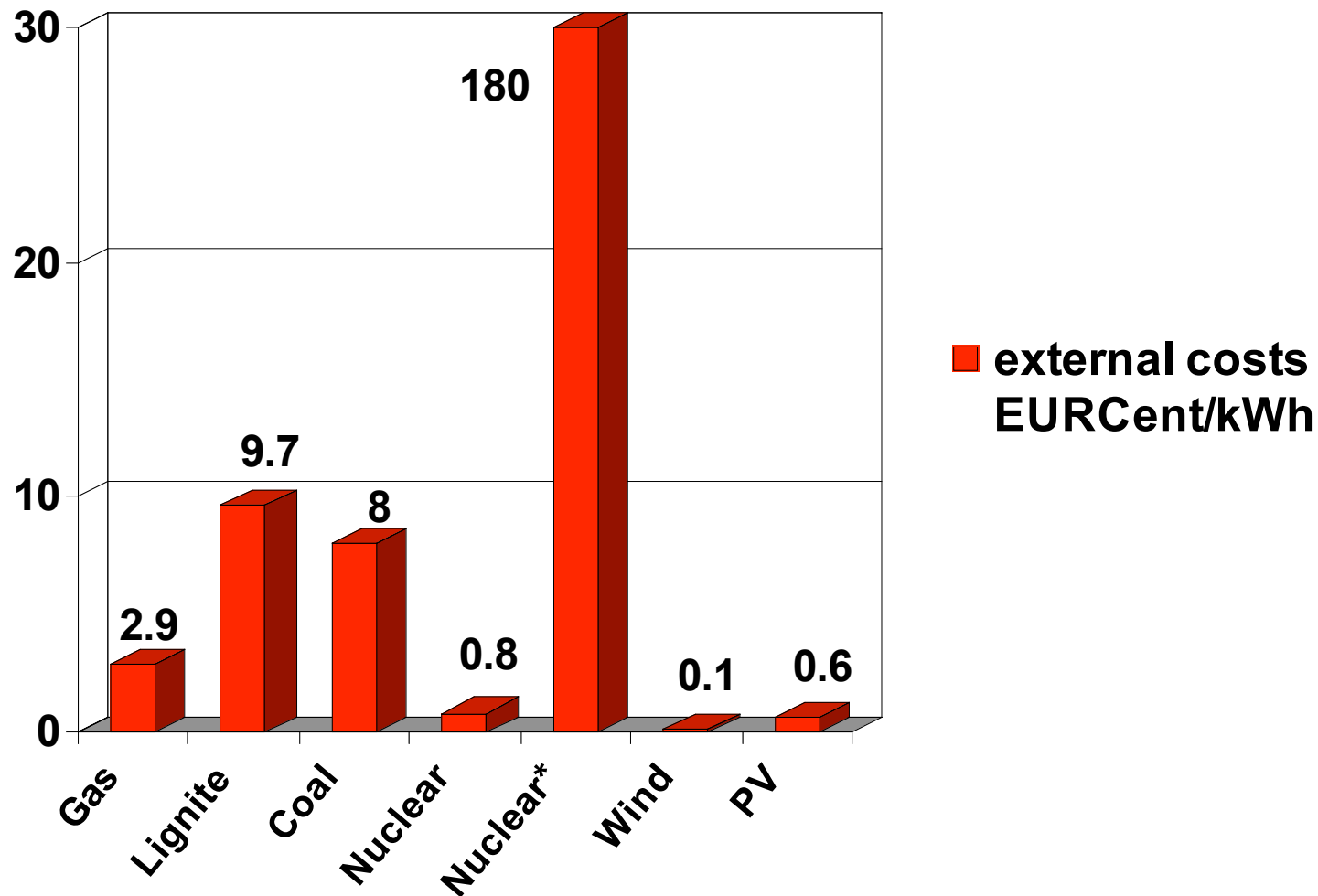
<b>Fossil fuels</b>	63 - 88
<b>Nuclear energy*</b>	0.7 – 1.4
<b>Renewables</b>	0.56
<b>Total</b>	<b>64.6 – 90.5</b>

**\* Nuclear risks not included**

Source: EC 1999g Table 19.14

# Obstacles for renewable energies

## Not internalized external costs



External costs of electricity generation in Europe. Source: ExternE (EU) 1995; \* Moths 1994 Including insurance for reactor catastrophes



# External costs of energy production



Uranium mining in Krasnokamensk, Chita Oblast,  
(Russia) Source: Greenpeace/Ivleva 1994



## Impacts caused by lignite mining in Germany

- more than 300 villages were wiped out and 100,000 people resettled
- precious drinking water stocks have been destroyed
- about 100 billion m<sup>3</sup> water (which is two times the amount of the „Lake Constance“) had to be pumped off in the German lignite areas since 1960



## **Monopoly structure hinders fair competition among the technologies:**

„Some countries still have the dominance of one or a few power companies, often vertically integrated. This might imply a monopoly-like situation, which could hamper the development of RES-E“

„For a good functioning of all the RES-E support systems, an independant TSO is an essential factor“

Meeting document for the Sustainable Energy Forum,  
Amsterdam, 13-14 October 2005

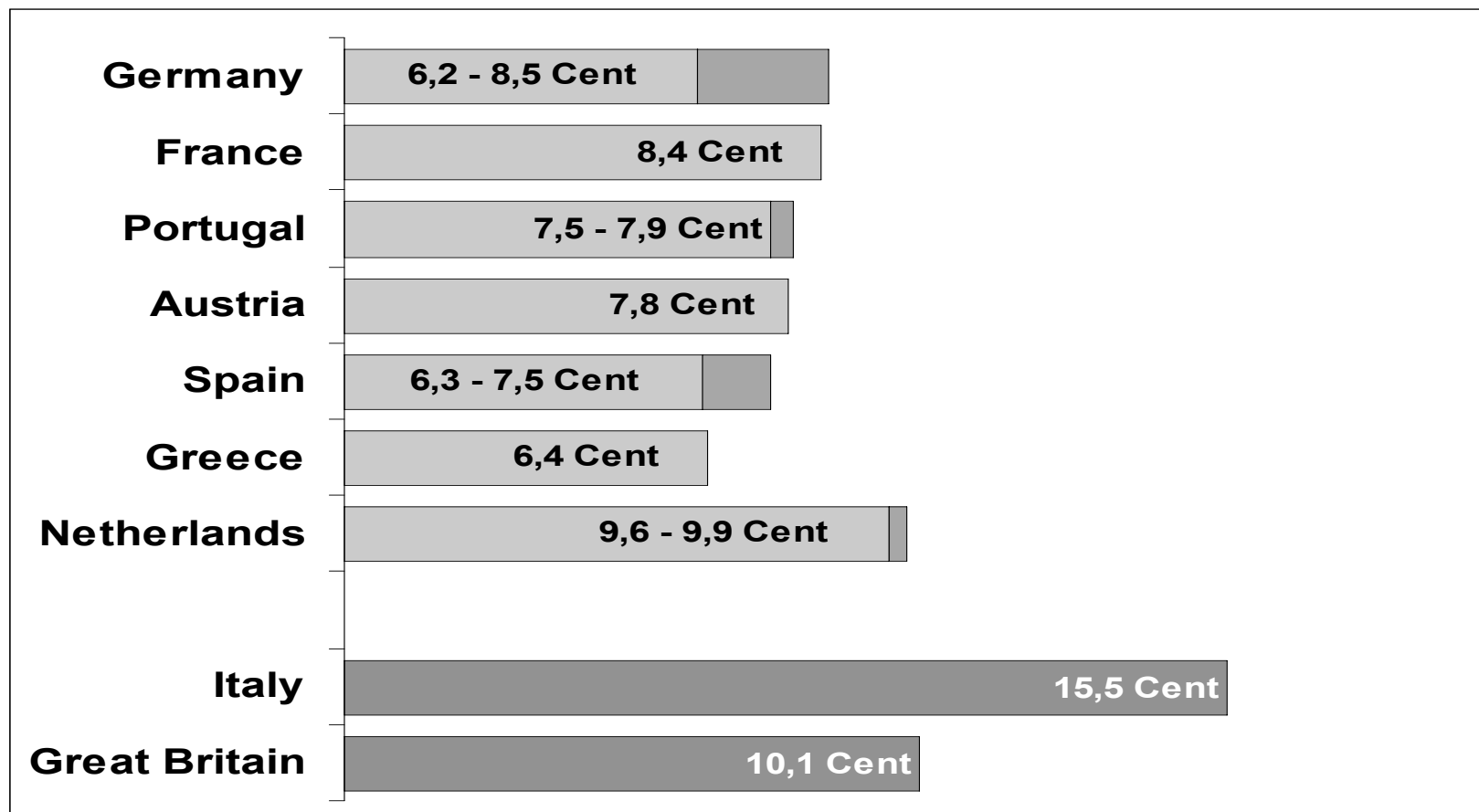
The Forum has been organised under the authority of the European Commission, Directorate-General for Energy and Transport and the Dutch Ministry of Economic Affairs.



# How to support renewables?

## **Major support schemes:**

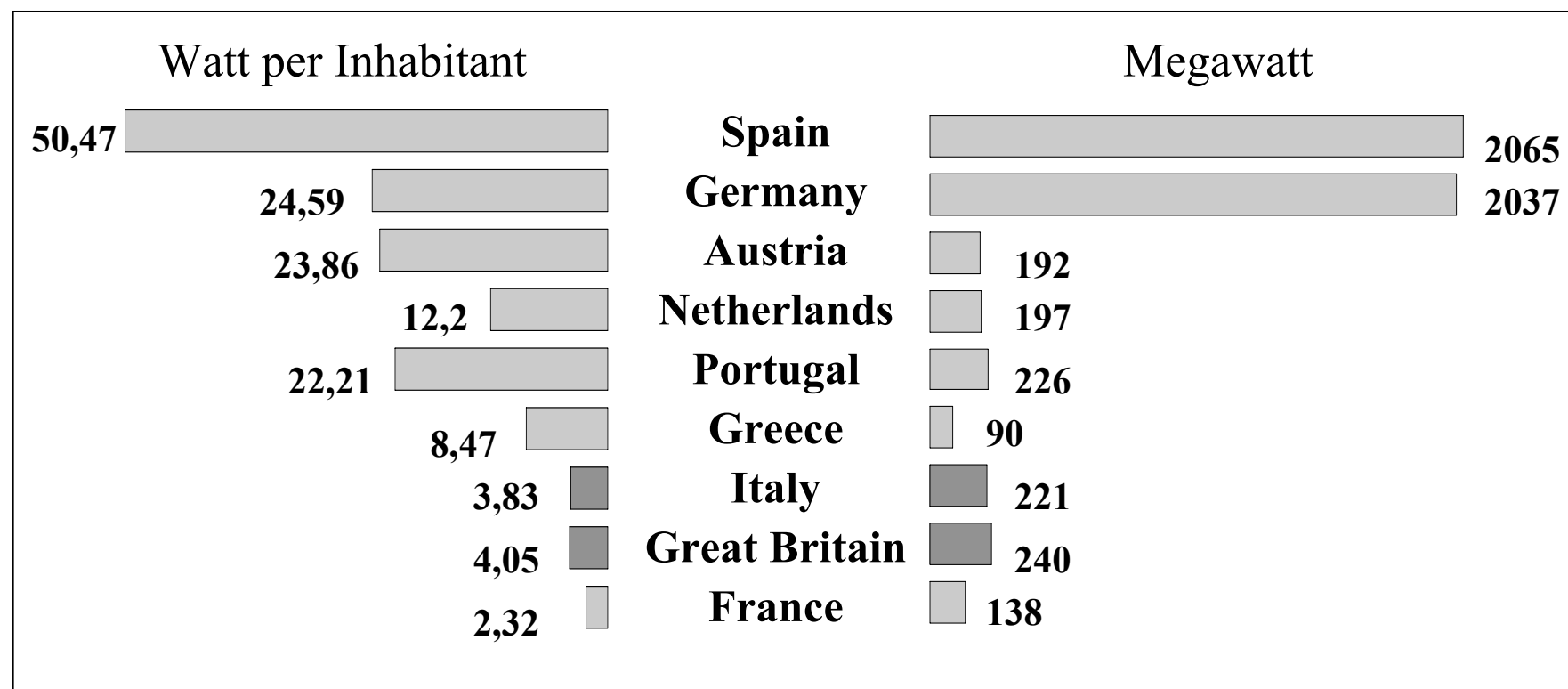
- Specific budget for research and development
- Energy taxes (ECO-taxes) combined with tax exemptions for renewable energies
- Renewable feed-in tariff, (REFIT)
- Binding use of RES shares in transport and heating sector
- Capacity building (like IRENA)



## Compensation levels for electricity from wind energy in comparison 2004



-  Countries with Feed-In Tariffs
-  Countries with Quota System

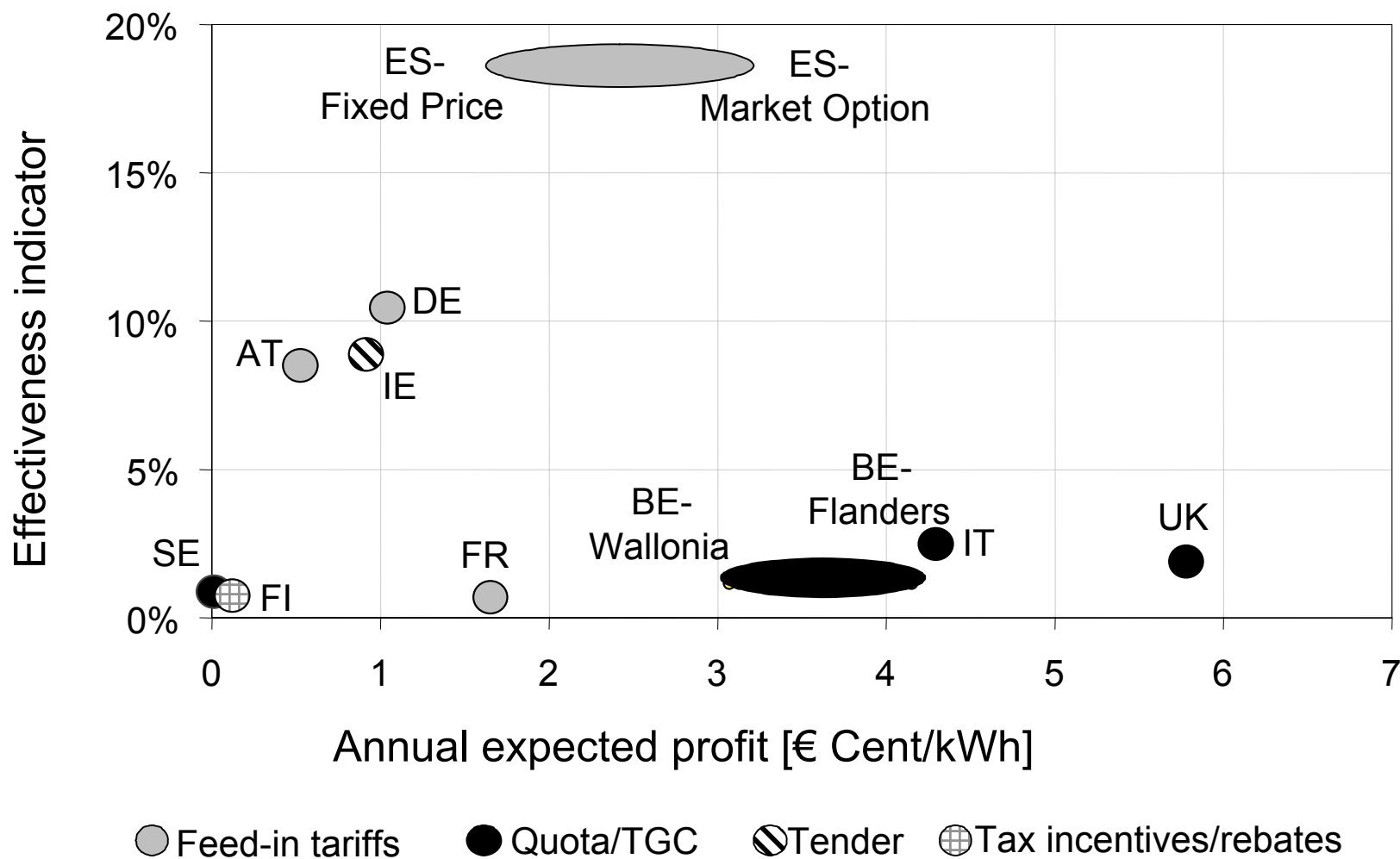
## Wind energy - increase of installed capacity in comparison



-  Countries with Feed-In Tariffs
-  Countries with Quota System

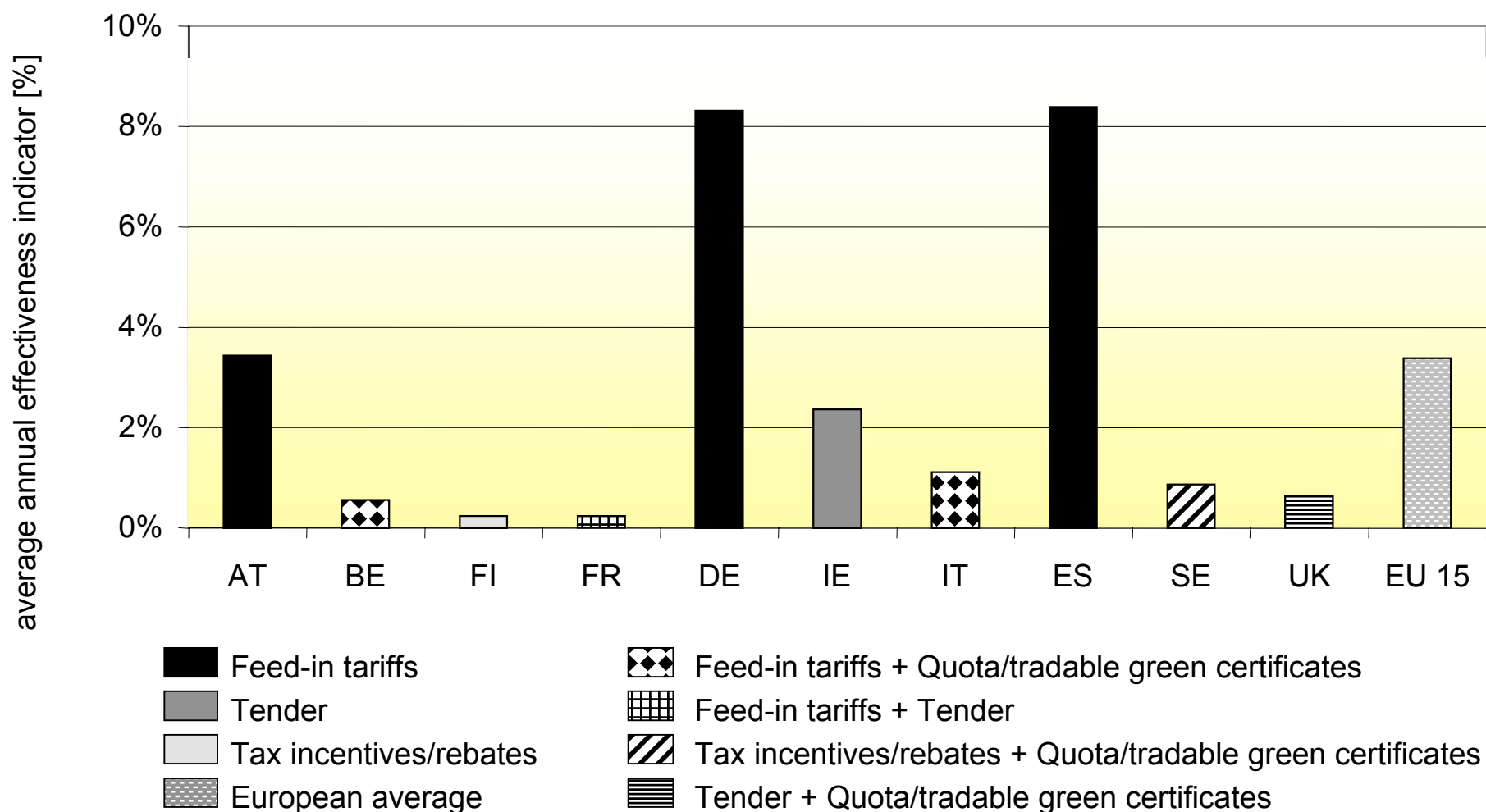


## Effectiveness of support systems – wind energy



Source: European Commission 2005

## Effectiveness of support systems







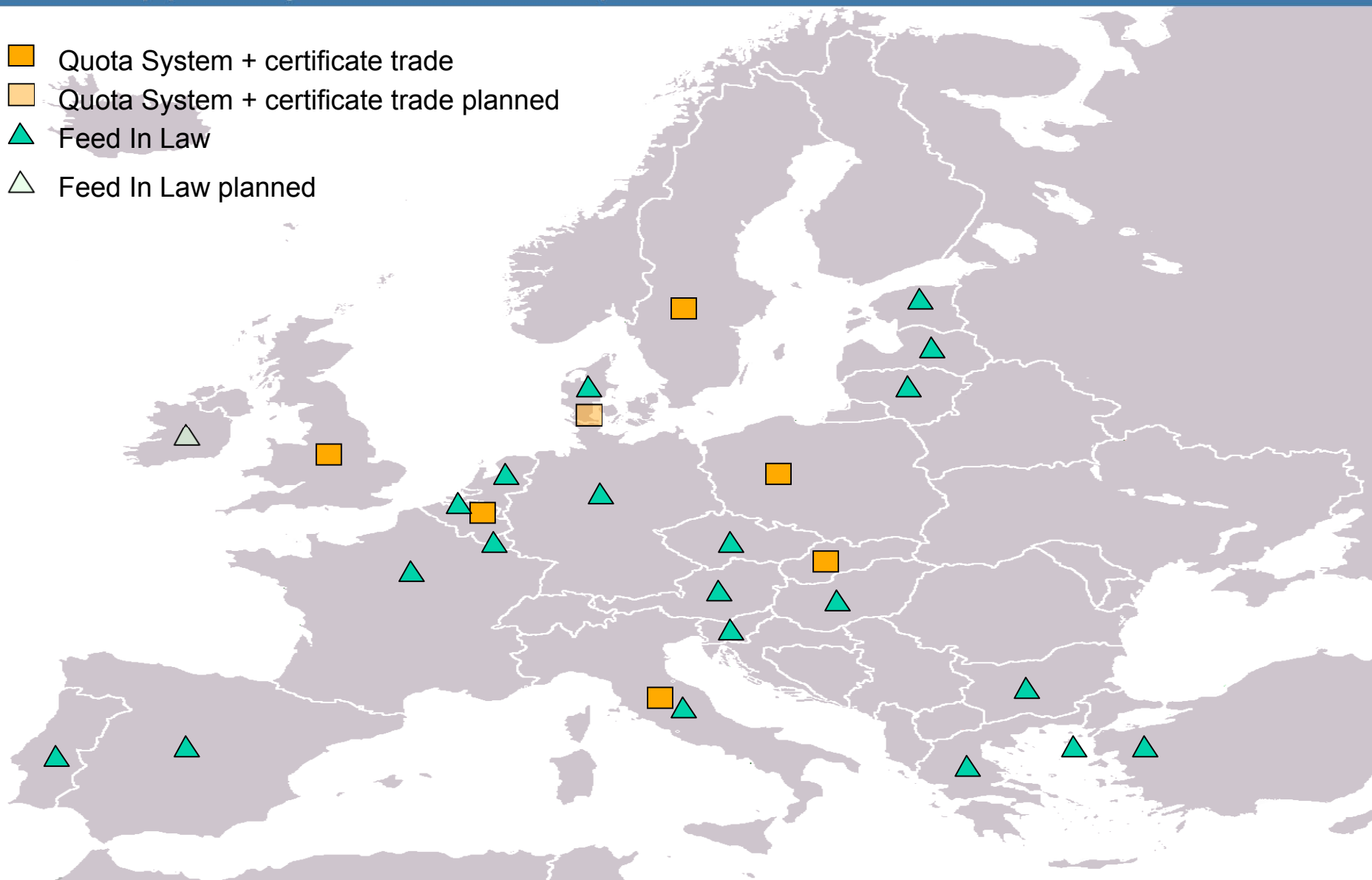
Source: European Commission 2005

## Wind energy in Europe – Payment levels and installed capacity

	Country	Payment level (€ ct/kWh)	Installed power End 2003 (MW)	Employment effects (employees 2003)
Countries with a payment regulating system (Feed in law)	Germany	6.6 – 8.8	14,609	46,000
	Spain	6.6	6,202	ca. 20,000
Countries with a quantity regulation system (Quota system)	UK	ca. 9.6	649	ca. 3,000
	Italy	ca. 13	904	ca. 2,500

## Support systems in Europe

-  Quota System + certificate trade
-  Quota System + certificate trade planned
-  Feed In Law
-  Feed In Law planned



## Effectiveness of support systems – wind energy

- The green certificate systems present currently a significantly higher support level than the feed-in tariffs. This could be explained by the higher risk premium demanded by investors, the administrative costs as well as a still immature green certificate market. The question is how the price level will develop at the medium and long term.
- The most effective systems for wind energy are currently the feed-in tariff systems in Germany, Spain and Denmark.
- Regarding profit, the feed-in systems investigated are effective with a relatively low producer profit. On the other hand, green certificates at present have high profit margins.



## Effectiveness of support systems – wind energy

- It is commonly stated that the high level of feed-in tariffs is the main driver for investment in wind energy especially in Spain and Germany. As can be seen, the level of support is rather well adjusted to generation cost. A long-term stable policy environment seems to be the key to success in developing RES markets, especially in the first stage.
- 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.

Source: European Commission 2005

# EEG – cost efficiency

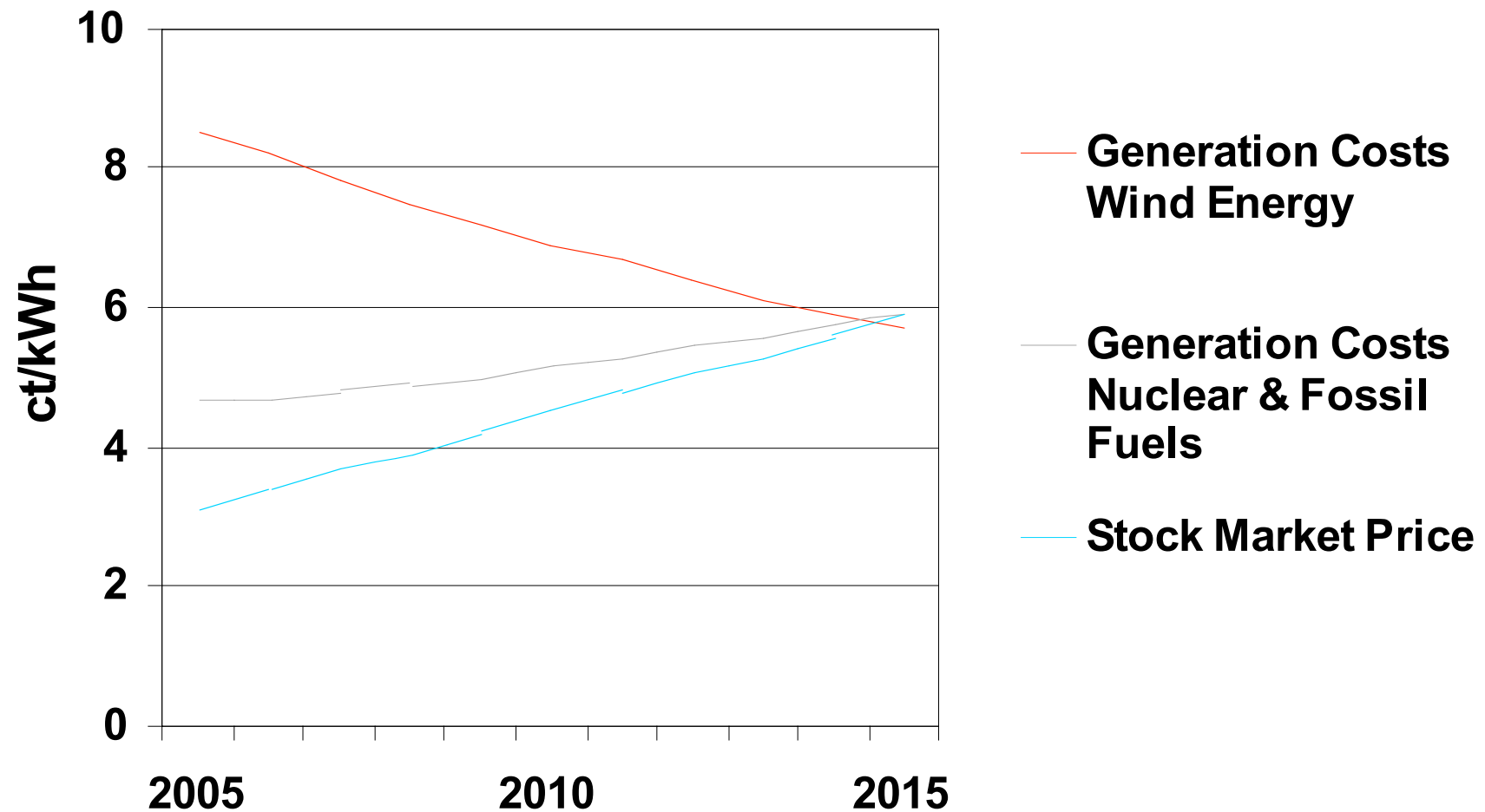
Differentiation of technologies

Differentiation according to size

Differentiation according to development status  
Declining remuneration annually

Differentiation according to site

# Convergence of wind energy and stock-market price



# Basis for effective promotion of renewable energy sources



Stable and reliable instruments of support

Transparent and unbureaucratic instruments of support

Opportunity for small and mid-sized enterprises /  
new players

## Competition impulses through new actors

Competition impulses through new actors in the energy market until now:

- reduction of measurement costs by 75%
- transformer stations 50%



## Supporting Biofuels in Germany

- Since December 1992 there has been a mineral oil tax exemption for biodiesel.
- On January 1<sup>st</sup>, 2004, tax exemption was extended to all biofuels, including blends (§2a of mineral oil tax law). For biofuels blended with fossil fuels, tax exemption is limited to the biogene share. Tax exemption so far extends only until December 31<sup>st</sup>, 2009.
- Starting August 1<sup>st</sup>, 2006, there will be partial taxation for biofuels:
  - \* 10 cents/litre for pure biodiesel,
  - \* 15 cents/litre for biodiesel as a blending component,
  - \* 15 cents/litre for vegetable oil.

## Supporting Biofuels in Germany

- For 2007, the introduction of a quota system for biofuels is scheduled:

- \* There will be separate quotas for petrol and for diesel. In 2009/2010 the total quota is scheduled to increase.

- \* The quota is related to the total sales of the obliged enterprise. It can be fulfilled by blending as well as by selling pure biofuels.

- Scheduled quotas:

- Diesel starting 2007 4.4%

- Petrol starting 2007 2.0%
  - starting 2010 3.0%.

- Additionally:

- Overall quota starting 2009 5.7%
  - starting 2010 6.0%

- Starting on January 1<sup>st</sup>, 2007, biofuels within the quota legislation are completely subject to mineral oil taxation.
- Until the end of 2009, tax exemptions for pure biofuels (+E85) are maintained on top of quota regulations.
- Until 2015, second generation biofuels will be subject to a degressive tax exemption.

# CDM - Emission Trading

## Transaction Costs (indicative)

- project screening: 10 – 20 t €
- consultancy for project authorization, documentation and execution: 25 – 75 t €
- validation through independent auditor: 10 – 30 t €
- approval of executive board
- Possible charge in the guest country (“tax”)
- adaptation fund: 2% of the certificates

# CDM - Emission Trading

## Experiences with Financial Contribution

<u>Country</u>	<u>Project Type</u>	<u>IRR without Certificates</u>	<u>IRR with Certificates</u>
Rumania	long distance thermal energy	10,5 %	11,4 % (+0,9)
Costa Rica	wind energy	9,7 %	10,6 % (+0,9)
Jamaica	wind energy	17,0 %	18,0 % (+1,0)
Morocco	wind energy	12,7 %	14,0 % (+1,3)
Chili	water energy	9,2 %	10,4 % (+1,2)
Costa Rica	water energy	7,1 %	9,7 % (+2,6)
Guyana	biomass	7,2 %	7,7 % (+0,5)
Nicaragua	biomass	14,6 %	18,2 % (+13,6)
Brazil	biomass	8,3 %	13,5 % (+5,2)
Latvia	landfill gas	11,4 %	18,8 % (+7,4)
India	landfill gas	13,8 %	18,4 % (+5,4)



## Real costs of emission trading in Germany

- rise of the electricity price through emission trading: 1.1 ct/kWh

➔ 5.7 Billion €/y

reduction goals until 2012: 7.5 Million t CO<sub>2</sub>/y

costs per t CO<sub>2</sub>: **560 €/t**

- costs of CO<sub>2</sub>-reduction through windenergy in Germany:

tariff for wind energy: 8.53 ct/kWh – market price of electricity: 4 ct/kWh

➔ 4.5 ct/kWh

reduction per kWh: 0.865 kg CO<sub>2</sub> ➔ **52.6 €/t**

**CO<sub>2</sub>-reduction through emission trading in Germany (2005): 7.5 Mio t**

**CO<sub>2</sub>-reduction through renewable energies in Germany (2005): 80 Mio**

**t Conclusion: Emission trading is the most expensive climate instrument ever!!**



## contact

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