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# Session 4: Market perception of coordination of support schemes – Stakeholders viewpoints and expectations

Roberto Vigotti

IEA Renewable Energy Working Party



**Realise final conference**  
 Berlin 3 november 2006

Drivers for RE market  
 accelerated policies and mechanisms

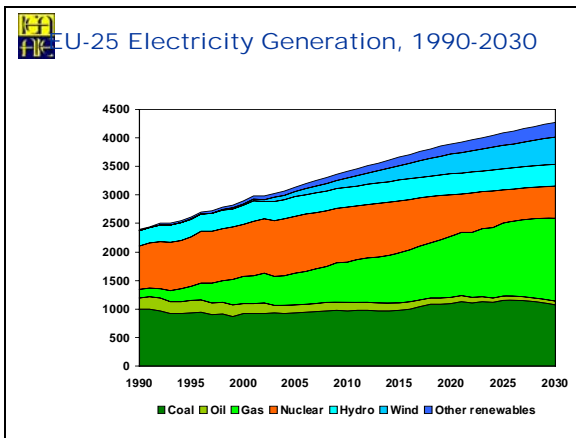
Roberto VIGOTTI  
 Chair of the IEA Renewable Working Party

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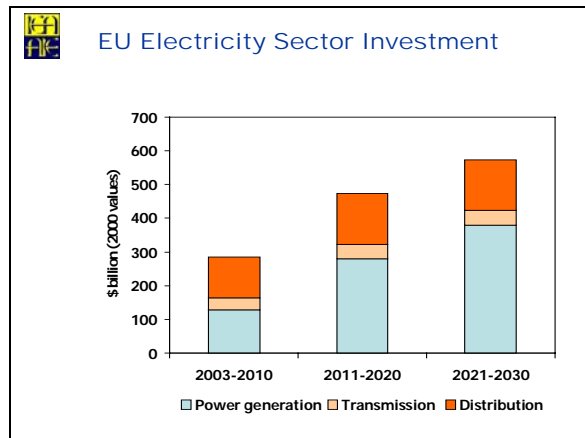


EU Energy Trends &  
 Strategic Challenges  
 Reference Scenario

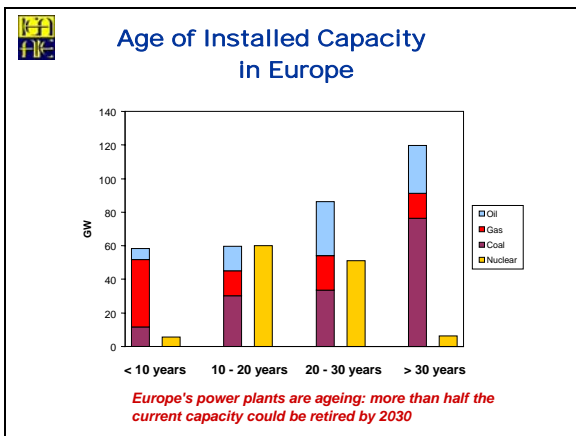
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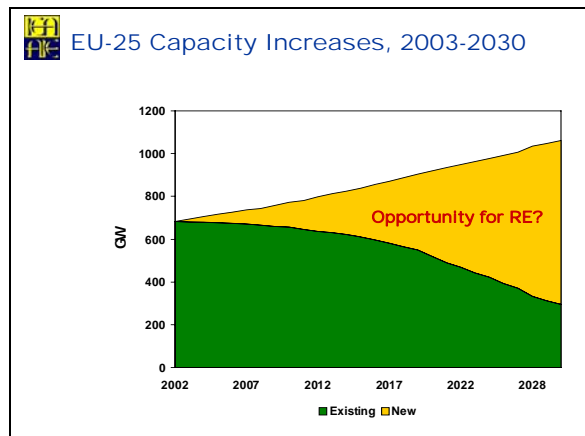
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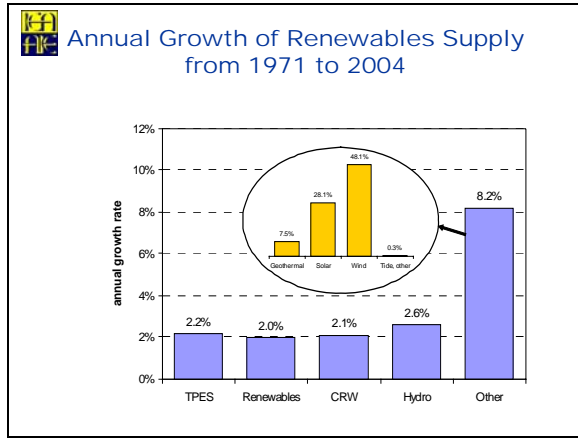
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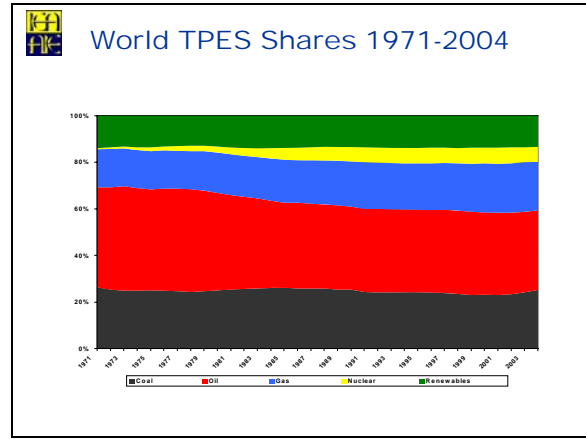
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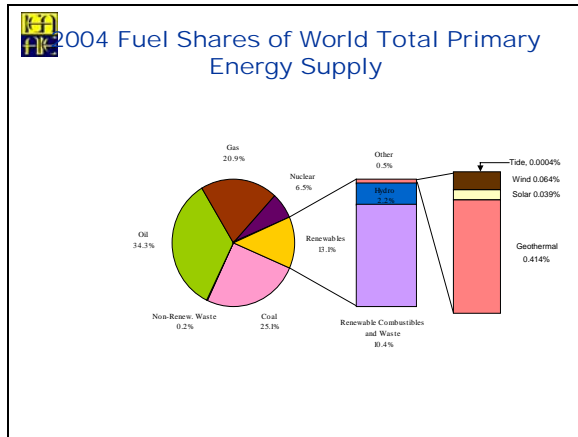
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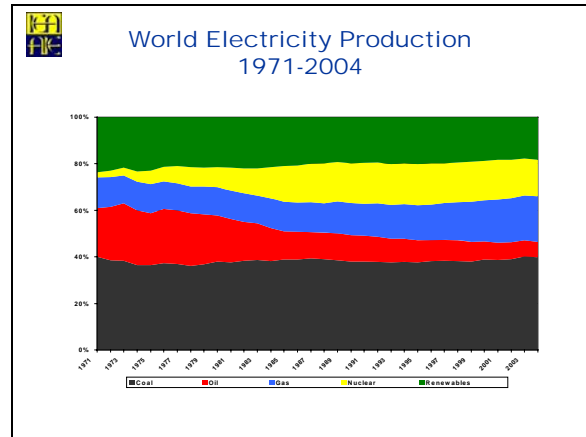
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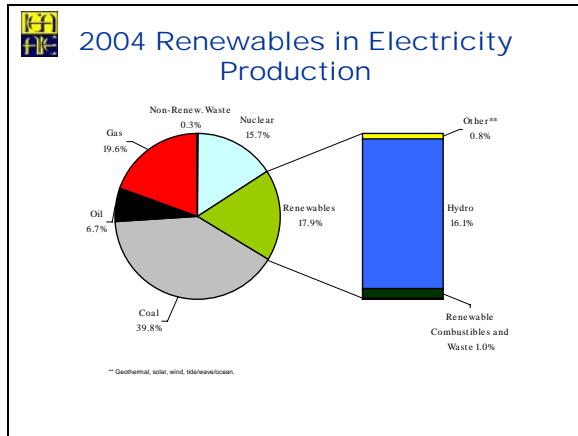
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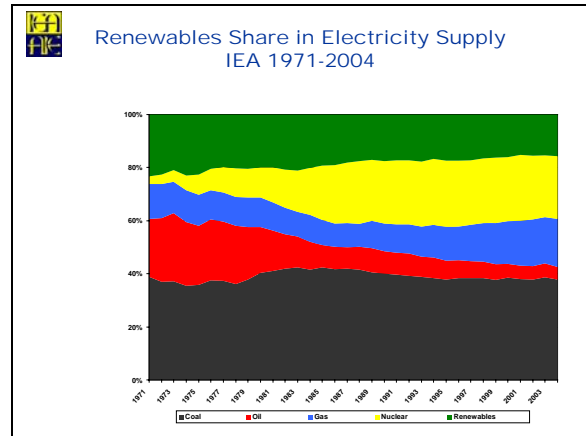
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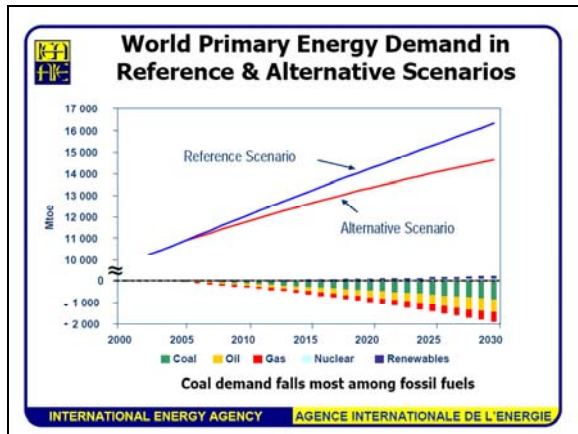
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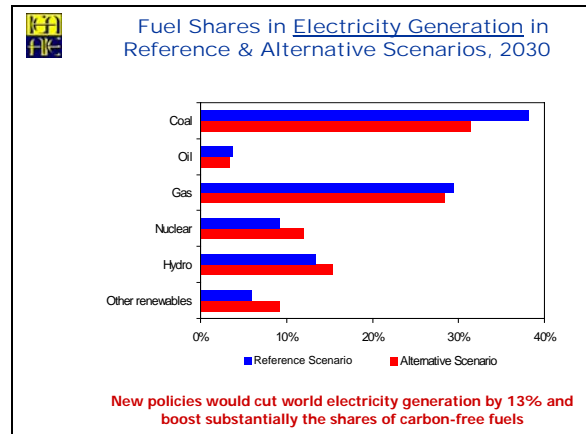
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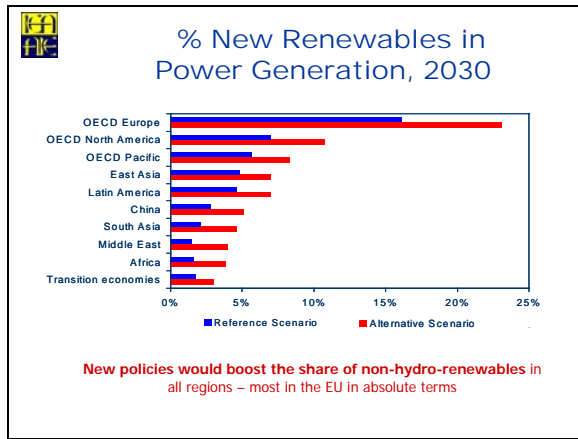
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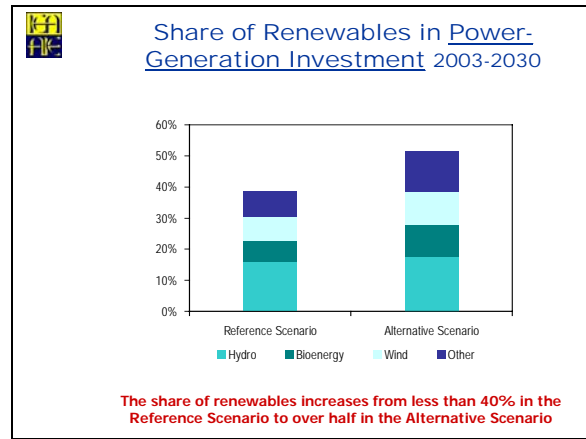
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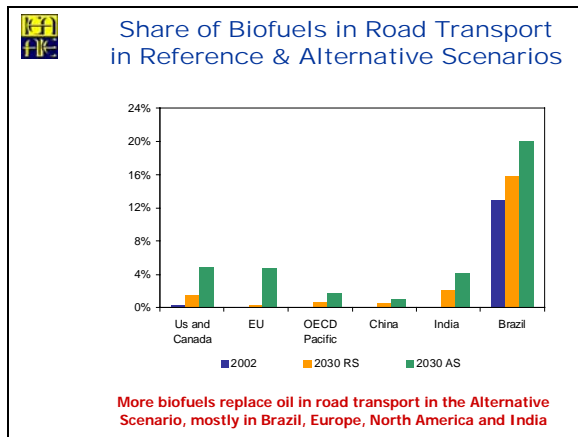
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### Energy Technology Perspectives – ETP- at 2050

The world is not on course for a sustainable energy future.  
ETP = Global energy technology scenarios to illustrate potentials for different technologies under accelerated policies.

Extending this outlook up to 2050 shows that these trends are likely to get worse.

- In the Baseline scenario, CO2 emissions by 2050 will be almost 2.5 times the current level !!
- Strong growth in transport demand will continue to put pressure on oil supply.

The carbon intensity of the world economy will increase due to greater reliance on coal for power generation – especially in rapidly expanding Developing Countries with domestic resources.

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### Technology Assumptions

Scenario	Renewables	Nuclear	CCS	H <sub>2</sub> fuel cells	Advanced biofuels	End-use efficiency
ACT Map	Relatively optimistic across all technology areas					2.0 % p.a. global improvement
ACT Low Renewables	Slower cost reductions					
ACT Low Nuclear		Lower public acceptance				
ACT No CCS			No CCS			
ACT Low Efficiency						1.7 % p.a. global improvement
TECH Plus	Stronger cost reductions	Stronger cost reductions & technology improvements		Breakthrough for FC	Stronger cost reductions & improved feedstock availability	

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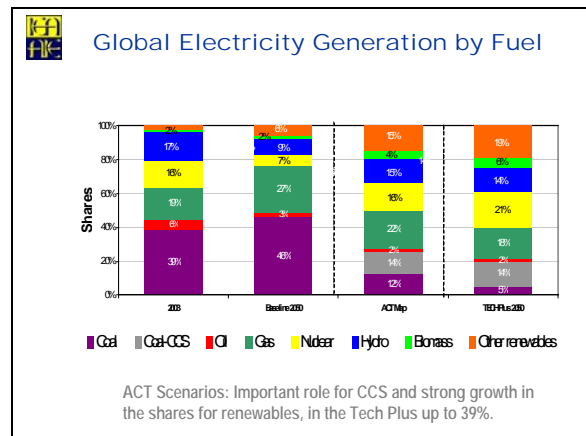
### The priorities areas

But this outlook of baseline can be changed. By employing technologies that already exist or are under development the world could be brought onto a much more sustainable energy path.


Strategies for helping key technologies make a difference:

- strong **energy efficiency gains** in transport, industry and buildings;
- electricity supply** becoming significantly **de-carbonised** as the power generation mix shifts towards, **natural gas, coal with CO2 Capture and Storage (CCS), renewables and nuclear power,**
- increased use of **biofuels for road transport**

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## Policy Implications

- A more sustainable energy future is possible with known technology
- The costs are not out of reach but urgent action is needed in public and private sectors:
  - Overcome barriers for adoption of energy efficient technologies
  - Enhance R&D
  - Accelerate demonstration and deployment
  - Provide clear and predictable incentives
- Collaboration between developed and developing countries essential

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## Contact

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<http://renewables.iea.org>  
<http://www.iea.org>

**robertovigotti@libero.it**

- × Special thanks to IEA Renewable Energy Unit led by Piotr Tulej
- × Thanks to Enel spa supporting the role of Chair at IEA REWP

Slide 24

# Renewable energy and liberalisation in electricity markets: Lessons and recommendations for policy

Oliver Schäfer

EREC, Belgium

**RENEWABLE ENERGY AND LIBERALISATION IN ELECTRICITY MARKETS: LESSONS AND RECOMMENDATIONS FOR POLICY**

**Session 4: Market perception of coordination of support schemes: Stakeholders viewpoints and expectations**

Oliver Schäfer, Policy Director, EREC,  
Final International Conference of the REALISE-Forum Project, Berlin, 02-03 November 2006

Slide 1

**EREC - European Renewable Energy Council**

**Umbrella organisation representing all RES sectors:**

- ✓ **AEBIOM** European Biomass Association
- ✓ **EGEC** European Geothermal Energy Council
- ✓ **EPIA** European Photovoltaic Industry Association
- ✓ **ESHA** European Small Hydropower Association
- ✓ **ESTIF** European Solar Thermal Industry Federation
- ✓ **EUBIA** European Biomass Industry Association
- ✓ **EWEA** European Wind Energy Association
- ✓ **EUREC Agency** European Renewable Energy Research Centres Agency

Slide 2

**Directive on the promotion of electricity from renewable energy sources**

- Adopted 27 October 2001
- Overall target: 21% RES-E by 2010 in EU-25
- National indicative targets for all Member States

Slide 3

**The Reality today**

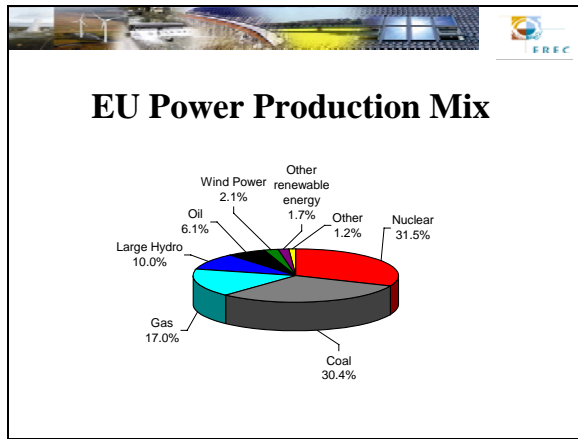
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**From...**

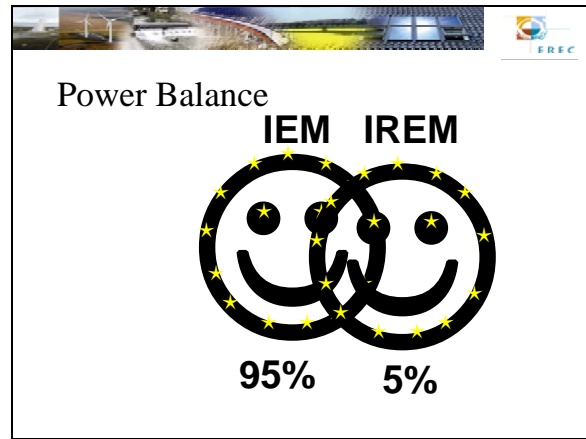
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**To...**

Slide 6



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Slide 8

### Competition in the internal electricity market ?

“Much work still has to be done to deal with the dominant and even monopolistic positions of the incumbent operators and investments will be needed to guarantee the interoperability of grids and networks, interconnection and an adequate level of capabilities and infrastructure”

*Loyola de Palacio, 13 October 2004*

“The current level of competition is not encouraging. (...) In most national markets, **customer switching rates are modest**, substantial barriers remain for new entrants, market structures are highly concentrated and, **last but not least a single European energy market has not been achieved.**”

*Mario Monti, 21 September 2004*

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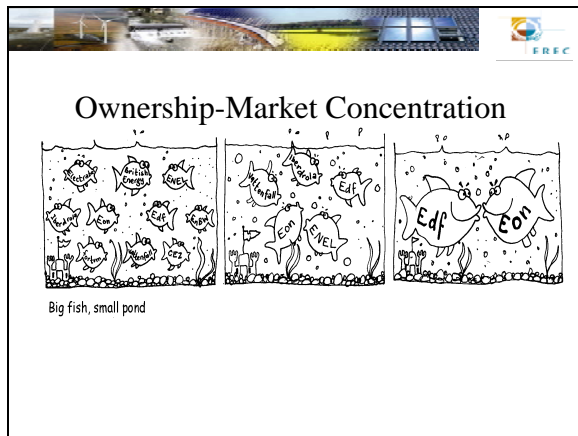
„An integral element of energy prices in the EU is, now that the full EU energy market opening will take place by mid-2007, to ensure that the gas and electricity markets are truly competitive and indeed European-wide market in nature. **Today, regrettably, we have to concede that this is not the case.** This was shown in the last Internal Market Report and the Interim Report of the Competition Sectoral Enquiry „

*Andris Piebalgs, 22.September 2006*

“It is clear that **no-one in their right mind could say that a competitive single European energy market is already in place today.**”

*Nelly Kroes, 28th of September 2006*

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- ### Distortions in the internal electricity market
- 5 Commission benchmarking reports: Endless distortions
  - National and regional monopolies / oligopolies
  - No real consumer choice
  - Lack of interconnectors
  - Little separation of production and transmission
  - Power companies acting on both demand and supply side in the wholesale market
  - 75% of electricity subsidies goes to conventional power
  - Euratom shields nuclear (33% of total EU production) from internal market rules (since 1958!)
  - Complete absence of any meaningful internalisation of environmental costs

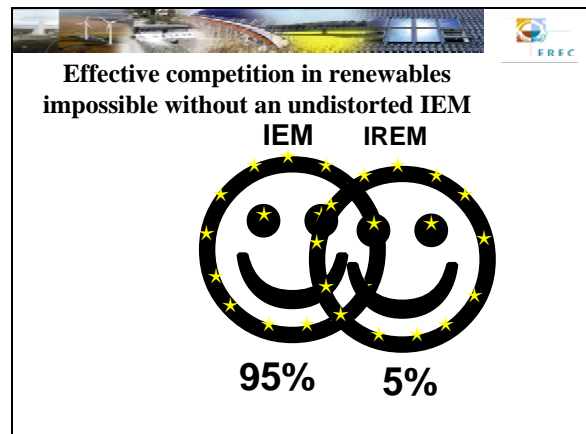
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### Liberalised Markets?

- 95% of the EU power market is still affected by huge market distortions
- Electricity prices do not reflect full costs as long as polluter pays principle is missing
- Subsidies -direct and indirect- to conventional power production are still massive
- National and regional monopolies / oligopolies

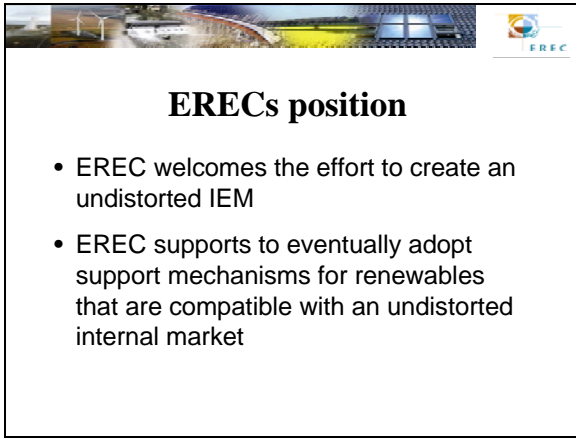
➔ **Competition not effective, but precondition for competition on RES market**

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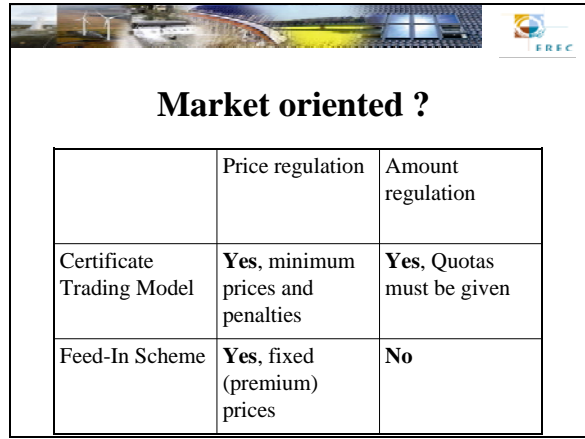




### ERECs position

- EREC welcomes the effort to create an undistorted IEM
- EREC supports to eventually adopt support mechanisms for renewables that are compatible with an undistorted internal market

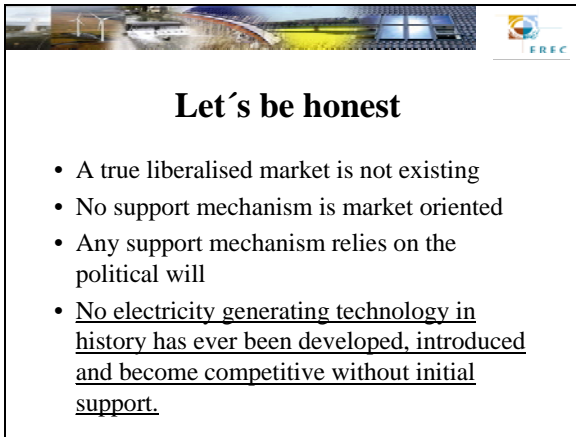
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### Market oriented ?

	Price regulation	Amount regulation
Certificate Trading Model	Yes, minimum prices and penalties	Yes, Quotas must be given
Feed-In Scheme	Yes, fixed (premium) prices	No

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### Let's be honest

- A true liberalised market is not existing
- No support mechanism is market oriented
- Any support mechanism relies on the political will
- No electricity generating technology in history has ever been developed, introduced and become competitive without initial support.

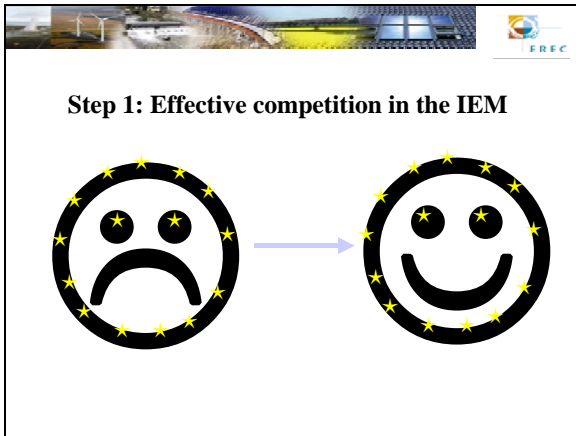
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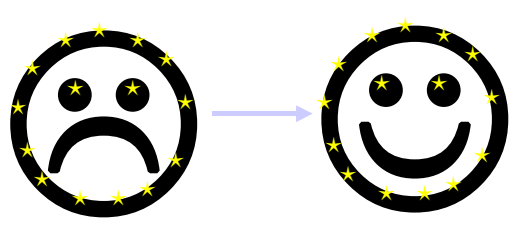
### ERECs position

- **Premature to force renewables into an Internal Market framework when competition is distorted in the IEM**
- **A hasty move towards a EU-wide support system would put EU-leadership in renewables at risk**
- **Any shift must be well prepared and follow after effective competition in the IEM has been achieved**

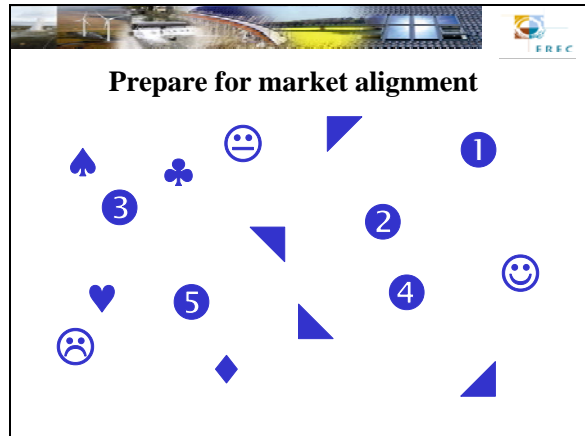
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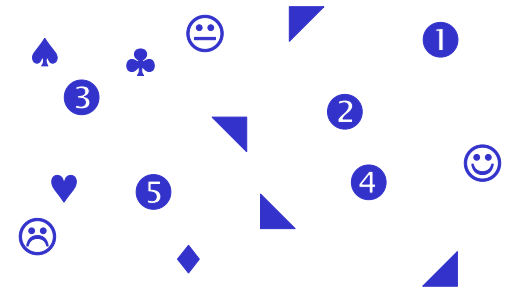
### Step 1: Effective competition in the IEM



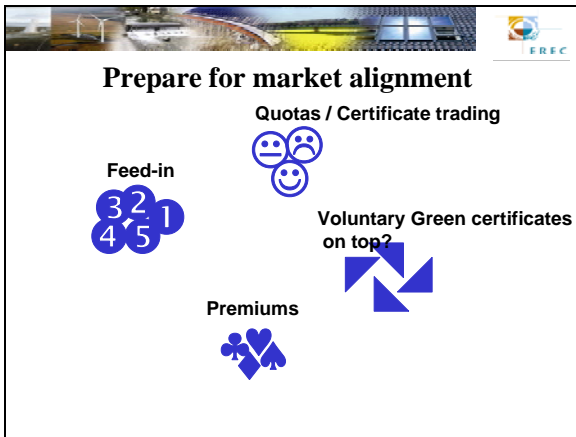
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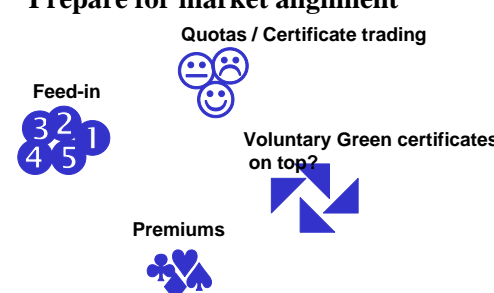
### Prepare for market alignment



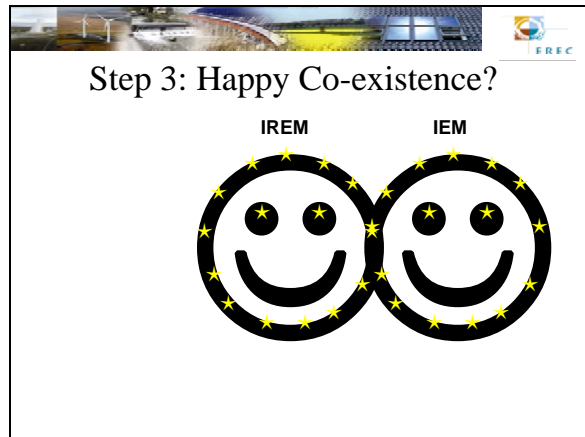
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### Prepare for market alignment



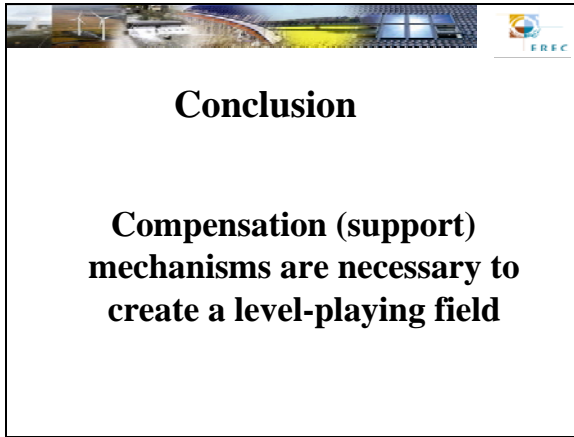
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### Step 3: Happy Co-existence?



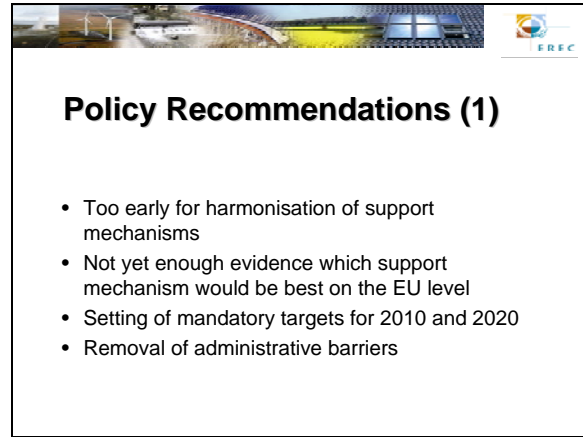
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**Conclusion**

**Compensation (support) mechanisms are necessary to create a level-playing field**

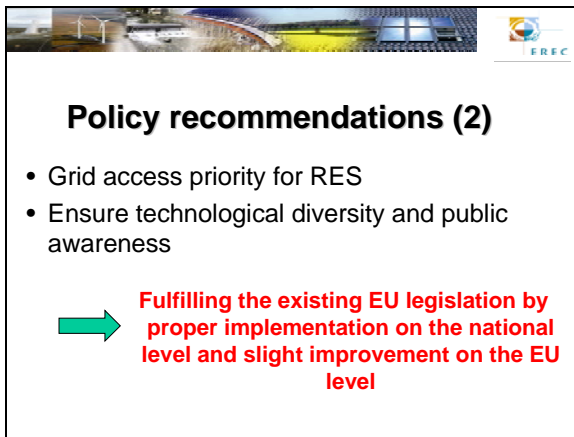
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**Policy Recommendations (1)**

- Too early for harmonisation of support mechanisms
- Not yet enough evidence which support mechanism would be best on the EU level
- Setting of mandatory targets for 2010 and 2020
- Removal of administrative barriers

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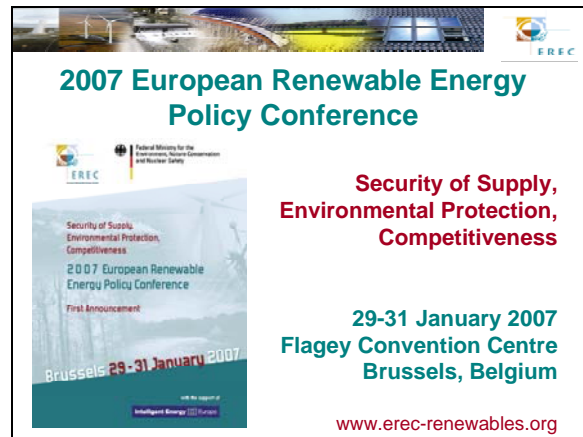


**Policy recommendations (2)**

- Grid access priority for RES
- Ensure technological diversity and public awareness

➔ **Fulfilling the existing EU legislation by proper implementation on the national level and slight improvement on the EU level**

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**2007 European Renewable Energy Policy Conference**

Security of Supply, Environmental Protection, Competitiveness

2007 European Renewable Energy Policy Conference  
First Announcement

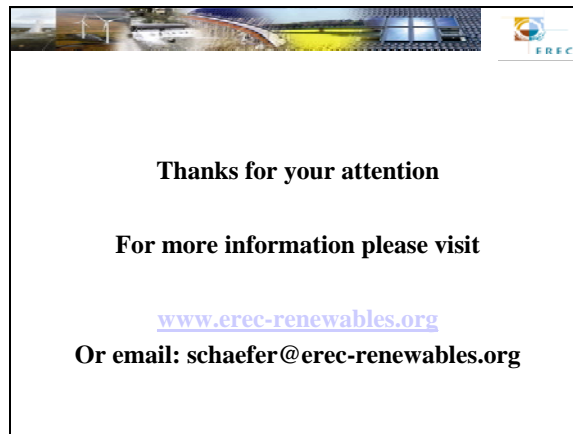
Brussels 29-31 January 2007

Security of Supply, Environmental Protection, Competitiveness

29-31 January 2007  
Flagey Convention Centre  
Brussels, Belgium

[www.erec-renewables.org](http://www.erec-renewables.org)

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**Thanks for your attention**

**For more information please visit**

[www.erec-renewables.org](http://www.erec-renewables.org)

**Or email: [schaefer@erec-renewables.org](mailto:schaefer@erec-renewables.org)**

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# Coordination of support schemes – do we need it?

Claudia Grotz

German WindEnergy Association / Bundesverband WindEnergie (BWE)

**Coordination of support schemes – do we need it?**

Claudia Grotz  
German WindEnergy Association / Bundesverband WindEnergie (BWE)

Final International Conference of the REALISE-Forum Project  
2/3 November 2006, Berlin

www.wind-energie.de

Slide 1

**Harmonisation of support systems in EU would be premature:**

- Shares of RES (new RES, without large hydro) are still small in EU – no critical mass for RES electricity trading reached
- Internal electricity market is presently dominated by conventional sources for power generation without real market competition

**Understanding of “coordination” = cooperation of similar systems (e.g. existing feed-in systems or quota systems in EU member countries)**

- Coordination to avoid double support (e.g. support through compensation system and certificate trading at the same time)
- Coordination to get experience with **cooperation** of systems

Slide 2

**Necessary preconditions for any harmonisation or intensified coordination:**

- Effective competition in the EU internal electricity market and level playing field for RES
- Removal of direct and indirect subsidies for fossil and nuclear energy
- Grid expansion at European level for transport of RES electricity (Kuppelstellen)
- Sufficient shares from RES: to reach these, mandatory targets for electricity, heat and biofuels are necessary up to 2020
- Long-term successful support policies, removal of administrative barriers

Slide 3

**Harmonisation: quota model is not efficient**

Feed-in systems (example of EEG): windfall gains avoided through

- Differentiated tariffs according to quality of site
- Annual degression (wind energy in Germany: 2 %)

Quota model:

- Certificate price is oriented on marginal costs for most expensive technology or least good site
- No differentiation according to site – windfall gains at better sites, cheaper technology or written off plants

**Conclusion: electricity generation is more efficient under feed-in system with differentiated tariffs than under quota model with single price.**

Slide 4

**Do we want the future structures implied in an EU-wide quota model?**

**1) Producers structure in quota model**

- High price risk because of insecure price development – established energy utilities will be main actors and investors, not SMEs and farmers
- Missing variety in market players, support of oligopolistic structures, higher prices

**2) Green electricity production on best sites in Europe only**

- Quota model will lead to concentration on utilisation of best sites in Europe
- Local and regional added value missing; consumers in one country would pay for renewable energy expansion in another country
- On the other hand acceptance e.g. for wind energy would fade in coastal regions if main capacity is concentrated there
- Danger: diminishing support in politics and society for RES

Slide 5

**In general: broad expansion will support acceptance and will contribute to equal distribution of decentralised generation and local value generation.**

“Harmonisation through a TGC scheme without technology bands (...): only the most competitive technologies would expand. While such an outcome would be beneficial in the short-run, investments in other promising technologies might not be sufficiently stimulated”.

“Employment and rural development, diversity and thus security of indigenous energy supplies and reduced local pollution are important effects of an active renewable policy. Member States that become importers of RES-E in a harmonised system may be unwilling to pay the bill if they do not profit of these local beneficial effects.”

(Meeting document for the Amsterdam Forum on 13 October 2005)

Slide 6



www.bwe.de German Wind Energy Association (BWE)

**Looking at the practical side: grid expansion needed!**

- Electricity trading can not happen in virtual space and without grid expansion
- Higher production of e.g. wind electricity in coastal regions needs to be transported to consumers
- Grid expansion is important subject in all countries with high shares of decentralised RES electricity generation

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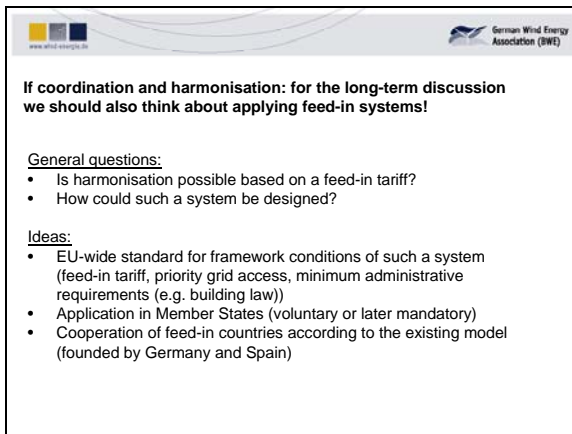


www.bwe.de German Wind Energy Association (BWE)

**Requirements for grid expansion at European level:**

- Development of a European electricity grid to improve the EU-wide trading (increase competition, more transparency in consumer prices)
- Strengthen the European grid to prepare it for increased quantities of renewable energies. Necessary to facilitate cross border exchange of renewable electricity.
- European regulator could develop and control common rules and procedures. Important to create and strengthen incentives for grid operators to expand the networks for cross border transport. Sanctions for culpable delay ?
- Improve cooperation of the network operators on data exchange and prognoses (European centre for energy networks as proposed in recent Green Book?)

Slide 8



www.bwe.de German Wind Energy Association (BWE)

**If coordination and harmonisation: for the long-term discussion we should also think about applying feed-in systems!**

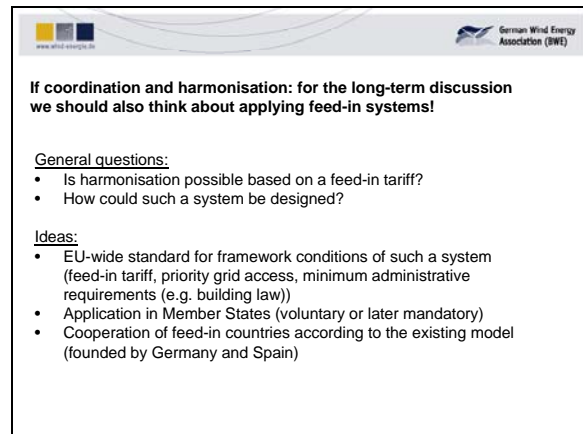
General questions:

- Is harmonisation possible based on a feed-in tariff?
- How could such a system be designed?

Ideas:

- EU-wide standard for framework conditions of such a system (feed-in tariff, priority grid access, minimum administrative requirements (e.g. building law))
- Application in Member States (voluntary or later mandatory)
- Cooperation of feed-in countries according to the existing model (founded by Germany and Spain)

Slide 9



www.bwe.de German Wind Energy Association (BWE)

**If coordination and harmonisation: for the long-term discussion we should also think about applying feed-in systems!**

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Slide 10

# Coordination of support schemes: Viewpoints from the Norwegian regulator (NVE)


Mari Hegg Gundersen

NVE, Norway



## Coordination of support schemes

viewpoints from the Norwegian regulator (NVE)



Slide 1




## About NVE

- NVE is a directorate under the Ministry of Petroleum and Energy
- NVE will ensure an integrated and environmentally sound management of the nation's water resources, to promote an efficient energy market and cost efficient energy systems, and to promote efficient use of energy.
- NVE is responsible for regulating the national power supply.





Slide 2




## Electricity production in Norway

- 99% from Hydropower
- In a normal year the power production from hydro is 119 TWh, the consumption is 125 TWh
- Norway has gone from being a net exporter to becoming a net importer of electricity



3 28. nov.

Slide 3



## Support schemes in Norway

Support schemes	Ar	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Investment support (25%)		█	█	█	█	█	█	█	█	█	█	█	█
Reduced investment support (10%)													
Production support (0,005 Eur/kWh)													
Planning el certificate - never in place													
Enova established - Energy Fund													
Transitional investment support													
Technology based production support													

4 28. nov.

Slide 4



## A coordination experiment – the No-Swe el certificate market (the short story)

**It was a good idea because:**


- Common electricity market
- Good neighbours
- Good combination of renewable resources
- Common understanding of the need for support

**It failed because:**

- Good neighbours do not always agree on splitting the bill.

5 28. nov.

Slide 5



## Coordination challenges

- Strong national interests
  - Security of supply
  - Technology development
  - Renewable resources
- Burden sharing
  - Costs
  - Environmental impact


6 28. nov.

Slide 6

# Market perception of coordination of support schemes: stakeholders viewpoints and expectations

Fiona Santokie


Natsource Europe Ltd, United Kingdom




**REALISE FORUM**  
Renewable Energy & Liberalisation in Electricity  
Markets: Lessons and Recommendations for  
Policy

**Market perception of coordination of  
support schemes: stakeholders  
viewpoints and expectations**

Fiona Santokie  
Head of Renewables Markets Europe  
Natsource Europe Ltd


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## Coordination of support schemes

- The main different types of support schemes:
  - Feed in tariff
  - Tender
  - Tax rebates
  - Tradable certificates
- It seems the solution at this time is not to dictate to MS to adopt only 1 support system, but a combination set with minimal criteria – i.e. primarily a market based system as the basis with elements of the other schemes.


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## Market based mechanism is the key for long term efficiency – as with many other markets

- EU energy policy is moving towards liberalised markets encouraging cross boundary trading to minimise physical barriers – why should RE go against this?
- The aim of liberalised tradable markets is to work towards more efficient pricing – which is a natural effect of competitiveness between market players

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## Lets not forget the basics! – What is a Tradable Green Certificate?


Physical green electricity

}


Renewable Energy Certificate / Green Certificate  
Allowing the green attributes of the generation to be traded separately

Underlying physical "brown/grey" electricity

- Usually representing 1MWh of generation
- **AIM:** to encourage the growth of renewable energy capacity
- **HOW:** by allowing the environmental benefits to be freely traded from physical power
- **RESULT:** physical bottlenecks traditionally associated with energy markets are avoided – therefore encouraging generation in the most economical sites


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## Make the most of renewable energy sources in the most efficient way

- Renewable energy is subject to geographical restrictions – i.e. some areas have very high RE resources but not such high electricity demand and vice versa
- By separating the environmental value from the physical electricity, you can freely move the environmental benefits to where demand is greatest – this is not always possible with feed in tariffs due to physical limitations such as interconnectors.

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## Tradable Certificates Markets are already operational on a mandatory basis

- Certificate systems are operating for some years now
- The UK's Renewables Obligation system has been running for 4 years and although there are some problems with the system, it has and is achieving what it was set out to do – i.e. increase the volume of RE. There is competition and the lowest cost projects and technologies are being developed (mainly onshore wind, landfill gas and cofiring) - volume of RES-E is increasing at lower cost!
- The existing structure of the UK RO does not encourage more expensive technologies to be developed – which is where elements from other support mechanisms can come into play – minimal feed in tariff, tendering, multiple certificates, grants used to get the technology to the level where it falls back into RO structure. Government consultation is now out considering these options

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### Tradable Certificates Markets are already operational – also on a voluntary basis


- There is voluntary demand from end consumers which is causing electricity suppliers to source certificates to meet this demand
- This is not always possible in their own area and so certificates are being traded from one country with the resources to another country where there is demand
- In this way the end consumer is achieving a green product at a competitive lower cost than if the electricity supplier was forced to buy this physical power in their own area
- There is already voluntary demand from end consumers (banks, financial institutes, domestic, commercial etc) – yes it is small at this stage – but market based system is the only one that will encourage this demand. Feed in tariff works against encouraging end consumer demand.

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- Remember that we are at the beginning!
- We are shaping a robust structure to increase RES-E over the very long term.
- Of course there will be problems with markets when they begin – but when you think it through logically – a market based mechanism makes use of the resources and delivers to where demand is greatest by avoiding physical bottlenecks

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### Learn from our mistakes – key components for a successful REC system

- Verifiable to ensure no double counting. Including well managed registry.
- Driver stimulating market demand – e.g. mandatory targets or financial incentive
- Simplicity – no excessive documentation. Clear wording.
- No revocation
- Encouraging, long-term policy

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- Systematic Demand:
  - Mandatory targets with some form of penalty, e.g. financial penalty, imposing trade restrictions (if supplier doesn't purchase certain volume of green, they are limited to the volume brown power they can purchase)
  - Financial incentives – e.g. tax rebates or exemptions (as with Dutch REB law)

Market players must have drivers to buy RECs. Too early in most MS for market to be purely driven by end consumer green demands

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### Conclusions

- Market based system is the most cost effective way forward in the long run and should be the key support scheme with elements of the other systems
- Current mandatory and voluntary REC systems are operational and are achieving new build
- Learn from our mistakes to remove trading barriers to make the market more efficient
- Create systematic demand – i.e. mandatory system or financial incentive – as consumer demand is not as strong in all countries

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Slide 12

# Harmonising of support mechanisms in the EU

Stefan Schurig

Greenpeace, Germany

**Harmonising of support mechanisms in the EU**

Stefan Schurig  
Head of climate-energy unit



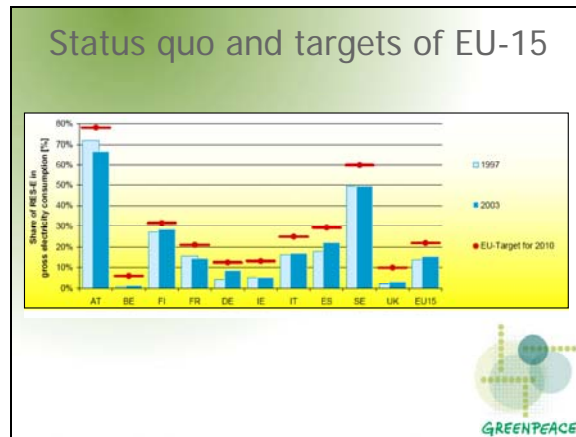
Slide 1

**The EU is an essential element in delivering sustainable, competitive and secure energy for European citizens.**

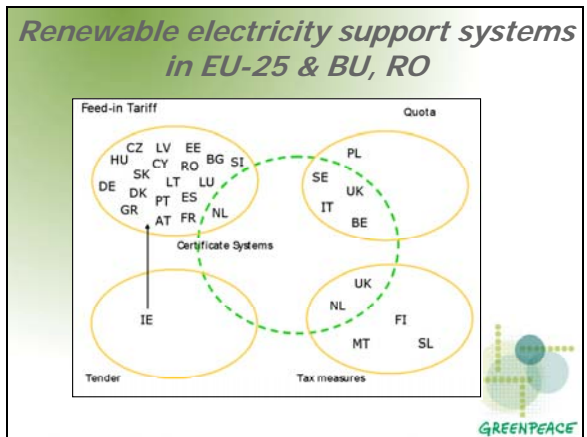
José Manuel Barroso, President of the European Commission



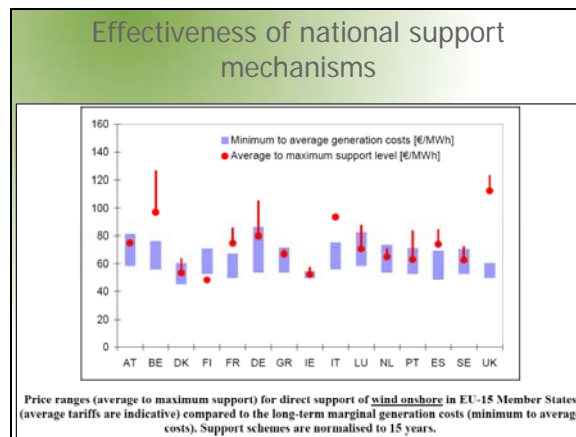
Slide 2



Slide 3




Slide 4



Slide 5

**State of EU**

- ⌚ Target for 2010 is hard to reach
- ⌚ Support of RES-E required even more
- ⌚ Different support mechanisms in power
- ⌚ Support mechanisms have varying levels of implementation and success
- ⌚ No single european electricity market




Slide 6



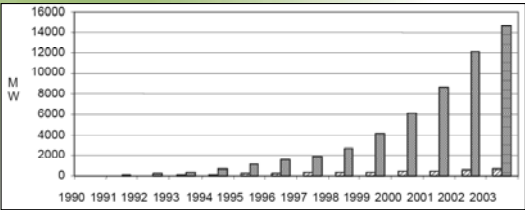
### University of Cambridge: Feed-in, Quota and Auction systems

- ⌚ Renewable deployment better with Feed-in
- ⌚ Price difference between systems is lower than expected
- ⌚ Higher competition among turbine producers and constructors with feed-in system
- ⌚ Low level of competition at operational stage for all systems




Slide 7

### Installed capacity



Year	Germany - Feed-In system (MW)	UK - Quota- and Auction-based system (MW)
1990	0	0
1991	0	0
1992	0	0
1993	0	0
1994	0	0
1995	0	0
1996	0	0
1997	0	0
1998	0	0
1999	0	0
2000	0	0
2001	0	0
2002	0	0
2003	0	0



Slide 8

### Greenpeace: Most effective support mechanism

- ⌚ Feed-in systems
- ⌚ Fixed-premium systems
- ⌚ effectively attracting investments
- ⌚ creating investor confidence
- ⌚ reaching national targets
- ⌚ creating technology diversity



Slide 9

### Coordination instead of Harmonisation


- ⌚ Major threat for renewables: uncertainty for investors
- ⌚ Harmonised community-wide support mechanism would be premature
- ⌚ Harmonisation might slow down expansion
- ⌚ No practical evidence of effectiveness beyond feed-in and fixed premium systems
- ⌚ National support mechanisms should guarantee adequate return on investment



Slide 10


### What the EU should do

- Improve framework for renewable energy
- Introduce detailed recommendations for member states
- Improve legislation at european level where necessary
- ⌚ limiting the variety of systems
- ⌚ leading to bilateral cross-border agreements where similar systems exist
- ⌚ clustering of systems
- ⌚ generating more experience



Slide 11

### Thank you for your attention!



Slide 12

## Session 4 – Minutes of the Round Table

In his introduction speech the chairman R. Vigotti stressed the importance to fully understand the context of the discussion and summarised the results of the previous day. One of his main conclusions of the debate so far was that it depends on which results policy makers want to achieve, when discussing pro and cons of feed-in or quota/certificates support systems.

Mr. Vigotti presented a scenario of renewables in the EU until 2020, stating that even for this conservative scenario high investments are necessary. One of the main goals thereby is to make sure to start with these investments soon and not to leave the entire burden to future generations.

When discussing renewables one has to bear in mind that we are starting out from a very low point when claiming a high increase in renewables. However, one needs to increase the renewable supply much more since energy demand is increasing as well. On a global level, the share of renewables has not increased at all remaining at 0.5 %, excluding biomass. Furthermore, developing countries as China are increasing their demand steadily. Thus - on the whole - the share of renewables is actually decreasing. Europeans should not just be content with their own national achievements but rather pursue best practice. Europe can do it and Europe should do it since this will also open new markets. In order to achieve the best scenario of 39 % renewables until 2050 a strong policy change is necessary.

### ***Stefan Zisler (representing Vattenfall Europe)***

For the Vattenfall-Group renewables have an increasing importance on the long term. Vattenfall's aim is to be the number one for the environment.

In order to promote renewables, Vattenfall believes that a harmonisation of the markets and politics are needed in Europe. Vattenfall recognises that Germany has achieved remarkable results with the feed-in system. However, this was achieved for a high price. Thus from an economic perspective Vattenfall recommends the more market oriented quota model. Vattenfall believes that the feed-in scheme is good for the initial phase. But, as soon as the innovation-phase is over, it gets too expensive. The quota-based system is cheaper and more successful on the long run and thus should be promoted by the EU.

Vattenfall wishes a discussion at European level on the harmonisation of the markets. This harmonisation process should be based on the market oriented quota system with green certificates. Since these certificates are based on the same mechanism as the greenhouse gas certificates, existing structures and experiences can be used.

### ***Oliver Schäfer (representing EREC)***

Only 5 % of the electricity supply in Europe is from new renewables. Thus before starting the discussions on how to harmonise support-schemes for RES-E we should harmonise the whole energy market. The EU should make sure that there is real competition on the European energy market, as direct and indirect subsidies to the conventional power production are still massive and national respectively regional monopolies in the electricity supply do still dominate the market. This includes internalising external costs and forbidding further subsidies for nuclear and coal based technologies. In a functioning European market where external costs are internalised, renewables would be competitive already today. EREC also believes that quota systems are not market oriented. After all, in a quota based scheme authorities appoint the quantity thereby setting the

price. Thus, both systems are based on political interventions and are everything but market based.

The tradable green certificates may be superior in theory. However, reality has proven that feed in systems work better. Thus EREC recommends the feed-in system suggesting that a new discussion on the tradable certificates should start when and if practice shows that it works better as the FIT. EREC believes that it is too early for giving a policy recommendation to the EU with regard to a harmonised RES-E support scheme. The markets are not ready for harmonisation yet. Furthermore, Europe needs to ensure that technological diversity is given. Mandatory RES-E targets should be set for 2010 and 2020. Also administrative barriers including those related to grid access should be removed.

***Claudia Grotz (representing BWE)***

BWE too believes that the harmonisation of the support systems on a European level should not take place yet, since competition is needed on the whole energy market first. At the same time, BWE wishes more coordination between countries with similar support systems in order to promote cross-border trade. There are a few preconditions, which need to be met before harmonising the market. These are: effective competition, no subsidies for fossils, sufficient shares from renewables. Mandatory goals are need for all markets – not only for electricity but also for heat and bio fuels, grid extension, mainly with regard to the international interconnections as well as long term successful support policies.

BWE sees no prove so far that quota based models work better since there is no evidence for such a statement. All empirical evidence shows that feed-in systems promote renewables more efficiently. On the contrary, quota models are not efficient, because TGC prices are orientated on the marginal costs of the most expensive technologies, respectively the least good site. Further, quota models allow windfall profits for the best sites/cheapest technologies or written off plants. At the same time the quota system promotes a concentration of big players which again leads to higher electricity prices. This was shown the previous day by the Polish representative. Feed-in tariffs on the other hand encourage small actors, local systems and regional economic growth. The feed-in systems further promote technological diversity: in a quota based system the cheapest energy is sold whereas the feed-in system allows promoting technologies which are not cost-efficient yet but bare high potential as solar energy.

One of the first measures for a European market is an expansion of the grid. Therefore an improvement of the cooperation of the national network operators is necessary as well as the creation of an EU grid operator. Since the argument was stated, that a harmonisation based on a quota model would be easier to implement on a European level, BWE asked why it should not be possible to harmonise on the basis of feed-in tariffs. This might be reached by setting EU wide standards for the framework conditions of such a system. After all, the vast majority of European countries already have feed-in systems.

***Mari Hegg Gunderson (representing NVE, Norway)***

NVE regulates the Norwegian energy market. 99.7 % of the electricity supply in Norway is based on hydro-power in a normal rainy year 119 TWh are produced. However, demand has risen to 125 TWh per year. Thus Norway has shifted from being an electricity exporter to being dependent on energy imports. One of the main concerns of the agency is to secure energy supply. Since 2001 Norway is working on establishing a certificate market. In order to ensure energy self-sufficiency Norway promoted a coordinated energy market with Sweden. Both countries have a considerable

potential for renewables, especially wind power and a coordination of the markets could benefit both countries. Most issues could be settled between the agencies, but the politicians could not agree on how to share the “cake”. Thus the whole project failed. Having experienced this, NVE believes that a common market in the energy sector will be very difficult to achieve since countries will have to accept that tax money will be spend for promoting renewables in other countries. This makes it very difficult to coordinate efforts between countries.

***Fiona Santokie (representing Natsource, UK)***

Natsource is company trading with green certificates. Ms. Santokie claimed that it is too early in the process for the EU to dictate member states one support system or another. The EU however should promote a mix of both systems. The European energy market is in the middle of a liberalisation process and renewables should be part of this process. Thus the support systems for renewables should also be as market oriented as possible.

Green certificates are running in many European countries thereby increasing the share of renewables at the cheapest price. This works very efficient. However, this does not promote costly technologies as of-shore wind and solar energy. Many other possibilities exist to change this e.g. handing out two certificates for off-shore wind energy. Further additional trade also takes place on a mandatory base. There is a demand by consumers to buy green energy at low costs, which is a market oriented approach. But we are still at the beginning and there are still many problems. In the medium run a certificate based system can satisfy demand for green energy at the lowest cost.

***Stefan Schurig (representing Greenpeace, Germany)***

Mr. Schurig started his speech by reminding the audience that the issues treated are closely connected to problems as climate change, nuclear legacy and security of supply. Renewables are the answer to these questions, hence the main issue of the conference should be how to promote alternative energies best.

In order to promote renewables it is important to achieve a European energy system with binding targets for all member states. The goal of 21 % of renewables on a European level until 2010 can hardly be met with the current system. Feed-in systems have proved to work well in Germany and other countries. hence there is no rationale for a change of the systems.

Greenpeace believes that the most effective scheme is a feed-in system, but at the same time it is premature to harmonise systems. Changes would cause uncertainty for investors. The EU should improve the framework and help countries which have not developed a good support system yet. The EU should also help EU member states with similar RES-E promotion schemes to reach cross border agreements (regional clustering of RES-E promotion systems).

One great benefit of renewables is that they can be used where they are produced. Thus renewable energy fosters decentralised systems. In the opinion of Mr. Schurig one of the basic questions of the conference should be whether we want to have a centralised or a decentralised system. Feed-in systems lead to decentralisation whereas other systems lead to centralised energy systems.

***Discussion***

In the discussion most participants stressed that the feed-in systems are cheaper than the quota systems. Being more effective and more efficient, the feed-in system appears to be superior. The German environmental ministry does not want to be forced to change the kind of support which could end up to jeopardise future developments. For off-shore wind a grid extension is necessary.

In Norway there was never a discussion on a certificate market limited to Norway, since the market is too small. After the negotiations with Sweden failed, a feed in system will be established. One of the big arguments against a quota based system is that there are many hydro-power stations in Norway. In a quota based system this would originate windfall profits

The indirect and direct subsidies for nuclear, hard coal and lignite since the 1950s in Germany sum up to c 350 Billion €. Thus the question is answered why renewables are not competitive yet and need to be supported and markets for renewables need to be protected.

# Session 5: Co-existence of various instruments or co-ordination? Options for regional cooperation

## The International Feed-In Cooperation

Uwe Büsgen

Ministry for the Environment, Nature Conservation and Nuclear safety, Germany

**The International Feed-In Cooperation**

Cooperation on Feed-In Systems for the promotion of renewable energies

Uwe Büsgen  
Federal Ministry for the Environment, Nature Conservation and Nuclear Safety  
Germany

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**Contents**

Research on RES-E promotion instruments  
RES-E promotion in the EU, position of the COM

**The International Feed-In Cooperation:**

- Targets
- Activities
- Upcoming international workshop
- Membership

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**Success of feed-in systems (I)**

Effectiveness indicator in relation to the annuity of expected profit for wind on-shore (2004)

average annual effectiveness indicator [%]

Country	Effectiveness Indicator [%]	Instrument
AT	~3.5	Feed-in tariffs
BE	~1.0	Quota/tradable green certificates
FI	~0.5	Tender
FR	~0.5	Tender
DE	~8.0	Feed-in tariffs
IE	~2.5	Tender
IT	~1.5	Tax incentives/rebates
ES	~8.0	Feed-in tariffs
SE	~1.0	Quota/tradable green certificates
UK	~1.0	Quota/tradable green certificates
EU 15	~3.5	Feed-in tariffs

Source: Fraunhofer ISI / Energy Economics Group (2006)

**Feed-in systems in some EU MS are very effective!**

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**Success of feed-in systems (II)**

Effectiveness indicator in relation to the annuity of expected profit for wind on-shore (2004)

Effectiveness indicator

Annual expected profit [€ Cent/kWh]

Source: Fraunhofer ISI / Energy Economics Group (2006)

**Feed-in systems are also economically efficient!**

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**More R&D information**

*from the Fhg ISI and TU Vienna R&D project*

- Harmonization of RES-E promoting instruments (e.g. EU-wide quota or feed-in system) can theoretically lead to lower costs compared to today.
- Optimized national policies can lead to the same cost reductions as an ideal designed harmonized quota system.
- An ideal designed harmonized feed-in system would be most cost efficient.
- Optimized national policies can lead to 2/3 of the cost reductions of an ideal designed harmonized feed-in system.

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**RES-E promotion instruments used in the EU**

Feed-in Tariff, Quota, Certificate Systems, Tender, Tax measures

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**Communication of the EU Commission, Dec. 2005**  
[COM (2005) 627]

**Communication on the support of electricity from RES – statement on future action:**

„The Commission considers a **co-ordinated** approach to support schemes for renewable energy sources to be appropriate, based on two pillars: **cooperation** between countries and optimisation of the impact of national schemes.“

„Intensified co-ordination between countries in the form of **“cooperation”** could be useful for the development of the different support systems within Europe. The emerging cooperation between the feed-in tariff systems in Germany, Spain and France, [...] can set examples for others.“

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**Policy diversity, co-ordination or harmonization?**

- For the time being, harmonization of policy instruments through-out the EU is premature.
- Optimized national policies can lead to significant cost reductions.
- Increased international information exchange and cooperation can be very helpful in order to implement optimized national policies.
- Optimized national policies can bring about most of the theoretically achievable efficiency gains of an ideal harmonization.

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**The International Feed-In Cooperation**

- Cooperation between – today - Germany and Spain. More members welcome.
- Initiated in June 2004 at the *International Conference for Renewable Energies*, Bonn, Germany as part of the *renewables2004 International Action Programme*.
- On October 6th, 2005, a Joint Declaration was signed between Spain and Germany.
- A new declaration will be finished soon in order to enable other countries to sign up.

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**Targets of the International Feed-In Cooperation**

1. to promote the use of RES
2. to improve existing feed-in systems
3. to exchange experience on feed-in tariffs
4. and with that help third countries introduce feed-in tariffs
5. to cooperate on the above mentioned issues

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**Activities of the International Feed-In Cooperation (I)**

Research & development, production of papers:

- Feed-In Systems in Germany and Spain – A Comparison
- Monitoring and Evaluation of policy instruments to support renewable electricity in EU Member States (Fhg ISI and TU Vienna)
- Best Practice Paper (to be presented and discussed in November at the workshop in Madrid)

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**Activities of the International Feed-In Cooperation (II)**

www.feed-in-cooperation.org:

- RES-E Legislation in the IFIC-countries and the EU
- Information on RES-E development in the IFIC-countries
- R&D-results and reports
- Information on past and future IFIC-workshops, including PPP presented there

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**Activities of the International Feed-In Cooperation (III)**

International Workshops

**1st workshop:**  
January 27th, 2005, in Madrid, Spain

**2nd workshop:**  
December 15th and 16th, 2005 in Berlin, Germany

**3rd workshop:**  
November 23rd and 24th, 2006 in Madrid, Spain

**4th workshop:**  
scheduled for June 2006

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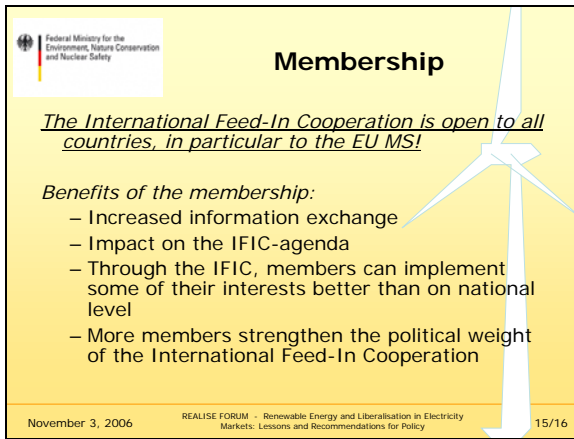
**Activities of the International Feed-In Cooperation (IV)**

3rd workshop in Madrid on Nov. 23/24, 2006

- Reports from Spain, Germany, Slovenia and DG TREN
- Round table
- Presentation of a best practice paper
- Approaches for a harmonized feed-in system in the EU
- Feed-in tariff systems and state aid
- Procedures for the access and connection to the network for renewable energy producers
- Indispensable requirements for wind farms to contribute to the stability and operability of the system

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**Membership**

*The International Feed-In Cooperation is open to all countries, in particular to the EU MS!*

*Benefits of the membership:*

- Increased information exchange
- Impact on the IFIC-agenda
- Through the IFIC, members can implement some of their interests better than on national level
- More members strengthen the political weight of the International Feed-In Cooperation

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**Thank you for your attention!**

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For more information, please visit

[www.feed-in-cooperation.org](http://www.feed-in-cooperation.org)

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# Green electricity in the Nordic countries

Prof. Dr. Atle Midttun

BI Norwegian School of Management, Oslo, Norway

## Green Electricity in the Nordic Countries

Atle Midttun  
Presentation at the Berlin Realise conference 2-3 November 2006

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## Outline

1. The Nordic green el contribution to Europe
2. Development of the Nordic support regimes for green electricity 90s and early 2000s
3. Green el related policy issues with Nordic stakeholders
4. Reflection on policy tools in an innovation perspective

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## The Nordic green el contribution to Europe I

Elproduktion  
S10 Total elproduktion inom Nordel 2004

Source	Percentage
Hydro	~50%
Nuclear	~25%
Other thermal	~15%
Other renewable	~10%

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## The Nordic green el contribution to Europe II

Source: IEA

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## The Danish regime: 1990s and 2000s

<p><b>1990s</b></p> <ul style="list-style-type: none"> <li>■ Efficient use of feed in model (between DKK 0.30 and 0.60 kWh)</li> <li>■ Investment support schemes 15-40% of costs (techn dependent)</li> <li>■ Purchase obligation on local utilities</li> <li>■ 1999: attempt to introduce certificate model (withdrawn)</li> </ul>	<p><b>2000s</b></p> <ul style="list-style-type: none"> <li>■ Regular energy markets + CO2 quotas</li> <li>■ 0.10 DKK/kWh flat rate support</li> <li>■ Grid investments</li> <li>■ Exemption from energy levies</li> <li>■ R&amp;D funds (30mill DKK pr year)</li> <li>■ Ad hoc auction: investment in 2 offshore windmill parks</li> </ul>
--	--

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## Kullkraft har blitt dyr pga kvotepriser på CO2

Variable prod. kostnader for kullkraft 1986-2008 (40% virkningsgrad)

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### Norwegian regime: 1990s and 2000s

**1990s**

- Investment support
  - maximum 25% of total costs
- Production support
  - ex: wind producers got equal to 50% of el-tax (NOK 0.05)
- Tax incentives
  - Wind power exempted from 7% investm. fee

**2000s**

- Creation of ENOVA 2001
  - Shall contribute to energy efficiency and renewable energy policy
- Planned ascension to Swedish cert system (2003-2005)
- Adoption of supplementary feed in system 2006:
  - Small hydro: 40öre / 0.48 Eurocent kWh
  - Wind: 8 öre / 0.96 Eurocent kWh
  - Bioel & immature techn: 10 öre / 1.2 Eurocent kWh



Slide 7


### Swedish regime: 1990s and 2000s

**1990s**

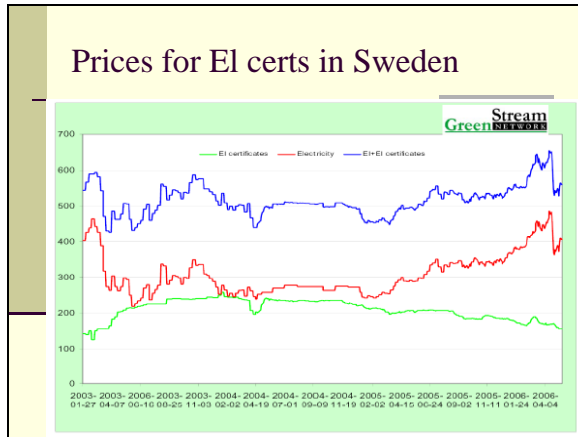
- Investment support
  - wind power up to 15%
  - biofuels up to 25%
- Tax incentives
  - Energy tax exemption on renewables, paid via an environmental bonus 0.162 SEK in 2000
  - Reduced grid fee 0.09 SEK kWh

**2000s**

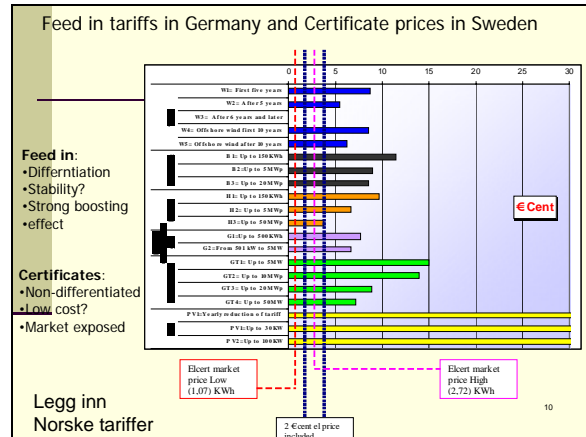
- Since may 2003 el certificate trading system
- Quota obligation of 17% by 2010 until 2030
- Price 150-200 SEK MWh



Slide 8



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### Finnish regime: 1990s and 2000s

**1990s**

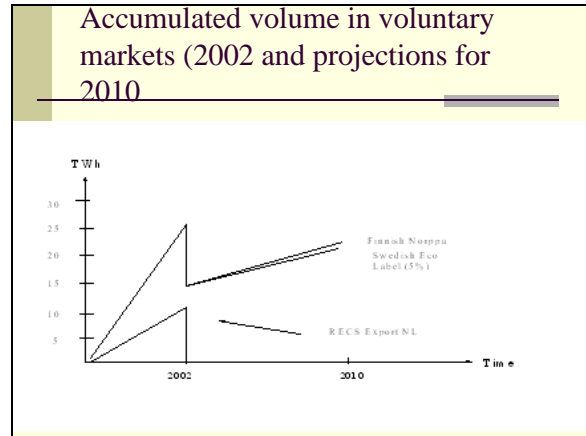
- Investment support
  - % support depends on the innovativeness of the technology: runs up to 40% generally 20-35%
- Electricity tax exemption
  - Under 1 Eurocent

**2000**

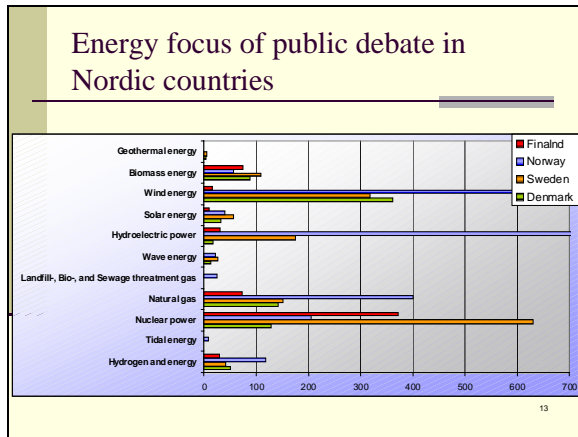
- Investment support
  - % support depends on the innovativeness of the technology: runs up to 40% generally 20-35%
- Tax incentives
  - 99 Action plan for renewable el sources: consumer tax refunded as subsidy to producer
  - Wind: 0.69 ct/kWh
  - Biomass: 0.43 ct/kWh
  - Small hydro: 0.42 ct/kWh
  - 2003 update: focus on bioenergy



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### Green el related policy issues in DK

- Fairly broad consensus on liberalist re-orientation from industry and energy industry
- Some concern about the late integration of EU CO2 policy
- Some fatigue with playing the pioneering role for green el in EU
- More scepticism to liberalist policy from wind energy actors and to some extent the ecological movement
- Joint concern about the late integration of EU CO2 policy
- Concern with lacking integration into German market
- Concern with investment uncertainty and capacity limitation in Danish el supply
- Concern with price effects of under-investment

Slide 14

### Green el related policy issues in S

- Mixed opinions about the certificate system, but acceptance that the system was there to stay
- Concerns with the functions of the cert syst
- Concerns with possible expansion to Norway (symmetry issues)
- Focus on the need for complementary support systems to elcert
- Concern with energy efficiency
- Concerns with power costs for heavy industry

Slide 15

### Green el related policy issues in N

- Orientation towards elcert market with Sweden
- Disappointment with failure to reach common agreement N+S
- Reorientation towards feed in
- Wide acceptance that high el and CO2 prices are not sufficient
- Small hydro may however partly be profitable with present prices
- Gas power continues to be debated: current policy on CO2 sequestration
- Concern with high electricity prices from el-consuming industry

Slide 16

### Green el related policy issues in FI

- Basic acceptance of present support system admin.
- Concern with possible competition for biomass between paper and pulp industry and ren. En ind.
- Concern with international pressure against Finnish peat
- Acceptance for both nuclear and renewables to solve supply deficit and fulfill Kyoto
- Nuclear issue was much debated, but is now decided on
- Green electricity pushed politically, as household consumers show moderate interest
- Dominant renewable is black liquor from paper and pulp
- Fortum stands alone in support for green certificates

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### A product cycle perspective on policy instruments and learning

Slide 18

### Reflection on policy tools

Slide 19

### Reflection on policy tools II

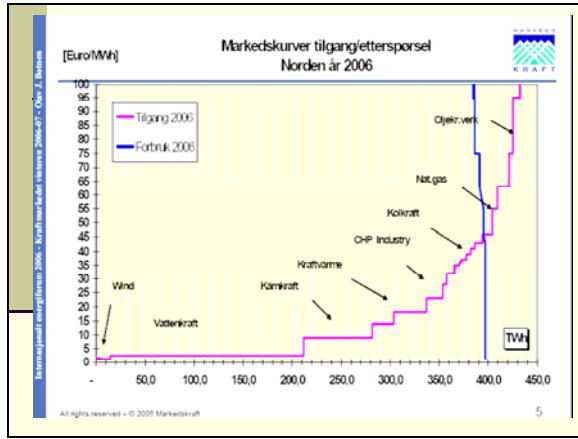
Slide 20

### Support systems and Learning Curves

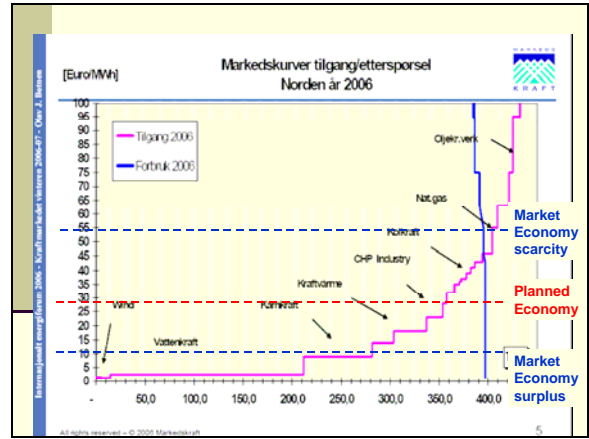
Slide 21

### Why competitive market orientation and why Europeanisation

Slide 22



Slide 23

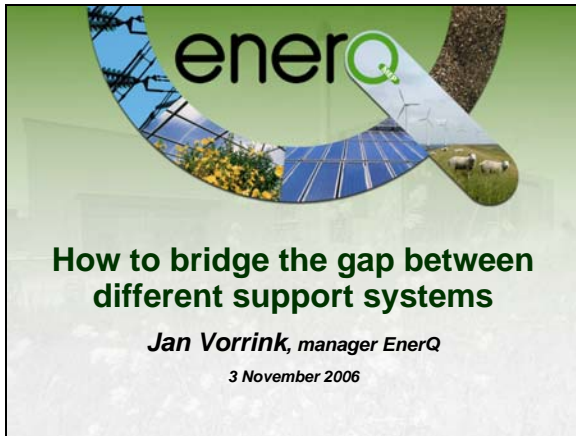


Slide 24

# How to bridge the gap between different support systems?

Jan Vorrink

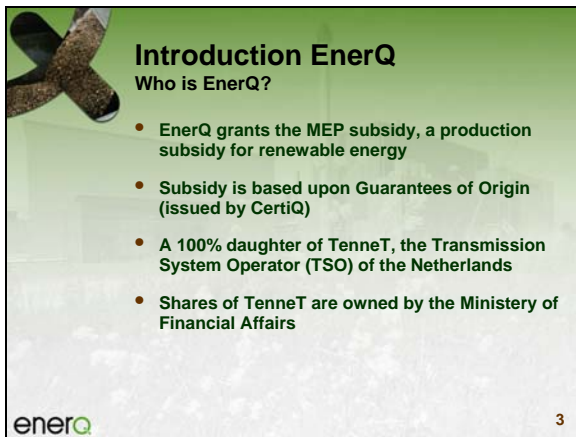
CertiQ, The Netherlands



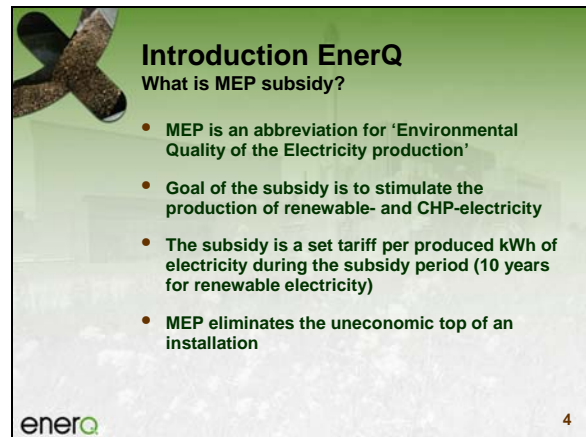
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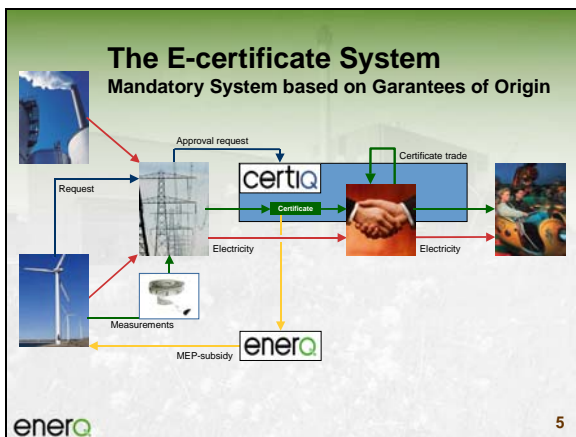
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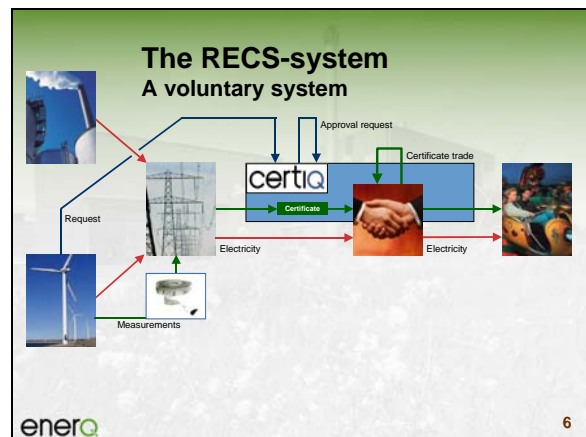
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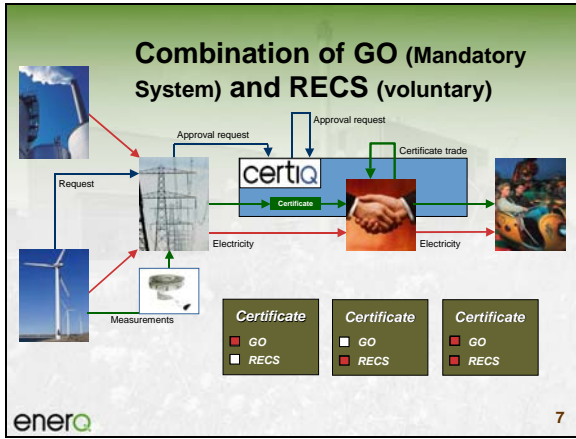


Slide 5



Slide 6





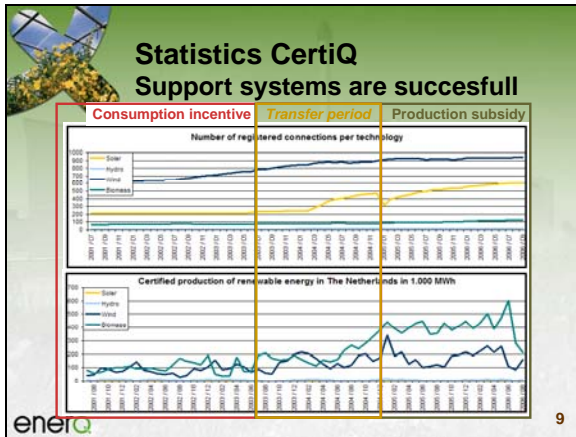
Slide 7

### Experiences with different support systems

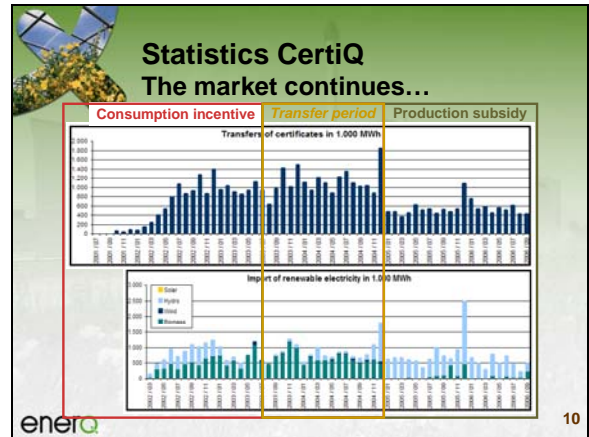
- Certificate system started with a consumption driven incentive; ecotax exemption for consumers
- Consumption driven incentive replaced step by step by a production subsidy; the MEP subsidy (eliminating the uneconomic top of the production of renewable energy during 10 years)
- Both subsidies are granted over the certificates issued at CertiQ
- Now only the production of renewable electricity is subsidised, the certificate trade has become a voluntary system

enero 8

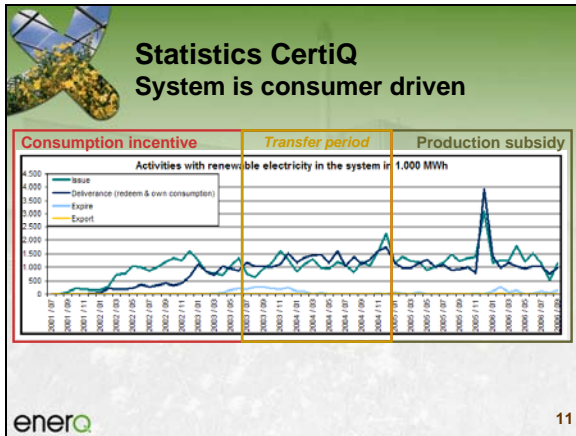
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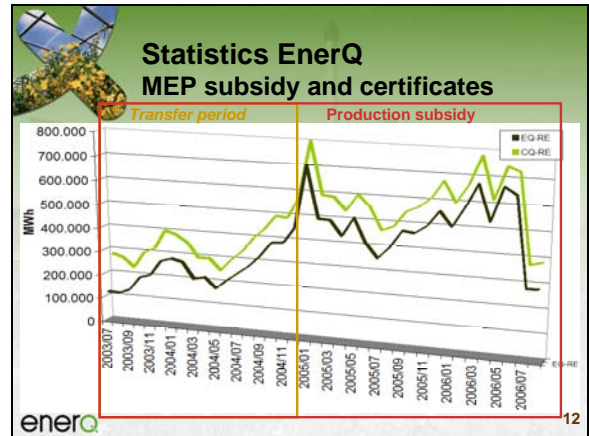
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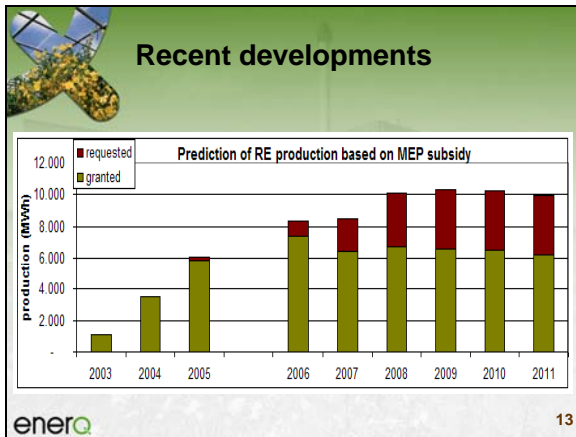
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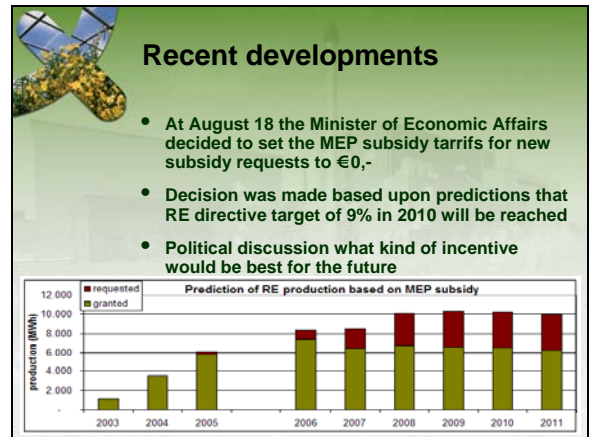
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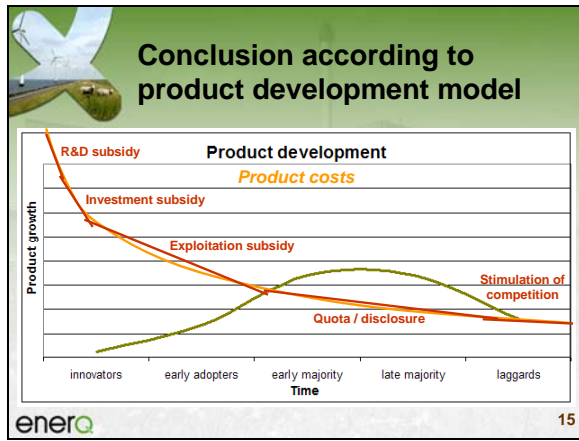
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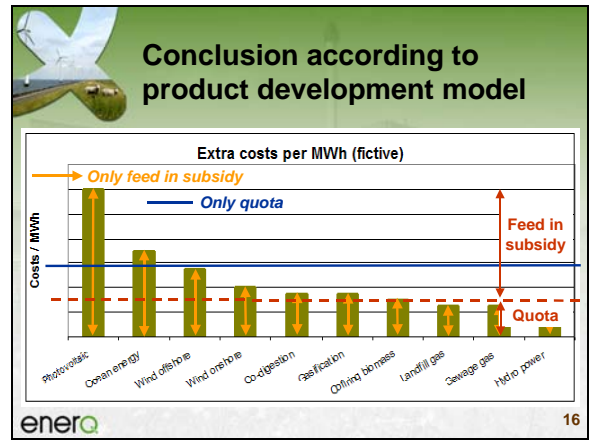
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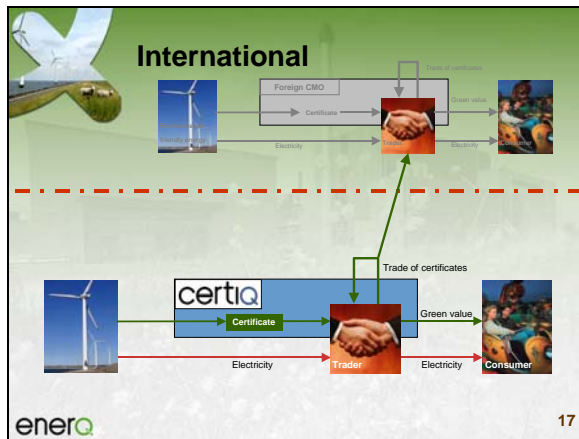
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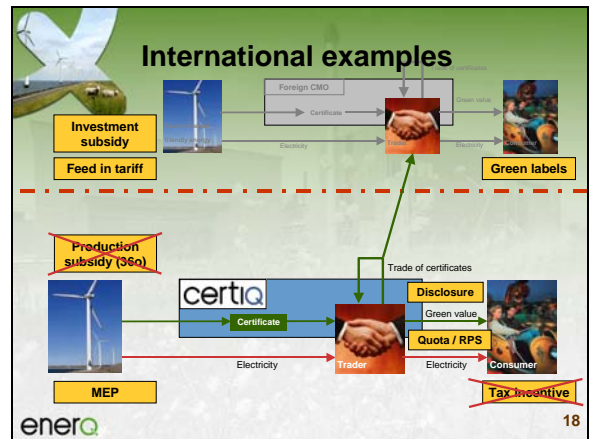
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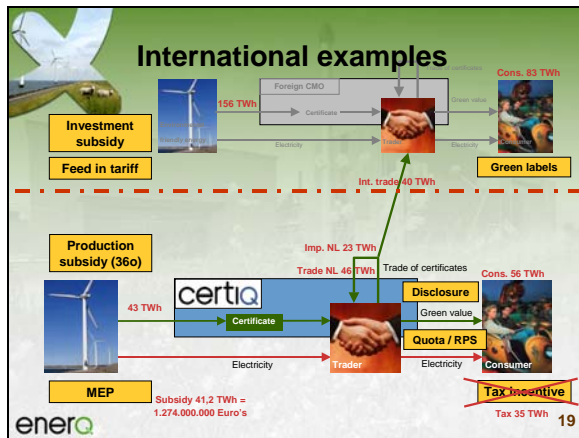
Slide 16



Slide 17



Slide 18



Slide 19

- 
- EECS standardised GO is now implemented in 7 countries + 1 EEA, but according to the European directive 2001/77/EC, it will be implemented in 25 (+2) countries
  - Combined Heat and Power (CHP) is now implemented nationally, but following a European directive it will be internationally implemented in Spring 2007
  - Disclosure in The Netherlands is now implemented with statistical data, soon it will be implemented more secured via the Certificate System

Slide 20



Slide 21

# Are the pillars built on solid ground?



Hans Nilsson

FourFact, Sweden

Are the pillars built on solid ground?

Hans Nilsson  
Chairman of the IEA DSM-Programme

FourFact

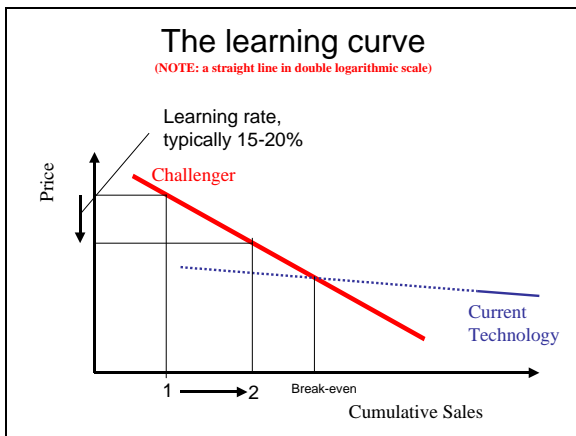



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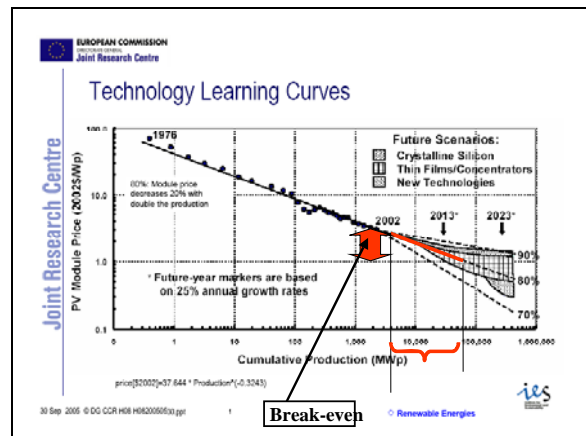
The foundation is moving

- The Stern report
- The ETS non-delivery
- The targets are manifold
- People are human
- Learning curves exist

Slide 2



Slide 3

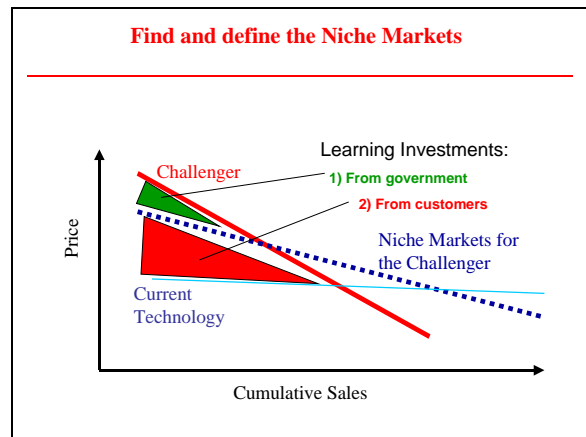


Slide 4

**Co-ordination**

- Energy Efficiency comes first (and the policies will have to be more "aggressive")
- New efficiency instruments e.g. White certificates  
<http://dsm.iea.org/NewDSMWork/shop/TaskXIVFinalReport.pdf>
- Technology maturity may motivate different approaches (Creating Markets for Energy Technologies: [http://www.iea.org/textbase/nppdf/free/2000/creating\\_market\\_s2003.pdf](http://www.iea.org/textbase/nppdf/free/2000/creating_market_s2003.pdf))
- Finding "niche markets" is essential

Slide 5



Slide 6

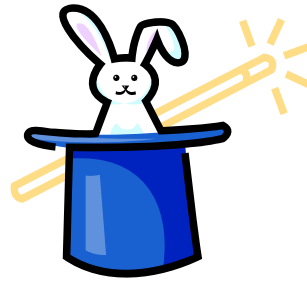


### Optimising when everything moves?

- ETS (expansion, reformation)
- Flexibility in demand (Demand Response)
- Demand response to firm intermittent power
- Smart grids to accommodate decentralised generation
- Future “alarms” (as we learn)
- Institutional restrictions (actor qualifications)

Slide 7

### Are there more surprises ahead!



Slide 8

<http://dsm.iea.org>



Slide 9

# Support mechanisms for RES-E in the UE: Lessons from the Spanish experience

Ana Madurga

IBERDROLA, Spain

Support mechanisms for RES-E in the UE: Lessons from the Spanish experience

Ana Madurga  
Department of Renewable Electricity Regulation  
amadurga@iberdrola.es


Berlin, November 3rd 2006



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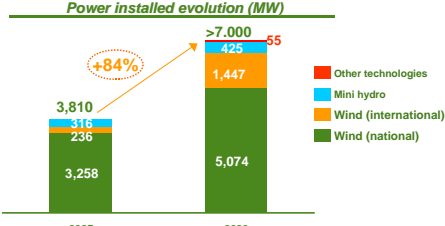
Slide 1

New renewables strategic plan 2007-2009



**Growth of 84% in the installed capacity...**

Power installed evolution (MW)



... with an average growth of 800 MW annually

IBERDROLA RENEWABLE ENERGIES

Slide 2

Renewables International expansion




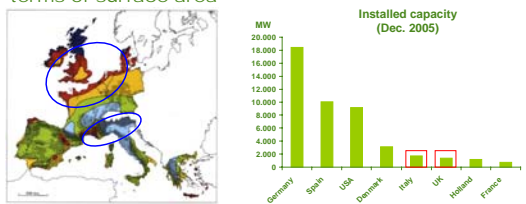
**International expansion as growth driver**



IBERDROLA RENEWABLE ENERGIES

Slide 3

The countries with the most installed wind capacity are not those with better wind resources, nor are they the largest in terms of surface area





- UK has very good wind resources but has little installed wind capacity
- USA surface area is three times the size of EU-15 surface area, but it has only 25% of its installed wind capacity
- Germany and Spain do not have the best wind resources but they are world leaders in this industry

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Slide 4

The key for the development of renewables is political will (backed-up by social support). It would allow an optimal regulatory environment



**Support for renewables is determined by:**

- Network access
- Guaranteed purchase of all production
- Economic support**


Common policy in EU countries

Different systems, different results

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Slide 5

Requirements



Without internalising environmental and other costs, renewable generation, a capital intensive business, is more expensive than conventional technologies.

As a result, investment requires support systems.

An effective support framework must be based on three basic pillars:

- Predictability:** the system must guarantee the remuneration over the life of the asset (long-term perspective, with profitability over 20 years).
- Stability:** the legal framework must be based on criteria of non retroactivity.
- Profitability:** defining a sufficiency scenario, necessary for the development of investments.

**The choice of the appropriate support model is the KEY**

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Slide 6

### Systems based on feed-in tariffs are the most widely used and efficient in the EU

COUNTRY	Installed Capacity (MW)		Support mechanisms	
	In year 2005	End 2005	Feed-in Tariff	Certificates
Germany	1.808	18.428	✓	✓
Spain	1.784	10.027	✓	✓
Denmark	22	3.322	✓	✓
Italy	452	1.717	✓	✓
UK	446	1.353	✓	✓
Netherlands	154	1.219	✓	✓
Portugal	500	1.022	✓	✓
France	387	757	✓	✓
Sweden	58	500	✓	✓
Austria	218	819	✓	✓
Greece	100	573	✓	✓
Belgium	71	187	✓	✓
	<b>5.960</b>	<b>39.704</b>		

- 90.5% of total wind capacity in the EU (39.704 MW) has been installed in countries with feed-in tariff systems.
- 82.7% of new wind capacity installed in 2005 (5.960 MW) was in countries with feed-in tariffs.
- No significant examples of successful green certificates systems.

*\* By the end of 2005*

**FIT: Successful and effective framework**

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Slide 7

### Current support framework for wind energy in Spain

- Established in the 1997 Electricity Law (Special Regime)
- Regulated by the Royal Decree 436/2004
- Payment is indexed to the Tarifa Eléctrica Media – TEM (Average Electricity Tariff)

$$TEM = \frac{\text{Total estimated cost of the electricity system}}{\text{Estimated demand}} = 76.4 \text{ €/MWh in 2006}$$

- TEM evolution defined by Royal Decree until 2010

Remuneration Options	
Regulated Tariff	Market
% of TEM (80-90%)	+ Market price
	+ Premium (50% of TEM)
	+ Capacity payments
	- Cost of deviations

- Remuneration is defined for the entire life of the asset
- Once an option is chosen, the operator must keep it for at least one year
- There are additional revenues by controlling the reactive energy under the grid requirements
- The system can be reviewed every four years, to be applied only to new assets

Independent of pool prices      Similar to the economic regime for conventional energy + economic incentives

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Slide 8

### Regulatory Security

#### Legal Security

- Special regime defined by LAW (1999 electricity law)
- Renewable targets defined by EU directive
- Regulatory developments of the Spanish regime defined by a Royal Decree

#### Special regime market

- More than 600 firms
- Strong political power
- Not only power sector players

#### Social support

- All political parties
- Region and municipal (income sources)
- General public support
- Ecologist Groups
- Trade Unions

No enemies and great social political and economic support  
No possible changes with retroactivity effect

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Slide 9

### The two pillars: co-ordination and optimisation

The European Commission Communication has stated that competing national schemes are healthy at least over a transitional period. No harmonisation appropriate at this stage...

...But a coordinated approach to support schemes based on 2 pillars:

- Cooperation:** Sharing of learned lessons
- Optimisation:** concerns economic mechanisms and cost-effectiveness but also the removal of administrative and grid barriers.

**Improve our systems**

IBERDROLA RENEWABLE ENERGIES 10

Slide 10

### How are we trying to do that in Spain?

- Improve the quality of the energy:**
  - Real-Time programming: The windfarms have to be able of being managed on real time by a Central Control connected to the System Operator Dispatch (CORE)
  - Voltage Dips Response: The windfarms must stay connected through the failures of the grid that create voltage dips
- Improve the efficiency:**
  - Voices claiming too high prices for wind in the market: cap&floor
  - Evolution different from TEM

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Slide 11

# Policies and measures to accelerate renewables

Roberto Vigotti

IEA Renewable Energy Working Party




**Realise final conference**  
**Berlin 3 november 2006**

Policies and measures  
to accelerate renewables

Roberto VIGOTTI  
Chair of the IEA Renewable Working Party


Slide 1



**Renewables can add new value to the energy mix by ....(1)**

- ... enhancing **security of supply** - both for **geopolitical**-concentrated in few countries in critical regions- and **infrastructure**-power plants, pipeline, sea straits...)
- ...allowing energy sources **diversification & reducing imports for consumers/ deferring production for exporters**
- ...**mitigating risks** in current energy portfolio and trends, due to volatility and instability of fossil prices;


Slide 2



**Renewables can add new value to the energy mix by ....(2)**

- ✓ ...creating **framework for investment** enhancing **industrial competitiveness** - and opportunities for export
- ✓ ...creating **new jobs**, favouring economic development
- ✓ ...advancing **environmental targets**;
- ✓ ...providing unique **access to energy services**;
- ✓ ...increasing public participation in energy decision-making

Slide 3



**Create fair market rules**


**Energy prices do not reflect the true costs of generation options** - a market failure:

- the **social and environmental costs** of polluting energy are **not internalised**
- The **added values of RE** for diversification, reduced portfolio risk, job creation, industrial competitiveness **not accounted for**
- there are also **massive subsidies** to 'conventional' energy sources

To acknowledge the benefits of Renewable Energy, **support frameworks are established – not just “subsidies”**

- They should be viewed as **compensation mechanisms** for correcting these market failures and
- a **learning investments** to reduce cost and improve performance


Slide 4



**National Policy Measures**

- **Establish legally binding targets** for renewable energy  
*Essential for maintaining and further **stimulate investor confidence***
- **Establish incentive mechanisms** which provide **defined and stable returns for investors**  
*Definition of technologies admitted*  
*The price for renewable power must **allow for risk return profiles** that are competitive with other investment options.*  
*The **duration** of a project must **allow investors to recover** their investment.*
  - **Appropriate administrative procedures**
  - **Fair grid access and strategic grid planning**
  - **Public acceptance and support**
  - **Focused R&D investment in support of industrial competitiveness**

Slide 5



**Complementary Strategies**

- × **R&D, Feed-In-Tariffs and Tradable RE Certificates** should be considered as **technology development policies**:
  - ✓ **R&D** encourages **new applications**
  - ✓ **Feed InTariffs** support **industry development**
  - ✓ **Tradable RE Certificates support markets** for lowest cost/most mature technologies
- × **Certified Emission Reductions monetise environmental externalities**

Slide 6

### R&D issues

- Cost reduction - basis for further market penetration
- RD&D play a vital role for present and future renewable technologies to deliver their potential
- Governments to consider restoring RD&D budgets.
- Industry expected to play a major role in RD&D, particularly for performance increase and cost reduction.
- New generation technologies depend on Government RD&D.
- Government RD&D to address public acceptability, grid connection, intermittency.
- Governments to consider transfer and share with developing countries.

Slide 7

### Technology learning curve

R&D = learning by searching  
 Improving manufacture process= learning by doing  
 Feedback by applications = learning by using

Source: C.O. Wene, IEA

Slide 8

### Policy Options to Optimise RE Markets

Short-term investments to reduce costs	Long-term market competitiveness rules
<ul style="list-style-type: none"> <li>demand stimulation by tariffs, portfolio quotas, national targets</li> <li>elimination of burdensome policies (siting, permits, licensing, etc.)</li> <li>continued R&amp;D</li> <li>International Financial Institution support of non OECD market development</li> </ul>	<ul style="list-style-type: none"> <li>valuation of security, diversity and environmental benefits</li> <li>elimination of subsidies to conventional energies</li> <li>tradable renewable energy certificates</li> <li>certified emission reductions with targets and penalties</li> <li>integration of distributed generation in energy market liberalisation rules</li> </ul>

Slide 9

### Current Geographic Distribution of Policies

	AT	AU	BE	CA	CH	CZ	DE	DK	ES	FI	FR	GB	GR	HU	IE	IT	JP	KP	LU	NL	NO	NZ	PT	SE	TR	US		
Investment Incentives																												
Tax Measures																												
R&D																												
Obligations																												
Incentive Tariffs																												
Green Certificates																												
Voluntary Programme																												

Slide 10

### RES Policy Chronology

Slide 11

### Policy messages-1

- Current policies will not bring us on a path towards a sustainable energy future. A more sustainable energy future is possible with a portfolio of clean and efficient technologies with renewables centralized and distributed and at village power level.
- It will take a major coordinated, international effort to achieve the results implied: unprecedented co-operation between the developed and emerging economies, and between industry and government will be needed.
- The task will take decades to complete and it will require significant investments costs. But also Business as usual would cost a lot!
- The task is urgent: to ensure that the energy sector remains on a sustainable path in the future. It must be carried out before a new generation of inefficient and high-carbon energy infrastructure is locked into place.

Slide 12

### Policy messages-2

- Implementing the ACT Scenarios will require a transformation in:
  - the way power is generated,
  - the way homes, offices and factories are built and used,
  - the technologies used for transport.
- In the end, it is the private sector that will have to deliver the changes required. But the market on its own will not always achieve the desired results.
- Governments have a major role to play in supporting innovative R&D and in helping new technologies to surmount some daunting barriers: this will happen only with credible, consistent and long term policy intervention

Slide 13

### IEA Renewable Energy Publications

Slide 14

## Session 5 – Minutes of the Round Table

This session was chaired by Oliver Schäfer

### **Ana Madurga (representing Iberdrola, Spain)**

Iberdrola, the largest wind power producer worldwide is a global player and has built wind parks in several countries. Drawing from their broad experience, Iberdrola favours investments in countries with strong political commitments to increase renewables. At the same time the social support is very important for the investors – the wind conditions and the availability of land being subordinate criteria for investment.

According to Ms. Madurga, renewables require support since they are not able to compete with fossils yet. This support is justified since renewables do not cause external costs. For investors it is very important that the legal support system is reliable and predictable. Feed-in systems guarantee a set price for a given number of years and thereby also the profitability of the investment. Thus feed-in systems are more effective and more efficient as argued earlier in the conference. In order to improve the whole system more cooperation between countries with similar support systems is needed not only to exchange experiences but also to create similar support systems, which makes investments easier.

### **Dr. Thorsten Schneiders (representing E.ON, Germany)**

For E.ON renewables are part of the everyday work, one of the main challenges being to integrate wind energy into the grid. Currently E.ON is building a 5 MW windmill nearby Cuxhaven. In a next step an off-shore wind park providing up to 60 MW will be built until 2008. Building on these experiences E.ON is planning a 500 MW wind park, which should be established by the end of 2011. E.ON is investing 1.3 billion € in these wind parks and at the same time is investing in biomass.

E.ON promotes a European approach to harmonise support systems. Since a European energy market is being established, a common legal framework for support systems of renewables is necessary. For this the market oriented green certificate trading system is most favourable. Therefore there is a need for harmonised guarantees of origin as well as an enhancement of the grid infrastructure.

A quota based system does not mean creating a monopoly for energy suppliers since the big companies buy renewables from local producers and thereby promote many small companies.

### **Roberto Vigotti (representing IEA Renewable Energy Working Party, Italy)**

Whilst discussing support systems we should not only focus on costs but also consider value added by RES-E as security of supply, diversification of the electricity supply and the mitigation of risks. The prices of energy currently do not reflect the whole costs for society. External costs are not internalised and are not considered in the prices of fossil fuels. At the same time the whole added value is not mentioned when referring to renewables. This includes an increase in new jobs and decentralised production. Thus all countries should promote renewables as strongly as possible.

The whole discussion on quota or feed-in systems will soon belong to the past. Thus governments should “think big”. Besides, an unprecedented cooperation between the developed and the

emerging countries and between governments and (RES-E) industries is urgently needed and in any case will take decades.

***Hans Randen (representing NordPool, Norway)***

In order to establish a certificate based system more companies are needed on the market since the market power of the few existing energy suppliers is worrying. Furthermore, political means should be taken to promote investment in the grid. The certificate based support system will only function if the market is transparent and many companies participate.

***Discussion***

In the discussion it was emphasized that Europe has a global responsibility. The problems deriving from the use of fossils have global impacts. Thus Europe needs to give a good example in order to encourage other countries. Besides promoting renewables, the EU should also formulate guidelines for energy-efficiency since we need to reduce consumption of energy. Therefore the EU will announce in January 2007 a global energy efficiency initiative.

Mr. Randen proposed clustering systems. Within these clusters countries should cooperate stronger and establish common energy support systems.

The REALISE Forum should not recommend sharp policy changes. The conclusion of this conference should rather stress the dynamic of the issue rather than recommending one simple support system.