

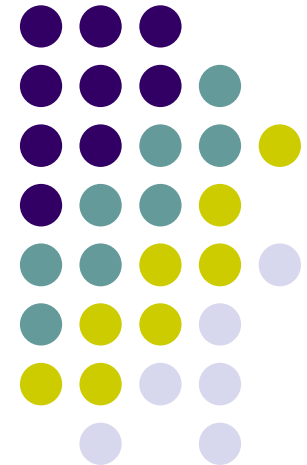
Call for a new paradigm: Deployment of Renewable Energies in Europe

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Why Renewables?

- Security of Supply
- Climate Change abatement
- Sustainability
- Shift towards a new energy mix (example replacing nuclear power as part of the German law to phase out nuclear energy – see: 26 April 2002 the German Parliament "Act on the structured phase-out of the utilisation of nuclear energy for the commercial generation of electricity).

Renewable industry became an economic force



- Investment in new renewable energy in 2005 was worldwide \$38 billion, up from \$30 billion in 2004.
- Germany and China were investment leaders, with about \$7 billion each, followed by the United States, Spain, Japan, and India.
- Overall:
 1. Wind power reached 59 GW.
 2. Biomass power production doubled in many countries.
 3. Biodiesel - 85 percent increase in overall annual prod.
 4. Grid-connected solar PV -55 percent increase in existing capacity
 5. Solar hot water existing capacity grew by 23 percent in China alone and reached record levels across Europe as well.

Source: REN 21, Renewable Global Status Report 2006

Pre-Conditions for Renewable Energy (RES) uptake



- Change in Paradigm: individual responsibility for own energy supply, as local and decentralised as possible
- Households and private sector in general should primarily produce their own heat and electricity from RES sources in an efficient environment
- Combination with drastic change in consumption pattern and increase in efficiency
- Political commitment beyond ideologies and short term thinking to go for strong national RES
- Clear instruments, targets for rapid uptake and enforcement
- High level of market penetration by Independent RES Power Production
- Swift abatement of open and hidden harmful subsidies to incumbent industry
- As long as one or more of these conditions are not met – counterbalance is necessity

Promotion of RES because of imbalance in the overall energy market



- The Energy market as such is still a myth, hampered especially by ever increasing oligopolies and harmful subsidies to the fossil and nuclear sector.
- Each of the European Commission's evaluation reports of the electricity market so far underlines that obstacles still prevail. An essential condition for the completion of the internal electricity market is non-discriminatory access to a transmission or distribution network; otherwise – the Directive 2003/54/EC states – competition will not work.

Barriers and Harmful subsidies



- EC Commission attests “serious malfunctions in EU energy markets” (EC Commission MEMO/06/78 from February 2006)
- Harmful subsidies to the traditional fossil and nuclear sector amount to 250 billion US\$ worldwide per year, representing “a substantial market distortion, discourage new entrants into the market, and undermine the pursuit of energy efficiency”. (*José Goldemberg, Thomas.B.Johansson, World Energy assessment, Overview 2004 Update (UNDP,2004, page 72)*)
- Barrier market - fails to focus and internalise all negative effects of conventional energy use into the price for electricity, so that the price for electricity on these markets are not cost related prices. (*Goldemberg, Johansson*)
- It is not the renewable energy which is too expensive but the traditional energy which is made to be too cheap.

EC Tools for RES encouragement so far:



- **Directive 2001/77/EC on the promotion of RES in the internal energy market**
- **Directive 2004/8/EC on the promotion of cogeneration**
- **Directive 2003/30/EC on the promotion of biofuels, in coordination with**
- **Directive 2003/96/EC on the restructuring of framework directives for taxation on energy products and electricity**

The EU world for RES beyond 2010



- Spring Council 2007 - Agreement on a binding target for 2020 to reach at least a 20% share of renewable energies (RES) in overall **energy** consumption and a minimum share of 10% for bio fuels in each member state. Goal of 20 % increase in energy efficiency in Europe
- European Commission revising current legal framework for RES and elaborating a proposal for an overall framework RES 2020 directive.
- Overall comprehensive Directive for all renewable energies and efficiency
- Publication of draft directive several times delayed towards 2nd half of January 2007 –due to heavy criticism by Member States and RES industry and NGOs

Major conditions for a successful comprehensive renewable energy directive



- Incorporate the main strong and positive elements of current Directives for RES Electricity and Biofuel
- National overall targets and respective growth strategies on a sectoral basis
- Member states to present regular interim reports on reaching the national overall and sectoral targets
- Introduction of penalty system with interim targets and control
- A general priority regulation for renewable energies.
- Safeguarding of successful support instruments to be chosen by member states,
- Removal of legal barriers especially for planning, authorisation and grid connection regulations.
- Legal framework for heating and cooling from renewable sources.
- Biofuel development with sustainability criteria

Some words on Emission Trading



- It is undeniable that there are many committed people in EU and National administration, politics and NGOs aiming for an improved and efficient European Emission trading scheme – in line with current and future Kyoto obligations and own commitment
- But slow progress, enormous obstacles, over-allocation, grandfathering, complicated structure and slow enforcement on MS level, all does not lead to real progress
- As long as this is not improving and clear evidence is given, Emission trading remains third in line, after energy efficiency and after renewable energy support policy

EU Emission Trading FACTS



- The Kyoto Protocol demands that the European Union cut CO2 emissions by 8 percent between 1990 and 2012, that means over a period of 22 years.
- The new adopted climate protection goal require the EU to cut emissions by a further 12 percent between 2012 and 2020, i.e. within only eight years.
- By the beginning of 2007, the EU-25 only managed to achieve approx. 1.0 percent of the 8 percent reduction agreed in Kyoto.
- This means in just 4.5 years Europe has to achieve further 7 %
- This means EU-ETS was a complete failure so far



Emission and Renewables

- Renewables' growth lead to concrete measurable and identifiable GHG decrease:
- Example Germany - Avoided CO₂-Emission: 97-100 Mio. tons (86 Mio. Tons in '05)
- Combined with efficiency and CO₂ taxation this is the strong Trio for sustainability

RES Support mechanisms in EU

27



- Fixed feed-in tariffs RE FIT
- Green certificate obligations
- (Tendering schemes)
- Tax incentives
- Investment grants



What is certificate trade?

- The Certificate Trading system is based on a mechanism obligating the companies who sell electricity to buy a certain proportion of the electricity they sell from renewable energy sources (the so-called quotas/certificates model). Under this system, for every kilowatt hour generated, the producers of electricity from renewable energies would receive a “green electricity certificate”, the price of which would be set on the certificates market.

Green Certificate trading increased RES prices



- So far Green Certificate trade has not delivered but made RES electricity expensive:
- Example: United Kingdom - the consumer has to pay 13-14 ct /kWh for wind electricity (2006) with only about 2 GW installed capacity (between 1999 and 2006)
- On the contrary: Feed-in in Germany- costs for wind electricity amount to 8.36 ct/kWh with more than 20 GW installed capacity (1999-2006)

Feed in Tariff System



- Priority access for RE to the power grid
- Priority transmission and distribution
- Obligation of grid operators to purchase the electricity produced from RE
- Fixed price ("tariff") for every kilowatt hour produced from RE for 20 years, digressing and based on specific reference models
- Equalisation of additional costs for electricity from RE between all grid operators and electricity suppliers
- All different types of RE are considered and tariffs are differentiated by source and size of the plant
- Annual decrease (-1,5% - -6,5%) due to technical development (digression)

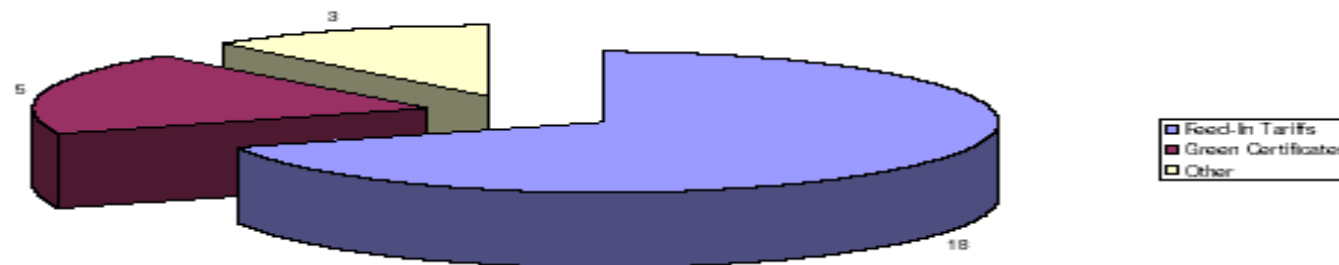
Majority in Europe is clearly “feed-in”



Part I: RES-electricity EU Frameworks & Prices

Graphic 1 Comparison between different support schemes in EU Member States

RES support schemes in EU Member States *



- Feed-in Tariffs: Austria, Cyprus, Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Ireland, Lithuania, Luxembourg, Netherlands, Portugal, Slovak republic, Slovenia, Spain.
- Green Certificates: Belgium, Great Britain, Italy, Poland, Sweden
- Tax subsidies: Finland, Latvia, Malta*

Source: EREF RES – Price Report 2006/2007

“Feed in” as major instrument



- The by far most successful system is the well tailored feed-in system in Europe, as especially in Spain and in Germany
- Quota and certificate trading have not delivered so far and are too expensive and limit growth of RES
- Any new directive from Europe for renewable energies has to acknowledge and to ensure the successful mechanisms
- Time is not ripe for one harmonised support mechanism in Europe
- But there are elements which should be harmonised: Grid access, certificate of origin, cross border entrance in the respective system

Achievement of Feed-In - Germany

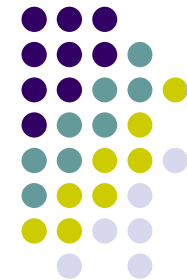


- Share of RES in German power production:
about 12.5 % in 2007 [1998: 4.7%]
-indicative target for 2010 already reached in 2007
- Comparison: United Kingdom 2% in 2006 -
UK will not be able to reach indicative target in 2010
- 235,000 jobs in German RE industries (2006), than
350,000 EU wide (2006)
- 21.6 Billion Euro turnover (2006),
- 97 Mio. tons of CO₂-reduction (2006),
- 1.6 € per month/household (2005) costs for RES

Commission analysis: Best notes for RE-FIT

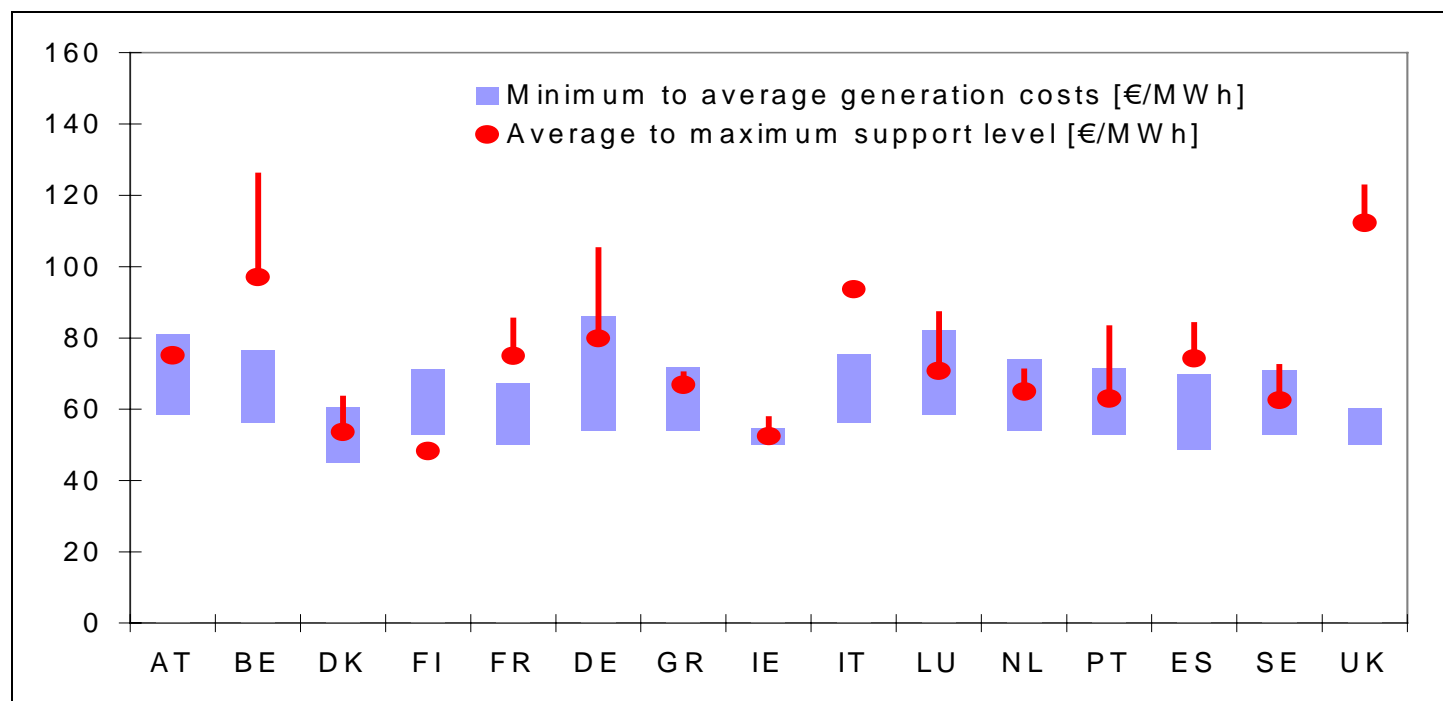


- COM(2005) 627: Feed-in is “cheaper and more effective”
- Reasons in view of Commission: Feed-In
 - more investment security
 - differentiates between technologies
 - > less windfall profits
 - > promotion of mid- and long term technologies
 - Chance for new comers and new technologies
- Logic calls for RE FIT as only applicable system in case of future harmonisation



COMMUNICATION FROM THE COMMISSION The support of electricity from renewable energy sources Com (2005)627 final

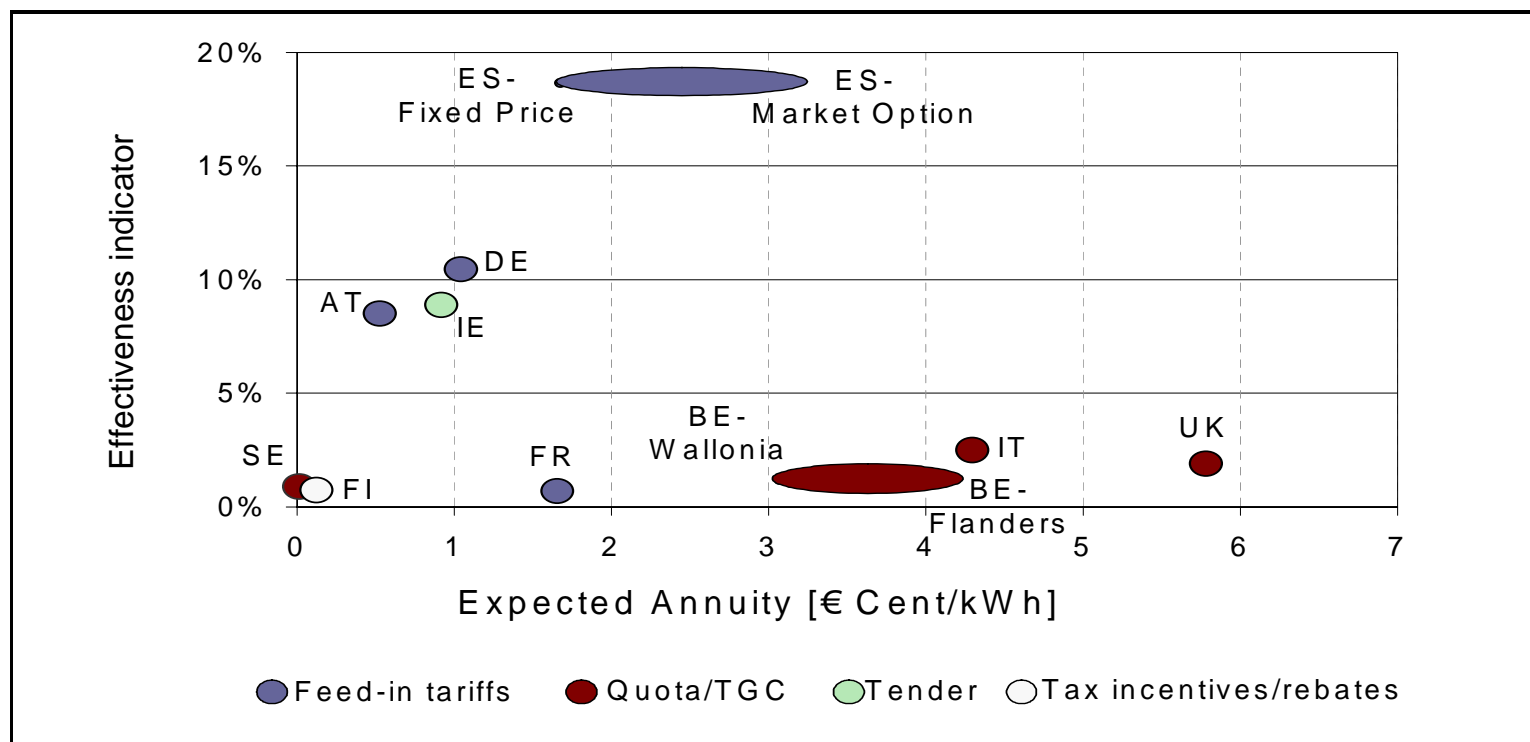
Price ranges (average to maximum support) for direct support of wind onshore in EU-15 Member States (average tariffs are indicative) compared to the long-term marginal generation costs (minimum to average costs). Support schemes are normalised to 15 years.





COMMUNICATION FROM THE COMMISSION The support of electricity from renewable energy sources Com (2005)627 final

- Historically observed efficiency of support: effectiveness indicator in relation to the expected annuity of investment. WIND

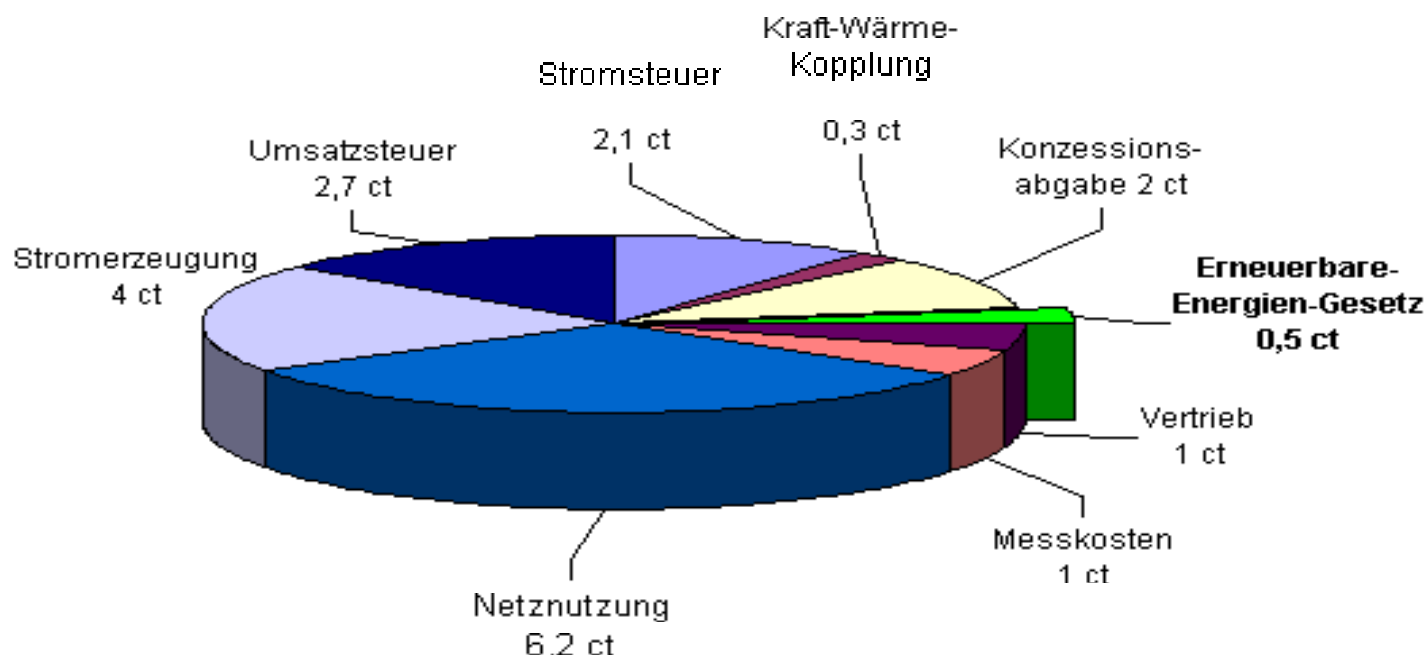


Reflection of RES part of electricity price in 2005 – Example Germany



Strompreis 2005: 19,8 Cent pro Kilowattstunde

Die Kosten für Erneuerbare Energien haben
daran beinahe den geringsten Anteil



Stand: Juni 2005; Quelle: RWE AG, VDN, EEX

The current Discussion in Europe and some Member States



- Within European Commission, some are pushed especially since this summer by UK Government towards:
- Call for mandatory EU 27 certificate trade for RES

Some Member States seem to get cold feet over their own March 2007 commitment for 20 % in 2020



- Saturday October 13, 2007
[The Guardian](#) “British officials attending a meeting in Brussels yesterday supported a system of mandatory trading permits between countries so that member countries that did not meet the renewables target would be able to buy in permits from other countries that had surpassed it. This would enable Britain to get to, say, 10% of its energy from renewables by 2020 and buy in permits from countries, perhaps outside the EU, to cover the rest. “
- Tuesday October 23rd, 2007: The Guardian: “Labour's plan to abandon renewable energy targets -Leaked documents detail strategy for climate change U-turn Ministers are planning a U-turn on Britain's pledges to combat climate change that "effectively abolishes" its targets to rapidly expand the use of renewable energy sources such as wind and solar power.
- “Leaked documents seen by the Guardian show that Gordon Brown will be advised today that the target Tony Blair signed up to this year for 20% of all European energy to come from renewable sources by 2020 is expensive and faces "severe practical difficulties". John Hutton, the secretary of state for business, will tell Mr Brown that Britain should work with Poland and other governments sceptical about climate change to "help persuade" German chancellor Angela Merkel and others to set lower renewable targets, before binding commitments are framed in December. Ministers are planning a U-turn on Britain's pledges to combat climate change that "effectively abolishes" its targets to rapidly expand the use of renewable energy sources such as wind and solar power.”

Any Harmonisation of support Mechanisms must ensure proportionality



- Must be “appropriate to ensure achievement of the intended aim and must not go beyond what is necessary in order to achieve that aim” *ECJ Case C-6/98 ARD vs Pro 7, paragraph 51, referring to cases: , Case C-288/89 Collectieve Antennevoorziening Gouda and Others vs. Commissariaat voor de Media, paragraph 15, and Case C-384/93 Alpine Investments v Minister van Financiën [1995], paragraph 45*



Efficiency criteria

- Art. 4 RES – E Directive 2001/77/EC : support should be effective, simple and efficient esp. in terms of costs
- Feed-in systems are comparatively easy to handle, whilst quota systems create a lot of administrative effort. The fulfilment of the quota obligations needs to be controlled, certificate-trading needs a structure, possible penalties need to be enforced.
- Regarding consumers' costs, experience shows that the price in quota systems are not lower but positive effect in price curve comes from rapid uptake in feed-in countries: In 2003, in Italy, the price per kWh electricity generated by wind turbines was 13,0 Ct (UK: 9,6 Ct), whilst it was only 6,6 – 8,8 Ct in Germany (Spain: 6,4 Ct).

Fouquet/Grotz/Sawin et al., "Reflections on a possible unified EU Financial Support Scheme for Renewable Energy Systems" (Brussels and Washington, DC, 2005), p. 15.

EU wide certificate trade –what would that mean?



- Mandatory certificate-based trade would set up new barriers for Renewables and it would violate internal market directive rules.
- Renewable energy producers wish to sell electricity directly to end-users or via the grid. Renewable technologies will need a market entrance support mechanisms as long as the overall energy market is distorted and its obvious discrimination therefore has to be balanced.
- Introduction of a mandatory trade mechanism in EU 27 alongside national support mechanisms would be resulting automatically in a forced niche "market" for renewables, would create a severe obstacle for market access and thus violate the Directive 2003/54/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in electricity and Directive 2001/77/EC.

Supremacy of National Energy Policy, cost reduction for RES and RES made in Europe jeopardised



- An EU-wide mandatory trading system is not compatible with national renewable energy policies since Member States would lose grip over their support mechanisms and would not have control over their ability to achieve their national binding targets.
- Introduction of those EC trade plans would make renewable energy more expensive all over Europe. The German Government estimates additional costs of such a scheme would be 100 billion Euro until 2020 for the consumers in the EU-27. For Germany alone, it is estimated, that the costs for renewable electricity compared to the present Feed-in costs will almost double.
- With the present Feed-in system in Germany, for example, costs for wind electricity amount to 8.36 ct/kWh with more than 20 GW installed capacity, whereas under the United Kingdom quota/ certificate system the consumer has to pay 13-14 ct /kWh for wind electricity (2006) with only about 2 GW installed capacity.
- According to the recent evaluation report on the German Feed-in law by the German Ministry for Environment the net benefit of the Feed-in law amounted to 5.9 billion Euro per annum.

Established market entrance for RES endangered



- Countries with a high amount of cheap renewable sources (see big hydro in Sweden for example) will - even if they have own national quote certificate systems - face the rapid export of certificates related to this energy and thus a huge lack in its own national RES energy programme and an increase in costs for home-made RES by staying behind with more expensive solutions (new offshore, new technologies).
- The EC trading proposal will lead to investment uncertainty and market disturbances.
- Only renewable electricity technologies with the lowest investment needs – such as co-firing bio pellets in coal-fired power plants, onshore wind and cheap hydro- will “survive”.
- Instead of decentralised deployment of renewable energies, large scale concentration of only a few technologies will be favoured. This will stop the fine industrial development in some EU Member States of the **wide portfolio of technology options** and in particular would slow down the deployment of the globally most competitive sources of new electricity – such as solar electricity and presumably also offshore wind energy.



Improvement of Feed-In

- Not all feed-in systems are structured well enough and not all are embedded in an efficient planning environment
- The successful feed-in countries are the ones which help Europe to come closer to its Kyoto and RES targets – without them the situation would be quite disastrous on Europe's promises



Feed-In Alliance

- The Spanish German Initiative on a feed-in MS alliance should be strengthened and vividly supported by RES Industry and MS in Europe
- In Slovenia in October 2007 more than 12 Feed-In countries and industry associations enforced this alliance

The advantage of a broad approach in RES: PV/Solar in Germany for example



- 2005- PV installation: 1.500 MW
- Cost reduction since 1995: 50%
- Investment in 2005 in PV: 3.75 bio €
- Employment: 42.500 (PV and Solar Thermal)

European success in RES is still too much in the hands of very few committed MS



- **Positive Example – Germany:**
- 2007: **12,5 % target for 2010 already reached**
- 2006 : 4,7 % share of RES in primary energy consumption
- **Planning:**
- 2020: 16 % RES in prim. Energy consumpt.
- 2030: Share of RES in electr. supply
45 % and by
- 2050: **77 % feasible**
- Source: (German Ministry of the Environment, BMU, Press Service 055/07, 27.02.2007; press declaration of 5th of July)

PV as astonishing concentration in a Northern Country – why?



- Use of PV modules is still concentrated in a few Member States
 - In the EU 27, end of 2006 3.419 Megawatt were installed.
 - Additional capacity of 1.246 Megawatt was installed last year, more than 90 % of this in Germany.
 - From this total figure of 1.246 new MW in 2006,
 - Germany installed 1.153 MW alone,
 - Spain 60,5 MW
 - Italy 11,6 MW
 - France 6,4 MW.
-
- See: press release of Observ'er from 26 June 2007

Economic value of RES in Germany in 2006



- 214,000 people working in RES (170,000 in '05)
- Avoided CO₂-Emission: 97-100 Mio. tons (86 Mio. Tons in '05)
- Gross Turnover: 21,6 bio. Euro (18,1)
- Split into:
- Turnover from new installation set up: 11,3 bio. Euro (10,3)
- Turnover from running of installations: 10,3 Mrd. Euro (7,8)

Promotion of RES because of imbalance in the overall energy market



- The Energy market as such is still a myth, hampered especially by ever increasing oligopolies and harmful subsidies to the fossil and nuclear sector.
- Each of the European Commission's evaluation reports of the electricity market so far underlines that obstacles still prevail. An essential condition for the completion of the internal electricity market is non-discriminatory access to a transmission or distribution network; otherwise – the Directive 2003/54/EC states – competition will not work.



Major barriers

- **Failure of Governments to deliver:**
- Consequent action planning
- Administrative capability and coherence
- Public Information on RES
- Sticking to promises given
- Ability to agree to new, decentralised market structure
- Flexibility
- Market incentives
- Market Fairness

The grid issue: No progress without full ownership unbundling



- The EU Commission urges towards full ownership unbundling that utilities have no direct power on the grid
- Germany and France stop all progress in this direction so far
- Grid enforcement cannot happen if subject to main competitor's decision and to pure return of investment strategies

Example: Subsidies to Nuclear



“More than half of the subsidies (in real terms) ever lavished on energy by OECD governments have gone to the nuclear industry.” (The Economist, **Nuclear power Out of Chernobyl's shadow** May 6th 2004, from print edition)

Example US:

- Wind, solar and nuclear power got around \$150 billion in cumulative US Federal subsidies over roughly fifty years, some 95% of which supported nuclear power.
- Nuclear power received far higher levels of support per kilowatt-hour generated early in its history than did wind or solar.

Subsidies II



- Between 1947 and 1961: Commercial, fission-related nuclear power development received subsidies worth \$15.30 per kWh.

This compares with

- subsidies worth \$7.19/kWh for solar and
- 46¢/kWh for wind between 1975 and 1989.
- In their first 15 years, nuclear and wind technology produced comparable amount of energy (2.6 billion/Nucl. and 1.9 billion kilowatt-hours/wind), but the subsidy to nuclear outweighed that to wind by a factor of over 40, at \$39.4 billion to \$900 million.

(Source: FEDERAL ENERGY SUBSIDIES: NOT ALL TECHNOLOGIES ARE CREATED EQUAL by Marshall Goldberg, REPP, July 2000 • No. 11)

Example: Non Full Insurance Coverage of Nuclear



- **Costs of Insurance**

Nuclear Electricity Production in Germany '06: **167,4 Mrd. KWh**
(Quelle Dt. Atomforum 17.1.2007)

Insurance obligation for all Nuclear Power Stations in Germany '06:
€ 11,523 Mio. + Vers.Steuer (insurance tax) = **€ 13,367 Mio.**

Cost of Insurance per KWh = **0,008 Cent/KWh**

- Source: Haftungsvorsorge und Versicherung der Atomenergie, Dirk Harbrücker, DKVG Köln

Paris Convention (new, not ratified yet) opening for “full responsibility”



- Since 2001 and a deal between Nuclear Industry and German Government in June 2001 in the Agreement of Phasing out of Nuclear:
- Increase of Insurance coverage to 2.5 Bio Euro - Higher risk is not insured

Capacity of the Nuclear Industry to Cover Risk



- **Overview of available financial capacity in Germany**
- €700 Mio. EURO per Power Plant

Source: Haftungsvorsorge und Versicherung der Atomenergie, Dirk Harbrücker, DKVG
Köln

- **Definitely not enough**

Responsibility and Coverage

Source: DKVG Dt Kernreaktorversicherungsgemeinschaft



Deckung durch:	Deutschland	Belgien	Finnland	Frankreich	Großbritannien	Niederlande	Schweden	Schweiz	Slowenien
	EUR	EUR	EUR	EUR	EUR	EUR	EUR	EUR	EUR
Versicherung	256	297	200	91	183	340	343	545 ³⁾	75
Solidaritätsvereinbarung der Betreiber	2.244								
Staatsgarantie -gebührenfrei- ¹⁾				109					
Umlage unter BZÜ-Staaten ²⁾	143	143	143	143	143	143	143		
Summe	2.643	440	343	343	326	483	485	545	75
weitergehende Betreiberhaftung	unlimitiert	keine	keine	keine	keine	keine	keine	unlimitiert	keine
Kurs SZR zu EUR vom 31.12.2006	1,142290	1,142290	1,142290	1,142290	1,142290	1,142290	1,142290	1,142290	1,142290
Kurs WE zu EUR vom 31.12.2006	1,000000	1,000000	1,142290	1,000000	1,308920	1,000000	1,142290	0,544716	0,036290

¹⁾ Für Staaten, die dem Brüsseler Zusatzübereinkommen beigetreten sind: Differenz zwischen SZR 175 Mio. und Versicherung, falls Versicherung < SZR 175 Mio.

²⁾ Betrag entspricht SZR 125 Mio

³⁾ Davon stehen aber nur CHF 500 Mio. für Schäden durch Terror zur Verfügung

⁴⁾ Berechnung: 104KKW haften bis zu USD 100,59 Mio. pro Block, maximal USD 15 Mio. pro Jahr

Potential Risk is vastly underinsured = State Support



- Potential Risk of costs of a major accident is at least more the 1000 Bio EURO
- All German Nuclear Power Producers in their solidarity pool could not cover such a risk
- Therefore State still the guarantor for such risk
- This state support must be calculated with a potential risk premium insurance calculation – per kWh result is the amount of state support
- EREF investigates

Some hope on the horizon on RES Directive 2020



- Protests also from Member States' side and lobbying seems to break up the Trading front:
- Peter Vis, Member of Cabinet of Commissioner Piebalgs apparently pronounced Friday, 9th of November shift away from RES certificate trading in opinion of DG TREN:
- COM would not any longer planning a certificate trading scheme ("we understood"-- mainly out of competition reason, meaning it would strengthen the incumbent utilities and big players), but will propose something similar to CDM principles. This would mean a balancing between Member States only - and only if a MS has something to give away - meaning if an intermediate target is fulfilled. (phone call with Oliver Schäfer from EREC)
- But further vigilance is necessary- one has seen all in this Commission



- Thank you very much for your attention !

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