



European Economic and Social Committee

TEN/156
Renewable energies

Brussels, 28 January 2004

OPINION

of the European Economic and Social Committee

on

Promoting renewable energy: Means of action and financing instruments

Own-initiative opinion

On 17 July 2003, the European Economic and Social Committee, acting under Rule 29(2) of its Rules of Procedure, decided to draw up an own-initiative opinion on

Promoting renewable energy: Means of action and financing instruments.

The Section for Transport, Energy, Infrastructure and the Information Society, which was responsible for preparing the work on the subject, adopted its opinion on 8 January 2004. The rapporteur was **Mrs Sirkeinen**.

At its 405th plenary session of 28 and 29 January 2004 (meeting of 28 January 2004) the European Economic and Social Committee adopted the following opinion by 113 votes to two.

1. **Aim and background**

1.1 Europe, as the rest of the industrialised world, is highly dependent on fossil fuels. Transport and energy generation are almost totally and to a high and still growing rate dependent on oil, coal and increasingly natural gas. In the EU their energy generation is around half and is forecasted to grow to 70% by 2020. Also governments' finances are substantially tied up to fossil fuels through, in particular, high taxes on transport fuels.

1.1.1 The high dependence on fossil fuels is linked with some problems. The future running-out of reserves of fossil fuels will probably somewhat exacerbate the supply situation in the long term. At the moment, however, this is not yet beyond the power of the markets to deal with. But fossil fuels are constantly in the focus of international politics. Most of the reserves of oil and gas are in politically unstable regions or otherwise not in the reach of normal market rules and competition. The most pressing challenge presently is, however, climate change, as fossil fuels emit carbon dioxide when combusted.

1.2 A central piece of energy policy in Europe is to increase the use of renewable energy sources. The Green Paper on security of energy supply in Europe identifies renewable energy sources as one cornerstone of a European energy strategy, aiming at sustainable development.

1.3 The Green Paper presented two main objectives for the strategies it outlined:

- enhancing security of supply by diversification of energy sources towards non-imported sources;
and
- combating climate change by substituting fossil fuels with sources which do not emit greenhouse gases.

The third simultaneous objective for energy policies is the competitiveness of Europe, in the spirit of the Lisbon strategy.

1.4 The main proposals on renewables by the Commission are the White Paper on renewable energy from 1997, the Directive on promotion of electricity from renewable energy sources ("RES-E"), which was adopted in 2001, and a Directive on biofuels adopted in 2003.

1.4.1 The EESC has adopted opinions on each of these proposals, and in addition produced an own-initiative opinion on *Renewable energy from agriculture in 2000*. In all these opinions the Committee gave its strong support to the objective of increasing the use of renewable energy sources. The proposed policy measures were also largely supported, but some detailed comments given. In its opinion on the RES-E Directive the Committee expressed its concern that leaving the choice of support measures and their level freely to the Member States could lead to distortions of competition in the internal market.

1.5 Support measures to renewable energy sources are necessary because many of the sources and technologies are not always competitive in relation to traditional energy production, but may have a potential to be so. Support can also be seen as compensation to renewables for the public support traditional energy sources and production methods have received over time and the external costs caused but not carried by traditional energy production and use. Many studies support these arguments, but all do not, at least not fully.

1.6 The aim of this own-initiative opinion is to give an input of facts, analysis and recommendations to the continuing vivid discussion on renewable energy at a time when the Commission is starting to prepare its review of the RES-E Directive. A lot has happened in the Member States, even if this Directive's implementation deadline is still only approaching.

2. Present EU goals and regulations

2.1 On the European level targets are set to increase the use of renewable energy sources. A definition of RES is given in the Directive on renewable electricity production. The directive states that renewable energy sources shall mean renewable non-fossil energy sources: Wind, solar, geothermal, wave, tidal, hydropower, biomass, land-fill gas, sewage-treatment plant gas and biogas. The directive specifies biomass further to mean the biodegradable fraction of products, waste and residues from agriculture (including vegetal and animal substances), forestry and related industries, as well as the biodegradable fraction of industrial and municipal waste.

2.2 The White Paper for a Community Strategy and Action Plan – *Energy for the Future: renewable Sources of Energy* aims at doubling the share of renewable in the total energy supply for EU. This means increasing the use of renewable energy sources (RES) to an amount that is equal to 12% of the European Union's final energy consumption by 2010.

2.3 To kick-start the implementation of the strategy set out in the White Paper a campaign for Take-off started in 1999, aimed to go on until 2003. For a couple of renewable energy sources indicative targets were set for additions in the period 1999-2003.

2.4 The Directive on the promotion of electricity from renewable energy sources (RES-E) sets an overall target for the share of electricity from renewable sources at 22% of total EU electricity consumption in 2010. The directive holds indicative targets for the share of renewable electricity production for each Member State.

2.5 The aim of the Directive on biofuels is to increase the consumption of biofuels to 2% of the consumption of diesel and gasoline in 2005 and 5.75% in 2010. In couple with this directive the Directive on tax deductions for biofuels has been approved, providing for a key instrument for Member States in promoting biofuels.

2.6 The RES-E directive does not set any clear rules on support measures to renewable electricity. It states, however, that the Commission will make an overview of the implementation and results in 2005 and then possibly decide on one common support method to be implemented throughout the Union.

2.7 Meanwhile the Commission has in 2001 set Community guidelines for State aid for environmental protection. These apply in principle to aid for RES. The main thrust of the guidelines are that renewable energy sources may receive state support. Aid schemes must be notified to the Commission. Four different, alternative types of aid are allowed. Only a given, but in some circumstances high, share of costs can be covered by aid and it must not lead to over-compensation. Aid schemes must be limited in time and the aid intensity have a declining trend.

2.8 At the World Summit on Sustainable Development in 2002 it was agreed to work towards increasing the use of renewable energy sources worldwide, but no target was set. The EU, however, committed itself by forming a coalition of likeminded states to work towards a global target for the share of renewables in line with the EU target. The Commission is preparing a communication on this issue.

3. Related Policies and Measures

3.1 Promoting energy efficiency is another pillar of energy policy with the same objectives as promoting renewables, i.e. security of supply and combating climate change. A key technology is combined heat and power generation, CHP. A directive on CHP will be adopted soon. Other measures for energy efficiency are efficiency standards for appliances, labelling, a draft Directive on design of electricity-using equipment and one on demand-side management (DSM).

3.1.1 Member States have also put into place own measures for promoting energy efficiency. In some cases Voluntary Agreements have been successful. The general appreciation is that there is still much potential in this area.

3.1.2 Measures for better energy efficiency do usually not overlap or intervene with measures to promote renewables. In the case of CHP there is, however, an overlap, because one

source in CHP generation is biomass. This overlap should not cause any problems on the market or vis-a-vis fulfilling obligations under the different directives.

3.2 The EU scheme for emissions trading, as designed in the recently adopted directive, covers energy generation causing CO₂ emissions. This directive does not directly cover renewable energy or other emissions-free energy sources, like nuclear - that is, under the scheme no credits are given for cutting CO₂ emissions by investing in emissions-free generation. The cap-and-trading system is, however, a very forceful instrument and will, indirectly enhance renewables, as the system will increase energy prices and the cost of using fossil fuels, rendering non-emitting sources more competitive.

3.2.1 The ET Directive and in particular the RES-E Directives overlap, and are in some parts probably not coherent. The ET Directive can also be seen to cover the climate change aspect of promoting renewable energy sources. One question is, whether the goal of decreasing CO₂ emissions should be left to emissions trading solely. Possibly redesigning measures related RES to promote the objective of security of supply only. The EU emissions trading will, according to several studies, increase the market price of electricity considerably (conclusions vary from 20% to over 100%). Is it economically and politically feasible to add to this cost burden by also applying any direct support scheme for RES that additionally increases the user's electricity bill?

3.3 EU agricultural policy has a major influence on the provision of biomass for energy use. In this respect, reform of the common agricultural policy (CAP) is bringing changes. Energy crops can now also be planted on normal agricultural land and promoted with a €45/ha subsidy.

3.4 The *Intelligent Energy-Europe*, a Community support programme for non-technological actions in the field of energy efficiency and renewable energy sources, was adopted in June 2003. It runs for 2003-2006 and support is granted to projects committed to remove market barriers to energy efficiency and renewable energy sources. The programme is structured in four fields with ALTENER directed to new and renewable energy sources. The others are SAVE for energy efficiency, STEER for energy relating to transports and COOPENER cooperation with developing countries.

3.5 R&D policies are key to both developing new renewables solutions and further refining those technologies, which already are on the marketplace or close to it. Some form of renewables that fall under the definition of the RES-E Directive are, as a matter of fact, still in a stage of early development and will require substantive R&D efforts before their potential can be fully developed.

3.5.1 Hydrogen technology attracts much attention and expectations. In some applications it seems to be close to market entry. Used as a transport fuel and in fuel cells, the big potential of hydrogen lies in the fact that its use does not emit greenhouse gases, it can offer a means of storing electricity and substitute oil. Hydrogen is produced either from natural gas (the primary fossil energy source), from water (through energy consumption) with electricity or from biomass. These sources, or

either of them, need to be sufficiently available. Since the known reserves of natural gas are limited, it would be preferable to direct them towards use as transport fuel. Nuclear and in the future hopefully photovoltaic are best suited to supply the electricity needed to produce hydrogen from water. Also the production techniques need to be further developed to cut costs, including technologies to handle this very explosive fuel safely.

4. Promotion of renewables in Member States

4.1 Transposition of the Directives promoting use of renewable energy and the biofuels directive are still under way in the Member States. It is too early to say whether all Member States will meet the target dates, but it is probable that all will not. All Member States have already notified their national targets.

4.2 Most Member States have meanwhile introduced national support schemes for renewable energy sources. Some have intensified schemes which were taken into use already before EU-level policy declarations. Support systems in Member States differ considerably from each other, and so do the levels of compensation they provide.

4.2.1 Five main forms of support methods can be identified:

- 1) guaranteed feed-in tariffs and mandatory buy-back obligations;
- 2) renewables certificates, usually coupled with take-in obligations;
- 3) public-bidding systems;
- 4) tax relieves or exemptions, and
- 5) direct support to investments.

4.2.2 Feed-in tariffs are in use in at least Austria, France, Germany and Greece. Certificate systems are in use Belgium, in Denmark, the Netherlands, Sweden and the United Kingdom and planned in Italy. Support is built into the energy/carbon tax system in Finland, the Netherlands and the United Kingdom.

4.2.3 An example of a feed-in tariff/buy back regime is the German Law on Renewable Energies. The system provides for guaranteed feed-in tariffs for generators of electricity from renewable energy sources over 20 years. There are different tariff groups for different technologies and different efficiency levels within a group, normally over €80/MWh. The tariffs are usually guaranteed for some years, then gradually decreasing over time. The costs are allocated to all consumers at the same rate. The German Law has been tried for its compatibility with State aid rule of the Treaty, and the judgement was that it does not constitute State aid as it does not involve State resources.

4.2.4 An example of a system built into the tax system is the Regulating Energy Taxation system of the Netherlands. Electricity not generated from renewable energy sources is taxed in order to support the generation of "green" electricity. Industrial electricity users are widely exempted from

the tax in consideration of an alternative instrument established for industry, i.e. the industry's obligation to meet world top energy efficiency targets.

4.2.5 The UK Renewables Obligation is an example on a system of certificates and obligations. An obligation is imposed on suppliers (3% in 2002, 10.4% in 2010). The costs thereof, including a possible cost of a penalty (about €45/MWh) is allocated to the consumers.

4.3 Systems are mostly purely national, imports are usually excluded. Even so, in some cases operators may achieve double benefits. An example is wind energy produced in Germany and exported to the Netherlands, which may get both the guaranteed feed-in tariff price in Germany and the support in receiving Netherlands.

4.4 Wind energy is expected to contribute most to the overall targets, and support programmes are set accordingly. Remuneration for wind power is presently over €100 per MWh in Italy and Belgium, and over €50 in addition in France, Austria, Portugal, Germany and the United Kingdom. In some Member States the remuneration levels will fall after between five and 15 years.

5. **Enlargement**

5.1 The share of RES in the national electricity generation in 1997 is in only three of the ten new EU member countries higher than the current EU average in the same year (12.9 %). These three countries are:

- Latvia with 42.4%;
- Slovakia with 17.9%; and
- Slovenia with 29.9 %.

All of them use mainly hydro power resulting from a good availability of this energy source. In all of the other seven countries the share of RES in electricity generation is quite low, i.e. about 2% in the average.

5.2 The national objectives of the new member countries amount to an increase of their RES electricity generation which in 2010 shall be more than double as high as 1997. This increase rate is thus nearly the same as the objective of the countries of EU. One of the problems will be that these ten countries do not have very much wind potential. Insofar the use of wind power does not promise an efficient way of electricity generation. Therefore, the use of bio mass seems to get a growing importance in most of the new member states.

5.3 As to the provision of heat, the new member states are largely covered by extended district heating networks, which have however partly suffered from lack of maintenance. The potential for use of biomass and CHP for district heating can be considerable, but details are not known.

5.4 There seems to be a big potential for increased energy efficiency in the new member states, still considerably bigger than in the EU. This must be enhanced in parallel with RES. In particular information campaigns to citizens should be initiated on how to save energy in households.

5.5 One benefit might result from the fact, that they have started their efforts to use RES at a later stage. Therefore, they can profit from experiences of success and failures in the EU concerning RES use. To enable both the new as well as the current EU Member States to do so, it seems necessary that positive and negative results of RES use in all EU countries should be monitored thoroughly each year. Thus, successful developments can be further improved, whereas mistakes could be reduced. Generating costs can become optimised.

5.6 To support the new members in this respect seems very important, as their experience in using RES seems to be rather restricted according to the statistical figures, which show that most of RES-electricity generation is based on hydro.

5.7 An additional aspect in this context relates to the costs of RES electricity. All new members suffer from scarcity concerning financial sources. Therefore any new technology which needs much capital and only few manpower is a heavy burden and reduces the possibility of the new EU members to reach the EU-levels within a certain number of years. Expensive energy consumption could result in reduced rates of growth and bad competitiveness.

5.8 Therefore, the development of competitive prices for RES electricity production is vital especially for this group of countries, since they will, of course, soon be obliged to accept the same obligations and targets as the current EU Member States.

6. Potentials and non-tariff obstacles to renewables

6.1 The potential of renewable energy sources is big, but in most cases still limited, even when disregarding costs. The potential differs both between sources, and in particular, over time. The forms of RES, which have the biggest potential in the short and medium term, mainly wind, hydro and biomass, also have obvious limitations. Other forms of renewables, like photovoltaic and tidal, are still in early stages of development and will show their potential only after 20-30 years, perhaps even more. They still need much effort of research and development. This means very different approaches and solutions than those directed to helping almost fully developed technologies be more efficient and thread the last steps to full competitiveness.

6.2 The use of wind power is limited by the need for back-up power and related grid capacity. The production of biomass is enhanced by agricultural and forestry policy. The use of biomass for energy generation is, however, influenced by other uses with higher value added. Any market-driven preference granted to such uses could, however, put the production of biomass at a competitive disadvantage. Building more hydropower is more difficult in Europe for reasons of natural protection; even forward-looking plans for small plants encounter resistance.

6.3 A growing, serious obstacle for increased use of renewables is public resistance. Resistance can be caused by insufficient insight in the importance of increasing the use of RES as well as misinformation about the qualities of the technologies. In order to deal with this information and educational campaigns should be set up, including taking the importance and features of RES up on school curricula. Location decisions must naturally always take account of local acceptance. Technological development can also provide for good solutions, like off-shore wind generation instead of on-shore.

6.3.1 Technologies for renewables attracts a lot of inventiveness and entrepreneurship. This should be encouraged and fostered. Also should possibilities for involvement of and investment by local people be encouraged. In spite of support systems, sometimes fairly open handed, one should however not ignore the risks involved.

6.4 Cumbersome and prolonged permit processes make investments in RES often too risky and costly. A time limit should be introduced and respected by authorities. Still, appeals to court on decisions by authorities can extend the permit process unpredictably, even to years.

6.5 In many cases the increased use of renewables requires development of infrastructures, which can take time. Also, increased use of RES leads to additional requirements on and sometimes problems for grids, in particular if location parameters are not carefully taken into consideration. Therefore the pace of increase in use may be somewhat slower than targets indicate, or costs can be higher.

6.6 In practical terms, the goal for promoting renewable energy is to substitute fossil fuels, as these emit greenhouse gases and are, to a large extent, imported from outside the EU. Taking into account efficiency rates for the use of primary energy, direct electricity generation from renewables, like wind, has the best substitution effect. Substituting primary fossil fuel use with renewable fuels is less effective. Combined heat and power production from biomass increases this substitution effect considerably. The Commission observed the substitution principle in its overall planning, but it has often not been taken into account when designing promotion measures and calculating results.

6.7 High expectations are put on renewable energy sources. Taking into account the above mentioned limitations and the long time span needed in many cases, it is obvious that renewables will not solve all of Europe's energy problems. They can make an important contribution in covering increased demand. In the short or medium term they cannot, even in the most positive but still realistic scenario, substitute coal or nuclear, let alone both. For the longer run scenarios and visions need to be developed, in order to inspire and direct R&D and other actions at an early stage.

7. Evaluation of promotion methods and results

7.1 The effectiveness of the instruments vis-a-vis increasing the use of renewables depends much on their detailed design. But it seems that feed-in tariff regimes are particularly

effective. Cost effectiveness, adverse impacts on markets and other implications of the systems must, however, also be taken into account.

7.2 Most support schemes do not open for competition between different forms of renewables nor between renewables and traditional generation. Most promotion schemes lack also otherwise any element of enhancing technology and efficiency development. Also a barrier mechanism for over-compensation is often lacking.

7.3 Markets structures for heat, electricity and transport fuels are fundamentally different. Heat has a purely local market, with the extension of district heating networks. Transport fuels markets are competitive, distorted to some extent by differing taxation within the EU. Electricity is starting to open up, but still has a lot of obstacles for transborder trade. Unbundling of infrastructure and ensured third party access are key issues.

7.3.1 Any measure to promote electricity and transport fuels from renewables should take careful consideration of not distorting competition in the internal market. A level playing field for all in the EU, which is presently not the case, should be put as a central goal.

7.3.2 In the case of electricity, EU-wide optimal use of natural and climatic circumstances as well as existing grid capacity should be taken into account when planning promotion measures. Otherwise solutions will be all but cost efficient, leading to much higher costs of investments and use for the same end result. One example is the positioning of wind power parks – they should be optimised in relation to beneficial wind conditions and, on the other hand, grid capacity and use. Today this is not the case, when driving factors are national targets.

7.4 The RES-E Directive sets criteria on national support schemes. They must be compatible with the internal market, take into account the different characteristics of RES, be efficient and simple and include sufficient transitional regimes to maintain investors' confidence. In its opinion on the RES-E Directive the Committee proposed additional principles to be taken into consideration. These include an affordable cost burden on users and public funds, decreasing compensation levels, no long term continuing support, full transparency and, as far as possible, leaving the final decision to the market, including normal market risks.

7.4.1 These principles are still fully valid. Unfortunately it seems that many national support schemes in place are not in line with them, usually differing on several points. When compared with these principles, the feed-in-tariff/buy-back system seems to contradict several of them.

7.5 Some studies have already been made on how support systems have worked and forecasts have been made on the resulting increases in the production and use of renewables. Some of the studies take into account that the EU instruments are mostly not yet in force. Some include the effects of policies and instruments to be taken into use in the near future. Results vary substantially,

but it seems that most Member States will have big difficulties reaching their targets for increasing RES by 2010, as will the EU as a whole.

7.6 In some cases substantial increase in renewables has, however, been achieved. The most obvious example is the increase of wind power in Denmark, Germany and Spain. This indicates that increases are possible, even in by natural circumstances less favourable areas, like inland Germany for wind. If every Member State would follow the example of those with the best achievements, the total EU target would be reached.

7.7 Reaching the EU target is thus not impossible, the question is whether politicians and voters are willing to put up the resources needed. Costs must be tolerable for consumers and the global competitiveness of European industries must not be jeopardised.

7.8 Many Member States, in particular the three mentioned above, have opted for substantially high remuneration levels for renewables. Evaluating acceptability of costs for meeting RES targets are political decisions. The impression is, however, that cost levels are in many cases very high, when one compares remuneration levels up to over €100 per MWh with the present market price for electricity (excl. transmission and taxes), which on average is about €25-30 per MWh.

7.9 As long as the amounts of renewables receiving support are fairly small, so is the total cost. But when the amounts increase, in accordance with objectives, the cost burden starts to have an impact of users' economy. This may cause reactions amongst voters, like in Denmark, or affect the competitiveness of, in particular, big energy users in industry, which hardly is in line with the objectives of the Lisbon strategy and other economic goals.

8. Conclusions and recommendations

8.1 At the moment it seems that neither most Member States nor the EU as a whole will reach their targets for increasing the use of renewable energy sources by 2010. Achievements in some Member States indicate, that it would not be impossible to reach the EU target. It is, however, uncertain whether the political willpower and the resources needed can be fully mobilised.

8.2 As there are no EU-wide guidelines for support systems for RES, Member States have applied national systems, varying much in approach, design and intensity. It seems that many of the present schemes need, in particular, to be critically reviewed vis-à-vis their cost effectiveness.

8.3 The present situation creates obstacles in the internal market when schemes are purely national and imports are excluded. The court's view on this concerning electricity is that this is not the case, because the internal electricity market is not fully open until 2007. Cross-boarder trade of electricity is, however, already everyday and growing all over the EU.

8.4 There is also no level playing field among market actors in different parts of the EU. There are several reasons for this: for instance the European Court of Justice decision¹ that the German feed-in-tariff system does not constitute state aid because state funds are not involved. In economic terms, however, there is hardly any difference between support flowing from consumers directly or the same money flowing from the taxpayer via the state pocket.

8.5 As to the different forms of support schemes, no-one meets fully the requirements of being effective, not distorting the market and enhancing competition and innovation. For feed-in-tariffs prices are set by authorities and amounts by the market. For certificate trading it is vice versa. Feed-in schemes can take into account efficiency, if properly used. Certificates may not give enough security for investment, while prices may be volatile.

8.6 The cost of RES promotion schemes is in some cases already very high. This is starting to raise concern and this can develop into a political backlash for the goal and policies of increasing renewables.

8.7 The Commission is, according to the RES-E Directive, in 2005 to review the developments of use of electricity from renewable sources and can propose one single support system. It will take until 2012 to reach full harmonisation. It is to be expected that most Member States will strongly resist if they have to change a system they have run for several years.

8.8 The introduction of a single support system for RES-E is not by many seen as necessary at this stage. Also there is no perfect choice for such a system. The Committee's view is that a common system should be developed and introduced in due course, and that developments towards further fragmentation of national systems should be counteracted already now. A common system should by its design particularly enhance innovation and competitiveness.

8.9 The Commission has responsibility for the execution of policies it has proposed. Even if it is an early stage in implementing EU policies for renewable energy, the Commission should pay serious attention to the above-mentioned problems before they worsen over time.

8.10 The EESC recommends that DG TREN:

- strengthens its efforts to facilitate the exchange of good practices between Member States, regions and other actors for promotion of RES, with a particular emphasis on the new member states;
- requests Member States to monitor yearly the developments in their RES markets with a view to compile both statistical figures and information on experiences, and that DG TREN publishes a yearly summary report on this;

¹ ECJ ruling of 13.3.2001, case C-379/98

- makes an in-depth evaluation of the interaction, coherence and practical effects of different EU policies affecting the use of renewable energy sources and technologies in order to avoid over-regulation. In particular the effects of the emissions trading Directive should be closely studied and acted upon before the implementation of the Directive;
- without delay starts a thorough study of the developments and the present situation of promoting RES, covering in particular innovativeness, market issues, cost effectiveness of support measures and their impact on cost burdens for consumers and on global competitiveness of EU industries.

Brussels, 28 January 2004.

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