



December 2005

How to support renewable electricity in Europe ?



An assessment of the different support schemes

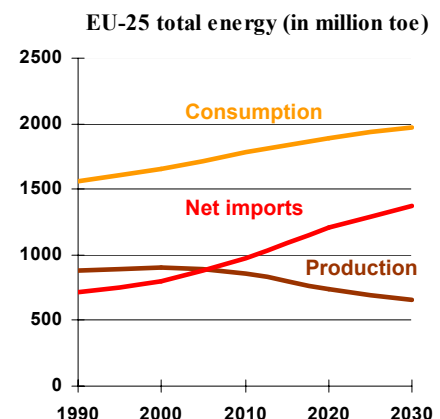
The Commission reports, in a Communication to the Council and the Parliament adopted on 7 December 2005, on the support of electricity from renewable energy sources in the 25 EU Member States. The Commission analyses the different existing support systems and their success in increasing the share of renewable electricity. Assessing that support systems in some Member States are more successful than in others but that even the best can be improved, the Commission calls on Member States to do more to optimise their systems and coordinate them.

Why do we need renewable energy?

We are increasingly dependent on fuel and natural gas imports, as was highlighted in the Commission's Green Paper on Security of Energy Supply (2000). The European Union now imports 50% of its energy needs. Around 2030, this figure is forecast to rise to 70% with an increasing share for fossil fuels. This situation makes us particularly vulnerable economically, politically and with regard to the environment. Additionally the EU has committed itself internationally to reducing greenhouse gas emissions.

In this context and even though traditional fossil fuels and nuclear energy will continue to play an important role, Europe has a special part to play in promoting renewable energy.

They are an attractive option to diversify the EU's energy supply: renewable sources are available locally, they bring environment benefits and they contribute to employment and the competitiveness of the European industry. Support for renewable energy is needed as long as technologies are still developing and market prices for non-renewable energy do not reflect their full costs to society due to subsidies and external costs.



The Renewables Directive

The European Union aims to have renewable energy sources providing 21% of the electricity by the year 2010. This target has been formulated in the Renewables Directive 2001/77/EC¹.

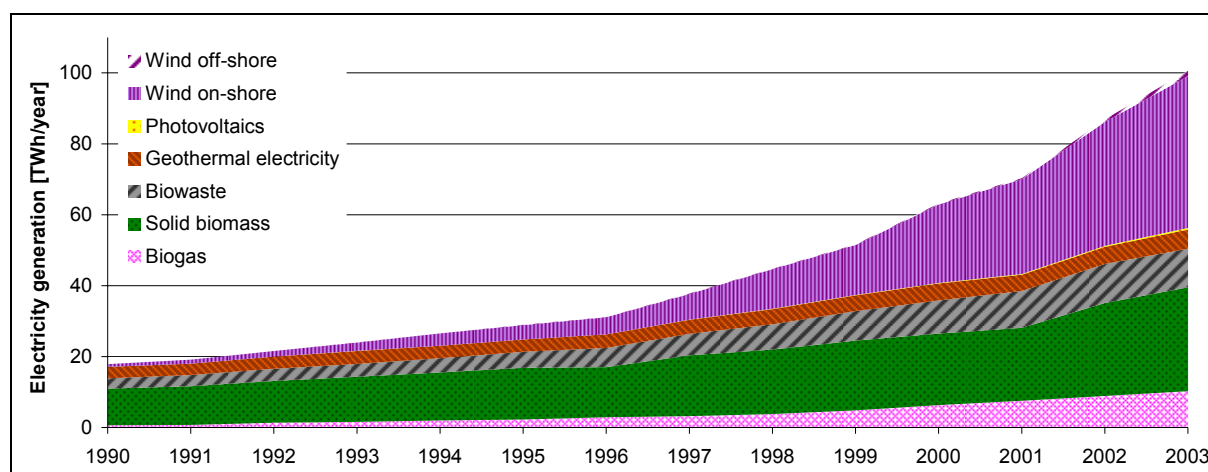
Under the Directive, Member States have set up differentiated targets for the production of renewable electricity and they can choose their preferred support mechanism. The Communication referred to here, which was foreseen in the Directive, reports on experience gained with the application and coexistence of the different mechanisms used in Member States. The report assesses the success of the support systems in promoting the consumption of renewable electricity according to the national indicative targets, including cost effectiveness, cost efficiency, compatibility with the internal market, and the ability to develop different technologies.

EU targets for 2010

- Double the share of **renewable energy** in national gross energy consumption from **6% to 12%**
- Increase the share of **green electricity** in total electricity consumption from **13% to 21%**

In the year 2003, 108 TWh electricity from new renewable energy sources – that is excluding hydropower – was produced, which is equivalent to the combined overall electricity production in Portugal, Denmark and Slovenia. The graphs below show the historical development and the composition of new renewable electricity and the targets and developments in the Member States.

Historical development of new renewable electricity generation in the EU-25 from 1990 to 2003



¹ Directive 2001/77/EC of 27 September 2001 on the promotion of electricity produced from renewable energies sources in the internal electricity market. J.O. 27.10.2001, L 283/33. Date for the implementation of this Directive was October 2003 and for the new Member States, 1 May 2004.

The different support schemes in EU countries

How did the Commission analyse the situation in the Member States?

The results presented in the Communication are based on various sources. Besides Member States' and the Commission's experience, extensive work was conducted by research institutes from several European Member States, and a large number of stakeholders were consulted.

How do the Member States currently support renewable electricity?

Two aspects are important for the deployment of renewable electricity: Firstly the financial support and secondly the reduction of administrative and grid barriers. Concerning the financial support a range of different systems is currently operational of which the two most important are feed-in tariffs and green certificate systems:

- **Feed-in tariffs** exist in most of the Member States. These systems are characterised by a specific price, normally set for a period of around several years, that must be paid by electricity companies, usually distributors, to domestic producers of green electricity. The additional costs of these schemes are paid by suppliers in proportion to their sales volume and are passed through to the power consumers. A variant of the feed-in tariff scheme is the fixed-premium mechanism currently implemented in Denmark and partially in Spain. Under this system, the government sets a fixed premium or an environmental bonus, paid above the normal or spot electricity price to renewable electricity generators.
- Under the **green certificate** system, currently existing in five Member States, renewable electricity is sold at conventional power-market prices. In order to finance the additional cost of producing green electricity, and to ensure that the desired green electricity is generated, all consumers (or in some countries producers) are obliged to purchase a certain number of green certificates from renewable electricity producers according to a fixed percentage, or quota, of their total electricity consumption/production. Since producers/consumers wish to buy these certificates as cheaply as possible, a secondary market of certificates develops where renewable electricity producers compete with one another to sell green certificates.
- Pure **tendering** procedures existed in two Member States (Ireland and France). However, France has recently changed its system to a feed-in tariff combined with tendering system in some cases and Ireland has just announced a similar move. Under a tendering procedure, the state places a series of tenders for the supply of renewable electricity, which is then supplied on a contract basis at the price resulting from the tender. The additional costs generated by the purchase of renewable electricity are passed on to the end-consumer of electricity through a specific levy.
- Systems based only on **tax incentives** are applied in Malta and Finland. In most cases (e.g. Cyprus, UK and the Czech Republic), however, this instrument is used as an additional policy tool.

How to assess the performance of support systems for renewable electricity?

Two criteria in order to assess the performance of support systems for renewable electricity are effectiveness and efficiency.

Effectiveness is understood as the capability of a support system to actually deliver renewable electricity. Thereby the amount of green electricity delivered needs to be assessed against the realistic potential of the country. When assessing the effectiveness, the effects of more recent systems are difficult to judge. Notably the experience with green certificates is more limited than with feed in tariffs.

Efficiency of a support system is understood as the capability to produce at the lowest possible cost. As the generation cost for renewable energies show a wide variation between the different technologies on the one hand and geographic conditions on the other, the assessment of support systems has been done per sector.

Another interesting criterion that is only assessed for a limited number of Member States is to compare the **investors' profits** and the effectiveness within a support system. This gives an indication whether the high effectiveness of a specific support system is primarily based on the high financial incentives, or whether other aspects have a crucial impact on the market diffusion in the considered countries.

So, how do the different support systems actually perform?

The assessment of the support systems was done separately for the different renewable technologies. Exemplarily the results for Wind and Biomass are explained:

The most effective systems in **wind energy** are currently in Germany, Spain and Denmark with feed-in tariff systems, although the green certificate systems, where they apply, present currently a significantly higher support level than the feed-in tariffs. This could be explained by the higher risk premium requested by investors in case of green certificate systems, the administrative costs as well as a still immature green certificate market. The question is how the price level for green certificates will develop at the medium and long term.

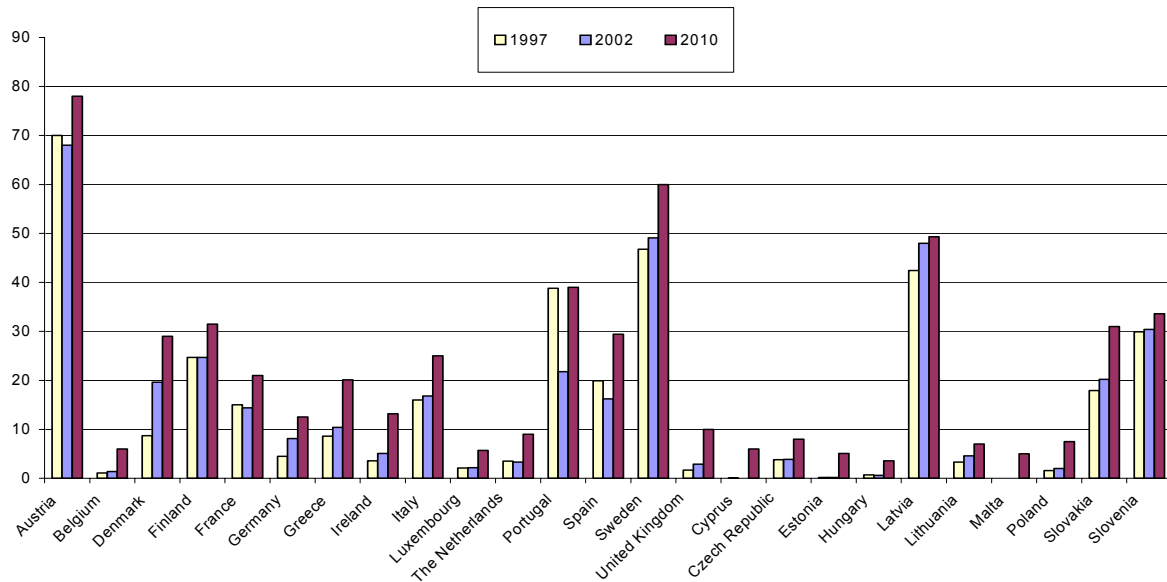
The analyses show that for wind energy, in one fourth of the Member States, the support is too low for any take off. Another fourth of countries show enough support but still mediocre results due to the existence of grid and administrative barriers.

The analyses for both the **biomass and the biogas sector** are not as clear as in the case of wind. The generation cost of biomass presents big variations, caused by different biomass sources, different processes of transformation and different sizes.

Denmark with feed-in tariffs and the Finish hybrid support (de-taxation and investment subsidies) clearly show the best performance in the biomass sector, both in terms of effectiveness as well as economic efficiency of support. A long tradition in biomass use for energy purposes, stable planning conditions and a combination with heat generation can be considered as key reasons for this development.

In the **biogas sector** six countries present effectiveness which is higher than the EU average, four of them with feed-in (Denmark, Germany, Greece, Luxemburg), two of them with green certificates (UK, Italy). But in nearly 70% of the EU countries the support level is too low to develop this high potential technology.

Share (%) of green electricity in the member states consumption of electricity compared to the national targets for 2010



Which barriers to a greater deployment of renewable electricity exist?

It is impossible to isolate the discussions on the support schemes from the issue of barriers, as barriers can increase the cost of renewable electricity or can inhibit the deployment completely. Barriers that project developers and investors encounter when installing new capacities can be of administrative, grid, social and financial nature.

Administrative barriers can unnecessarily hamper the planning process, e.g. when:

- A high number of authorities are involved in the planning process and there is a lack of coordination between them.
- Long lead times to obtain necessary permits exist.
- Potential sites for renewable electricity production are insufficiently taken into account in spatial planning.

Estimation of administrative barriers in the renewable energy deployment in the EU

AT	BE	CY	CZ	DK	EE	FI	FR	DE	GR	HU	IE	IT	LV	LT	LU	MT	NL	PL	PT	SK	SI	ES	SE
😊	😊	-	😞	😊	-	😊	😞	😊	😞	😞	😊	😞	😞	😞	-	-	😊	😊	😞	-	😞	😊	😊

Priority **access to the grid** at a reasonable and transparent price is essential to the development of renewable electricity generation, but is not provided for in many Member States. Furthermore grid infrastructure was mainly built when the electricity sector was publicly owned and has been designed to allow large power plants being situated near mines and rivers, or near the main centres of consumption. Renewable electricity generation is normally not situated in the same places as conventional electricity production and has, in general, a different scale of generation. Thus renewable electricity production can be confronted with a lack of sufficient grid capacity. This barrier is worsened by the lack of transparent rules for bearing and sharing of various grid investment costs, as well as the existence of vertical integration and dominant utilities.

Transparent rules for bearing and sharing of costs of various grid investments have been put in place in Denmark, Finland, Germany and the Netherlands.

How can we do better in the years to come?

Can the Member States do "more and better" – how?

While gaining significant experience in the EU with renewables support schemes, competing national schemes could be seen as healthy at least in a transitional period. Competition among schemes should lead to a greater variety of solutions. Moreover, it is too early to compare the advantages and disadvantages of well-established support mechanisms with systems with a rather short history. Therefore and considering all the analyses in this Communication, the Commission does not regard it appropriate to present at this stage a harmonised European system.

The Commission considers a **co-ordinated** approach on support schemes on renewable energy sources as appropriate, based on two pillars: **cooperation** between countries and consideration for **optimising** the impact of the national schemes.

Intensified co-ordination between countries in the form of "**cooperation**" should be the first step towards a harmonisation in the long term. Examples like the starting cooperation between the feed-in tariff systems in Germany, Spain and France, and the new foreseen common Swedish-Norwegian green certificate system can be examples for others.

The Commission proposes a process of **optimising of national systems** and recalls that the instability of the systems is normally translated into higher cost for consumers. Optimisation concerns the economic mechanisms but also the removal of administrative and grid barriers. Member States shall optimise and fine tune their support schemes by:

- **Increasing legislative stability and reducing investment risk.** One of the main concerns with national support schemes is any stop-and-go nature of a system. Any instability in the system creates high investment risks, normally taking the form of higher costs for consumers. Thus, the system needs to be regarded as stable and reliable by the market participants in the long run in order to reduce the perceived risks. Reducing investment risk and increasing liquidity is an important issue, notably in the green certificate market. The design of a support mechanism must minimise unnecessary market risk. Increased liquidity could improve the option of long term contracts and will give a clearer market price.

- **Reducing of administrative barriers**, including the streamlining of administrative procedures. The administrative requirements for access support schemes should be reduced in order to minimise the burden on consumers. Clear guidelines, one-stop authorisation agencies, the establishment of pre-planning mechanisms and lighter procedures are concrete proposals to Member States in addition to the full implementation of the Renewables Directive.
- **Addressing grid issues** and the transparency of connection conditions. Transmission reinforcement needs to be planned and developed in advance with appropriate financing. The Commission recommends, firstly, that the principles of cost bearing and sharing should be fully transparent and non-discriminatory. Secondly, the necessary grid infrastructure development should be undertaken to accommodate the further development of renewable electricity generation. Thirdly, the costs associated with grid infrastructure development should normally be covered by grid operators. Fourthly, the pricing for electricity throughout the electricity network should be fair and transparent, taking into account the benefits of embedded generation.
- **Encouraging technology diversity**. Some support schemes tend to support only the strongest of the renewable technologies in terms of cost competitiveness. For instance, offshore wind energy would usually not be developed if it came under the same financial framework as onshore wind power. Such schemes could therefore be complemented with other support instruments, in order to diversify the technological development. A good overall support policy for renewable electricity should preferably cover different renewable technologies.
- Member States should better use the possibilities of **tax exemptions and reductions** offered to renewable energy sources under the Directive on the taxation on energy products (2003/96/EC).
- **Ensuring compatibility with the internal electricity market**. EU Member States are in the process of liberalising their power markets. This criterion assesses the ease with which a support scheme can be integrated into a liberalised power market, and its effectiveness in functioning together with existing and new policy instruments.
- **Encouraging employment and Local and Regional Benefits**. A substantial part of the public benefits pursued by policies supporting renewables relate to employment and social policies, rural development while other national policy goals should be respected and duly take into account.
- **Twinning with actions on energy efficiency and demand management**. The progress of renewable electricity generation is being offset by excessive growth in electricity consumption and must be avoided. Only a combination of RES-E support measures with electricity end-use efficiency measures will bring Europe further in its energy policy goals.

MEMO is prepared by the Strategy, Coordination, Information and Communication Unit of DG Energy and Transport. Don't hesitate to contact us for further information (tel +32 2 299 19 15)

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