

EREF

European Renewable Energies Federation

March 2004

EREF Missing Targets – Update 2004

Share of Renewable Electricity in the national electricity consumption in Europe

	1999	2002	2003	2010	2010	2010
	Actual	Actual	Actual	EU targets	Optimistic Scenario ^a	Realistic scenario ^b
	%	%	%	%	%	%
Austriaⁱ	71.9	64.5	57	78.1	61	58
Belgium	1	1	1.2	6.0	6	3
Denmarkⁱⁱ	13	20	not yet avail.	29	24	22
Germany^c	6	7.6 ^d	7.5 ^d (7.9 ^e)	12.5	15	12
Finland	24	23 ^f	not yet avail.	31.5	26 ^g	25
France	15	16.7	14.1 ^f	21	19	18
Greece	10	8.4 ^h	not yet avail.	20.1	14.5	12
Ireland	5	4.8	not yet avail.	13.2	11	8
Italy	17	18.3 ^j	17.6 ^j	22.0	17-20	17
Luxemburg	3	2.4	2.6	5.7	5	4
Netherlands	2	2.7	5.2	9.0	7	6
Portugal	36	20.4 ^h	37.5 ⁱ	39.0	37	34
Spain	19	16.7 ^h	23.3 ⁱ	29.4	30	24
Sweden	52	48	41 ^h	60.0	60	55
United Kingdom	2	2.9	not yet avail.	10.0	10	7
EU-15	14,5	14,8	not yet avail.	22	20,4	17,8

a) Based on the assumption that all goes according to National plans, including all legal and administrative instruments for its execution enforced and no modifications threatening planning.

b) Business-as-Usual, based on real world in respective countries, assumptions according to reality.

c) German values for 2002 and 2003 based on calculations.

d) Not corrected for average hydro and wind year

e) Including biomass share of waste incineration.

f) Preliminary or estimated figure, the result for 2001 was 23,3 and for 2000 24,9 %

- g) Finnish Government has according to its report to the EC lowered its 2010 target to 26 percent.
- h) Value is dependent on hydropower: this year was a dry year; for 2010 an average year is assumed.
- i) Value is dependent on hydropower: this year was a wet year; for 2010 an average year is assumed.
- j) Renewable national production related consumption, excl. 12 TWh/year imports and industrial waste.

Background information

Introduction

The European Union will certainly fail to deliver its promised 22 % reduction target by 2010 on the European level and in the majority of Member States unless drastic changes are taken and commitment replaces passiveness and stubbornly old fashioned attitudes. Europe's international image and prestige would suffer as a consequence and it could no longer claim to be an example for other countries and continents.

It should nevertheless be underlined that some countries in Europe do a lot and have to be praised for their efforts. This is especially true for Germany. But even there, current debate and criticism against the German support schemes and its legally sound structure coming especially from the big utilities and their associations have resulted in reluctance in the investment market and could jeopardise past success.

It must also be acknowledged that some member states, such as Austria and Greece, have put sound support structures in place, which administrative and planning practices and especially the reluctance of the transmission grid companies are undermining. This is also the case in France, with the exception that the support structure itself already contains too many obstacles for independent power production outside the EDF area.

Some governments and mainstream opinion have still not awakened to the necessity to switch towards decentralised RES energy production and supply. This is especially the negative example in Sweden and Finland, which seem focused on nuclear and large hydro-electricity projects.

Other reasons involve stalling efforts on the political and administrative level, as well as on the level of grid upgrading/connection, with sometimes drastically negative results possible such as could be the case for Austria, Denmark, Finland and Greece.

Real efforts towards energy efficiency appear to have become foreign concepts, in view of the current drastic increase of electricity consumption in Europe.

The following brief country notes provide an insight into the real world for RES in most EU member states and some explanations to the current trend shown in the above table.

Austria

Austria has experienced a rapid growth of electricity consumption. According to IG Windkraft, Austria's estimates for 2003 and beyond have to be seen in the following light: If the Austrian "Ökostromgesetz" is implemented in an appropriate way, Austria should reach an electricity consumption of RES by 2010 of about 61 %. But since currently the overall electricity consumption rate is increasing drastically, for example last year, with an increase of 3,2 % to 3.6 %, and without energy efficiency planning the estimate is that Austria will have a realistic share of RES in 2010 of 58 %.

Installed capacity wind power in Austria:

End of 2002: 139,3 MW (164 turbines)

End of 2003: 415 MW (318 turbines)

In 2003 276 MW of wind power were installed in Austria. End of 2003 415 MW were installed, reflecting a threefold increase! In 2003 Austria appears among the top three European markets for the first time. This success has only been possible because of stable and clear conditions created by the Ökostromgesetz/Green Electricity Act adopted in July 2002 and which implements a feed-in-system for RES. Windpower projects get a feed-in-tariff of 7,8 Cent, guaranteed for 13 years. This tariff is applicable for projects that have obtained all planning permissions by 31.12.2004 and that will be put into operation by 30.06.2006. By end of 2004 a total installed capacity of 615 MW is expected.

Concerning the Austrian RES target of 78,1%:

Due to the immense growth of electricity demand (plus 3, 2 % in 2003) in Austria in our opinion in 2010 a level of 61% will be reached according to an optimistic scenario, not the 78,1% targeted. It has to be said that Austria has a footnote in the directive, stating that for Austria the target of 78,1% would be a realistic objective if the basis for the calculation is a gross national electricity consumption of 56,1 TWh. In fact this was the gross national electricity consumption of the year 1997. By 2010 it is expected that a gross national electricity consumption of at least 71,9 TWh will be the case. Therefore the real gross national electricity consumption in 2010 we will never reach this target of 78,1%.

The targets of the green electricity act correspond to a target of 43 TWh RES (large hydro included). With regard to a gross national electricity consumption of 56,1 TWh 43 TWh are 78,1%, but with regard of a gross national electricity consumption of 71,9 TWh 43 TWh are only 61%.

Unfortunately, the Austrian producers of RES had to file complaints with the European Commission against the Austrian government. The *Verbund Austrian Power Grid AG*, a 100% subsidiary of the *Verbundgesellschaft*, which again belongs to 51 % to the property of the Republic of Austria, does not give any further contracts to green electricity producers. The *Verbund Austrian Power Grid AG* is the body that is obliged to conclude contracts with producers and to purchase green electricity from the producers. This clearly contradicts and infringes the Green Electricity Act and violates from our point of view Article 6 Par.1 and Article 7 Par. 1 of the 2001/77/EC directive. Producers do currently not get any payment. Only on the 18th of March a decision seems to be reached concerning this dispute on Eco-financing, though the viability has still to be seen. The RES sector has seen roughly every one

and a half year a modification of the legal situation in Austria. This is counterproductive and endangers swift development.

Regarding just the field of wind energy, running projects that have already been feeding in electricity into the grid since December with a value of 120 Mio EUR were endangered due to the opposition of the Verbund Power Grid AG. In the field of biomass, biogas and wind power, projects with an amount of capital investments of 500 Million EUR are in the pipeline that cannot be realised. These projects would create/save further 6.000 to 8.000 jobs in Austria.

Denmark:

Denmark has seen drastic shifts away from their former feed-in system. The development in 2002/2003 was still extremely positive and led to an increase – irrespective of the change of government – of installed 273 MW of wind energy. But this is still based on two new off-shore wind farms which were ordered during the previous government. This represents much more effort and success than in several big countries. Denmark as small country with 5 million people and 44.000 km², proportionally has two to three times more wind power installation than any other country – including Germany! Germany has 4,5 times more windmills than Denmark but the population is 16 times larger. But the 2004 prospects for renewable energy are extremely dark in Denmark. Unless a new re-powering programme is launched, nothing more will be installed in biogas, wind power and solar energy. Everything from the former governmental policy including support to organisations for the promotion of RES has been stopped.

A further negative step is that the 200 small high-efficiency cogeneration stations, which currently deliver 25% of the electricity, will in the future not be obliged to make combined production of heat and power. This will have the consequence of changing the structure of small and often family-driven enterprises towards or ending of this business or selling it off especially to E.ON and EDF.

Finland:

Finland experienced a strong increase of electricity consumption in recent years, with quite alarming levels in Summer and Winter of 2002. It is foreseen that Finland will have a total consumption of more than 94 TWh in 2010. The Finnish Government has according to its first report to the European Commission concerning Art. 3 of the Directive EC/2001/77 lowered its 2010 target from 31,5 % to 26 %.

France:

For 2003, the official figures are not yet available. But it is estimated by the French Renewable Energy organisation and EREF member Hespul, that the figures will be very low, due to the fact that electricity consumption increased by 4 % according to the Government's and EDF declarations in January 2004 and due to the fact that it was a very bad year for hydropower and wind power, although the latter's share is still too low to make a substantial impact. The French DGEMP (direction générale de l'énergie et des matières premières du ministère de l'industrie) confirmed in a recent report a decline of more than 10 % for electricity production for hydro for 2003. This leads to the conclusion, that together with an

increase of electricity production, the French figures for RES in 2003 should be 14,0 % (hydro) , plus 0,1 % from wind power generation, that means 14,1 % maximum overall.

Germany:

The German Environment Ministry initiated a new working group on renewable energy statistics (Arbeitsgruppe Erneuerbare Energien-Statistik , AGEE-Stat) in February 2004. The working group is an independent body of experts which groups together experts from the Ministry for the Environment, the Ministry of Economics, the Ministry for Consumer Protection and researchers and experts for statistics and economics from different institutes such as the Federal Statistical Office, the Centre for Solar Energy and Hydrogen Research of Baden-Wuerttemberg, the German Institute for Economic Research (Deutsches Institut für Wirtschaftsforschung, DIW) in Berlin and the Federal Association for Renewable Energies (Bundesverband Erneuerbare Energien, BEE). Information on renewable energies and recent data on the contribution of renewable energies to energy consumption can be obtained from the website of the Federal Ministry for the Environment under the topic renewable energies www.erneuerbare-energien.de (in German only).

For Germany the following calculation can be made:

Calculation for 2002 and 2003 for Germany :

	source	unit	1999	2000	2001	2002	2003
Gross consumption	DIW 2004	TWh/a	557,3	576,4	584,5	581,2	588
Hydro	BMU	TWh/a	21,798	25,141	23,57	23,824	20,35
Wind	BMU	TWh/a	5,528	9,5	10,456	15,856	18,5
PV	BMU	TWh/a	0,048	0,071	0,116	0,176	0,332
Geothermal	BMU	TWh/a	0	0	0	0	0
Biomass	BMU	TWh/a	1,17	1,625	3,785	4,467	5,14
All		TWh/a	28,544	36,337	37,927	44,323	44,322
Quota			5,10%	6,30%	6,50%	7,60%	7,50%
Biogene share of waste incineration	BMU	TWh/a					1,945
All		TWh/a					46,267
Quota							7,90%

The EEG has led to very stable framework conditions for renewable electricity in Germany in recent years. To date it seems certain that Germany will meet the target to reach a share of 12.5 % until 2010. Looking at wind energy, if the trend continues from the last three years, the share of electricity from wind energy alone might reach 8-10 % until 2010. The Renewable Energy Act is currently undergoing changes; the new Act is expected to be in force by June or July of 2004. In section 1 the new text underlines that the government is aiming to reach at least a share of 12.5 % until 2010 and to continue this path by achieving a 20 % share until 2020.

Greece:

For Greece, the following figures were used for 2002 calculations :

Gross electricity consumption	:	50600 GWh
Electricity production from renewables	:	880 GWh (1.74%)
Electricity production from large hydro	:	3350 GWh (6.62%)

(2002 was a dry year for Greece)

At the end of January 2004, the installed RES power capacity in Greece was as follows :

- Wind	:	417 MW
- Small hydro	:	51 MW
- Biomass	:	21 MW
- Photovoltaics	:	1 MW
<hr/>		
TOTAL	:	490 MW

As far as RES development by 2010 is concerned, Greece's "Second National Report regarding penetration level of renewable energy sources in the year 2010" (published in October 2003) provides unsubstantiated and unrealistic (over-optimistic) predictions of future RES penetration in Greece. For the purposes of EREF's down-to-earth report, the National Report's so-called "optimistic" scenario is discarded as completely unrealistic, while the Report's so-called "conservative" scenario is adopted as EREF's optimistic scenario (14.5% penetration level by 2010, including large hydro).

In order to develop a more reliable scenario for Greece, the following RES capacity development has been realistically estimated for the year 2010 :

Wind	:	800 MW
Small hydro	:	150 MW
Biomass	:	70 MW
Large hydro	:	3680 MW (*)
Geothermal	:	8 MW (*)
Photovoltaics	:	5 MW (*)

(* Same prediction for 2010 with the National Report)

The above mix gives an overall RES electricity penetration of 12.3% for the year 2010 (including large hydro), a figure way below Greece's target of 20.1%. Even this low figure is conditional on the continuation of the favourable national framework for RES that exists today (feed-in tariffs, capital subsidies for RES investments, etc.).

Ireland:

The Irish Government submitted to the European Commission in its first report according to Art. 3 Par 3 under the 2001/77/EC Directive only estimates and no concrete figures for 2000 to 2003. These estimates were unfortunately exaggerated and do not represent the reality,

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shown in our table. The Government had estimated the following: for 2001 4,13%, for 2002 5,5% and for 2003 6,45% . This is not correct, according to public statistics as shown in the following graphs:

According to statistical data from Netcent communications, (<http://www.ncbuy.com/reference/country/economy>), Ireland had in 2001 a much lower RES share:

Electricity - Production :	23.53 billion kWh (2001)		
Electricity - Production by Source :	fossil	fuel:	95.9%
	hydro:		2.3%
	nuclear:		0%
	other: 1.8% (2001)		
Electricity - Consumption :	21.63 billion kWh (2001)		

Which would lead to a share of **only 3,73 % of RES** electricity (including “other” under RES)in 2001.

According to Phrase base, the following statistics appear for 2002:

Electricity Production:	Electricity Exports:
22,285,000,000 kWh	71,000,000 kWh
Electricity Consumption:	Electricity Imports:
20,823,000,000 kWh	169,000,000 kWh
<i>Electricity Production by Source:</i>	
Fossil Fuel: 94.86 %	Nuclear: 0.00 %
Hydro: 3.77 %	Other: 1.37 %

(<http://www.phrasebase.com/countries/Ireland.html>), this means that the figures for 2002 are only 4,8 % for RES electricity consumption in Ireland.

The Irish Government, which is also the major shareholder of the country’s main power utility, the Electricity Supply Board (ESB), announced in July 2003 that under the AER (Alternative Energy Requirement) tendering system, all offshore “renewable energy power purchase contracts” were won by the Kish Consortium, a wholly owned subsidiary of the ESB,¹ against a large number of independent renewable power producers. The actual liberalisation of the Irish power market was weak in any case and this quota system seems to cement its remoteness further.

¹ Though according to [http://www.iwea.com/news/The Kish Consortium](http://www.iwea.com/news/The_Kish_Consortium), comprising ESB Power Generation, Saorgus Energy Ltd. and PowerGen Renewables is progressing a major feasibility study into a windfarm 10km off of Dublin Bay.

Italy

Italy left the feed-in system in 2001. The year 2003 has also in Italy seen a very difficult situation for hydroelectricity. Italy also faces a considerable increase of overall electricity consumption which will without further efforts endanger any possibility of reaching Italy's indicative target. The Italian Government declared that the 22% RE share could be a reasonable 2010-target, should Italian electricity consumption at 2010 be equal to 340 TWh/y.

The Italian Decree which adopts the EU Directive 2001/77/EU (*Decreto Legislativo 29 dicembre 2003, n.387*), introduces new rules in order to minimise barriers and to encourage the development of new RE plants by simplifying the administrative and the grid connections procedures. Moreover the new Decree increases the quota obligation from 2% this year up to 3,05% to year 2007 (2% 2004; 2,35% 2005; 2,70% 2006; 3,05% 2007).

Despite those increasing quotas, the expected share 2010 is foreseen decreasing, due to the consistent growth of the domestic electricity consumption (more than 2% per year). Additional measures will be introduced by the Italian Government, as a consequence of the release to the European Parliament and the Council of the first summary report on renewables.

According to the EU Directive, the RE share is calculated considering the import of RE electricity from abroad: the figures take into account a yearly electricity import of 12 TWh (figures in brackets).

Considering the inclusion of waste, the definition of renewable sources into the new Italian Decree is according to our Italian member APER now coherent with that of the EU Directive (only the biodegradable fraction is considered). Electricity produced by combustion of a list of non-biodegradable waste could apply for green certificates, whereas that list of eligible waste will be defined by a second Decree, according to the current Community legislation on waste management.

Netherlands

The Dutch government attempted to correct its original reference value of 3.45 % in 1997 down to 1.8 % in its first report to the EC Commission, explaining that now waste incineration plants are only considered 50 % of their output as renewable (against 100 % in the past). Moreover energy saved from industrial heat pumps is no longer considered renewable energy. The Dutch RES Association De Koepel developed the following estimate:

Duurzame energie bron Werkgelegenheid

	Economische activiteit								
		2000	2003	2004	referentie	2003	2004	referentie	
		ref 1.							
		fte's	fte's	fte's		(x € mln)	(x € mln)		
Windenergie		860	3542	3400	ref. 2	419	400	ref. 2	
Fotovoltaïsche Zonne-energie		550	782	327	ref.3	149	74	ref.3	
Thermische		335	373	239	ref. 3	26	17	ref. 3	

Zonne-energie									
Warmtepompen		155	190	200	<i>ref. 4</i>		14	15	<i>ref. 4</i>
Bio- energie		1900	4050	4050	<i>ref. 5</i>		464	464	<i>ref. 6</i>
Overig (waterkr., aardw. Etc)		90	100	100	<i>ref.6</i>		13	10	<i>ref. 6</i>
Totalen		3890	9037	8316			1085	980	
		Vershil '04 -'03		- 8,00%				- 9,70%	

Ref. 1: Rapport : Werkgelegenheid in de Nederlandse Duurzame Energiesector- Ecofys/ Kema- Oktober 2001

Ref. 2: Prognose : wind-koepel waarin vertegenwoordigd: FME windgroep, Newin en Pawex

Ref. 3 : Prognose : Holland Solar

Ref. 4: Prognose : Stichting Warmtepompen

Ref. 5: Prognose : Platform Bio-energie

Ref. 6: Prognose : DE Koepel

Portugal

Portugal has a quota of 39% of renewable energy set for 2010, that in average that are dependent on the hydrology. For instance 2002 was a very dry year and 2003 a very wet year, and the large hydro production doubled from 2002 to 2003 without change in the power installed.

Currently it is very difficult and time-consuming to obtain a license for a small hydro-power plant. To meet the targets, Portugal will have to rely on wind farms because other sources (photovoltaic, biomass, and waves) will contribute very little.

The government has set a target for 2010 as follows:

Type	Power (MW)
Large Hydro	5 000
Wind	3 750
Small hydro	400
Biomass	150
Biogas	50
Solid waste	130
Photovoltaic	150
Waves	50
Total	9 680

From these targets, it is very clear that the wind energy is the source that will provide the largest increase in renewable energy. At the end of 2003, there were 300 MW of wind power installed and it will have to increase more than 12 times its current capacity within seven years.

Nevertheless, eve with this increase it is not expected that the target of 39% will be met, since in an average year there would be a shortfall of around 4 TWh if the predicted consumption of 65 TWh for 2010 is achieved.

Some changes in licensing procedures recently adopted could help to speed up the process, if interpreted and implemented effectively and the balance between renewable energy and the environment is favourable.

Sweden

The official Swedish target for electricity from renewable energy sources is to increase the output by 10 TWH/yr. from 2003 to 2010. A calculated level for 2010, based on medium output for many years, of large hydro of 64 TWH which together with 10 TWH other RES-E in 2003 and the planned new 10 TWH adds up to a total of 84 TWH for 2010. That together with an estimated electricity consumption of 152 TWH makes a RES-E percentage of 55 % for 2010. To meet the EU target of 60 % the Swedish official target must be increased with another 7 TWH/yr.

The slow development of Swedish RES-E is due to three obstacles, investment uncertainty, slow admittance process and general resistance against wind power and small hydro.

The uncertainty for investors is now related to the new quota/certificate system, which started in May 2003. The present market price of around 2,3 eurocent/kWh together with another 2,7 eurocent/kWh for the electricity is to start with a weak base for investments in wind power and small hydro. How the prices for certificates will develop in the future is uncertain. If the sum of certificate price and electricity price is higher than at present the investment will be profitable and if the sum is lower it might be a loss. For biomass the situation is different, as there is capacity available for change of fuel from fossil to bio. We therefore expect to see an increase of RES-E in that market.

The process for permission to build RES-E can be fast or slow dependent on the interest and knowledge of the official bodies in charge. If the first instance is negative, it then can take many years before the final decision is taken due to slow the process in the following planning phases. Much basic material is needed for the processes. In other cases, regional or local official bodies have taken the standpoint not to allow wind power on or outside the coast.

General resistance towards small hydro can be raised from certain NGO and fishing organisations. Unfortunately they have rather strong political influence. General resistance against wind power is experienced from the industry organisations who prefer nuclear power arguing that then other energy sources are not of interest. Also organisations for landscape preservation are active against wind power. Grid owners can delay the investment by arguing for high connection costs. The rules and the legal framework are rather clear but are often not followed in practice. The appeal process is slow.

United Kingdom

In order to develop the real figures, EREF used the following statistical data: statistical data of UK Department of Trade and Industry (DTI), comparative analysis between total Electricity production (384.490 GWh in 2002) and respective share of RES (11.346 GWh) in relation to total consumption (332.780 GWh) and related RES share; see data in

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www.dti.gov.uk/energy/inform/energy_stats/electricity/dukes5_1.xls , table 5.1. commodity balances

ⁱ “Statistic Austria” does not include wind energy or other renewable energy, but only waterpower (including water storage facilities) in its electricity consumption statistics yet

ⁱⁱ Data for 2002 taken from the official Danish statistics on

http://www.ens.dk/graphics/Publikationer/Statistik/stat_02/34_Fremskrivning.htm