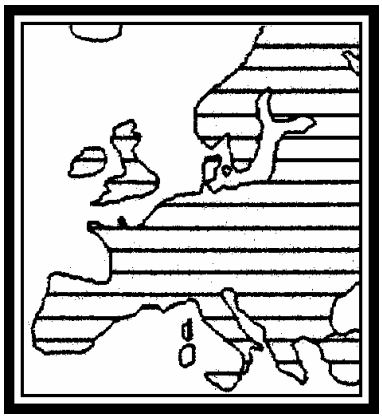

PROMOTION OF RENEWABLE ENERGIES IN THE EU MEMBER STATES

Consequences on the Price of Electricity for Industrial Consumers

A Study carried out by

IFIEC Europe – International Federation of Industrial Energy Users

2004 Issue

January 2005

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IFIEC Europe, the International Federation of Industrial Energy Consumers, has for the third time run a study on the promotion of renewable energies in the EU. The 2004 update could incorporate data on two additional EU member states – Denmark and Czech Republic - as well as changes in the promotion regimes introduced in recent months. The study now includes data on 11 EU Member states.

The study again focuses on the financial consequences for industrial energy users resulting from national renewable energies support policies in EU Member States. These consequences are essential for large consumers, since electricity pricing is one of the most critical aspects for the competitiveness of industrial energy consumers.

Thereby, the study only deals with the direct earmarked burden from such support mechanisms. Additional indirect consequences are not investigated. However, such indirect costs are also significant. They result e.g. from infrastructure strengthening needs, balancing power requirements etc. Furthermore, in some EU Member States, there are other surcharges to the electricity price serving to finance different environmental or other purposes.

This study, therefore, covers just one of the various cost elements added to the energy bill of consumers. It is, as the study demonstrates, already alone in most of the EU Member states a serious threat to the competitiveness of energy intensive industries.

Although the study shows that more and more countries have in the meantime realised the need for capping the burden or other special regimes applicable to industrial consumers, the main findings of this study update underline the conclusions made for the earlier versions:

- The financial surcharges on the electricity price resulting from renewable energies promotion systems for industrial energy consumers are already currently significant, and are likely to still increase in the future with a further growth of renewable energies installations and/or higher certificates prices with increasing quotas.

- The financial burdens resulting from renewable energies support differ significantly. No European level playing field is in sight!

For European industry it is vital not to increase the price for an essential industrial product – power – to support a single technology otherwise far from being marketable!

The IFIEC Europe position is therefore:

Renewable energies promotion systems must not jeopardize the competitiveness of industry on the European as well as on the international level.

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1. Introduction

For industrial energy users the price to pay for energy plays an important role for the competitiveness at the national, the EU and the global level. In energy intensive industries, energy costs cover a significant share of the production cost, and every increase, especially when it is not equally applicable for competitors, means a threat to a profitable business and the future of the undertaking.

Within the last years, renewable energy support schemes have been established throughout the EU. This is mainly based on the targets related to the proportion of electricity produced from renewable energy sources within the national overall electricity volume for the year 2010, which have been set by the EU Directive 2001/77/EC dated Sept. 27, 2001.

Renewable energies may have an important role to play to help reaching objectives related to security of supply and environmental protection. However, economic aspects are critical, since renewable energy sources are still far from being competitive in comparison with fossil fuel sources.

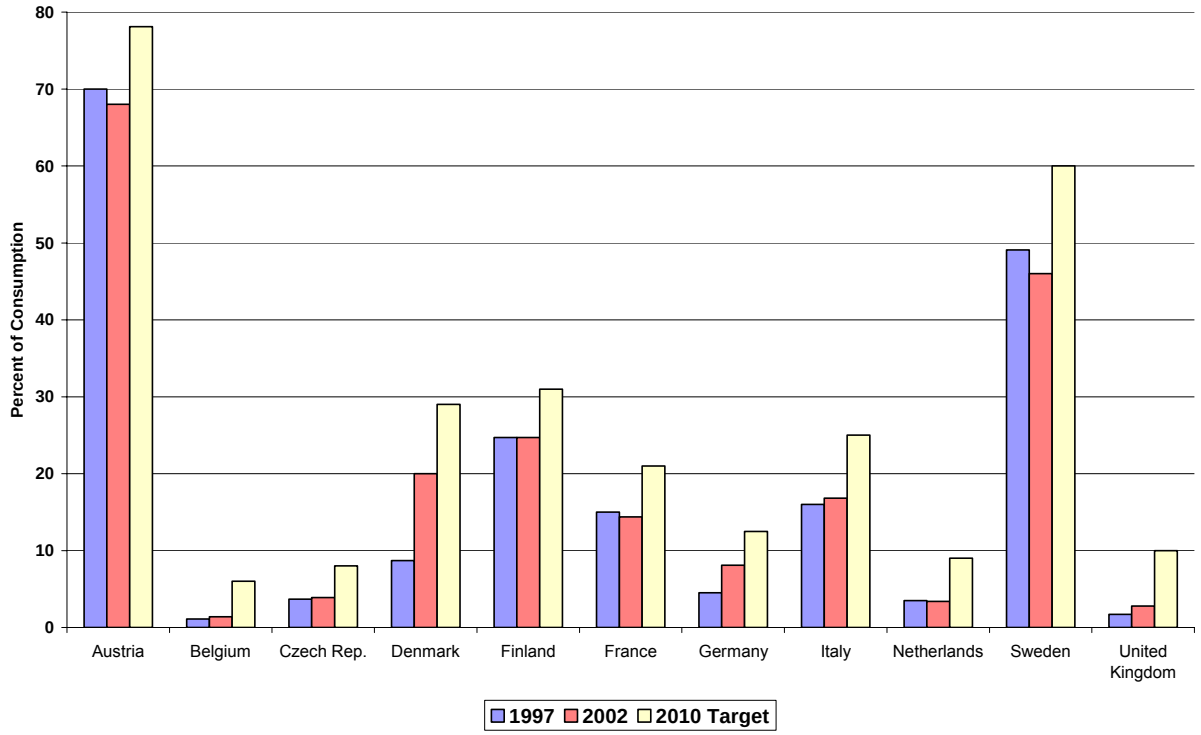
This study investigates and compares the existing support schemes in various EU Member States with special regard to the consequences on electricity prices and thus on the competitiveness of the industry.

The situation within the following countries could be incorporated into this benchmarking:

- Austria
- Belgium
- Czech Republic
- Denmark
- Finland
- France
- Germany
- Italy
- Netherlands
- Sweden
- United Kingdom

2. Electricity from renewable energies: The current and target situation for the EU Member states

The following picture shows the starting point of the countries investigated in 1997 regarding the share of electricity produced from renewable energies compared to the actual achieved level in 2002 and the targets as set for 2010 in the EU-Directive.



Pic. 1: Electricity from renewable energy resources in 1997, 2002 and as targeted in 2010 in the EU Member States

This picture shows that the situation significantly differs in the various countries regarding the share of "green" electricity in the present and in the future in the various countries. But it also shows that the fast majority of the countries is not on track to meet the individual targets.

According to the targets for 2010 set by the EU Directives, compared to 1997 an additional volume of electricity from renewable energies of 168 TWh is required in the 11 countries investigated here. This is nearly half the total UK consumption in 2001. Up to 2002, however, with the efforts of the initiated promotion schemes only 43 TWh, i.e. only 26 percent of the targeted volume, could be realized. However, as the following chapter will show: the financial burden resulting from the measures taken is already now on a significant level.

3. Support Systems within the EU – National Characteristics

There are various support systems in place within the different EU member states, which should help meeting the national targets set by the EU Directive.

Austria

The Renewables Electricity Act (August 2002) has implemented a support scheme for electricity from renewable energy sources, which provides for guaranteed differentiated feed in tariffs over a period of 13 years for the various renewable energy sources. For example, these feed in tariffs are for

wind	78 €/MWh
biomass	up to 165 €/MWh
photovoltaic	up to 600 €/MWh

These tariffs are financed by two sources:

- The electricity dealers and suppliers must purchase a certain quota of electricity from renewable energy sources for a fixed price of 4.5 ct/kWh.
- The consumers must pay a supplement to the network tariff, which varies for different network levels according to the below table. This differentiated tariff system installs lower rates for large consumers, which are normally connected to a higher network level (1-3 or 4-5), in order to take account of other efficiency and environmental contributions from the industry (e.g. development of CHP, measures for improved energy efficiency, improved usage of biomass, energy management etc.).

	2003	2004	2005 (planned)
Network level 1-3 (380 and 220 kV)	0.94 €/MWh	1.43 €/MWh	1.89 €/MWh
Network level 4-5	1.10 €/MWh	1.68 €/MWh	2.22 €/MWh
Network level 6	1.15 €/MWh	1.75 €/MWh	2.31 €/MWh
Network level 7 (1 kV and less)	1.34 €/MWh	2.04 €/MWh	2.70 €/MWh

The additional costs incurred at suppliers level for the above mentioned fixed prices, however, are in a second step also charged to the consumers, since the suppliers have introduced an extra surcharge to cover these extra costs. This surcharge amounted to 2.028 €/MWh in 2003, is 1.995 €/MWh in 2004 and is expected to amount to 1.885 €/MWh in 2005. The total additional element in the electricity price thus amounts from 3.425 €/MWh up to 4.035 €/MWh (2004).

Belgium

In 2002 the earlier established buy-back-regime for electricity from renewable energy sources has been replaced by a certificates system for electricity produced from renewable energies and, in the Wallonie also in CHP plants. This is based on imposed quotas for the percentage of purchased electricity generated from renewable energies produced in Blegium. In 2004, the quota is 2 percent for Flanders and 4 percent for the Wallonie (CHP included). In Flanders there will be a separated CHP certificates system from 2005 onwards.

In the Wallonie, for large consumers having concluded an energy efficiency agreement this quota applies with a 25 % discount for a yearly consumption between 20 and 100 GWh. For the consumption above 100 GWh a maximum quota of 2 percent is fixed. In Flanders, for large consumers this quota applies with a 25 percent discount for a yearly consumption between 20 and 100 GWh. For the consumption above 100 GWh a discount of 50 percent is applicable.

In the Walloon region, the state guarantees a minimum price of 65 €/MWh (i.e. per certificate) during a period of the first 10 years after putting into operation of a new plant.

In Flanders, the following guarantees minimum prices apply over 10 years:

- o wind power (onshore), biomass 80 €/MWh
- o wind power (offshore) 90 €/MWh
- o hydro tidal, geothermal 90 €/MWh
- o photovoltaic 450 €/MWh

The cost for the grid operators to pay these prices are integrated in the grid access tariffs.

A penalty for electricity producers not meeting the green certificates quota is set at 100 €/MWh for the Walloon region and 125 €/MWh for Flanders.

The current prices of the certificates are very close to the penalty value. In Flanders it is about 110 €/MWh, in Wallonia 92 €/MWh.

The costs for those certificates are invoiced by the electricity suppliers to the consumers in form of surcharges. This surcharge for 2004 is 2 €/MWh in Flanders and 3.2 €/MWh in Wallonia. For industrial consumers these surcharges are differentiated depending on the consumption volume in accordance with the discounted quota mentioned above. These discounts are generally applied in a transparent way.

The surcharges will rise significantly over the next years: for 2005 and 2006 they will be from 2.5 to 3 €/MWh in Flanders and from 4.0 to 4.8 €/MWh for Wallonia. The surcharges will increase in later years by 0.75 €/MMWh each year till 2010 (Flanders) or 2007 (Wallonia).

Czech Republic

The Czech Republic as a new EU Member state has already taken measures to increase the renewable energy proportion in power consumption. There is in place a feed in tariff system for electricity generated from renewable energy sources or from CHP plants. It is based on a governmental price decision from Nov. 2003, which is valid for one year. A Renewable energy law is being prepared currently. A certificates system is planned for the future.

According to the current regime minimum purchase prices are fixed for the different renewable energy sources and CHP. Electricity produced from wind power installations e.g. achieves a guaranteed price of 3000 CZK/MWh (= 94.85 €/MWh) if commissioned before Jan. 1, 2004 or 2700 CZK/MWh (= 85.37 €/MWh) if commissioned after Jan. 1, 2004.

The promotion scheme is financed through surcharges to the electricity price, which are currently about 37 to 39 CZK/MWh (=1.17 to 1.23 €/MWh).

Denmark

In June 2002 an agreement between the government and the political parties of the opposition has been concluded which introduced modified rules for the promotion of renewable energies. As a replacement for the then planned certificates market, a system with supplement remunerations for electricity from renewable energies was established. Thus e.g. wind power generators from existing plants get a price supplement of 10 Øre/kWh (about 13.5 €/MWh) plus 17 Øre/kWh (about 17 €/MWh) for the first 12,000 hours of full load on top of the market price for a period of 20 years. Windpower from new plants get a price supplement of 10 Øre/kWh (about 13.5 €/MWh), which corresponds to the amount of CO_2 tax. Furthermore, they get a compensation for balancing cost of 3.1 €/MWh.

For new and future plants an environmental bonus system will be established. According to the relevant agreement between the government and the political parties, this system should be outlined "*corresponding to what is needed for cost-effective fulfilment of Denmark's international environmental obligations compared with alternative measures to reduce greenhouse gases*".

The promotion scheme is financed through a surcharge to the electricity price. This amounts to 12 €/MWh in 2004 and 2005. This surcharge applies to electricity consumption up to 100 GWh per site. That means, that the financial burden is capped for each site at 1.2 mln €.

Finland

The producers of electricity from renewable energy sources are paid a special remuneration for each kWh produced. This is e.g.

for wind power :	6.9 €/MWh
for small hydro power (< 1 MW) :	4.2 €/MWh

These means are financed from the state budget.

The same applies to state subsidies for investments into new capacity. An investment aid program for wind power generators is in place, which covers 30 to 40 percent of the total investment costs.

The consumers pay an energy tax e.g. on electricity consumption, which is differentiated for private (6.9 €/MWh) and industrial users (4.2 €/MWh) without a direct earmark to the financing of renewable energy support schemes.

France

A fund to finance a package of special regimes in connection with electricity production in France and its overseas territories, the "Fonds de Service Public de la Production de l'Electricité" (FSPPE), was introduced in 2002. One part of it is a buy-back regime with guaranteed feed-in tariffs for electricity generation from renewable energies.

According to this system, charges were initially paid by generators and large self-producers and then passed through to customers in their electricity supply bills. The feed-in tariffs for electricity from wind power are 85 €/MWh for the first 5 years after installation, 65 €/MWh up to 10 years after installation and 30 €/MWh for further 5 years.

Furthermore, because of legal and technical loopholes, the system was considered impossible to administer. Consequently, the regime has been modified under the Energy Law dated Jan. 3rd, 2003, with the FSPPE replaced by the new "Contribution Sociale de la Production de l'Electricité" (CSPE), also covering different financing purposes (public service obligations and environmental purposes). All charges in connection with this fund are billed directly by the grid operator RTE to all customers. The CSPE fee has increased from 3.3 €/MWh in 2003 to 4.5 €/MWh in 2004. A limit has been set for the financial burden of industrial sites capping public service charges at 500.000 € per industrial site.

Only a part of the CSPE is really used for the support of renewable energies, whereas the separation of this proportion could not be realized.

Germany

A buy-back-regime has been established based on the Renewables Energy Law with guaranteed feed-in tariffs for generators of electricity from renewable energy sources. This regime has differentiated remuneration rates for the various renewable energy sources, which are currently:

wind power (onshore):	87 €/MWh over 5 years
	55 €/MWh over the next 15 years
photovoltaic:	457 - 624 €/MWh over 20 years

The costs are allocated to the final consumers, whereas the charge is permanently adjusted depending on the actual input of electricity from renewable energy sources. In 2003, this surcharge was 3.9 €/MWh. It is currently about 4.8 €/MWh.

Originally no differentiation has been introduced regarding the financial burden for private and industrial electricity consumers. However, a reduced rate has been introduced starting first from July 2003 for a very limited group of energy intensive sites based on the criteria: consumption > 100 GWh and share of electricity costs at least 20 percent of the gross value added ("Bruttowertschöpfung"). Such reduced rate (0.5 €/MWh) applies only to the electricity consumption beyond 100 GWh.

In a review of the Renewable Energy Law a modification of the special regime has been implemented which will be valid starting from January 2005. According to this, the thresholds regarding consumption and percentage of gross value added have been reduced to 10 GWh and 15 percent respectively. The reduced rate, applicable for these consumers is to be 0.5 €/MWh for 90 % of their consumption. The reduced rate applies for the whole consumption for consumers, who fit into the old thresholds (> 100 GWh and ≥ 20 percent of gross value added). Such rate, however, will only apply, in case this will result in an additional financial burden for all other consumers not exceeding 10 percent of the burden without special regime. Otherwise, it has to be adapted upwards respectively. There is, however, also a significant debasement in the reviewed law for a group of large consumers, since now electricity produced in industrial areas/parks and submitted to other companies on this area is subject to the renewable energy surcharge. This significantly adds to the costs of the industry.

Italy

For certain existing plants a buy-back regime is established (CIP6/92) granting a financial support to the plants for the first 8 years. The costs resulting thereof are allocated to the consumers. However, for industrial users the financial burden resulting thereof is reduced, since the surcharge is applied to the first 8 GWh of monthly consumption only. This surcharge amounts to 7.30 €/MWh (as part of a surcharge of 10.10 €/MWh, which includes various financing purposes). In accordance with this charging mechanism, the specific burden is thus the lower, the higher the electricity consumption is.

For new plants a certificates system applies (Decree 79/99 revised by decree 387/03 in Dec. 2003). Thereby, every electricity producer and importer is obliged to meet a quota of 2.35 percent of the electricity produced in 2004, with an increasing scale of 0.35 percent per year in 2005 and 2006. These quotas do not apply to CHP producers as well as to the first 100 GWh consumption per year. In order to meet this quota, the producer or importer must purchase green electricity certificates, issued by GME and negotiated in the IPEX (Italian Power Exchange) on the basis of the green energy sales by green producers. Electricity from renewable energy sources is always granted first priority in the merit order classification for despatching.

The 2003 price for a certificate (1 MWh) was about 100 €. The costs thereof are financed by the electricity companies and transferred indirectly to the consumers for a consumption of more than 100 GWh with a rate of 2.35 €/MWh.

Netherlands

A new system to promote renewable energies has been established in 2003 and 2004 in the Netherlands. In the past the Regulating Energy Taxation (REB) on electricity not generated from renewable energies was the heart of the promotion, making green electricity cheaper for

the consumers by exempting them from taxes. Now, the promotion is more and more based on a feed-in tariff system for producers, the MEP ("Milieukwaliteit Elektriciteit Productie").

The MEP has been introduced by a law in June 2003 and is directed to stimulate renewables as well as combined heat and power production. According to the MEP the relevant power production installations receive special remuneration rates in addition to the selling price for a period of 10 years. These rates differ for the different energy sources. For wind power these are e.g.:

	MEP in €ct/kWh			
	2003	from Jan 1, 2004	from July 1, 2004	from Jan 1, 2005
Wind onshore	4.9	4.8	6.3	7.8
Wind offshore	6.8	6.7	8.2	9.7

The funds necessary to finance this scheme are sourced as a lumpsum per electricity connection to the grid in the amount of 34 €/a. This lumpsum is totally irrespective of the volume of consumption at the individual connection. In this way, industrial consumers are safeguarded from excessive cost.

The energy tax (EB) as the successor of the REB, is a tax that all consumers have to pay on electricity consumed. However, it is charged on a reducing scale. That means, the rate is lower the higher the electricity consumption is. Above 10 million kWh/a it is set to zero for companies participating in the "covenant benchmarking" or the "covenant MJA" (relevant for small companies), i.e. for companies having agreed to meet challenging efficiency targets for their productions. In this way EB is limited to a maximum of about 66,000 € per company. The EB as a means for promoting renewable energies is step by step losing its role and importance during 2004 since the special reduced tax rate applicable for electricity from renewable energies is growing in 2004 (for a consumption up to 10,000 kWh: 3.57 ct/kWh from Jan. 1, 2004 and 5.04 ct/kWh from July 1, 2004 whereas the normal rate is 6.54 ct/kWh) and will be equal to the normal rate starting from Jan. 1, 2005.

Investments in renewable energy projects are supported by the Dutch state based on the Energy Investment reduction (EIA), which foresees a corporate tax deductibility of 55 percent of the investments. It results in a financial advantage of 19.3 percent after taxes for such investment projects.

Sweden

A system of trading in green electricity certificates has been established from May 1, 2003. The electricity generators, being approved by the Swedish Energy Agency, receive one electricity certificate for every MWh of renewable energy produced. The certificates are sold to electricity users who are legally obliged to purchase certificates equivalent to a certain proportion of their electricity consumption. This proportion is increasing from year to year. A dedicated certificates market emerges, which is independent of physical trading in electricity. The electricity supplier is allowed to charge the electricity consumer, who is not individually taking care of the quota obligation, with the cost of the electricity certificates through their electricity bills.

The government guarantees generators a minimum price, which is 60 SEK (6.5 €) in 2003 with a reducing scale down to 0 SEK in 2008. The prices of the electricity certificates are determined by supply and demand. The average price during the period May 2003 to March 2004 was 215 SEK (23.3 €). The penalty charge is maximised to 175 SEK (19 €) during 2004

and 240 SEK (26 €) during 2005. After 2005 the penalty charge is 150 percent of the average certificate price during the year.

For 2003, the proportion of renewable energy was 7.4 percent of the electricity consumed. By 2010, this will have increased to 16.9 percent.

Energy intensive industries – steel, pulp and paper, mining and chemicals – are until further notice exempted from quota obligations. The definition of energy intensive industry is expected to be changed in accordance with the definition in the EU directive on energy taxation, i.e. "purchases of energy products and electricity amounts to at least 3.0 percent of the production value or the national tax payable amounts to at least 0.5 percent of the added value."

The certificates system is currently under evaluation by the Swedish Energy Agency. A report will be published in November 2004.

United Kingdom

A Renewable Obligation is imposed on suppliers. It started with the obligation to supply a proportion from the overall supplies of 3 percent from renewable energy sources in 2002. In 2004 it is 4.9 percent. This quota will rise further up to 10.4 percent in 2010. The costs thereof, as well as the costs relating to penalties in case of not meeting the obligation (about 43 € per MWh), is allocated to the consumers. The amount charged to the consumer in 2004 is estimated at 1.65 £/MWh in 2004 (2.33 €/MWh). Renewable obligation certificates are currently trading at around 70 €/MWh. This high price is caused by an existing shortage of generation capacities from renewable energies.

In addition, a climate change levy on electricity, which is not generated from renewable energy sources or in "good-quality" CHP plants is established exclusively for commercial and industrial electricity consumers. It amounts to 4.3 £ per MWh (about 6 € per MWh). 80 percent discounts on the levy are available for most energy-intensive sectors, that can demonstrate progressive energy efficiency improvements in line with sector-negotiated agreements.

National Schemes - Overview

The following picture gives an overview of the different approaches and systems in place:

Country	Buy-Back-Regime	Certificates Regime	Taxation
Austria	X		
Belgium	X	X	
Czech Republic	X	(planned)	
Denmark	X ←	(planned)	
Finland			X
France	X		
Germany	X		
Italy	X →	X	
Netherlands	X		X
Sweden		X	
United Kingdom		X	X

Table 1: Support scheme approaches in the EU Member States

The table shows that the majority of EU Member states has installed a feed-in tariff system guaranteeing the generators of electricity from renewable energy sources a bonus remuneration over a determined number of years.

4. The consequence for the industry's electricity price

In most of the countries investigated, the electricity price is taken as a vehicle to finance the means necessary for the installed promotion schemes. The situations are as follows:

EU Member States	Financing Source	Description (2004 situation)
Austria	Electricity price	Two price elements are added to the electricity price (direct and indirect surcharge). They result in a total additional element in the electricity price from 3.425 €/MWh up to 4.035 €/MWh.
Belguim	Electricity price	For industrial consumers differentiated rates depending on the consumption volume from 2 €/MWh to 1 €/MWh in Flanders and from 3.2 €/MWh to 1.6 €/MWh in the Wallonie are established, whereas part of this rate in the Wallonie is related to CHP support. The surcharges will rise significantly over the next years.
Czech Republic	Electricity Price	The surcharges to the electricity price are currently about 37 to 39 CZK/MWh (=1.17 to 1.23 €/MWh) for renewable energies and CHP together.
Denmark	Electricity Price	The surcharge to the electricity price amounts to 12.0 €/MWh up to 100 GWh per site.
Finland	State budget	No direct surcharge on the electricity price applies. However, an energy tax applies to electricity consumption with differentiated rates for private (6.9 €/MWh) and industrial users (4.2 €/MWh). This means are without a direct earmark to the financing of renewable energy support schemes.
France	Electricity Price	The total CSPE covering different public service obligations results in a surcharge of 4.5 €/MWh. In 2003 16 percent of this total fee (0,72 €/MWh) was directly allocated to renewable energies support. This share is likely to increase significantly. There is a CSPE burden limit per industrial sites set at 500.000 €.
Germany	Electricity Price	A surcharge is permanently adjusted depending on the actual input of electricity from renewable energy sources. In 2003, this surcharge was 3.9 €/MWh. It is currently about 4.8 €/MWh. A reduced rate of 0.5 €/MWh applies to a limited group of energy intensive companies for the consumption exceeding 100 GWh.
Italy	Electricity Price	The surcharge for the support of old plants amounts to 7.30 €/MWh up to a consumption of 8 GWh/month. The support of new plants results in another surcharge of 2.35 €/MWh and applies to a consumption above 100 GWh only.
Netherlands	Grid connection	A lumpsum per electricity connection to the grid in the

EU Member States	Financing Source	Description (2004 situation)
	fee and Tax	amount of 34 €/a is charged. The energy tax (EB) is charged per kWh on a reducing scale with a maximum of about 66,000 € per company.
Sweden	Electricity Price	The costs for purchasing the necessary volume of certificates is charged to the electricity consumer, who is not individually taking care of the quota obligation.
United Kingdom	Electricity price (Surcharge and Tax)	The costs of purchasing necessary certificates are allocated to the consumers. The resulting surcharge in 2004 is estimated at 2.33 €/MWh. The climate change levy amounts to 4.3 £/MWh (about 6 €/MWh) with 80 percent discount for a group of energy intensive users.

Table 2: Financing sources, mechanism and consequences.

5. Conditions for Large Industrial Consumers within the established support schemes for renewable energies

When burdening the electricity price with additional surcharges for the support of renewable energies, the consequences for the competitiveness of the industry, for which energy costs really matter, have to be taken into account.

In the countries assessed this is differently reflected in the established support regimes. During 2004, however, the need for such special conditions have get a wider recognition in the countries investigated. It is now reflected in the financing schemes for the support in 9 of the 11 investigated countries.

Special beneficial conditions for industrial consumers

Such special conditions exist within the following systems:

- In **Austria** the surcharges differ depending on the grid level, to which a consumer is connected. The higher grid levels, typically applicable to industrial consumers, have preferential rates, which may be as a minimum 2/3 of the highest rate.
- In **Belgium** the resulting surcharge is determined on a reducing scale depending on the volume of consumption.
- In **Denmark** the resulting surcharge only applies to a consumption of up to 100 GWh.
- In **Finland** the costs for supporting renewable energies are financed from the state budget. However, an energy tax applies on the electricity consumption to feed in the state budget. The tax rate for industrial consumers is reduced in comparison for the rate for private consumers (4.2 €/MWh instead of 6.9 €/MWh).
- In **France** the total charge for CSPE is limited to 500,000 € per year for each site.
- In **Germany** a reduced rate of 0.5 €/MWh is applicable for the consumption above 100 GWh a very limited number of companies depending on the criteria: a consumption of more than 100 GWh and a share of electricity costs at a level of at least 20 percent of the gross value added ("Bruttowertschöpfung"). Starting from Jan. 2005 these criteria have been changed. Then a reduced rate (probably 0.5 €/MWh, maybe higher) will apply to a 90 percent of the consumption of companies with a consumption of more than 10 GWh having an electricity cost proportion in the gross added value of at least 15 percent.

- In **Italy** the tariff surcharges for large consumers resulting from the promotion systems for old plants is capped at a consumption of 8 GWh/month. This results in a maximum burden per of 700,800 €/a. However, this effect is counteracted by the financing mechanism for the new plant support. Hereby, a surcharge only applies for a consumption of more than 100 GWh.
- In the **Netherlands**, the burden for industrial electricity consumers is limited at a quite low level of about a maximum of 66,000 € per year for the Energy tax. This special treatment is based on the fact that an alternative instrument has been established for the industry in order to aim for energy efficiency and the reduction of CO_2 emissions. Hereby the industry has concluded a voluntary agreement (Benchmark covenant), in which it has accepted to meet very ambitious efficiency targets. Additionally, the new MEP results in a charge per grid connection of 34 €/a. This is independent of the volume of electricity delivered, which is to the benefit of large consumers.
- In **Sweden** the quota for purchasing „green" electricity certificates for industrial consumers is for the time being set to zero.

Special detrimental conditions for industrial consumers

- There is an opposite situation in the **UK**, however. Here, the Climate Change Levy installed to promote renewable energies and CHP is solely applied to commercial and industrial consumers and does not apply to household customers.

In the **Czech Republic** there is no differentiation between the different types of consumers.

6. Excursus: The Dominance of Wind Power

In most of the countries the increases in volumes planned to meet the targets in 2010 are predominantly based on electricity generation from wind power. Whereas in 1997 wind power generation reflected only 2.3 percent of the renewable power production in the 11 countries, in 2002 this was already 8.6 percent. Therefore, in this study a special emphasize should be given to the support schemes for wind power generation.

Special remuneration rates are applicable for wind power generation within all the countries of this study. These rates are either fixed feed-in tariffs in the countries with a buy-back regime, or relate to an additional revenue for the generators resulting from the certificates sale in the countries with a certificate and quota system. The actual amount of the additional revenues in these cases are not fixed, but depend on the market price for the certificates. In Tab. 3 and Pic. 2 below, in these cases the following figures have been assumed:

- For Belgium the figures for the first years are an average of the actual prices achieved in the auctions in Flanders and Wallonia (110 €/MWh and 92 €/MWh). The price for the subsequent 10 years is assumed at a level of 90 €/MWh, which is the state guaranteed price of certificates for off-shore wind power.
- For the certificates system in Italy a constant certificates price at 100 €/MWh, which is the current price, is assumed over the whole period of 8 years.
- In the UK, the current price level of 70 € is taken as the basis for 5 years. After that period, the penalty level of 45 €/MWh is applied.
- In Sweden the current price level of 23.3 €/MWh is applied for the whole period.

Some remarks have to be made regarding the feed-in tariffs in some countries:

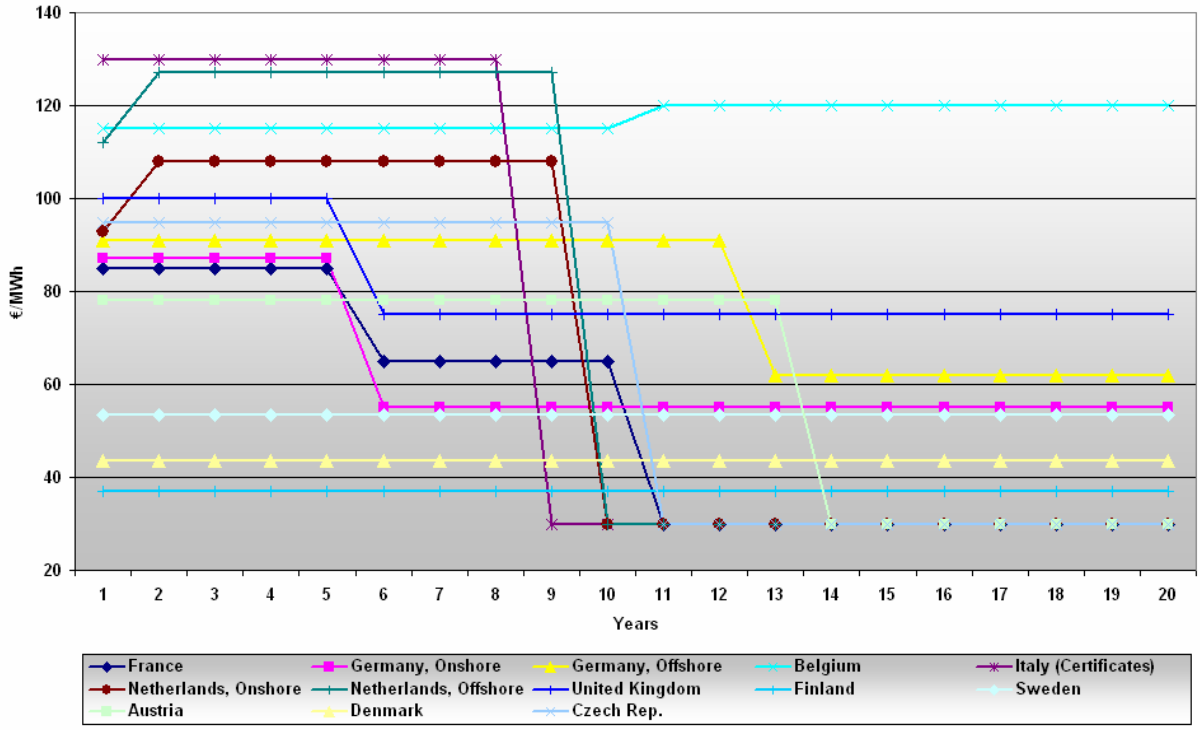
- The feed-in tariffs in France are for plants with a capacity of less than 12 MW only.
- Germany has reviewed the feed-in tariff rates, which resulted in a slight decrease for onshore, and an increase for offshore projects.
- The Netherlands has established differentiated tariffs for offshore wind projects compared to onshore projects. Both rates are shown below.
- The Czech system is for the time being established for the year 2004 only. The applied rate, however, is assumed valid for a period of 10 years.

The below Tab. 3 and Pic. 2 show the remuneration levels for wind power generation over a period of 20 years. It comprises the bonus systems as established in the individual countries plus, if applicable, the normal selling price. This price is assumed to be 30 €/MWh, which should reflect a realistic electricity price level. It must be underlined, that this price is not equally valid for all countries. Especially in Italy a higher normal price level of 40 €/MWh is considered to be more realistic. Nevertheless, for benchmarking reasons a common value is assumed.

Year	Austria	Belgium	Czech Rep.	Denmark	Finland	France	Germany Onshore	Germany Offshore	Italy, Certificates	Nether-lands, Onshore	Nether-lands, Offshore	Sweden	United Kingdom
1	78	130	94,85	43,5	36,9	85	87	91	130	93	112	53,3	100
2	78	130	94,85	43,5	36,9	85	87	91	130	108	127	53,3	100
3	78	130	94,85	43,5	36,9	85	87	91	130	108	127	53,3	100
4	78	130	94,85	43,5	36,9	85	87	91	130	108	127	53,3	100
5	78	130	94,85	43,5	36,9	85	87	91	130	108	127	53,3	100
6	78	130	94,85	43,5	36,9	65	55	91	130	108	127	53,3	75
7	78	130	94,85	43,5	36,9	65	55	91	130	108	127	53,3	75
8	78	130	94,85	43,5	36,9	65	55	91	130	108	127	53,3	75
9	78	130	94,85	43,5	36,9	65	55	91	30	108	127	53,3	75
10	78	130	94,85	43,5	36,9	65	55	91	30	30	30	53,3	75
11	78	120	30	43,5	36,9	30	55	91	30	30	30	53,3	75
12	78	120	30	43,5	36,9	30	55	91	30	30	30	53,3	75
13	78	120	30	43,5	36,9	30	55	61,9	30	30	30	53,3	75
14	30	120	30	43,5	36,9	30	55	61,9	30	30	30	53,3	75
15	30	120	30	43,5	36,9	30	55	61,9	30	30	30	53,3	75
16	30	120	30	43,5	36,9	30	55	61,9	30	30	30	53,3	75
17	30	120	30	43,5	36,9	30	55	61,9	30	30	30	53,3	75
18	30	120	30	43,5	36,9	30	55	61,9	30	30	30	53,3	75
19	30	120	30	43,5	36,9	30	55	61,9	30	30	30	53,3	75
20	30	120	30	43,5	36,9	30	55	61,9	30	30	30	53,3	75

Tab. 3: Revenues from selling electricity generated from wind power (€/MWh) comprising of bonus tariffs, certificates prices and/or normal selling prices
(black: only bonus remuneration, blue: bonus remuneration and selling price, red: selling price after termination of bonus scheme)

The different approaches towards volume and time for granting support is made more visible in the below a graph (pic. 2).



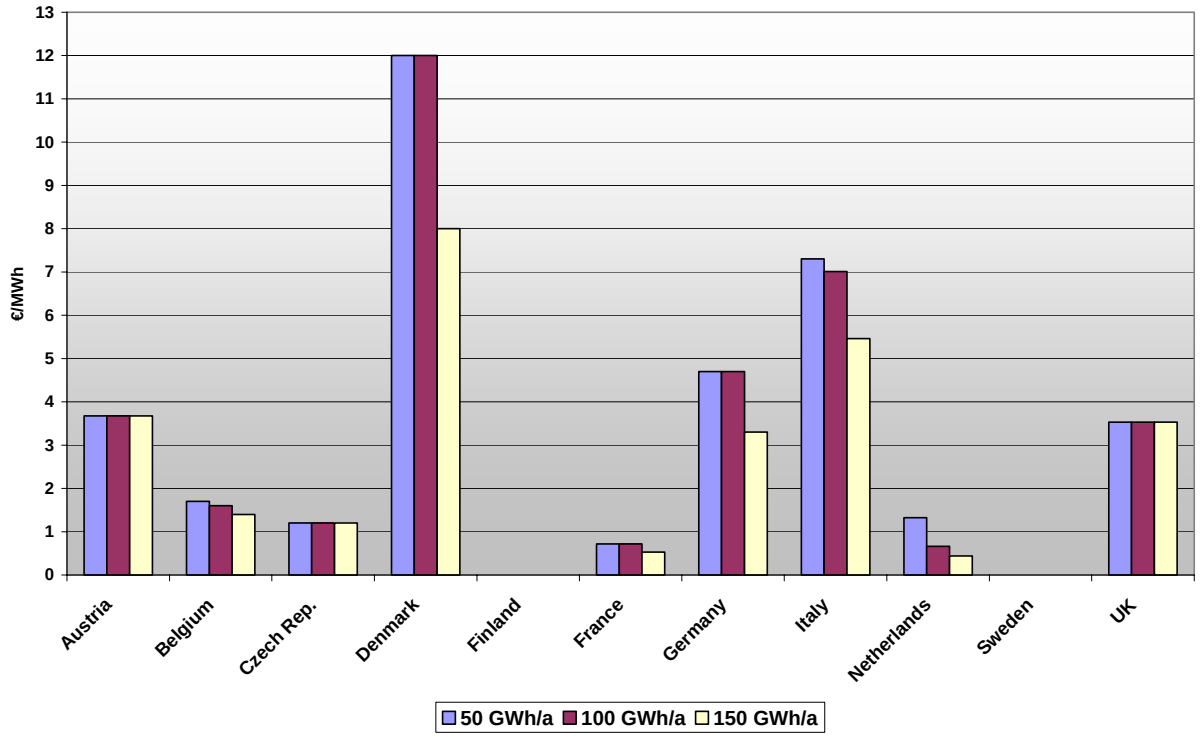
Pic. 2: Revenues from Electricity Generated from Wind Power

These figures show that a level much beyond the normal price level for electricity is applicable for wind power generators for extensive periods of time. A high amount of revenues are therefore gathered by the generators.

7. The Resulting Cost Burden

Such questions are especially important when making clear, that in most of the countries, finally the means are financed by sources coming directly from the consumers. A higher electricity price is the result. It is not surprising that the resulting surcharges on the electricity price already at present are significant in most of the countries assessed even though reductions and/or special conditions apply in most of the countries to industrial consumers.

The actual situation for the year 2004 is reflected in pic. 3 for three types of consumers, from 50 to 150 GWh of annual consumption. It shows the specific financial burden per MWh. Thereby, it is always assumed, that this consumer falls under the relevant established special regimes.



Pic 3: Financial burden on the electricity price in 2004 resulting directly from the promotion schemes for renewable energies for three different industrial consumer types

Regarding the figures shown in the above pic. 3 the following remarks are to be considered:
- In Austria a grid connection at the network level 4-5 is assumed for all three types.
- For Belgium the Flanders situation is reflected, since the rates in Wallonia also comprise CHP support. In the next years the surcharges will rise significantly.
- In the Czech Republic the rate is also used to finance CHP support.
- For France 16 percent of the whole CSPE rate is taken. This share was directly allocated to these purposes in 2003, whereas this share is probably bigger in 2004 and will grow significantly in future.
- In Germany the financial burden will be considerably lower in 2005 based on the new Renewable Energy Act of 2004.

The above picture shows a situation, where:
- The levels of financial burdens are very different in the EU Member States
- Although in most of the countries preferential regimes for industrial consumers have been established, the overall burden remains significant in many of them!

Having in mind, that furthermore, only a small part of the target for 2010 could be realized, it is most likely, that the cost burden will still significantly increase with a further increase of installed capacity and electricity produced. That means, there is a real threat for even higher surcharges in the future, if the financing mechanisms do not foresee a clear capping of the overall supporting funds or change of the financing sources away from electricity price burdening.

It must be considered in addition, that the direct charge for renewable energy support in many countries is not the only surcharge coming from environmental policies. Therefore, the above picture gives only a part of the overall threatening situation. In the countries investigated in addition to the described burden, the following other surcharges exist:

Austria	A support scheme for CHP results in a further electricity price surcharge of currently 1.5 €/MWh. The planned figure for 2005 is 1.3 €/MWh.
Belgium	In the Wallonie, CHP support is included in the certificates system, resulting in a surcharge, which is higher in comparison to Flanders by an amount of up to 1.7 €/MWh. In Flanders, there will be a separate certificates system for CHP from 2005. The estimated surcharges resulting thereof amount to 0.4 €/MWh in 2005, rising to 2 €/MWh in 2010. A federal contribution on electricity at the amount of 1.65 €/MWhis partly used to finance the federal climate change and social policy. Furthermore, there are other taxes and public service obligations, as e.g. a Flemish tax of 4.9 €/MWh for the first 25 GWh/a to finance the municipalities.
Denmark	A promotion system is installed for existing CHP plants. Accordingly, CHP plants built before April 15, 2004 get a supplement remuneration covering the difference between the market price and a price at 45.8 €/MWh. This promotion system results in an additional surcharge on the electricity price of 5.3 €/MWh for a consumption up to 100 GWh.
Germany	- A support scheme for CHP plants result in a reduced surcharge for industrial consumers of 0.5 €/MWh. A further reduction to 0.25 €/MWh applies to a limited group of very energy intensive companies. - An ecotax in the amount of 12.3 €/MWh applies to industrial consumers, whereas producing companies have the right of reimbursement of part of the amount depending on their individual relation between labour and energy cost. The higher the energy cost proportion, the higher is the reimbursement.
Finland	An energy tax with a reduced rate of 4.2 €/MWh applies to industrial consumers.
France	The CSPE package puts together different financing purposes (public service obligations and environmental issues). CHP support is the most important element of it amounting to 56 percent of the total surcharge of 4.5 €/MWh in 2003.

8. Conclusions

- When comparing targets, efforts taken, financial consequences and the achievements reached so far, it must be questioned whether the objectives set are realistic and proportionate.

- Renewable energies build an important option for the future. But their promotion is a costly political decision.

- The promotion of renewable energies is to a very large extent still research work and should be therefore primarily financed from R&D funds.

- However, the financial burdens resulting from renewable energies promotion systems for industrial energy consumers are often directly linked to the electricity price making this essential production input more expensive.

- The resulting additional costs are already currently significant, and are likely to increase quickly and intensively in the near future if not capped.

- All countries reviewed have established promotion systems, however with significant differences in the resulting financial burdens. No European level playing field is in sight!

- In most of the countries, the promotion systems hardly address any measures to strengthen the competitiveness of renewable energies, but simply guarantee revenues over an extensive period.

- Thus improvements in the economics of generating electricity from renewable energies are hardly provoked, and an over-financing of renewable energy plants is not excluded especially in case of technological and economic progress.

- **Renewable energies promotion systems should not jeopardize the competitiveness of the industry on the European as well as on the international level.**

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