

Securing a Sustainable Energy Future in an Enlarged European Union



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Report Prepared for:

Green/EFA Group in the European Parliament



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Front Cover Source; Border Wind UK

Executive Summary

Energy policy discussions are highly political and complicated. However, there are a number of facts that are indisputable and give clear guidance for the development of a secure energy future for Europe. These are:

1) Energy Efficiency is the key to a sustainable energy future for the European Union (EU). A strategy to make Europe the Energy Efficiency economy of the world can be achieved over the next two decades. This would generate economic opportunities and reduce environmental impact. Estimates suggest that an aggressive Energy Efficiency program could reduce Europe's imported energy by 3 billion Mtoe saving € 750 billion over twenty years.

2) Renewables are the only long-term supplier for the EU's energy and can, with the right measures, provide 29% of the EU's energy within twenty years. Furthermore by 2050 renewables should provide 50% of the EU's energy. Efforts will have to be undertaken, both in Research and Development and in market penetration, to ensure the quickest possible development of a large renewable sector. This will increase energy security as renewables will become the dominant energy worldwide in the 21st century, providing Energy Efficiency measures are implemented.

3) Natural gas is the fuel of transition to a fossil free energy future. Priority must be given to utilising gas sparingly and reducing emissions from its extraction and transportation. Emphasis should be placed on the development of Combined Heat and Power plants and reducing gas use in heating. Special attention should also be given to the development of biogas to reduce use of natural gas.

4) Currently eleven out of the fifteen Member States of the EU are non-nuclear or committed to phasing out their national programs. There are no nuclear reactors under construction in the Union. Nuclear power is not a fuel for the 21st century. Europe's nuclear industry is gradually being phased out, as it has proved uneconomic, environmentally damaging and incompatible with a sustainable energy future.

Introduction

2001 will be an important year for the development of energy policy in Europe. Within the European Union's (EU) institutions there will be a number of reviews on energy issues including:

- The development of a White Paper on Security of Supply.
- The review of the Gas and Electricity Market Liberalisation.
- The discussion of a Directive on Energy Efficiency in the Transport and Building sectors.
- The adoption of the 6th Framework Research and Development Program.
- The finalising of the Directive on Renewable Energy.
- The production of a Sustainable Energy Strategy for Europe (at the Gothenburg EU Summit in June 2001).

In November 2000 the Commission published its Green Paper on Security of Supply.¹ The EU is lacking a coherent energy policy —there is no energy chapter in the EU Treaty. The old industries, nuclear and coal, have specific agencies to subsidise their existence (Euratom and European Coal and Steel Treaty, respectively). The less polluting energy options efficiency, renewables and co-generation remain insufficiently supported. The discussion on energy security opens the way to develop a Sustainable Energy Strategy for the EU. Some

¹ Towards a European Strategy for the Security of Energy Supply, Green Paper, 29th November 2000, Com (2000)769.

elements of the Green Paper offer hope that this will occur as the document stresses the fundamental importance of these technologies.

This paper examines the role of a number of energy sources and Energy Efficiency in the context of both the Green Paper on Security of Supply and the other key events of 2001, namely:

- Energy Efficiency
- Renewable Energy Sources
- Co-generation
- Natural Gas
- Nuclear Power

Energy Efficiency and Demand Side Scenarios

Within the framework of the energy discussions an overriding goal should be to reassess and compare the environmental impact of different energy sources. Unless damage to the environment from the extraction and use of energy is reduced or even eliminated, a particular energy source can have no long-term future and should not be considered a secure supply.

By this criteria Energy Efficiency should be prioritised as it reduces the impact of energy use on the environment, as well as increasing economic competitiveness in industry and reducing dependency on imported energy. These three issues are, following the Amsterdam Treaty, the three core principles of the EU's energy policy. In spite of this Energy Efficiency is given a low priority in the Green Paper, in the Commission's legislative program and in action by Member States. A key test for the Commission's resolve on Energy Efficiency will be at the Stockholm European Council meeting in March, at which time the Commission will present a revised legislative plan to save energy particularly in the transport and building sectors.

Energy Efficiency was recently referred to by a senior member of the Directorate for Transport and Energy (DG TREN) as the "*priority of priorities.*" Vice President de Palacio has stated that "*supply-side measures will be inadequate unless at the same time a*

*genuine demand-side policy is embarked upon.*² Within the Green Paper there are a number of references to the importance of energy efficiency, including:

*“This policy of demand management is all the more necessary in that it is **the only way** of meeting the challenge of climate change.”³*

*“Nonetheless, the European Union **will only** reduce its external energy dependency through a determined policy of demand management.”⁴*

“If the EU cannot reverse current energy consumption trends—energy and transport use, especially in urban areas, it will have to resign itself to massive dependency on imports for its energy supplies and will have trouble meeting its commitments under the Kyoto Protocol.”⁵

²Future European Energy Policy and Security of Supply, Mrs Loyola de Palacio, Vice President of the European Commission, Coaltrans Conference Madrid, 23rd October 2000.

³Green Paper, page 54.

⁴Green Paper, page 54.

⁵Green Paper, page 85.

In the light of these statements it is remarkable that so much of the paper addresses supply rather than demand issues. The paper needs to address the fact that the development of a secure energy supply is not the key issue, but rather the important question is how can energy services be ensured. This would enable Energy Efficiency and demand side management to be viewed with equal weight to supply options. Furthermore, the Green Paper readily admits that current initiatives to increase energy efficiency have failed to meet their objectives, but the paper fails to make adequate recommendations as to how to improve the situation.

The failure of the Green Paper to give sufficient weight to Energy Efficiency is unfortunately not unique in European Commission documentation and thinking. In 1996 and 1999 the Commission published reports based on scenario analysis, forecasting the development of energy use in the EU through until 2020. Neither of these scenario based reports seriously reviewed the potential for Energy Efficiency. In the 1996⁶ report the most significant reduction in energy use over the Conventional Wisdom (CW) scenario (business as usual scenario) was only 5.6% by 2020, with the CW scenario resulting in an increase of around 1.4% per year between 1995-2020. In the 1999⁷ report a more limited scenario analysis was put forward, with again only limited energy reductions. The most ambitious scenario for energy savings forecast only a 6% reduction by 2020.⁸

By contrast, the Green Paper notes that 40% of the EUs current energy consumption could be saved through Energy Efficiency based on present day technical knowledge. No other technology can bring such benefits to the consumer, economy and environment. While the 40% savings potential does relate only to the technical potential, even in the short term impressive economic potentials—in the order of 20%— can also be achieved. The table on the following page (1.1) shows the economic potential—i.e. the investment that would be

⁶European Energy to 2020 A Scenario Approach, Special Issue, Spring 1996, European Commission, ISBN 92-827-5226-7.

⁷European Union Energy Outlook to 2020, Special Issue, November 1999, European Commission, ISBN 92-828-7533-4.

⁸Energy Efficiency and the CO₂ Emissions from Energy Systems, Bernard Laponche, International Consulting on Energy, November 2000, Paris.

1.1 Economic Energy Efficiency Potential in Western Europe, 2010 and 2020⁹

Sector and technological area	Economic Potential (%)	
	2010	2020
Industry		
Iron and steel, coke ovens	9–15	13–20
Construction materials	5–10	8–15
Glass Production	10–15	15–25
Refineries	5–8	7–10
Basic organic chemicals	5–10	
Pulp and Paper		50
Investment and consumer	10–20	15–25
Food	10–15	
Co-generation in industry		10–20
Residential		
Existing buildings		
Boilers and burners	15–20	20–25
Building envelopes	8–12	10–20
New buildings		20–30
Electric appliances	20–30	35–45
Commercial, public and agriculture		
Commercial buildings	10–20	30
Electricity	10–25	20–37
Heat		15–25
Public buildings		30–40
Agriculture and forestry		15–20
Horticulture		20–30
Decentralised cogeneration		20–30
Office equipment		40–50
Transport		
Cars	25	
Door-to-door integration	4	
Modal split of freight transport		3
Trains and railways		20
Aircraft, logistics	15–20	25–30

⁹World Energy Assessment Energy and Challenge of Sustainability, chapter 8, energy End-use Efficiency, page 186, table 8.4.

recovered by the improved economic efficiency at current or expected prices for energy— across a range of sectors.

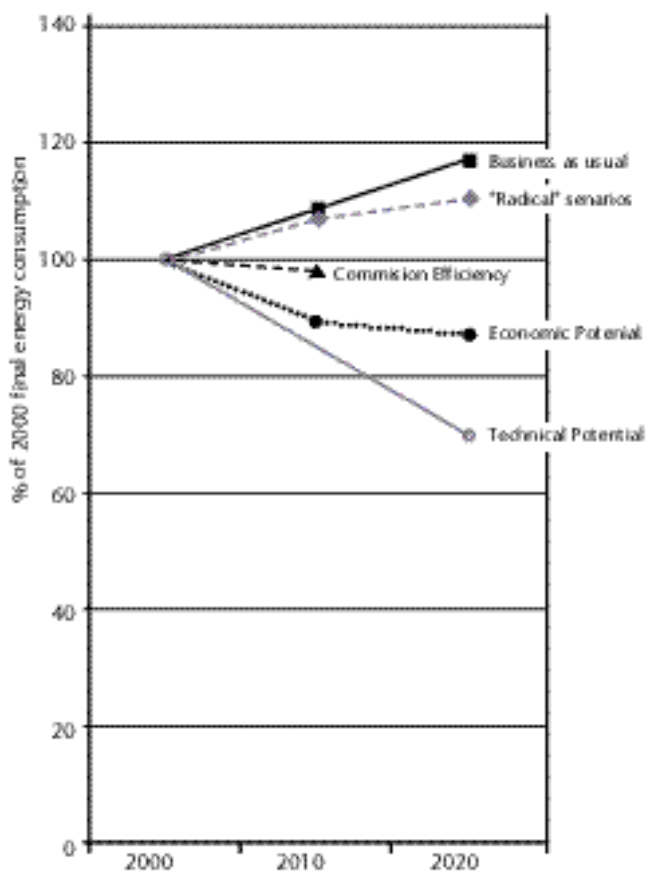
Energy savings offer a win-win situation. Industry and consumers benefit because they have lower energy bills, including investment costs. Lowering consumption reduces the impact on the environment and reduces dependency on imported energy. However, these energy saving potentials have not even been translated into the indicative targets of the Commission's Energy Efficiency Action Plan from April 2000, which estimated that by 2010 only 100 Mtoe of energy per year can be saved.¹⁰ According to the PRIMES base-case scenario these savings equate to only about 6% of energy consumption. The graph on the following page (1.2) shows how the Commission is down-playing the role for efficiency. Its own efficiency scenarios do not even capture the savings which would bring financial benefits to consumers (economic potential).

The impact of the implementation of programs to meet the economic and technical potential of Energy Efficiency can be demonstrated by comparing these “saved” energies with the predicted energy used by different sources. This is demonstrated in the graph 1.3.

Clearly, efficiency can significantly help to reduce the environmental impact of energy use and

¹⁰Green Paper, page 69.

1.2 Commission's Efficiency Scenarios vs Potentials



decrease energy imports. By 2020 around 70% of the EUs gas is expected to be imported. If the full economic potential of energy savings measures were implemented it would very nearly equate to the amount of gas imported.

In 2000 detailed analysis was undertaken in France to assess the potential for Energy Efficiency by 2020. This showed that energy savings of around 30% could be achieved with an aggressive energy saving strategy. Extrapolating these results for the EU as a whole would suggest a reduction in energy imports by 2020 of over 3 billion Mtoe, saving Europe € 750 billion.¹¹

The low priority of Energy Efficiency is further demonstrated by the EU's research and development budgets. For 2001 and 2002 only € 14.0 million and € 11.0 million have been allocated to the SAVE program.

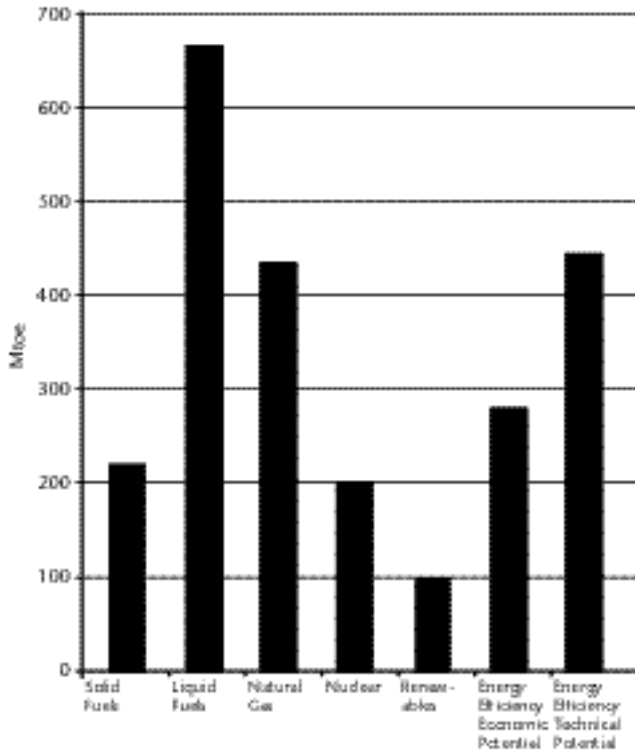
The failure to take full advantage of the potential for Energy Efficiency is not just seen in the European Commission. Some Member States are not even implementing the current Energy Efficiency regulations, as the Green Paper states:

“Moreover, eight Member States have either failed to implement parts of the [SAVE] Directive or failed to report results. As a consequence, infringement procedures were initiated in October 2000.”¹²

¹¹Scenarios of Energy Futures and the Potential Energy Efficiency, Comparison and Transposition of France and the European Union, Bernard Laponche, International Consulting on Energy, January 2001.

¹²Green Paper, page 68.

1.3 Expected Contribution of Energy Resources by 2020 vs Efficiency Potential



Action Needed for Energy Efficiency

The Green Paper calls for action on Energy Efficiency, when it states:

“The European Union has very limited scope to influence energy supply conditions; it is essentially on the demand side that the EU can intervene, mainly by promoting Energy Efficiency in buildings and in the transport sector.”¹³

- 1) The European Commission needs to establish a long-term program to make the European economy more energy efficient. This plan should run from 2002 to 2022, have a clear target and the necessary financial and staff resources. In order to allow the Commission to concentrate on their core business—definition of policies and legislation— Europe needs a professional European agency for Energy Efficiency.
- 2) The Commission must ensure that all future scenario work includes options that utilise high efficiency models.
- 3) The 6th Framework Program must increase its allocation to Energy Efficiency.
- 4) Firm action needs to be taken against Member States that have failed to fully implement the existing European Energy Efficiency legislation.
- 5) The Stockholm/Lisbon process must require unambiguous Energy Efficiency targets in the building and transport sectors – 2.5% increase per year.
- 6) The revised Electricity Market Directive should include an obligation for utilities to implement Demand Side Management measures.

¹³Green Paper,
page 11.

Renewable Energy

Together Energy Efficiency and Renewable Energy offer the only technologies that will simultaneously reduce dependency on imported energy and emit no net CO₂. In a number of areas the Green Paper notes the importance of renewable energy.

*“With regard to supply, priority must be given to the fight against global warming. The development of new and renewable energies (including biofuels) is the key to change.”*¹⁴

*“Only technology-intensive renewable sources can help mitigate the present trend towards increasing energy dependency.”*¹⁵

However, the Green Paper only calls for Member States to give a *“firm commitment”*¹⁶ to achieve the *“realistic”* objectives of the White Paper. If, as the Green Paper, points out, Renewables are fundamental for the future energy supply of the Union, then the targets should be mandatory. The Energy Council at their meeting on the 5th December 2000 also adopted the voluntary approach when, instead of calling for legally binding targets, the Council required only *“reference values of Member States national indicative targets.”* By failing to make the targets legally binding the draft Directive shows disregard for the importance of Renewables by the Commission and some Member States. The 2000 Directive endorses and further refines the objectives of the Council in its

¹⁴Green Paper, page 5.

¹⁵Green Paper, page 22.

¹⁶Green Paper, page 49.

Resolution of 8 June 1998 on Renewable Energy sources¹⁷ and calls for Member States to achieve specific voluntary targets for the implementation and use of Renewable Energy by 2010. It is expected that the EU will then produce around 12% of its energy and 22% of its electricity from Renewable Energy sources. A breakdown of the targets for each Member State is given in table 2.1 on the following page.

The longer-term objective must be that by 2050 over 50% of the EU's energy must come from Renewable Energy sources. This is both necessary and achievable if Renewables are to be given priority for investment in the energy market.

The full potential of Renewables is now beginning to be realised. Shell Renewables, recently suggested that up to 50% of the World's energy needs could be met by Renewable Energy within fifty years. The Commission-funded TERES II study published in 1997 estimated that Renewables could contribute 29% of the EU's energy by 2020, reducing energy imports by 19% over 1993 levels.¹⁸ Global studies show that renewable energy could provide many times the current total energy use. However, to date, solar energy is not economically viable for most grid connection applications in Europe.

Other technologies, notably wind power, are already competing with conventional sources and

¹⁷OJ C 198, 24.6.1998, page 1.

¹⁸Energy for the Future, Meeting the Challenge, TERES II 1997.

2.1 Indicative Council Targets for Producing Electricity from Renewable Energy Sources

Source: EU Environment Council of Ministers, December 2000

	RES-Electricity TWh 1997	RES-Electricity % 1997	RES-Electricity % 2010
Austria	39.05	70.0	78.1
Belgium	0.86	1.1	6.0
Denmark	3.21	8.7	29.0
Finland	19.03	24.7	31.5
France	66.0	15.0	21.0
Germany	24.91	4.5	12.5
Greece	3.94	8.6	20.1
Ireland	0.84	3.6	13.2
Italy	46.46	16.0	25.0
Luxembourg	0.14	2.1	5.7
Netherlands	3.45	3.5	9.0
Portugal	14.30	38.5	39.0
Spain	37.15	19.9	29.4
Sweden	72.03	49.1	60.0
UK	7.04	1.7	10.0
EU	338.41	13.9	22.0

meeting or exceeding generation targets. By the end of 2000 the installed capacity for wind power was over 10,000 MW. Due to its rapid introduction the European Wind Energy Association believe that the

2010 target of 40 GW installed capacity, as outlined in the 1997 White Paper on Renewable Energy should be revised upwards to 60GW and the 2020 target increased to 150GW.¹⁹

One area that is now developing very quickly is offshore wind. Wind potential in the North Sea was recently assessed to be nearly 2000 TWh, three times the combined electricity consumption of Belgium, Denmark, German, Netherlands and UK.²⁰

Biomass is another technology that has the potential to produce cost effective Renewable Energy in the short term. However, to date this has not occurred and the 1997 White Paper targets will probably not be achieved. Despite this, recent research suggests that energy from Biomass can play a significant role in reducing CO₂ emissions and reducing energy imports. A number of field analyses suggest that it may be economically feasible to save around 400 million tonnes of CO₂ per year by 2030 by using energy from biomass. This equates to around 9% of 1990 emissions.²¹

The Green Paper notes that € 165 billion will be needed between 1997 and 2010 to enable the EU to meet its White Paper targets.²² Interestingly, the International Energy Agency estimate that Energy Efficiency measures over the same period would enable up to € 160 billion to be saved, by not building new power stations.²³

¹⁹Wind Energy Targets Increased by 50%, European Wind Energy Association Press Release, 11th October 2000.

²⁰German Wind Power Institute, cited in European Union Energy Policy Options for 2020, Huges Berlin, European Information Service, December 2000, page 10.

²¹Biomass for Greenhouse Gas Emission Reduction, Task 9: Optimal emission reduction strategies for Western Europe, D.J. Geilen, A.J.M.Bos, M.A.P. C.de Feber, T. Terlagh, ECN-C-00-001, March 2000.

²²Green Paper, page 48.

²³Rational Techniques: Save Money by Energy Saving. =>

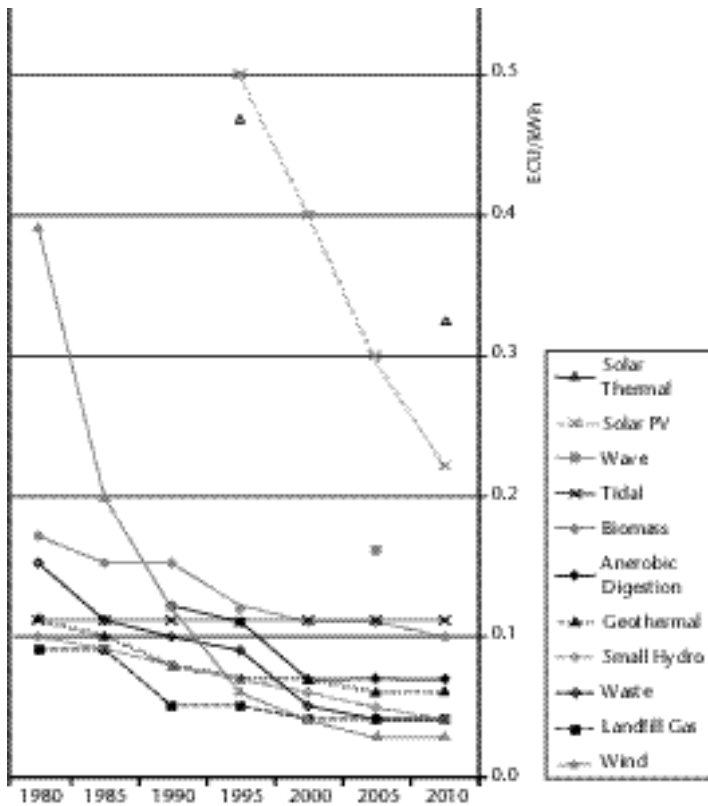
(²³cont.)
Environment
friendly energy
services to the
benefit of the
Consumer and
Industry. The
European
Commission Com
(95)369.

²⁴Energy
Technology, The
Next Steps:
Renewables, Heat
and Power, Oil and
Gas, Industry,
Buildings,
Transport,
Summary Findings
from the Atlas
Project. Published
by DGXVII,
December 1997.

In addition, as Renewable Energies become more established and widespread so the cost of the electricity they generate is expected to fall. While Renewable Energy technologies do not currently have the installed capacity of either nuclear power or fossil fuels within the EU, they are rapidly becoming economic in comparison to nuclear power. The graph below is taken from the EU Sponsored Atlas study. It shows that since 1980 prices for the electricity generated across a range of Renewable Energy technologies have dramatically fallen and that further falls are expected.²⁴ This study concurs with other research that shows that Renewable Energy is already competitive with existing conventional energy sources. It is likely that, with further reductions in the subsidies to the conventional electricity industries, Renewable energies will become the fuel of choice in Europe.

2.2 The Price of Electricity Generated by Renewable Energy Technologies Since 1985

Source; Atlas Project



Action Needed for Renewable Energy

“Only technology-intensive renewable sources can help mitigate the present trend towards increasing energy dependency.”²⁵

- 1) Member States should go further than the requirements of the Directive and pledge to make targets legally binding. The European Parliament should stand by its original demand for binding targets.
- 2) Mandatory targets must be set for Renewable Energy for 2020.
- 3) Specific action should be taken to ensure that energy from Biomass is encouraged across the EU.
- 4) The EU funding for Renewable Energy needs to be significantly increased in the 6th Framework program —reversing the current Commission proposals.

²⁵Green Paper,
page 22.

Co-Generation

The increased use of Combined Heat and Power (CHP) is an essential element of the reform package necessary to meet environmental commitments and decrease dependency on imported energy. CHP significantly increases the efficiency at which the fuel is utilised. In a modern CHP plant efficiency levels of 85-90% can be achieved, compared to 30-40% in conventional power stations and 55% in combined cycle power plants. These increases in efficiency can result in significant reductions in fuel use and a halving of CO₂ emissions.²⁶

In 1997 the Commission approved a strategy to promote CHP across the EU. One of the main objectives was to see a *“doubling of the current share of CHP from 9% to 18% of the total gross electricity generation of the Community produced by CHP by the year 2010.”*²⁷ The Commission claimed that *“The environmental benefits would be significant. A rough estimate indicates that if a doubling of CHP share were achieved, considered as replacement of existing electricity and heat production plants, it could reduce CO₂ emissions by 150 Mt. per year or approx. 4% of the total EU CO₂ emissions in 2010.”*

The document further states that *“CHP is an environmentally friendly concept of energy production having the potential to contribute significantly and cost effectively to the security of supply and competitiveness policy aims of the Community.”*²⁸

²⁶What is Cogeneration. Cogen Europe web site, accessed January 2001 –www.cogen.com.

²⁷Communication From the Commission to the Council and the European Parliament. A Community Strategy to Promote Combined Heat and Power (CHP) and to Dismantle Barriers to its Development 15.10.97 COM(97) 514 final. Section 4.1.

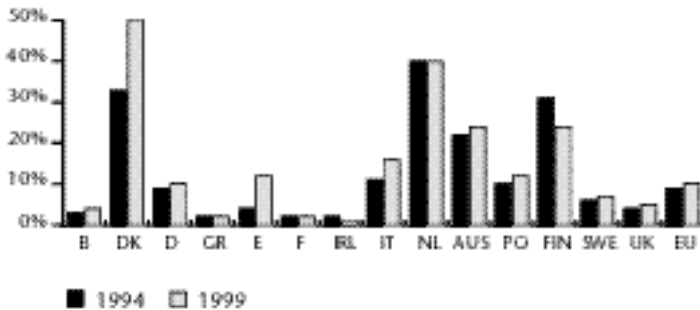
²⁸Com (97) 514 final. Section 4.2.

Despite these clear statements the Green Paper only makes one significant reference to the importance of CHP:

“Meeting the Community-wide target of doubling the use of co-generation to 18% of EU electricity production is expected to lead to additional avoided CHP emissions of over 65 Mt CO₂/year by 2010. The potential for co-generation is, however, much greater and with the right framework in the liberalised market it has been estimated that CHP could triple by 2010 leading to an additional reduction of CO₂ of around 65 Mt per year.”²⁹

²⁹Green Paper, page 69.

3.1 Status of EU Member States CHP Power Plants in 1994 and 1999



The Green Paper estimates of CO₂ reductions based on a doubling of CHP contradict the findings of the 1997 strategy paper. The Green Paper also fails to address the problems currently experienced in the introduction of CHP. Figure 3.1 shows the state of CHP production in Member States between 1994 and 1999 —only in Denmark and Spain have significant increases occurred. Under the current rate of introduction, CHP will fail to meet the 18% target set for it by 2010.

Action Needed for Co-generation

1) An initiative on Combined Heat and Power should be developed that puts forward legally binding targets for Member States. At minimum the 18% target for 2010 should be included in the revised Electricity Market Directive or in a separate directive.

The Role of Natural Gas

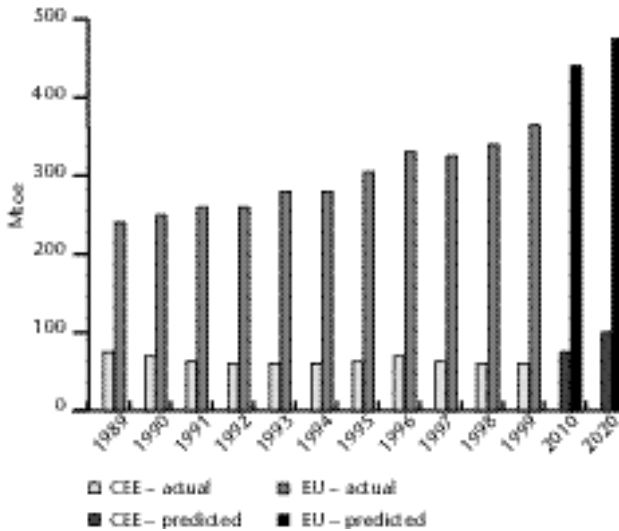
It is predicted in “business as usual” scenarios that Member States’ and accession countries’ use of natural gas will increase significantly in the coming years. The installed capacity in the EU is predicted to increase ten-fold between 1995 and 2020 from a level of 35GW installed. This increase will occur both as a result of an increase in demand within the Union and gas being used as a replacement when the older, nuclear and coal, power plants are closed. The graph on the following page (4.1) shows the historical development of gas consumption in both the CEE (Central Eastern Europe) and the EU.

In order to reduce this predicted increase efforts must be taken to lower demand and diversify sources. Significant savings can be made in the heating sector both by demanding higher efficiency standards in new developments and retrofitting existing buildings. Biogas also has the potential to radically reduce dependency on natural gas. Research suggests that by 2020 the consumption of 18Mtoe of natural gas could be displaced by biogas.

Within the EU power sector, natural gas use is expected to increase from 77Mtoe in 1995 to 186Mtoe in 2020, while in the CEE sector, over the same time period, the increase will be from 8.5Mtoe to 47.2Mtoe. There is a much greater rate of increase within the CEE with, on average, an annual increase of 7.1% compared to 5.0% in the EU.

4.1 Gas Use in CEE and EU

Source; European Commission and BP Statistical Review 2000



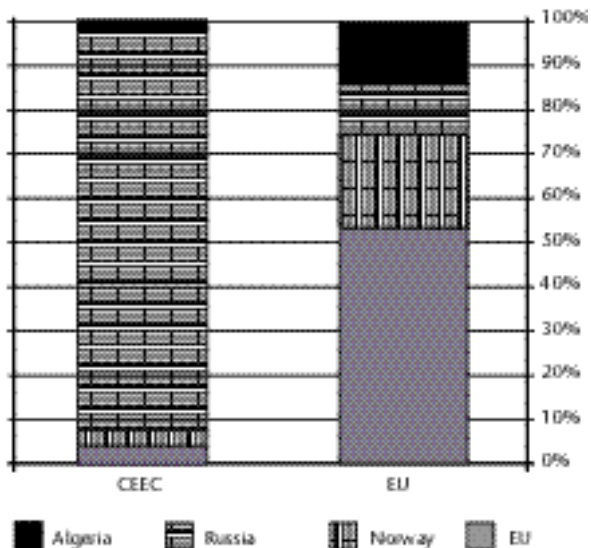
Gas Sources

Unless there is a rapid, and highly unlikely, turnaround in the production rate of gas in Accession countries, the enlargement of the European Union will lead to an increase in import dependency for the Union as a whole. Currently, within the EU, around 40% of gas is imported

(graph 4.2). In CEE the level of import is around 70%, with Russia, the dominant supplier, providing 92% of gas for the region. Regardless of enlargement, the level of gas imported into the EU is expected to rise to 67.3% by 2020, a total import of around 320Bcm per year. By the same time, gas use in CEE is expected to reach around 100Bcm per year, of which imports will account for at least 80%.

4.2 Comparison of Gas Sources of the EU and CEE Regions

Source; BP Statistical Review 2000



Comparisons of Security of Supply

As the percentage of imported gas is increasing, it is interesting to examine if this will cause problems from a security of supply perspective. One useful comparison involves the EU's current dependency on oil. The graph 4.3 reveals the differences between oil and gas and shows that oil has five significant supply sources, while gas only has four. However, in current percentage terms, 60% of current gas requirements come from the EU or Norway while in the oil sector it is only 40%.

Russia is expected to remain the largest external supplier of gas to the EU. Gazprom, the Russian Government's gas company, has become a major continental operator with equity in the UK-Belgium Interconnector, and holdings in a range of gas companies in Eastern Europe and the Baltic States. Exports to the European market have made Gazprom a highly profitable concern, earning the equivalent of US\$8 billion from gas sales during 1998, when the company sold 120.5Bcm of natural gas to nineteen European countries. 1999 evidenced a further increase with deliveries of 126.8Bcm during the year.

The Russian government retains a 38% stake in Gazprom, and the government appoints five of the company's nine directors. One important commercial consideration arises from Ruhrgas's

(Germany) 4% stake in Gazprom, acquired in 1998. This, combined with the dependency of Gazprom on European revenue, indicates that the flow of Russian gas is likely to continue, as Europe is too important a customer to undermine. The interdependency of the EU and Russia was underlined in October 2000 with the announcement by the Commission of the so called Prodi Plan, which would see significant increasing in energy imported from Russia, which is thought to include an 100Mtoe increase in gas imports as well as an increase in electricity and oil importation.³⁰

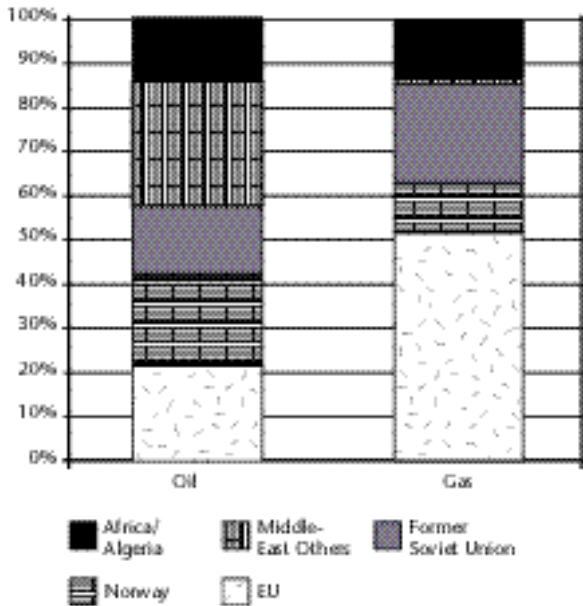
To increase the diversification of gas sources the EU could consider increasing the quantity of liquid natural gas (LNG) it uses. This would enable a greater volume of gas to be imported from across the globe, especially from the Middle East and Algeria.

However, any increase in natural gas use comes at a price to the environment. When burned natural gas produces CO₂ and consequently contributes to climate change. The burning of natural gas results in lower CO₂ emission per kWh than other fossil fuels. It thus has a role in a transition to a sustainable energy future. However, it is still a greenhouse gas and must be used sparingly. The burning of fossil fuels is already impacting on the global climate. Humanity must move towards the

³⁰EU to Import More Energy from Russia, 2nd October 2000 XINHUA.

4.3 Comparison of Sources of Oil and Gas – 1999

Source; BP Statistical Review 2000



cessation of these activities that are leading to imbalances in the atmosphere and eventually all future exploration for natural gas and oil should cease.

Action Needed for Natural Gas

- 1) Incentives should be implemented to minimise transition losses and maximise operational efficiencies in natural gas.
- 2) Further analysis must be made into the environmental consequences of increased transport of LGN, one mechanism for increasing the diversity of gas sources.

Nuclear Power – Fission

Nuclear power is on the decline in Europe. 2001 will be the first year since the founding of the EU or its predecessors that there are no reactors under construction. In Member States seven countries, Austria, Denmark, Greece, Ireland, Italy, Luxembourg and Portugal do not have nuclear power. In Belgium, Germany, Netherlands, Spain and Sweden political agreements have been reached to limit the life of the existing reactors. In the UK, a closure schedule has been drawn up for over half of the country's reactors. In France the lack of future construction plans halt any long term future for the industry which appears to be abandoning its attempts to develop the next generation of reactors, the European Pressurised Water Reactors (EPR). Only in Finland does the industry show any possibility of activity. Proposals may be presented to the Parliament for the construction of a new reactor in 2001. However, this proposal has been rejected by a previous Parliament and its success is far from certain.

³¹Pedro Miguel de Sampaio Nunes
Director of
Conventional
Energies, DG
Energy and
Transport
Heinrich Böll
Foundation
Conference
Sustainability and
the Future of the
European
Electricity Policy,
11 October 2000.

Despite this senior officials from DG TREN have declared that one of the purposes of the Green Paper is to *“re-launch the debate on nuclear power”*³¹ citing a lack of debate within the EU as justification. The early draft of the Green Paper reflected this and included statements like *“It has to be said that the part played by nuclear energy in reducing CO₂ emissions is played down by the*

*politicians responsible and by public opinion who are clearly not sufficiently aware that without nuclear energy the European Union cannot meet its commitments.*³² The initial draft was prepared by DG TREN, whose Commissioner Vice-President Loyla de Palacio is an ardent supporter of nuclear power. On numerous occasions she has made clear her desire to see nuclear power revived within the EU.

The position taken by Mrs de Palacio or the draft Green Paper does not reflect that of Member States or of other members of the Commission. During the COP6 negotiations the EU Member States adopted a common position on nuclear power which stated:

*“Annex 1 Parties declare that they will refrain from using nuclear facilities and new large hydro-power plants for generating certified emissions reductions under the CDM and JI.”*³³

Other Commissioners have adopted similar positions. EU Environment Commissioner Margot Wallström stated to the European Parliament in November 2000 that it *‘is not envisaged’* to include nuclear power in any future emissions trading scheme.³⁴

During the review of the Green paper undertaken by the Commission the majority of the more

³² 31st October
Draft Green Paper,
page 20.

³³ EU Amendments
to Paper
Distributed by
Chairman Pronk,
12:15 AM 25th
November 2000.

³⁴ EU Commission-
er Rules Nuclear
Out of Emissions
Trading, NucNet
November 1st
2000.

extreme pro-nuclear language, as quoted above, was removed. The Green Paper now states on climate change that *“The present phase-outs [of nuclear power] do not affect the Community’s ability to fulfil Kyoto objectives from 2012.”*³⁵ In addition, the revision of the draft significantly reduces the amount of CO₂ saved by the EUs nuclear power stations, from 800 Mtoe of CO₂³⁶ to 312Mtoe.³⁷

However, the pro-nuclear bias of the original draft remains in a number of areas. In one passage the Commission calls for EU Member States to continue to promote the export of technology to allow the reprocessing of spent nuclear fuel.

*“The Union must maintain its leading-edge technological capabilities, know-how and potential for exporting to third world countries, notably with respect to supply of equipment, enrichment, manufacturing and reprocessing of spent fuel, and waste management.”*³⁸

³⁵Green Paper, page 86.

³⁶Draft Green Paper, page 21 –note there is a mistranslation in the English version, which states 8 000 Mt per year.

³⁷Green Paper, page 33.

³⁸Green Paper, page 86.

In the draft Green Paper and other Commission documents it is possible to see that, at present consumption levels, the economically exploitable volumes of uranium will be exhausted quicker than the major fossil fuels.

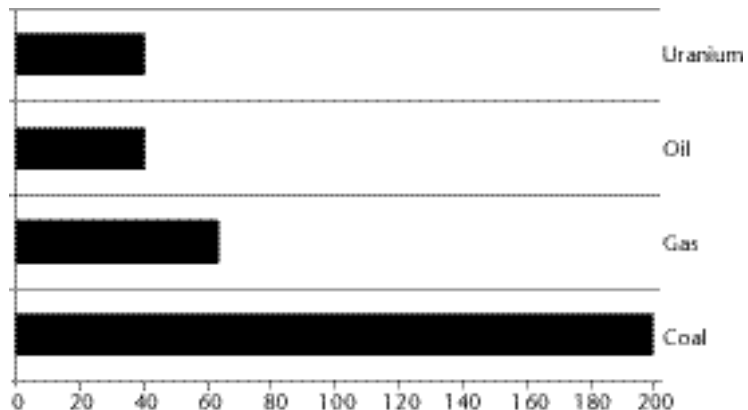
Experience has shown that over time exploration leads to discovery of greater reserves and thus the figures represented in graph 5.1 are only the economically recoverable reserves thought to exist

at present. However, it clearly shows that nuclear power, as currently envisaged, is not a power source for the long term.

Nuclear power is important due to its actual and potential environmental impact, but its reliance on massive government subsidies makes it inappropriate to encourage its development in other parts of the world. There is a clear trend within the EU to abandon reprocessing.

5.1 Current Economically Retrievable Fuel Reserves

Source; BP Statistical Review, Draft Green Paper, DG TREN Website



Action Needed for Nuclear Fission

- 1) The White Paper on Security of Supply must reflect the reality that nuclear power does not and cannot play a role in a long term, secure and sustainable energy future for Europe.
- 2) Nuclear power should not be treated as a special case. Priority for resources within the Framework Program and other EU assistance programs should be removed. Furthermore, specific agencies established to promote nuclear power, such as Euratom, should be scaled-back or removed.
- 3) The Euratom Loan facility should not be extended.
- 4) Nuclear power should not be given priority status within the Kyoto negotiations and not included within the CDM or JI.

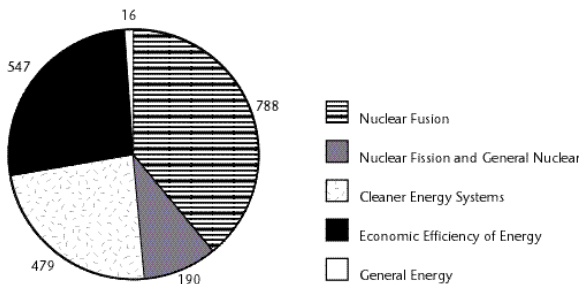
Nuclear Power – Fusion

The final Green Paper continues to express support for expanded research into nuclear fusion to enable it to “become a reality,”⁴⁰ without any justification. Within the European Union budgets fusion has already received significant funding. In the fourth framework program it received ECU 846 million, the largest share (35%) of any energy program. In the 5th program the budget was € 788 million, (see figure 6.1). The Scientific and Technical Committee for Euratom recently called for an increase in the Euratom budget as a whole for the 6th framework program and specifically to allow construction of the next stage of the fusion program.⁴⁰ Yet despite receiving considerable levels of funding fusion seems no closer to commercial realisation than thirty years ago.

³⁹ Green Paper, page 34.

⁴⁰ Strategic Issues Related to 6th Euratom Framework Programme (2002-2006), EUR 19150 EN.

6.1 The 5th Framework Program: Energy Budgets – MEURO



Action Needed for Nuclear Fusion

1) The EU should not support large scale fusion research. The 6th Framework program should cut its fusion program dramatically.

Climate Change

The emission scenarios put forward in the European Commission's publication *Energy Outlook to 2020* question the ability of the EU to meet even the first of the Kyoto targets, a reduction of 8% of 1990 emissions levels of CO₂ by 2010. The report predicts that the EU will increase its emissions by 7% between 1990 and 2010. Under their base line scenario the share of fossil fuels is projected to increase from the 1995 figure, even *"despite the significant pro-environment assumptions adopted in the baseline."*⁴¹ This predicted increase in the use of fossil fuels includes use by the power sector. Within the power sector, CO₂ emissions are expected to be stable until 2010 and then increase until 2020, 17% above 1990 levels. This rise is above the 14% average increase predicted across all sectors; only the transport sector is predicted to have greater increases in CO₂. The study further notes *"the crucial role that electricity and steam generation may be called to play in reducing emissions. Orchestrating this role may prove quite difficult in the circumstances of liberalised, mostly privately owned and competitive markets."*⁴²

The enlargement of the EU is unlikely to impact significantly upon the CO₂ emission scenarios in the short term for two main reasons.

- During the 1990's many countries in Central Europe experienced a significant decline in their

⁴¹ *Energy Outlook to 2020*, Chapter 3, page 63.

⁴² *Energy Outlook to 2020*, Chapter 4, page 95.

CO₂ emissions due to a reduction in industrial output caused by economic restructuring. Consequently, most of the Accession countries will, without having to employ specific reduction measures, meet their CO₂ targets of between 6-8% below 1990 levels.

- The overall CO₂ emissions of the CEE-10 (accession countries) are markedly lower than that of the EU-15.

However, the proportional rate of increase by CEE countries is expected to be higher than the EU as industrial output increases. Although large efficiency gains can be made in accession countries, additional action has to be taken across an enlarged EU to reduce CO₂ emissions particularly in the transport sector.

Key Events of 2001

Sustainable Development Strategy

Under the guidance of Commission President Romano Prodi, six themes are being investigated to produce a Sustainable Development Strategy for Europe. The Strategy will be discussed at the June 2001 Gothenburg EU Summit. The six areas are: poverty and social exclusion, public health, demographic prospects and ageing, climate change and clean forms of energy, depletion of natural resources, and mobility and the use of space. At the end of March a draft document will be released.

Discussion on Liberalisation of Energy Markets

The Lisbon EU Summit in March 2000 asked the Commission to prepare a review of the liberalisation of the EUs gas and electricity markets. The review was presented at the Stockholm European Council meeting in March and was mandated to investigate the implications for accelerating the liberalisation process, with some countries wanting a rapid move toward full market opening in both sectors. However, due to lack of consensus, no concrete date for market opening was agreed.

Green to White Paper for Security of Supply

In December 2000 the Commission released its Green Paper on Security of Supply. During 2001 the Commission will consult with various stakeholders before producing a White Paper.

Renewable Energy Directive

The Council amendments made to the Renewable Energy Directive will be reviewed by the European Parliament. Arbitration is expected by the end of 2001.

Energy Efficiency Discussion

Later this year the Commission will present a plan targeted to save energy, particularly in the building and transport sectors. The proposal will look at the development of a new generation of vehicles to improve fuel efficiency and to diversify towards electrical cars.

Framework Funding

The funding allocations for the 6th Framework program will be finalised during 2001. This will establish the priorities for energy research in the EU for the next five years. Currently (in the 5th Framework Program) nuclear fission and fusion receive a disproportionately high level of funding,

given their status and potential, while Energy Efficiency and Renewables attract only a disproportionately small fraction of the total energy bill. These allocations must be revised to reflect the potential of the technologies and their environmental impact.

What should be done?

DG TREN are proposing to stimulate a broad discussion on the Green Paper on Security of Supply. It claims to be open to all ideas and comments. It is vital that the public and interested bodies from the non-industrial sector become involved to counter the lobbying from the energy industry. DG TREN are developing a web site for comments; (http://europa.eu.int/comm/energy_transport/en/lpi_en.html). Comments must be submitted by November 2001.

National governments are expected to discuss and prepare their positions in April/May 2001. It is also expected that a series of round tables discussions will take place in Member States during 2001 with NGOs, political parties and industry.



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Web-page: <http://www.europarl.eu.int/greens-efa/>