ENERGY

Let us overcome our dependence

EUROPEAN COMMISSION

A great deal of additional information on the European Union is available on the Internet. It can be accessed through the Europa server **(http://europa.eu.int).**

The Directorate-General for Energy and Transport invites you to visit the Internet site devoted to the Green Paper: **(http://europa.eu.int/comm/energy_transport/en/lpi_lv_en1.html).**

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EUROPEAN
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LET US OVERCOME OUR DEPENDENCE

People only start to become concerned about energy when it is in short supply. Without energy, however, our daily life would be very different as the factories would grind to a halt, aeroplanes could not take off, cars could not start, and we would have no heating, hot water, electricity or computers. When we flick the switch on entering an unlit room, when we switch on the heating in our homes when the air starts to get chilly, we hardly spare a thought for the power stations which generate electricity, the electricity networks, the oil and gas pipelines which connect Europe to the Middle East or to the tankers cruising in the Channel.

While it may appear that Europe has been benefiting from a relative abundance of energy since the 1986 rebound from the oil crisis, thanks, in particular, to the nuclear power programme of some countries such as France, Belgium and Spain, or the penetration of natural gas into important markets like that of heating and electricity, the future might be less reassuring. The internal energy resources which nowadays cater for half our needs are drying up, whereas consumption is increasing. If no action is taken in the next 20 to 30 years, the environmental impact of energy will be untenable and our external energy dependence will rise to a level of 70 % on average, going up to

90 % in the case of oil products. This situation makes us vulnerable, particularly on account of our economic dependence on certain types of energy, such as oil and gas, and on particular exporting countries, such as Russia for natural gas and the Middle East for oil. What is more, energy production and consumption in fact account for almost all the man-made emissions of carbon dioxide into the atmosphere.

The time is right for us to make conscious and informed choices among the various sources of energy at our disposal before we flick that switch or jump into our cars. Important political decisions will have to be taken soon to ensure that our energy supply and consumption is more secure and more respectful of our environment. The purpose of this brochure is to provide readers with the knowledge they need to become aware of what is at stake regarding energy so that they may take part in the debate on energy launched by the Commission at my initiative, through a Green Paper on security of energy supply.

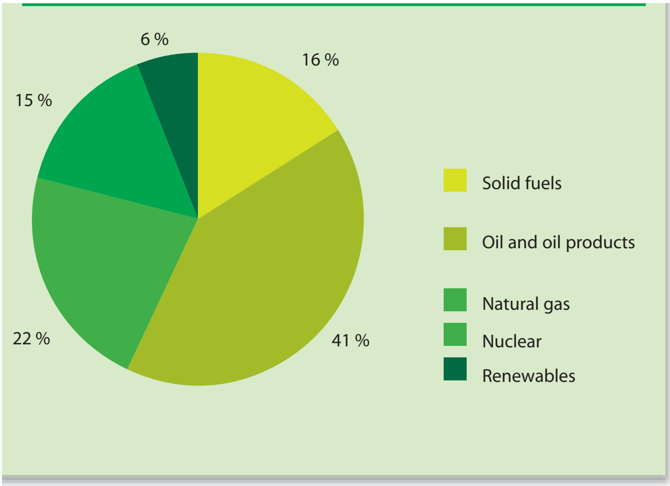
Loyola de Palacio
Vice-president
of the European Commission

INTRODUCTION

As we enter the third millennium, it is time for Europe to discuss the topic of energy. We must rethink our policy on securing energy supplies. This debate concerns all of us, as energy is essential in our daily life.

Our enormous dependence on fossil fuels (oil, gas and coal) is becoming ever more marked. This gives rise to a number of problems, among which we may list the prices of oil and gas with their impact on our economy and the life of millions of companies, the power attributed to the few external suppliers we have, pollution, of course, and finally, as we have witnessed recently, the risk of social upheaval when the markets spin out of control.

EU-15 — Primary energy balance 1998



Constraints which are less and less tolerable

We are already too dependent

Geopolitical constraints weigh heavily on the energy sector. Europe imports 50 % of its needs. Around 2030 this figure will have risen to 70 %. These imports concern almost exclusively fossil fuels.

Environmental constraints are making themselves felt in daily life. As from today we must lay the groundwork to produce energy or to travel in a way which is more respectful of the environment. Fossil fuels give rise to many environmental problems connected with their combustion and transport.

Geological constraints cause us to reflect that, in 50 years, there will be almost no more oil or gas. Alternatively, it will be very costly to extract these products, in a way which bears no relation to current prices. In other words, these natural resources exist in finite quantities and we are just squandering them.

A European debate

The aim is to put forward proactive strategies to attenuate, if not to counteract this dependence.

This debate can no longer be confined to each individual country, it must take place at European level. These constraints are, after all, shared by all the Member States and environmental laws within the European Union are being integrated. Since it was set up, the single market has been getting stronger. The role of European integration is precisely to avoid distortions of competition between Member States, particularly economic and fiscal distortions. The energy markets themselves are rapidly becoming integrated thanks to liberalisation, if not to say globalisation. The future enlargement of the Union where energy is concerned must be actively followed and monitored, as can already be seen in the area of nuclear safety. Finally, the Union needs to muster all its economic and political weight to face its major external energy suppliers. If we are to be taken seriously, we must present a united front.

An urgent debate

Why launch this discussion now? The electricity industry is undergoing upheavals, as a number of power plants are coming to the end of their lives and new investments must be decided on for the period 2005–10. The nuclear industry is also awaiting decisions about its future, given the particular circumstances in which the electricity market has been liberalised, the public is reticent, and the issue of waste, not to mention recycling and reprocessing, is currently unresolved. Economists have predicted that we are about to reach the point where oil will become more and more expensive to extract. But oil consumption is not falling, quite the opposite.

The short-term development of the energy industry must take account of the environmental undertakings entered into by the Union in Kyoto. In any case, if we carry on as we are, we will not even be able to respect them. Make no mistake, people in the Union are now highly aware of their environment and care about their health. Despite that, energy-saving measures are now nothing but old memories. Finally, the time seems ripe for partnerships with our major suppliers, such as Russia, in exchange for commitments to protect our investments.

Our energy choices must show more respect to the environment

To sum up, we can already start preparing a better future for our energy supply by lowering our dependence on fossil fuels. The Union would simultaneously solve the problem of its too great geographical dependence on energy imports. Let us not forget the social strife caused by the volatility of oil prices, for example. It would also eliminate many of our environmental problems. Finally, it could contribute to a better management of the planet's natural resources.

The operation proposed by the Green Paper amounts, ultimately, to working out strategies to guarantee Europeans clean energy at a reasonable cost and in sufficient quantity. To achieve this aim, action can be taken with regard to both energy supply and demand. It is, however, much more effective to work on demand: four units of energy are needed to start with for only one to be consumed. In order to do this, our first step must be to think about a more effective use of energy in order to consume less, while preserving our quality of life. All your proposals are welcome.

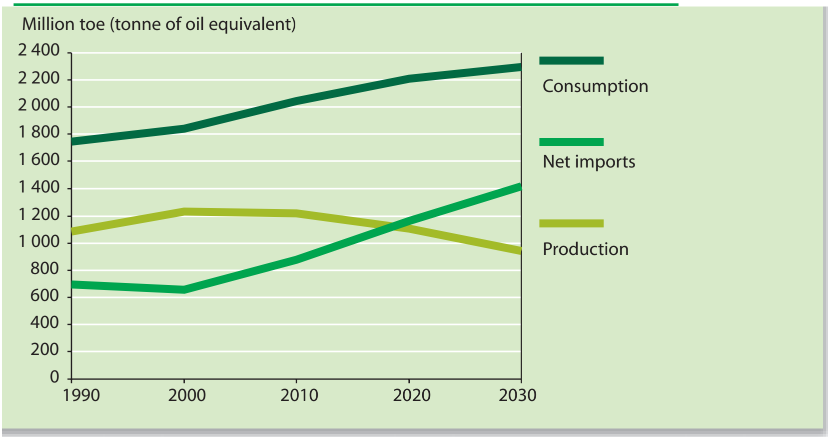
There is only one way forward: joint action

THE SITUATION REGARDING ENERGY IN THE EUROPEAN UNION

There is no point beating about the bush: the situation is far from rosy. Even if the EU has managed to reduce its energy intensity (the quantity of energy needed to produce a unit of wealth), all the warning lights are flashing. Energy consumption is rising by 1 to 2 % a year. Dependence on non-EU countries is starting to rise above 50 % again. Our scarce domestic resources are beginning to run out; in the case of coal, we talk about 'economic depletion', as it is far too expensive to mine. And to complete the picture, oil remains the favourite fuel of households, the services sector and transport. As luck would have it, this latter sector will witness a spectacular development in the near future. Let us look at all this in closer detail.

We are more and more dependent

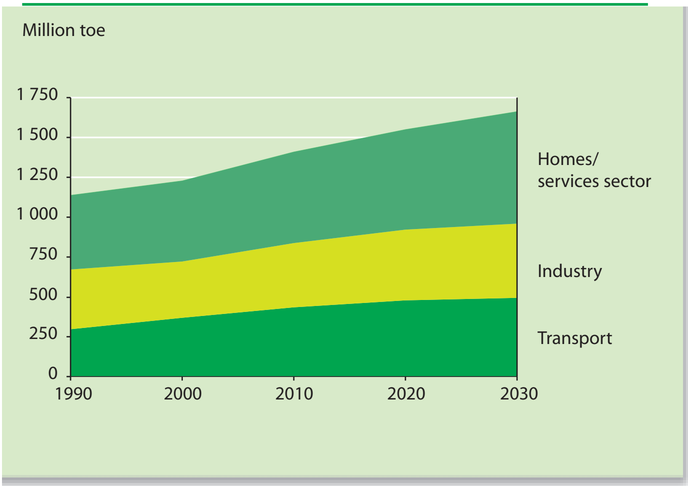
EU-30 — Energy balance



Consumption is not going down

Households and the services sector are mainly responsible for the growth in electricity consumption, transport and heat. It is indeed fortunate that industry has stabilised its consumption thanks to modernisation investments. Transport, on the other hand, is without doubt the leader in energy demand. All the forecasts predict an explosion in the activity of this largest consumer of oil.

EU-30 — Final energy consumption



Enlargement will not solve the problem as the new member countries of the EU will experience high economic growth (5–6 %). Energy demand will follow: 2 % every year from now until 2020. When it comes to transport, it is obvious that a geographically expanded Union will entail a steep increase in traffic.

We are all responsible

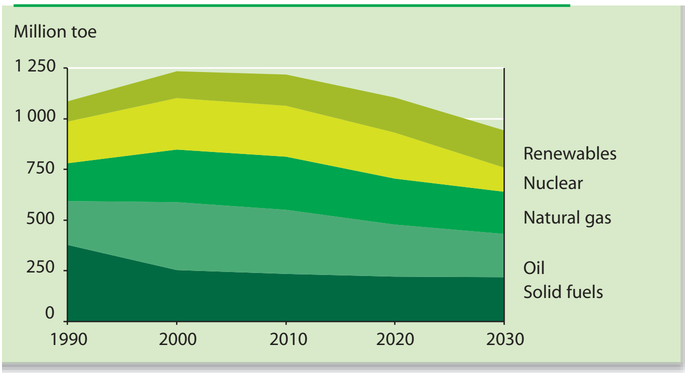
Transport accounts for 67 % of the final demand for oil, on which it is totally dependent (98 %). Energy intensity increased by 10 % between 1985 and 1998. Growth forecasts from now to 2010 are phenomenal: +16 % for cars, +90 % for aircraft, and 50 % more road traffic. The external cost of transport — from congestion, among other things — is estimated at 2 % of GDP.

Domestic resources are running out

The Union does not enjoy large domestic resources. Extraction costs more than elsewhere. We can expect our resources to steadily fall. The pace at which they run out will depend on world prices and technological progress. Enlargement will not improve this situation, except for coal. Only the potential of renewable energy sources has not been exploited as much as it could be because of their high production cost. If we remedy that problem, renewables could be the only source for the future in the Union.

We cannot count on our own resources

EU-30 — Energy production



North Sea **oil** will not last forever. It costs a lot to exploit the oil fields and reserves are limited. In the best case, these would represent a further 25 years of production or eight years of consumption at current levels. The costs of extraction are much higher than in the Middle East.

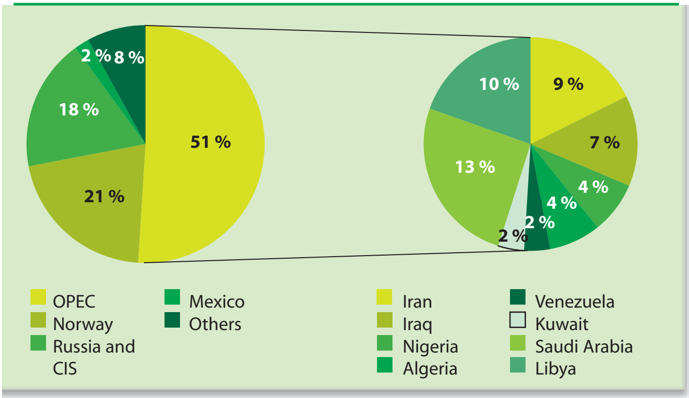
Our energy costs a lot to produce

Natural gas from the North Sea is following the same pattern as oil. Here, however, we can at least count on the production of Norway, a member of the European Economic Area. Its reserves represent 23 years of consumption at current levels.

Community coal costs three to four times the world price. Reserves of this mineral are very extensive and will be even more so with enlargement. But the problem of competitiveness will lead the EU to cut production drastically. Practically only in the United Kingdom could coal production become competitive again. Lignite and peat are profitable, but do not make any significant contribution to EU energy production.

Europe holds 2 % of world **uranium** reserves. Given that world prices are very low, an increasing number of European mines are no longer competitive. Vast amounts of uranium exist on the planet.

EU-15 — Imports of crude oil from non-EU countries in 1999

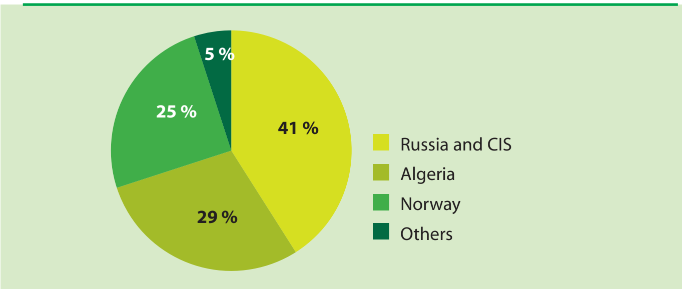


External dependence is increasing

If we consume more than we produce we will be obliged to either import more or to consume less. Even if we were to do that, we would never be self-sufficient in energy. The voluntarist energy policies (energy-saving, the nuclear programme, support for renewables, domestic production) which followed the first oil crisis are no longer sufficient. Imports are therefore going to increase to deal with growing demand. In 20 to 30 years, we will be 90 % dependent for oil, 70 % for gas and 100 % for coal. And enlargement can only reinforce these trends.

We are too dependent on some producers

EU-15 — Imports of natural gas from non-EU countries in 1999



The EU is an important customer on the international energy scene. In 1997, the bill for energy imports into the EU was EUR 120 billion. The EU absorbs 14–15 % of world energy consumption and is the biggest world importer of oil (19 % of world consumption) and of natural gas (16 % of the planet's requirements). In 1999, the bill for oil in the EU was EUR 240 billion. The price went through the roof in 2000. More than half the sum paid ended up in the coffers of Middle East oil producers.

External dependence does not of course raise the same problems for all energy products. The world markets for coal or uranium being highly fluid, well distributed geographically and not suffering from price volatility, there is no problem concerning these products. In the case of oil or gas, however, the market is very precarious and reserves are also distributed unequally. Price fluctuations can seriously affect our economy. What will happen when the demand for energy explodes in the developing countries?

The Union's present suppliers are not very numerous. Broadly speaking, we depend on the Middle East for oil and Russia and North Africa for gas. The products have to be paid for in American dollars. To that must be added the physical and political risks linked to the transport of energy products to Europe, which are more serious in the case of gas rather than oil. Geopolitical considerations are gaining ascendancy over economic considerations. In the present situation, we are less and less able to overcome our vulnerability.

In other words, we suffer from a singular lack of means for negotiation and pressure. Our margin for manoeuvre is limited, whether the crisis be acute or long-term.

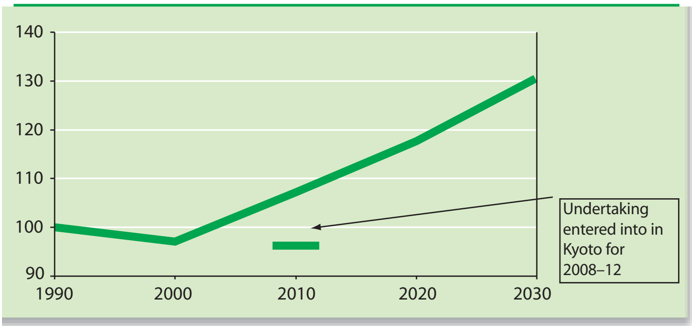
Threats weighing on the environment

Energy production, transport and consumption has a significant impact on the environment. The Union has fixed the environment as one of its priorities. Environmental considerations could therefore influence our decisions on energy in the future. Environmental impact assessments are becoming more and more strict for any economic activity. This concerns climate change, for instance, but also environmental pollution, oil pollution or nuclear incidents.

The battle against the greenhouse effect has become emblematic. Almost all the CO_2 emissions generated by man are attributable to the energy sector. This is a further consequence of our dependence on fossil fuels. European efforts must be focused on this issue, therefore. Transport and electricity/steam production are each responsible roughly for a third of CO_2 emissions.

Nine tenths of the increase in CO_2 emissions, however, is attributable to transport, particularly road transport. This is therefore a sector where action absolutely has to be taken. The longer we wait, the harder it will be.

EU-30 — CO_2 emissions (1990 = 100)



Without drastic measures, we will not be able to uphold our commitments

In the last decade, greenhouse gases (CO_2, methane, etc.) for which man is responsible were acknowledged as a serious threat to the planet's climate. These gases were speeding up climate change. Among other things, they are causing the ice caps to melt, the oceans to rise and even greater increases in atmospheric temperatures. These phenomena are occurring faster and in even more significant proportions than initially predicted. The EU is responsible for 14 % of world CO_2 emissions. At the Kyoto Conference in December 1997, it undertook to reduce between now and 2008–12 its greenhouse gas emissions by 8 %, compared with the figures for 1990. The current trend is an increase of 5 %.

Reducing emissions (apart from greenhouse gases) is a further economic challenge for the Union. European law has been imposing more and more strict constraints on activities which pollute. The following are particularly concerned: the quality of fuels, waste recovery operations and national emission ceilings for acidifying gases. It is clear that favour will be given to those activities which pollute the least.

Maritime safety is a great concern for the Union. The recent oil slicks are intolerable. There is much traffic of hydrocarbons in European waters. The Union is in the process of providing itself with better adapted laws on maritime safety. The fact remains that the more oil we consume, the more traffic there is and hence the risk of accidents is higher.

Nuclear safety is an important feature in our relations with the east European countries. While the Union itself does not yet have common standards, it is pushing for 'high' standards in central and eastern Europe. Potential health and environmental hazards from the nuclear industry are a cause for concern with a section of the public. Attention has been focused on the current failure to find a solution to the problem of storing highly radioactive waste.

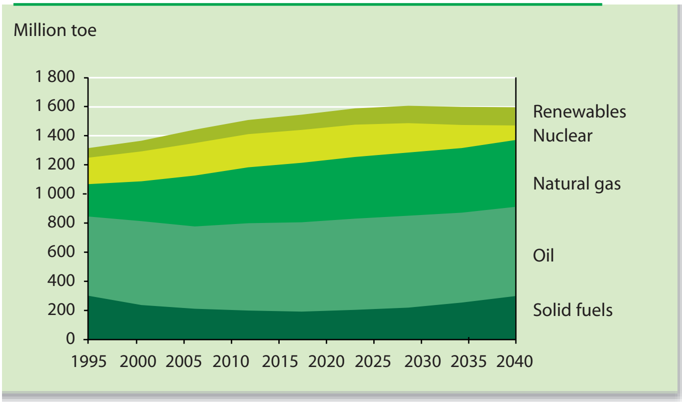
To conclude, unless we rectify some of the present trends regarding our energy balance, the future will be grim. We must slow down the growth in consumption by applying measures to demand. Renewable energy sources have an enormous potential. Our dependence on our external suppliers must be handled in a different way. Where the environment is concerned, we must take account of it in all our energy choices in order to favour the cleanest solutions possible. If we do not take radical steps from today onwards, we will not be able to honour our commitments. Nobody is going to do this for us and the consequences for the climate would be catastrophic. Now let us take a detailed look at the possible paths of action we could take.

ACTION CONCERNING SUPPLY

How can we ensure that there will always be energy sources to meet our requirements? In other words, how can we guarantee a sufficient supply and at a reasonable price? Every energy source can replace another, even partially, but this has advantages and drawbacks.

The all-powerful fossil fuels

Gross inland consumption in the EU



The EU is capable of generating 600 GWe of electricity. Between now and 2020 we will have to produce practically as much again to meet consumption requirements and to replace half of the present power stations which will reach the end of their lives. There are calls for oil and coal to reduce their role. Natural gas is going to predominate in new capacities. The nuclear sector will probably not expand. Its contribution will depend on several factors: the Kyoto process, competitiveness, acceptance by the public, solving the waste problem and safety in the countries applying for membership. The contribution from renewables will

depend on the political will to promote them and make them economically attractive. The liberalisation of the electricity and gas markets will certainly improve the efficiency of the system, but a drop in prices will incite people to greater consumption.

Oil must forfeit its supremacy

Oil's future looks bright, thanks to the transport industry. Oil unfortunately remains an essential component of our economy. We can either try to replace it, which is what has happened with electricity production (but is impossible in the air transport sector). Or we can do all that we can to guarantee its supply, at 'reasonable' prices, of course.

The substitution of liquid biofuels for road fuels is possible to a considerable extent. The only problem with these fuels is their production cost. The Member States do not appear to be willing to give them a great deal of support. They are, however, a source of energy which is 100 % indigenous. The other substitution fuel is natural gas, but its contribution will remain marginal if it is not given assistance.

Why not have 'Made in Europe' fuels?

The Union's **current suppliers** are concentrated in the Middle East and within OPEC. Their reactions are highly unpredictable since they are based on a number of geopolitical parameters. We must therefore set up a continuous dialogue with producers. This dialogue must lead to a reduction in price volatility. Together we must reach agreements and decide on courses of action which are in our mutual interest.

The possibility of finding **new suppliers** is more than feasible. Russia and the Caspian Sea area are the obvious choices. This would call for enormous investment and the Union's role would be crucial in creating the legal security needed to protect our investments. Talks with Russia have already begun concerning partnership in the energy sector.

National **energy reserves** should be placed under European control. In this way we could react consistently and rapidly to crises. In the event of price hikes, we could even envisage a system for intervening, as happens with the money markets.

There is always coal if we need it

Coal was the subject of the first European Treaty (ECSC). Despite this glorious past, it is now in an unfavourable position compared with hydrocarbons, being more polluting, having a lower calorific value, being less practical to transport and more bulky to stock. Its main advantage is its price, which is low and stable. Nevertheless, its share in our energy balance is going down.

Technological progress permits us to imagine that coal still has a future. Research is focusing on reducing its environmental impact and increasing its energy efficiency. Clean technologies (gasification, combustion) do exist but cannot be used without costly programmes for modernising power stations.

We still need coal

Maintaining access to Community coal reserves merits analysis. The electricity directive provides for 15 % of production being excluded from the liberalisation rules to give priority to indigenous energy sources. Why not European coal? In this way we could keep the mines open and preserve the technical know-how built up in the sector.

Natural gas is a double-edged sword

It took gas years to achieve its current status. It is now a favourite option thanks to its main advantages. It is easy to use, pollutes less than other fossil fuels, is abundant and relatively cheap. It could, however, become the victim of its own success.

The gas market is relatively inflexible because of this price indexation, deliveries under long-term contract and its transport via gas pipeline. Between now and 2010 a price increase in gas of about 20 % is expected. We must therefore ensure that there is real competition between our suppliers. As in the case of oil, reserve stocks could help the Union to arm itself against excessive vulnerability.

The price of natural gas is indexed to that of oil. There are historical reasons for this. Since it was geologically close to oil, the oil companies exploited it. Indexation enabled it at the beginning to be introduced progressively. Nowadays this mechanism can no longer be economically justified. It could ultimately be replaced by the law of supply and demand for gas. But there would have to be real competition between suppliers following liberalisation in the Union.

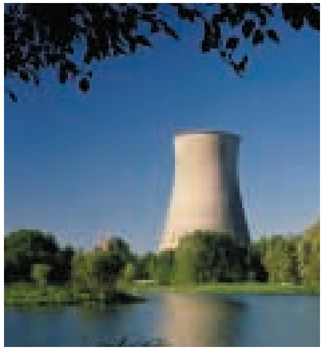
Diversifying supplies seems to be an appropriate solution to our growing external dependence. As with oil, it would be in the Union's interest to contribute to the construction of new transport infrastructures. It should be noted that it is possible to transport liquefied natural gas overseas. Potential suppliers can be found in central Asia, via the Atlantic (Nigeria, Trinidad), in the Middle East or in North Africa.

We must diversify our supplies

The nuclear industry can play a part

Nuclear energy makes a positive contribution to the Union's energy supply security. It produces only a negligible quantity of CO_2, and thus helps in the fight against climate change. It is used only for generating electricity, of which it provides more than a third in the Union.

The future of the nuclear sector is uncertain in the Union. Some Member States with nuclear power have decided to gradually shut down their power stations. They will be replaced by conventional power stations and by production units which use renewables. Apart from in Finland, there are currently no plans to build new nuclear power stations.



The future of the nuclear industry must be discussed

Research on nuclear power must be continued. The Union must safeguard its know-how in this area and maintain its leading edge. The experience acquired must be handed down to future generations and new, so-called 'clean', reactors must be developed. The research concerns the reactors of the future, nuclear fusion, irradiated fuel management and waste storage.

Waste management is currently blighting this industry. It is vital that the Union tackles this problem in the most transparent way to solve it. This will condition, to a certain extent, the future of the industry in the Union. It will not be possible for the nuclear industry to develop unless it is guaranteed a sufficient period of stability. For that, it will need the consensus of the population.

We must do more than just encourage renewables

Renewable energy sources cause very little pollution but are not yet profitable in the present context. It is high time that they were given a helping hand to develop. The Union cannot allow itself to neglect this indigenous energy source. The obstacles are, however, legionary. Apart from their cost, conditions of access to the market are unfavourable. A directive will guarantee renewables significant penetration into a liberalised electricity market.

The fiscal framework must be adapted for renewable energies. It must enable them to benefit from preferential conditions in order to be competitive with other energy sources. The fate of biofuels, for example, is totally conditioned by tax exemptions. Measures to promote their use are provided for.

What support should be given to renewable energies?

Aid is indispensable if they are to make an economic breakthrough. Initial investments are costly. Such aid can take a number of forms, including compensation funds, tax incentives, fixed prices, aid for R & D, priority rights to access electricity networks, development and operating subsidies, a contribution from other sources which are now profitable, etc.

The Union is currently providing itself with the most open and integrated single electricity and gas market in the world. This is based on a common approach to liberalisation comprising gradual openness, essential transparency measures, public service obligations, official forums for regulatory bodies, common principles for transmission tarification and a pan-European infrastructure plan. There are proposals on the table to go further in this direction. Their aim is that from 2005 every citizen will be able to choose his electricity and gas supplier. These sectors are currently introducing changes aimed at greater efficiency and improved services.

The combined production of heat and electricity (cogeneration) is considered a green energy. The applications of this mode of production are highly innovatory. Micro turbines make it possible to generate more and more decentralised heat/electricity. Thanks to its ever higher efficiency (between 80 and 99 %), cogeneration makes it possible to reduce the demand for primary energy and CO_2 emissions. With the appropriate regulatory framework, it could triple between now and 2010.

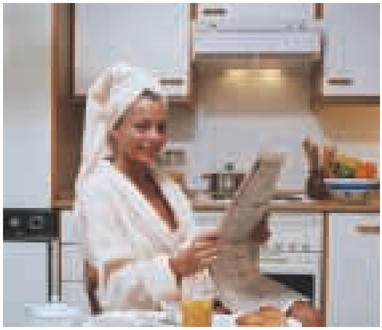
In current conditions, the market share of renewables will stagnate around 7 % within 10 years. Only financial measures will help them to double their share in the energy balance from 6 % to 12 %.

No frontiers for electrons and methane

To sum up, the Union is faced with difficult choices. Energy is occupying an increasingly important position in our foreign policy. For us to secure our external supplies, new forms of partnership will be required with the supplying and transit countries. We will have to step up the dialogue with producing countries, establish favoured partnerships, find new suppliers thanks to new networks and, finally, secure and modernise existing supply networks. We will have to give massive support to renewables, just as we have supported other energy sources. Renewables are far from replacing other sources, however. We must also respond rapidly to the sensitive question of the role of nuclear energy in the Union. In any case we will have to favour less polluting energy sources. Greater integration of the electricity and gas markets will help to make the system more efficient. Nevertheless, we can see that the scope for intervening with respect to demand is limited. There is no consensus within the Union for a common energy policy. Energy market trends and outlook also limit our margin of manoeuvre. That is why action concerning demand seems much more within our grasp.

ACTION
TO CURB DEMAND

Europe first took measures to curb its demand for energy during the first oil crisis in 1973. At that time national measures were introduced, with uneven results. Now it is high time to adopt a voluntarist policy. The potential for energy saving is great and there are many courses of action which could be followed.

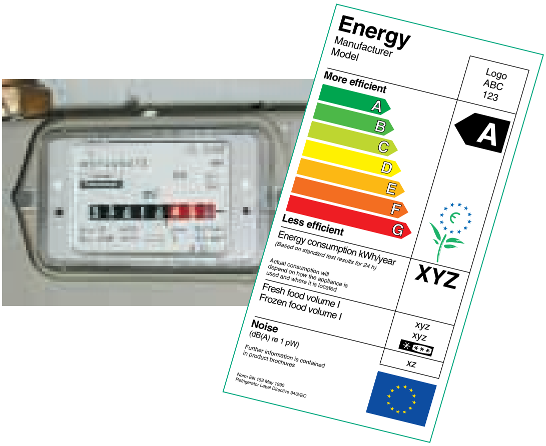


There is a price to pay for our comfort

Greater energy efficiency will have a positive impact on supply. Our overall efficiency is only 25 %. The rest is wasted. For instance, when electricity is generated, the very best we can hope for is 50 % efficiency; the rest is lost as heat. Energy is also needed upstream of the power station to produce and convey the fuel it needs. Downstream there are losses on the electricity grid. And what about all the energy that is wasted later on! A unit which is not consumed, therefore, is equal to saving four, in fact.

Reducing energy intensity further

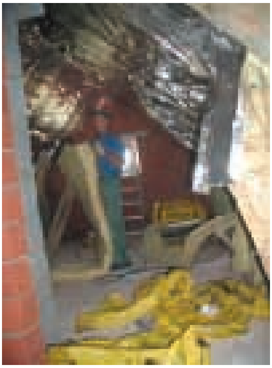
Energy efficiency endeavours have gradually run out of steam. The economic potential of improving energy efficiency, however, is still estimated at 18 % of current energy consumption. The main stumbling block is the attitude of consumers, who are reluctant to use energy efficiency technologies. The efficient products available, however, can really contribute to energy saving.



More efficient appliances

The specific measures financed by the European programme SAVE have made it possible to achieve very good results. Rules on the labelling of equipment and standards concerning the efficiency of refrigerators and boilers have been successful when they have been correctly implemented. That depends, above all, on monitoring the implementation of the directive. Refrigerators on sale nowadays consume on average 27 % less energy than before. Just think: 15 large electricity power stations are needed to fuel all the fridges of Europe! Similar tendencies are seen in the case of washing machines and ovens, which have been included in a complete strategy for domestic appliances.

The Union must now completely review its demand management policy. The European Commission adopted an action plan on improving energy efficiency in April 2000. It proposes improving the energy intensity of the EU by 1 % per year up to 2010. The funds allocated to this area are, however, derisory.



Major potential for savings in our buildings

The building industry is responsible for more than 40 % of total energy consumption. This includes the costs of heating, hot water production, cooling and lighting. It might be possible to reduce this consumption by more than 22 % between now and 2010 if good conditions concerning costs and efficiency are applied. A proposal for a directive on the energy performance of buildings is now on the table. It puts forward a common methodology for calculating the energy performance of new buildings under construction or buildings being renovated, the application of minimum standards in this area, a system for certifying buildings and the inspecting of heating and cooling installations. More than 10 million boilers in the Union are more than 20 years old. Replacing these boilers would alone reduce consumption of the energy used to heat private homes by about 5 %.

A number of paths to explore in different sectors

If we consider sectoral policies, the potential for energy saving is within our grasp. There are substantial job prospects in some sectors. The European Commission is intending to launch new measures without delay.

Industry can still play a part. The major energy consumers have made remarkable progress. They are now reaching high levels of efficiency. There is still some room for improvement, however.

The construction industry remains a priority sector when it comes to improving energy efficiency. In this area, at least a fifth of energy consumption could be saved easily. All that is needed is to make use of the available and viable energy saving technologies such as thermal insulation, air circulation, electrical equipment, etc. Legislators have a whole panoply of instruments at their disposal for this, including renovation incentives, standards regarding consumption, energy saving thresholds, energy certificates, etc.

Lighting offers tremendous scope for savings. Appropriate investment would make it possible to save 30 to 50 % of electricity. The European Commission is currently introducing a voluntary agreement with industry in this area. The Union has also adopted a directive laying down efficiency standards for fluorescent lights.

Electrical appliances also represent an enormous savings potential. More effective standby mechanisms would permit substantial savings. This concerns computers, office equipment, television sets, video recorders, etc.

Transport, given its importance where demand is concerned, especially for oil, calls for drastic measures. A rebalancing of the different modes of transport will have to take place. Rail must be revitalised, to the detriment of road transport. The latter must be restructured. Short-distance sea transport and river transport must be stepped up. Clean public transport systems must be encouraged in towns. We must develop more energetically efficient vehicles (hybrid vehicles, fuel-cell vehicles).

New technologies are the future of energy efficiency. It is vital that they benefit from increased Community support. Support for the technological supply side has existed for a long time. More support could be given to demand in order to benefit potential users. By helping local entities to equip themselves, assistance can be given to the progressive creation of markets of sufficient size. That is more effective than giving aid to industry. In addition, large-scale experiments are true showcases of what can be achieved.

Road transport's share must be reduced

The White Paper on transport aims at curbing the expected growth of transport between now and 2010. The imbalances between the different modes of transport must be reduced and respect for the environment promoted. Restructuring of the road haulage sector will be encouraged. The opening up of the market will revitalise rail which will thereby become more competitive compared to road. Boosting intermodal transport, the creation of a real trans-European transport network and the promotion of technological innovation will also feature among the priorities. The Commission would also like to encourage the Member States to harmonise their pricing principles. The latter must take into account the external costs (pollution, accidents) of the different modes of

transport. This will help to reduce distortions between the latter and their harmful effects. There is also a need to promote non-polluting urban transport. The Commission also intends encouraging energy efficiency in transport, particularly that of engines and fuels.

Tax on energy must be adapted

This is a simple and effective tool for inducing changes in behaviour. It also makes it possible to incorporate into the price of energy damage caused to the environment. Fiscal disparities must not exist in a single European market. There is a risk of competition between tax systems and distortions of competition. So the Union must provide itself with a common tax framework for energy. Some Member States do not want this and that is a pity. As long as energy prices do not reflect their real cost for society, consumer choices and behaviour will not change.

In conclusion, we need to equip ourselves now with the most efficient instruments to tailor demand. These include taxation, regulatory measures and market instruments. We cannot carry on consuming indiscriminately. The price of energy must be fair and must encourage people to make savings. Better management of demand would also have positive effects on the environment. If fewer fossil fuels are used, that means less CO_2 and less pollution. Above all, however, it reduces our dependence on the outside.

Paying the right price for energy

DEBATING OUR FUTURE
ENERGY OPTIONS

To sum up, the Union still has the means for action, even if such means are limited. The discussion launched by the European Commission should make us face the facts. We are heading for a dependence on resources from outside the EU which will be difficult to sustain. We will not fulfil our environmental objectives if we do nothing. The situation will get worse when the Union expands. So how can we guarantee security of energy supply?

The role of the authorities remains primordial

The public authorities set the framework within which the market operates. Energy policy can be firmly oriented, particularly through action in the taxation field. In any case, security of supply requires much more than simple coordination between the Member States. Policies will have much more force and legitimacy if they are decided at European level. How long can we carry on without this?

Action to secure supply: killing two birds with one stone

To affect supply, some actions have to be taken right away with a view to guaranteeing security of energy supplies. Networks must be made more secure, agreements formulated with our suppliers. Renewables are the only indigenous source of energy which we possess. They must be given massive support. It is also by favouring some sources to the detriment of others that we can guarantee that energy production is more respectful of the environment. It cannot be said that present taxation systems reflect properly the overall cost of each energy source for society.

Action to curb demand: consumer choice

No choice is left for action to curb demand: only restrictive polices such as taxation or regulatory measures can lead to a concrete result. Action has to be taken on two levels. Firstly, energetically efficient technologies have to be made available (products, home automation, etc.). The next step is to make consumers take responsibility by making them aware to what extent their choices weigh on the environment. Pollution and the steady dwindling of resources are everybody's business.

Reviewing all the options

To devise a coherent strategy, all the options must be reviewed and agreement reached on the measures to be taken, on an acceptable cost and on how the efforts are to be divided among those responsible. That is what this debate launched by the Green Paper is all about. We can however already be certain that transport will be one of the key sectors in the strategies to be devised.

A debate to turn citizens into responsible consumers

To sum up, it is probably necessary to make consumers more responsible by giving them the means to choose their energy options, as regards both production and consumption. Decision-making must be decentralised, the power being conferred to choose and manage the consequences of one's choices. The Union must however guide these choices according to strategic objectives (security of supply and the environment). It is clear that the capacity for public intervention is more and more limited in a single market. Despite all that, only the national and European authorities can influence the future with the aid of appropriate instruments. This Green Paper sets out to reflect on these instruments.

European Commission

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