

THE MANAGEMENT OF RADIOACTIVE WASTE IN THE EUROPEAN UNION – OPINIONS, SITUATION AND PROPOSAL FOR CHANGES

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Introduction

Radioactive waste is seen by many as the major issue for nuclear energy. It is a widely held view that the nuclear option can only remain open if all radioactive wastes can be managed in a safe and sustainable way. Public opinion surveys conducted by the European Commission show that while they know little about radioactive waste, the Public feel concerned about it and have very little trust in the nuclear industry (**Part A**). Most do not realise that the industry is already safely disposing of a high percentage of the waste that it generates. However, no long-lived high-level waste has yet been disposed of in the European Union and progress towards identifying a disposal route has been too slow in several States (**Part B**). There is a growing need to guarantee a high level of nuclear safety across a soon to be enlarged European Union. The Commission's proposal for legislation covering spent fuel and radioactive waste should be an important step in achieving this (**Part C**).

Part A. Public Opinion on radioactive waste

In 1998, the European Commission conducted a public opinion survey on the subject of radioactive waste (Eurobarometer EB 50¹). Over 16 000 people across the Union were interviewed on the subject. A new survey was carried out in October/November 2001 (Eurobarometer EB 56.2²). A comparison of the results of the two surveys on public opinion in the European Union on radioactive waste generally show that in the intervening period there had been very few really significant changes. The events of 11 September 2001, in particular, appear to have had no measurable impact on people's views.

The information from these two surveys is supplemented by data from a more recent Eurobarometer survey (spring 2002) covering all energy sources that included a number of questions about nuclear energy and its wastes (Eurobarometer EB 57³).

More detailed results of the survey are available on the European Commission's web site[†].

People are worried about radioactive waste

From both radioactive waste management surveys it is clear that the average European is worried about radioactive waste. He or she is also very poorly informed about the topic. In 1998, three quarters of the population were worried about radioactive waste. There was considerable regional variation in the replies. Those in the south of the Union were most worried (up to 98% in Greece) while those in the Northeast had the least concern (down to 41% in Sweden).

In five Member States there were more people who said they were "not worried" than said they were "worried". These were Luxembourg, Finland, the Netherlands, Denmark and Sweden. Greece still had the most people worried by radioactive waste. Rather surprisingly, among the "worried" States, France scored very highly – with nearly 75% being worried about waste.

* The views expressed in this paper are those of the author and may not reflect the position of the European Commission

† For nuclear activities: http://europa.eu.int/comm/energy/nuclear/index_en.htm
For Public Opinion surveys: http://europa.eu.int/comm/public_opinion/archives/special.htm

People are not well informed about radioactive waste

Three quarters of the people questioned thought they were not well informed on the subject in both surveys. Only between 2% and 3% of the Public thought they were very well informed. From the questions we included to test the knowledge of the individuals, they were generally accurate in their assessment of their low level of knowledge.

For example, in the 1998 survey we asked each person which Member State in his or her opinion produced the most radioactive waste. The answer is France. However, Germany was the first choice in five Member States (Denmark, Greece, Spain, Portugal and Sweden), equal first with France in Finland and only slightly behind France in the opinion of the French. The UK was first choice in the UK - and also in Ireland. However, over 40% of those interviewed replied "don't know" to this question.

What is done with low-level radioactive waste?

When we asked what was done with low level radioactive waste, very few people – one person in eight - realised that the large majority of the waste is disposed of by shallow burial. Even in France – where disposal sites have been in operation for many years - only 16% identified at or near surface burial as the technique used for disposal of such wastes, with nearly twice as many opting for deep disposal.

Trusted sources of information

Asked who they would turn to for further information or trust concerning how radioactive waste is managed in their country, the average European is divided between independent scientists (32%), NGOs (31%), government bodies (29%), waste agencies (27%) with the media (23%) and international organisations (22%) also playing a role. The nuclear industry was the least trusted source of all – with only 10%. There was considerable regional variation – with Swedes trusting most sources and Italians trusting hardly anybody!

The people in Sweden, for example, have a high level of trust in their national waste management agency (60%) and over 36% trust the nuclear industry in general. The large majority of Swedes also trust NGOs (70%), the Media (55%) and Government (52%). Over 40% of the people in Germany trusted their waste agency – though only 10% trusted the nuclear industry. Portugal has the lowest level of trust in NGOs (19%). Italy has little belief in its Media on such issues (17%) and even less in independent scientists (16%)!

It is interesting to note that nearly 10% of the population spontaneously said they did not trust anybody to give them information about radioactive waste.

Accurate reporting

When we asked people if they thought the media was fair in its reporting of nuclear issues, there was a 50/50 split. The Irish had the greatest faith in their Media, with 80% thinking the reporting is fair. The Danes are also ready to believe the Media (66%) with the UK not that far behind (63%). The Italians have the lowest opinion of the accuracy of the Media with only one person in three thinking it reports fairly.

Less than 20% thought that the nuclear industry was open in its reporting, while almost 70% said it was not. This is a very worrying statistic. However, once again there is significant regional variation. While only 12% of Italians think that the nuclear industry is open in providing information, over 46% of the people in Sweden agreeing that the industry in their country is. It might not be unreasonable to assume that this is because Sweden is probably the Member State with the strongest industry/public interaction in the nuclear sector – and a leader in Public involvement in the various consultation processes.

Why has high-level waste not been disposed of?

When we asked people why they thought high-level waste had not yet been disposed of, nearly half of them (46%) said because there was no safe way to do it. Not surprisingly, it is in the more "anti-nuclear" of the States (such as Austria and Ireland) that this percentage tends to be highest. However, rather surprisingly, it is a view held by close to 50% of Swedes and over 50% of French people. On the

other hand, only around 20% believe that the delay was caused by the authorities carefully assessing all the risks before taking a decision and a similar percentage believe that that a decision might be politically unpopular.

Ninety percent of respondents thought that the lack of a decision on how to dispose of the high-level waste had a negative impact on the image of nuclear energy.

Some interesting perceptions about nuclear in relation to other energy sources

It is interesting to examine the Public's view on radioactive waste in the context of their perception of present and future energy supply and nuclear's role in it. The following results are taken from an even more recent Eurobarometer regarding European opinions on energy in general (EB 57). This survey was conducted in spring (mainly March) 2002.

- Asking people how much of the electricity in their State was produced by nuclear energy gave some rather surprising results. Nearly one Austrian in five believes that nuclear produces a significant amount of electricity in the country. In Italy a majority of respondents thought nuclear produced at least a "medium" amount of their electricity. There was a surprisingly high percentage of "don't knows" with 34% in Portugal and 30% in Greece – neither State producing nuclear electricity.
- Around 90% of those interviewed thought global warming and climate change are serious issues which need immediate action. However, nearly half the people interviewed thought nuclear power makes a significant contribution to climate change. Excluding the "don't knows" this percentage rose to 63%. In fact, the majority of respondents gave this answer in most Member States (over 90% in Greece, close to 90% in Spain and over 85% in Portugal). In only four Member States – Sweden (23%), Denmark (30%), Finland (34%) and the Netherlands (43%) – was this view held by the minority.
- Over 30% think that new and renewables (including hydro) will provide us with most of our energy in 50 years time. Fusion (16%) was the second choice, followed by gas (14%), nuclear (12%) and Oil (10%). Solid fuels came last with 3%. Fusion was identified as likely to produce more of our energy than fission.
- The majority of people also thought that new and renewables would be the least expensive form of energy by that time. Asked if they would be willing to pay more for such energy, the resounding answer was "No"!
- Given a list of eight possible priority topics for government action, the majority of people identified food safety (52%), but this was quite closely followed by nuclear safety (50%) and then by management and disposal of radioactive waste (47%). A maximum of three answers was possible. Road accidents – that result in thousands of deaths across the EU each year – was only identified as a priority by 19%. Safety of oil and gas transport was identified by 16%.

Do you agree that.....?

In the 2001 survey, we made a number of statements and asked the Public if they agreed or disagreed with them.

One of these concerned keeping the nuclear option open. We said "if all the waste is safely managed, nuclear power should remain an option for electricity production in the European Union". Just over 50% of the people agreed with this statement while only 25% disagreed and the same percentage did not know. This 2:1 ratio holds for many Member States and rises to over 3:1 in Belgium, Italy and Sweden. In fact, in only one Member State (Austria) was there a majority against keeping the option open.

Another statement was that "the generation using nuclear power should be responsible for dealing with its waste". You will probably not be surprised to know that 80% agreed with this while only 7% disagreed. There was a 13% "don't know", with again the Iberian peninsula accounting for many of these while the Scandinavian Member States had by far the smallest number. If you are not surprised, maybe you can explain why so few States are not really doing anything about taking decisions on the long-term management of their waste.

Some key messages from the Public

Some brief conclusions can be drawn:

- The average European is worried about radioactive waste
- The average European knows very little about radioactive waste and how it is managed
- The average European wants to know more about radioactive waste.
- The waste management agencies are trusted sources of information in some countries – but not in all
- The nuclear industry is trusted by very few people
- A solution to the waste issue is a vital step in Public perception

Part B. Radioactive Waste Management -The present situation

Earlier this year, the Commission published its fifth “Situation Report” on radioactive waste management in the European Union⁴. The full report can be downloaded from our web site.

Annual production of all conditioned radioactive waste in the EU is reported at around 40,000 m³. This is around 10,000 m³ year less than was reported in our fourth situation report in 1999. A comparison with what was expected when we produced the previous report shows an even more dramatic reduction. In 1992 we forecast 80,000 m³/year for the Community. Even without taking into account the arisings in Austria, Finland and Sweden, which were not Member States at that time of the last report, the present production of waste is now less than half of what we had predicted.

The reasons for this reduction are: the construction of new power plants has been practically halted; a number of older plants have been definitively closed down; nuclear power plant operators have made tremendous efforts to reduce waste production at the source; and they have applied advanced volume reduction techniques. Costs and charges for management and disposal have been important drivers here.

Quantities of high level waste and spent fuel are somewhat more difficult to calculate as it depends on the actual technology used for the management of the spent fuel – the reprocessing or direct disposal route. Some States calculate the actual amount of glass containing the waste for disposal rather than the volume of the waste itself. Others calculate the weight of heavy metal contained in the fuel elements. We would estimate that the total volume of such waste – once it is in a form for disposal – would be in the region of 400 to 500 m³/year. Around half of this would be vitrified waste and the remainder spent fuel.

We should keep these quantities in perspective. It is estimated that approximately 2 billion tonnes of waste are produced in the Union every year – close to 4 tonnes per inhabitant. Around 35 million tonnes of this is “hazardous waste” – 80 kg per inhabitant. These include pesticide residues, heavy metals, asbestos and contaminated hospital wastes. There are around 55 000 sites in the Union contaminated by waste disposal – of which almost half are in a “critical state”, threatening public health and groundwater quality in the vicinity of the site.

Of the radioactive waste, a very large percentage of it is now disposed of in very closely regulated sites. By now, close to 2 million m³ of low and some intermediate level wastes have been finally disposed of. A large majority of the wastes have been disposed of at Drigg in the UK and at the Centre de la Manche and Centre de l’Aube in France. Until 1982 ocean disposal was frequently used, but there is a moratorium on such practices that is unlikely to be overturned in the foreseeable future. Near surface and shallow disposal are still the main techniques used. Finland, France, Spain, Sweden and the United Kingdom operate surface- and shallow-disposal facilities for radioactive waste containing only small quantities of long-lived radionuclides. Until recently, Germany ran a deep geological disposal facility in a former salt mine. This is now closed and will be decommissioned. A new site, the Konrad mine, has recently been granted a licence, but this is now the subject of a legal challenge that could take at least another year to reverse. Belgium and the Netherlands do not have disposal sites for low and intermediate level waste – nor does Italy many years after it closed its nuclear power plants.

The fifth situation report, for the first time, also contains estimates of radioactive waste in the “adhesion countries” – those States that will join the Union in May 2004. They produce around 5,000 m³ of low and intermediate level waste each year and approximately 500 tonnes of spent nuclear fuel. Only two

countries – the Czech Republic and Slovakia – have repositories for low and intermediate level nuclear waste. (Some others have repositories for institutional wastes only).

The biggest issue for radioactive waste management

Undoubtedly the single biggest issue concerning radioactive waste management is that of high level waste. Most processes involved in radioactive waste management have reached the stage of industrial use. The only element lacking is actual disposal of high-level and heat-generating waste.

Some countries managing high level wastes have no plans for what to do with it. Several countries with nuclear power production plants, have - to date - decided to postpone disposal of high-level waste for periods ranging from at least fifty to more than one hundred years. Only Sweden and Finland are close to authorising sites. Most are still far from doing so. The accession countries are generally lag behind the current Member States, having initially expected to export their spent fuel to Russia.

It must be clear that the present situation regarding storage of high level radioactive waste in the European Union does not pose any significant environmental or radiological threat. However, it was never the intention to store these wastes indefinitely. Therefore the delays in identifying sites for geological repositories in many of the Member States must be a cause for concern.

In the past, some of the reasons for delay were technical. Storage at the surface allows the highly active shorter-lived radionuclides to decay, reducing their radioactivity and heat generation. This makes their eventual disposal easier and simplifies repository design. In addition, the volumes of such waste are small and they could be easily managed at or near the surface. There was little urgency to identify a disposal site. This delay allowed extra time for possible advances in disposal technology.

But now, there is a very broad consensus on the concept of geological disposal. The necessary technologies to do it have all been tried and tested. Research and development will continue to refine data, models, and concepts related to long-term safety of disposal. In particular, it is most important that work continue in the underground laboratories as they provide invaluable insight into the behaviour of future repositories. However, the experts have very little, if any doubt that we could dispose safely of wastes today. There are now no technical reasons to delay decisions on disposal.

However, there continues to be opposition from large sectors of the public to most proposals concerning the siting of repositories. Given this, it is increasingly difficult to get political support – or even political decisions – on such sites. This failure to advance to the next stage in the waste management process reinforces the Public's initial suspicions and resistance. In turn, this makes political decisions even harder.

Part C. The “nuclear package”

The nuclear package contained five sets of documents. Three of these were formally adopted by the Commission:

- A Communication from the Commission to the Council and to the European Parliament on “Nuclear Safety in the European Union” [COM(2002) 605 final]
- A Communication to the Commission “Trade in nuclear materials with Russia “ and a proposal for a Council decision instructing the Commission to negotiate a co-operation agreement between the European Atomic Energy Community and the Russian Federation in the area of trade in nuclear materials
- A proposal for a Council Decision to raise the ceiling for Euratom loans for nuclear installations from 4 billion euros to 6 billion euros⁵

The two other documents were draft proposals for new legislation that were “approved” by the Commission for submission to a group of experts from the Member States for its opinion. They were:

- A draft proposal for a Council Euratom Directive “Setting out the basic obligations and general principles for the safety of nuclear installations “
- A draft proposal for a Council Euratom Directive “The management of spent nuclear fuel and radioactive waste”

The Group of Experts gave their opinion on the drafts in December 2002 and the two proposals were formally adopted by the Commission in January 2003 [COM(2003)32 final].

A Community approach to nuclear safety

The future approach to nuclear safety at a Community level is set out in a new Directive “Defining the basic obligations and general principles for the safety of nuclear installations “. This is usually referred to as the “Safety Directive”. The interest from the specific point of view of radioactive waste management is twofold. Firstly, the Directive covers all nuclear installations, not just nuclear power plants. As such it covers all the facilities for the management on spent nuclear fuel and radioactive waste – including for their disposal. Secondly, there is an important part dealing specifically with “decommissioning funds”. Decommissioning wastes form an ever more important part of the radioactive waste stream – and the management of spent nuclear fuel and radioactive waste is responsible for a major part of the costs following closure of a nuclear facility.

In brief, what this Directive would do is take the methodology that the Member States themselves used to evaluate or verify the level of nuclear safety in the candidate countries – a methodology based mainly on national reports and peer reviews by nuclear regulators - and to formalise it into European law. It could then be applied to all Member States – both old and new - in an enlarged European Union.

Member States will be required to produce regular report on all aspects of nuclear safety in their country and these will be the subject of “peer reviews” and compiled into a regular report on nuclear safety in the EU. This reporting will be backed up by a system of verification that will rely mainly on the technical experts from national safety authorities. The focus of this verification system will be on checking the ways in which national safety authorities carry out their tasks in order to assure the Community that there is an equivalent level of nuclear safety regulation and control throughout the EU.

In addition, given the difficulties the Member States had in setting up and making the safety evaluations because of the absence of common standards for nuclear safety, the Directive includes a proposal that the Union set about building up a body of European standards. These would, at least in the first instance, be based on the standards developed at the International Atomic Energy Agency (IAEA) in Vienna. An important element in the area of radioactive waste management, will be the Safety Requirements for geological disposal of radioactive waste, that are currently being developed in the IAEA’s Waste Safety Standards Committee (WASSC)⁶.

Decommissioning funds

There is also a small part of the “Safety Directive” that deals with the rather sensitive – but very important – issue of decommissioning funds. This was not initially foreseen when the Safety Directive was drafted, but was inserted into the package in response to a proposal by the European Parliament.

In March 2002, the European Parliament voted with a large majority to adopt an amendment to a Directive on opening up of the electricity market. This amendment called for decommissioning funds to be set up and managed in such a way that sufficient funds would be available when necessary for the safe decommissioning of all nuclear power plants, including for the management of the wastes. Moreover, the amendment said that the funds should not be used for any other purpose than decommissioning

Decommissioning of nuclear installations is inseparable from the issue of radioactive waste management. Decommissioning is the process that provides an ever-increasing part of the radioactive waste stream. Also, the management of the wastes following closure of an installation is a very important element of the total liabilities. In some instances, especially in those countries with small or relatively limited nuclear programmes, the cost of managing the wastes may account for more than half of the total decommissioning costs.

The primary objective of the proposed new European legislation in this area is to make sure that sufficient resources are collected over the operating lifetime of an installation to cover all end-of-life nuclear liabilities.

Normally, the necessary resources will have to have been built up by the plant operator during the active life of the nuclear installation. However, it is not simply a question of collecting money but of managing it in such a way that it is available as and when required over a long period of time.

Furthermore, because of the size of the funds, there is concern that they are managed in such a way so as not to disrupt the electricity market.

In order to meet the primary objective and other concerns, the legislation aims at creating decommissioning funds that are independent from the regular accounts of the operators and specifically earmarked for the decommissioning of their nuclear installations. In other words, the funds would be “segregated” or “ring-fenced”. Only in exceptional cases, where duly justified reasons make such a separation of funds impossible, the management of the funds could continue to be undertaken by the operator, provided that the availability of assets to cover the costs of decommissioning operations is guaranteed.

The proposed legislation covers the decommissioning of **all nuclear installations** – not just nuclear power plants. While the funds are referred to as “decommissioning” funds for simplicity, they must also cover **all nuclear liabilities** that remain at the end of an installation's normal life. In other words, they must cover the management of any remaining spent fuel and radioactive waste, including disposal.

The present proposal leaves a great deal of the detail concerning the size of the funds, how they are to be collected and how they are to be managed to the individual Member States. This is reasonable given the variety of financing schemes presently in use throughout the Union which will take some time to harmonise and the fact that Member States will be ultimately responsible for making sure that decommissioning is completed to a high standard of safety.

Management of spent fuel and radioactive waste

The use of nuclear energy to generate electricity results in the production of spent nuclear fuel and radioactive waste. In the European Union – as in other regions of the world - the most hazardous and radiologically toxic forms of this material are presently held in temporary storage facilities. None has yet been disposed of. In the meantime, accumulations of this material continue to grow.

Irrespective of future strategies regarding energy production, the waste that exists now must be dealt with in a way that respects the basic principles of protection of human health and the environment. Action must be taken very soon to ensure that the responsibility and burden of managing the growing quantities of spent fuel and waste held in temporary storage are not passed on to future generations. Current policies in most Member States and those countries that are candidates to join the Union do not adequately address these issues.

This situation must change. It is simply not sustainable. What in the past might have been regarded as technical reasons for delaying decisions have now become excuses for failing to make progress. The proposed legislation sets out to address this issue. It is clearly motivated by the absence of progress in most Member States – particularly, but not exclusively, in the long-term management of high-level waste.

The proposed new legislation

The objective of the proposed legislation is to bring about progress towards the safe long-term management of spent nuclear fuel and radioactive waste. While the emphasis of the Directive is on high-level waste – including spent nuclear fuel that is to be disposed of directly – it does cover all forms of radioactive waste and all spent nuclear fuel regardless of the management route followed (reprocessing, storage or direct disposal).

The Directive is very much inspired by the **Joint Convention⁷** on the safety of spent nuclear fuel and radioactive waste management. It includes a number of “basic requirements” for safe management that will be quickly recognised by all who have studied the Convention. These measures can be considered as established international best practice in the field of spent nuclear fuel and radioactive waste management, and cover such aspects as public health, environmental protection, nuclear safety, financing and governance. Many of these measures are part of current policy in many Member States.

The Directive requires that each Member State establish a **clearly defined programme** for radioactive waste management covering all radioactive waste under its jurisdiction and covering all stages of management including disposal. The programme must also cover the management of all spent nuclear fuel that is not subject to reprocessing contracts or, in the case of research reactor fuel, take-back agreements. In particular, the programme shall specify an approach to long-term management and

disposal with a definite timetable for each step of the process. Where there is no suitable alternative to disposal available, a small number of decision points must be included in the programme.

The Member States must report at regular intervals on their programmes and the Commission, with the help of national experts, will review these reports and publish its own report on the situation regarding radioactive waste management in the Union.

Possibly the most controversial element of the proposed legislation relates to the **decision points** that must be included in the programmes. There are three of these. They are:

- authorisation for development of appropriate disposal site(s) to be granted no later than 2008. In the case of geological disposal of high-level and long-lived waste, this authorisation could be conditional upon a further period of detailed underground study;
- in the case of short-lived low and intermediate-level waste, if this is to be disposed of separately from high-level and long-lived waste, authorisation for operation of the disposal facility to be granted no later than 2013;
- in the case of high-level and long-lived waste, to be disposed of in a geological repository, authorisation for operation of the disposal facility to be granted no later than 2018.

There have already been a number of comments that these dates are not “realistic”. The main objection being that it will take time to develop the necessary local consensus around potential sites. It should be clear that we are not saying any Member State should be able to identify and authorise a site within 6 years of starting producing waste. Some of our Member States have been producing radioactive waste now for over 50 years and have still not identified even potential disposal sites. The message to these States is “if you have not already identified a site – you are late”.

There has also been criticism that the Directive emphasises geological disposal to the exclusion of possible **alternative technologies**. This is not true. It clearly states that there is a consensus based on current knowledge that geological disposal is the best method for long-term management of high-level wastes. It is also very widely accepted that some of the present waste forms will not be further processed and that even if partitioning and transmutation becomes technically feasible and economically attractive, it would still leave a high-level waste stream that would need to be disposed of. The Directive does strongly encourage progress on geological disposal, but it also advocates research, including into new technologies that would result in less radioactive waste.

In addition, the Directive allows the **shipment of wastes to third countries** as an alternative to disposal in a national repository. However, in order to avoid the risk of radioactive waste being sent to a country that could not safely manage it, there are strict conditions that would apply to such shipments. In particular, the shipments must be covered by firm contracts and only take place to a country with appropriate facilities that met the accepted norms and standards of the country of origin and, in the case of special materials are under adequate safeguards.

Finally, the Directive aims to encourage more – and better – research on radioactive waste management. The Commission’s concern here is two-fold. First, the level of **research on radioactive waste management** is presently inadequate. Secondly, the research that is done could be more effectively co-ordinated. From looking at the level of research being carried out in those countries that are the most advanced in management of their waste, and often closest to identifying disposal sites, we derived a figure for the amount of research that is required relative to the amount of nuclear electricity that is produced. This appears to be a reasonable application of the “polluter pays” principle. The amount is around 500 000 euros/year for every terawatt-hour of nuclear electricity generated. Only two or three of our Member States spend this much on radioactive waste research. The Commission believes that the present level of research in the Union is inadequate. But, in addition to encouraging a higher level of research, the Commission wants to see the work better co-ordinated and plans to introduce proposals to achieve this in the coming months.

Summary

The objective of the nuclear package, in particular of the proposed new legislation, is to try to provide better guarantees of a high level of nuclear safety throughout and enlarged European Union.

The proposed legislation will impact in a number of ways on the management of radioactive waste in the EU:

- It will promote the development of common standards and good practices for spent nuclear fuel and radioactive waste management;
- It will require the establishment of segregated funds that will cover all nuclear liabilities that remain at the end of life of nuclear installations, including for the management of the spent nuclear fuel and waste;
- It will require Member States to establish clearly defined programmes for waste management, including a firm time scale for disposal, and encourage a higher level and better co-ordinated research across the Union.

The proposals do not depend on future decisions about the role of nuclear energy. In the Commission's view the European Council should adopt them before the end of 2003. They should then be implemented as quickly as possible – preferably before enlargement takes place - regardless of any changes in policy on the nuclear option.

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