

## editorial



**Bruno Sido**  
Senator,  
Chairman  
of Haute-Marne  
"County Council"

## Europe, Haute-Marne and Meuse *For a Public Debate Area*

While the environment and ecology are now seen as leading issues to be taken into account in preparing the future, the management of radioactive waste is emerging as a major consideration in energy policies and their environmental impacts. The subject must now be seen within a European context since the scientific community is working within an international framework and energy-related regulations are, for the most part, drafted at European level.

The question of radioactive waste is eminently complex, in particular because of the wide range of expertise involved - from physics to geology, from sociology to climatology. This complexity requires effort in the provision of information and the popularisation of science, areas which are very important for populations that are quite legitimately concerned by this issue. These concerns are particularly relevant in Meuse and Haute-Marne, drawing the attention of local and regional councillors since it is in their geographical areas that research is currently being carried out into the possibility of deep geological disposal. The work carried out at a European level, and the regulations likely to be laid down by Europe, must take account of local acceptance. There is an urgent need for all those who will be involved in the European debate on radioactive waste over the next few years to integrate the local dimension and work to ensure transparency and communication. This is why, with Bertrand Pancher, Chairman of Meuse "County Council" (Conseil Général), I wanted to bring a European dimension to a matter which is of direct concern to our areas. At a time when the European Union is preparing to expand, decisions on radioactive waste must be taken at a European level. Such decisions, which should be extended to create a general energy policy, must be compatible with issues of local importance. A large number of stakeholders have agreed to participate jointly in considering this question and the consideration will culminate in **the European Forum on the Management of Nuclear Waste, which will be held on 28th November 2003 in Nogent (Haute-Marne)**. I hope that the Symposium will go some way towards making Meuse and Haute-Marne the sites of benchmark discussions on European policy regarding the management of radioactive waste, and creating a European public debate area.

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## COMMUNITY INITIATIVE Taking Decisions together

**BY PROPOSING A DIRECTIVE ON NUCLEAR WASTE<sup>(1)</sup>, THE  
EUROPEAN COMMISSION WANTS TO ENSURE A HIGH LEVEL  
OF PROTECTION FOR EUROPEAN CITIZENS AGAINST**

### **THE DANGERS POSED BY RADIOACTIVITY FROM THIS WASTE.**

Claude Fischer and André Ferron from  
Confrontations Europe put questions to Mrs. Loyola  
de Palacio, Vice-President of the European  
Commission, with responsibility for transport  
and energy.



**Why do we need an EU directive when waste management has,  
until now, been left to individual countries?**

When taken in the context specific to the nuclear industry, the general question of EU construction and energy policy has led us to seek a joint solution to the thorny problem of radioactive waste, an issue that is common to all Member States. The use of radioactivity in medicine, industry, food-processing and the production of electricity creates radioactive waste. All Member States in the European Union are concerned to a greater or lesser extent. The future use of radioactivity rests on the availability of waste management processes that

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warrants Europe's citizens to be protected against the danger of ionising radiation.

In fact, the European Union will have to make some radical choices as regards energy, to get us out of the geopolitical deadlock in which we find ourselves, to free us from the domination of the oil-based economy as well as for environmental reasons linked first and foremost to global warming. If it wants to escape asphyxia, the European Union must deal with these two aspects. The Green Paper on security of supply showed that, although the future of the European Union will require more effective control of demand, it will also have to consider the diversification of possible energy sources. In this respect, nuclear power will continue to play a far from negligible role and will produce waste. Over the next quarter-century, i.e. by 2025, electricity from nuclear power plants will, *mutatis mutandis*, represent almost one-fifth of all the electricity used with the EU.

Finally, the arrival into the European Union of new Member States with nuclear power plants, the on-going accumulation of nuclear waste as a result of hesitations on the part of Member States (and this will increase still further with the dismantling of some fifty nuclear plants in the very near future) and the profound changes in the electricity market within the Union bring about an urgent need for a joint reference framework in order to protect public health. It appears as necessary to reassure the 450,000,000 European consumers who will be required to make individual, responsible choices in 2007 when the electricity production market is deregulated. This is why the present draft Directive proposes a joint framework based on a political and legal approach

which fits in with the principles of EU construction and complies with the concept of subsidiarity.

**Why propose a joint timetable when the situations in Member States vary so widely?**

Half a century of accumulation of long-lived, high-level radioactive waste in temporary storage sites has not any led to national management policy in Europe that would provide a final, definitive solution to the problems posed by all types of nuclear waste. Yet technical solutions exist for the management and safe removal of radioactive waste, including high-level waste. Today, it is high time these solutions be implemented.

A staggered timetable could be justified objectively if there were differing situations. However, the same causes (political back-peddalling by local opposition groups with regard to the setting-up of radioactive waste treatment and storage sites) produce the same

**I believe in the virtue of the Directive : a common framework for the management of radioactive waste will facilitate the adoption of programmes by Member States.**

effects i.e. a delay in the implementation of effective solutions that would provide safe management of radioactive waste. It is not, therefore, appropriate to discriminate between Member States.

**Is the proposed timetable realistic? What is the reaction from Member States?**

This is a new, politically sensitive area at EU level and it is quite normal for the draft Directive to arouse discussion. Nobody enjoys confronting changes in EU regulations. Yet a credible radioactive waste management policy must include a common, mandatory timetable.

Most Member States claim that they are facing difficulties at the national level when it comes to complying with time limits. We should not ignore these difficulties; they have often prevented decision-making and led to situations even though technical solutions existed. By its very nature, an EU initiative can help to unblock the situation. The political objective being sought by the Commission seems to be shared by a majority of Member States. The Commission will be flexible as regards time limits but intransigent as regards the need to implement national programmes in accordance with a joint timetable. It should be remembered that this timetable has been inspired by nuclear safety and by the urgency to introduce the appropriate management of nuclear waste expected by public opinion throughout Europe. A recent opinion poll (Eurobarometer)<sup>(2)</sup> showed that radioactive waste was one of the main areas of concern for Europe's citizens.

(1) This directive is part of a package that includes reactor safety, decommissioning and relations with Russia.  
 (2) Cf page 9.

**DRAFT DIRECTIVE**  
**on the management of spent nuclear fuel and radioactive waste**

- Each Member State shall draw up a clearly defined programme for the management of radioactive waste, applicable to all waste under its jurisdiction. The programme shall cover every stage of the management process.
- Authorisation for the development of one (or more) site(s) shall be granted by 2008. In the case of geological disposal of long-lived high-level waste, this authorisation could be subject to the completion of a detailed underground survey requiring an extension of the time limit. The authorisation for the operation of the disposal facility must be granted by 2018.

On the basis of a proposal from the Commission, the Council may decide to modify the above dates.

Storage, for an indefinite period, of spent nuclear fuel not destined for reprocessing in an above-ground or subsurface facility is not considered as an alternative to disposal.

- The programme may include transfers of radioactive waste or spent fuel to another Member State or a third country subject to certain conditions.

**The draft Directive gives preference to geological disposal. Would it not be preferable to keep several options open in Europe?**

If we go on waiting that scientists, who deserve our deepest respect, find an even better system for the reduction of radioactive waste, we might encourage lack of action. The possibility of future scientific progress is not an adequate reason for accepting the storage of radioactive waste on or near the surface, over an indefinite period. Remember the popular saying, "A bird in the hand is worth two in the bush".

In the current state of knowledge, there is consensus among international experts. They agree that the best option for the management of high-level waste



remains disposal in deep stable geological formations. It is however clear that research must continue and be strengthened on these questions. This is why the draft Directive encourages the continuation of research in order to stimulate the emergence of new solutions. I hope very much that this will eventually produce results.

Whatever scientific research teaches us, however, disposal sites will always be necessary in order to dispose of end waste. These sites should be such that it is possible to recover the waste in order to reduce its activity and toxicity where appropriate.

**Why does not the draft Directive ban the transfer of waste within the wider Union?**

The draft Directive allows Member States to reach agreement on the setting up of joint or regional disposal sites. This is a possibility given in order to take account of Member States which produce only low quantities of radioactive waste, most of it from medical or industrial uses. The draft Directive therefore allows certain Member States to come to an agreement and find a joint solution. This is a possibility, not an obligation. Obviously, the agreement of all involved Member States will be needed. No Member State can be obliged to agree to the importing of waste under this condition.

*Mrs. Loyola de Palacio*

## An Outstanding Opportunity



The draft Council Euratom Directive offers a standard Community-wide solution to the problem posed at both European and international level, through the management of spent fuel and radioactive waste. This draft is an opportunity to seek out a definitive, sustainable solution.

Harmonisation is vital in a Europe extended to 25 States, a Europe in which cooperation and agreement on waste management is a necessity. The various situations facing this sector in the Member States makes it essential to achieve a rapprochement at European level. However, it does not seem reasonable to use this standardisation to treat all

Member States in exactly the same way. A more flexible Directive is necessary. The scheduled timetable is too rigid and not at all realistic. Each Member State should therefore present its own detailed programme setting out a timetable. Without waiving the idea of a standardised European framework, these programmes would bring the Directive the flexibility it requires if the objectives are to be attained.

Stable deep geological disposal is currently seen as the most adequate solution to the problem of the final disposal of high-level radioactive waste. However, it seems imprudent to consider this solution as the only viable one, closing the doors to all other possibilities. Research must continue, to find other options such as separation, partitioning, transmutation, etc. The research would be carried

out nationally and at Community level. In fact, Member States would be required to draw up a two-stage strategy. The first stage would consist of the drafting of a national programme for the management of spent fuel and radioactive waste and would establish a detailed framework for the achievement of the Directive objectives in the manner most appropriate to the situation of individual countries. The second stage would consist of the application of these programmes. Finding a definitive, sustainable solution to the problem of managing spent fuel and radioactive waste is a priority for the European Community and it must be achieved by a flexible, adequate response to each specific situation.

*Alejo Vidal Quadras Roca*  
*MEP, Spain, Rapporteur to the European Parliament*

## Towards a Permanent Solution to Radioactive Waste



Leaving aside emotive issues, two arguments are put forward against the peaceful use of nuclear energy:

- any accident could have repercussions on regions and people very far from the accident site;

- we are passing on to future generations the radioactive waste, e.g. plutonium, which continues to emit radiation for several thousand years. In other words, the consequences of nuclear energy cannot be circumscribed within space or time. Yet it is possible to show that there is a solution to this problem. As far as the safety of nuclear plants is concerned, even today's power plants

are safe, as far as it is possible to judge. The new designs known as Generation IV plants promise to provide intrinsic safety i.e. if a fault occurs, they shut down automatically. Contrary to what was once claimed, it is therefore possible to limit the effects of nuclear plants to within the site itself.

### **Without reprocessing...**

As to radioactive waste, there are normally two ways of removing it safely. Firstly, the spent fuel rods can eventually be stored in underground repositories where they can remain for all time, unaffected by human activity. The concept of direct, definitive disposal has been taken on board by a large number of states e.g. Finland, Sweden, Germany - and the United States of America.

The advantage of this strategy is its simplicity. The rods can be placed in metal containers, without any further processing, and taken to deep geological disposal sites that can be rendered totally inaccessible. It is true that this does not physically destroy the radioactive waste but it is totally separate from all human activity and does not therefore constitute a danger for Man or his environment.

For many years, the risk of the proliferation of nuclear weapons was advanced as an argument in favour of direct, definitive disposal. When Mr. Carter became President of the United States, his country resolved to implement direct, definitive storage and Germany followed its example. There is no extraction of the plutonium, avoiding the

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>>> possibility that it could fall into unauthorised hands. However, the International Atomic Energy Agency believes that the risk of proliferation is now close to zero and the United States are taking another look at the alternative i.e. reprocessing and transmutation.

### ... or with reprocessing

It is this second possibility that is currently being considered by France, Russia, China and India. During this operation, the fuel rods are chemically broken down into their various components. They consist of 95% uranium, 1% plutonium and 4% elements known as minor actinides.

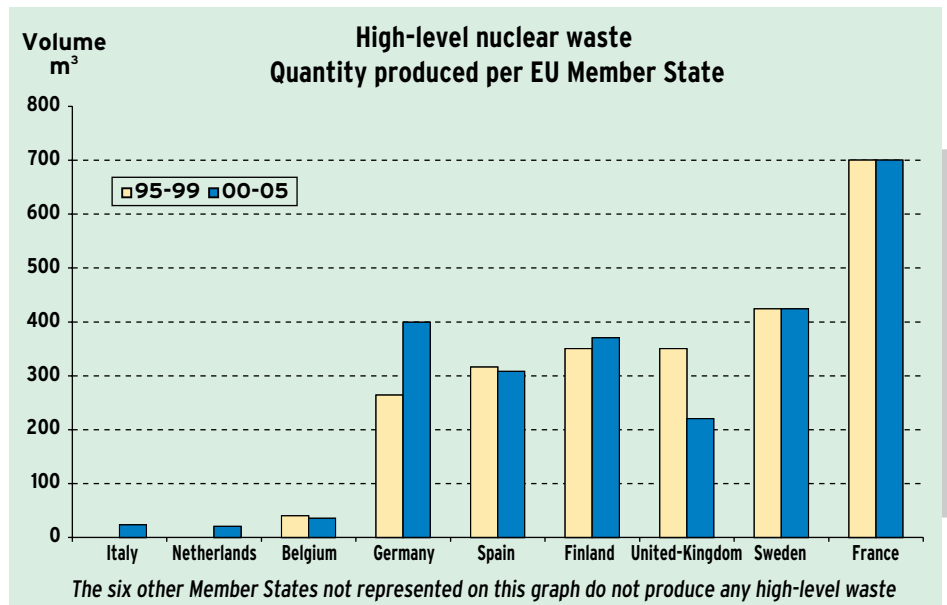
Both the plutonium and uranium can be recycled as new fuel rods in the form of a mixture of oxides. This extends the useful life of the uranium by a factor of 20, which pleases those who wish to use atomic energy in the future but does not please those who favour its abandonment. Minor actinides can be turned into short-lived isotopes using a process known as transmutation. This can be done, for example, in a fast reactor where sufficiently high-energy neutrons are available. One example would be the Phénix reactor in Marcoule (France).

According to current experiments, this would achieve a level of radioactivity, after 150 years, close to the known values for natural uranium. It is, then, possible to counter the claim that

## JOINT RESEARCH IN EUROPE

As soon as it was set up, in 1957, the European Atomic Energy Community (instigated by the EURATOM Treaty) considered that, at the same time as promoting nuclear energy, it should develop research in this area. This concern, which is an integral part of the Treaty, is seen in the Framework Programmes for Research and Technological Development (FPRTD). Waste management came to the fore as a priority area of research and has become increasingly important. Between 2002 and 2006, the 6<sup>th</sup> FPRTD EURATOM set aside 90 M€ to fund geological disposal projects, partitioning and transmutation and the design of reactors which minimise the production of waste. FPRTD projects are undertaken within the framework of scientific partnerships between researchers in various Member States.

The draft Directive on the management of radioactive waste envisages the setting up of a Joint Undertaking in order to achieve a higher level of integration for European research into waste.



Source : European Commission. Website : <http://www.rwm-eu.org/fr/index.asp>  
Situation on 7/7/2003

nuclear energy would still be having effects far in the future. By means of reprocessing and transmutation, it is possible to reduce the future consequences to an acceptable timescale. Moreover, fossil fuels also have a long-term effect if we think of the climate. Greenhouse gases also have a permanent effect and the quantities of CO<sub>2</sub> or CH<sub>4</sub> emitted today will still be influencing the climate in 100 years' time or more. Nuclear energy is not therefore an exception among the possible means of energy production if we consider the long-term consequences.

The response to the question of deciding which of the two solutions (direct, definitive storage or reprocessing and transmutation) will eventually win the day depends, among other factors, on cost. We do not yet know which of the two strategies is more expensive. However, when calculating these costs, we have to take account of the fact that the useful life of the uranium is extended in the case of reprocessing, making nuclear energy available for several centuries to come.

### No Solution without Trust

Whether or not the decision will be taken depends partly on public opinion in our various countries. For the moment, however, there are other matters to worry about for, in almost every location where the building of a final nuclear waste disposal facility is being studied or prepared, local resistance is coming to the fore. Finland is perhaps the only exception since the location of the facility has been fixed by Parliament. Sweden does not seem to be far off a parliamentary decision. It is arguable that the open, transparent,

democratic decision-making procedure and the totally frank discussions with these countries' citizens have helped in the determination of a disposal site.

Whatever the means implemented to treat waste, transparency and frankness should constitute a *fil rouge* when seeking a solution. This is the only way of building trust.

### A Proposal Forming the Basis of Debate

In the mean time, the European Commission has found the strength to take the initiative. Confirmed by a judgment of the European Court of Justice stating that even radioactive waste and nuclear safety are within the scope of its competence, subject to certain conditions, it has drawn up a draft Directive requiring Member States to set up final disposal facilities for radioactive waste before a date that remains to be fixed. The Commission, however, has proposed a timetable that no Member State will be able to comply with and the final date will therefore have to be negotiated. But, given the fact that a number of small States which once called upon the Soviet Union to dispose of their radioactive waste are now part of the European Union, an internal EU solution would be a judicious choice. Thanks to this draft directive, discussions on final disposal have become more animated and it may that they will eventually facilitate and accelerate decisions on the part of Member States with regard to the building of disposal facilities.

**Dr. Rolf LINKOHR**

Member of the European Parliament  
President, European Energy Foundation

# FRENCH CHOICES

## Each to his own Waste, but Joint Research and Common Timetables



**CHRISTIAN BATAILLE,  
M.P. FOR THE  
"DÉPARTEMENT  
DU NORD" AND A  
MEMBER OF OPECST<sup>(1)</sup>  
IS THE AUTHOR  
OF FRANCE'S LAW**

### **ON THE MANAGEMENT OF RADIOACTIVE WASTE, WHICH WAS UNANIMOUSLY PASSED IN 1991.**

André Ferron and Brigitte Bornemann-Blanc questioned him on the progress already achieved and the prospects for Europe in the future.

**We are now only three years away from the final date fixed for new decisions.**

**What stage has been reached in the three areas of research?**

Basic research undertaken by the CEA and CNRS into partitioning and transmutation has led to significant progress with regard to the reduction of toxicity and the volume of waste. Research into conditioning and storage in an above-ground environment requires techniques that are widely and commonly used both in France and abroad but it has not progressed to the level we had hoped for.

In Bure, the research has had an eventful history, with a fatal accident on the site causing a one-year delay. When Parliament debates the issue, it must have very precise information on the conditions of the clay subsoil and its compatibility with deep disposal of nuclear waste. Without it, Parliament will have to adjourn the decision-making date. The information at our disposal at the present time would tend to support such a decision.

Another problem has also arisen. At the present time, we have only one laboratory, in Bure, whereas the law allowed for a minimum of two laboratories in an effort to avoid putting all our eggs in one basket. However, we shall have to accept the situation as it is. After all, if Bure gives positive results, we shall be able to store the waste there. I remain fairly optimistic with regard to the timetable set and I think that we shall be able to make progress and find solutions.

**Why are you proposing a law upstream in the cycle?**

People would have you believe that France is inter-

ested in reprocessing all spent fuels but in fact EDF needs to have only two-thirds of the spent fuel reprocessed. The remaining one-third (350 tonnes) is "pending".

Somebody has invented the expression "deferred reprocessing". I dispute this linguistic nicety. You cannot say that, if reprocessing is deferred for 50 or 60 years, it is short-term reprocessing. This is contrary to the spirit of the 1991 law which demanded that each generation should deal with the consequences of its own pollution and not bequeath the problem to future generations.

I believe that we are talking about waste rather than about a resource awaiting re-enhancement. We have to clarify exactly what we are talking about. The propensity to ambiguity is discrediting the nuclear industry. We cannot continue to accept today's pretexts and false pretences.

The 2006 law may authorise an underground disposal facility and specify the types of waste to be disposed in it. For the moment, the idea is to dispose of

actual waste rather than of spent fuel bundles. They require a specific solution.

At the present time, they are stored at the power plants or in La Hague, but La Hague was not designed for permanent storage. We cannot continue to use temporary storage as if it were a long-term solution.

**Is there not a need for greater social acceptability? Although information seems to be circulating well locally, it appears to be insufficient, on a national level, to allow for a decision on disposal possibilities in 2006.**

A large part of the brief entrusted to me by the government was concerned with social acceptability. I said at that time that the subsoil had to be suitable for the deep disposal of waste but that the people living in the area also had to accept it. It was not sheer chance that took us to Meuse. Four or, later, three potential sites in Meuse and Haute-Marne were inspected. I regret that the other sites have now been abandoned.

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### **LAW OF DECEMBER 30TH 1991 (BATAILLE 'S LAW) on Scientific Research for Management of Radioactive Waste**

#### **An evaluation system for the research**

§4 - The government sends annually to the parliament a report on the progress of scientific studies carried on for the management of high level - long life radioactive waste ; they pertain to three routes :

**ROUTE 1** - studies on separation and transmutation of radioactive elements contained in the waste

**ROUTE 2** - studies on (reversible or not) waste disposal in deep geological formations, in particular through exploitation of underground laboratories

**ROUTE 3** - studies of ways to condition the waste and ground store it on the long term.

The reports are written by an Evaluation National Committee (CNE)

In parliament, the office on scientific and technical choices (OPECST) implements expertise.

#### **A rendez - vous**

In year 2006, new legislation on waste management should be launched in parliament

#### **Association of local populations**

§6 - prior to any project of building of a laboratory, agreements of local populations and representatives must be obtained.

§8 - installation and exploitation of underground laboratory requires full safety studies and procedures to have been completed.

§12 - A public consortium can be created (GIP) under government control.

§14 - A local Commission on information on all aspects of the research carried on locally is created (CLIS).

full text : <http://www.legifrance.gouv.fr/WAspad/UnTexteDeJorf?numjo=INDX9100071>

(1) OPECST : Parliamentary Office for the Assessment of Scientific and Technical Choices,

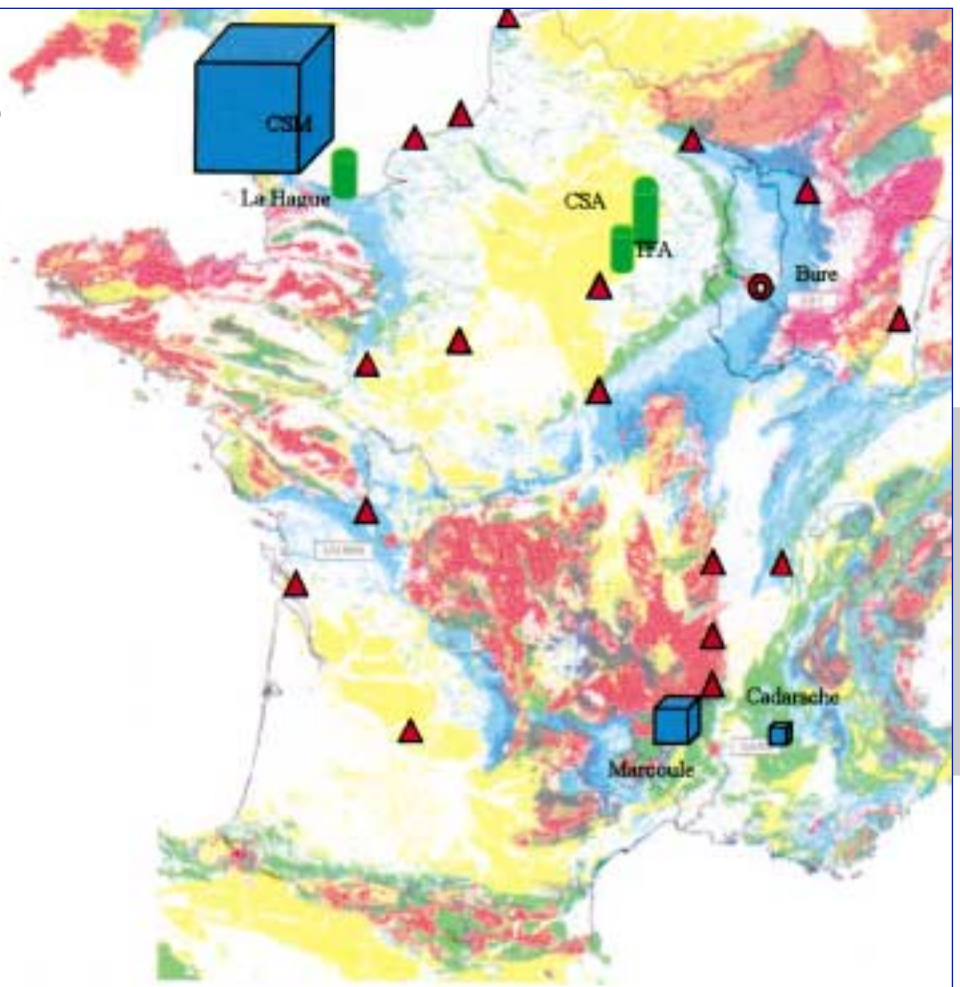
<http://www.assemblee-nat.fr/connaissance/choix-scientifiques.asp>

<http://senat.fr/opepst/index.fr>

## Geographical Distribution of Waste in France

■ La Hague: 3/4 of the radioactivity in Bq  
 Marcoule and ▲ 19 power plants: 1/4  
 Other: <1%

*Three-quarters of the radioactivity, counted in becquerels, is concentrated at La Hague (less than 10% of volume). The remainder (almost one-quarter) is divided between Marcoule, the 19 EDF power plants and Cadarache. Less than 1% is at the storage facility in Aube (more than 90% of volume) and the 120 other sites listed annually by ANDRA.*



Source : ANDRA

>>> In Bure, there was a good level of social acceptability with agreement from towns and "départements" ("counties"). The Laboratory and, if appropriate, the disposal facility will lead to economic development. They must not be inert installations with no financial advantage; they must make a contribution to local development. This does not seem to me to be a shameful idea. Opponents claimed that we were buying clear consciences but, in my opinion, a site of this type makes as much of a contribution to economic development as any other industrial site.

We have to keep a constant check on social acceptability through a Local Information Committee (CLI, Commission Locale d'Information) i.e. a body which has the necessary resources, in particular the ability to call for second opinions in order to allow for a pluralistic approach.

We need to circulate information nationally, beginning with Parliament itself since it is Parliament in its entirety which will have to take the final decision. This is a political and technical matter for which a minimum of technical knowledge is required in order to make a relevant choice.

With Claude Birraux, Chairman of the Office Parlementaire d'Evaluation des Choix Scientifiques et Techniques, we are drafting a report which is due to be published in 2004.

We must continue actions aimed at providing the media with information. At the moment, their approach to the subject is too emotive, especially among the anti-nuclear lobby.

**The fears expressed by the French people with regard to nuclear waste must be overcome on a national level but should we not also be looking at a European solution? The European Commission is proposing to lay down a joint timetable and it seems to be opting for the solution of irreversible geological disposal. What do you think about this?**

We are primarily concerned with our national requirements, in line with the idea of "each to his own waste". We have no intention of looking beyond our borders and disposing of waste from neighbouring countries in France. In times past, "exotic" solutions such as disposing of waste under the sea or in deserts were discussed. I have always rejected them as being irresponsible.

We must continue to look for national solutions but it is quite possible to cooperate with our neighbours. We already do so in the research field, with the Germans, Belgians, Swiss and Swedes.

I do not see the need for European nuclear waste

disposal facilities other, perhaps, than on a regional level.

I should like to emphasise this point because it seems to me that the issue would be clouded by any suggestion that it would be possible to permanently deal with waste from other countries in our back yard.

The 1991 law forbids that, beyond a certain cooling period. In La Hague, German and Japanese waste can only be stored for ten years. Thereafter it must be sent back to the country of origin.

The drafting of a common timetable by the European Commission and a European decision in favour of geological disposal seems to me to be fairly unavoidable. However, I do not at all agree with the proposal for irreversibility. The notion of reversibility must be maintained in Law through the maintenance of basic research into transmutation. This means that, as long as research is continuing, there is a scientific possibility of transmuting the waste. We must therefore leave open the possibility of retrieving it. Deep geological disposal is only a viable option if it is reversible. We cannot place too great a burden on local populations and they are very fearful of irreversible disposal.

*Christian Bataille*

# Integration in a European Union Approach is both Possible and Desirable

The draft Council Euratom Directive on the management of nuclear fuel and radioactive waste contains principles and proposals which do not appear to fundamentally contradict the approach taken in France. The Council, which is aware of differences of opinion between Member States on the question of policies for nuclear end-of-life products, is not stating any position on strategic questions. A clear position in favour of deep geological disposal, which is described as the "best" solution compared to indefinite storage in an above-ground or sub-surface environment, is the main point in the draft Directive. The other major point concerns the drafting of a timetable and the establishment of funding for the implementation of this solution.

## Deep Geological Disposal

The first position may seem to contradict the national approach if we consider three areas of research i.e. partitioning and transmutation (project 1), deep disposal (project 2), long-term storage with specific waste conditioning (project 3). In fact, this is not so. Projects 1 and 3 lead to solutions which, in practical terms, cannot avoid deep geological disposal. Project 1 aims to decrease, but not eliminate, the quantities of long-lived heavy elements (transuranics) contained in the waste but this is fairly ineffective for the products resulting from fission. In fact, the end-waste resulting from partitioning and transmutation is unsuitable for disposal in an above-ground or sub-surface environment and can therefore only be disposed definitively deep underground (in the absence of a hypothetical solution based on disposal in outer space). The same applies to Project 3 which concerns the interim management of nuclear material and waste until such time as it can be used or processed. This does not actually preclude a form of deep geological disposal. This is the position taken by the National Evaluation Committee (Commission Nationale d'Evaluation) and it echoes the positions taken by various international bodies (see the latest report

from the NEA<sup>(1)</sup>) on the long-term risks resulting from indefinite storage in an above-ground or sub-surface environment.

## Funding and Timetable

The European approach is very similar to its French counterpart. The minimum recommended annual funding of 0.5 M€ per TWh is exceeded in the budgets announced by AEC and ANDRA. The Directive sets 2008 as the date for the authorisation of the development of a disposal facility, with an additional delay for an underground research laboratory. With this exception, the timetable should be feasible in France, even though the completion of the laboratory in Bure is 2 years behind schedule. Finally, the date for operating authorisation, given as 2018

in the draft Directive, is not unrealistic for France. The Directive does not contradict the conditions adopted in France and it insists on the importance of research into the minimisation of long-lived waste (Project 1).

The national approach can, therefore, integrate into an EU framework. Indeed, this is preferable. The French nuclear industry must turn its attention outwards and encourage cooperation in all respects, especially on the question of waste.

*Jean-Paul Schapira*

*Emeritus Research Director, CNRS*

*Member of the National Evaluation Committee*

*(1) Nuclear Energy Agency.*

## The AEC's centre in Marcoule is working on two sections of the Bataille Law, Project 1 and Project 3



## Project 1: Transmutation, a Russo-European Pilot

The demand for power and the geopolitical importance of this issue require the development of "sustainable" nuclear power. This is currently prevented because of the problem of managing nuclear waste. Its transmutation prior to deep geological disposal decreases its radiotoxicity to a level equivalent to the natural radioactivity of mines. This possibility has been scientifically proven in a laboratory setting since 1998.

However, a pre-industrial prototype must be built in order to develop the engineering, equipment and procedures required for industrial use. In February 2003, the Pôle Universitaire Léonard de Vinci signed a cooperation agreement with all the relevant Russian institutes with a view to building the world's first prototype actinide incinerator. The project, code named "Troitsk", consists of coupling a 6 MW sub-critical fast reactor and

an existing 150 kW linear accelerator in the "Moscow Meson Factory". This is the only plant in Europe with a licence to operate such a unit. The three-year project is an example of outstanding cooperation between France and Russia and it is a direct result of decisions taken during the meeting of the two Presidents last February.

*Panagiotis Pavlopoulos*

*Emeritus Research Director, CERN, Geneva*

# OPTIONS AND OPINIONS



## The Swedish Way



### GENERAL BACKGROUND

About 50 % of the electricity in Sweden is generated by means of nuclear power. Eleven reactors are currently in operation, while one reactor at Barsebäck nuclear power plant was phased out at the end of 1999. There is almost no debate about nuclear waste on a national level, and only a little debate about nuclear power.

The plan for the final disposal of spent nuclear fuel is to encapsulate it in durable copper canisters to be placed (embedded in bentonite clay) in a deep repository about 500 metres down in the bedrock.

### Public communication in the 1970s and 1980s

Test drilling was carried out at a total of eleven sites in Sweden during the 1970s and 1980s. Opponents prevented drilling at two additional sites. In several cases, the drilling was started without providing adequate information to those living close to the sites. In April 1980, for example, drilling machines took the inhabitants of Kynnefjäll, north of Gothenburg, by surprise and they promptly stopped the drilling operations. It was too late to save the project.

The provision of clear and open information to the local inhabitants on what the objective was (to improve general geological knowledge, not to establish a deep repository) might perhaps have defused the confrontation. One lesson to be learnt from this is that it is not good to be in too much of a hurry.

25 years ago, many people simply assumed that once the scientists and engineers had solved the problem, the politicians would reach a decision and everyone else would gratefully accept what had been decided. But we soon realised that the problems associated with radioactive waste from nuclear power go far beyond science and technology.

It is difficult, but necessary, to present the message using *ordinary and familiar terms and concepts*. Unfortunately, experts seldom like to abandon their exact terminology because of the risk that the content of their message may somehow be distorted. Furthermore, we must always remember that communication is a two-way street that involves *dialogue*. A personal meeting is the best information medium, but any dialogue worthy of the name must allow both sides to listen to each other. In fact, you will always be unable

to convince a person about anything if you are the only one who talks.

**And people's fears and anxiety must always be taken seriously and not just waved aside.**

It pays to be *open*. Nothing is more convincing than seeing things with one's own eyes. We passed an important milestone when the touring exhibitions started. One of the opponents' strongest symbols for SKB was the special transport ship, M/S Sigyn, known as the "toxic waste ship". It came as a shock to some people to find it suddenly moored alongside the quay in Stockholm or in tourist ports. Visitors were allowed to go aboard and look at the transport containers, and could talk to the crew who ran the ship and actually handled the waste and its potential hazards.

*Words cannot replace action.* Trust or distrust will depend mainly on how an organisation is seen to behave. Give priority to actions - they speak louder than words. Visits to operational sites are important in terms of moulding public opinion. People rarely disbelieve what they see with their own eyes, and practical demonstrations of how spent nuclear fuel can be handled help to enhance confidence in future plans.

Above all, we learned that *the formulation of the problem* is of crucial importance. We could never establish confidence, or win an argument, with the help of complex technical facts alone. Instead, we had to expand the ethical dimension of the waste problem and present it in terms of our generation's responsibility both for dealing with the waste and for paying for the process. The nuclear waste management project is a major environmental project - not an energy project. Besides these strategic lessons, we also realised that very few politicians supported SKB publicly. Politicians generally have great difficulty in working with issues that really lie beyond the scope of their present mandate, especially if the electorate seem to have different views.

We also found that controversial scientists often grabbed the headlines, while we had problems getting our messages out. There is always a professor somewhere who is prepared to claim the exact opposite of what a colleague has said elsewhere.

### Feasibility studies and present situation

Two feasibility studies were performed between 1993 and 1997 in Storuman and Malå in the north of

Sweden. After completion of the studies, local referenda were held on the possible continuation of the siting studies. About 70 % of the Storuman votes in 1995 were against continuation, as were about 54 % of the votes in Malå in 1997.

There are many lessons to be learnt from Storuman and Malå and we have studied what happened from a variety of perspectives. One important aspect of the outcome in Storuman and Malå is that it provided a concrete example that the volunteer principle is respected by SKB. This has contributed positively to the credibility of the subsequent siting process. SKB will never work anywhere without local support. Another important lesson is the fact that it was difficult for both sides to find common ground in the discussion held in the mass media. SKB mostly emphasised technical and scientific arguments whereas those who opposed the project used emotional, ethical and environmental arguments.

The local politicians were not fully prepared for an intense public debate. This resulted in the public debates often becoming discussions between SKB and opponents. The meetings thus became too much of a David and Goliath confrontation - the big company against the small people - which of course was used by the opponents and gave them media support. After completion of the feasibility studies in northern Sweden, SKB turned south and initiated discussions with a number of municipalities. One very important contribution to the process was that the local municipalities set up formal review teams with the explicit task of scrutinising and assessing SKB's proposals. The review teams were appointed by the municipal boards, which thereby assumed the responsibility of representing their residents and serving as counterparts to SKB in the discussions. The feasibility studies performed over a decade have resulted in us deciding to continue the siting programme with site-specific investigations in two municipalities. We view this as a good result since we are now working together with most of the residents in the municipalities of Oskarshamn and Östhammar. Our plan is to be able to file an application to site and build the deep repository on one of these two sites within about six years.

*Claes Thegerström  
President, SKB, Sweden*



# The French and their Nuclear Industry

The opinions of the French people can be generally summarised as follows:

- 25% for, 25% against, 50% don't know's (70% among young people).
- Nuclear power is probably economic but is it safe?
- Ah, if only there wasn't the problem of waste.
- We would like sun and wind to be used in place of nuclear energy, but that's far in the future!
- Coal, oil and gas are not in inexhaustible supply.
- French technology is well placed (we're not going to let the Americans take over top position again, for heaven's sake!).
- There has already been progress and there is more to come.

If we look at these opinions in closer detail, it becomes obvious that:

- Although a majority of the French consider nuclear power to be competitive in terms of cost, 40% of them have no idea about its relative competitiveness.
- The French are particularly aware of the international aspects and globalisation of the energy problem.
- People are gradually coming to realise the effect of greenhouse gases as the years pass (storms, flooding, heat waves) but fewer than one in two French men are clear about the causes of the greenhouse effect and, therefore, about the advantages of nuclear power in this respect.



• 60% of the French are waiting for an effective compromise between sustainable energy and nuclear power. Their desire to see the strong development of sustainable energy is not in contradiction with this.

• 20% of the French complain of a lack of information about the progress being made by nuclear power. The violent controversies about nuclear power obviously hinder a clearer perception of the subject.

• Despite progress as regards safety, the risk of a catastrophe such as the one caused by Chernobyl is seen as a very real threat by one in two people. The credibility of the safety authorities has been strengthened over the past decade.

**With regard to waste, 4 points seem to us to stand out from the others:**

1. The problem of waste is seen as very important by many people. Yet, as we have also seen from European surveys, the information provided to most of them remains far from detailed.

2. There is now a much stronger demand for information than there was in the past.

3. The 1991 law is not well known even though it received Parliament's unanimous support. This situation is even more noticeable with regard to the results of on-going work and knowledge of similar work carried out abroad.

4. The controversy centres on interim storage or permanent disposal but the effectiveness of these two solutions is much less well known.

*Alain Bucaille*

*Adviser to the Board of Management of AREVA*

## OPTIONS OPINIONS

### EUROPEANS AND NUCLEAR ENERGY

A public opinion poll conducted in October 2001 by the European Commission shows that a significant majority of the people connects future of nuclear energy and safe management of radioactive waste. This opinion prevails in 14 member states out of 15.

This Eurobarometer poll (n° 56.2) follows a similar one in 1998 (n° 50). Both polls inquired about knowledge and opinions on radioactive waste. 16,000 persons in the 15 member states have been polled.

These two polls stressed an important diversity between various countries.

Generally, even though the European public is concerned about radioactive waste, it feels poorly informed. In a more recent Eurobarometer (n° 58, April 2003), 25 environmental problems were mentioned. First concern, with 50% of the Europeans, was the radioactive waste. The use of GMO was a concern to only 30% of the population. France was third in the "very concerned",

with 60%. This result can be partially due to bad information of the public. In France, only one person out of four (26%) feels well or very well informed on nuclear questions (compare with 60% in Sweden or Finland).

A surprisingly large number of persons does not know one single benefit of producing electrical power from nuclear energy. To the phrase "an advantage of nuclear energy is to produce less greenhouse gas than other energy sources" almost 40% of the people answered "don't know" and over 20% disagree.

Nearly half of the people polled think it impossible to dispose indefinitely of highly radioactive waste. They nevertheless stress that they should not be left to future generations. And almost 70% of Europeans would be reassured if the European Union would set the rules for treatment and safety of radioactive wastes.

**Eurobarometer polls are on the Commission site :**

[http://europa.eu.int/comm/public\\_opinion/index.htm](http://europa.eu.int/comm/public_opinion/index.htm)

# THE MEUSE AND HAUTE-MARNE LABORATORY

## Research into Deep Disposal: What Progress has been Made?

### A MANAGEMENT OPTION CURRENTLY UNDER STUDY: DEEP GEOLOGICAL DISPOSAL

The study of deep geological disposal aims to assess whether, by placing long-lived radioactive waste in a stable geological environment, it is possible to isolate it from the external environment and local population on a long-term basis.

The use of the geological environment was inspired by the long-term stability of rocks. In the case of the argillites studied in Bure, the environment is more than 150,000,000 years old and has changed very little since then. This constitutes a major guarantee for the future.

The research undertaken for long-lived high-level waste is aiming at a defined objective i.e. an

assessment of the feasibility of disposal. To achieve this, the research team is calling upon a very wide range of scientific fields and one of the main roles of ANDRA is to ensure their integration.

With this in mind, research is structured in the form of projects and based on an iterative approach. It combines three main areas:

- acquisition of the knowledge and data required for design projects and safety analyses (waste packages, geological environment, manmade materials and components);
- design of the disposal facility, analysis of its reversibility and operating safety;
- analysis of long-term safety in order to assess the performance and robustness of the disposal concept studied in the face of a set of natural or human stresses.

### Progress in research

As far as the geological environment is concerned, the work carried out on the site in Meuse/Haute-Marne, on the surface since 1994, during the geophysical study carried out in 2000 and in the laboratory access wells since 2000, has provided a great deal of knowledge. The Callovo-Oxfordian layer, which has been studied within the framework of this research, is homogeneous. It is approximately 140 metres thick and is located at an average depth of 450 metres. It contains very little water and there is very little circulation of water. The rock formations flanking the layer also contain very little water. The geochemical characteristics of the Callovo-Oxfordian suggest worthwhile properties with regard to the retention of radionuclides. Moreover, underground constructions are feasible from a mechanical point of view. The site is located in a stable zone, not subject to seismic or tectonic activity. Finally, an initial model of the general environment has been built, showing in particular the circulation of water.

In 2001-2002, a comprehensive overview of available knowledge was drafted and an initial general assessment made. This led to the revision of certain design options and closer targeting of research priorities, resulting in the choice of a set of architectures and the definition of a revised scientific programme for the next few years.

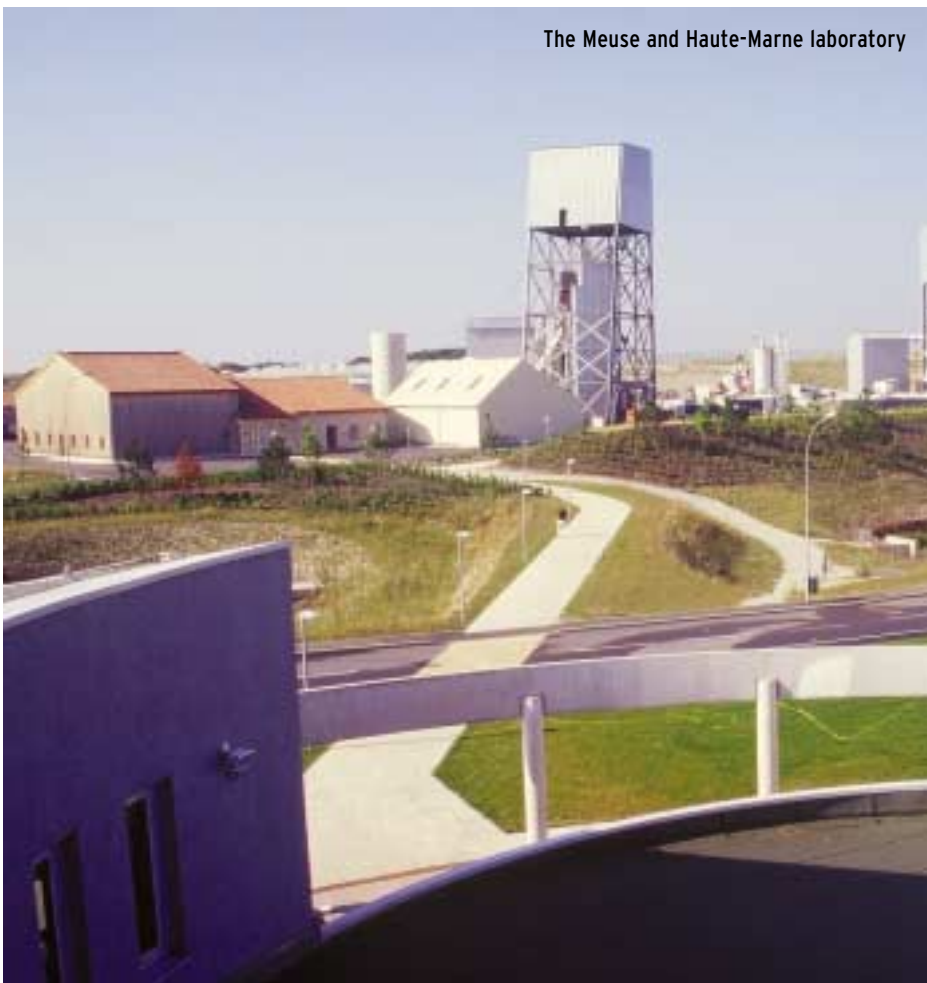
### Integrating the project in its environment

ANDRA is a technical player which carries out areas of research for which it is responsible. It is not responsible for organising discussions or assessment, and is even less responsible for decision-making methods.

It should, however, be noted that ANDRA contributes to discussion and the provision of information to the best of its abilities, as requested of it by the authorities. To this end, it circulates a regular review of its work. Although it is not possible to pinpoint actual results, it is noticeable that these reviews arouse a great deal of interest and that progress has been made in the general understanding of the subject. One condition, though, is the achievement of a high-quality debate, without prejudice or bias.

**Jack-Pierre Piquet**

Head, Meuse/Haute-Marne  
Laboratory



The Meuse and Haute-Marne laboratory

L'ANDRA, National Agency for Radioactive Waste management, is a public administration with an industrial and commercial status, under control of three Ministers, Industry, Research, and Environment (created by law, 30.12.91). ANDRA is in charge of the management of all radioactive waste in France. It pilots research on the feasibility of reversible disposal in deep rocks for long-lived and high-level waste (Projet 2 in Bataille's law).

# ANDRA and the General Public: Intentions and Problems

In the early 1990's, after numerous vexatious episodes, the people responsible for the management of high-level radioactive waste finally realised that a good disposal site was first and foremost a site tolerated by the local people. The governments led by Mr. Rocard and, later, Mrs. Cresson claimed that they were determined to maintain concertation. Several episodes later, and contrary to the objectives set out in the "Bataille Law", only Bure had been selected. ANDRA, which was commissioned to set up an underground research laboratory there, also took social acceptability as one of its objectives. However, a survey among local stakeholders showed that the project was badly managed. In particular, some of the players deny that there was any real consultation with local people who are said to have been short-changed during the initial concertation. Among other complaints, the most revealing are the following:

- Before the setting up of the two Public Interest Groups, the funds distributed to local players were managed by ANDRA and this is a problem for some people. It does not seem appropriate for grants to

have been paid to certain towns before the public enquiry was even launched.

- CLIS<sup>10</sup> meetings showed that the questions asked seldom received answers. An increasing number of councillors were reticent about the project and there has been a U-turn within the CLIS, in particular because of the increasing number of questions left unanswered by ANDRA or the Government.

- An increasing number of mayors are coming to realise that earlier promises have not necessarily resulted in actual development. They are expressing

**Le CLIS a été installé en novembre 1999 par le secrétaire d'État à l'industrie, Christian Pierret. Il est composé de 93 membres (élus, chambres consulaires, syndicats, associations de protection de l'environnement, membres du pôle scientifique). Il est présidé par le préfet de la Meuse et est chargé de suivre les avancées des études sur le laboratoire souterrain et d'organiser les débats autour de la gestion à long terme des déchets radioactifs.**

doubts about the plans for the setting up of a centre of technological excellence and expertise in the region.

- Numerous criticisms have been raised with regard to ANDRA's sponsorship of sports fixtures and cultural or other events. This is public money. What connection is there between these actions and ANDRA's purpose?

In addition to the blunders committed in the past, ANDRA is facing difficulty in its search for social acceptability. It is not alone in this field. Other public bodies are involved and the Agency has no hold over them. Taken as a whole, these bodies, including ANDRA, lack a common strategy that would win the confidence of local stakeholders. Of the complaints expressed by these stakeholders, some are not attributable to ANDRA but they contribute to a loss of image. Joint consideration should be given to this question to ensure that the errors of some do not cancel out the efforts of others. This is an approach which concerns the whole nuclear industry.

*Nicolas Buclet*

*University of Technology, Troyes - CREIDD*

(1) Local Information and Monitoring Committee.



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## At Stake: Keeping the Memory Alive

High-level nuclear waste is special industrial waste which deserves special processing. As long as a disposal system has not been validated, it would be logical to think that industrialists should refrain from producing any. Interim solutions are not acceptable. On-site temporary storage makes the everyday management of facilities more complicated and aggravates the conditions that arise if major accidents occur in nuclear power plants and the other plants downstream in the fuel cycle. The plausibility and availability of geological disposal are understandable by all, unlike disposal in outer space which has a few, sparse supporters. It is, one might say, a "backyard" solution. Disposal in an above-surface or sub-surface environment appears to pose particular problems in

terms of security and maintenance. There is no doubt that it imposes on future generations the technical and financial responsibility for waste produced in a distant past. In our opinion, the principle of reversibility is not applicable to deep geological storage. If the geological option is validated and applied in the appropriate rock cavities, all the passive and active barriers must converge to ensure that radioactivity cannot migrate.

Reversibility implies premeditated accessibility, which does not seem to us to be desirable. However, such stocks of nuclear waste should be placed under the control and responsibility of regulatory bodies from the international community for as long as they exist and for as long as the problem of

keeping the memory alive over several thousand years continues to exist. Experience has shown that, in a few decades, stocks of chemicals and toxic materials fall prey to collective amnesia.

*Jacky Bonnemains*

*Robin des Bois*

### A devilish thought

What if nuclear waste was:

A politician? ... **Hitler or Bin Laden!**

An animal? ... **A scorpion!**

A flower? ... **A carnivorous plant!**

*Extract from a public opinion poll.*

Source : ANDRA.

# Classifying Radioactive Waste

Radioactive waste is any residue produced by the use of radioactive materials for which no further use has been planned. Radioactive waste is unusual in that it changes over time and its danger level gradually decreases. This is why it is classified on the basis of the radiation that it emits and the length of its life. Short-lived low and medium-level waste becomes totally non-toxic after approximately 300 years. Such waste represents 90% of the total volume of radioactive waste produced in France, but only 10% of the radioactivity.

Long-lived high-level waste contains short-lived radioactive elements but they have a very high level of activity; it also contains less active radioactive elements which are long-lived. Because of this, a distinction is made between two types of long-lived radioactive waste:

- Low and medium-level radioactive waste, which comes mainly from nuclear fuel plants and research centres. It includes, for example, sludge from the reprocessing of spent fuel, packed in bitumen.
- High-level waste which, when packed, has a high thermal power. It is mainly glass containing fission products from the reprocessing of the fuel used in the reactors of nuclear power plants.

Both types of waste require a very long period of management which may exceed one hundred thousand years.

Source: ANDRA

## The European Forum will deal solely with long-lived high-level nuclear waste and its disposal



This sculpture represents "The Watchful Eye". It was placed outside the Meuse/Haute-Marne Laboratory on 21st July 2002 by protestors who oppose the disposal of nuclear waste in Bure. (Source: [www.burestop.org](http://www.burestop.org))

## Public Debate between Councillors and Citizens



Meuse "County Council" (*Conseil general*) initiated an experimental approach based on public debate, called the *Institut du Débat Public Local* (IDPL). The aim of the Institute was to organise public debates on development projects within the region that are of concern mainly to the local people in Meuse. One such example is the laboratory in Bure.

### The IDPL is based on two principles

It is the area's local and regional councillors who decide to launch a public debate and who draw conclusions from it.

There can be no debate unless citizens are able to change the final outcome. If the debate reveals a clear orientation supported by a majority of people but the

councillors do not conform to this orientation, they have to justify their choice to the local population.

The IDPL has had two advantages from the outset i.e. its mediating capacity and the ability to obtain second opinions. There are situations which are so tense that all dialogue becomes impossible without mediation by a third party. Experts can validate or question the information provided and choices being proposed thereby helping local people to structure their questions or avoid possible traps. This, along with the mediation provision, is a vital factor in the building of confidence. Moreover, there cannot be public debate without prior information for citizens. The information must be adequate to enable them to understand the possible choices. It must also be as objective as possible or, at the very least, it must present both sides of the argument. The IDPL has taken as its own the three rules for public debate proposed by the National Committee for Public Debate (Commission Nationale du Débat Public) and it ensures that these

three rules are complied with. They are as follows: *Transparency*: it is impossible to come to a conclusion on a subject without knowing all the ins and outs of the question.

*Equivalence*: all those participating in public debate must be regarded with the same dignity.

*Argumentation*: people join a public debate to defend a point of view based on a number of arguments.

The IDPL has begun to look into the development of the Meuse and its tributaries with EPAMA<sup>(1)</sup> and it will shortly be turning its attention to the tributaries in Oise. It will be making its voice heard on the question of the laboratory in Bure and its future, with all necessary prudence, as part of a debate that will highlight the importance on a local, national and European level.

**Bertrand Pancher**

*Chairman of Meuse County Council*

(1) EPAMA: Public agency for the development of the Meuse and its Tributaries.

# Citizen Involvement in the Public Debate

When public debate gives ordinary people and associations a legitimate right to express their opinions, they are able to take part in the decision-making process. This participative approach is crucial and necessary in order to advance democratic processes.

For many years, the Danish Board of Technology has been organising consensus conferences, giving a panel of citizens an opportunity to consider problems linked to science and society before any legislation takes effect. This structure has been imported into various countries, with varying degrees of success. It has to be said that, in France, the political will of parliamentarians and other councillors sharing knowledge and seeking citizen involvement in decision-taking remains strongly atypical.

In our country, it is only over the past few years that various schemes have been implemented with a view to defining and testing participatory processes. Such schemes have included the research work carried out by the

Centre for the Study of Public Debate (*Centre d'Étude du Débat Public*<sup>(1)</sup>), the participatory protocols tested during the "Science & Ethics" seminars in Brest<sup>(2)</sup>, the deliberations tested at the *Cité des Sciences et de l'Industrie*<sup>(3)</sup> and the recent attempts at citizen conferences. These have been the main expressions of this desire to define and organise

consultations that inform citizens while giving them a chance to become involved. Other initiatives, many of them arising from society as a whole, are currently beginning to emerge.

By encouraging a convergence of opinions and the implementation of social projects in educational, political, economic or scientific areas, these initiatives are part of the citizen-based approach that has, as its framework, respect for future generations. The Nogent European Forum ("*Les Entretiens européens de Nogent*") is part and parcel of this "concertation" approach, bringing together the main stakeholders in society with European politicians.

**Jean-Paul Natali**

*Associate Researcher Cité des Sciences et de l'Industrie and Centre d'Étude du Débat Public and Brigitte Borneman-Blanc  
General Secretary, "Science & Ethics"*



(1) [www.univ-tours.fr/msv/unite\\_cedep.htm](http://www.univ-tours.fr/msv/unite_cedep.htm)  
(2) <http://science-ethique.enst-bretagne.fr>  
(3) [www.cite-sciences.fr/](http://www.cite-sciences.fr/)

## USING THE RIGHT WORDS: STORAGE, DISPOSAL, REVERSIBILITY

Historically, the language of nuclear engineering made a clear, dichotomous distinction between:

- temporary storage of radioactive waste,
- definitive disposal of radioactive waste with no intention of retrieval.

The Joint Convention on the safe management of spent fuel and radioactive waste signed on 05/09/1997 defines the terms as follows:

• **Storage:** holding of spent fuel or radioactive waste in a facility that guarantees its confinement *with the intention of retrieval*.

• **Disposal:** placing of spent fuel or radioactive waste in an appropriate *facility without any intention of retrieving it*.

The dichotomous nature of this distinction has been lost with the introduction of the notion of *reversible* disposal imposed in 1998 by the Government as one of the solutions to be assessed within the framework of Research Project 2, the management of long-lived, high-level waste (art. L. 542 et seq. of the Environmental Code bringing the 1991 law into effect). The notion of reversibility (or retrievability) demonstrates the increasing impact of the principle of precaution. Under this principle, the management of long-lived, high-level waste must integrate for a sufficiently long period the possibility of scientific and technological progress resulting in a diminution or suppression of radiotoxicity in waste. ANDRA, the main player in research into deep geological disposal, will have to specify what is meant by reversibility as it affects the design, operation, timetabling and conditions of sealing of any geological disposal facility. Sealing that is irreversible after several centuries

is likely to guarantee the passive safety of the facility in the very long term.

The notion of long-term **interim storage** in an above-surface and sub-surface environment is integrated into Project 3 of the 1991 law. The design, completion and operating mode of such a facility would allow, from the outset, for storage over a particularly long period (300 years maximum).

**Above-ground interim storage** is built on the surface and usually consists of buried tanks or vaults below a building containing the utilities and management of the facility. In France, there is one such site in Cadarache and another in La Hague.

**Sub-surface interim storage**, in which waste is stored several tens of metres below the surface, also includes tanks and vaults, as well as the utilities, facility management and galleries carved into the hill or mountainside to give horizontal or gently-sloping access. There is an example of this type of storage at Oskarshamn in Sweden.

**Disposal** can also be carried out above ground, in a sub-surface environment or in deep geological formations several hundred metres below the ground, in rocks that are stable and give a high level of containment (clay, salt or granite). In France, there are disposal facilities in Manche and Aube, and a research laboratory studying deep geological disposal in clay in Meuse; it is managed by ANDRA (National agency for the management of radioactive waste).

Source: CEA

# 28<sup>TH</sup> NOVEMBER IN NOGENT

## The European Forum

### National Choices within a European Framework Regulation

The European Forum on the Management of Nuclear Waste will be opened by Senator **Bruno Sido**, Chairman of Haute-Marne "County Council" (Conseil Général). Nine European countries will be represented at the two round tables, by people from the social, economic and political arenas<sup>(1)</sup> who will discuss the question between themselves and with the 200 delegates in the auditorium<sup>(2)</sup>.

Two Members of the European Parliament will chair the debates, **Philippe Herzog** and **Rolf Linkohr**.

**François Lamoureux**, Director at the European Commission's DG TREN (transport & energy) and **Nicole Fontaine**, France's Minister of Industry, will give their positions and representatives from Japan and the CERN in Geneva will describe their experiences. **Bertrand Pancher**, Chairman of Meuse "County Council", will add his conclusions.

#### Questions for a Debate

1. With its draft "Nuclear Waste" directive, the European Commission hopes to move on from the provisional laxist position. By offering Member

States an opportunity to make firm, constricting, verifiable commitments with a set timetable, it will lead to decisions that are beneficial for all European citizens. We support this initiative.

We are fully aware of the implications for national commitments - it gives neighbours the right to monitor something that has previously been domestic policy. It may "upset" certain reticent States. Its contents require discussion:

- The matter is urgent and short timescales are necessary but is a single timetable aiming at 2008-2018 not rather excessive? At the same time, would longer timescales not remove all real meaning from the initiative?

- Special treatment for CEEC's<sup>(3)</sup> seems necessary but this cannot constitute a waiver. Perhaps they should be helped, financially if necessary, in order to ensure that they sign up to a joint timetable?

- For certain small countries, a regional solution seems necessary. What, though, are the limits to the "Each to his own Waste" policy if the credibility of the process is to be retained?

- Existing national processes already involve national Parliaments to a greater or lesser extent. As far as the Directive is concerned, would it be enough to merely consult the European Parliament?

2. The solutions retained for the management of long-lived, high-level radioactive waste must be scientifically safe and accepted by society.

- Is there consensus on deep geological disposal? There are several different ideas on reversibility. Which one is acceptable?

- What level of guarantee can scientists give with regard to the safety of disposal?

- Social acceptability is vital at local and national level. All the countries have tried to make progress in this respect. How can we extend discussions on experiences, to the benefit of all concerned? Social acceptability must also be achieved at European level. Does this require a minimum European standard? Should national consultation and assessment processes be open to players from other European countries?

- How can political decisions be taken while involving society as a whole?

(1) See opposite for the list of guests invited to attend the conference.

(2) Complexe sportif et culturel, Nogent - Tél. : 00 33 (0)3 25 31 71 24. Fax: 00 33 (0)3 25 32 36 03.

(3) CEEC: Central and Eastern European Countries which will become members of the EU in 2004.

FOR MORE  
[www.entretiens-europeens.org](http://www.entretiens-europeens.org)

## Waste Management Worldwide

Most of the countries faced with the question of the management of long-lived high-level radioactive waste envisage underground disposal, after provisional storage lasting varying lengths of time. Numerous programmes are underway in a range of different geological formations e.g. volcanic tuff, argillite, granite and salt mines.

The programmes have rarely gone past the study stage. Most of the storage sites brought into service are used only for very low-level waste.

The most spectacular facility built to date is the "Waste Isolation Pilot Plant" (WIPP) opened by the Americans in 1999 in New Mexico. Built in the middle of a layer of salt 655 metres below the surface, seventy chambers can cater for 180,000 cubic metres of waste, but only of the medium-level type.

For high-level waste, the **United States** are concentrating their efforts on the Yucca Mountain site, in the volcanic tuff of Nevada.

**In Finland**, the Parliament confirmed Olkiluot as its choice of site for underground disposal of medium-level fuel in 1999. This site consists of granite.



**In Sweden**, the government authorised SKB to look into three potentially appropriate sites for geological disposal.

**Japan** is currently defining sites for the building of underground research facilities in granite and clay.

**Canada** is preparing a legislative framework to allow for the launch of research into potential sites. In 1998, the concept of underground disposal was not validated by the general public.

**In Spain**, the search for an underground disposal site has been covered by a moratorium since 1999; it will last until 2010.

As far as the management of high-level radioactive waste is concerned, **Switzerland** has implemented a research programme based on two laboratories in Grimsel (granite) since 1983 and in Mont Terri (clay) since 1996.

**The UK** will be launching national consultation to draw up the legislative framework required for political agreement on the management of radioactive waste.

**In Germany**, deep geological disposal was chosen in the 1960's, in a salt dome in Gorleben and in an iron ore deposit in Konrad, but only for medium-level waste.

**Belgium** decided to build a laboratory (1980-1984) in clay in Mol.

ANDRA, which manages the site in Bure for **France**, is closely involved with work being carried out in Switzerland, Belgium, etc.

Extract from conference papers: "Environment and Energy", Chaumont in Haute-Marne, 8<sup>th</sup> June 2002, organised by the "County Council" (Conseil Général).

## Programme

9.00 a.m.

**Welcome the delegates**

9.30 a.m.

**Opening address** by **Bruno Sido**, Senator, Chairman of Haute-Marne "County Council"

9.45 a.m.

**Hearing of François Lamoureux**, Director-General of DG TREN, European Commission

10.30 a.m. - 12.30 p.m.

**First Round Table** chaired by **Philippe Herzog**, M.E.P, France  
*Is a European directive feasible? Within what time frame? What flexibility is required? What democratic process is needed?*

With:

**Bertrand Barré**, Manager, in charge of Scientific Communication, AREVA

**Christian Bataille**, M.P, author of the "Bataille Law"

**Pascal Colombani**, Director, British Energy, United Kingdom

**Dr. Franz Koch**, Vice-President of European Affairs, RWE, Germany

**Bruno Lescoeur**, Manager of the Energy Sector, EDF

**Serge Perez**, Trade-Unionist, member of the national bureau, FNME CGT

**Dobrev Rubin**, Head, Bulgarian Safety Authority

**Alejo Vidal Quadras Roca**, M.E.P, Rapporteur on the nuclear waste

directive, Spain

**Magnus Westerlind**, Manager Nuclear Security, SKI, (Sweden)

**Hearing of Nicole Fontaine**, French Minister of Industry

12.30 p.m.

1.00 p.m.

**Luncheon**

2.00 p.m.

**Hearing of Hideo Nagashima**, Executive Director, NUMO,

Japan and **Panagiotis Pavlopoulos**, Director of Research, CERN, Geneva

2.45 p.m. - 4.45 p.m.

**Second Round Table** chaired by **Rolk Linkohr**, M.E.P, Germany

*The scientific and social importance of the various options for the management of nuclear waste*

With:

**Antoine Allemeersch**, Mayor, Cirfontaines en Ornois

**George Beveridge**, Manager, Environmental Services, BNF, UK

**Jacky Bonnemains**, President, Robin des Bois

**Jack-Pierre Piquet**, Head, Meuse/Haute-Marne Laboratory, ANDRA

**Paul Rigny**, Scientific Advisor

**Timo Seppälä\***, President, Posiva, Finland

**Jean-Marie Streydio**, President of ONDRAF, Belgium

**Michèle Tallec**, Manager, development/innovation, CEA

**Ivo Vasa**, Head, Nuclear Safety and Security Department, Czech Institute of Nuclear Research, member of RAWRA

4.45 p.m.

**Conclusion** by **Bertrand Pancher**, Chairman of Meuse "County Council".

\* Subject to his confirmation

Simultaneous translation : english, french and german

## "Les Entretiens", to Push forward the Debate on Nuclear Waste

For over 40 years, experts have been looking into the nuclear waste issue. From reports of the American Academy of Sciences to meetings of ad hoc committees, to scientific colloquia or to public debates, does there remains anything new to learn? And nevertheless, decisions seem to be frozen : are we any closer to consensus on what to decide now than in the sixties ? Meanwhile, society has changed its perception of risk - a situation that everyone can observe and that keeps sociologists fruitfully busy. The recent crisis on questionable practices in agriculture or food safety, or the respiratory syndrome of Spring 2003 are here to open our eyes on this evolution. No surprise then that nuclear energy, first brought to public attention by the atom bomb, keeps arising fear. One cannot expect the simple citizen to go deep into technical intricacies to make his own philosophy, when the specialists have needed years of studies to master them. However, one can be sure he will be able to identify with whom sincerity and honesty rest in a debate between stakeholders, provided the technical jargon is avoided. But can such a debate not give an example of chaos ? To take the case of the sanitary effects of ionizing radiation, which are at the basis of most worries, expert opinions remain very diverse - therefore worrying - and the same could be said of nuclear safety or, in a different register, of economical analysis.

Would that mean that specialists are too often biased ? Would it be vain to ask for competent and objective analysis ? Reshuffling the cards of traditional debators, setting from the start the discussions at the european level, move them away from the sheer technical topics, that are the options which found the "Entretiens Européens" making them an innovative initiative.

**Paul Rigny**  
Scientific Advisor

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### IF YOU WISH TO ATTEND THE EUROPEAN FORUM

Please return the registration form enclosed in La *Lettre des Entretiens européens*, with your payment in favour of ASCPE  
For further information, contact: Vasilka Najdoski on 00 33 (1) 49 88 11 94 or Marie-Ange Schilling on 00 33 (1) 40 51 83 87  
email : [contact@entretiens-europeens.org](mailto:contact@entretiens-europeens.org)



# An annual *European Forum*, a Half-yearly Newsletter, partners...

## CONFRONTATIONS EUROPE, THE "SCIENCE AND ETHICS" SEMINARS AND THE EUROPEAN ENERGY FOUNDATION ARE JOINING FORCES WITH THE "COUNTY COUNCILS" IN HAUTE-MARNE AND MEUSE TO TAKE LOCAL DEBATE INTO THE EUROPEAN FORUM<sup>(1)</sup>

Providing information and aiding comprehension, opening a dialogue with no taboos in order to pave the way for decision-taking - the democratic ambitions are far from negligible when it comes to nuclear waste<sup>(2)</sup>!

However, because it will not be possible for one group of people to answer all the questions at one time, the Forum will be an annual event, supported by a twice-yearly Newsletter and a website<sup>(3)</sup>. Discussions will be on-going and, we hope, interactive.

• Every year, the European Forum will bring players from several different countries (especially European countries) together for a one-day conference with a view to clarifying a number of points. In 2003, the topic will be the European context<sup>(4)</sup>; in

2004, the topic will be the social and economic aspects; and in 2005, discussions will focus on the environmental and democratic challenges.

• The Newsletter, which will have a circulation of several thousand, will report on the discussions and provide the best possible information, including options and opinions.

A working party with members drawn from a range of political and socio-professional backgrounds meets regularly. Having studied the subject at length and considered the points for discussion, they are now

preparing the "right" questions for public debate, publication in the Newsletter and during the Forum.

**Claude Fischer**

*General Secretary, Confrontations Europe*

(1) The deep geological disposal facility is located in Bure, on land belonging to Haute-Marne and Meuse.

(2) Cf. the opinion poll published on pages 9 and 11.

(3) The Newsletter is available in French on the website : [www.entretiens-europeens.org](http://www.entretiens-europeens.org)

(4) The Forum will take place in Nogent in Haute-Marne on 28th November 2003: cf. the programme on pages 14 and 15.

## PARTNERS IN THE EUROPEAN FORUM



### • CONFRONTATIONS EUROPE,

Chaired by **Philippe Herzog**, M.E.P., was set up in 1991.

The association leads a European network of citizens and players of various persuasions and from various backgrounds (companies, trades unions, associations, local authorities etc.). Despite their differences, these members work on all the key issues that have marked, and continue to mark, the building of Europe. They share the same objective i.e. to create a society in Europe by inventing a new, mixed economy and a participatory form of democracy. The association publishes two journals, *La Lettre de Confrontations Europe* (circulation: 25,000) and *l'Option* (circulation: 2,500).

Website: <http://www.confrontations.org>

### • THE « SCIENCE & ETHICS » SEMINARS

Since 1997, 3B Conseils managed by **Brigitte Bornemann-Blanc** has been organising international discussions in Brest every year in November under the name "Science & Ethics, or the Duty to Speak". The speakers (politicians, lawyers, scientists, university staff and representatives from the world of business) debate questions of current interest and issues of major geopolitical and scientific importance.

In 1997, and again in 1998, the nuclear industry and the management of waste were central to the discussions. Over the next three years, the seminars will be focussing on "The Sea, an Ocean of Resources and Diversity".

Summaries and reports on the website:

<http://science-ethique.enst-bretagne.fr>

### • THE EUROPEAN ENERGY FOUNDATION



Chaired by **Rolf Linkohr**, M.E.P.

The European Energy Foundation is a forum for discussions on subjects linked to the

European Union's energy policies. Its aim is to promote and facilitate exchanges of information and opinion between the members of the European Parliament, companies or research institutes and the European Commission. The Foundation remains totally neutral during debates. Through its active or associate members, it organises dinner-debates in Brussels and Strasbourg during the parliamentary year and visits from official delegations (China, Iceland, France, Spain and Finland over the past five years). It also publishes a review. Website: <http://www.f-e-e.org>

*ASCPE, a company specialising in research and training in topics of major European importance, managed by Claude Fischer, is charged to coordinate the preparation and organisation of the European Forum.*

**la lettre**  
**des Entretiens européens**  
the management of nuclear waste

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