

# RADIOACTIVE WASTE: WHAT PEOPLE THINK

## SURVEYS IN EUROPE AND THE USA TRACK PUBLIC OPINION

Over the past year, the results from a number of surveys examined public attitudes toward radioactive waste and its disposal. They include surveys in Europe and the United States, where most of the world's nuclear plants are located. This article reports on major findings.

In April 2002, the European Commission, through its Eurobarometer series, surveyed public awareness and attitudes to radioactive waste. The survey was conducted between 13 October and 19 November 2001 in all 15 Member States of the European Union (EU), with nearly 16000 people interviewed.

Where appropriate, the survey results were compared with those of a similar study conducted in late 1998 to see if there are any noteworthy changes in levels of understanding and opinion in this field. In results reported here, the percentages quoted usually refer to the whole sample polled rather than just those who expressed an opinion. Where there is a high number of "don't knows" then the results may also be quoted as a percentage of those who actually expressed an opinion.

**Information on Radioactive Waste.** Respondents were asked to self-assess how well informed they were of the subject, ranging from "very well informed" to "not at all well informed". There are differences between men and women, with men generally considering themselves better informed, as do those with

higher levels of education. Similar trends are noted for respondents with a high level of media exposure. When comparing individual countries, large variations from the average EU figures are evident. For example, considering the category "not at all well informed", there is a very large variation between respondents in Belgium (48%), Portugal (47%) and Spain (43%) compared with countries such as Denmark (10%), Sweden (12%) and Finland (16%). Comparing the 1998 survey with that conducted in 2001, there is minimal change in the total figures for EU countries.

**Confidence in Sources of Information.** The survey assessed what were considered to be trusted sources of information on this topic both as regards the situation in the respondents' home country as well as the situation in other EU countries. Concerning the respondents' home country, independent scientists (32.0%) and NGOs (31.4%) are the most trusted sources across the EU. The least trusted sources are the nuclear industry itself (10.2%) and the EU (11.0%). Within each country, Swedes are most trusting of NGOs (70.1%) and Portuguese

least trusting (19.1%). Italians are least trusting of independent scientists (15.7%) and the Danes most trusting (49.5%).

The EU and nuclear industry are broadly trusted to the same extent. For the EU, the responses range from Finland (6.1%) to Sweden (19.9%). Sweden also shows by far the greatest trust in the nuclear industry (36.2%), with Italy and Austria the least (4.4%).

Looking back to a broadly comparable question in the 1998 survey, national governments (45.2%) were the most trusted sources of information for EU citizens, closely followed by the media (42.5%). EU environment departments were trusted by 22.0% of the people polled. Political parties (10.8%) and "other sources" (3.8%) were the least trusted sources.

From the latest survey, national agencies responsible for radioactive waste management are considered trustworthy in Sweden (59.5%) but much less so in Spain (14.4%). However, these bodies may not be very well known in many countries, and in others (e.g. Denmark, 45.5%) they are considered trustworthy even though no such agency actually exists.

*The survey by the European Commission was managed and organized by the Press and Communication Directorate, and reported on 19 April 2002 as Eurobarometer 56.2, "Europeans and Radioactive Waste". For more information, see the EC web pages at [http://europa.eu.int/comm/public\\_opinion](http://europa.eu.int/comm/public_opinion). The surveys in the United States were reported in June 2002 by the Nuclear Energy Institute in association with Biscanti Research, Inc. in the USA. More information is accessible at [www.nei.org](http://www.nei.org).*

## IAEA CONFERENCE TAKES STOCK OF GLOBAL PROGRESS

The IAEA convened an International Conference on Issues and Trends in Radioactive Waste Management in Vienna, Austria, 9-13 December 2002. Partner organizations were the European Commission and the Nuclear Energy Agency of the Organization for Economic Cooperation and Development. The Conference brought together worldwide experts to foster information exchange on current issues and to promote international coherence on strategies and criteria for their resolution.

Sessions took stock of progress -- including decisions in the USA and Finland with respect to permanent disposal of high level wastes -- and focused on issues and problems which still need to be resolved, as well as on public attitudes and roles in decision-making.

Some unresolved technical issues are related to the underground disposal of waste. They include, for example, determining the safety implications of providing for the retrieval of waste from repositories, making the case for safety in the long-term future and providing for the long-term monitoring and surveillance of waste repositories and for the retention of knowledge concerning their existence.

In some countries surface storage of radioactive waste is being seen as a long-term management strategy mainly because of the delays and difficulties in establishing underground repositories. At the same time questions are being raised concerning the safety and sustainability of such an approach.

The long-lived nature of some types of radioactive waste and the associated safety implications of disposal plans have raised concern amongst those who may be affected by such facilities. For these reasons the subject of radioactive waste management has taken on a high profile in many countries. Over the years many lessons have been learned and, nowadays, a recognized important common feature in all programmes is the involvement of concerned parties or "stakeholders" in the process of decision-making with respect to repository siting and development.

Small amounts of radioactive waste exist in almost all countries. While solutions are readily available for most of the waste types, the management of some types of small volume highly active and long-lived waste, for example disused sealed sources and research reactor fuel, can present a problem, especially for smaller countries with limited resources.



Upgrading the safety and security of radiation sources, for example, is one area in which there are several ongoing international initiatives.

Policies on the discharge of low-level gaseous and liquid radioactive effluents are coming under review and there are moves to reduce discharges ever closer to zero. In this context, the OSPAR Convention is bringing about changes to the effluent discharge policies of many European countries.

Radioactive waste residues from a past era still remain to be rendered safe. Examples are the residues from previous activities concerned with the mining and milling of uranium and thorium and the processing and use of radium which still exist often in an untreated state. There are problems concerned with finding technically appropriate means of disposal which would be at the same time economic and safe in the long term. Another related issue concerns the need to bring certain older storage and disposal systems which were designed and operated to earlier standards up to the standards of today.

Many of these concerns will be addressed, at least in part, by the international safety regime. It has gradually come into being comprising a specific international legal instrument addressing the international safety of radioactive waste (the Joint Convention on the Safety of Radioactive Waste Management and on the Safety of Spent Fuel Management), internationally endorsed safety standards, and programmes of review, advice and assistance facilitated by the IAEA.

For updated information about the Conference, visit the IAEA *WorldAtom* web site at [www.iaea.org](http://www.iaea.org)

*Photo caption: Mr. Abel Gonzalez of the IAEA was one of the keynote speakers on the opening day of the Conference. Credit: Calma/IAEA*

## INFORMING THE PUBLIC DEBATE

Countries are placing more and more emphasis on enlisting public "stakeholders" in the debate over solutions to radioactive waste management.

**Public Participation.** Recent workshops organized by the Nuclear Energy Agency in Paris, France -- around the theme of "Stakeholder Confidence and Radioactive Waste Disposal" -- have addressed questions of public roles and attitudes in the decision-making process.

Some conclusions that have emerged are that experts and lay people have different perceptions of risk that need to be understood and taken into account. Another finding was that the early participation of stakeholders is a key factor in improving confidence and trust in solutions, and that public interest in participation can be maintained only if stakeholders believe they can have an influence on key decisions. A case study analyzed was the experience of Finland, where the Parliament has ratified a decision in principle on the disposal of spent fuel.

More information may be obtained on the Internet at [www.nea.fr](http://www.nea.fr). NEA member countries are Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Republic of Korea, Luxembourg, Mexico, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland, Turkey, United Kingdom, and United States.

**Public Opinion in France and the UK.** Governmental authorities in France and the UK have commissioned surveys in recent years that assess attitudes toward radioactive waste disposal. In France, surveys have been reported by the French Energy Commission (CEA), which found that 65% to 77% of the those surveyed supported a waste disposal site in France. More information is at [www.cea.fr](http://www.cea.fr)

In the UK, a 2002 report by the Future Foundation, a research firm, reviewed public attitudes to the future management of radioactive waste in the country. It found that public awareness about the issue of radioactive waste was very low. The overwhelming majority of respondents wanted more information on the subject, and there was widespread support for greater public involvement in the debate about the management of radioactive waste. More information is at [www.nirex.uk](http://www.nirex.uk).

The 2001 survey then looked at those sources trusted by EU citizens regarding information about radioactive waste in other EU countries.

As in the domestic case, independent scientists (26.7%) and NGOs (25.7%) come out best. The nuclear industry (7.8%)

and national governments (9.1%) are the least trusted. However, trust in the EU has now jumped to 21%.

**Basic Knowledge About Radioactive Waste.** When questioned as to whether nuclear power stations produce radioactive waste, 91% of all

Europeans correctly believe that they do, with only 2% saying no and 6% being unsure. Standing out amongst the "don't knows" are Portugal (15%) and Greece (11%).

As the questions became more "technical", the "don't know" group became more significant. For example, 69% of respondents are aware that hospitals produce nuclear waste. However, many respondents across the EU are either unsure (16%) or believe they do not (15%). However, only 44% of those polled realise that the oil industry also produces radioactive waste, with nearly one-third (30%) replying "don't know".

When respondents were asked whether the statement "all radioactive waste is very dangerous" was true, the percentage of people replying in the affirmative decreased slightly from 79% to 75% over the period 1998-2001. Those who correctly answered "no" increased from 10% to 14% over this period. More than one-third of respondents (37%) replied "don't know" when asked whether radioactive waste is produced in smaller quantities than other types of hazardous wastes. Some 45% of respondents correctly answered "yes".

In the case of other questions that appeared in both the 1998 and 2001 surveys ("do hospitals produce radioactive waste?" and "are there several types of radioactive waste?"), there were no appreciable shifts in opinion.

**Siting of Disposal Facilities for High-Level Radioactive Waste.** This question relates to whether each country should have its own facility, or whether

regional shared sites should be developed. Across the EU as a whole, 63% of all respondents endorse the concept that each European country that produces the most hazardous category of waste should be responsible for developing its own disposal site. However, this is a significant decrease relative to the 75% in the 1998 survey who believed this was the best strategy.

Over this same period, there has been a corresponding increase in the acceptance of the regional solution, with the EU figures climbing from 12% to 18% (with a similar increase in "don't knows"). In Greece, Spain, France, Ireland and Portugal, support for a regional solution has approximately doubled since the 1998 survey, again with a similar leap in the number of "don't knows". In the Netherlands, the country most in favour of the regional solution, supporters of the purely national strategy no longer had an absolute majority. Between 1998 and 2001, substantial increases in the number of "don't knows" are noticed in Spain (14% to 24%) and Portuguese (12% to 26%). The highest number was recorded in Ireland (34% compared to 27% in 1998). Throughout the survey there are considerably higher than average numbers of "don't knows" in Spain and Portugal.

**The Impasse in the Disposal of Highly Radioactive Waste: People's Attitudes.** The 1998 poll asked respondents four "yes/no" questions related to why no country had yet managed to dispose of high-level radioactive waste. The most commonly agreed reason, selected by 83% of the

## USA SURVEY SUPPORTS PERMANENT NUCLEAR FUEL DISPOSAL FACILITY



The American public attaches very high importance to a clear plan of action for high-level radioactive waste from the nation's 103 nuclear power plants. And the public supports by a 3-to-1 margin the concept of central disposal

over leaving the material at these plant sites. These were the findings of a national public opinion survey conducted 31 May to 2 June 2002 by Bisconti Research with RoperASW. Telephone interviews were conducted with a nationally representative sample of 1000 US adults.

The survey found that:

### ■ America Wants a Clear Nuclear Waste Disposal Plan

Almost all Americans (92%) believe it is extremely or very important to have a clear plan of action for handling the high-level radioactive waste from nuclear power plants. Sixty-nine percent believe a clear plan is extremely important.

### ■ Centralizing Nuclear Waste is Helpful to the Environment

The predominant view of the public -- in virtually every demographic group -- is that taking high-level radioactive waste to a permanent underground disposal facility is more helpful to the environment than leaving the waste above ground at the nuclear power plant sites where it is now. One-fourth of the public is uncertain.

The survey was done before the US Senate, in July 2002, backed the designation of Yucca Mountain in Nevada as the USA's national facility for the underground disposal of highly radioactive materials, including spent fuel from the country's nuclear power plants. The action paved the way for the US Department of Energy to seek licensing of the facility in keeping with the country's nuclear regulatory rules and policies.

The Yucca site is located in rock formations and, if licensed, would become the USA's second geological repository for radioactive wastes. In March 1999, the US opened the Waste Isolation Pilot Plant in New Mexico for specific types of radioactive waste that must be safely contained and isolated for centuries.

More information may be obtained on the Internet from the Nuclear Energy Institute at [www.nei.org](http://www.nei.org), or the US Department of Energy at [www.energy.gov](http://www.energy.gov).

respondents, was that implementation of such disposal was politically unpopular. Three-quarters of the people polled in 1998 also believed that another reason was simply that there was no safe way to get rid of this waste. The least supported reason, selected by 51% of the people polled, was that "all the possibilities and all the risks" were being studied before a decision was made.

Three years later in the 2001 survey, respondents were asked instead to choose just one of these three reasons. In total, 14% throughout the Union do not have an opinion why no country had yet disposed of this waste. However, this average figure is made up of widely varying figures from different countries, ranging from 4% in Sweden to 34% in Portugal. The concepts of "political unpopularity" and "assessment of options and risks" each attract approximately 20% of the respondents.

However, 46% believe that the reason why no disposal of the most hazardous category of radioactive waste had yet taken place is simply because there exists no safe way to do it.

**Public Concerns Regarding Proximity to Underground Disposal Sites.** In both the 1998 and 2001 surveys, respondents were asked about their concerns regarding proximity to a disposal site for radioactive waste. The questions differed in that the 1998 survey allowed multiple responses, while the more recent survey asked for the most important concern only.

In 1998, the issue that caused the most concern was health (74%), with impact on the local environment (71%) and long-term risks (67%) also being very

important. The 2001 survey highlighted similar concerns, with the risk of leaks while the site was operating (39%) and long-term risks for future generations, i.e. up to thousands of years, (38%) being rated virtually identical in terms of importance. Although only 11% of the EU countries surveyed express most concern about the risks associated with waste transports, Finns (19%) and Swedes (25%) both rate these risks as more important than the other short-term risks associated with site operation. A major drop in local property values is seen to be of little concern (3.5%).

**Disposal Programme for Low-level Waste.** The 2001 survey asked respondents what they thought happens in their country to the treated low-level and short-lived (i.e. least hazardous) waste that is routinely packed into steel drums. However, they could only choose one option from the list provided. In 1998 a similar question was asked, but people were allowed to select more than one management option.

In the three years between the two surveys, the percentage of people responding that they did not know rose from 17% to 26%. Also, the number selecting the banned practice of sea dumping fell from 26% to 10%. These figures could be as a result of greater precision in the wording of the question in the latter survey and the fact that in 1998, there might have been confusion between disposal of solid waste and ocean discharges of radioactive effluents.

In the UK, France, Spain, Sweden and Finland, burial in shallow disposal sites is the most common method of disposal.

Overall, this method is the one most used in the EU in terms of quantities of waste, though at the moment it is being practised only in the countries cited above. In all other countries (except Luxembourg, which probably exports its very small quantities of waste) temporary storage is the management strategy that is currently being practised.

With this in mind, in four of these other countries, plus Luxembourg, the highest ranked choice is in fact the correct answer (if the "don't knows" are ignored).

The growth of the "don't knows" was substantial in several countries over the three years since the 1998 survey. The most significant being Portugal (34% to 50%), Ireland (29% to 42%), Italy (27% to 42%) and Spain (31% to 42%). In fact, only 8% of people in Spain knew the correct answer (shallow disposal), though results in the other countries practising this form of management were not much better.

**Concern About Radioactive Waste Management at Home and Abroad.** Respondents were asked to assess their concern about the management of radioactive waste in their own country, in other EU countries and in the Central and Eastern European Countries (CEECs) wishing to join the European Union.

The respondents who are "very worried" at the way radioactive waste is handled in their own country amount to 29% across the EU. However, this figure is misleading since results for individual countries range from Sweden at 11%, through Austria at 33% to Greece with 65%.

The results also show significant shifts in opinion between 1998 and 2001. The average EU figure for those “very worried” about the way radioactive waste is managed in their own country fell from 41% to 29% between the two surveys, though there was a 5% increase in the “fairly worried” category, with a similar increase in the “not very worried” category.

Once again, these average figures tend to hide some significant variations at the national level. For example, In 1998 only 16% of Danish respondents were ‘not very worried’ about the way their country managed radioactive waste. Three years later, this figure had nearly trebled to 47%, with a similar but opposite effect in the “very worried” group, falling from 46% to 12%.

Concerning the figures relating to management of waste in other countries, people in general are more worried about other EU countries than their own, and more worried about the CEECs than the EU. In the case of the CEECs, the level of concern has increased slightly since 1998, the 2001 survey showing that 49% of the 16,000 people questioned are “very worried”, compared with a figure of 47% in the 1998 survey.

The results show large variations from country to country and the EU average figures can therefore be misleading.

**General Opinions on Broader Nuclear Issues.** Opinions on five separate issues/propositions were assessed:

■ *The media are fair in their reporting of radioactive waste*

*issues.* Opinion on this is divided almost exactly 50:50 across Europe as a whole, with a total of 41.6% either strongly agreeing or tending to agree while 41.3% strongly disagree or tend to disagree.

Once again, however, there are marked differences between different member countries, with 59.4% of Irish people strongly agreeing or tending to agree with the statement compared with only 26.8% of Italians.

■ *The nuclear industry is open in providing information about radioactive waste.* Less than 1 in 5 Europeans (18.9%) either strongly agree or tend to agree with this statement. The extremes are represented by Sweden, where 40% of those polled think that the industry is open in providing information, and Italy where the figure is only 10%. Nearly 30% of Spaniards polled say they do not know.

■ *An advantage of nuclear power is that it produces less greenhouse gas emissions than other energy sources.* Well over one-third of those polled throughout the EU replied “don’t know”, though this ranged from 3.6% in Sweden to as high as 55% in Spain. Indeed, the figure for “don’t knows” is very similar to the total agreeing with the statement (41%).

This shows an appreciable lack of knowledge on the part of large a fraction of the EU population. In Sweden and Denmark, 47% and 42% respectively of respondents strongly agree with the proposition. This compares with a European average of only 12.5%.

■ *If all waste is managed safely, nuclear power should remain an option for electricity production in*

*the EU.* Across Europe, an average of 51% of the respondents agree, of which 15% strongly so, with this statement. On average there are 24% who “don’t know”. Therefore, after elimination of the latter, there is a two to one majority supporting the statement across Europe as a whole, with a majority in all Member States except Austria. In Austria, the results are diametrically opposite to those in the rest of the EU. One explication could be the “Temelin effect” (in reference to the power plant in neighbouring Czech Republic.)

Even if the sometimes sizeable number of “don’t knows” are not discounted, there is still an absolute majority in support of the statement in Belgium, Denmark, France, Italy, Luxembourg, Netherlands, Finland, and UK.

However, these results should also be viewed in the light of the replies to another question, which show that some 46% of the EU population believe that the reason why no disposal of high-level radioactive waste has yet taken place is because there is no safe way to do it.

Again, there are much higher than average “don’t knows” in Spain and Portugal.

■ *The generation using nuclear power should be responsible for dealing with its waste and not leave it for future generations to manage.* In total, 80% of those polled agree with this concept, with 50% agreeing strongly.

This question of responsibility was also raised in the 1998 survey, though in this instance the options were “this generation” (54%), “future generations” (6.1%), and “both” (35%). □