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Lot 3

Situation Concerning Public Information about and Involvement in the Decision-Making Processes in
the Nuclear Sector

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ACTIVITY 1.1:

PUBLIC OPINION REVIEW

CIEMAT

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I. OBJECTIVE

The objective of Activity 1.1 is to report the expectations and concerns of the European Union citizens as regards public information and involvement in the nuclear domain. (*Not to report concerns and expectations as regards nuclear energy or waste management options*).

A secondary objective would be to make proposals or suggestions for the Eurobarometer to improve the follow-up on public information and stakeholder involvement in the nuclear sector.

II. PROCEDURE

To achieve this goal, the **first step** will comprise an analysis of the way in which Eurobarometer polls have addressed the expectations and concerns of the EU citizens as regard public information and involvement in the nuclear domain.

One of the results of the EB analysis will possibly be the identification of different opinion patterns among the EU countries. The **second step** will consist in analysing national polls in three to four countries that are each characteristic of one of the patterns identified.

III. BACKGROUND

In order to set our study in context, previous public opinion reviews on the subject have been searched. Special attention has been paid to possible studies carried out by both international nuclear institutions and social research institutions, such as the NEA, the IAEA or the ISSP (International Social Survey Programme).

Very few studies have been found, and almost all of them were focused on opinions and attitudes towards nuclear energy or waste management options. Taking into account the goal of our study, the basic fact is that extremely few relevant references¹ or reflections about public information or participation issues in the nuclear domain have been found. It is also interesting to note that quite a lot of the articles/papers including significant inputs for our study are based on the latest Eurobarometer polls (*Taylor & Webster, 2003*), (*Poireau, 2004*) (*Taylor, 2005*), and will consequently be integrated in our EB review.

In this context, one of our main references is a recent public opinion review carried out by the **NEA**. In order to illustrate public behaviour and reactions related to nuclear energy, a limited number of opinion polls carried out during the period 1997-2001, in a selected number of member countries were reviewed by the NEA. (*NEA, 2002*) The member countries selected – six out of seventeen where nuclear electricity is produced (Finland, France, Germany, Japan, the United Kingdom and the United States) – cover a variety of contexts regarding nuclear energy programming and development, ranging from continued growth, e.g. Japan, to accelerated phase-out, e.g. Germany.

¹ We mean "relevant references" for our study, in other words, not just a single question addressing, for instance, knowledge about the Chernobyl Accident.

As a first comment it should be noted that most of the general findings of the NEA study relate to attitudes towards nuclear and other energy sources, the role of nuclear energy in protecting the environment, the concerns about health and environmental risks, the prices stability or the security of supply (**Table 1**). As already mentioned the goal of our study is not to report on attitudes and opinions towards nuclear energy but on expectations and concerns of the European Union citizens as regards public information and involvement in the nuclear domain.

As a consequence, the very first result would highlight the very little information dealing with public information and involvement included in the polls review in the NEA study.

KEY QUESTIONS ADRESSED IN REVIEWED POLLS (NEA)
Attitudes towards various energy forms
Attitudes towards nuclear energy
Differences in attitudes towards nuclear energy between population groups
Attitudes towards the future of nuclear energy
Aspects of nuclear energy raising more concern
Trust in information provided by various sources
Public participation in decision making

Table 1: Key topics in the NEA review

Let's underline the relevant findings for our EC-DGTREN public opinion review.

- As far as **public information** is concerned, the main generic worries of the public about nuclear energy, according to the surveys reviewed, include safety and radioactive waste management and disposal. Concerns are expressed in particular regarding the adequacy and reliability of the information provided to the public on nuclear safety, especially in case of a major incident or accident, and on the local impacts of radioactive waste repositories.
- Regarding **trust in information** provided by various entities, the public in almost all countries believed that the information on nuclear energy provided by professionals was the most credible.

In Japan people thought that newspapers (73% of the respondents among plural choice questions) are the most reliable followed by TV programmes (61%), professionals (44%), local government (11%), magazines (11%), electric company (10%) and plant workers (7%). The government was viewed as having low credibility (only 4% of respondents gave a favourable rating).

A larger majority of the respondents in France (76%) expressed confidence in scientists to inform them about nuclear power.

In the Unites States, nuclear professionals and plants workers were considered the best sources of accurate information on nuclear energy issues, with ranking as follows: nuclear scientists/engineers (60% of the respondents among plural choice questions), electric company (51%), plant workers (48%), nuclear regulatory commission (45%), consumer groups (42%), environmental groups (43%), news media (39%), Federal government (28%), anti-nuclear groups (22%).

- There are only few opinion polls that include questions directly related to **public participation in decision-making on nuclear energy policy or nuclear power projects**. Generally, responses to such questions are very positive and indicate a willingness of the respondents to be involved more closely in the process of planning and deciding about nuclear energy especially at the local level (sites of nuclear power plants, fuel cycle facilities and radioactive waste repositories).

According to the Finnish poll reviewed for the NEA study, citizens felt that their chances of participating and influencing the decision making in energy issues were minor. Two-thirds (66%) of people considered that citizens' opinions had not been sufficiently heard in energy solutions. Citizens were also eager to directly participate in, and contribute to decision-making concerning the disposal of radioactive waste.

As part of its programmes in the field of nuclear power, the **IAEA** compiles information from its Member States about the operational and institutional framework of their nuclear power programmes. The **Country Nuclear Power Profile (CNPP)** covers background information on the status and development of nuclear power programmes in countries having nuclear plants in operation and/or plants under construction. It reviews the organizational and industrial aspects of nuclear power programmes in participating countries, and provides information about the relevant legislative, regulatory and international frameworks in each country. The CNPP compiles the current issues in the new environment within which the electricity and nuclear sector operates, i.e. energy policy, and privatisation and deregulation in these sectors, the role of government, nuclear energy and climate change, and safety and waste management, which differ from country to country.

Public opinion is only considered in one of the CNPP, the Finish one. Let's see the "Public Acceptability of nuclear power" section included in the Finish CNPP (IAEA; 2003).

"An independent university group has conducted public opinion surveys on energy alternatives since 1983. Public attitude was rather favourable towards nuclear power before the Chernobyl disaster. The survey taken immediately after the accident showed a drastic change in opinions. At that time only 14 % were in favour of increasing nuclear capacity. The confidence lost in 1986 quickly returned by 1988 and the trend has been slowly improving since that. The latest poll of showed that 45 % favoured expanded use of nuclear, while 28 % were opposed. The change after the decision- in- principle of the fifth Finnish reactor is clear. The biggest uncertainty seems to concern nuclear waste. A question put in the opinion poll in spring 1999 concerned especially the opinion of the inhabitants living in those municipalities that were the candidate host communities for a spent fuel repository in Finland. The results show that a clear majority of the people in Loviisa and Eurajoki would agree that a spent fuel repository is sited in their home community, provided that studies can show that the encapsulation and disposal facility is safe".

It seems that very little attention is paid to public information and participation issues. Of course it does not mean that the polls do not include questions dealing with information or participation but it means, at least, that such information, if any, has not been considered in the presentation of its results.

Since in the reviewed polls the choices of methods, questions and audience were made by the organisations performing the survey, which all have some connection to the nuclear industry, the results presented in the NEA and other studies may differ from those of public opinion polls that would have been conducted by organisations entirely independent from the nuclear energy sector. Another important limitation is that each poll considered has its own structure and list of questions. Besides, given the different points in time at which the various

polls were executed, differences in the answers provided may have arisen as a result of a mere asynchrony. Therefore, as the own authors of the NEA study underline it is difficult to draw generic findings and conclusions from the polls reviewed, although a number of useful elements are distinguished and should be displayed.

As a hint for future work in this area, the NEA suggest a targeted public opinion poll in interested member countries using an agreed common methodology and an homogeneous set of questions. This poll would need to be performed at one point in time, and preferably be realised by an institution with as small as possible connection to the nuclear industry. This could consolidate the findings of the present study and could ensure comparability between the answers given in opinion polls in different countries, as well as a better consistency of results in various member countries.

The technical characteristics of the kind poll suggested by the NEA totally fit in with the Eurobarometer polls or the ISSP studies. Let's see what does the Eurobarometers tell us about public information and participation in the nuclear domain.

IV. EUROBAROMETERS REVIEW

Eurobarometer Standard Surveys (EB) are carried out twice yearly and cover the population of the European Union (EU) aged 15 and over. In total, some 16,000 interviews are conducted with approximately 1,000 interviews in each Member State with the exception of Germany, where 1,000 are interviewed in both ex-West and ex-East Germany, Luxembourg, where only 600 are interviewed, and the UK where, out of the total of 1,300 interviews there are 300 in Northern Ireland. This number of interviewees ensures an acceptable level of statistical accuracy in the final results.

Over the 28 years that these surveys have been conducted they have proved to be an invaluable source of information for EU policy makers and analysts on a broad range of economic, social, environmental and other issues of importance to EU citizens.

1. SCOPE

Although the preliminary idea was to focus on today's' situation (from 1998 up to now), including all EB dealing either with energy, science and technology, or environmental matters, the preliminary analysis of current EBs clearly showed that there is a really small amount of questions dealing with information, and even less with participation, in the nuclear domain.

Even more, almost all the information and participation related questions came out in EB specifically focus on nuclear matters, and not in those dealing either with energy in general, the environment, or science and technology issues. Therefore, the final decision was to go over all EBs explicitly dealing with nuclear issues since 1974.

Table 2 shows the EBs that, according to the GESIS² search system, have particularly addressed nuclear matters since 1974. As can be seen, and if we add the forthcoming 2005 EB on Nuclear Waste, we have a total of 14 "nuclear" Eurobarometers since 1974.

² (German Social Science Infrastructure System) GESIS offers an official Eurobarometer Data Service at the Zentralarchiv (ZA). This data service offers basic information on the Eurobarometer surveys and attempts to support the interested user in basic technical and methodological information; in identifying relevant topics and Eurobarometer surveys; and in the access to documentation and data for secondary analysis.

EUROBAROMETERS DEALING WITH PUBLIC INFORMATION AND PARTICIPATION ISSUES IN THE NUCLEAR DOMAIN

Year	From 1974 to 1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
EB		17		22		26	28	29	31	33	35.0		39.1	42	43.1	46.0		50.0			56.2				63
<i>Nuclear Energy</i>		K2		K2		K3, I1 T1	K2			I4, T3	I5, T3		I5, T3												
<i>Radioactivity</i>								K1, I4, T2	I4, T3				I5, T3		I5, T3										
<i>Nuclear Reactor Safety</i>																									
<i>Nuclear Waste</i>																		K5, I2 P3				K2, I1, T2, P1			K2, I1, T1, P3

 	EB including "nuclear" questions dealing with K, I, P or T issues (the number after the letter reflects the number of questions on the issue)
K	Knowledge
I	Information
T	Trust
P	Public participation or decision making process
 	EB including "nuclear" questions but none dealing with K,T or P

Table 2: Eurobarometers Dealing With Public Information And Participation In The Nuclear Domain

According with the objective of the review, in each of the selected EB the following thematic areas were searched and addressed in the nuclear EBs:

- Basic Knowledge & Awareness
- Information
- Trust
- Public participation & Decision Making Processes

As can be seen in **Table 2**, one of the nuclear EB (EB 46.0 – 1996) does not include any question pertinent for our study. Thus, the final amount of relevant EBs for our review is 13th.

An additional look will show us the nuclear issues that “have attracted the EB attention” along its history. It could be said that this cross -thematic and temporal evolution is the very initial result of the present review.

- In the nuclear energy and radioactivity field (1988 to 1995), information and trust issues were addressed
- In the nuclear waste domain (1998 to 2005), knowledge, information, trust, and participation issues were assessed.

2. RESULTS

The Eurobarometer Review comprises two kinds of data analysis. First we will present the conventional descriptive analysis for all the selected questions, and then we will include an analysis on the country profiles for both nuclear energy and radioactivity and radioactive waste.

A. DESCRIPTIVES

Nuclear Energy & Radioactivity:

The following Eurobarometers include relevant questions for our review: EB 29 (1988), EB 31 (1989), EB 33 (1990), EB 35.0 (1991), EB 39.1 (1993) and EB 43.1 (1995) .As already mentioned, EB 46.0 from 1996 was reported by GESIS as a Eurobarometer with nuclear energy data but in fact it did not have any question dealing with knowledge, information, trust or participation issues.

	NUCLEAR ENERGY & RADIOACTIVITY			
	Knowledge	Information	Trust	Participation & DM
EB 29 / Mar-April1988	-	q273 q277 q278 q279	q272 q280	-
EB 31 / Mar-April1989	-	q223-225 (5) q226 q227 q228	q223-225 (4) q229-233 q234	-
EB 33 / Mar-April 1990	-	q59 (5) q60 q61 q62	q59 (4) q63 q64	-
EB 35.0 / Mar 1991	-	q62 (5) q56 q57 q58 q59	q62 (4) q60 q61	-
EB 39.1 / May-Jun 1993	-	q25a (5) q19 q20 q21 q22	q25a (4) q23 q24	-
EB 43.1 / Apr-May 1995	-	q62 (e) q56 q57 q58 q59	q62 (d) q60 q61	-
EB 46.0 / Oct-Nov 1996				

Table 3: Relevant questions in the nuclear energy and radioactivity selected EBs

Moreover, only questions about 2 of our 4 main topics (Information and Trust) were identified in these EBs. In other words, there was no relevant information about Knowledge and Participation³.

EBs include “trend questions”, i.e., the same question is asked through years. In **Table 3**, questions with same colour are the ones that were asked in the same way during years. In some cases the answer choices were not exactly the same but it was easy to recode them in order to have approximately similar contents. Thus we have been able to compare responses in different years using the so called a trend analysis.

For an easier understanding, the literal wording of the selected questions are included as footnotes. (For more details about the selected questions please see **Annex 1**)

➤ Information:

The first question regarding this domain makes reference to the level in which European citizens agree with the need of giving trans-national information about the functioning of nuclear power plants in those countries that have plants near its

³ It is true that some questions concerning knowledge were found from 1982 until 1987, but they do not have continuity through time and were impossible to bound to any other posterior information. Taking into account the goal of this report, we decided not to include them into the analysis as they did not contribute to it in a remarkable way

borders⁴. This question has four answer choices in the 1988 Eurobarometer, and two in the ones from 1989 to 1995. That is the reason why the data from 1988 has been dichotomised, joining the possibilities “agree completely” and “agree to some extent”.

As can be seen in **Figure 1**, Europeans agree a lot with the fact that a country with nuclear power plants in its borders should keep the neighbouring countries well informed about their functioning. The agreement percentages in all years are above 90%.

Figure 1. Trans-national information: Europeans average by years.

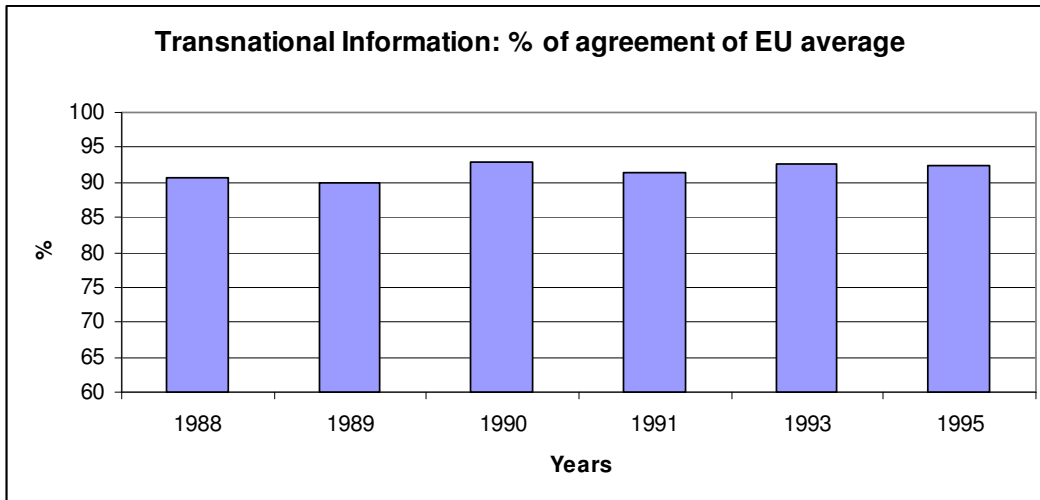


Figure 2 and Table 4 shows that even all the countries agree with this necessity, there are several differences among them.

On the one hand Finland, Denmark, Sweden, The Netherlands and Luxembourg show percentages equal or above 95% in all years; on the other hand we find Portugal, in which the percentage of agreement falls to 72% in some years. Spain, Austria and Belgium show average percentages between 87-89%.

The countries figure keeps quite constant through time. Nevertheless, the level of agreement slightly increases through time. Those countries in which the influence of time seems to be higher are: Belgium, Greece and Portugal, the same ones that gave less importance to trans-national information in 1988.

⁴ Do you agree or not with the next opinion: A country which has a nuclear power station near its borders should keep its neighboring countries informed about the way the power station is working.

⁷ Generally speaking, are you very satisfied, quite satisfied, not very satisfied, not at all satisfied or DK with information you receive about radioactivity in our country?

Figure 2. Trans-national information: EU average by countries from 1988 to 1995

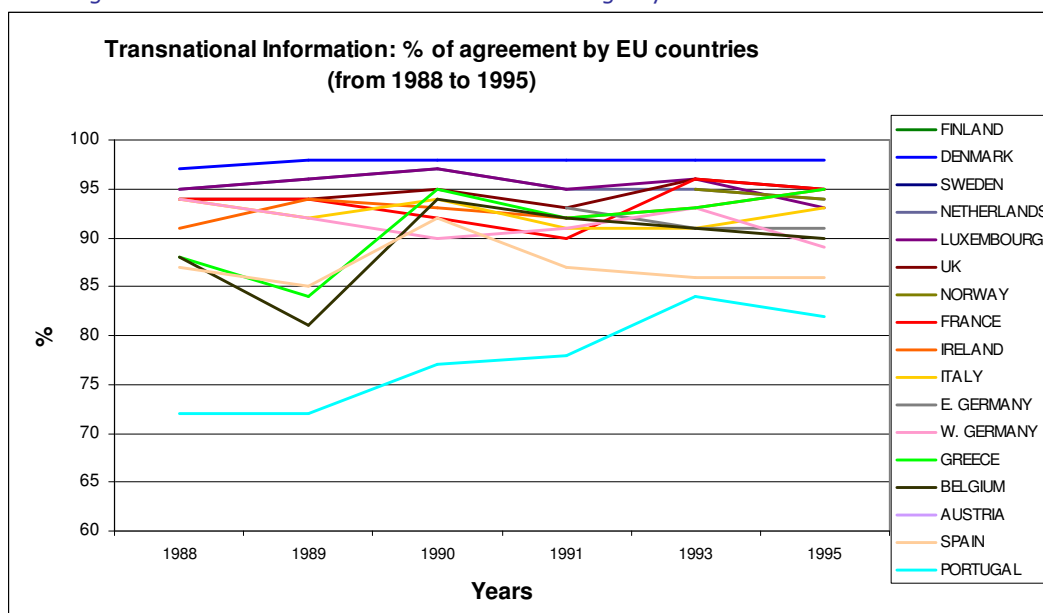


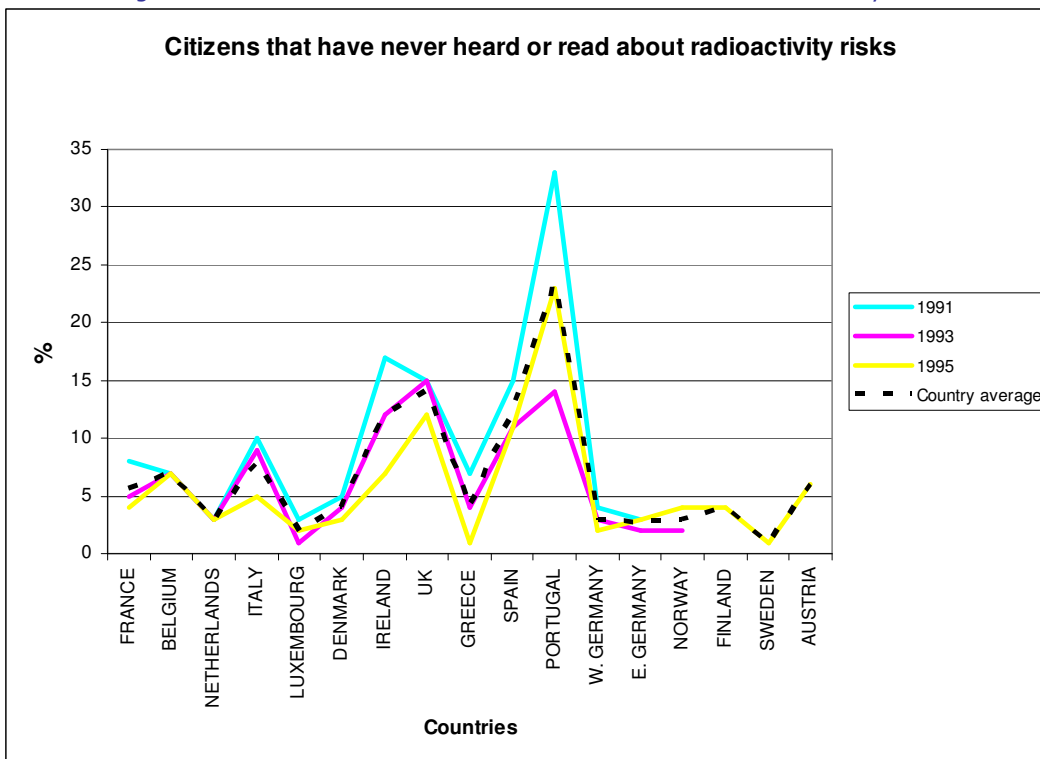
Table 4. Trans-National Information: % Of Agreement

Country	1988	1989	1990	1991	1993	1995	Country Average
FINLAND						98	98,00
DENMARK	97	98	98	98	98	98	97,83
SWEDEN						96	96,00
NETHERLANDS	95	96	97	95	95	94	95,33
LUXEMBOURG	95	96	97	95	96	93	95,33
UK	94	94	95	93	96	95	94,50
NORWAY					95	94	94,50
FRANCE	94	94	92	90	96	95	93,50
IRELAND	91	94	93	92	93	95	93,00
ITALY	94	92	94	91	91	93	92,50
E. GERMANY				93	91	91	91,67
W. GERMANY	94	92	90	91	93	89	91,50
GREECE	88	84	95	92	93	95	91,17
BELGIUM	88	81	94	92	91	90	89,33
AUSTRIA						88	88,00
SPAIN	87	85	92	87	86	86	87,17
PORTUGAL	72	72	77	78	84	82	77,50
Year average	90,75	89,83	92,83	91,31	92,71	92,47	

The key point is the wide agreement on the need of trans-national information. Besides, EU countries have higher percentages of agreement regarding that need of trans-national information in 1995, so the level of dispersion among countries reduces from 1988 to 1995.

The **second question** refers to the sources of information that Europeans use to be informed about the risks of radioactivity⁵ This is a multiple choice question, in which citizens can select more than one alternative (more than one source of information). Furthermore, this question appeared just in 1991, 1993 and 1995 Eurobarometers. In order to analyse the basic level of knowledge, answers of people that had never heard about radioactivity risks will be commented first. In **Figure 3** it can be seen that the percentage of people that had never listened to this topic is quite small.

Figure 3. Citizens that have never heard or read about radioactivity risks



None of the years average is higher than 10% (Table 5). Nevertheless, there is a little but important part of the EU population that have neither read nor heard about radioactivity risks. Taking into account the social desirability phenomena, we have to think that the real percentage of unformed people could be higher, because some people do not like to recognize that they have never heard about radioactivity risks.

Table 5. Percentage of citizens that have never heard about radioactivity risks

Country	1991	1993	1995	Country Average
PORTUGAL	33	14	23	23,33

UK	15	15	12	14
SPAIN	15	11	11	12,33
IRELAND	17	12	7	12
ITALY	10	9	5	8
BELGIUM	7	7	7	7
AUSTRIA			6	6
FRANCE	8	5	4	5,67
DENMARK	5	4	3	4
GREECE	7	4	1	4
FINLAND			4	4
NETHERLANDS	3	3	3	3
W. GERMANY	4	3	2	3
NORWAY		2	4	3
E. GERMANY	3	2	3	2,67
LUXEMBOURG	3	1	2	2
SWEDEN			1	1
Year average	10	6,57	5,76	

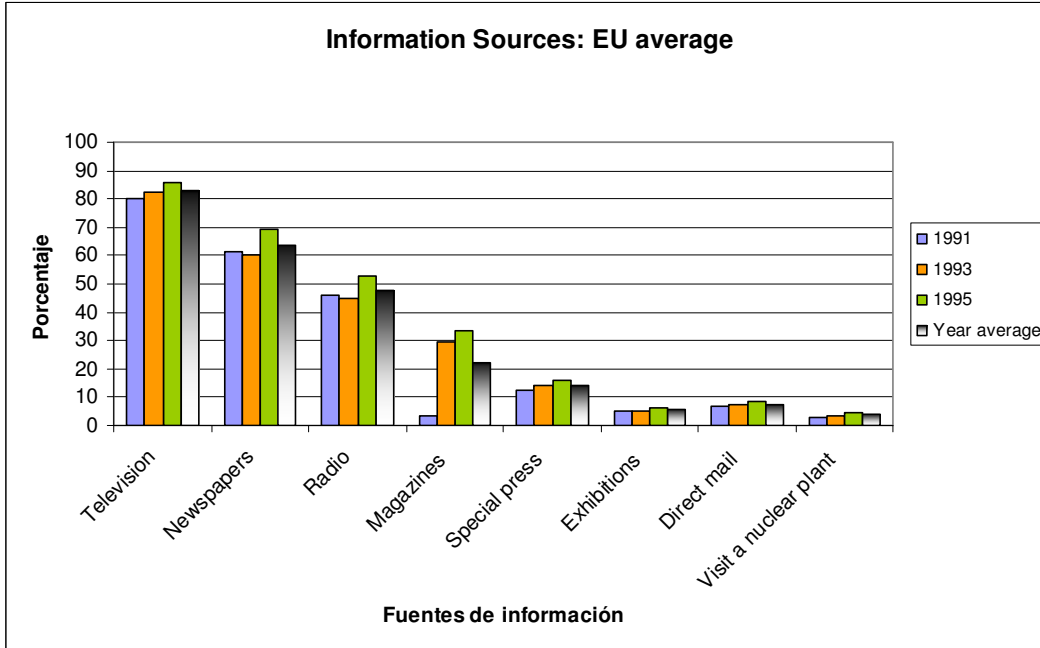
We can see that the percentage of misinformed people is smaller in 1995 (5,76%) than in 1991 (10%), in fact in 4 years it has decreased by a half. The new countries incorporated to the EU in 1995 have an important effect to the year average. The average of this year without these three countries (Sweden Finland, Austria) is more or less similar to the one in 1993. So the main decrease in misinformed people took place from 1991 to 1993. In summary, by years, there is a small but also significant improvement on the level of information for all EU countries. It seems that available information has been growing through years.

By countries, there are significant differences on information levels: from only an average of 1% of the Swedish having not heard or read about radioactivity to 23'33% in Portugal. Clearly, there are a few countries that have better information than others; this is the case of Sweden, Luxembourg, Germany, Norway and the Netherlands. In contrast, the countries with the highest % of people in this situation (never heard about it) are Portugal, UK, Spain and Ireland.

Let's focus on the remaining question options: the European ranking of the information sources used to get information about radioactivity risks. In [Figure 4](#) it is shown that television is the most used source to get information, followed by newspapers, radio and magazines. So, mass media are the source reaching a higher % of people (over 50%). In contrast, visiting a nuclear power station is the least frequent source, even though not all EU countries have nuclear power plants. Direct mail was not a very used source during the period from 1991 to 1995. Nowadays the situation would probably be very different.

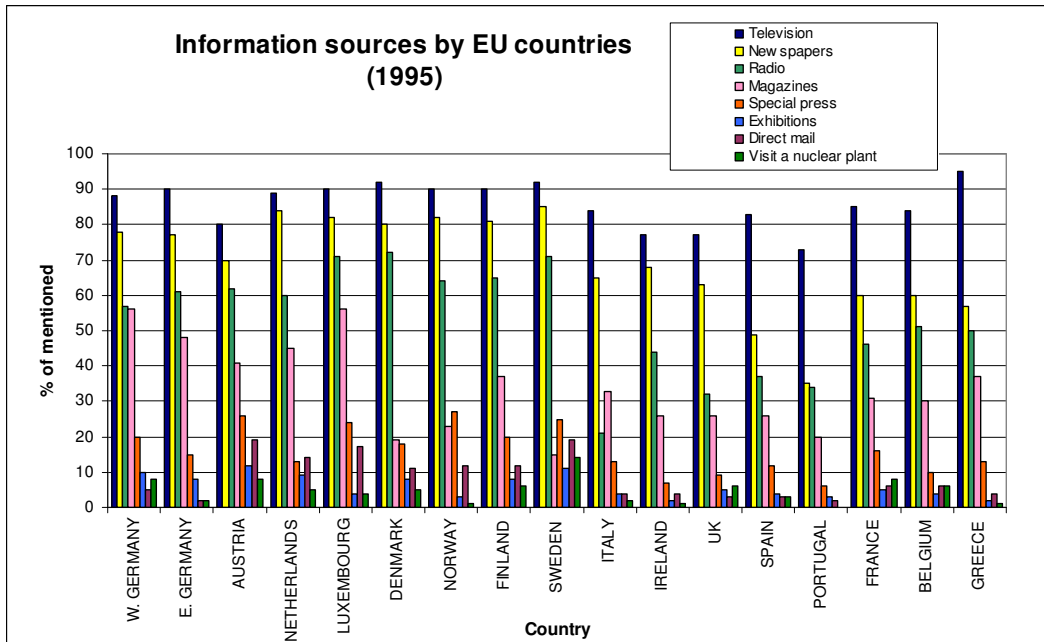
By years, there is a trend for all the information sources to increase. This is probably due to the fact that the number of informed citizens was also higher. It is worth mentioning the spectacular growth of magazines use from 1991 to 1993.

Figure 4. Used sources to get information about radioactivity risks: EU average



By countries, in 1995, television is the most used source (Figure 5). Only in 3 countries it is mentioned below 80%: Ireland, UK and Portugal. Newspapers have more differences between countries: while in Luxembourg, Norway, Finland and Sweden have a % over 80; Spain has 49% and Portugal only 35%. It is important to take a look to the “distance” between TV and newspapers: while some countries have little difference (From Germany to Sweden in the Figure) others have a big one (From Italy to Greece in the Figure). This would be important for giving information to the different countries. However, we should always keep in mind the dates of this EBs.

Figure 5. Used sources to get information about radioactivity risks: EU countries



It is important to take into account that the level of information about nuclear energy and radioactivity of EU countries is contributing to the percentage of use of the mentioned sources. This could lend into erroneous interpretations of the results. The bigger the percentage of informed people is the higher the use of all sources. Moreover, it is important to consider the singularity of each country while considering its “information culture” and mass media use.

In short, there is a small percentage of people not having heard or read about nuclear energy and radioactivity, and this percentage decreases through time. It is worth mentioning that there are significant differences among countries.

Regarding the sources of information, mass media are the most used source as far as nuclear energy and radioactivity issues are concerned

The **third question** refers to the degree of satisfaction citizens have with the received information about radioactivity in the own country⁷

This question appears in an identical form within the six Eurobarometers from 1988 to 1995. In the analysis we have match “very satisfied” with “quite satisfied” in order to get the proportion of satisfied people.

As can be appreciated in **Figure 6**, the perception of being informed about radioactivity is quite low, no year exceeded 40%. Focalsing in the evolution through time, from 1988 to 1995, the EU year average rises from 19’25% (1988) to 39’65% (1995), so it

increases nearly a half. The effect of new 1995 incorporations (Norway, Finland and Austria) has to be pointed out because of its growing effect in the average. Even though, without these countries the increase trend can still be found.

Figure 6. Satisfaction with information: EU average from 1988 to 1995

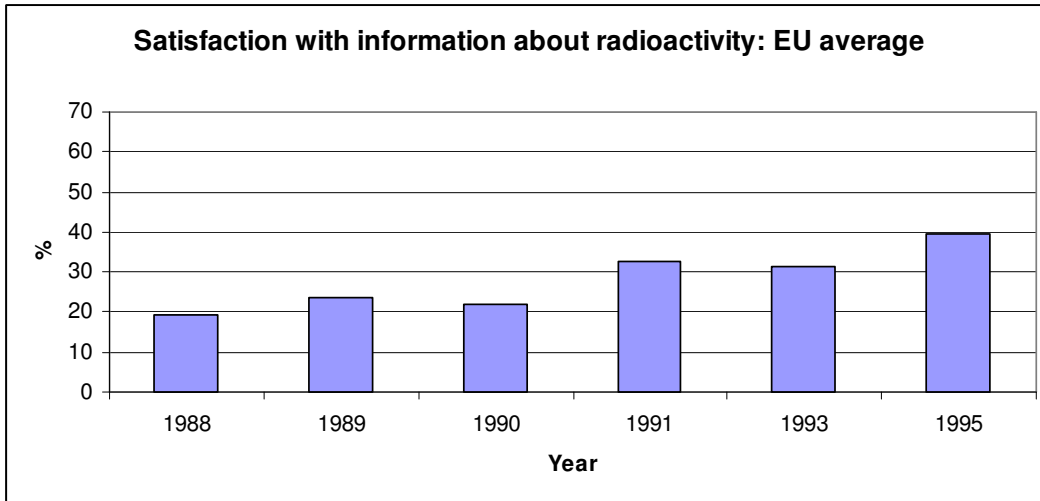


Figure 7 and Table 6 show a general increment in the satisfaction level for almost all countries by years. The most satisfied countries are: Sweden, Finland, Austria, Denmark, Norway and East Germany (upper than 46%), and the least satisfied are: Greece, Italy and Spain (lower than 20%).

Figure 7. Satisfaction with the received information: EU countries

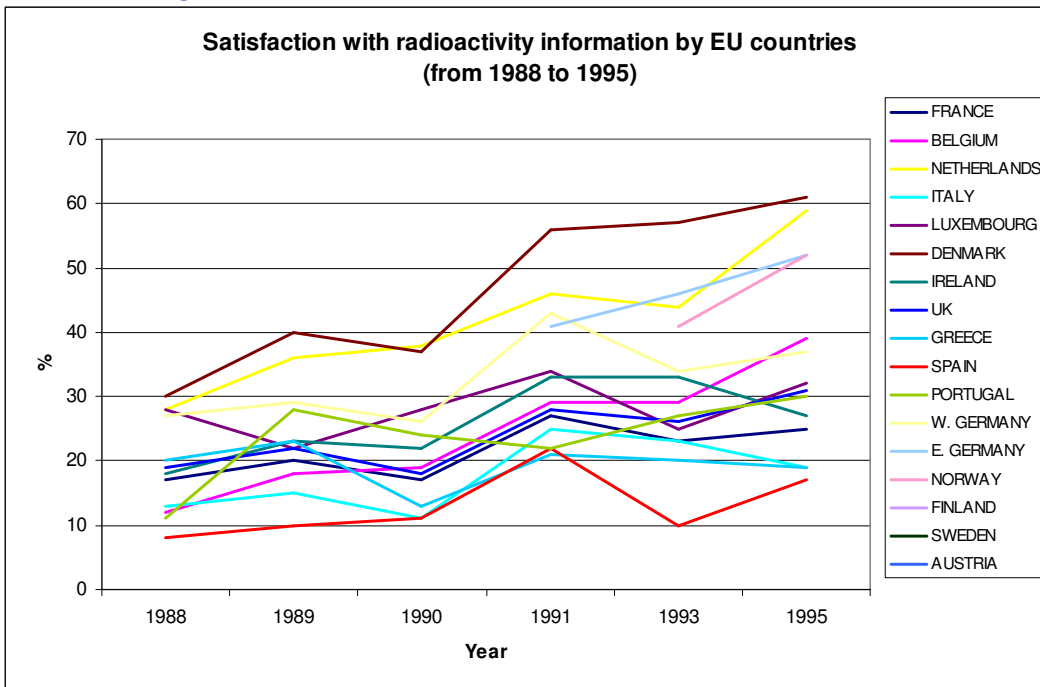


Table 6. Satisfaction with the received information

Country	1988	1989	1990	1991	1993	1995	Country average
SWEDEN						63	63,00
FINLAND						59	59,00
AUSTRIA						52	52,00
DENMARK	30	40	37	56	57	61	46,83
NORWAY					41	52	46,50
E. GERMANY				41	46	52	46,33
NETHERLANDS	28	36	38	46	44	59	41,83
W. GERMANY	27	29	26	43	34	37	32,67
LUXEMBOURG	28	22	28	34	25	32	28,17
IRELAND	18	23	22	33	33	27	26,00
BELGIUM	12	18	19	29	29	39	24,33
UK	19	22	18	28	26	31	24,00
PORTUGAL	11	28	24	22	27	30	23,67
FRANCE	17	20	17	27	23	25	21,50
GREECE	20	23	13	21	20	19	19,33
ITALY	13	15	11	25	23	19	17,67
SPAIN	8	10	11	22	10	17	13,00
Year average	19,25	23,83	22,00	32,85	31,29	39,65	

In summary, the perception of being informed about nuclear energy and radioactivity is quite low (no year exceeded 40%), although it increases through time, from 1988 to 1995.

The **fourth question** was only answered by the people who are very or quite satisfied with the received information about radioactivity. This question concerns the reasons that explain their satisfaction with information⁹. It is written in exactly the same way along the six Eurobarometers containing nuclear information from 1988 to 1995. More than one answer is permitted in this question.

Concerning the EU average, as can be seen in **Figure 8**, the first reason for satisfaction cited by Europeans is “to be sufficient”. In other words, this first reason remits to the amount of information. This data seems to indicate that people who are satisfied do have enough information. The following reason for satisfaction is “trustworthy”, a more qualitative attribute of trust dimension. The reason that appears to be the least important is that the information would “be announced quickly”.

⁹ Which of the following reasons best explain why you are satisfied with the information you get about radioactivity?

1. Trustworthy
2. Sufficient
3. Objective
4. Clear and well explained
5. Interesting
6. Announced quickly
7. Others
8. DK

By years, the percentage of people who mentioned a specific reason tends to increase. This is probably an effect of the level of satisfaction, as it is growing too.

Figure 8. Satisfaction reasons: EU average from 1988 to 1995

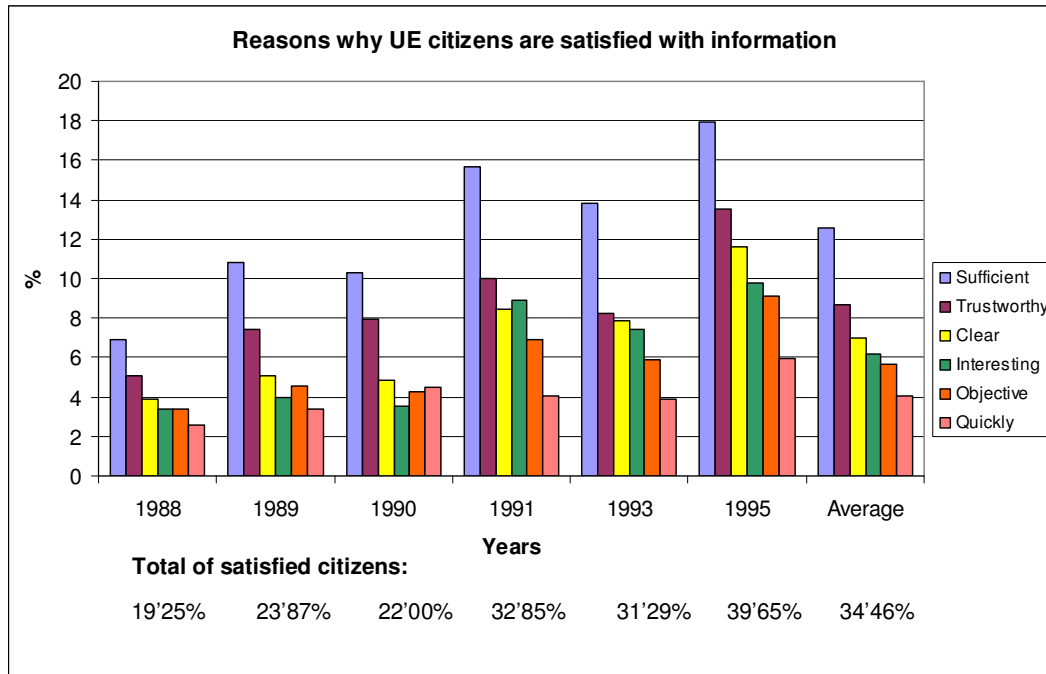
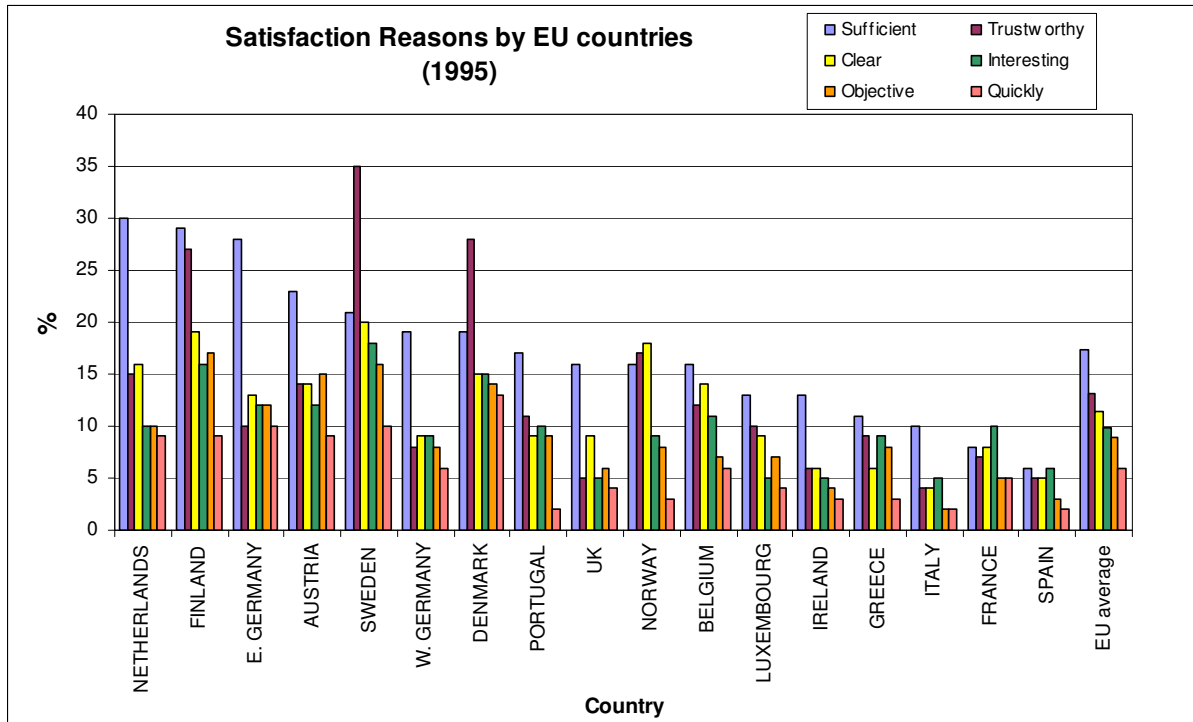


Figure 9 presents the situation by countries in 1995. Here it can be seen that most countries emphasize “sufficient” as the first reason to be satisfied with information. Trustworthy of the information as a reason to be satisfied stands out in Denmark, Finland and especially in Sweden. Specifically, in Denmark and Sweden trustworthy exceeded the sufficient reason. It is possible that in these countries there is more information about this topic and, furthermore, they are more satisfied with the received information. When the first step is achieved (information is at one’s disposal), credibility becomes the important thing. Receiving the information “quickly” is the last reason given to explain satisfaction. Finally, “to be objective” was not an important reason in 1995. Only in Finland and Sweden we could see a percentage over 15%.

Figure 9. Satisfaction reasons: EU countries in 1995



In short, as far as the reasons for satisfaction with “nuclear information” are concerned, on the EU average, the key issue is the amount of information. It is worth mentioning how trust becomes the most significant dimension in the Nordic countries (*When the first step is achieved- (information is at one’s disposal-, credibility becomes the important thing).*

Question number five, the last one related to “Information”, complements the previous one by making reference to dissatisfaction reasons in those citizens not satisfied with the information about radioactivity provided by their own country¹¹ (those who said they were “not very satisfied” or “not at all satisfied”).

Again, the amount of available information (“insufficient”) is the key issue through time (**Figure 10**) Therefore it could be concluded that information availability is the most important dimension for both satisfaction and dissatisfaction. The key role played by

¹¹ Which of the following reasons best explain why you are not satisfied with the information you get about radioactivity?

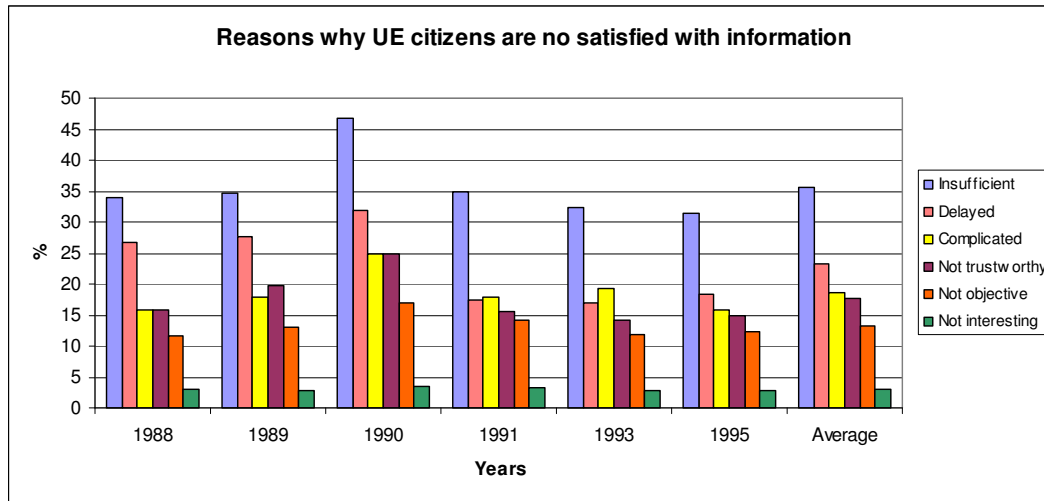
1. Not trustworthy
2. Insufficient
3. Not objective
4. Complicated and badly explained
5. Not interesting
6. Not circulated well and delayed / Given late and widely circulated
7. Others
8. DK

¹³ Do you agree or not with the next opinion: An accident like Chernobyl could not happen in a nuclear power station in your country (if there is no power stations in the country change for power stations in western Europe).

“quantity” of information could be associated to a lack of it or, in other words, to a demand of more information on the nuclear subject throughout the EU.

The second reason for dissatisfaction with information is related with the time dimension, i.e., “delayed information”. It should be noted that “to be quickly announced” is relevant for dissatisfaction but not so much for satisfaction. Curiously, lack of trustworthiness does not seem to be an outstanding reason for the EU citizen’s satisfaction levels. It may be argued that, by that time, EU citizens were still focused on the amount, the quantity, of the information and not so much on its quality (like if the first step was not taken by then).

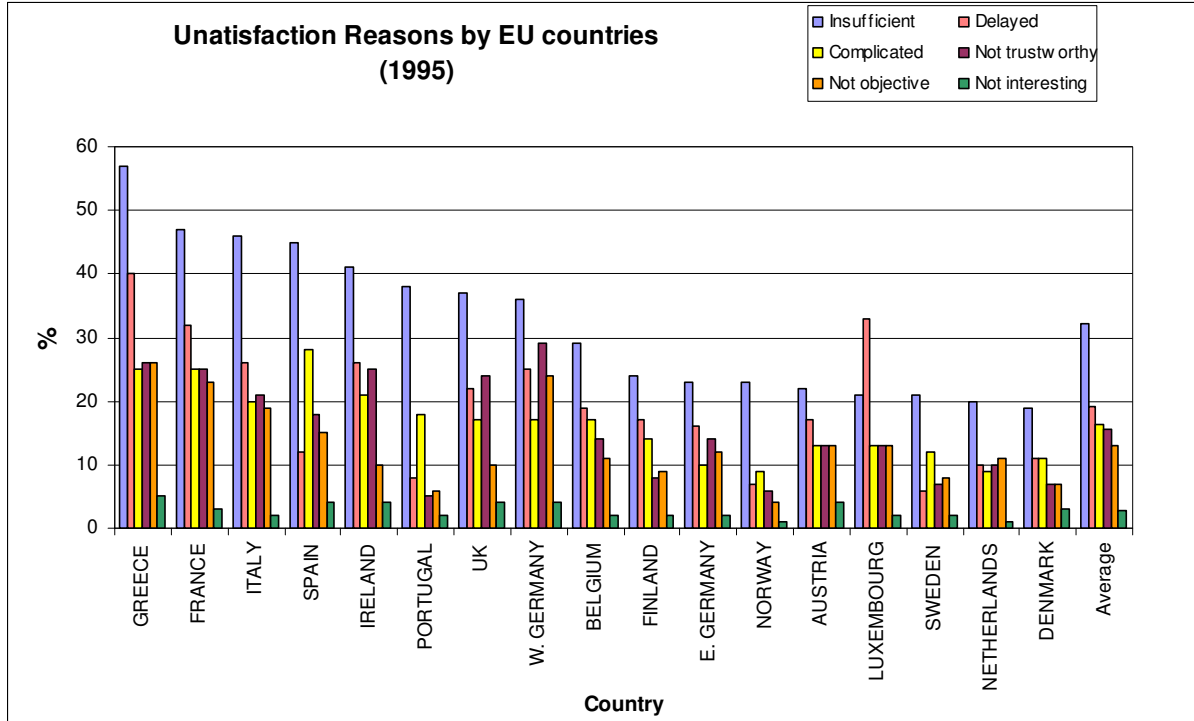
Figure 10. Dissatisfaction reasons: EU average from 1988 to 1995



Let’s focus now on the countries’ situation (**Figure 11**) in 1995, the most recent year of the EB series we are dealing with. Most countries emphasize “insufficient” as the first reason to be dissatisfied with information. This reason stands out in Greece, France, Italy and Spain. Only in Luxembourg the reason “delayed” is more mentioned than “insufficient”. In accordance with the satisfaction data, Luxembourg, Sweden, the Netherlands and Denmark are the countries paying less attention to the amount of information. The “delays” with the information are the second most mentioned reason for dissatisfaction among the EU citizens in 1995. Countries such as Greece, Luxemburg and France stand out with percentages over 30%. On the other hand, Portugal, Norway and Sweden mentioned such delays in a percentage below 10%.

The less satisfied countries are the ones mentioning more the “complicated” argument as the reason for their dissatisfaction (Spain, Greece, France, Ireland, Italy and Portugal).

Figure 11. Dissatisfaction reasons: EU countries in 1995



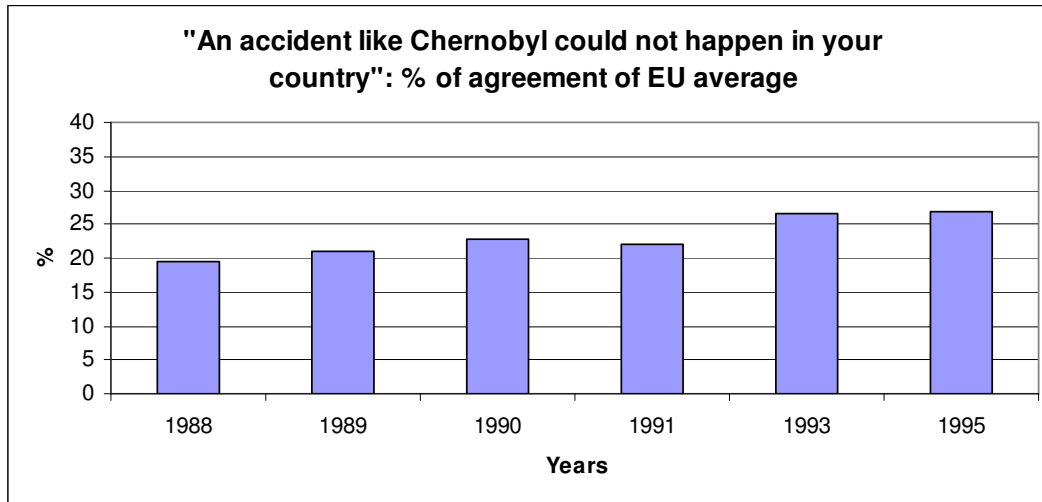
To sum up, information availability is the most important dimension for both satisfaction and dissatisfaction. In the most satisfied countries (Finland, Sweden, Denmark...), qualitative dimensions stand out, notably, trust. In the less satisfied countries (Spain, Portugal, France Ireland and Italy) more quantitative issues are raised, such as the amount of information or its level of complexity.

➤ Trust:

The **first question** in this chapter deals with the possibility of an accident like Chernobyl in the own country (in the case that a country did not have nuclear power plants the questions asked for the possibility of a nuclear accident in western Europe)¹³.

The answer choices offered in 1998 have been dichotomised in order to make them equal to the ones in the rest of the years. This question has been analysed as an indirect indicator of trust in the nuclear sector.

Figure 12. Indirect indicator of trust in the nuclear sector: EU average from 1988 to 1995



In general terms, between 20% and 27% of the European citizens think that an accident like Chernobyl is not possible in the own country (**Figure 12**). So, a minimum of 7 out of 10 “distrust” nuclear sector in their own country or in Western Europe. Despite the efforts of nuclear industry to keep citizens informed about risks, most of European citizens do not perceive it in a safely way.

Over years, a major % of people thinks that a nuclear accident is not possible. Indeed, in 1988 (two years after the real Chernobyl accident) there were more people thinking that an accident like Chernobyl was possible than in 1995 (9 years after the accident). Anyway, the increase of trust is small. In 8 years it has grown only a little.

By countries (**Figure 13 / Table 7**), Finland (43%), Sweden (34%) and Portugal (31%) have the biggest % of agreement with the statement, so they tended to think that a nuclear accident was not possible in their country. Finland and Sweden have nuclear stations in their territory, but Portugal does not.

Figure 13 Indirect indicator of trust in the nuclear sector: EU countries from 1988 to 1995

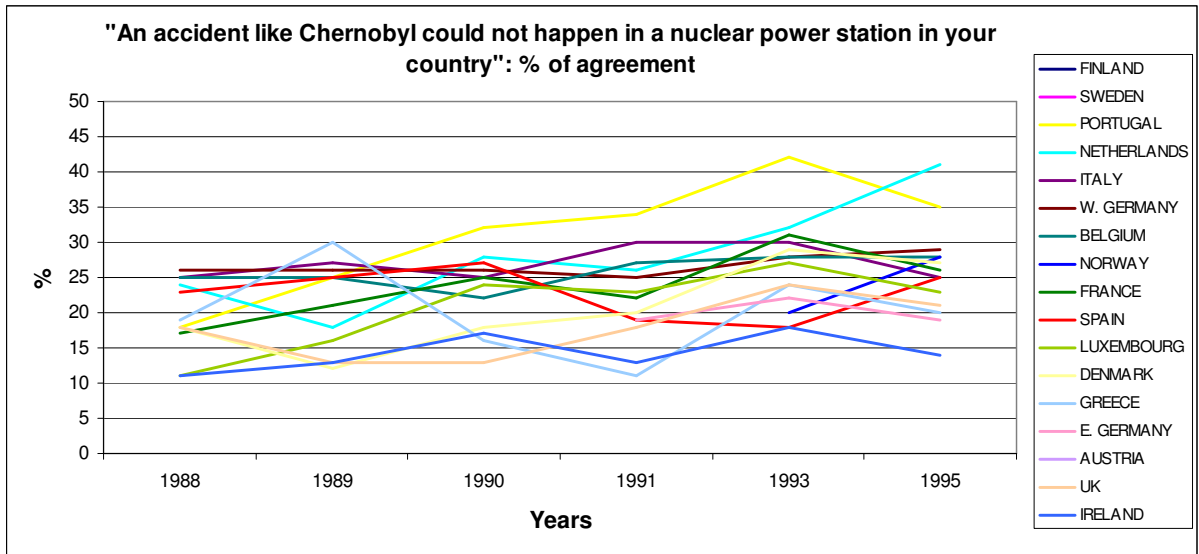


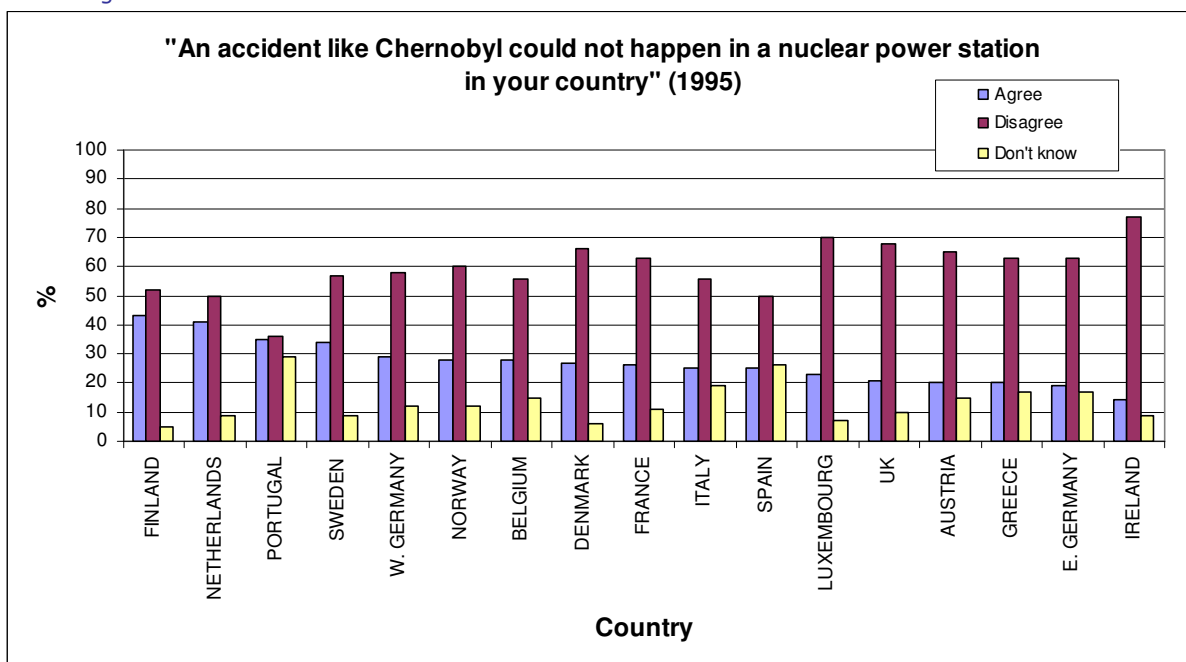
Table 7 Indirect indicator of trust in the nuclear sector: EU countries from 1988 to 1995

Country	1988	1989	1990	1991	1993	1995	Country average
FINLAND						43	43,00
SWEDEN						34	34,00
PORTUGAL	18	25	32	34	42	35	31,00
NETHERLANDS	24	18	28	26	32	41	28,17
ITALY	25	27	25	30	30	25	27,00
W. GERMANY	26	26	26	25	28	29	26,67
BELGIUM	25	25	22	27	28	28	25,83
NORWAY					20	28	24,00
FRANCE	17	21	25	22	31	26	23,67
SPAIN	23	25	27	19	18	25	22,83
LUXEMBOURG	11	16	24	23	27	23	20,67
DENMARK	18	12	18	20	29	27	20,67
GREECE	19	30	16	11	24	20	20,00
E. GERMANY				19	22	19	20,00
AUSTRIA						20	20,00
UK	18	13	13	18	24	21	17,83
IRELAND	11	13	17	13	18	14	14,33
Year average	19,58	20,92	22,75	22,08	26,64	26,94	

So, Portugal inhabitants were in fact asked about power stations in Western Europe. The countries showing higher percentages of trust (with the exception of Portugal) are the most informed ones. Ireland has in average the lowest % of agreement (14%), and it is followed by UK (18%).

If we focalise now in the different EU countries in 1995, the last year in which the question was included (**Figure 14**), we can see that only Netherlands and Finland agree with this statement over a 40%. Most countries show an agreement rate between 20 and 35%. In reference to “don't know” answers they range from 5 to 20%, with 2 exceptions: Spain (26%) and Portugal (29%).

Figure 14. Indirect indicator of trust in the nuclear sector: EU countries in 1995



The **second question** refers to trust in agents to give information about radioactivity levels¹⁴. For the analysis we have matched “complete confidence” and “a fair degree of confidence” in order to get the proportion of confidence for each source. This question is identically formulated during the period from 1989 to 1995, and several answers were possible.

In average, in Europe (**Figure 15**), Doctors were the most trusted group with 76% of favourable answers. Independent scientists and environmental groups, both of them with nearly 73% of support, followed them. University and schoolteachers rose to 62%. Public authorities were the least trusted group as only 37% of the European citizens

¹⁴ Information on radioactivity levels can come from various sources. For each Information source which I read out to you, please tell me to what extent you have confidence in it to tell you truth about levels of radioactivity in (OUR COUNTRY):

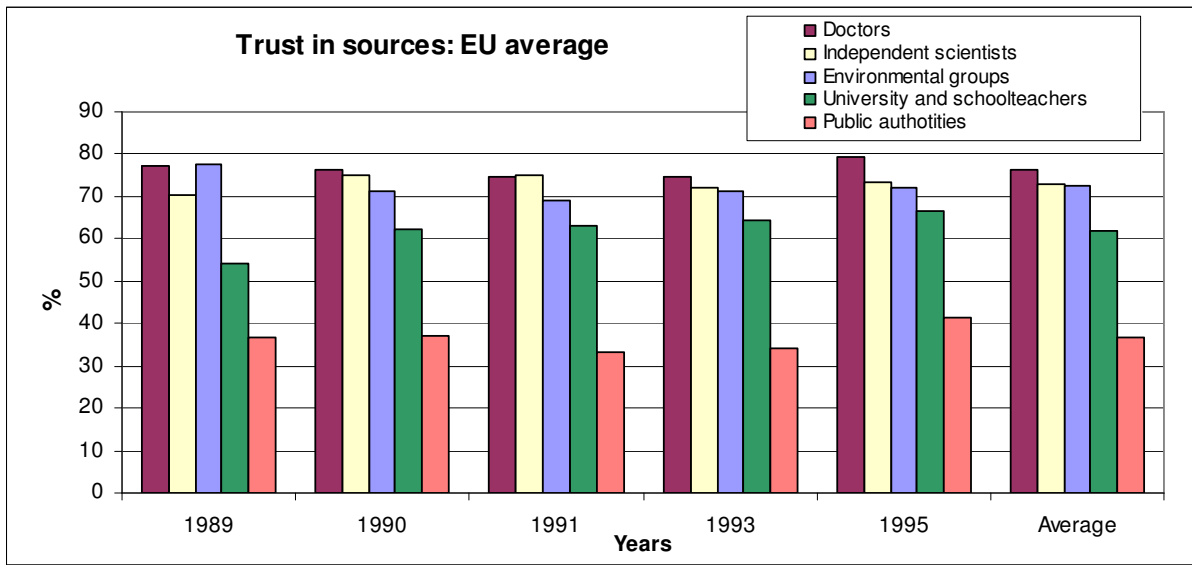
Complete confidence, a fair degree of confidence, not much confidence, no confidence at all or DK?

- Environmental groups and associations
- Doctors
- Independent scientists
- University and schoolteachers
- Public authorities
- DK

have confidence on them. What we can see is that, in general terms, people trust social agents with “expert” knowledge.

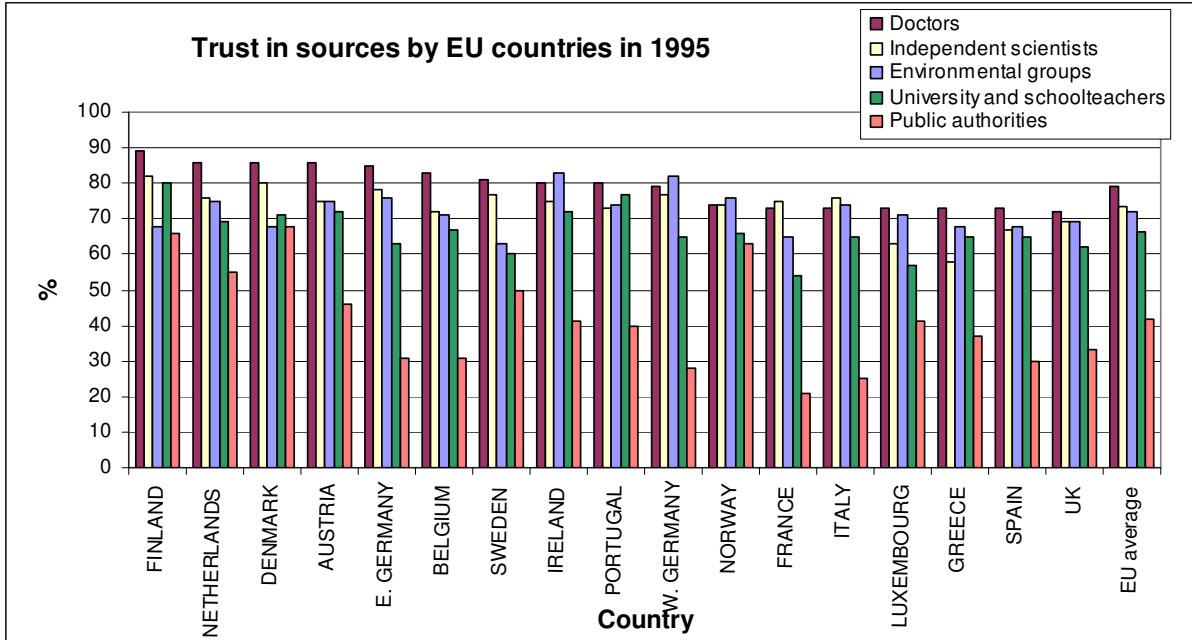
By years, confidence in all information agents increases slightly, with university/schoolteachers and public authorities increasing more than the others.

Figure 15. Trust in agents to give information of radioactivity levels: EU average from 1988 to 1995



Finland, the Netherlands, Denmark and Austria are the countries in which Doctors are the most trusted information source. In these countries (Denmark, Finland, Norway and the Netherlands) there is also more confidence on public authorities (between 55 and 70%), in contrast with UK, Spain, Belgium, Italy, and France (between 20 and 30%). (Figure 16)

Figure 16. Trust in agents to give information of radioactivity levels: EU countries in 1995



Summing up for the EU average, and regarding trust in information sources, people trust social agents that have an “expert” knowledge. Doctors are the most trusted group followed by independent scientists and environmental groups. It should be noted that public authorities are the least trusted group. Even though, in some northern countries, notably in Finland, Norway and Denmark, public authorities are quite trusted.

The **third question** on trust relates to the desirable qualities in people giving information about levels of radioactivity¹⁵. This question is identically formulated during the period from 1989 to 1995. Several answers were possible.

In accordance with previous results, people giving information about levels of radiation “should be an expert” (**Figure 17 and Table 8**). Despite all the addressed qualities range from 30 to 60%，“expertise in the subject” is the most valued quality to give information about levels of radioactivity, with a yearly average of 58%. In contrast, “expertise in health” is less valued, with a 39%. Surprisingly, “commitment to public concerns” is the least valued quality with only 31% of the sample mentioning it.

¹⁵ Which of the following qualities would you particularly look for in people giving you information about levels of radioactivity in (OUR COUNTRY):

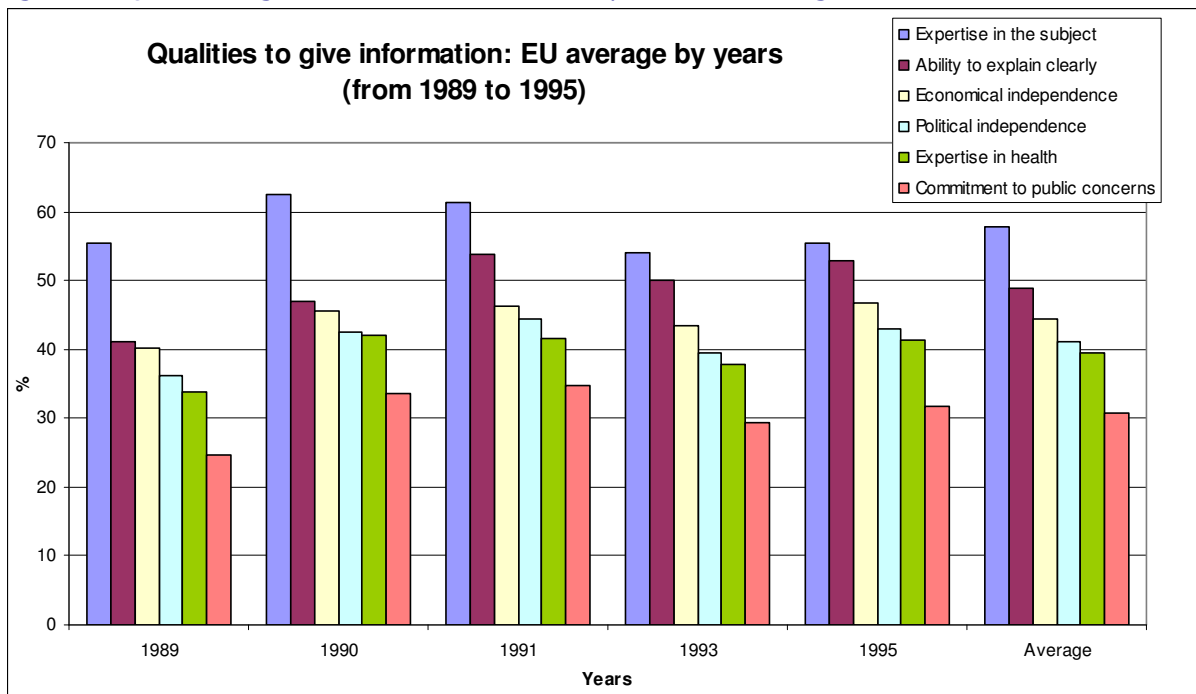
1. High level of expertise in the subject
2. Genuine independence from any economic or industrial vested interests
3. The ability to explain clearly what is going on
4. Significant commitment to what concerns the public at large
5. Genuine independence from any political influence
6. A high level of expertise in the area of health problems
7. Other answers
8. DK

Table 8 Qualities to give information of radioactivity levels: EU average

Qualities	1989	1990	1991	1993	1995	Average
Expertise in the subject	55,50	62,58	61,38	54,07	55,35	57,78
Ability to explain clearly	41,17	47,08	53,85	49,93	52,76	48,96
Economical independence	40,17	45,50	46,38	43,36	46,71	44,42
Political independence	36,08	42,50	44,38	39,50	42,94	41,08
Expertise in health	33,92	42	41,69	37,86	41,35	39,36
Commitment to public concerns	24,75	33,5	34,69	29,29	31,65	30,78

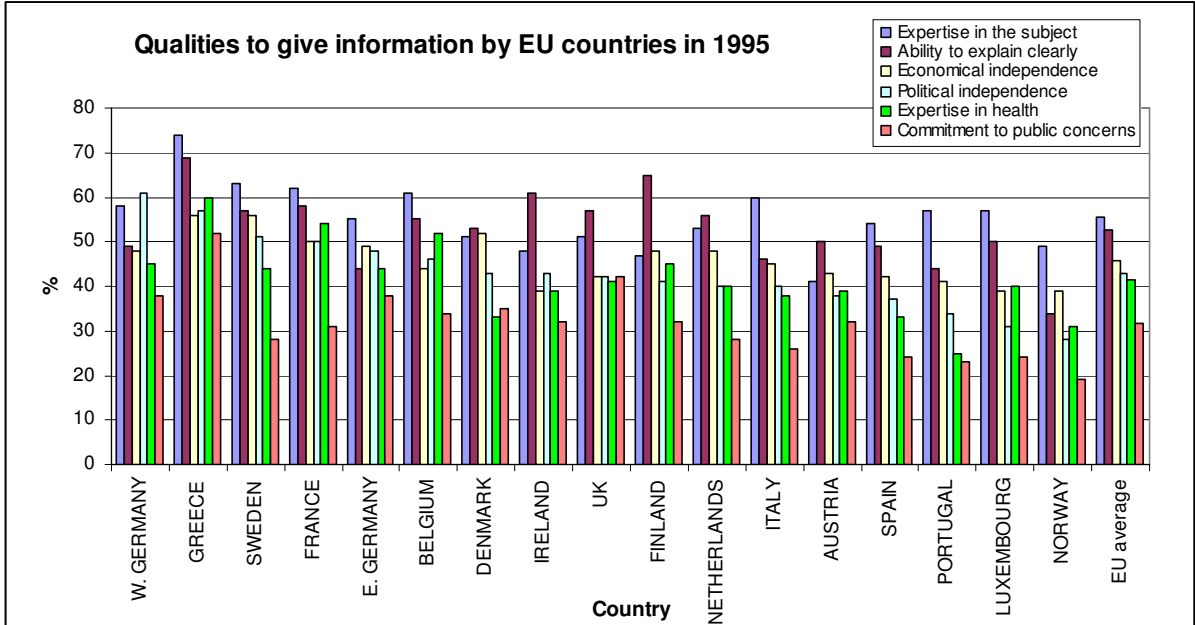
It seems that “expertise” is the most required quality for the potential information agents in the EU, while “commitment to public concerns” does not seem to play a significant role by that time.

Figure 17. Qualities to give information of radioactivity levels: EU average from 1988 to 1995



By countries (Figure 18), the quality “expertise in the subject” highlights mainly in Greece (74%.) In Sweden, France and Belgium it is also the most valued quality, with percentages over 60%. Regarding political independence, it is specially valued in West Germany and Greece. On the other hand, in the Netherlands, UK, Denmark, Ireland, Finland and Austria “expertise in health” is more valued than “expertise in the subject”.

Figure 18. Qualities to give information of radioactivity levels: EU countries in 1995



To sum up, and despite differences among countries, it seems that “expertise” is the most required quality for the potential information agents in the EU, while “commitment to public concerns” does not seem to play a significant role by that time (1988-1995).

Nuclear Waste

In the whole Eurobarometer data base only in 3 surveys concerning the Nuclear Waste domain were found: EB 50.0 (1998), EB 56.2 (2001) and the last 2005 survey. There are no questions on our topics in the area of Waste management along the previous EB (before 1998), probably because this area has become more important in the last few years. In those 3 Eurobarometers we have found questions in the 4 main topics: Knowledge, Information, Trust and Participation (Table 9).

Table 9. Relevant questions in the Radioactive Waste Domain

	NUCLEAR WASTE			
	Knowledge	Information	Trust	Participation & Decision Making
EB 50.0 / Oct-Nov 1998	q48 q49 q50 q51 q53	q47 q62	-	q56 q58 q59
EB 56.2 / Oct-Nov 2001	q53 q57	q51	q52 q59	q55
EB -- / 2005	q5 q10	q1	q12	q11 q14 q15

In contrast to “Nuclear Energy and Radioactivity”, the “Nuclear waste” domain show almost no continuity through years. We only found four questions that present this continuity, but even those show different formulations or unequal answer formats, making them difficult (and sometimes even impossible) to compare. The only question that allows a proper tendency analysis is the yellow one, which was formulated exactly in the same way through different years. Even though a real trend analysis is not possible for the other questions, data do allow a “feeling” of the temporal evolution.

For an easier understanding, the literal wording of the selected questions are included as footnotes. (For further details about the selected questions please see **Annex 2**)

➤ Knowledge

The **first question** in this section deals with the radioactive waste producers¹⁶. **Figure 19** shows the three most mentioned responses, as well as the “don’t know” answers.

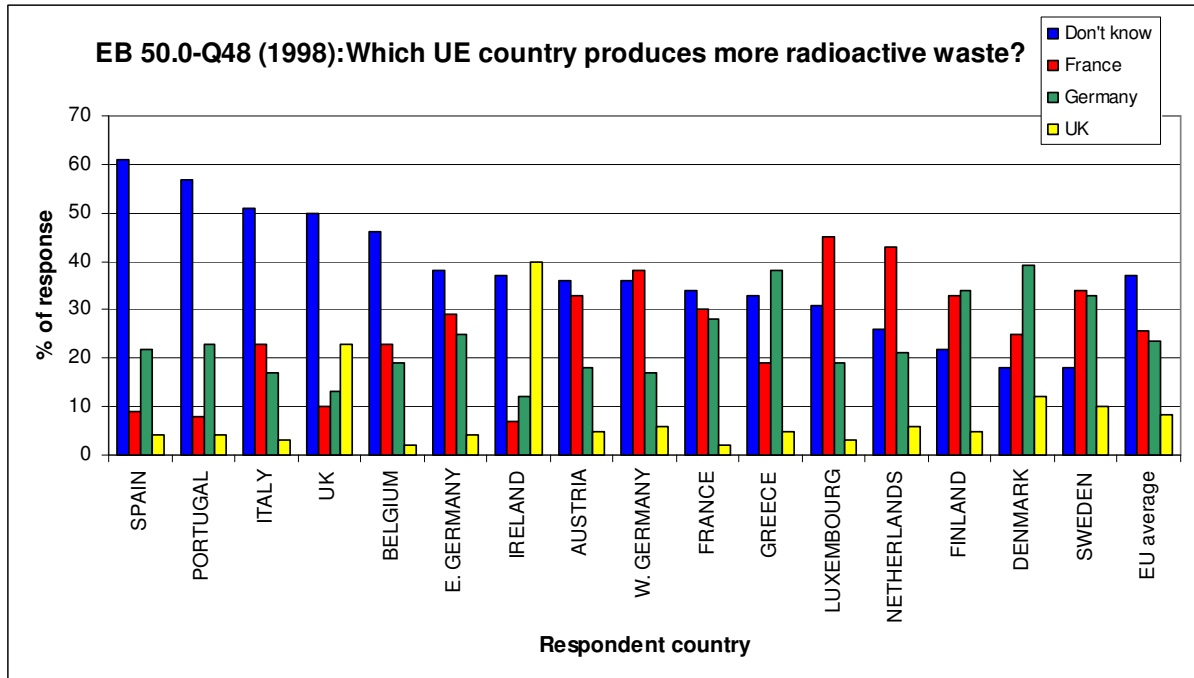
The “don’t know” answer (almost 40%) represents, on average, the first response option for the EU citizens.

¹⁶ In your opinion, which European Union country produces the greatest amount of radioactive waste?

1. Belgium
2. Denmark
3. Germany
4. Greece
5. Spain
6. France
7. Ireland
8. Italy
9. Luxembourg
10. The Netherlands
11. Portugal
12. Austria
13. Sweden
14. Finland
15. United Kingdom
16. Don't know

In many countries this percentage (don't know) gets over any of the other possible options. Spain is the country with a higher percentage of "don't know", followed by Portugal, Italy and UK (all of them with rates over 50%)

Figure 19. Radioactive waste producers: most mentioned answers by countries in 1998



France and Germany, followed very far behind by the UK, are the most frequently referred to as the countries that produce the greatest amount of radioactive waste within the European Union. We note that the existing statistics broadly confirm these results. Therefore, Europeans in average, come very close to reality in their assertions.

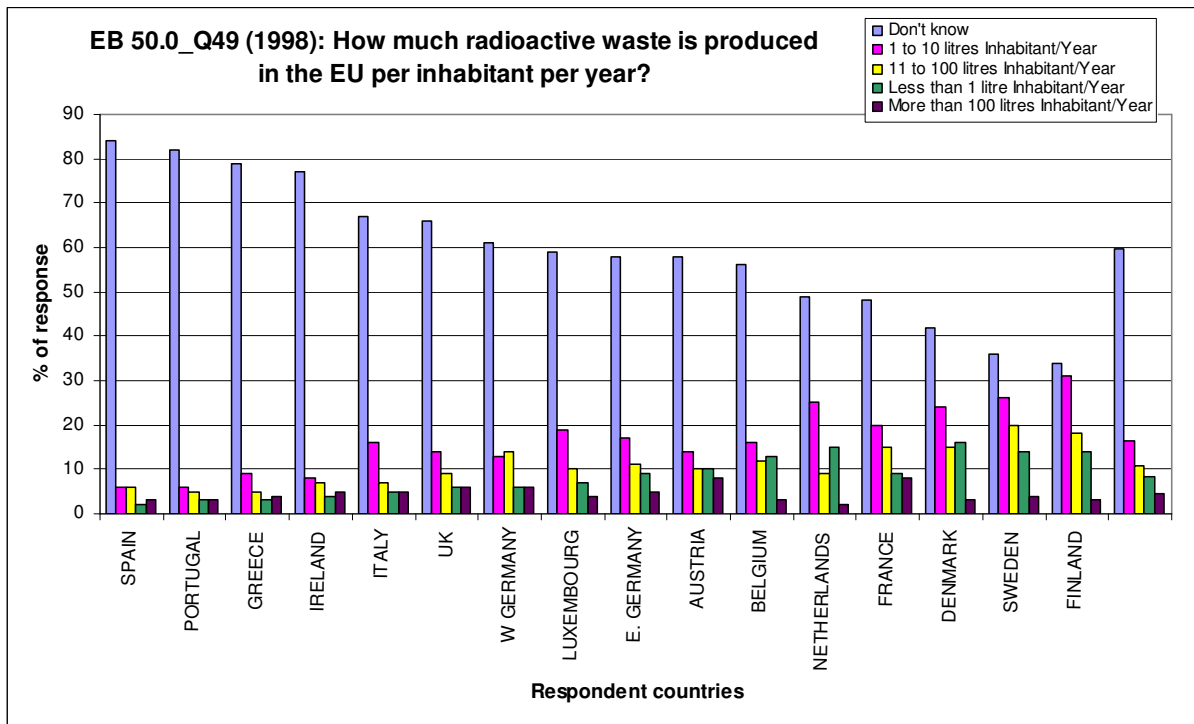
Most of the countries mention France as the first option. However, Denmark, Greece, Spain, Portugal, and Finland choose Germany as the first waste producer. Both Ireland and the UK mentioned the UK.

In summary, although the majority of the countries get close to the correct answer (France), the high percentage of "don't know" answers is showing a general lack of knowledge regarding the production of radioactive waste by the EU countries.

The **second question** is about the amount of radioactive waste that is produced in the EU¹⁷.

As in the previous question, the majority of the EU citizens give a “don’t know “answer, with an average rate around 60% (**Figure 20**) Thus, there is a significant lack of knowledge on this topic. Sixteen percent of the European citizens believe that the production of radioactive waste per inhabitant and per year is between 1-10 litres, whereas eleven percent believes it varies between 11-100 litres inhabitant/year. “Only” eight percent give the correct answer, that is to say an annual production per head of less than 1 litre of radioactive waste

Figure 20. The amount of radioactive waste production by countries in 1998



There are significant differences among countries. While Spain, Portugal and Ireland are around 80% of “don’t know” answers, Finland and Sweden are around a 35%. Leaving out the “don’t know” answers, a trend to over estimate the amount of radioactive waste production is detected. Please note that the bigger the percentage of don’t know answers a country has, the smaller the percentage of correct answer it shows.

As in the previous basic knowledge question, the majority of the EU citizens give a “don’t know “answer, showing a significant lack of knowledge about the amount of radioactive waste production.

¹⁷ In your opinion, on average, how much radioactive waste is produced in the European Union per inhabitant per year?

1. Less than 1 litre per inhabitant per year
2. Between 1 and 10 litres per inhabitant per year
3. Between 11 and 100 litres per inhabitant per year
4. More than 100 litres per inhabitant per year
5. Don't know

The **third question** also focus on basic knowledge regarding production of radioactive waste¹⁸. In this section, six statements were presented in both 1998 and 2001 Eurobarometers and seven in the last 2005 survey. European Union citizens were asked to respond with true/false/don't know. Although the format of the question is practically identical for the three data gathering, the content of the statements were quite different. Thus, temporal sequences can be only obtained for the following statements, which were identical in the three surveys:

- “Hospitals produce radioactive waste”,
- “There are several types/categories of radioactive waste”
- “All/any radioactive waste is very dangerous”.

Temporal trend Figures for these three statements are presented below, ranked according to the % of correct answers in 2005.

Table 10 clearly illustrates that, on average (70%), Europeans correctly assess the statement “hospitals produce radioactive waste”.

The average European Union decreases a little bit between the first wave (1998) and the second one (2001), but it increases again by the third wave (2005). In short, the time effect does not seem to play a significant role.

However, there are significant differences among countries on this basic knowledge issue.

Figure 21 shows the results obtained for all three waves in all countries. In order to better illustrate the results the left section of the Figure covers the EU 15 results, while the right section covers the 10 new countries (only data for 2005). As can be seen, the ranking of the EU 15 results are presented from the higher to the lowest, while for the 10 new countries the ranking is the opposite one (from the lowest to the highest)

¹⁸EB 50.0 (1998) For each of the following statements, please tell me if you think it is true, false or DK:

1. Only nuclear power reactors produce radioactive waste (F)
2. Radioactive waste is produced by industry in general (F)
3. Hospitals produce radioactive waste (T)
4. Any production or use of radioactive material leads to radioactive waste (T)
5. There are several types of radioactive waste (T)
6. Any radioactive waste is very dangerous (F)

EB 56.2 (2001) For each of the following statements, please tell me if you think it is true, false or DK:

1. Nuclear power stations produce radioactive waste (T)
2. Hospitals produce radioactive waste (T)
3. Oil industry produces radioactive waste (T)
4. There are several categories of radioactive waste (T)
5. All radioactive waste is very dangerous (F)
6. Radioactive waste is produced in smaller quantities than other hazardous waste (T)

EB 227 (2005) For each of the following statements, please tell me whether you think it is T or F?

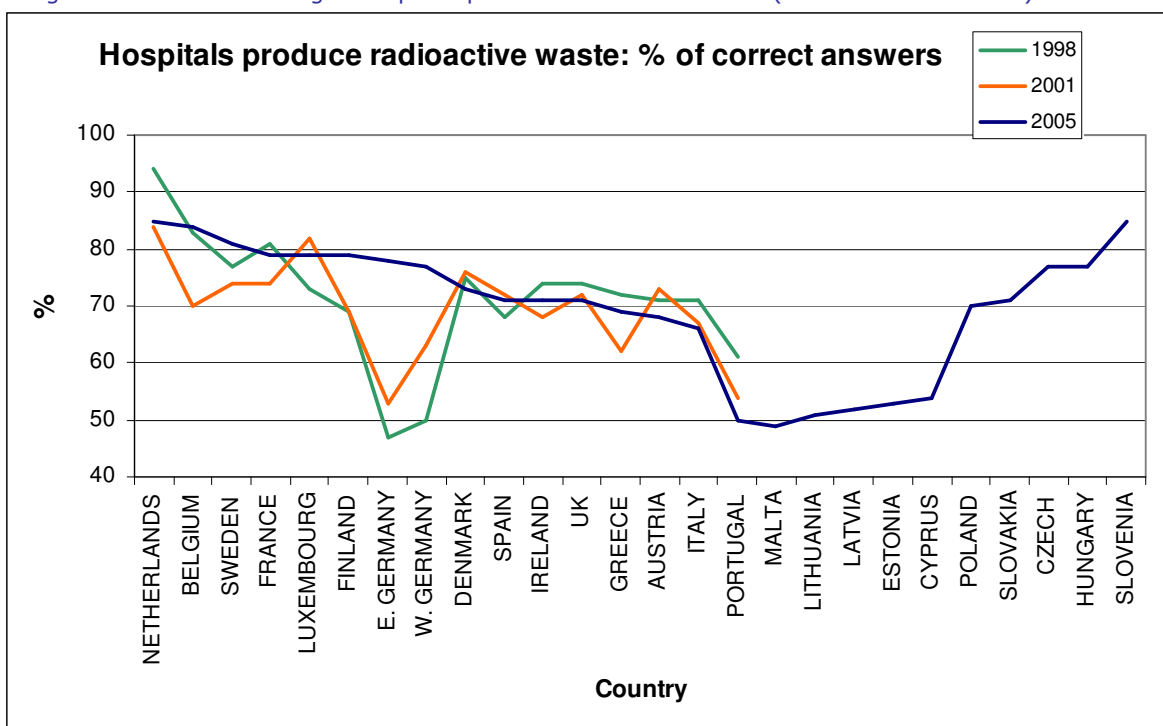
- a) There are several categories of radioactive waste (T)
- b) There are Hospitals which produce low level radioactive waste (T)
- c) Some Non-nuclear industries produce low level radioactive waste (T)
- d) Some Research centers produce radioactive waste (T)
- e) High level radioactive waste is produced only in nuclear reactors (F)
- f) Radioactive waste is produced in similar quantities to other dangerous waste (F)
- g) All radioactive waste is very dangerous (F)

As far as the 15 UE is concerned, while in the Netherlands the percentage of correct answer is over 80% in the three waves, in East Germany and Portugal it does not reach the 60% (as average)

Table 10. Hospitals produce radioactive waste: % of correct answers

Country	1998	2001	2005	Country average
NETHERLANDS	94	84	85	87,67
BELGIUM	83	70	84	79,00
SWEDEN	77	74	81	77,33
FRANCE	81	74	79	78,00
LUXEMBOURG	73	82	79	78,00
FINLAND	69	69	79	72,33
E. GERMANY	47	53	78	59,33
W. GERMANY	50	63	77	63,33
DENMARK	75	76	73	74,67
SPAIN	68	72	71	70,33
IRELAND	74	68	71	71,00
UK	74	72	71	72,33
GREECE	72	62	69	67,67
AUSTRIA	71	73	68	70,67
ITALY	71	67	66	68,00
PORTUGAL	61	54	50	55,00
MALTA			49	
LITHUANIA			51	
LATVIA			52	
ESTONIA			53	
CYPRUS			54	
POLAND			70	
SLOVAKIA			71	
CZECH REPUBLIC			77	
HUNGARY			77	
SLOVENIA			85	
EU15 Year average	71,25	69,56	73,81	
EU25 Year average			70,00	
New EU10			63,90	

Figure 21. Basic knowledge: Hospitals produce radioactive waste (% of correct answers)



Regarding the 10 new countries, Slovenia holds the first position, followed by Hungary and the Czech Republic (the three of them over 75% of correct answers). Malta, Lithuania, Latvia, Estonia and Cyprus hold the latest positions, i.e., the lower levels of appropriate answers (all of them below 55% of correct answers).

On average (70%), Europeans correctly assess the statement “*hospitals produce radioactive waste*”. The significant variable to understand this knowledge indicator is not the time but the country.

As can be seen in **Figure 22** most of the Europeans are also right when assessing the statement dealing with the fact that there are *different kinds of radioactive waste*.

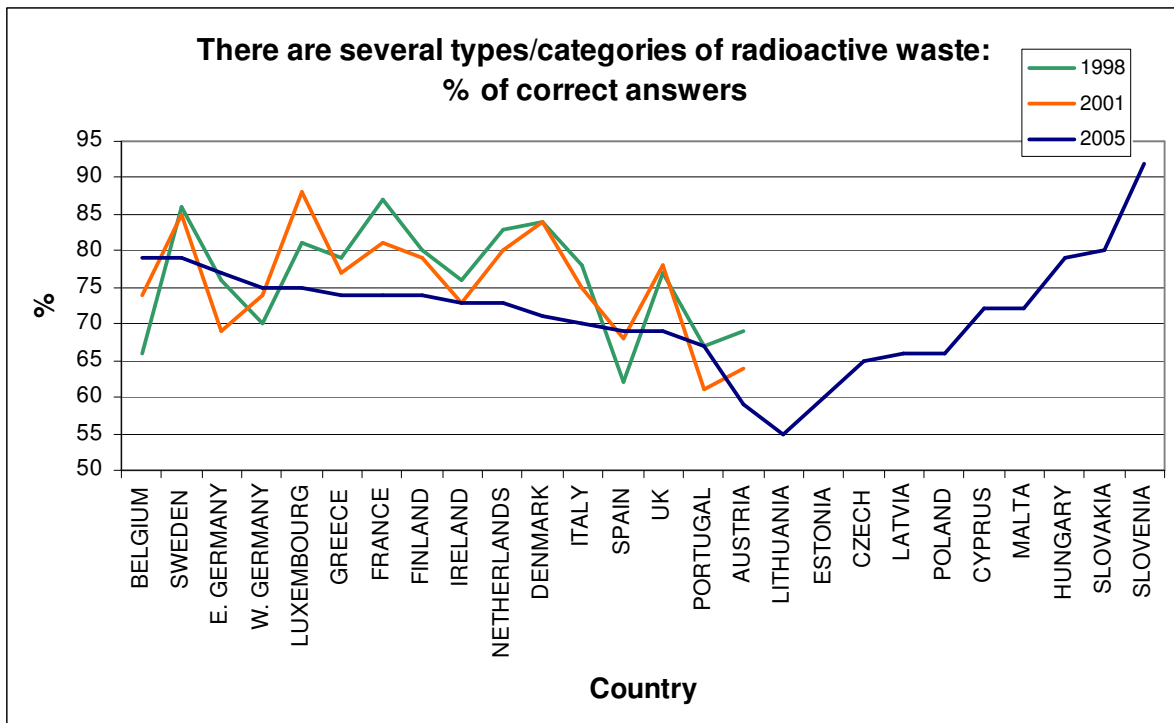
As far as the time evolution is concern, it can be said that there are no relevant differences between the first wave (1998- 76.31% of correct answers), and the second one (2001 - 75,63% of correct answers). However, there is a slight trend to “get worse” between the second wave (2001) and the third one (2005). The average of the EU 15 (the ones measured before) goes down to 72.38% (the average of the EU 25 is 71.73%).

As far as the countries are concerned (**Table 11**), while Sweden, Luxembourg, France, Denmark and the Netherlands are over 80% in the first two waves (and over 70% in the third); Austria, Spain and Portugal never reach the 70% of right answers. Anyway, in this case differences among the EU 15 countries are not so remarkable.

Table 11. There are several types/categories of radioactive waste: % of correct answers

Country	1998	2001	2005	Country average
BELGIUM	66	74	79	73,00
SWEDEN	86	85	79	83,33
E. GERMANY	76	69	77	74,00
W. GERMANY	70	74	75	73,00
LUXEMBOURG	81	88	75	81,33
GREECE	79	77	74	76,67
FRANCE	87	81	74	80,67
FINLAND	80	79	74	77,67
IRELAND	76	73	73	74,00
NETHERLANDS	83	80	73	78,67
DENMARK	84	84	71	79,67
ITALY	78	75	70	74,33
SPAIN	62	68	69	66,33
UK	77	78	69	74,67
PORTUGAL	67	61	67	65,00
AUSTRIA	69	64	59	64,00
LITHUANIA			55	
ESTONIA			60	
CZECH REPUBLIC			65	
LATVIA			66	
POLAND			66	
CYPRUS			72	
MALTA			72	
HUNGARY			79	
SLOVAKIA			80	
SLOVENIA			92	
EU15 Year average	76,31	75,63	72,38	
EU25 Year average			71,73	
New EU10			70,70	

Figure 22. Basic knowledge: There are several types of radioactive waste
(% of correct answers)



Regarding the 10 new countries, Slovenia and Slovakia hold the first positions. It is worth mentioning that both countries are in fact the “best” of the EU 25. On the opposite side we find Lithuania, Estonia and Czech Republic with the worst percentage of correct answers in the whole EU 25.

Most of the Europeans are also right when assessing the statement dealing with the fact that there are *different kinds of radioactive waste*. Differences among the EU 15 countries are not so remarkable, but differences among the 10 new countries are huge.

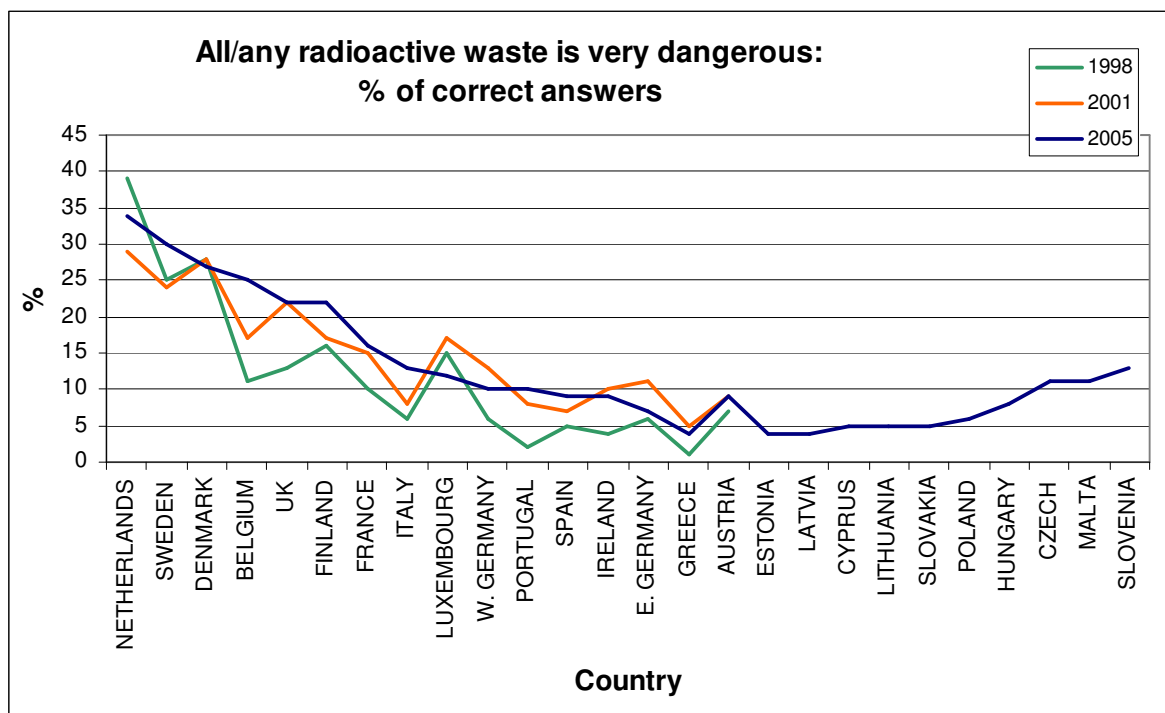
Table 12 and Figure 23 illustrate the results obtained when addressing the knowledge EU citizens have about the *danger of radioactive waste*

In contrast to the results for the previous statements, in general terms percentages of right answers are quite low. In other words, quite a lot of EU citizens failed to properly answer this question, and this is especially true for the 10 new EU countries. It could be said that the belief about the very dangerous character of all radioactive waste is very spread.

Table 12. All/any radioactive waste is very dangerous: % of correct answers

Country	1998	2001	2005	Country average
NETHERLANDS	39	29	34	34
SWEDEN	25	24	30	24,5
DENMARK	28	28	27	28
BELGIUM	11	17	25	14
UK	13	22	22	17,5
FINLAND	16	17	22	16,5
FRANCE	10	15	16	12,5
ITALY	6	8	13	7
LUXEMBOURG	15	17	12	16
W. GERMANY	6	13	10	9,5
PORTUGAL	2	8	10	5
SPAIN	5	7	9	6
IRELAND	4	10	9	7
E. GERMANY	6	11	7	8,5
GREECE	1	5	4	3
AUSTRIA	7	9	9	8
ESTONIA			4	
LATVIA			4	
CYPRUS			5	
LITHUANIA			5	
SLOVAKIA			5	
POLAND			6	
HUNGARY			8	
CZECH REPUBLIC			11	
MALTA			11	
SLOVENIA			13	
EU15 Year average	12,13	15	16,19	
EU25 Year average			12,73	
New EU10			7,20	

Figure 23. Basic knowledge: All radioactive waste is very dangerous (% of correct answers)



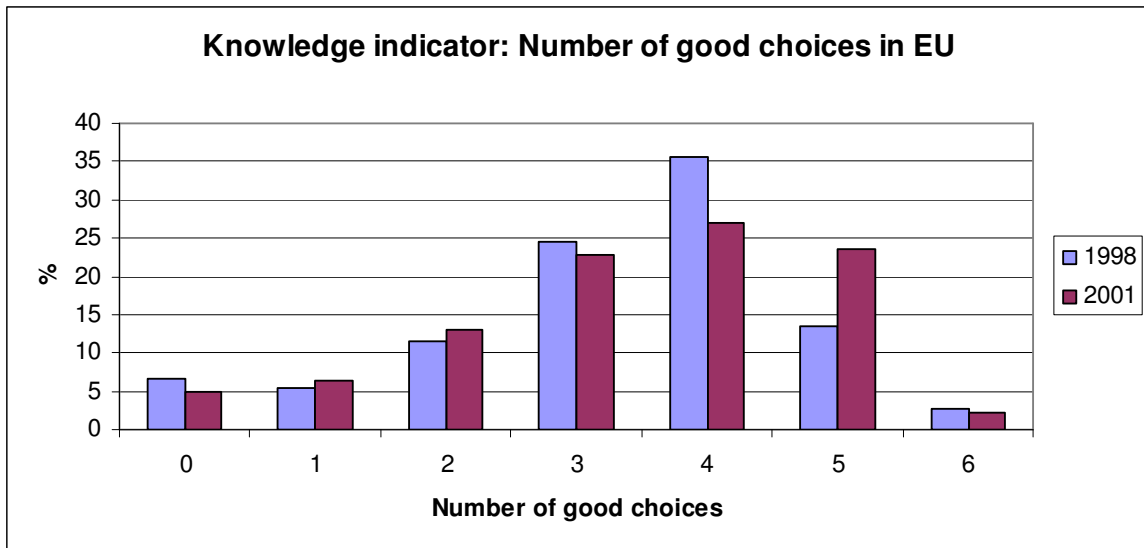
In terms of temporal evolution, and in average, from 1998 to 2005 the ability of the European citizens to discriminate between different types of radioactive waste has increased (from 12% to 16%).

Regarding differences among countries, on the one hand we find the Netherlands, Denmark and Sweden (higher levels of knowledge – percentage of correct answers between 24% and 34%), and on the other hand we have Italy, Ireland, Spain, Portugal and Greece (with lower percentages of correct answers, all of them below 8%). Regarding the 10 new countries, all of them except Czech, Malta and Slovenia are below 8% too.

Quite a lot of EU citizens failed to properly assess the level of danger of radioactive waste, and this is especially true for the 10 new EU countries. It could be said that the belief that all radioactive waste are very dangerous is widely spread.

In order to compare the European's basic knowledge along time, a "knowledge indicator" has been developed. This indicator assigns "marks" which indicate the level of knowledge) according to the number of correct answers. To do so similar levels of complexity for all questions have been assumed. Unfortunately it has not been possible to obtain this knowledge indicator for the 2005 EB, as we did not have the raw data. This means that we do not have the knowledge indicator for the 10 new EU countries. **Figure 24** summarizes the marks obtained by the EU citizens on this knowledge indicator.

Figure 24. Basic knowledge indicator: comparison between 1998 and 2001 for the EU average



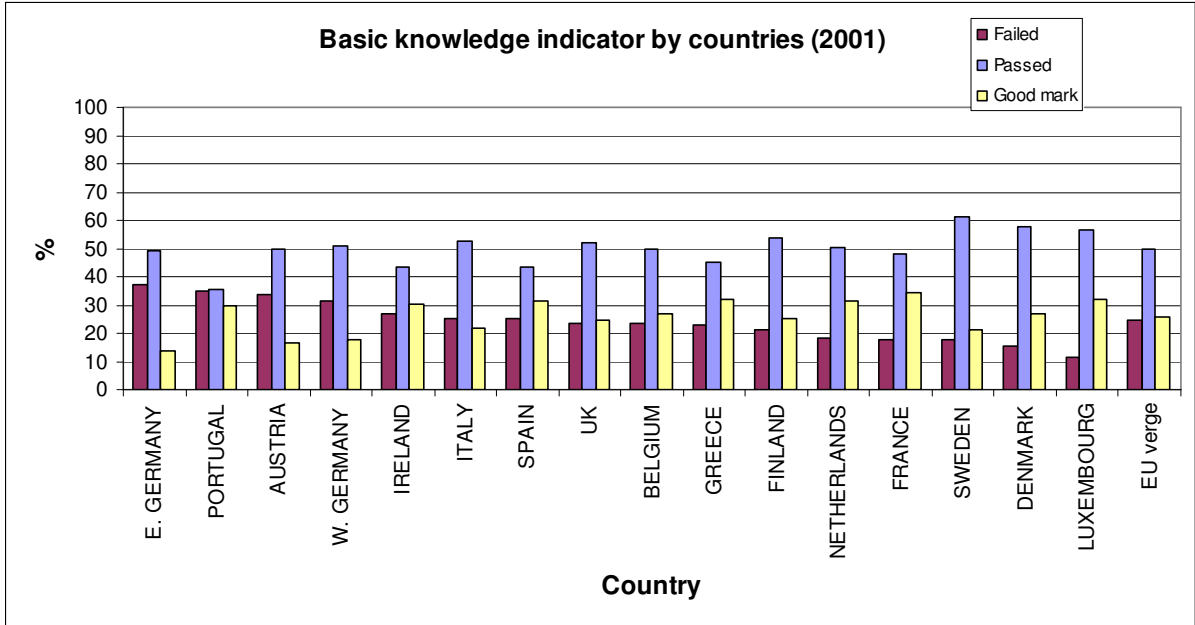
In 1998, 7% of the EU citizens got “0”, in other words, do not give a single correct answer to any of the 6 statements. In 2001 this percentage decreases down to 5%.

In 1998 most of the EU citizens are between “3” and “4”. Thus, the EU citizens had an “acceptable” level of knowledge by this time. However, in 2001 the majority is equally distributed among “3”, “4”, and “5”; there is a move to the right section of the Figure. In other words, EU citizens got better marks in 2001 than in 1998, as there are more people obtaining higher marks (24% of the sample only failed on one statement)

Please note that that half of the statements imply a very basic level of complexity, and a right answer to these three statements equals a “pass”.

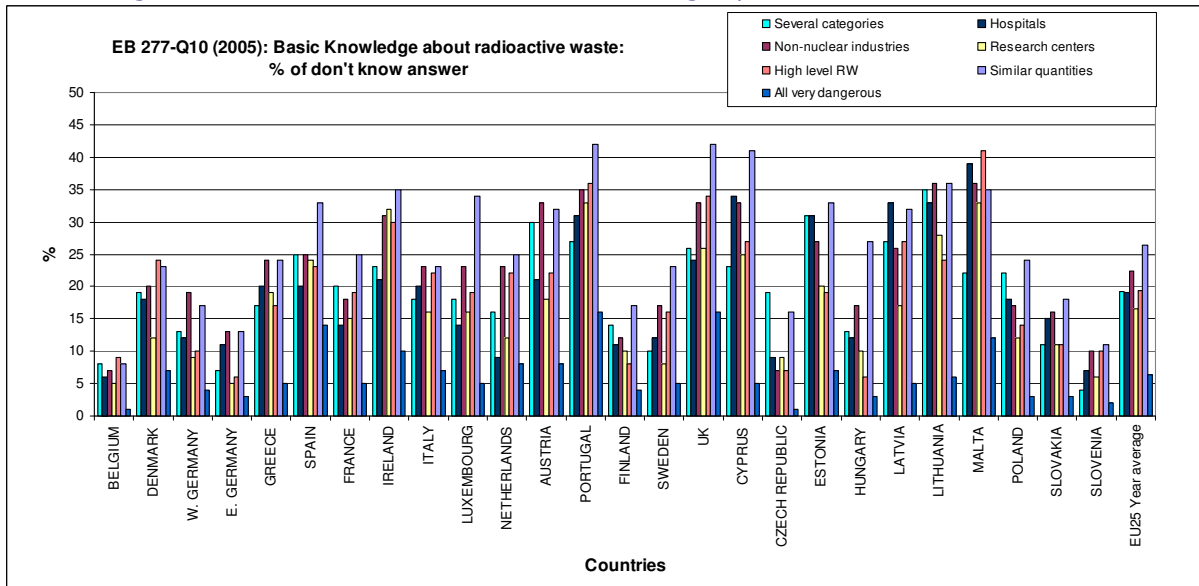
In order to better analyse differences among countries, categories have been recoded as follows: “failed” if the mark was 0, 1 or 2; “passed” if the mark was 3 or 4, and “good mark” if the mark was 5 or 6.

Figure 25. Basic knowledge indicator by countries in 2001



Let's pay attention to the 2001 data (Figure 25). Germany, Portugal and Austria are the countries with bigger percentages of people who failed in the statements (>30%). On the contrary, Netherlands, France, Sweden, Denmark and Luxembourg have the lower percentage of failure (<19%).

Figure 26. "Don't know" answers in Basic Knowledge by countries in 2005



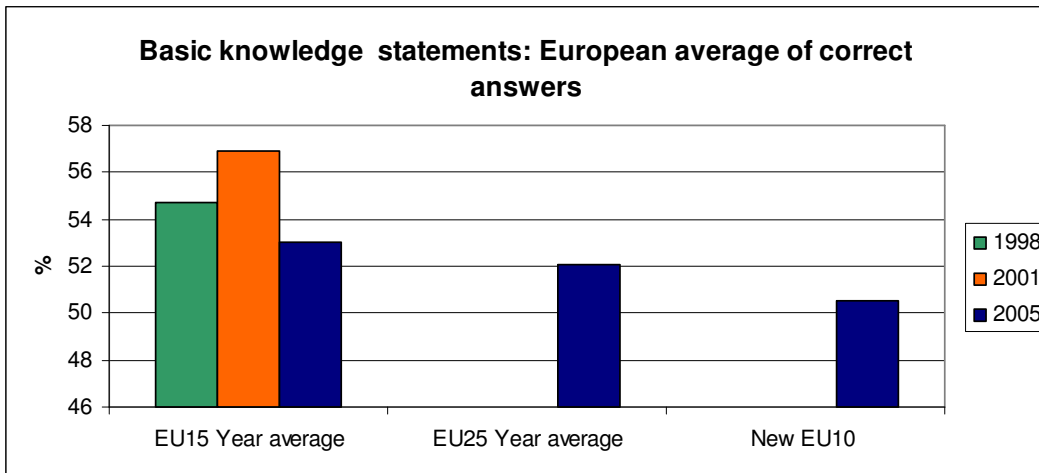
"Don't know" answers were assumed as another incorrect option in our knowledge indicator. In order to examine this percentage of responses in more detail we have used the 2005 data. (Figure 26)

At first sight it is evident that there is a high percentage of people not positioning themselves in most of the statements. It is worth mentioning that almost 10% of the Europeans declare not to know if a NPP produces radioactive waste. The more difficult the questions are, the higher the percentages of don't know answers. Thus, questions such as "radioactive waste is produced in smaller quantities than other hazardous waste" or "oil industry produces radioactive waste" are the ones with highest levels of don't know answers.

To sum up, regarding basic knowledge about radioactive waste, there is a significant percentage of do not know answers among European citizens. There are relevant differences in terms of countries, time, and the specific knowledge statement under evaluation. The knowledge indicator shows that most of the EU citizens have an acceptable level of basic knowledge although it may be biased because of the "success" on the easiest questions. It would be, of course, very interesting to develop this indicator for the 2005 data.

** Note: 2005 Data: Additional Information: Although the Knowledge indicator cannot be developed, we did have the percentage of correct answers. In order to have a better vision of the temporal evolution, % of right answers for the three waves are included below.*

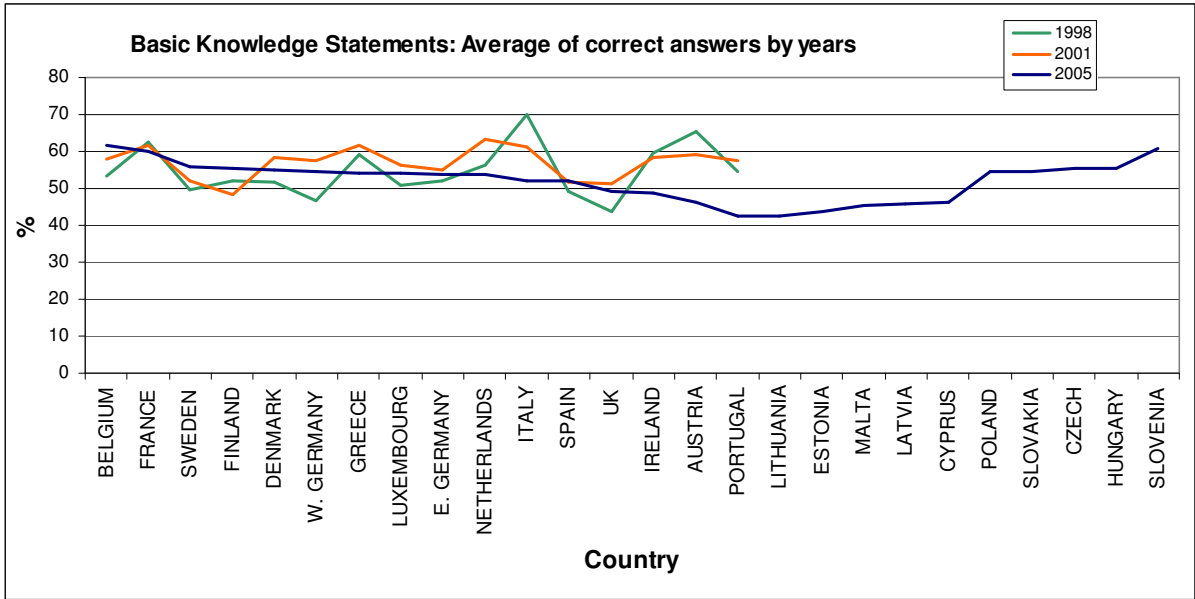
Figure 27. Percentages of right answers – EU Average - Three waves 1998/2001/2005



The EU average (correct answers) is between 50 and 60% in all three waves. The higher average was reached in 2001 and then there is a decrease, down to 53% in 2005-

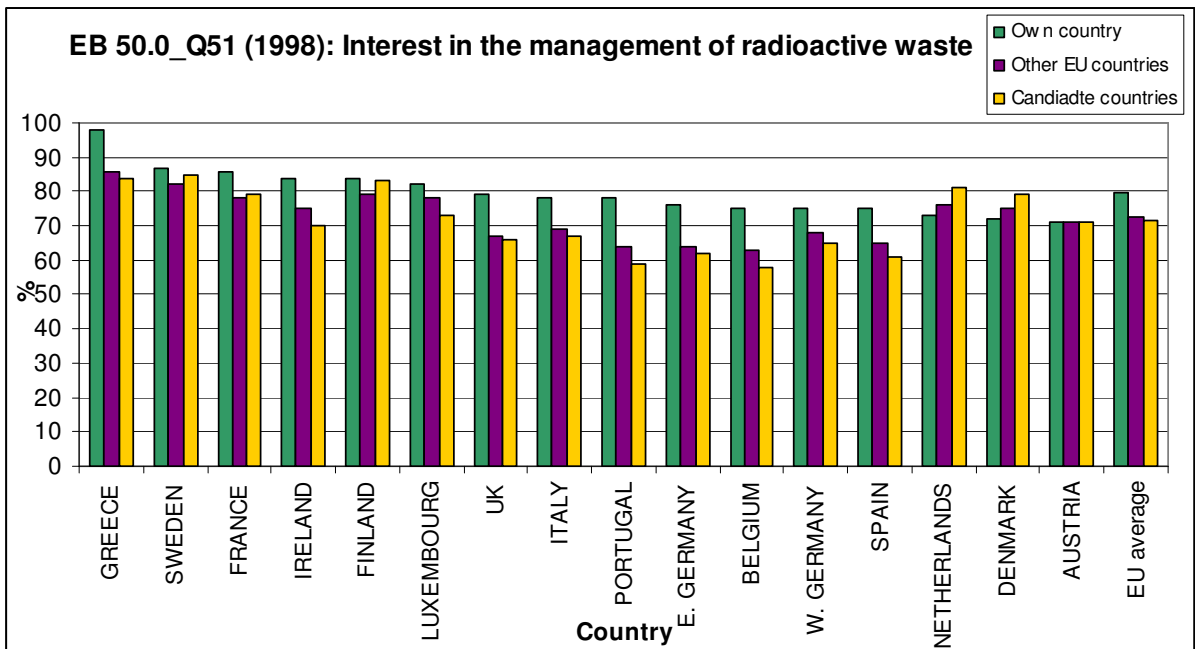
In 2005, the 10 new countries on average present lower percentages of right answers than the EU15. As far as country are concerned, no significant differences among them are found in 2005

Figure 28 Percentages of right answers – By countries - Three waves 1998/2001/2005



The **forth question** refers to the interest citizens have on radioactive waste management²⁰. This question clearly deals with awareness. According to **Figure 29** it can be said that, on average, there is higher interest in the management of radioactive waste in the own country (79.58%) than in the other EU countries (72.5%), or in the candidate countries (71.44%).

Figure 29. Interest in the management of radioactive waste by countries in 1998



²⁰ Would you say you are very interested, fairly interested, not very interested, not at all interested or don't know in the way in which radioactive waste is managed in...?

1. Our country
2. In the other European Union countries
3. In the central and eastern European countries wanting to join the European Union

Regarding the own country, the most interested citizens in radioactive waste management are the Greeks (98%). Then we find Sweden, France, Ireland, Finland and Luxembourg with more than 80%. In contrast, Denmark and the Netherlands are the least interested countries (although both of them show percentages over 70%).

If we look at the interest on radioactive waste management in other countries, the ranking varies significantly. Here, and despite the still high interests of the Greeks (86%), Sweden, Finland, France and Luxembourg follow very closely. The less interested citizens are the ones from Belgium, East Germany, Portugal and Spain, (again with percentages over 60%.)

Finally, Sweden, Greece, Finland and the Netherlands are the most interest on radioactive waste management in candidate countries. Belgium, Portugal, Spain and East Germany appear to remain disinterested.

On average, there is higher interest in the management of radioactive waste in the own country (79.58%) than in the other EU countries (72.5%), or in the candidate countries (71.44%). Greece presents a singular profile with really high levels of interest on radioactive waste management.

The **fifth question** looks at respondent's knowledge regarding how the low-level hazardous radioactive waste is managed in the own country²¹. In this question a direct comparison between years is not possible because in both 1998 and 2005 more than one management option could be selected, while in 2001 only a single choice was permitted. Nonetheless, it is worth comparing the ranking of beliefs in the 1998, 2001, and 2005 surveys.

Table 13. Ranking of believes about low-level radioactive waste

Ranking	1998	2001	2005
1	Temporary storage	Don't know	Temporary storage
2	Sent abroad	Temporary storage	Shallow disposal
3	Buried deep underground	Buried deep underground	Buried deep underground
4	Dumped into the sea	Sent abroad	Sent abroad
5	Don't know	Shallow disposal	Dumped into the sea
6	Shallow disposal	Dumped into the sea	Don't know

Please note that a direct interpretation of **Table 13** could lead to erroneous conclusions. For instance, the "don't know" as the first option in 2001 is due to the answer format (citizens could only select one option)

²¹ Most radioactive waste is much less hazardous. After treatment, these radioactive waste is in solid form and can be packed into standard steel drums. What do you think is done with these drums in your country?

1. They are dumped into the sea (F)
2. They are buried deep underground at special disposal sites (F)
3. They are buried at special disposal sites, but not deep underground (T)
4. They are sent to other countries for disposal (T)
5. They are stored temporarily, pending a final decision on disposal (T)
6. They are dealt with in another way (F)
7. DK

Anyway it is important to take into account that, nowadays, low-level radioactive waste management is different between European Union countries. Although currently only practised in five countries (France, Spain, Sweden, Finland and the United Kingdom), the burial of low-level waste in specially engineered shallow disposal sites is at present the most common management method for this type of waste in the European Union. In all other countries, with the possible exception of Luxembourg (which routinely sends its very small quantities of waste to neighbouring countries for processing) interim storage is practised. Waste is buried deep under ground only in rare occasions, except in Germany where shallow tips or those close to the surface are not used (however, a large amount of the waste in Germany is stored temporarily). In practice, the temporary long-term storage of waste is the only method currently used in most European Union countries. So, “dumped into the sea” and “Buried deep under ground” are false options for all the countries.

We are able to compare, more or less, the results in 1998 and 2005 surveys but not the ones in 2001 because due to the single choice answer format the results cannot be related to the previous or the last.

Forty-three percent of Europeans in 1998 and sixty-three percent in 2005 think that radioactive waste is **stored temporarily**, pending a decision on disposal. As we have just seen, the reality corresponds to this opinion in the majority of countries.

Shallow disposal is ranked sixth in 1998 but second in 2005. Spain, France, United Kingdom, Sweden and Finland (the countries in which this method is the correct answer) are particularly noticeable in 1998 since less than 20% of the population knows the correct answer. Especially in Spain and France where shallow disposal is running since long time ago, population seems not to know. Nevertheless, the figure has changed in 2005: 66% of the Swedish, 62% of the French, 61% of the Finns, 55% of the British and 42% of the Spanish know the correct answer. The improvement in knowledge can be attributed to the change in the formulation of the answer: while in 1998 was “

In Luxembourg, more than a half of the population knows in 1998 that **send abroad** is the method used. In 2005 the percentage has increased to 75%.

Some 23% of the European population in 1998 and 29% in 2005 still believe that waste is disposed of by **dumping at sea**, even though such a method has not been practised anywhere in the world for over two decades. Similarly, 29% of Europeans in 1998 and 52% in 2005 believe that radioactive waste is **buried deep under ground**.

With the above in mind, in 1998, the most popular choices in the case of Belgium, Germany, Luxembourg, the Netherlands and Austria do in fact correspond to the correct answer in these countries.

In 2005 the situation is quite different (**Figure 30**) with Slovenia, Germany, Finland, Sweden and Belgium as the countries with a best knowledge as far as low-level radioactive waste are concerned. In the other side, Portugal, Ireland, and Spain are the countries with the lowest number of correct answers.

Figure 30 Believes regarding management of low-level radioactive waste: % of correct answers by EU countries in 2005

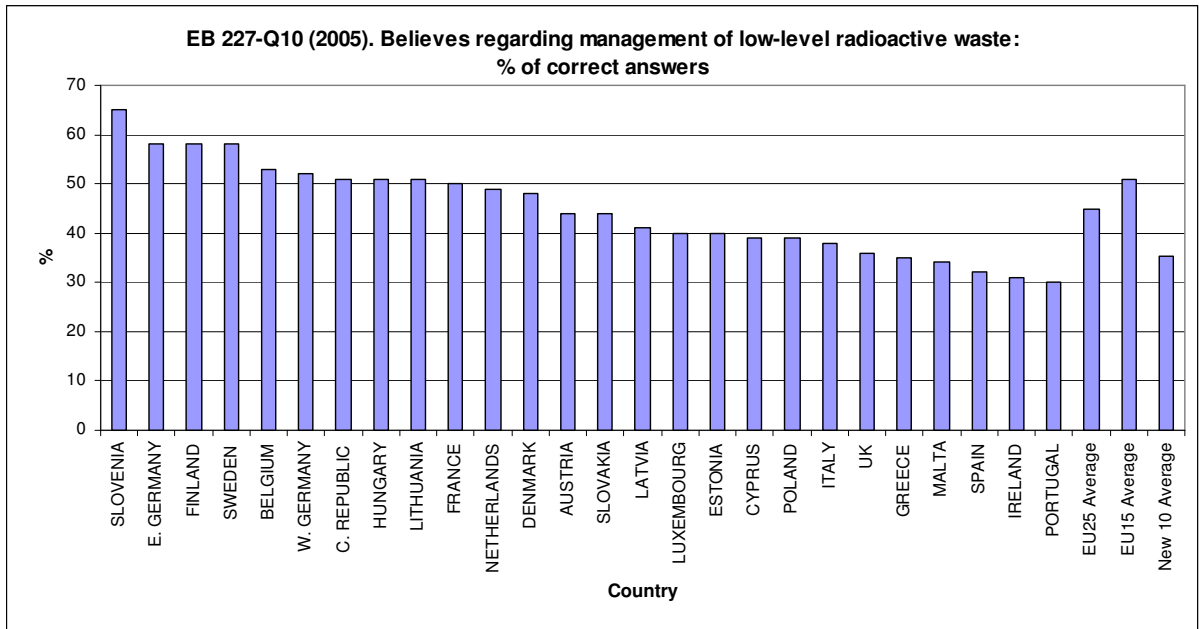


Figure 31. Believes regarding management of low-level radioactive waste: EU average

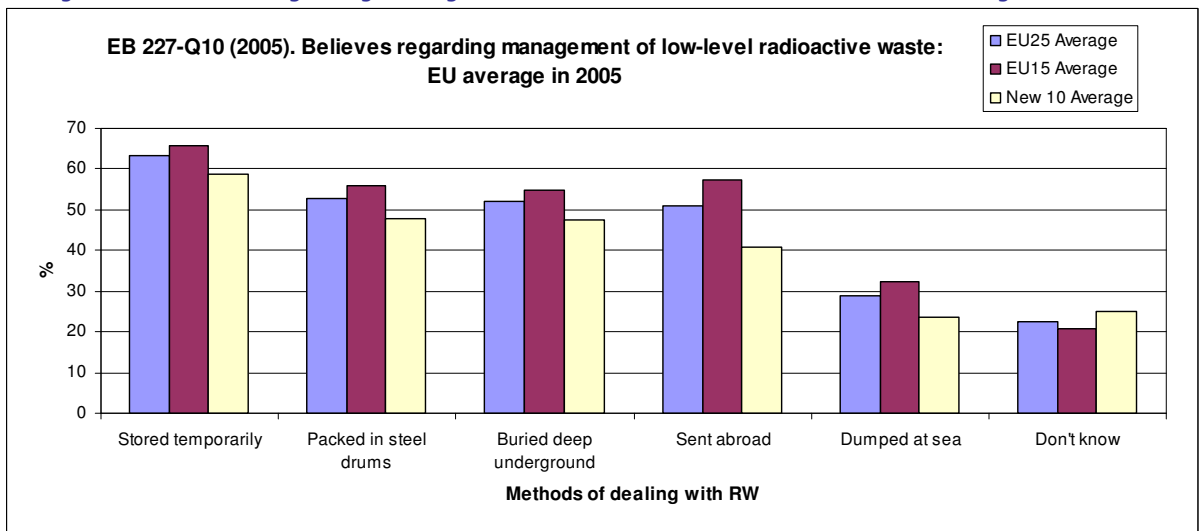
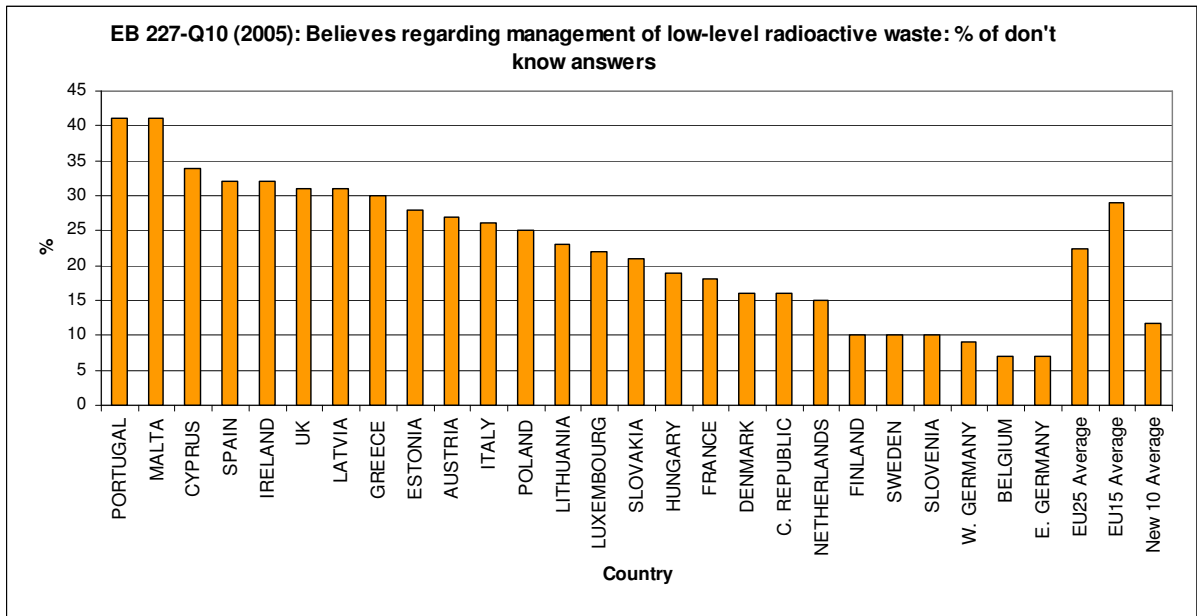


Figure 31 shows the differences between the 10 new countries and the EU15 regarding believes about the management of low-level radioactive waste. It is quite evident that the 10 new ones fail to a greater extent than the EU 15.

The “don’t know” category of answers accounts in 1998 for 17% of European citizens, 25% in 2001 and 22% in 2005 (Figure 32). In 1998 and in 2001 Spain, Ireland and Italy this “don’t know” factor is much higher than the average, though the highest figure is in Portugal where virtually half the population (51%) gave this answer when polled. In 2005 the situation is very similar:

Portugal and Malta exceeded 40% of the population saying “don’t know” followed by Cyprus, Spain and Ireland (34%, 32% and 32% respectively). Indeed, the countries with a higher percentage of correct answers have a lower percentage of “don’t know” answers.

Figure 32. Believes regarding management of low-level radioactive waste: % of don’t know answers by EU countries in 2005



➤ **Information**

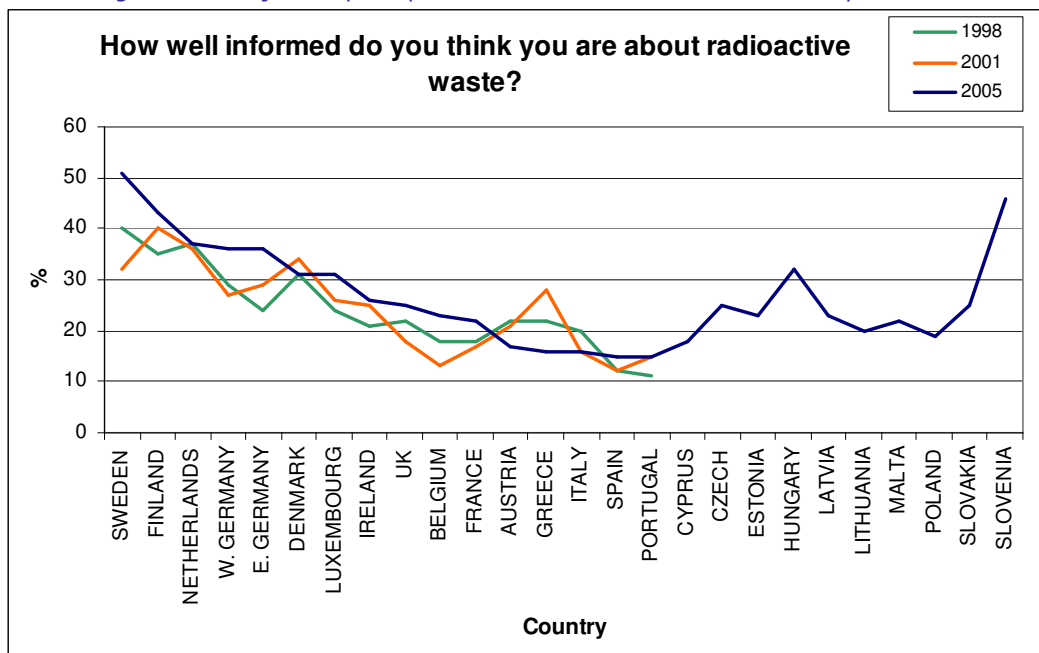
In the **first question** of this chapter, respondents were asked to self-assess their level of information about radioactive waste issues by ranking themselves in one out of four categories. An additional option –‘don’t know’- was also included²².

This is the only question within the radioactive waste domain that really allows a trend analysis, as the question was identically formulated in the three waves, and the answer format was also identical in the three years. **Figure 33** and **Table 14** show the percentage of people declaring to be very well or quite well informed about radioactive waste.

²² How well informed do you think you are about radioactive waste?

1. Very well informed
2. Fairly well informed
3. Not very well informed
4. Not at all well informed
5. Don't know

Figure 33. Subjective perception of the own level of information by countries



When asked whether they regard themselves as well informed about radioactive waste, Europeans' replies tend to be on the negative side. Comparing the 2001 survey with the one conducted in 1998, there were minimal changes in the overall figures across the European Union as a whole. In both years ¼ of the Europeans considered themselves to be bad informed about the issue. If we look at the 2005 data in the EU15, a slight increase in the subjective perception of own level of information is identified, although the average appear to remain approximately in the same value (25%)

Table 14. Subjective perception of the own level of information by countries

Country	1998	2001	2005	Country average
SWEDEN	40	32	51	36,5
FINLAND	35	40	43	37,5
NETHERLANDS	37	36	37	36,5
W. GERMANY	29	27	36	28
E. GERMANY	24	29	36	27
DENMARK	31	34	31	33
LUXEMBOURG	24	26	31	24
IRELAND	21	25	26	23,5
UK	22	18	25	19,5
BELGIUM	18	13	23	15,5
FRANCE	18	17	22	17
AUSTRIA	22	21	17	21
GREECE	22	28	16	24,5

ITALY	20	16	16	18
SPAIN	12	12	15	12
PORTUGAL	11	15	15	13
CYPRUS			18	
CZECH REPUBLIC			25	
ESTONIA			23	
HUNGARY			32	
LATVIA			23	
LITHUANIA			20	
MALTA			22	
POLAND			19	
SLOVAKIA			25	
SLOVENIA			46	
EU15 Year average	24,13	24,31	27,50	
EU25 Year average			26,65	
New EU10			25,3	

As far the 10 new countries are concerned, by the one hand Cyprus Lithuania and Poland show the lowest percentages on this subjective perception holding a position quite similar to the one of Spain, Portugal, Austria, Italy, and Greece. On the other hand Slovakia and notably Slovenia, show the highest values holding a position very similar to the one of Sweden, Finland, and Netherlands.

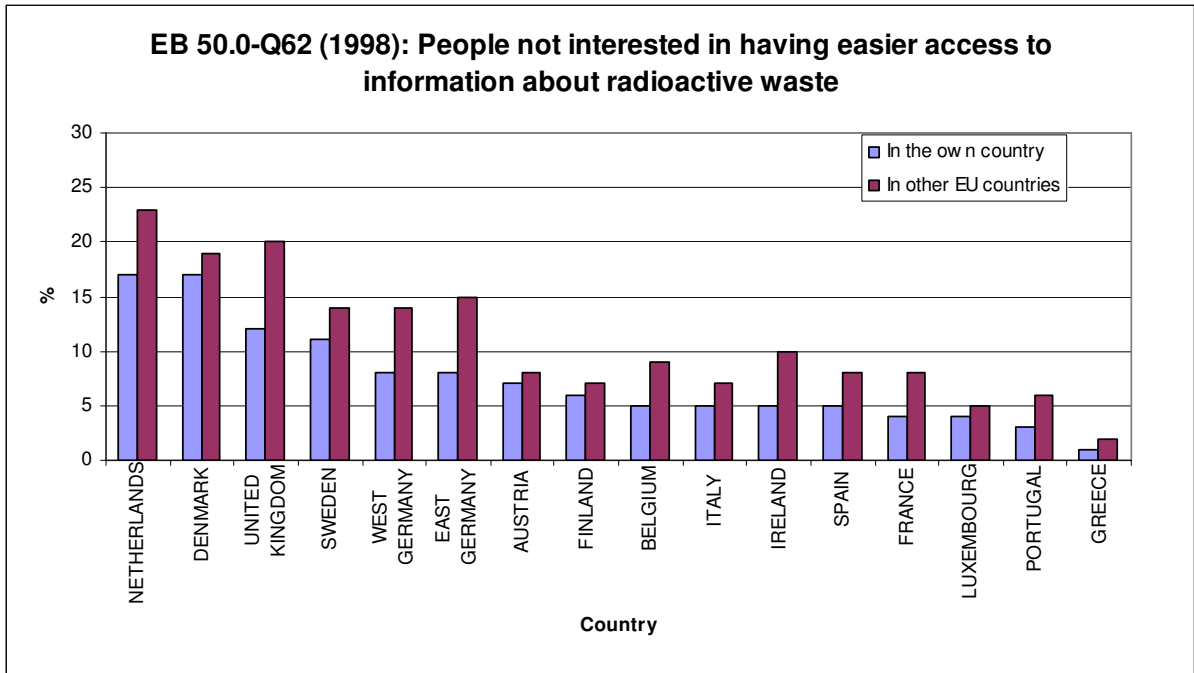
All countries show a low subjective perception of being well informed. Only an average of 3% of the EU citizens admits to be very well informed. Spain, France, Italy and Portugal are the worst informed ones in the EU25.

The **second question** refers to the access to information about radioactive waste, and the citizen's preferences in terms of information sources.²³ In this question, only formulated in 1998, several answers were possible, so it's not surprising that the total of percentages is over 100%.

²³ Would you like to have easier access to information about the way in which radioactive waste is managed in (OUR COUNTRY / IN OTHER EUROPEAN UNION COUNTRIES)?

1. Yes, from national agencies in charge of processing and eliminating radioactive waste
2. Yes, from the government (NATIONALITY)
3. Yes, from non-governmental organisations (NGO), such as Greenpeace, Friends of the Earth, etc.
4. Yes, from independent scientists
5. Yes, from the media
6. Yes, from European Union departments in charge of environmental issues
7. Yes, from those who produce the waste
8. Yes, from political parties
9. Yes, from other sources (SPONTANEOUS)
10. No, I don't want easier access to this information
11. Don't know

Figure 34. People not interested in having easier access to information about radioactive waste (by countries in 1998)

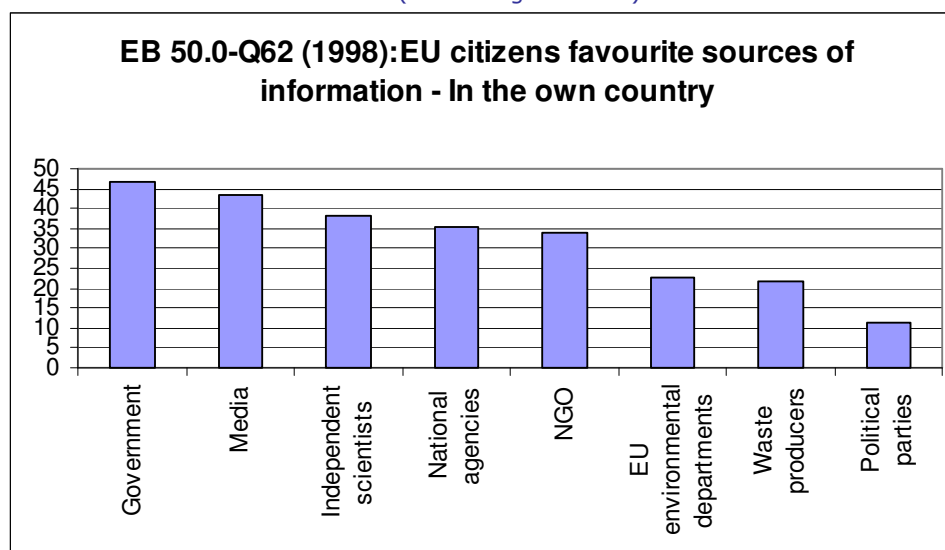


First we will look at the citizens that have no interest in getting easier access to such information (Figure 34). Seven percent of the sample declared that radioactive waste management in their own country has no interest for them. This figure reaches 11% in the case of waste management in other European Union countries. The less interested citizens, either on their own country or in other countries, are the ones from Netherlands, Denmark, United Kingdom and Sweden. Maybe this data suggest that these countries already have an easy access to the information and, therefore, it is not a priority for them any longer.

On the other hand, the most interested citizens are the ones from Spain, France, Luxembourg, Portugal and Greece. In average, over 85% of Europeans would like to have easier access to information about the management of radioactive waste in their own country.

Accountability for providing easier access to information is mainly placed on the national governments, followed by the mass media and the independent scientists. (Figure 35). Waste producers and political parties are the less mentioned sources in this context.

Figure 35. Favourite sources for providing easier access to information about radioactive waste (EU average in 1998)



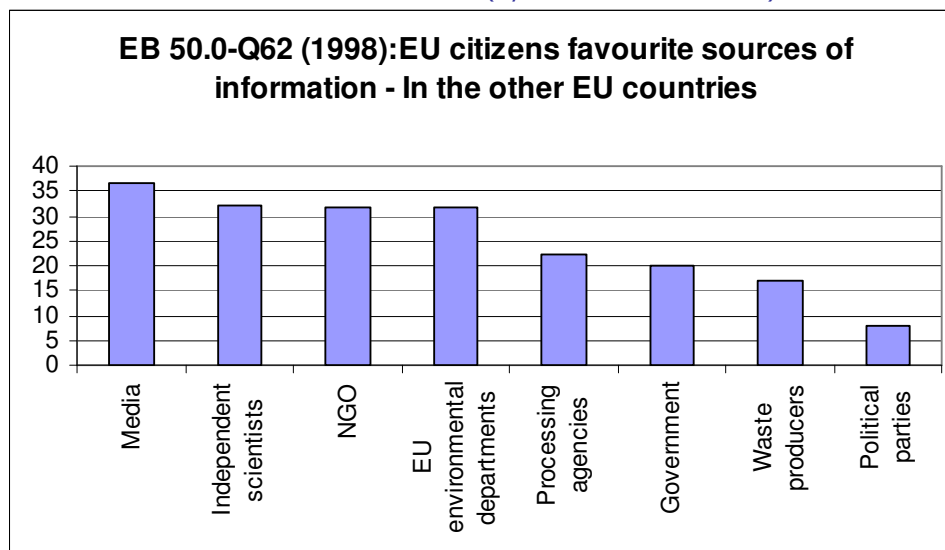
Southern Europe seems less keen than other regions on non-governmental organisations as sources of information on the national management of radioactive waste (Table 15). Consequently Italy, Portugal and Spain display results below the average (<35%). The reverse can be said to be true for Finland. National agencies in charge of processing and eliminating waste have proportionately the lowest approval in Spain and the highest in Sweden. The European Union departments in charge of environmental issues seem to be less valued than other sources in Spain.

Table 15. Favourite sources providing easier access to information about radioactive waste in the own country: EU countries in 1998

Country	Government	Media	Radioactive waste National agencies	NGOs	Political parties
FRANCE	50	41	43	37	8
BELGIUM	48	62	29	46	17
NETHERLANDS	49	43	23	24	11
W. GERMANY	43	42	43	37	16
ITALY	31	45	29	33	5
LUXEMBOURG	49	46	35	41	17
DENMARK	46	36	38	22	9
IRELAND	59	37	41	40	18
UK	54	38	33	34	16
GREECE	52	53	33	46	5
SPAIN	46	44	19	33	8
PORTUGAL	56	45	31	27	10
E. GERMANY	43	38	42	29	11
FINLAND	38	49	49	27	6
SWEDEN	35	31	50	36	11
AUSTRIA	47	43	31	31	12
EU Average	46,63	43,31	35,56	33,94	11,25

Regarding the picture we get “on the access to information in other European countries”, the popular sources for providing easier access to information are still the mass media and the independent scientist. As could be expected in this new context, the national governments received less attention (sixth place), while the NGO and the environmental departments of the EU receive more than before (**Figure 36**).

Figure 36. Favourite sources providing easier access to information about radioactive waste in the other EU countries (by EU countries in 1998)



The media stand out in Belgium and in Greece, whereas not in Sweden and UK. As regard NGO, there is a 25-point difference between their highest and lowest scores. Belgium and Greece (45% each) and Denmark (20%) (**Table 16**). Independent scientists receive the highest scores in Sweden (47%), Finland (46%) and Belgium (43%), and the lowest score in Italy (17%). The departments of the EU in charge of environmental issues are mainly designated in Sweden, Finland and Belgium.

Table 16. Favourite sources providing easier access to information about radioactive waste in the other European Union countries: EU countries in 1998

Country	Media	NGOs	Radioactive waste National agencies	Government	Political parties
FRANCE	36	39	29	20	7
BELGIUM	53	45	25	22	15
NETHERLANDS	41	23	16	37	8
W. GERMANY	35	34	27	17	9
ITALY	37	30	16	9	3
LUXEMBOURG	39	37	20	20	13
DENMARK	31	20	32	18	6
IRELAND	32	37	29	23	12
UK	26	26	21	28	11
GREECE	47	45	21	23	2

SPAIN	36	32	13	20	5
PORTUGAL	35	28	15	14	6
E. GERMANY	30	26	27	16	7
FINLAND	41	26	30	12	4
SWEDEN	26	30	17	16	5
AUSTRIA	39	30	21	23	11
EU Average	36,50	31,75	22,44	19,88	7,75

In average, over 85% of Europeans would like to have easier access to information about the management of radioactive waste in their own country. Accountability for providing easier access to information is mainly placed on the national governments, followed by the mass media and the independent scientists. Waste producers and political parties are the less mentioned information sources in this context.

➤ **Trust:**

The **first question** about Trust appeared in 2001 Eurobarometer and was also asked in the last 2005 survey. It deals with the trusted sources when receiving information about nuclear waste management²⁴. Since respondents were able to make multiple selections, totals can exceed 100%. First of all, we have analysed the “None” answers both in the own country in order to see how many people do not trust anyone (see Figure 30).

Nearly 6% of the European citizens do not trust anyone when receiving information about waste management (**Figure 37**). Germany and UK are the countries with the most quantity of people in this situation, both in 2001 and 2005. On the contrary, Estonia, Hungary, Latvia, Cyprus, Finland and Sweden have the least quantity of people not trusting anyone.

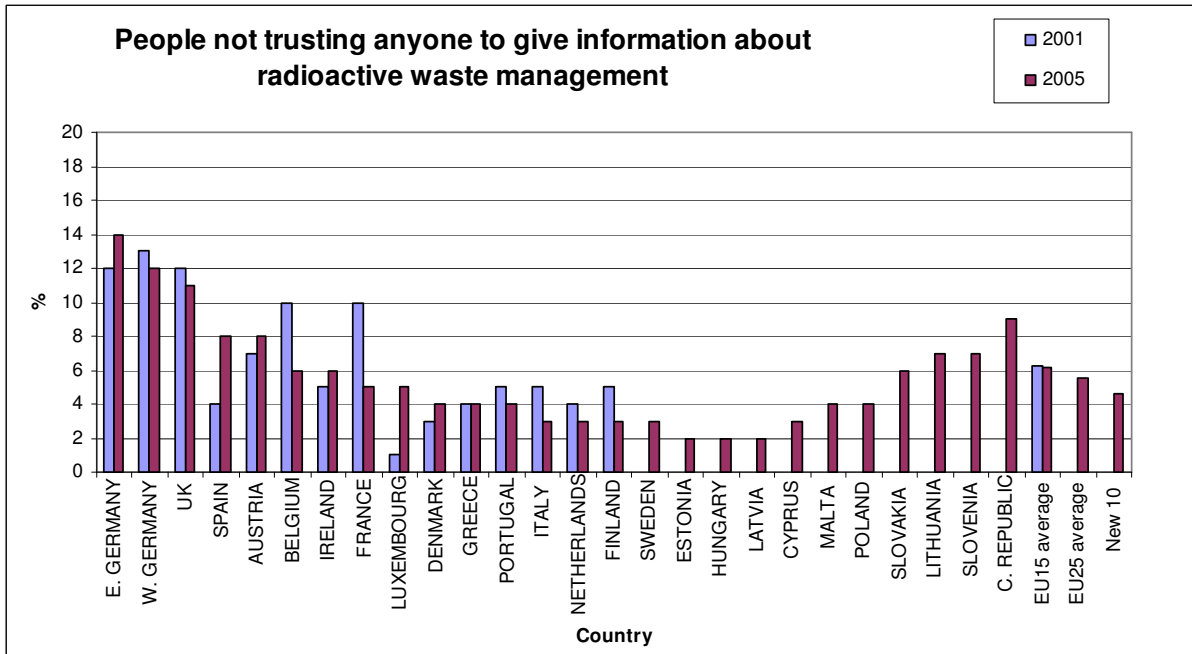
Only Greece has kept constant from 2001 to 2005. Some countries, like Spain and Luxembourg, have increased the rate of people not trusting anyone from 2001 to 2005. Others, like Belgium and France have decreased.

²⁴ a) Which, if any, of the following would you trust to give you information about the way radioactive waste is managed in (OUR COUNTRY)

b) Which, if any, of the following World you trust to give you information about the way radioactive waste is managed in the other European Union countries?

1. National agencies in charge of dealing with radioactive waste
2. The (NATIONALITY) government
3. Non-governmental organisations (NGOs) concerned about the environment
4. Independent scientists
5. The media
6. The European Union
7. The nuclear industry
8. International organisations working on peaceful uses of nuclear technology
9. None (SPONTANEOUS)
10. Don't know

Figure 37. People not trusting anyone to give information about radioactive waste (by countries in 2001)



Taking into account the EU average, independent scientists are the most trusted source of information both in 2001 and 2005 (Figure 38). In 2001 it is nearly followed by NGO and national government. European Union and nuclear industry are the least trusted. In 2005 independent scientists and NGO's are followed by international organisations working on peaceful uses of nuclear energy. Nuclear industry is the least trusted source too.

Figure 38. Trusted sources to give information: EU average

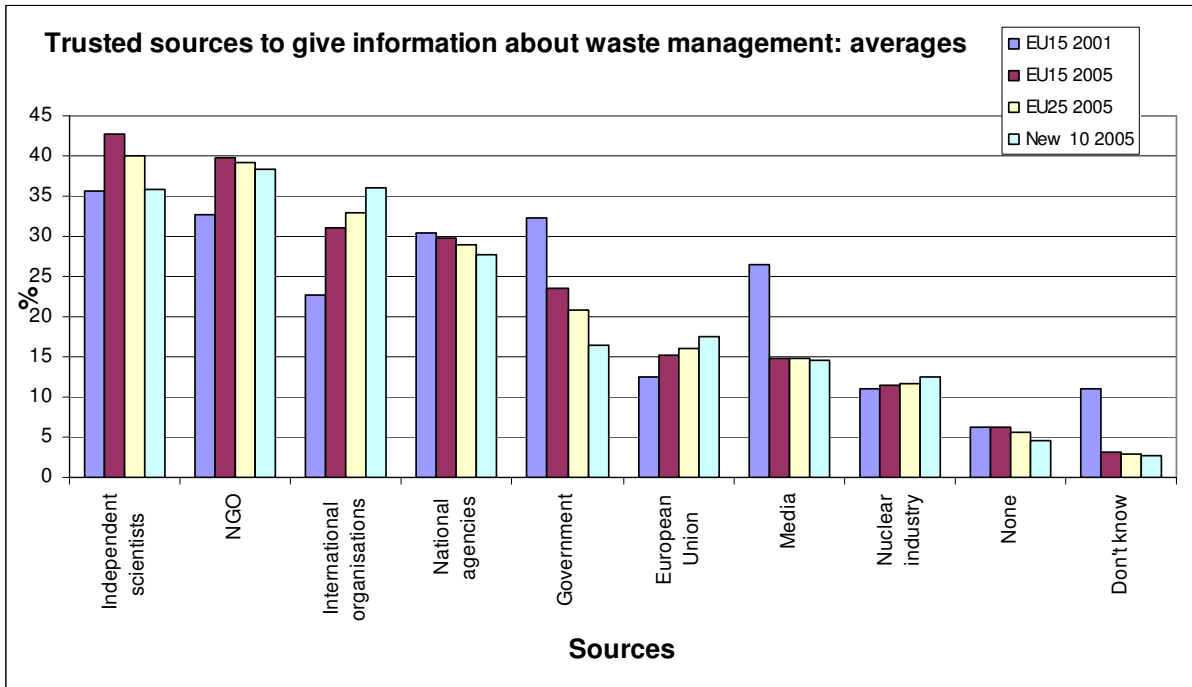


Table 17. Trusted sources to give information: EU countries in 2005

Country	Independent scientists	NGO	International organisations	National agencies	Government	European Union	Media	Nuclear industry
BELGIUM	50	43	38	33	21	24	14	14
DENMARK	56	39	37	37	31	15	12	9
W. GERMANY	44	33	32	35	14	8	14	7
E. GERMANY	43	30	36	40	11	11	13	10
GREECE	43	40	25	23	25	18	28	5
SPAIN	32	31	15	14	30	15	22	8
FRANCE	43	48	33	23	14	14	11	15
IRELAND	32	36	25	24	27	18	19	9
ITALY	21	40	20	24	21	11	6	8
LUXEMBOURG	34	44	26	27	29	17	11	11
NETHERLANDS	60	46	50	38	34	24	9	10
AUSTRIA	46	53	27	36	20	13	19	6
PORTUGAL	26	33	18	23	34	17	24	10
FINLAND	55	33	37	34	22	14	20	18
SWEDEN	58	50	50	46	28	10	6	26
UK	41	38	29	20	16	13	10	16
CYPRUS	41	35	40	27	13	12	13	11
C. REPUBLIC	29	37	32	13	7	13	12	9
ESTONIA	39	39	43	29	32	26	19	15
HUNGARY	35	39	28	22	24	27	16	7
LATVIA	41	45	44	49	20	23	17	17
LITHUANIA	41	41	30	25	15	17	5	4
MALTA	35	49	43	37	19	17	19	22
POLAND	30	19	36	16	10	18	10	18
SLOVAKIA	32	26	28	22	15	10	19	7
SLOVENIA	35	54	36	37	9	12	15	14
EU25 average	40,08	39,27	33,00	29,00	20,81	16,04	14,73	11,77
EU15 average	42,75	39,81	31,13	29,81	23,56	15,13	14,88	11,38
New 10 average	35,80	38,40	36,00	27,70	16,40	17,50	14,50	12,40

Once again, there are large country-by-country variations (Table 17). For example, Italy, Czech Republic and Portugal are the countries that trusted less in independent scientists. Slovenia, Austria and Sweden are the ones that trusted more in NGOs. Moreover, an average of 29% of people across the Union trusts national agencies in charge of dealing with radioactive waste. However, while 49% of the citizens in Latvia and 46% in Sweden expressed trust in this source of information, in Poland, Spain and Czech Republic the figures are less than 20%. These views may or may not relate to how well known these agencies are in the respective countries and the perception of their role by the population.

It should also be noted that in those EU countries without a nuclear power programme such specialised agencies do not exist, yet there are still significant numbers of people in these countries who selected this option. However, the above results will disappoint those national agencies in Spain and France, dedicated to the management of radioactive waste and whose mandate includes providing information to the public.

Furthermore, countries where governments were trusted by at least 25% of the respondents numbered nine out of the EU25, with Netherlands, Portugal, Estonia and Denmark on the top. As regard to media, they are more trusted in Greece, Portugal and Spain; and less in Sweden, Italy and Lithuania. Nuclear industry is the least trusted source, above all in Austria, Greece and Lithuania. Besides, Sweden and the Netherlands are the countries that trusted more in all sources, while Spain, Slovakia, Poland, Czech Republic and Italy are in the opposite side.

Nearly 6% of the European citizens do not trust anyone when receiving information about waste management. For the EU citizen average, independent scientists are the most trusted source of information. Nuclear industry is the least trusted source. There are large country-by-country variations

The **second question** dealing with trust includes five “statements” although only two of them will be considered for our analysis (the others are not relevant for the study) the statements to be analysed relate to trust in mass media and nuclear industry.²⁵ This question was formulated only in 2001.

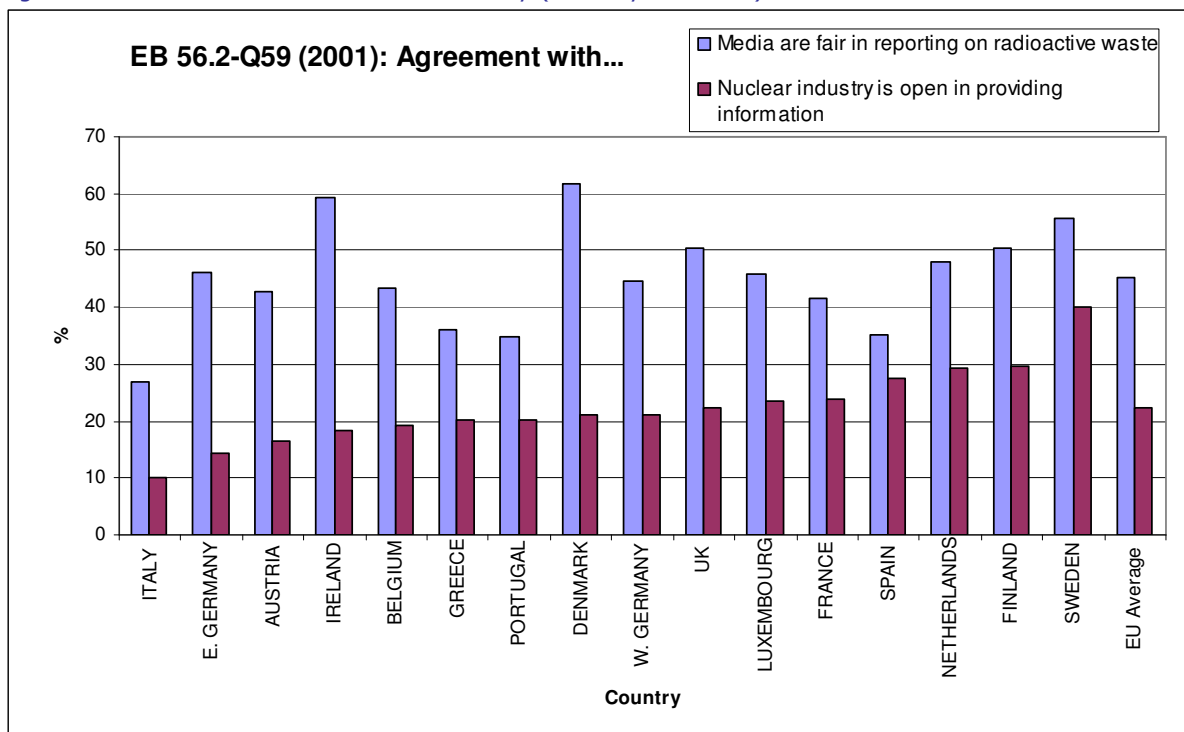
Looking at the overall European figure (**Figure 39**), there is an almost perfect split in opinion about the fairness of media, 45% of the EU citizens declare that the media are fair in reporting about the subject.

Less than one in five Europeans (22%) agree with the openness of the nuclear industry. It is clear that despite the efforts of the nuclear industry in this field during the last years, it still has a long way to go to demonstrate the European citizens its openness in providing information. The two countries in which perhaps the greatest efforts have been made by the industry towards openness, Sweden and Finland, show the highest level of agreement with the statement.

²⁵ For each of the following statements, please tell me if you strongly agree, tend to agree, tend to disagree, strongly disagree or don't know.

1. The media are fair in their reporting of radioactive waste issues
2. The nuclear industry is open in providing information about radioactive waste
3. An advantage of nuclear power is that it produces less greenhouse gas emissions than other energy sources
4. If all the waste is managed safely, nuclear power should remain an option for electricity production in the European Union.
5. The generation using nuclear power should be responsible for dealing with its waste, and not leave it for future to manage

Figure 39. Trust in Media and Nuclear Industry (2001 by countries)



Looking at the overall European figure, there is an almost perfect split in opinion about the fairness of media, while less than one in five Europeans agree with the openness of the nuclear industry

➤ **Participation and decision making:**

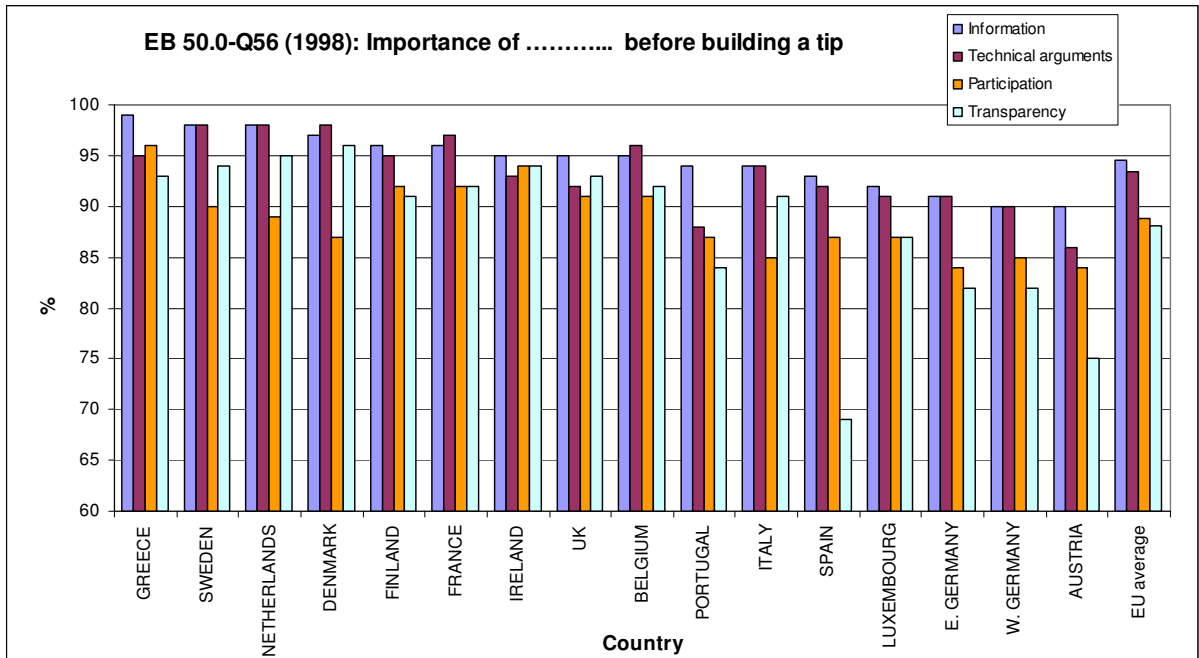
The **first question** deals with the importance endorsed to a range of procedures in order to build a tip for radioactive waste²⁷. This question was only asked in 1998, so no year comparison is possible. Several answers were feasible.

Option "a" would cover the "transparency" speech (*"Being open about the choice of site, technical details, etc."*); Option "b" would match the "technical" one (*Undertaking a detailed study of the environmental consequences*); while Option "g" would go with the "information" statement (*Keeping people informed*). Options c to f relate to several participation processes (*Consulting people who live near the chosen site; Consulting independent scientists; Consulting environmental protection associations; Consulting medical experts*). For **Figure 40**, all "participation" options have been group.

²⁷ Before building a tip for radioactive waste, various procedures have to be followed. For each of the following, please tell me if it is fairly important, fairly unimportant to you or don't know ?

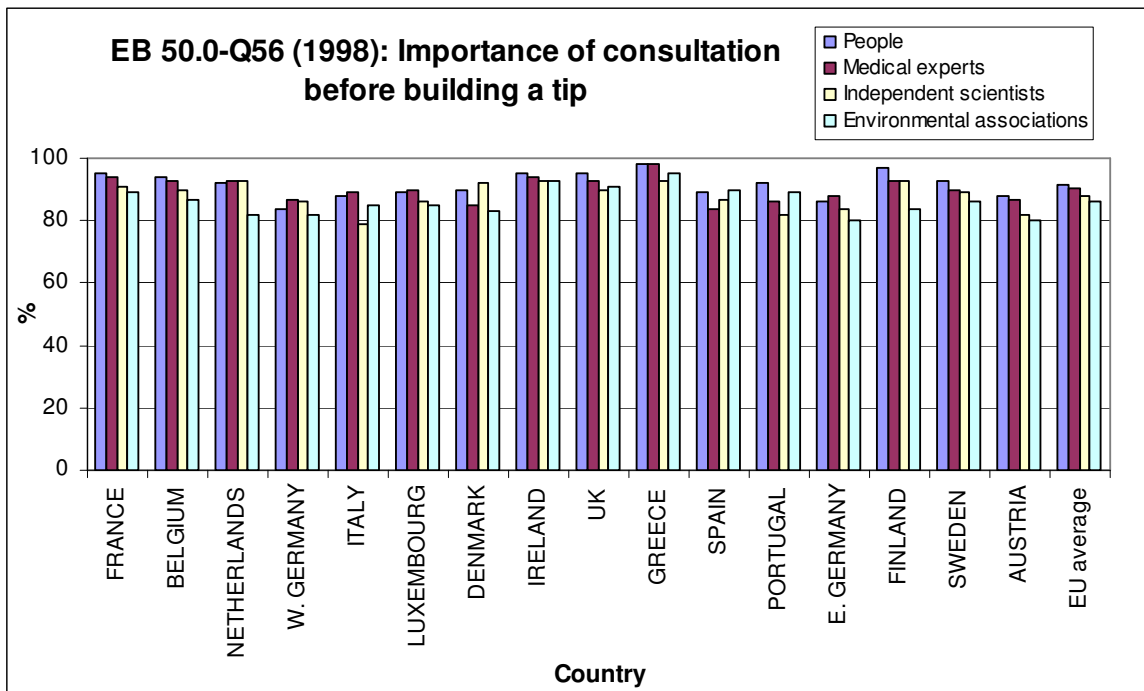
- a. Being open about the choice of site, technical details, etc.
- b. Undertaking a detailed study of the environmental consequences
- c. Consulting people who live near the chosen site
- d. Consulting independent scientists
- e. Consulting environmental protection associations
- f. Consulting medical experts
- g. Keeping people informed

Figure 40. Importance of various arguments before building a tip (1998 by countries)



If we first focus on the EU average, more importance is given to “information” and “technical arguments” than to “participation” and “transparency”. By countries, we can see that all countries give 90% of importance, or more, to “information”. 90% or more in all countries mentions “Technical arguments”, except in Portugal (88%) and Austria (86%). Greece and Ireland are the two giving more importance to “Participation”. Spain with 69% and Austria with 75% are the two countries giving less importance to “transparency”. Let’s focus now on the differential importance of the four consultation processes addressed by the EU citizens in this question (Figure 41).

Figure 41. Importance given to several consultation processes before building a tip (1998)



If we focus on the EU average, we can see that there are no important differences between these kinds of participation. Nevertheless, consulting people is the most mentioned choice, and consulting environmental associations is the less mentioned one. By countries, there are not significant differences.

As far as the procedures to be applied before building a tip are concerned, more importance is given to “information” and “technical arguments” than to “participation” and “transparency” by the average EU citizen. Among the participation processes, consulting people is the most mentioned choice while consulting environmental associations is the less mentioned one. By countries, there are not significant differences.

The **second question** looks at the perceived reasons given to explain why no disposal of the most hazardous categories of radioactive waste has taken place yet in any European country²⁸. Only the third response option has been analysed, as it was the only one relevant for this study. This third option is proposed as an indicator of the need to develop new decision-making models. This question was asked in all the radioactive waste Eurobarometers (1998, 2001, 2005). However no direct comparison of data is possible due to the differences in the answer format. 1998 data can be directly compared to 2005 data, but not to 2001 data.

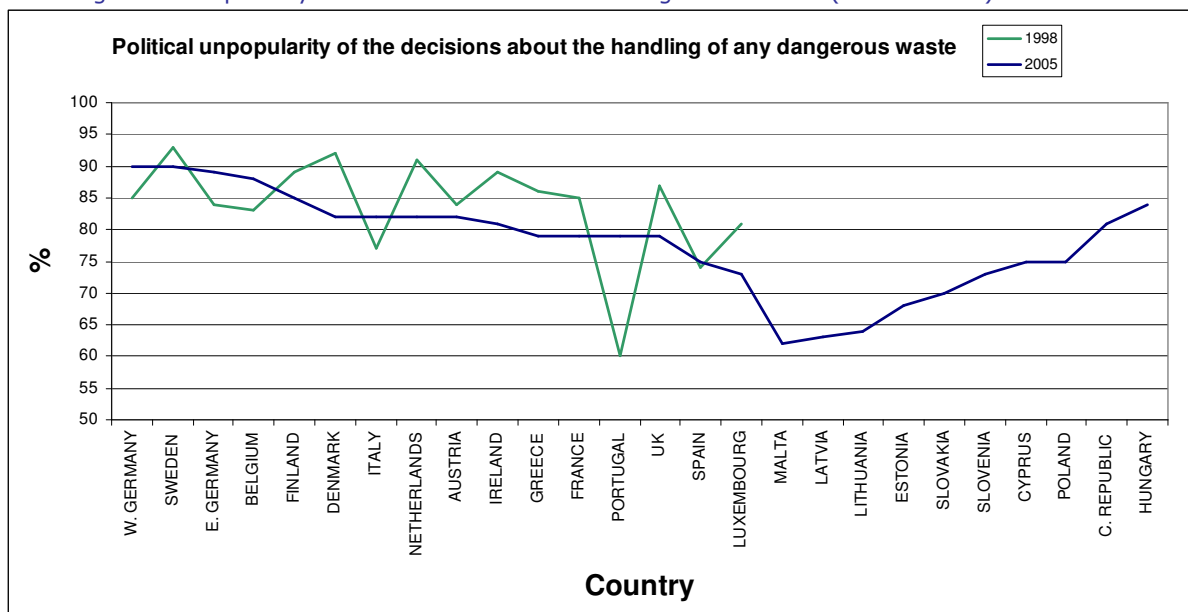
It should be noted that in both 1998 and 2005, each citizen valued all the statements included in the question (multiple answers), while in 2001 only one statement was

²⁸ For the moment, with some exception, most of the countries have not taken a decision on the final disposal of highly radioactive waste. Please tell me to what extent you agree, disagree or don't know with the following statement:

- c) This shows how difficult and politically unpopular it is to take decisions about the elimination of any toxic waste

choose by the citizen (single answer). Therefore, let's focus on the 1998 – 2005 comparison (Figure 42).

Figure 42. Popularity of decisions about the handling of radwaste (1998 – 2005)



Sweden and Finland are the countries with a major percentage of agreement with this statement, in both years. On the contrary, Spain and Portugal are those with less percentage of agreement. It seems that northern countries are more aware about the need of a change in the decision-making processes. Finland, specifically, has recently gone through quite an intense political debate on the issue of siting of a national deep geological repository, culminating in the selection of a site acceptable to politicians, industry and the local community concerned. One could therefore assume that the public in this country has been more exposed to the issue than in most other European Union countries. As far as the 10 new EU countries are concerned, Czech Republic and Hungary show the highest levels of agreement with the need to develop new decision-making processes, at a similar level than Italy, Ireland or Greece. On the other hand we find Latvia, Lithuania and Malta showing the lowest percentages of the whole 25 EU.

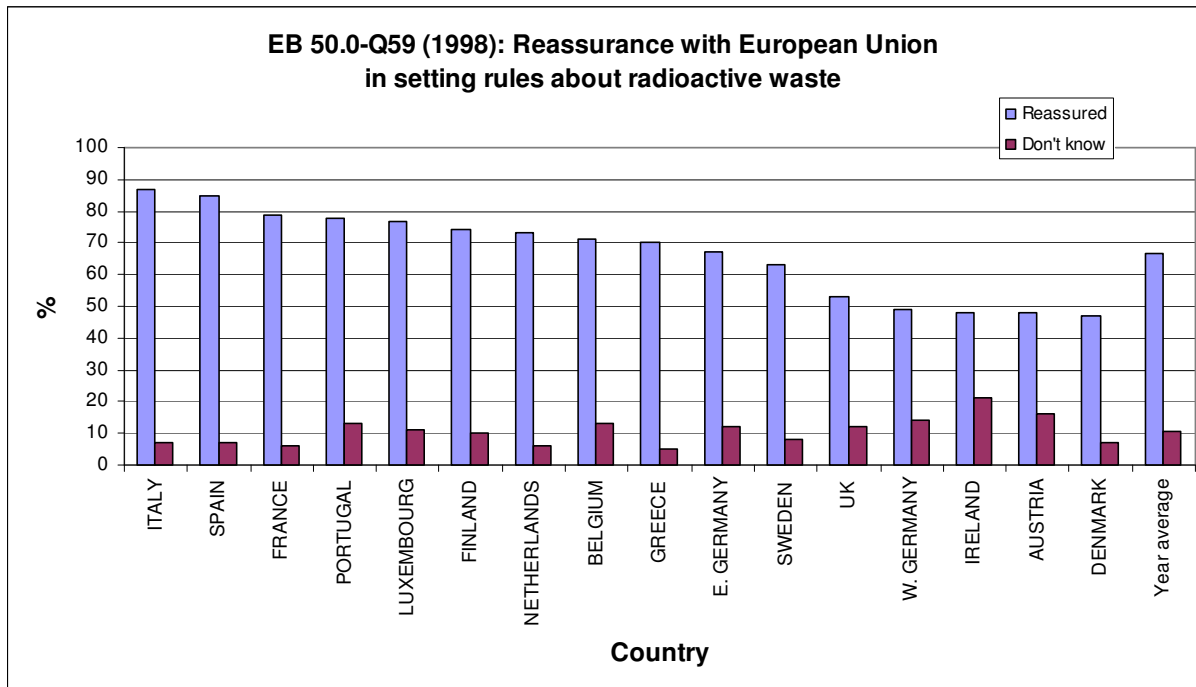
It seems that northern countries are more aware of the need for a change in the decision-making processes regarding the construction of a tip. Latvia, Lithuania and Malta show the lowest percentages of agreement with such a need for change in the whole 25 EU.

The **third question** deals with the role of the UE in setting the rules for the processing and safety of radioactive waste²⁹. (Only asked in the 1998 EB). In general terms (Figure 43), a significant support (65%) for the involvement of the EU in fixing the rules covering the processing and safety of radioactive waste is shown by EU citizens.

²⁹ Would you feel reassured or not if the European Union was to set the rules for the processing and safety of radioactive waste?

1. Yes, reassured
2. No, not reassured
3. Don't know

Figure 43. Role of the EU in setting rules for radwaste (1998)



The countries that would like the UE to play a significant role in the processing and safety of radioactive waste are Italy, Spain, France, Portugal and Luxembourg (all of them over 75%). Those who would not feel so reassured by the EU playing such a role are mainly Denmark, the United Kingdom, Austria, Germany and Ireland. Moreover, Ireland, Austria and West Germany are the ones showing a higher percentage of “don’t know” answers.

In general terms a EU citizens show a significant support for the involvement of the EU in fixing the rules for the processing and safety of radioactive waste. Southern European countries are more for a relevant role of the EU, while Denmark, Austria, Ireland, West Germany and the UK are not so much for it.

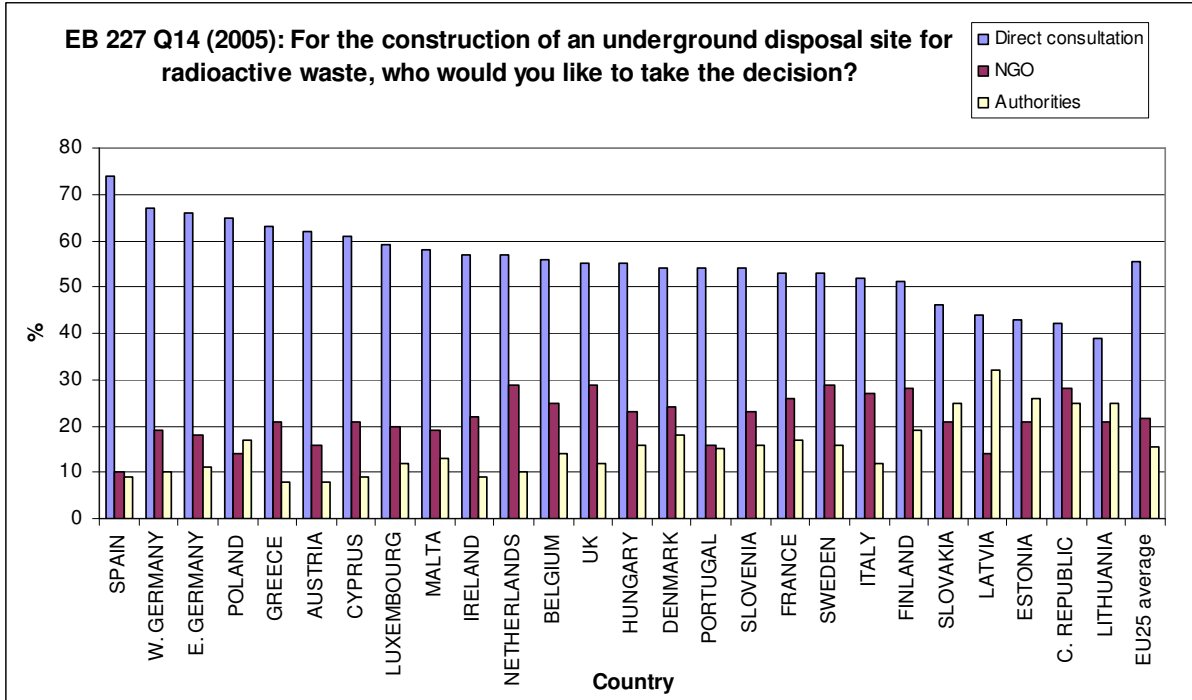
The **forth question** was only included in the 2005 EB, and it deals with the role that different institutional and social agents should play in the decision making process associated to the hypothetic construction of an underground disposal site for radioactive waste near the own home³⁰.

On average more than 55% of the EU 25 would like to be directly consulted and participate in the process (Figure 44).

³⁰ Thinking about the hypothetic construction of an underground disposal site for radioactive waste near your home, with which of the following you agree the most?

- I would like to be directly consulted and to participate in the decision making process
- I would like local non-governmental organizations to be consulted and to participate in the decision making process
- I would leave the responsible authorities to decide on this matter
- [NONE OF THESE]

Figure 44. Relevant stakeholders for the decision making process (2005)



Around 20% of these citizens would like local non-governmental organizations to be consulted and to participate, while only 15% would leave the responsible authorities to decide on this matter. Spanish citizens are the ones claiming for a direct consultation process to a higher extent (74%), followed by the Germans (66%), and the Polish (65%). On the contrary, only 39% of the citizens from Lithuania would like to be directly consulted.

As far as the active role of NGO are concerned, Netherlands (29%), Sweden (29%), UK (29%), Finland (28%), and Czech Republic (28%) supported it. It is worth mentioning that Spain shows the lowest percentage of “support” to NGOs (10%). Regarding the national governments role, Latvia (32%), Estonia (26%), Czech Republic (25%), Lithuania (25%) and Slovakia (25%) present the highest rankings in this option. In other words, the 10 new countries seem to be the ones more in favour of the traditional institutional approach. There is only one exception to this picture in Cyprus (9%). The countries showing less support to the active role of their national governments are Greece (8%), Spain (9%), Ireland (9%), and Austria (8%).

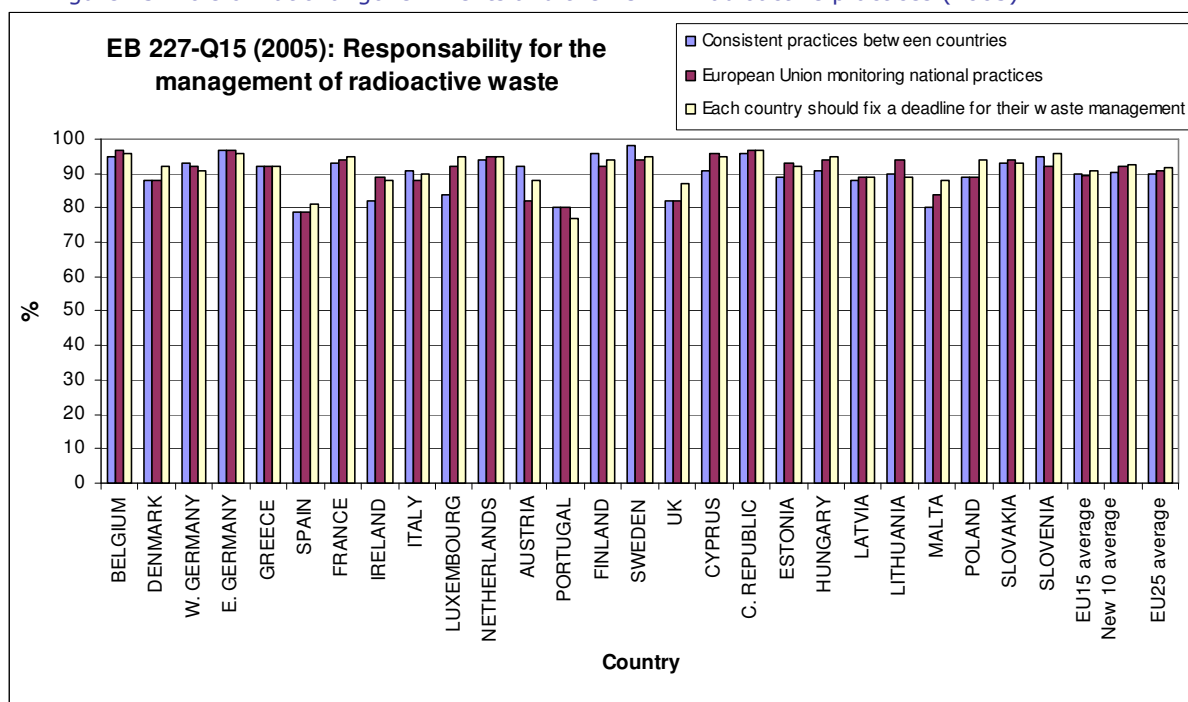
To sum up, for the Average EU citizen direct consultation and participation is the most relevant issue when approaching a decision process regarding the construction of an underground disposal site near the own home.

The **fifth question**, only asked in 2005, regards the role of the national governments, and of the own European Union, in the definition, application and monitoring of radioactive waste management practices.³¹ There were three response options:

- “Since management of radioactive waste may have effects beyond national borders, harmonized and consistent practices should be found”
- “The European Union should be able to monitor national practices and programs”.
- “It’s high time for each European Member State to fix a deadline for setting up management approaches for their waste”

As can be seen in **Figure 45**, all options received very similar evaluations. On average the three of them are above 90%, with a slight augment of the first option, i.e., it should be the own country the one taking care of the issue. Spain, Portugal, UK and Malta show the lowest percentage of agreement for all three options. Belgium, East Germany, France, Netherlands, Finland, Sweden, Cyprus, Cache Republic, Slovakia and Slovenia show very high percentages of agreement for all the three options.

Figure 45. Role of national governments and the EU in .. radioactive practices (2005)



To sum up, it seems that there is no clear preference towards the roles to be played by the national governments or the EU in the definition, application and monitoring of radioactive waste practices.

³¹In the European Union, each member state appear to remain fully responsible for the management of its own radioactive waste. For each of the following statements concerning this question, please tell me to what extent you agree or disagree?

- Since management of radioactive waste may have effects beyond national borders, harmonized and consistent practices should be found
- The European Union should be able to monitor national practices and programs.
- It’s high time for each European Member State to fix a deadline for setting up management approaches for their waste

B. COUNTRY PROFILES

In an effort to summarize the huge amount of available information in both domains (nuclear energy & radioactivity and radioactive waste) some additional statistical analysis were carried out.

The aim was to deep in the national singularities and commonalities identifying country profiles or similar public opinion patterns.

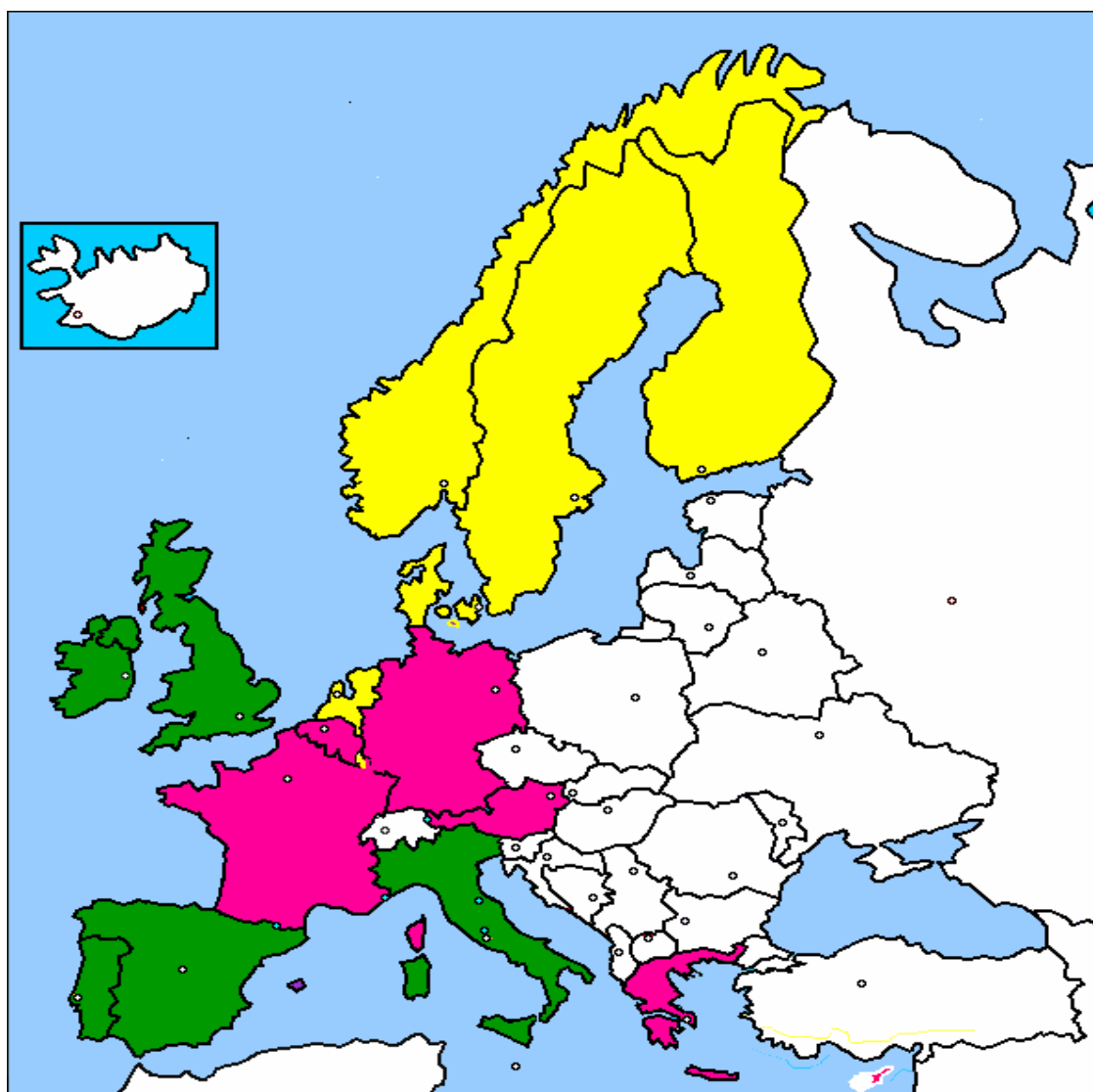
A statistical procedure named cluster analysis, and notably the two-stage conglomerate, was run (SPSS 12.0). This analysis classifies the data (countries) according to the input information (all EB questions).

It has to be noted that there are not statistically significant differences among the three country profiles presented below. (As the exploratory approach gave a single profile, the confirmatory approach was applied). Therefore, from the statistical perspective, the three country profiles are somehow “artificial” (as we required them to the statistical procedure), but they do match with the country data we already have at the descriptive level.

For each of the country profiles a graphic representation is presented first, and then a table including the most outstanding characteristics of each cluster in comparison to the others.

- The first country profile refers to the nuclear energy & radioactivity domain and covers the period 1988 – 1995
- The second profile reflects the picture of radioactive waste in 2001
- The third one reflects the same “radioactive waste picture” but in 2005, with the 10 new EU countries.

▪ **Nuclear Energy & Radioactivity / 1988 – 1995 EB Surveys**



CLUSTER 1 Netherlands, Luxembourg, Denmark, Norway, Finland, Sweden

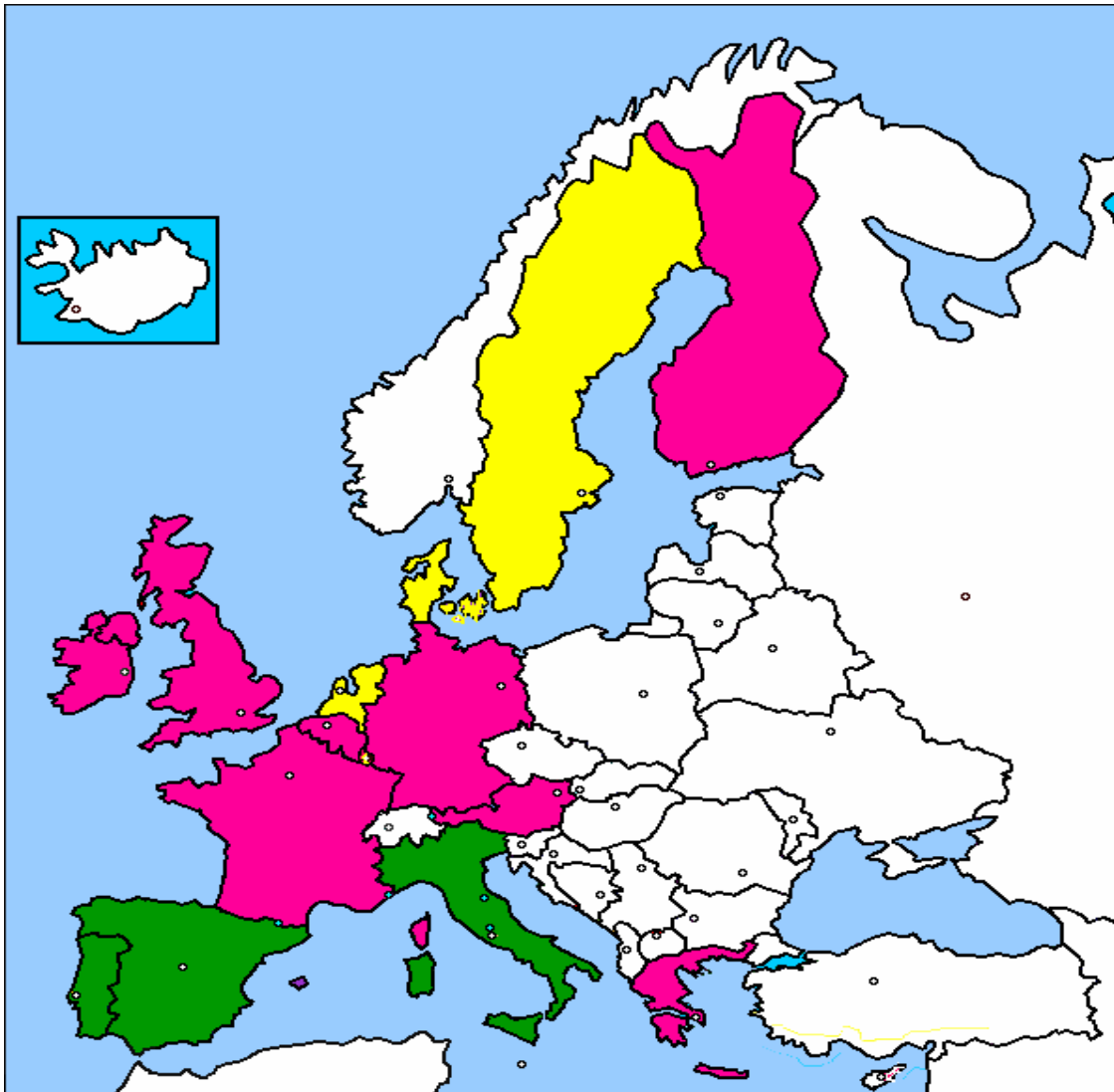
CLUSTER 2 France, Belgium, Germany, Greece, Austria

CLUSTER 3 Italy, Ireland, UK, Spain, Portugal

Table 18. Country Profile –Differential Characteristic by clusters

Cluster 1	Cluster 2	Cluster 3
▪ Magazines	▪ Newspapers, special press	▪ Never heard
▪ Objective, interesting, quickly	▪ More satisfied with information	▪ Sufficient
▪ Ranks higher in all the addressed qualities of the information sources	▪ More trust (Chernobyl)	▪ Environmental groups and teachers as trusted agents
	▪ Doctors, scientists and public authorities as trusted agents	

■ Nuclear Waste / 2001 EB Survey (EU15)

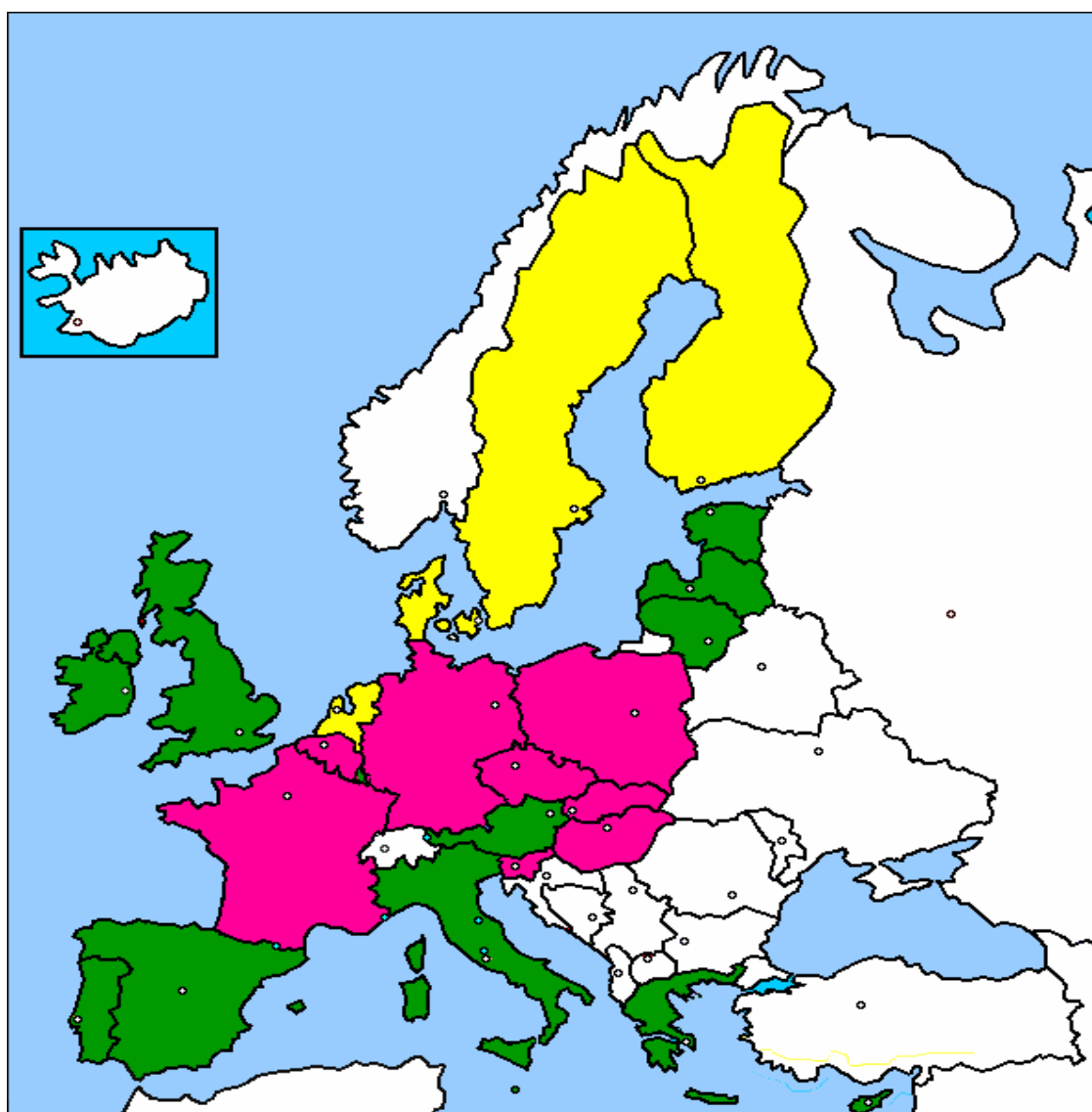


- CLUSTER 1** Denmark, Luxembourg, Netherlands, Sweden
- CLUSTER 2** Belgium, Germany, Greece, France, Ireland, UK, Finland, Austria
- CLUSTER 3** Italy, Spain, Portugal

Table 19. Country Profile –Differential Characteristic by clusters

Cluster 1	Cluster 2	Cluster 3
<ul style="list-style-type: none"> ▪ Better knowledge 	<ul style="list-style-type: none"> ▪ Do not trust anyone 	<ul style="list-style-type: none"> ▪ Major quantity of “don’t know” regarding Trust
<ul style="list-style-type: none"> ▪ Higher level of information 		
<ul style="list-style-type: none"> ▪ More trust in all agents 		
<ul style="list-style-type: none"> ▪ More aware about participation 		

■ Nuclear Waste / 2005 EB survey (EU25)



CLUSTER 1 Denmark, Netherlands, Sweden, Finland

CLUSTER 2 Belgium, Germany, France, Czech Republic, Hungary, Poland, Slovakia, Slovenia

CLUSTER 3 Greece, Spain, Ireland, Italy, Luxembourg, Austria, Portugal, UK, Cyprus, Estonia, Latvia, Lithuania, Malta.

Table 20. Country Profile –Differential Characteristic by clusters

Cluster 1	Cluster 2	Cluster 3
<ul style="list-style-type: none"> Higher level of information 		
<ul style="list-style-type: none"> More trust in national agencies, government and scientists 		<ul style="list-style-type: none"> Worse knowledge
<ul style="list-style-type: none"> More aware about participation 		<ul style="list-style-type: none"> More trust in media

V. NATIONAL POLLS REVIEW

1. SCOPE

As already mentioned the objective of Activity 1.1 was to report the expectations and concerns of the European Union citizens as regards public information and involvement in the nuclear domain.

To achieve this goal, the first step comprised an analysis of the way in which Eurobarometer polls have addressed the expectations and concerns of the EU citizens as regard public information and involvement in the nuclear. As we have already seen, one of the results of the EB analysis has been the identification of different opinion patterns among the EU countries. The second step will consist in analysing national polls in three to four countries that are each characteristic of one of the EU public opinion patterns identified.

In order to find out relevant national surveys, and taking into account the NEA recommendations in terms of public opinion polls on nuclear energy matters³², [Official Social Science Organisations](#) webs were consulted through the [European Commission WebPages](#). 17 EU members Social Data Archives (the ones available) have been checked. These social data archives have been systematically consulted, several times, to find out information on nuclear matters. However, most of the web pages:

- Do not work correctly
- Have no data available in English (study reports on national language)
- Have no keywords related to energy
- Have no actual studies with information on nuclear issues
- Have no specific surveys with information on nuclear issues – They divert us to the Eurobarometers and ISSP

National surveys from 3 countries, representative of the EU public opinion country profiles, with few questions on participation and decision-making or information on nuclear matters, were found:

- [Finland](#): *Energy attitudes of the Finns (83-03)*
- [Spain](#): *Opiniones de los españoles sobre el medio ambiente (2004)*
- [United Kingdom](#): *UEA-MORI Risk Survey (2002)*

It is quite evident that very little information on our subject is available at the national official social science organizations. Taking this shortage of information into account and in an effort to wide our national perspective, it was decided to also include the [ISSP \(International Social Survey Program\)](#) surveys. In addition, and following the suggestion of the project coordinator, it was decided to also incorporate the [French IRSN Barometer](#).

Therefore, and besides the ISSP data, four countries representative of the different EU public opinion patterns were selected for further analysis: Finland, Spain, UK, and France.

³² As a [hint for future work](#) in this area, the NEA suggest a targeted public opinion poll in interested member countries using an agreed common methodology and an homogeneous set of questions. This poll would need to be performed at one point in time, and preferably be realised by an institution with as small as possible connection to the nuclear industry.

2. RESULTS

Results from the ISSP surveys will be presented first, and then the available national data information will be commented.

➤ ISSP

The International Social Survey Programme (ISSP) is a continuing annual programme of cross-national collaboration on surveys covering topics important for social science research. It was founded in 1983 by national research institutes from four countries (USA, UK, West Germany and Australia). Since then it has been expanded to include 39 countries in total. 19 countries of the current UE participate in the ISSP (Cyprus, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Ireland, Italy, Latvia, Netherlands, Poland, Portugal, Slovakia, Slovenia, Spain, and Sweden)

The ISSP combines two powerful research designs, cross time and cross-national, in the study of societal processes and the comparison of people's values, attitudes and behaviours. The questions fielded in each ISSP module are designed to be relevant in all countries and expressed in an equivalent manner in all languages. Initially, the questionnaire is drafted in British English before being translated into other languages. Modules are replicated after several years in order to allow for longitudinal analysis.

ISSP MODULE	YEAR FIELDED			
	1985	1990	1996	2006
Role of government	1985	1990	1996	2006
Social networks	1986	2001		
Inequality	1987	1992	1999	
Family and changing gender roles	1988	1994	2002	
Work orientations	1989	1997	2005	
Religion	1990	1998		
Environment	1993	2000		
National identity	1995	2003		
Citizenship	2004			
Leisure and sport	2007			

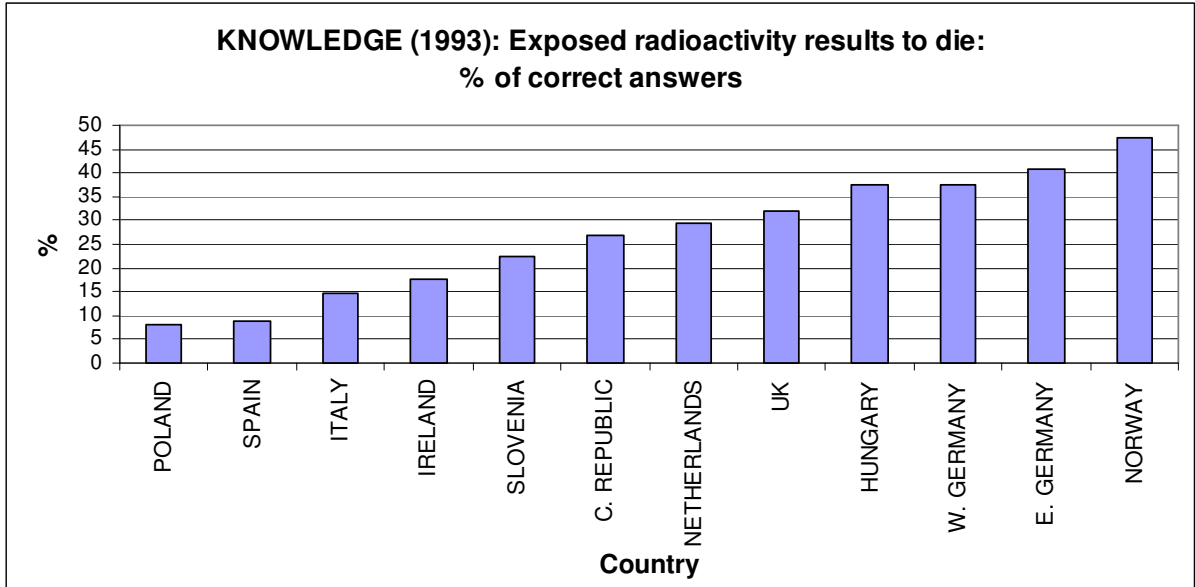
Table 21. International Social Survey Programme (ISSP) Modules Fielded By Year

As can be seen in **Table 21**, two ISSP modules dealt with environmental issues (1993 – 2000). Only three questions relevant for our review were found in the pertinent ISSP surveys, one of them deals with information, other with trust, and the last one with public participation.

The first question of our interest deals with basic knowledge on the nuclear energy domain. Citizens were asked to define the extent to which they agree with a statement such as: "If someone is exposed to any amount of radioactivity they are certain to die as a result".

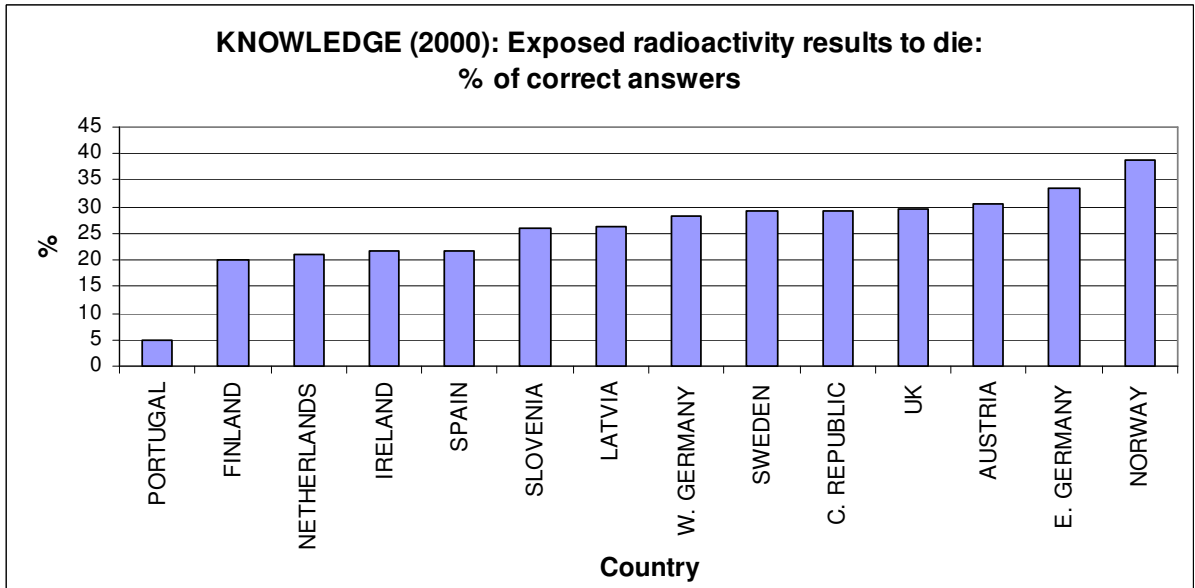
In 1993 (**Figure 46**), the percentage of correct answers is higher in Norway, Germany and Hungary (from 35 to 50%). On the other hand, Poland, Spain, Italy and Ireland have the lowest percentage of correct answers (lower than 20%). Anyway, the differences between all these countries are not very big. Consistently with the Eurobarometers results, people tend to "over estimate" radioactivity risks. Moreover, the country results by knowledge are consistent with the ones found in Eurobarometers too.

Figure 46: ISSP 1993 – Knowledge



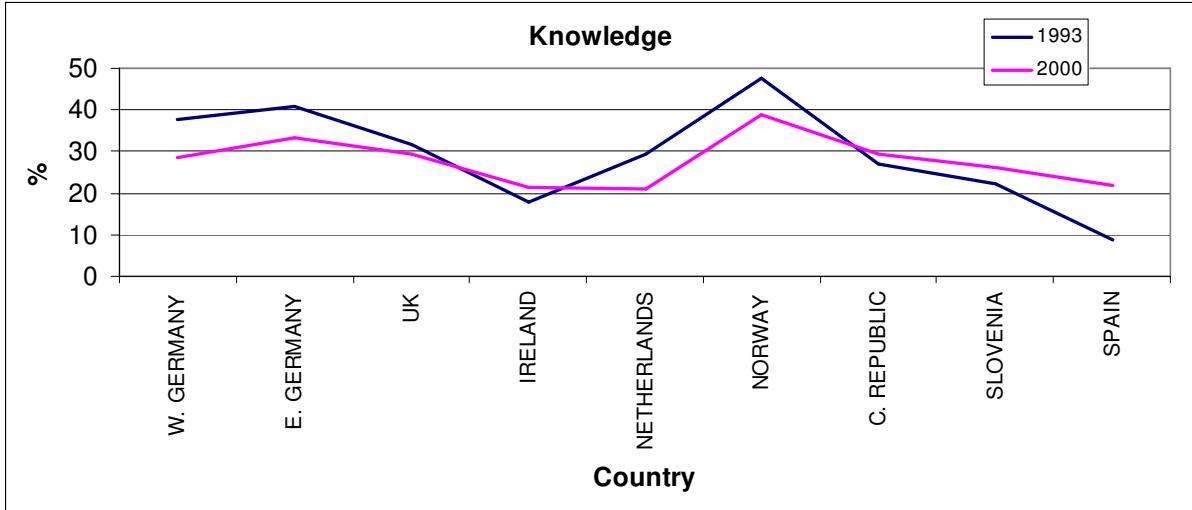
In 2000, Portugal and Finland are the two countries with the lowest percentages of correct answers (lower than 20%) while Norway is the only one with a percentage higher than 35%.

Figure 47. ISSP 2000 – Knowledge



If we look the evolution in those countries, which had been surveyed both in 1993 and 2000, we see that most of the countries had decreased in their knowledge level during this period of time, with the exception of Ireland, Czech Republic, Slovenia and Spain.

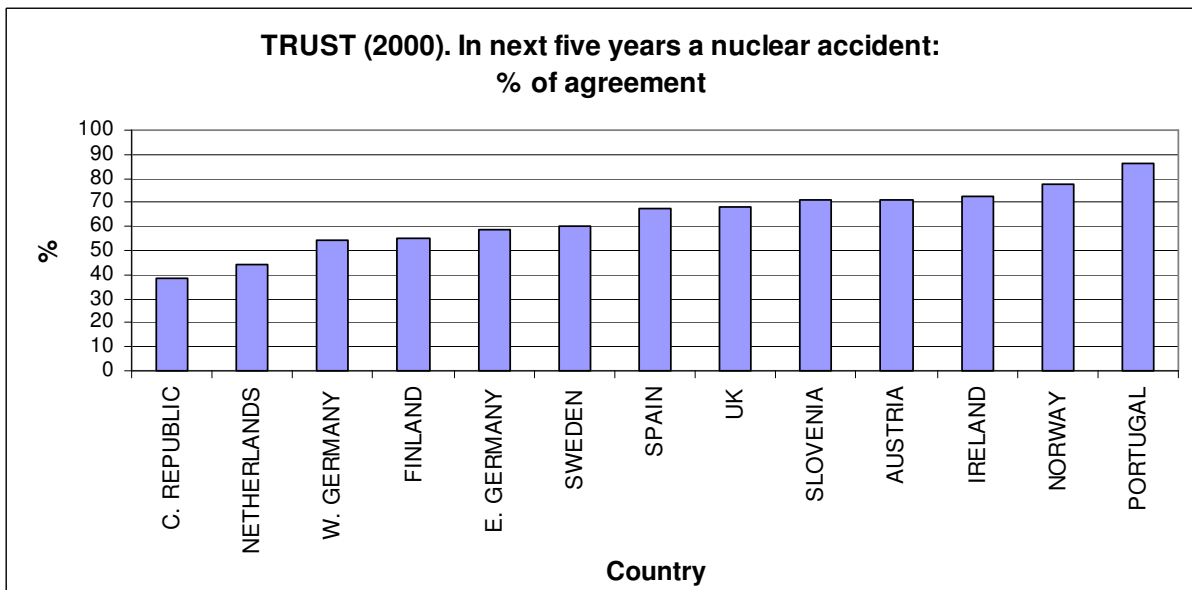
Figure 48. ISSP 1993/ 2000 - Knowledge



Consistently with the Eurobarometers results, people tend to “over estimate” radioactivity risks. Moreover, the country results by knowledge are consistent with the ones found in Eurobarometers too

If we focalised on **trust**, a question similar to one of the nuclear EBs was also asked in the ISSP survey of 2000 (“Within the next five years, how likely is it that an accident at a nuclear power station will cause long-term environmental damage across many countries?”).

Figure 49: ISSP 2000 – Trust



Here we find important differences between countries. In Czech Republic and in Netherlands less than 5 out of ten of the citizens think that a severe nuclear accident is possible in the next five years. On the contrary, in Norway and Portugal more than 75%

of the population agrees with this statement. These findings are similar to those found in the 1995 Eurobarometer survey.

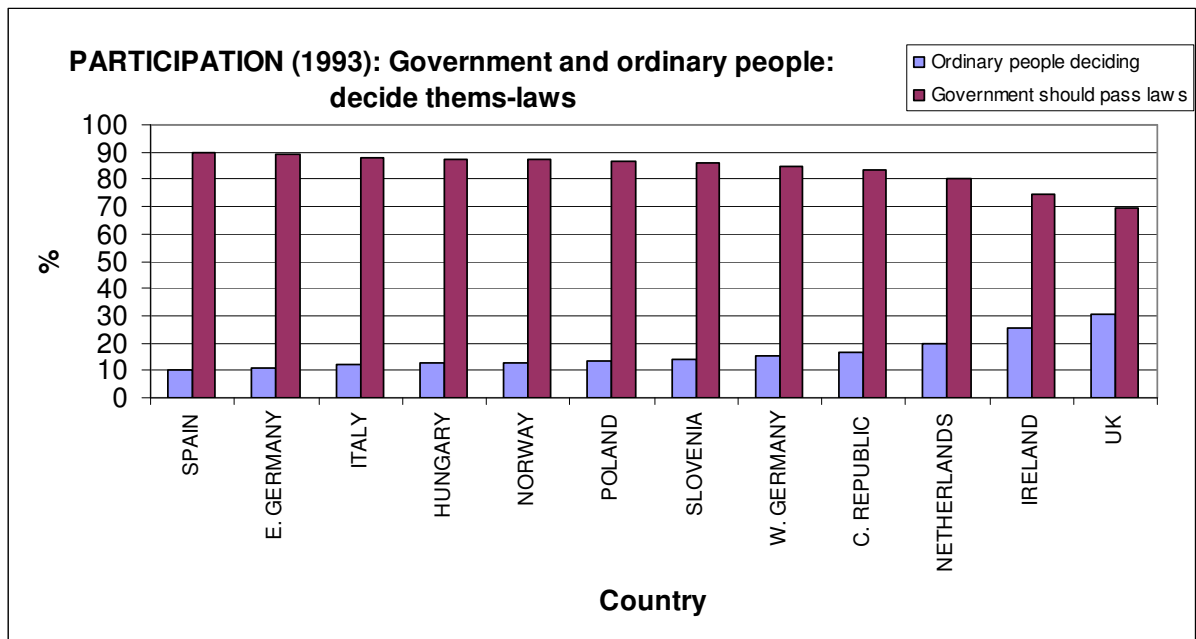
Finally, there was a question about [participation in the decision-making on the general environmental field](#) (both in 1993 and 2000 survey).

The specific formulation was: “If you had to choose, which one of the following would be closest to your views?”

- Government should let ordinary people decide for themselves how to protect the environment, even if it means they do not always do the right thing
- Government should pass laws to make ordinary people protect the environment, even if it interferes with people’s rights to make their own decisions.
- Can not choose / Don’t know

As can be seen in **Figure 50**, in 1993 citizens thought that government should pass laws to make ordinary people protect the environment. This view is stronger in Spain and East Germany with 90% of agreement, while in the UK only 70% claim for public participation. In 2000, the figure is very similar.

Figure 50: ISSP 1993 – Participation

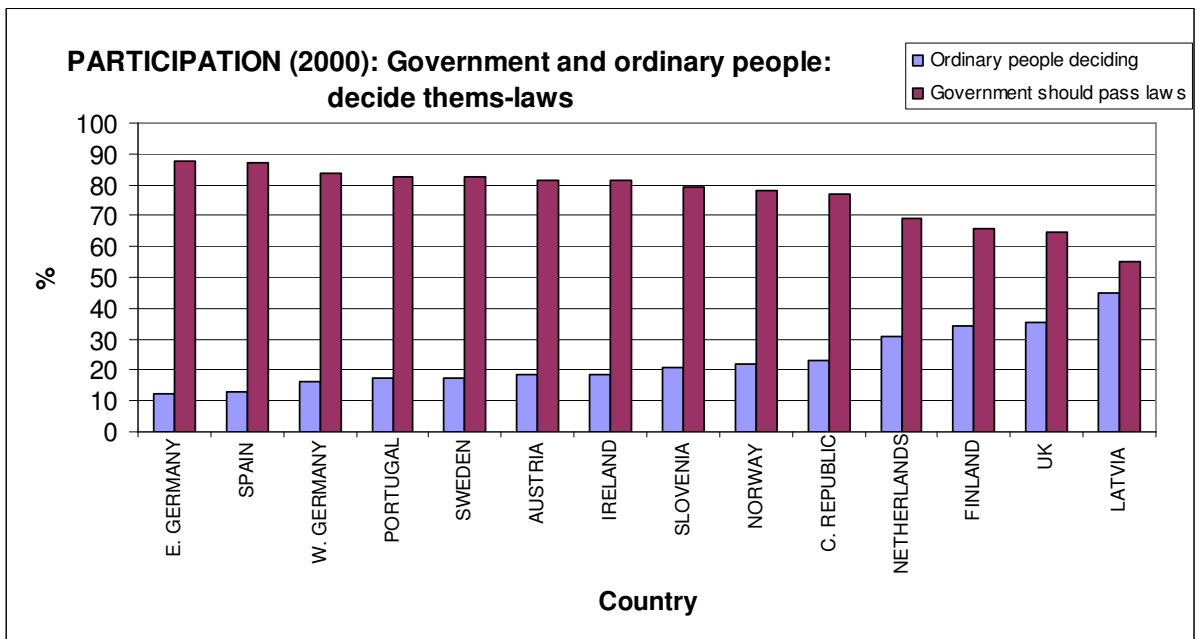


This result (strong support for national governments passing the laws) could apparently contradict the one obtained in the 2005 EB. In this EB, data showed that for the EU average citizen, direct consultation and participation was the most relevant issue when approaching a decision making process.

However, it should be noted that not only the formulation but also the content of the questions are quite different. In the ISSP question the issue at stake is a global one (“to

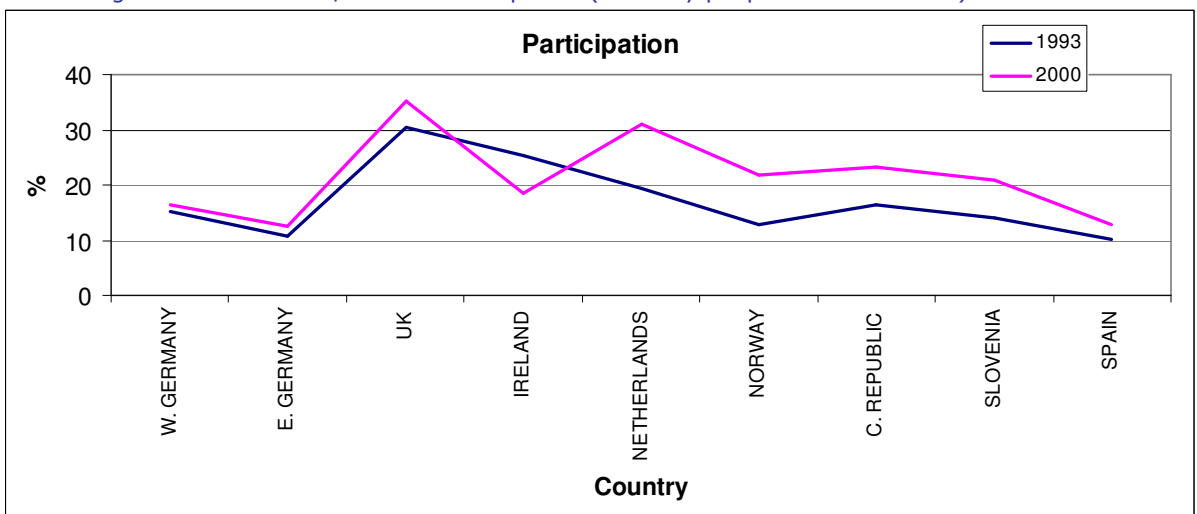
protect the environment”), while in the 2005 EB the issue could be defined as a local one (with obvious global consequences, but a local one as formulated in the question) (“to construct an underground disposal site near my home”). Then we have the evidently dissimilar formulations in terms of the “effects” of the potential participation processes. In the 2005 EB this effects are not even mentioned whereas in the ISSP the are clearly mark in strong terms (“even if it means they do not always do the right thing”; “even if it interferes with people’s rights to make their own decisions”).”

Figure 51. ISSP 2000 – Participation



If we look at the countries which had been surveyed in both years, and focusing on the option “ordinary people should decide”, we see that only Ireland suffered a decrease in the interests on such public participation (Figure 52).

Figure 52. ISSP 1993/ 2000 – Participation (Ordinary people should decided)



➤ **Spain:** [Opiniones de los Españoles sobre el Medio Ambiente (Febrero-Marzo 2004)]

- **Knowledge:**

Only 20.5% of Spaniards knows that the following statement is not at all true: "if somebody exposes to certain amount of radioactivity, the smaller it may be, he or she will surely die because of that". 41.1% considered that the statement is totally or probably true, while 17% do not know.

Therefore, in 2004 the level of basic knowledge Spaniards have on this radioactivity issue is quite reduced.

- **Trust:**

8% of the Spanish citizens think that a nuclear power plant accident in the next 5 years is highly probable, while 42,5% thinks it is just probable. It is significant that almost 20% of the sample did not express their opinion as they used the "don't know" option.

It could be said that almost half of the Spanish citizens have little trust in the management of the national NPP, as they believe there is a high potential for an accident in the short term.

The key point regarding the [Spanish national poll](#) is the scant attention being paid to the topics of our study. No questions dealing with information or public participation have been found, and there is little information on basic knowledge and trust.

In line with the EB results, in 2004 the level of basic knowledge Spaniards have on radioactivity is quite low, and their confidence on the management of the national NPP is low.

➤ **UK:** [UEA-MORI Risk Survey (2002)]

This study investigated public attitudes towards science, risk and types of governance. It covered five core issues namely: climate change, radiation from mobile phones, radioactive waste, genetically modified food and genetic testing.

- **Awareness/ Information:**

71'5% of the British was very or fairly interested in the issue of radioactive waste.

- **Decision making process:**

The overall confidence in risk regulation by the government is low. People feel that current rules and regulations in the UK are not sufficient. An important percentage of people claim for an independent regulation of radioactive waste issues, notably by organisations unconnected to both government and industry.

As many studies have shown that the majority of people agree with the idea of public involvement in managing risks, people were also asked about they

agreement with the statement: "I would like to be personally consulted in policy making decisions". The results show that the British agreed that the general public should be involved in decision making. Respondents believed more strongly that environmental organisations, scientists working for environmental organisations, national governments and the general public should be involved in making decisions about radioactive waste. Otherwise, Ministry of Defence, scientists working for industry, nuclear industry and the EU should be the ones less involved in such decision-making processes.

- **Trust:**

Respondents were asked to indicate to what extent they trusted various sources to tell them the truth about radioactive waste risks. Overall, people seem to trust doctors, environmental organisations, and to a somewhat lesser extent friends, family and scientists working for environmental groups or university. On the other hand, people seem to distrust the EU, scientists working for industry, the national government and nuclear industry.

British people are interested in the issue of radioactive waste. The overall confidence in risk regulation by the government is low. British citizens believe that the general public should be involved in decision making.

➤ **France:** *[Baromètre IRSN: Perception des risques et de la sécurité (2004)]*

Periodical survey on the perception of risk and safety, including topics on nuclear energy, nuclear risks, and nuclear wastes.

- **Trust:**

French citizens think that the information they receive about nuclear risk is little trustworthy. Trust levels on information about NPP or radioactive waste are always lower than 20%, and lower than 10% for information related with the Chernobyl accident.

There is little trust in the authorities in charge of nuclear energy. 51% of the French citizens have a good opinion of scientists, although 82% thinks that quite often they are under economic pressure. In fact, 55% considers that a scientist is never independent. 44% believe that the ecologist associations are competent agents for the risk issue.

As far as the control and the environmental monitoring of a risky facility are concerned, scientific experts are the most trusted agents (30,8%), followed by public authorities (23,3%), and local politicians (22,6%). The owner of the facility (8,6%), the NGOs (8,1%), and the local citizen committee (4,8%) received much lower levels of trust.

- **Decision Making:**

Regarding the role of scientific experts, 64% of the French people think that political decisions are not enough based on expert and scientific knowledge. Therefore, there is some kind of demand for a more significant role of scientist in the decision making process.

70% believes that the general public can provide additional and useful information to the scientific experts. 58% considers that citizens should better organize themselves to make “their voice” more clearly and aloud so the scientific experts could take this opinions into account. 49% feels that scientific experts should consider more the public opinion before making any decision. 60% is in favour of public participation in informative and decision-making meetings dealing with the management of risky facilities. 91% thinks that a joint management of risky situation involving scientific experts, political actors, businessmen, citizen associations and the general public would be useful.

In short, it looks like French citizens are in favour of public participation but mainly in favour of a decision making process involving all relevant stakeholders.

French citizens think that the information they receive about nuclear risk is not entirely trustworthy. French citizens are in favour of public participation, particularly when it involves all relevant stakeholders. However, when it comes to the control and environmental monitoring of a risky facility, scientific experts and public authorities are perceived as the key actors

➤ **Finland:** [*Finish Energy Attitudes (2003)*]

Basic attitudes towards various energy forms were measured by asking citizens which way the country’s electricity generation should be developed in respect of various energy alternatives. In Finland there has been an intense and even passionate public discussion following the nuclear power decision and the related opinions of the different interest groups. Although there was no referendum, a large amount of information was given to citizens. The media piled up information even for people who were not much interested in this topic.

- **Information:**

More than half of respondents (53%) agree with the view that there is a sufficient amount of reliable information available on energy matters. However, more than one in four (28%) are not satisfied with the available amount of information.

- **Trust:**

About every third person (32%) considers that the disposal of nuclear waste at the Finnish bedrock is safe. The number of suspicious people is greater, more than two fifths (44%) of the population. Despite the scepticism, there is an increase in confidence throughout the follow-up period (from 1983 to 2003)

About two out of five (39%) accept the notion that it would be better to keep nuclear waste in its present intermediate storage and wait for new solutions rather than to definitively deposit it in the bedrock. Every fourth respondent disagrees (27%). “A reconsideration period” is gradually less and less supported each year.

Two in five (40%) consider that a nuclear power plant accident resulting in major damage is so unlikely that there is no reason to be concerned. The number of people who consider an accident risk as realistic is in 2003 considerably smaller than a year before (56%). This measurement also indicates the greatest confidence throughout the study period. Nevertheless, there is a tendency to see all kinds of nuclear accidents as devastating. This notion seems to be very stable.

- **Decision Making:**

Decision-making in energy issues is felt to be distant. People feel that they have few chances to influence on these matters. Six out of ten (60%) think that their opinions have not been sufficiently heard in energy decisions. This opinion has been dominant throughout the follow-up period of the study. The latest information refers to decreasing criticism.

There is an extensive confidence in the legislation and official control relating to energy solutions. When the aspect of control is extended to the level of the European Union, opinions become less certain. Although the role of the EU as an 'overseer' of the national practices in nuclear power questions is as such considered recommendable, it is not believed that this would directly benefit the own country. Furthermore, people want to keep decision-making on nuclear power requiring official confirmation since independent decision-making by companies arouses mistrust amongst the population.

More than half of the [Finish](#) perceives that there is sufficient amount of reliable information available on energy matters. There is significant confidence in the legislation and official control relating to energy solutions. People feel that they have few chances to influence these matters. Six out of ten (60%) think that their opinions have not been sufficiently heard during the energy decision-making process.

VI. CONCLUSIONS

1. In terms of the EU public opinion, the follow up of the public information and participation domains is not receiving as much attention as necessary. Taking into account the social and legal framework we are embedded in, this lack of consideration appears to be an especially sensitive issue.

Extremely few relevant references or reflections about public information or participation issues in the nuclear domain were found in previous public opinion reviews on the subject. Moreover, both in the Eurobarometers, and in the national polls reviewed in this study, few questions dealing with our subject have been found.

2. However, Eurobarometers still provide an invaluable source of information on the topics we are interested on at the EU level. The Eurobarometer review allows a longitudinal description (*trend analysis*) of some key issues in our area of interest.

3. Key results in the nuclear energy and radioactivity field: [1988/89/90/91/93/95]

- Wide agreement on the need of trans-national information about the functioning of Nuclear Power Plants
- A small percentage of people have not heard or read about nuclear energy and radioactivity risks. This percentage decreases through time. There are significant differences among countries.
- Mass media are the most used source of information.
- The perception of being informed about nuclear energy and radioactivity is quite low (no year exceeded 40%), although it increases through time.
- Information availability is the most important dimension for both satisfaction and dissatisfaction with the information. In the most satisfied countries (Finland, Sweden, Denmark...), qualitative dimensions stand out, most notably, trust. In the less satisfied countries (Spain, Portugal, France Ireland and Italy) more quantitative issues are raised, such as the amount of information or its level of complexity.
- Seven out of ten EU citizens believe that an accident like Chernobyl could happen in their own country. The most informed countries are the ones showing higher percentages of trust.
- The EU average citizen trusts social agents with “expert” knowledge. Public authorities are the least trusted group.
- Despite differences among countries, “expertise” is the most required quality for the potential information agents in the EU, while “commitment to public concerns” does not seem to play a significant role at that time (1988-1995).

- The new countries incorporated to the EU in 1995 have an important effect in the EU average in terms of levels of information and trust.

4. Main findings in the radioactive waste domain [1998/ 2001/2005]

- There is a significant percentage of do not know answers among EU citizens on basic knowledge questions. There are relevant differences in terms of countries, time, and the specific knowledge statement under evaluation.
- The knowledge indicator shows that most citizens have an acceptable level of basic knowledge, although it may be biased because of the “success” on the easiest questions.
- There is higher interest in the management of radioactive waste in the own country (79.58%) than in the other EU countries (72.5%)
- There is a low perception of being well informed. Only 3% of the EU citizens feel very well informed. Spain, France, Italy and Portugal are the worst informed ones in the EU25.
- Over 85% of Europeans would like to have easier access to information about radioactive waste in their own country. Accountability for providing easier access to information is mainly placed on the national governments. Waste producers and political parties are the less mentioned information sources in this context
- Nearly 6% of the EU citizens do not trust anyone when receiving information about waste management. Independent scientists are the most trusted source of information, and nuclear industry is the least trusted source. There are large country-by-country variations
- Regarding the procedures to be applied before building a tip, more importance is given to “information” and “technical arguments” than to “participation” and “transparency”. Among the participation processes, consulting people is the most mentioned choice, while consulting environmental associations is the less mentioned one. By countries, there are not significant differences.
- Northern countries are the most aware of the need for a change in the decision-making processes regarding the construction of a tip. Latvia, Lithuania and Malta show the lowest percentages of agreement with such a need for change in the whole 25 EU.
- EU citizens show a significant support for the involvement of the EU in fixing the rules for the processing and safety of radioactive waste. Southern European countries are more for a relevant role of the EU, while Denmark, Austria, Ireland, West Germany and the UK are not so much for it.

- For the EU average citizen direct consultation and participation is the most relevant issue when approaching a decision process regarding the construction of an underground disposal site near the own home
- It seems that there is no clear preference towards the roles to be played by the national governments or the EU in the definition, application and monitoring of radioactive waste practices

5. Country Profiles

- Some of the analysed variables show very significant differences among countries but others do not, so the statistical procedures did not identify relevant differences. However, descriptive data clearly show various patterns or profiles among the EU countries.
- Cluster or profile 1: “Northern” EU countries (i.e. Finland), higher level of information, better knowledge, more trust in the addressed agents or sources, and more awareness about the need for new decision making processes.
- Cluster or profile 2: “Central” EU countries (i.e. France), higher levels of satisfaction with the received information, lower levels of trust in recent years.
- Cluster or profile 3: “Southern” EU countries (i.e., Spain) (+ most of the 10 new EU members), higher percentages of people having not read or heard about the issue, worse knowledge, strong demand of information, more trust in “non expert” agents, notably the media, although the % of do not knows in terms of trust are also high.

6. In general terms, ISSP and National Polls data are consistent with the EB main findings.

- Even though it should be considered that each poll has its own structure and list of questions and were applied in different points in time.
- More than half of the Finish perceives that there is sufficient amount of reliable information available on energy matters. There is significant confidence in the legislation and official control relating to energy solutions. People feel that they have few chances to influence these matters. Six out of ten (60%) think that their opinions have not been sufficiently heard during the energy decision-making process.
- French citizens think that the information they receive about nuclear risk is not entirely trustworthy. French citizens are in favour of public participation, particularly when it involves all relevant stakeholders. However, when it comes to the control and environmental monitoring of a risky facility, scientific experts and public authorities are perceived as the key actors.
- British people are interested in the issue of radioactive waste. The overall confidence in risk regulation by the government is low. British citizens believe that the general public should be involved in decision making.

- The key point regarding the [Spanish national poll](#) is the scant attention being paid to the topics of our study. No questions dealing with information or public participation have been found, and there is little information on basic knowledge and trust. In line with the EB results, in 2004 the level of basic knowledge Spaniards have on radioactivity is quite low, and their confidence on the management of the national NPP is low.

7. Reflections for the improvement of the EU public opinion follow-up in terms of public information and participation in the nuclear domain.

- This Report describes and illustrates an extensive and complex reality. The information underlying such an “illustration” offers great potential for further analysis and interpretations (out of the scope of this Report).
- Results of Activity 1.2 (Legislation), and Activity 1.3 (Case Studies) would provide an excellent framework for a deeper understanding of some of the trends and the results included in the present Report.
- Suggestions in terms of new or improved content to be considered by the EB should be based on the integration of all the activities (current legislation, and case studies).
- However, available data clearly show areas for improvement, for example in updating the nuclear energy and radioactivity EBs (there has been no new information since 1995), or developing questions dealing with knowledge and, most notably, participation (there is no EB data dealing with public participation in the nuclear energy domain). Regarding radioactive waste, at least it should be desirable to continue with the existing topics (information, knowledge, trust, and participation). In practical terms, it would be desirable to have the 2005 raw data in order to develop the Knowledge indicator for the EU25.
- Suggestions for the format and the temporal series would include issues such as the proper comparisons (including new questions without changing those of the past); the keeping of the same format of response over years, or the changing of multiple choice format by asking respondents to select 3 or 4 answers and rank them by importance.

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ANNEX 1: NUCLEAR ENERGY AND RADIOACTIVITY

Thematic areas and relevant topics	Selected questions
Basic Knowledge & Awareness	
Awareness of energy problems	* Do you think there is an energy problem in your country today?
Basic knowledge about nuclear energy and radioactivity	* In the spring there was an accident a nuclear power plant in the Soviet Union. Have you heard about it?
	* I am going to mention certain dangers, which people sometimes mention when talking of nuclear power stations. Which of these dangers do you believe one may have reason to seriously worry about? <ul style="list-style-type: none"> -Explosion of the power station -The radioactive gaseous emissions whilst the power station is working -Dangers of storage of radioactive waste -None of these
Information	
Subjective perception of the own level of information	* Some people say that the public in your country is not as well informed as it should be on the way nuclear stations work. Do you personally think you are sufficiently or not informed on this?
Source of the information	* What was (were) the source(s) of this information?
Degree of satisfaction with the received information	* Generally speaking, are you very satisfied, quite satisfied, not very satisfied, or not at all satisfied with the information you receive about radioactivity in our country?
Reasons for satisfaction/dissatisfaction	* Which of the following reasons best explain why you are satisfied (not satisfied) with the information you get about radioactivity?
Role of trans-national information	* Do you agree or not with ... A country which has a nuclear power station near its borders should keep its neighbouring countries constantly informed about the way the power station is working.

Trust

Confidence on information sources

* Information on radioactivity levels can come from various sources. For each information source, please tell me to what extent you have confidence in it to tell you the truth about levels of radioactivity.

Qualities of the "ideal" information source

* Which of the following qualities would you particularly look for in people giving you information about levels of radioactivity?

Trust on the authorities capabilities' to manage NPP or nuclear accident

* In your opinion, are the authorities properly prepared for the protection of people if an accident were to happen in a nuclear power station here or in a neighbouring country?
* An accident like Chernobyl could not happen in a nuclear power station in your country.

Participation & Decision Making

Role of the UE in improving the safety of Eastern Europe NPP and surveillance of radioactive substance traffic.

*For each of these, could you tell me if you tend to agree or tend to disagree?
We should help the countries of Central and Eastern Europe, to improve the safety of their nuclear power stations.
It should be a top-priority to stop the illegal traffic in radioactive substances (e.g. plutonium), from Central and Eastern Europe.

ANNEX 2: RADIOACTIVE WASTE

Thematic areas and relevant topics

Selected questions

Basic Knowledge & Awareness

Interest on RWM

* Would you say you interested in the way in which radioactive waste is managed in our country, the UE And in the central and eastern European countries wanting to join the European Union?

Basic knowledge about radioactive waste

* In your opinion, which European Union country produces the greatest amount of radioactive waste?
 * In your opinion, on average, how much radioactive waste is produced in the EU per inhabitant per year?
 * After treatment, this radioactive waste is in solid form and can be packed into standard steel drums. What do you think is done with these drums in (OUR COUNTRY)?
 They are dumped into the sea
 They are buried deep underground at special disposal sites
 They are buried at special disposal sites, but not deep underground
 They are sent to other countries for disposal
 They are stored temporarily, pending a final decision on disposal
 They are dealt with in another way
 *For each of the following statements about how radioactive waste is currently dealt with (IN YOUR COUNTRY), please tell me whether you think it is true or false?
 There are several categories of radioactive waste
 There are Hospitals which produce low level radioactive waste
 Some Non-nuclear industries produce low level radioactive waste
 Some Research centres produce radioactive waste
 High level radioactive waste is produced only in nuclear reactors

Information

Subjective perception of own level of information

* How well informed do you think you are about radioactive waste?

Demand of easier access to information

* Would you like to have easier access to information about the way in which radioactive waste is managed?

Source of the information

From which source(s)?

Trust	
Confidence on information sources	<ul style="list-style-type: none"> * For each of the following statements, please tell me if you agree: <ul style="list-style-type: none"> The media are fair in their reporting of radioactive waste issues The nuclear industry is open in providing information about radioactive waste * Which, if any, of the following would you trust to give you information about the way radioactive waste is managed in (OUR COUNTRY)? And in the other European Union countries?
Participation & Decision Making	
Role of consultation (to different stakeholders) and responsibilities in RWM decision making processes	<ul style="list-style-type: none"> * Before building a tip for radioactive waste, various procedures have to be followed. For each of the following, please tell me if it is fairly important or fairly unimportant to you...? <ul style="list-style-type: none"> Consulting people who live near the chosen site Consulting independent scientists Consulting environmental protection associations Consulting medical experts Keeping people informed * Thinking about the hypothetical construction of an underground disposal site for radioactive waste near your home, with which of the following you agree the most? <ul style="list-style-type: none"> I would like to be directly consulted and to participate in the decision making process I would like local ONGs to be consulted and to participate in the decision making process I would leave the responsible authorities to decide on this matter
Role of the UE in setting rules for RWM	<ul style="list-style-type: none"> * Would you feel reassured or not if the European Union was to set rules for the processing and safety of radioactive waste? * In the European Union, each member state remains fully responsible for the management of its own radioactive waste. To what extent you agree or disagree.. <ul style="list-style-type: none"> Since management of radioactive waste may have effects beyond national borders, harmonized and consistent practices should be found The European Union should be able to monitor national practices and programs. It's high time for each European Member State to fix a deadline for setting up management approaches for their waste
¿Complexity of decision making processes about highly radioactive waste? ¿?	*For the moment, with some exception, most of the countries have not taken a decision on the final disposal of highly radioactive waste. Please tell me to what extent you agree or disagree with...: This shows that it is politically unpopular to take decisions about the handling of any dangerous waste

COUNTRY	ANNEX 3: NATIONAL DATA RELATED TO NUCLEAR MATTERS
<i>Austria (WISDOM)</i>	<i>English page does not work</i>
<i>Belgium (BASS)</i>	<i>Surveys from 1972 to 1997</i>
<i>Czech Republic (SDA)</i>	<i>No keywords related to nuclear matters</i>
<i>Denmark (DDA)</i>	<i>No actual surveys related to nuclear matters</i>
<i>Estonia (ESSDA)</i>	<i>Can't have access to data</i>
<i>France (CIDSP)</i>	<i>Only socio-political data</i>
<i>Greece (SDB)</i>	<i>No access to data</i>
<i>Hungary (TARKI)</i>	<i>No keywords related to nuclear matters. Data in Hungarian</i>
<i>Ireland (ISSDA)</i>	<i>Data about general matters</i>
<i>Italy (ADPSS)</i>	<i>No actual surveys related to nuclear matters</i>
<i>Slovenia (ADP)</i>	<i>Web does not work. Can't have access to data</i>
<i>Sweden (SSD)</i>	<i>No actual surveys related to nuclear matters</i>
<i>The Netherlands (NIWI)</i>	<i>No actual surveys related to nuclear matters</i>
	No specific actual surveys related to nuclear issues in these countries except from the EB and the ISSP
	Some specific actual studies related to nuclear issues in these countries as part from the EB and the ISSP
<i>Finland (FSD)</i>	<i>Energy attitudes of the Finns (83-03)</i>
<i>Spain (CIS)</i>	<i>Opiniones de los españoles sobre el medio ambiente (2004)</i>
<i>United Kingdom (UK-DA)</i>	<i>UEA-MORI Risk Survey (2002)</i>

