PUBLIC PARTICIPATION IN WASTE REPOSITORY PROGRAMMES: A EUROPEAN CROSS-COUNTRY COMPARISON

M. Martell, L. Duro, J. Bruno
ENVIROS SPAIN S.L.

ABSTRACT

In the last decades, communication and public involvement in radioactive waste management has become a paramount concern for many European governments. It has been acknowledged that nuclear waste management is not only a technical option but a complex societal process. Nevertheless, the sense of mistrust and alienation towards politicians and radioactive national agencies often impedes an effective repository site selection process. This paper is based upon ongoing research undertaken by Enviros Spain which reviews international experience on public consultation and participation in radioactive waste management.

The paper reviews European national experiences of site selection processes and explores the factors that contribute to facilitate or hinder social acceptance of a nuclear fuel waste management approach. It comparatively assesses methodologies for public involvement across Europe. In particular, the study draws upon five different countries which show different waste management contexts: Sweden, Finland, Belgium, Germany and Spain. The aim is to identify the social variables that should be taken into account when drawing up radioactive waste management programmes to be publicly accepted. These social variables should be integrated in the current research and development and sitting efforts of nuclear waste management agencies.

A comparison of participatory methodologies in nuclear waste management in European countries has not yet been undertaken in a systematic fashion. In the frame of the current proposal for a Council directive on the management of spent nuclear fuel and radioactive waste, the question of how can European countries improve the practices and the quality of public decision-making around nuclear waste management is crucial. The draft proposal establishes that Member States shall establish a clearly defined national detailed programme for the management of radioactive waste types under their jurisdiction and which covers all stages of management. These programmes should consider public information and involvement as essential aspects in the decision-making process of regarding radioactive waste management.

The first part of the paper presents the evolution of national waste management programmes in the five case studies mentioned above, focusing on the analysis of public participation issues and communication techniques implemented. The second part of the paper examines the barriers to gaining social acceptance of radioactive waste approaches. The paper concludes by referring to some critical views about the conceptions of public participation invoked by national policy frameworks and how these can be addressed in current research and development programmes. Conclusions focus on practical lessons to be learned for an effective realisation of a participatory programme in radioactive waste management policy-making for the case of Spain.

INTRODUCTION

This paper is based on on-going work supported by the old Ministry of Science and Technology in Spain (nowadays, the Ministry of Industry, Tourism and Commerce) to evaluate the efficiency of current practices of stakeholder involvement in radioactive waste management programmes in European Union (EU) countries and to develop practical recommendations for Spain. The information covered in this paper has been gathered from the relevant literature and via Internet searches. Semi-structures interviews are foreseen in order to complement the analysis presented here.

Over the last few yeas, it has been acknowledged that one of the most important unresolved issues in radioactive waste management is the disposal of high level waste. Traditional approaches, focused solely on technical considerations, have shown that there is a need to consider public perception and stakeholder participation in decision-making processes related to radioactive waste management. In this context, some of the major challenges faced by governments are to understand stakeholder concerns and to establish effective communication and participatory programmes to improve social acceptance. Nevertheless, political, socio-economic and cultural specificities of the different countries, together with other variables, may facilitate or hinder the extent to which public involvement leads to more acceptable decisions. Drawing on a comparative analysis of radioactive waste management programmes in European countries, this paper explores a series of criteria which may shed light on the role of stakeholder involvement in the decision-making process on radioactive wastes. As the project is still developing, these criteria are under-review. The paper ends up with preliminary suggestions for how public participation can be enhanced in the Spanish context, given the experiences of other European countries.

EUROPEAN CONTEXT: TOWARDS THE HARMONISATION OF RADIOACTIVE WASTE MANAGEMENT PROGRAMS

On 6 November 2002, the European Commission announced the adoption of a draft proposal for a Council Euratom Directive on the management of spent nuclear fuel and radioactive waste (1). This draft proposal establishes that Member States should develop clearly defined national programmes for the long-term management of all the waste types under their jurisdiction. The proposal clearly advocates the geological disposal of high-level waste as the safest technique to date and requires the Member States to authorise the development of appropriate disposal sites no later than 2008 and to have these sites operational no later than 2018. These programmes should consider public information and involvement as essential aspects in the decision-making process regarding radioactive waste management.

The Commission carried out a number of consultations with the different stakeholders concerned with this proposal, such as industry, national authorities, group of experts and international organisations. After consultation with the Economic and Social Committee, the Council requested the opinion of the European Parliament. Although the European Parliament considers it appropriate to set up binding legislation in the field of radioactive waste management, it has adopted a number of amendments acceptable to the Commission. Concerns were manifested with regards to the methods of public information and the rigidity imposed to Member States in terms of policy options and timetable. A more flexible system in which Member States decide upon

their own dates for the authorisations of development and operation of final disposal sites was suggested. Overall, the Commission's proposal for legislation covering spent nuclear fuel and radioactive waste if, approved as Directive, may be an important step towards encouraging, and even accelerating, the implementation of public consultation and participation in countries where decisions on high-level radioactive waste have been delayed.[a] Furthermore, this amended proposal Directive (2) could undoubtedly constitute an important step towards harmonisation of policies for radioactive waste management in Europe.

The draft proposal is also aimed at supporting and developing research as well as better coordinating national research programmes. Over the last years, research being carried out under the 5th Framework Programme has addressed both technical and social issues concerning radioactive waste management. Some of the most relevant research projects in the areas of risk governance (e.g. RISKGOV (3), TRUSTNET 2 (4)) or more generally, on science and society were COWAM (5), RISCOM II (6) and EVATECH (7) among others. In addition, Euratom Research and Training Programme on Nuclear Energy (2002-2006) underlines the importance of promoting a common European view on key problems and approaches, in accordance with the need of the European Research Area. A thematic priority of the work programme for 2004 is to develop better approaches to risk governance and coherent off-site emergency management in Europe. In this regard, COWAM 2 specifically addresses the objectives of EURATOM FP6 work programme regarding the "development and evaluation of alternative measures of better governance processes" with the aim to develop decision processes that are perceived as fair and equitable by stakeholders involved" (5).

BACKGROUND OF THE DIFFERENT REGULATORY FRAMEWORKS

Despite the current attempts at the European level to harmonise radioactive waste management policies, European countries show different levels regarding the progress made in the field of public consensus for the high-level radioactive waste problem. Most EU countries have undergone through phases of harsh reactions in public opinion and rejections of feasibility studies which were solely based on a scientific approach. Gradually, some countries have realised that technical and social aspects are of equal importance and have to be jointly considered when trying to find an acceptable solution to deal with radioactive waste. Certain countries have progressively started to develop methodologies to consult all parties on nuclear waste issues whilst others have not yet attempted to bring in the social component in the nuclear waste management debate. This section briefly reviews public participation activities by national waste management agencies in Finland, Sweden, Belgium, United Kingdom (UK), Germany and Spain.

If we reflect on levels of progress towards politically acceptable solutions for high level radioactive waste management in European countries, one could argue that three different groups can be identified. This preliminary classification is aimed to serve as a basis for future discussion. A first group of **pioneer countries** are those which have proactively undertaken consultations with all interested parties concerning the sitting, scope, design and environmental impact of nuclear waste disposal facilities. Paradigmatic examples of these pioneer countries which have followed the principle of voluntary participation as a major criterion in the search for suitable sites, are Sweden and Finland. Both countries are widely recognised to be the most

advanced, with long-established programmes for the development of deep disposal and successful experiences of interaction between public administrations, concerned municipalities, interested groups and the general public. Firstly, the Swedish Nuclear Fuel and Waste Management Company (SKB) started extended consultations during 2002 and 2003 focusing on the Environmental Impact Assessment (EIA) process in accordance with the requirements of the Environmental Code (8). These consultations are held with the County Administrative Board, other government agencies, the municipalities, the citizens and the organisations that are likely to be affected. The consultation covers the location, scope, design and environmental impact of the activity or measure and the content and structure of the Environmental Impact Statement (SKB, 2004). Secondly, Finland has successfully nominated Olkiluoto at the municipality of Eurajoki as the potential site for spent fuel disposal. Similar to the Swedish case, Posiva undertook an EIA procedure, where the stakeholders have the opportunity to express their viewpoint on the different alternatives and influence planning decisions. Posiva submitted an application to the government for a Decision in Principle on Olkiluoto. The Finish Parliament approved the Decision in Principle with an ample majority in December 2000, after the favourable vote at the municipal level. At present, Posiva is preparing the construction of the underground rock characterisation facility at Olkiluoto and plans to submit an application for a construction licence for the disposal facility in the early 2010s (9).

The second group assembles countries defined as **followers** because as a result of siting programme failures in the past, they undertake new public involvement initiatives, following the experience in the pioneer countries. The Belgian Agency for Radioactive Waste and Enriched Fissile Materials (ONDRAF/NIRAS) completed the SAFIR 2 report (10, 11) which covers the Research & Development & Demonstration activities in the Belgian programme on the final disposal of high-level and long-lived radioactive wastes in a deep geological repository in Belgium. As recognised by the OECD/NEA (11) the SAFIR 2 report has made an important contribution on how to integrate social considerations with technical and scientific issues. The SAFIR 2 report is a starting point to launch "dialogue with different stakeholders as a preparatory step on how to proceed with siting and with the associated decision-making". Furthermore, the Belgian disposal programme is considered to be "at the forefront internationally in considering issues of stakeholder involvement" but has yet to translate this political consensus on social considerations in radioactive waste programmes into real deliverable actions. Local partnerships were founded in the Belgian municipalities of Mol and Dessel to address the low level waste disposal siting problem (12). Nevertheless, up to now, the dialogue structures to enable the adoption of a feasible technical and economic as well as safe and socially acceptable final disposal solution for high level waste are not in place. ONDRAF/NIRAS research and development programme tries to establish a balance between technical-scientific and societal dimensions.

Other countries which could be considered followers are UK and Germany, where previous site selection programmes have failed due to insufficient attention paid to public concern and are taking proactive actions to deal with social aspects, which is not without difficulties. In Germany, the decision to suspend exploration on the Gorleben site for a maximum of 10 years whilst clarifying conceptional and safety-related issues (13) led the government to set up a discussion forum on radioactive waste. With the establishment of the Committee on a Site Selection Procedure for Repository Sites (AkEnd) in early 1999, the Federal Ministry for the

Environment, Nature Conservation and Nuclear Safety supported the need to open up the scientific debate around radioactive waste disposal to the broad public. AkEnd is a technical-scientific body consisting of 14 experts on a wide range of fields in the topic of disposal and who work independently to develop a traceable procedure for the identification and selection of a site for the disposal of all types of radioactive waste in Germany. AkEnd developed a set of siting criteria on the basis of three guiding principles: priority to safety, participation of the public in all steps in the siting process, integration of the repository in a regional development concept and transparency of the selection procedure. After AkEnd's report was released at the end of 2002, no progress in terms of a new siting process involving widespread consultation has been made.

Finally, the situation in the UK is similar to the one in Germany in that the context of distrust in Nirex policy and procedures in the case of Sellafield provides the background of the current consultation exercises. The UK government has set up the Committee on Radioactive Waste Management (CoRWM), an independent committee to consult and recommend long-term solutions for managing radioactive waste whilst protecting people and the environment. CoWRM has been asked to make recommendations to Ministers by July 2006 (14). Furthermore, NIREX is committed to give their stakeholders access to and influence on future programmes, as declared in its transparency policy. Nirex stakeholder involvement programme uses different dialogue techniques to listen to stakeholders' concerns and engage them in the debate.

Finally, we consider here the **laggards** as those countries which have adopted the "wait and see" approach and therefore, future management of high level waste is uncertain because they have decided to postpone any decision. Up to now, the main strategy of the Spanish radioactive waste management company, ENRESA, has been to reassess all their options, including partitioning and transmutation, as well as the decision-making process. According to the 5th Radwaste Plan: "*given the current availability of safe technology for temporary storage, the consensus is that in Spain it would be appropriate to postpone any decision regarding the final management of these waste until approximately the year 2010*" (15). The impossibility to gain public acceptance to build an underground laboratory to enable concept and site specific studies to be conducted, prior to final repository development, involved the suspension of the siting programme. However, recent political changes in the organisation could be leading to significant changes in policy style. One of the priorities announced by the current President of ENRESA is to endorse a policy of transparency and communication (16). Furthermore, the COWAM Spain project, which is explained later on, is a promising opportunity to develop a methodology for decision-making in siting procedures, based on the consensus of a wide range of stakeholders. The authors' participation in this project will allow them to examine the experience and monitor the effectiveness of the COWAM approach.

LOCATING PARTICIPATION IN COMPLEX ARENAS

Although public involvement is a convoluted and abstract concept, it is often invoked by modern governance theories. Governance refers to patterns of interaction within and beyond formal institutions of government and can be characterised by networks of linked organisations. In this complex scenario, there is not a single actor who has the sufficient knowledge or the information to solve the problems of the modern society (17). Rather, there is a complexity of interrelationships between actors, which uncover mutual dependencies and pursue certain

objectives. In short, as Rhodes (18) declares: "governance is about managing networks". Figure 1 shows the preliminary analytical framework which establishes that a better understanding of the nature and quality of public participation in radioactive waste programmes is related to increased legitimacy, trust and transparency. Figure 1 shows the preliminary analytical framework used in this paper.

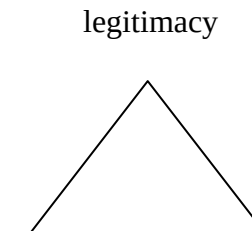
Public participation and legitimacy

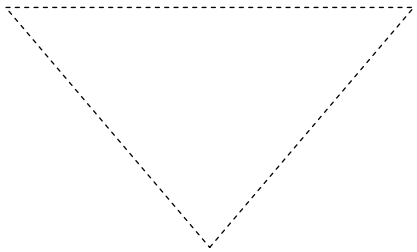
Networks of governance are also invoked in the concept of public involvement. Networks help to define participation from the point of view of nature and quality of this type of involvement: what are the conditions that make genuine this involvement and allow stakeholders' concerns to be taken into account and influence decision-making? Participation is thus interpreted in terms of opportunities of access and influence in the policy-making process. At issue here is how far public involvement can be effective in building a consensus around controversial issues and reaching an acceptable solution to the nuclear waste problem. Although the purpose of this paper is not to enter the discussion of whether participation and efficiency are contradictory or complementary concepts, it is worth mentioning that the thesis we defend here is that technical consensus *per se* does not guarantee the acceptability of a certain solution. Discussions around conflictive issues penetrate into the realm of opinions, values and interests and as such, it will be difficult to make progress unless a debate is opened on costs and benefits, alternative choices and solutions. Theoretically, a decision which has been reached through a legitimate process is more easily accepted than an imposed decision. The perceived legitimacy of policy decisions is enhanced by the direct involvement of members of the public.

Trust and transparency

Transparency and public participation are strongly linked. The RISCOM model for transparency gives new criteria for the evaluation of participative processes based on the three rationales for the desirability of public involvement: ethical, political and knowledge (19). However, there are limitations in the value of the comparison between the different national waste management strategies (20).

Another issue which is at stake when discussing the notion of participation is the context in which this involvement takes place. Radioactive waste management is both a national and a local issue. The local level is often considered to be the closest one to the citizen and therefore, participation can be more effectively articulated at the local than at the national level. Nevertheless, empirical research studies like the RISKGOV project underline that decisions on risk (e.g. radioactive waste management) made at one level may have implications at other levels and the quality of the decision-making process depends on the capacity to integrate local, regional, national and international dimensions (21). There is increasing evidence of the importance of the level of trust and transparency of the institutions that manage risk in influencing public perception. It is important to take into account the democratic structures at the national and local level as well as the public perception of radioactive waste management.





Sustainability

Fig. 1. Preliminary analytical framework

Public participation and sustainability

When considering public participation, particular attention should be given on the ways public participation in radioactive waste policy-making can meet the criteria of sustainability. Sustainability is another awkward concept which proves difficult to summarise and hugely complicated to implement into real actions. It carries with it the idea of ensuring the well-being of present and future generations. From the 1992 Rio Conference on Environment and Development, sustainability is often associated with public participation in the field of environmental policy-making. Principle 11 of the Rio Declaration states that "each individual shall have the opportunity to participate in the decision-making process" (22). This led to the UN/ECE Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, also known as the Aarhus Convention (23). The Convention establishes that "each party shall ensure that in the decision [on specific activities listed in annex I, such as radioactive waste] due account is taken of the outcome of the public participation" (in Article 6).

Continuous efforts must be paid to communicate the issues associated with radioactive waste and involve the public in decision-making in order to contribute to sustainable radioactive waste management solutions. The concept of sustainability goes beyond environmental protection and has much to do with maintaining and improving the wellbeing for people and ecosystems. Therefore, a wide variety of interests should have the opportunity to participate in decisions which affect the future and need to understand the implications of the decision-making process from a sustainability perspective.

EUROPEAN COUNTRIES COMPARED: OBSTACLES TO PUBLIC PARTICIPATION

The past experiences with selection procedures in the different countries under investigation have led to regard public participation of special importance. Despite the different levels of progress between countries, all national approaches to site selection processes tend to consider not only technical-scientific issues but also social criteria. Reports of the FSC have made a valuable contribution in increasing knowledge about the way different countries address societal concerns (24, 25).

The classification of pioneers, followers and laggards has proved to be useful for the purpose of this analysis. The initial cross-country comparison has been made on the basis of a set of conceptual indicators of transparency, trust and participation. The paper's conclusions can only be tentative at best. The main problems with cross-country comparisons are the clear delineation of the institutional and political responsibilities and powers, and the measurement of the relevant "output", e.g. what is a "good" decision? Furthermore, the present comparative analysis confines itself to a broad comparison of public involvement in national radioactive waste programmes using four parameters: transparency, trust, political power and quality of decision-making. The analyses of the case studies, which are still being investigated, allow us to point out conclusions which are only indicative. The following paragraphs give the main findings of the comparative analysis.

The tradition of *secretism* and the inevitable loss of trust

An evolution can be observed in all countries investigated here related to the need to increase transparency. The traditional approaches to decision making, which involved exclusively operators, experts and regulators, led to a lack of public confidence in political arrangements for waste management programmes. According to the NEA (26) public trust is based both on track record and on perceived morality and values. Some radioactive waste management agencies decided to make openness one of the core values in the company. In an attempt to open up traditionally secretive policy-making processes to public scrutiny, Nirex adopted the Transparency Policy in 2000 and a corporate responsibility policy (27). Apart from the implementation of the involvement programme, another issue which helps Nirex to move towards greater transparency and therefore, to create public confidence is its independence of the nuclear industry.

Involving local actors helps to increase (or restore) credibility of the decision making process. The existence of new structures for dialogue between decision-makers and stakeholders, such as AkEnd and CoWRM, creates the conditions to build up trust. However, a long-term strategy for interaction with stakeholders is a necessary condition for the quality of the decision-making process. The participatory structures mentioned above may further erosion of citizens' trust if the participants' contributions have no impact on the final decisions adopted or if these experiences result in one-off single event. According to NEA (28) the stepwise approach facilitates multiple opportunities for implementers and regulators to earn public trust.

Even the laggards are starting to provide opportunities to the different stakeholders to interact in the framework of specific projects. The COWAM Spain project illustrates this situation. AMAC, the Association of Municipalities in Areas with Nuclear Power Plants, is leading a 2-year project

under the auspices of ENRESA and the Nuclear Safety Council (CSN), with the aim to develop a participatory methodology to search for solutions in projects which are difficult to be accepted. Based on COWAM Europe, the approach in COWAM Spain is based on the participation of local and regional communities potentially concerned by the operation of nuclear power plants and by the siting.

The weak political and legal "power" of the local level

One of the observations arising from the AkEnd report is that "success or failure of the site selection in many countries depends on the very specific legal and political basic conditions to be considered" (13). Stakeholder programmes in the field of radioactive waste generally seek input from representative democratic institutions, the general public and the potentially affected communities. Some of the difficulties in these consultations stem from the fact that the municipalities in different countries cannot be involved in the debate on siting in the same way. In the two pioneer countries, Sweden and Finland, municipal councils have a right to veto over a siting proposal. The principle of voluntary participation is crucial in the search for suitable places. In Finland, the approval of the site at the local level is clearly the result of a long-term programme consistent with the Decision-in-Principle on the national political level and with the EIA. The process in Sweden has been similar: "the municipality of Oskarshamn achieves an open democratic decision making process with public influence over the program by the use of the "Oskarshamn model" (29).

However, in the cases of the countries which have been classified as followers and laggards, municipalities do not legally have the formal right to veto, as in Finland, and certain decisions can be imposed from national governments. In the case of Spain, some of the current discussions within COWAM Spain revolve around the extent to which focusing on the local level facilitates or hinders the debate at the national level. It is clear that radioactive waste management is a national problem with a strong local dimension. Hence, conflicts between national and local interests are expected if the institutional baseline conditions are not clearly set up and communicated to the interested parties.

The lack of an adequate decision-making framework

A number of experiences in facility siting have shown that countries which have taken a traditional approach to decision-making (e.g. deciding a priori a list of potential sites, without addressing local concerns sufficiently or undertaking a one-off single involvement technique) have failed in their attempts to promote an acceptable and legitimate decision. An incremental, stepwise decision-making approach, which provides opportunities for social and political review after each step and for revising former decisions and modifying plans, is often regarded as advisable in the field of radioactive waste management. Scandinavian countries have regarded the stepwise approach as a prerequisite for later consent of the citizens to a disposal concept and therefore, have already implemented this approach in national waste management programmes. In the "follower" countries, such as the UK, NIREX is also developing recommendations for a stepwise process to be applied in decisions on radioactive waste management and the Department of the Environment, Food and Rural Affairs (DEFRA) and Devolved Administrations have already put in place a stepwise decision-making process (30).

The need for meaningful participation

Past experiences have shown that stakeholders, who are involved in participatory processes, become even more sceptical about the usefulness of participation if their influence on key decisions is not obvious. From the documentary analysis, Finland and Sweden seem to have developed radioactive waste programmes which have participation as a core value. However, the rest of the countries have introduced the consideration of social aspects of in their discourses but have certain difficulties to translate the discourse into real projects.

THE EVOLVING SPANISH CONTEXT

One of the aims of this on-going research is to analyse the extent to which key issues for successful public involvement programmes identified in other countries can improve governance of radioactive waste in Spain. When considering this question, particular attention should be given to the on-going COWAM project which could be changing the traditional ways to deal with the public. As stated above, the aim of COWAM SPAIN is to define a methodology to search for real and possible solutions in projects which may be difficult to be socially accepted. The COWAM SPAIN project is divided into four working groups. There are three thematic groups working on the following issues:

Working Group 1: Democracy and Local participation systems
Working Group 2: Institutional framework, decision-making process and strategy
Working Group 3: Long-Term governance
Working Group 4: coordination of the rest of the working groups.

Participants in COWAM Spain are representatives from the potentially affected municipalities (AMAC), regulators, operators, experts, the nuclear industry and regional councils. Environmental NGOs have been invited to join the project but have argued that their fundamentals to participate are associated with the request to phase out nuclear power in Spain.

The first COWAM seminar took place in April 2004 and there will be a second one in the beginning of December 2004. The seminars will be open to everyone interested and aim to address the topics which are discussed in the working groups and draw conclusions on how to move forward. The outcome of COWAM is expected to draw final conclusions from a number of case studies related with facility siting decision-making processes as well as a proposed methodology to assist policy formulation for facility siting. The project aims to get to concrete conclusions and recommendations. For instance, the authors are currently developing a project to investigate the efficiency of financial arrangements made to local communities hosting nuclear power plants in Spain.

COWAM SPAIN has created a pluralistic network involving key actors who aim to investigate how a participatory process on facility siting might be accomplished in Spain. It is promising as a key starting point to exchange knowledge on the issue of radioactive waste among representatives of different levels of government and other stakeholders. However, the extent to which COWAM SPAIN results in an agreed methodology which can be applied to radioactive

waste management remains to be seen. The context in which COWAM SPAIN is taking place is slowly changing but is highly influenced by the historical and institutional traditions. Spain, as a newly democratic country, is characterised by a set of contextual factors:

- embryonic participatory processes in the field of environmental policy-making
- hierarchical models of policy-making and statist policy style
- traditionally secretive approach to policy-making
- low interaction between the government and the civil society
- deeply rooted distrust and cynicism towards governmental structures.

Given these conditions and the fact that path dependence has characterised the approach to policy-making in Spain (31), policy change will not take place in a straightforward way. Furthermore, it is unlikely that the drivers for change in radioactive waste management policy will emerge from public participation processes. At present, the final outcome of this exercise remains to be seen.

CONCLUDING REMARKS

There is considerable research at the European level regarding consultation and public participation in the field of radioactive waste management. Most research on this topic and on detailed analysis of the situation at national levels has been undertaken by the OECD/NEA Forum on Stakeholder Confidence.

There are yet no reliable criteria for comparable evaluation of public involvement across European countries given the highly different contextual parameters. Thus, one has to be very cautious when comparing such a diversity of approaches. Developing a systematic framework to compare public participation still requires much research and development efforts. Although there is a constantly growing acceptance that social aspects need to be incorporated in radioactive waste management programmes, there are no universal solutions on how to approach participation. Lessons learned may only be partially transferable from one country to another. For this research, issues of trust, transparency and public involvement need to be further investigated. The analysis here can only offer sketchy answers and raises a number of additional questions that need to be considered in further research:

- on measuring the quality of participation: is policy networks theory the adequate theoretical framework to deal with the nature and quality of public involvement? Shall we explore other social science theories focusing on other criteria, e.g. fairness and competence?
- the problem of transferability: to what extent is comparison a clearly defined process and how far solutions in some countries can be applied to others?

REFERENCES

1. Commission of the European Communities "Draft Proposal for a Council Directive (EURATOM) of the management of spent nuclear fuel and radioactive waste". Brussels, 30 January 2003.

2. Commission of the European Communities (2004). Amended proposal for a Council Directive (Euratom) on the safe management of the spent nuclear fuel and radioactive waste. Brussels. http://europa.eu.int/comm/energy/nuclear/safety/doc/com_2004_0526_en.pdf
3. RISKGOV web site: http://www.riskgov.com
4. TRUSTNET 2 web site: http://www.trustnetgovernance.com
5. COWAM web site: http://www.cowam.org
6. RISCOM II web site: http://www.karinta-konsult.se/RISCOM.htm
7. EVATECH web site: http://www.evatech.hut.fi
8. SKB (2004) Extended consultations according to the Environmental Code. Compilation 2003. Swedish Nuclear Fuel and Waste Management Co. Stockholm.
9. Posiva Oy (2003) Nuclear Waste Management of the Olkiluoto and Loviisa Power Plants: Programme for Research, Development and Technical Design for 2004 - 2006. http://www.posiva.fi/tyoraportit/TKS-2003.pdf
10. ONDRAF/NIRAS (2001) SAFIR 2 report. Safety Assessment and Feasibility Interim Report 2. http://www.nirond.be/engels/Safir2_eng.asp
11. NEA (2003) SAFIR 2: Belgian R&D Programme on the Deep Disposal of High Level and Long-Lived Radioactive Waste. An International Peer Review. Paris.
12. Hooft, E. et al. (2002) "Locating partnerships: achieving stakeholder consensus on low-level waste disposal?" WM '02 Conference, February 24-28, 2002, Tucson, Arizona.
13. AkEnd (2002). Site Selection Procedure for Repository Sites. Recommendation of the AkEnd - Committee on a Site Selection Procedure for Repository Sites. December 2002.
14. CoWRM (2004) Committee on Radioactive Waste Management. http://www.corwm.org.uk/
15. MINER (1999) Fifth General Radioactive Waste Plan. Ministerio de Industria y Energía. Madrid. http://www.enresa.es.
16. *La Vanguardia*, Enresa inicia una etapa en defensa del entorno, published on 24/10/2004.
17. Koiiman (2000) "Societal governance: levels, modes and orders of Social-Political interaction" in Pierre, J. (ed.) *Debating governance*, Oxford, Oxford University Press, pp. 138-164.
18. Rhodes, R. (1997) *Understanding governance*. London. Open University Press.
19. Andersson, K. (2001) Transparency and Public Participation - the need for a new paradigm. VALDOR Symposium, Stockholm, June 2001.
20. Andersson, K et al. (2003) Transparency and Public Participation in Radioactive Waste Management. RISCOM II Final Report. October 2003. http://www.karinta-konsult.se/FR.pdf
21. RISKGOV. Comparative Analysis of Risk Governance for Radiological and Chemical Discharges of Industrial Installations. June 2004. http://www.riskgov.com/index.html

22. United Nations Environment Programme (1992) Rio Declaration on Environment and Development. Rio de Janeiro. June 1992.

23. UNECE (1998) Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters, Aarhus. [www.unece.org/env/pp.welcome.html]

24. NEA (2003) Public Information, Consultation and Involvement in Radioactive Waste Management: an International Overview of Approaches and Experiences. OECD, Paris.

25. NEA (2004) Learning and Adapting to Societal Requirements for Radioactive Waste Management. Key Findings and Experience of the Forum on Stakeholder Confidence. OECD, Paris.

26. NEA (2003) The Regulator's Evolving Role and Image in Radioactive Waste Management. Lessons Learnt within the NEA Forum on Stakeholder Confidence. OECD, Paris.

27. NIREX (2004) http://www.nirex.co.uk/foi/policies/transparency_policy.pdf

28. NEA (2004) Stepwise approach to decision making for long-term radioactive waste management. Experience, issues and guiding principles. OECD, Paris.

29. Ahagen, H. et al. (2003) Linking the Oskarshamn model for public participation with the RISCOM model of transparency. VALDOR Symposium, Stockholm, June 2003.

30. Lidskog, R. & Andersson, A. (2001) The management of radioactive waste. A description of ten countries. SK AB.

31. Font, N. & Subirats, J. (2001) 'La participación pública en los procesos de Agenda 21 Local' in Font, J. (coord) *Ciudadanos y decisiones públicas* Barcelona: Ariel.

FOOTNOTES

[a] There are some countries which argue for a non-legally binding alternative to a directive on waste management. In particular Finland, Sweden and UK put forward a joint proposal for a draft Council Resolution on radioactive and spent fuel management in September 2003.