EIA, large development projects and decision-making in the Nordic countries. Editor Tuija Hilding-Rydevik. Stockholm 2001. (Nordregio Report 2001:6)

EIA and Decision Making in Search of Each other

The final disposal of nuclear waste in Finland

Pekka Hokkanen

Introduction

The final disposal of nuclear waste as a research subject in the social sciences

The final disposal of spent nuclear fuel, (i.e. highly active nuclear waste), is a research topic usually approached from a technical or natural scientific standpoint. Naturally, the substantive issue connected to nuclear waste management is safety[1]. For the social sciences however the most important point is that of the connection between the "technical" and "social" worlds. In this sense, the technical model of the nuclear waste management obviously intertwines with social structures and situations. Nuclear waste management thus emerges as a political and social phenomenon. In a practical sense, the problem of nuclear waste is seen no longer as a problem for technical specialists alone, but as a social problem demanding the attention of politicians, activists and indeed civil society more generally. The issue of nuclear waste is thus one of societal importance and political complexity, where the play of individual and group values and interests precipitates potential conflict. It should therefore be stressed that, when approaching the nuclear waste problem as a social scientific question, the arena of operations, is characterised by a certain measure of unpredictability. Changes in society, political fluctuations and technical innovations all contribute towards maintaining the dynamic nature of nuclear waste management as a policy issue. (Hokkanen et al. 1999, 8-9.)

The topical issue of nuclear waste is now an *international* phenomenon. It is a topical issue for all countries using nuclear power

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[1] For more about the basis of assessment of safety in the case of nuclear waste in Finland see Rasilainen et al. 2000.

and consequently struggling with nuclear waste issues. International research regarding policy-making and administration is thus interesting and relevant, moreover technical studies relating to issues of final disposal are particularly important. This is especially so for Finland as it will be one of the first countries in the world to make the decision in principle to opt for the final disposal option.[2]

In the 1990's Finnish environmental policy changed profoundly: environmental impact assessments (EIA) were developed, environmental management systems became more common, life cycle analysis of goods was developed, and environmental programs were adopted (e.g. Jalkanen 1999, 5-6; Sairinen 2000, 255-257). Sairinen et al. (1999, 11) summarize the development by saying that a characteristic feature of this process is the integration of social aspects into environmental questions.[3] They claim that at least five important factors are behind this development: 1) the increasing integration of environmental principles into decision making, 2) the expanding role of the social sciences in environmental discussion, 3) the diversification of means of control, 4) the greening of markets and 5) recognition of the importance of ecological principles across the economic sector.

Such a description may at first glance convey a harmonious picture of environmental policy, as with most things however the devil is usually in the details, and it is here that the picture becomes much more complicated. As such, we can illustrate this by reviewing the use of EIAs as a new tool of environmental policy in the case of nuclear waste. In this way notions of a harmonious aura surrounding environmental policy can be put to the test. The adaptation of EIAs in this case showed that the general aims of the legislation are not easy to fulfil. Although usage of the social sciences in environmental policy has increased, the relationship between natural science and environmental policy remains uneasy. The integration of social science research into Finnish nuclear waste management is now a fact, though this process has thrown up both pros and cons. On the one hand such studies have helped in the evaluation of the social impact of the siting of nuclear waste facilities, whilst on the other, it should be noted that such research is more often than not driven by the needs of

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2 For more about the nuclear waste management models and timetables in other countries see e.g. Posiva 1999a, 17-22; 2000; Rasilainen & Vuori 1999, 23-24.

3 The same phenomenon can be seen in nuclear waste management.

the supervising authorities and the promoters of such projects (Litmanen, Hokkanen & Kojo 1999; Litmanen & Kaunismaa 1999).

The research problem and research tasks

This study is part of a joint Nordic project called "The Role of Environmental Impact Assessment in the Planning and Decision Processes of Large Development Projects in the Nordic Countries" financed and co-ordinated by Nordregio. The aim of the project is to analyse the role of the EIA in planning and decision making processes in large scale plans across the Nordic countries. The comparative analysis of five cases provides an opportunity to analyse each case in a national context in addition to also analysing them from a wider Nordic perspective.

The purpose of the present study is to examine the role of EIA in the planning and decision-making process of final disposal of nuclear waste in Finland. *The main question of this chapter is therefore, on whose terms, and for whom are EIAs carried out*. The aim of the study is to analyse the purpose and the meaning of the EIA process for the different actors connected with nuclear waste management. It is however important to remember that the EIA is a planning tool, and thus that no decisions are made during the EIA process. It is for this reason that it is important to study the relationship between the EIA process and decision making more generally, and to analyse the effects of the EIA on decisions and/or decision makers. There is also a growing special interest in public participation in the EIA process, at the forefront of which is the goal to increase public information and participation in EIA legislation (Environmental Impact Assessment Act 267/1999, 1 §). The focus of this aspect of the study is to examine different forms of public participation in the EIA process and to define the concept of participation in an EIA context.

The main research question can be divided into four parts:

- How was implementation of the EIA process concerning final disposal of nuclear waste carried out (legislation and regulations, actors, procedural steps)?
- How distinct is the EIA process from that of general planning and decision-making (interaction, legitimacy, acceptability, effectiveness)?
- What was the role of public participation (amount, modes, importance, effectiveness)?

- Was the EIA process concerning final disposal of nuclear waste a success or a failure (which parts of the EIA functioned effectively, and which did not)?

In the present study the EIA is viewed as a process seen from the viewpoint of public participation. The study itself is based on the perspectives inherent to the discipline of political science. As such, the research approach does not emphasize either the impacts of the plan or the contents of EIA as much as the form and the construction of the EIA. This methodological approach is in line with an increasingly discernable trend towards research interest in public participation in environmental planning and decision making (see e.g. Haverinen 1999; Karvinen 1997; Lauber & Knuth 1999; Leskinen et al.; Tuler & Webler 1999). In other words, in this study the subject of study is the EIA process itself, not the environmental impacts of the final disposal of nuclear waste. In this way the EIA can be viewed as a part of the political process. In this political process the EIA becomes a tool for the use of power. The definitive question thus emerges, *what is the relationship between the EIA and policy making*? In the present study the EIA process and the concurrent decision making process relating to the final disposal of nuclear waste are viewed, even if only in an artificial sense, as two separate entities. The point being to bring forth, or uncover, the deeper connections and linkages between the EIA and the policy-making?

For this reason, there is a description of the Finnish model of nuclear waste management and the decision making process in Chapter Two, and a description of the EIA process as a part of nuclear waste management in Chapter Three. The relationship between these two processes is shown in Chapter Five. Public participation in the EIA process is analysed individually in Chapter Four whilst final conclusions are drawn in Chapter Six.

Material for the study is mainly culled from existing studies in a project entitled "The Final Disposal of Nuclear Waste as a Local Political Process". The project is being carried out at the Department of Political Science and International Relations at the University of Tampere and it is a part of Public Administrated Nuclear Waste Research Programme (JYT2001).[4]

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[4] A multiphase research program was launched initially in 1989 to support Finnish authorities in their activities concerning nuclear waste management. The main objective of the Public Administrated Nuclear Waste Research Programme (JYT) has been to provide the authorities with expertise and

Background of the plan

The final disposal of nuclear waste

As a plan, the final disposal of nuclear waste is both unique and highly specialised. In practice it is a world wide problem that remains as yet unsolved. As with all dimensions of nuclear power itself, nuclear waste arouses strong public emotions. The subject of nuclear waste management is thus a highly controversial entity somewhat loaded with values and opinions. It should also be noted however that data as well as emotion has a role to play in this context. As such, an important part of solving the nuclear waste problem is encapsulated in the attempt to unravel the endless struggle between scientific data and basic human commonsense. Speculation remains as to the most important criteria and over the clinching arguments in deciding the question of nuclear waste. As a political question however the issue of nuclear waste is both complicated and controversial. Moreover, the eternal struggle between sentimentality and rationality also stimulates such a polarisation of attitudes, generating stereotypes of the rational supporter and of the emotional opponent in turn (see e.g. Litmanen 1999).

Finnish legislation on nuclear waste management places certain restraints on management by excluding the possibility of it utilising certain policy instruments. Legislation of course is not unchangeable, thus it should be able to react both to the technical and the social changes occurring in the nuclear waste management environment, which itself can be characterised as a system whose different parts are in constant interaction with each other. It is possible to set the terms of reference through legislation, though the need to continually re-evaluate the impact of technology and science calls into question current legislation on nuclear waste management. It is important therefore to observe the co-existence of, and the reactivity between the technical and social aspects of nuclear waste management.

All aspects of the final disposal of nuclear waste are highly unusual. It is for instance uncommon for the environmental impacts of

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research results relevant to the safety of nuclear waste management in order to support the various activities of the authorities. The first phase of the research programme was conducted in 1989-1993 (JYT1), the second from1994-1997 (JYT2) and the current third phase (JYT2001) from 1997-2001. The programme is financed by the Ministry of Trade and Industry. (Vuori 2000, 127-128.)

a plan to be assessed within a time frame of one million years. The exceptional significance of the nuclear waste management issue has however also been increased by the inevitable "seepage" of political and economic interests into the process. Nuclear waste management raises a political question laden with controversy, drawing together questions of principle and ideological issues. It is therefore unavoidable that the issue of Finnish nuclear waste management be closely associated with the general debate over Finnish energy and economic policy. Issues relating to the final disposal of nuclear waste, and to the nuclear waste problem in general, are thus intimately connected to nuclear energy and to the possible construction of a fifth nuclear power plant in Finland. Through such linkages nuclear waste management becomes a remarkably political question, through which political actors' general attitudes towards economic growth and seeing increased conventional energy production as a panacea for all future needs may be raised and legitimately questioned.

The EIA process itself as it relates to the final disposal of nuclear waste also stands out as something "beyond the norm". Indeed it has been dubbed "the EIA of the century" in Finland. It is understandable that the implementation of a neutral EIA on such a sensitive and complicated question is a rather onerous task. The central political aim of the EIA – to increase participation – moreover brings the question of nuclear waste into a new arena. It is taken for granted that all actors in the process are already oriented to the new planning culture, where public participation and interaction have an increasingly important role to play. As such, interest then focuses on the suitability of the EIA model for the nuclear waste management, and on the local policy context. The question therefore emerges, what then is the role of the EIA process, with its transparent procedures and its impressive range of related background materials, in the making of decisions on the final disposal of nuclear waste?

The Finnish model

The Nuclear Energy Act and Decree provide a distinct framework for the implementation and research of nuclear waste management in Finland. According to the legislation, the producers of nuclear waste are responsible for all measures needed for the management of the waste and for the subsequent costs. In other words, the starting point of nuclear waste management is the "polluter pays" principle. The authorities supervise nuclear waste management and issue regulations for this purpose. The objectives and timetables for the implementation

of nuclear waste management and for the related research and planning were defined in a decision in principle by the Council of State, i.e. the Cabinet, in 1983.[5] Later the Ministry of Trade and Industry (KTM) took decisions on the more detailed principles and requirements, which power companies must comply with in their handling of nuclear waste. (KTM 1998, 3; Nuclear Energy in Finland 1997, 14; Vuori 1997, 9).

The Finnish model of nuclear waste management is a decidedly national solution to the problem. According to European Union rules, each country is itself responsible for its own nuclear waste management. The Union aims in future to increase technical collaboration in the field and to harmonise the safety regulations, whilst the objective of co-operation remains to avoid the concentration of waste management services in any one country. To this end, implementation of the EU's principles of self-sufficiency and subsidiarity in all waste management issues has been emphasised in several contexts. According to these principles, the EU countries are primarily responsible for their own waste management. The guiding principle of the EC Treaty is the free movement of goods within the Communities. However, the Treaty does not exclude the implementation of prohibitions and restrictions, which can be justified for example on environmental grounds. In practice, current regulations on the transfer of nuclear waste alone make it possible to prohibit the import of waste separately in each individual case. Similarly, the Union cannot decide on the concentration of final disposal in a certain member country against the wishes of that country. Such a decision would require an amendment to the Treaty, an amendment, which any member country could potentially veto (Alanen 1994; 1999; Hermunen 1998; Posiva 1999a, 7; Posiva 2000).

The basic idea behind the Finnish model is to isolate nuclear waste from organic nature using geological final disposal in the bedrock at a depth of 500 metres. The basic idea is based on the legislation:

> ”Nuclear waste generated in Finland in connection with or as a result of the use of nuclear energy, shall be processed, stored and disposed of in Finland in a permanent manner.”
>
> (Amendment to the Nuclear Energy Act 140/1994, 6 a §).

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[5] For a more detailed analysis of the history of Finnish nuclear waste management see Suominen (1999).

Spent fuel bundles are stored first for a few years in the fuel pools of the reactors. Thereafter, they are transferred in a heavy container to an interim spent fuel storage site at the plant. Finally, they are transported to the encapsulation facility. Some 2 500 tonnes of spent fuel will accumulate during the projected 40 years of operation of Finland's four nuclear power plant units. For disposal, the spent fuel assemblies are encapsulated in double-layered metal containers. The containers are isolated from the biosphere by placing them into the bedrock, at the depth of about 500 metres. According to current estimates, the repository will be sealed in 2050 (KTM 1998, 2; Nuclear Energy in Finland 1997, 14-15; Posiva 1999a, 6, 15, 33-35; 1999b, 17-18, 27; Rasilainen & Vuori 1999, 13-15).

Until 1995, the strategies followed by the different companies differed in regard to nuclear waste management. The Loviisa nuclear power plant returned spent fuel to the Soviet Union/Russia, whilst the Olkiluoto plant made domestic arrangements for final disposal. The amendment made to Finnish nuclear legislation late in 1994 however, prohibits the export of nuclear waste. In consequence, the transport of nuclear waste from Loviisa to Russia continued until the end of 1996, when it was finally brought to a close. For this reason, Teollisuuden Voima Oy (TVO) and Fortum Power and Heat Oy (formerly Imatran Voima Oy) signed an agreement to co-operate in the management of nuclear waste. It was also agreed that co-operation would take place within a joint company, Posiva Oy [6] (Posiva 1998, 6-7; 1999b, 3-4).

The Nuclear Energy Act and Decree provide a clear framework for the implementation of nuclear waste management as well as a clear division of responsibilities (see also Figure 1). On the basis of the Nuclear Energy Act, the Council of State regulates the use of nuclear energy in Finland, KTM grants the required licences and STUK, the Radiation and Nuclear Safety Authority supervises the safety of the use of nuclear energy. (KTM 1998, 5; Posiva 1998, 6-7; 1999a, 5; 1999b, 3;Rasilainen & Vuori 1999, 16-18).

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6 Posiva is owned by Teollisuuden Voima Oy (60%) and Fortum power and Heat Oy (40%), the power companies, which are responsible for nuclear waste management and have set up a fund for future costs. Posiva is responsible for the characterization of sites for final disposal of spent fuel and also for the construction and operation of the final disposal facility. The decommissioning of the final disposal facility will also be carried out by Posiva (Posiva 1999a, 9; 1999b, 3-4).

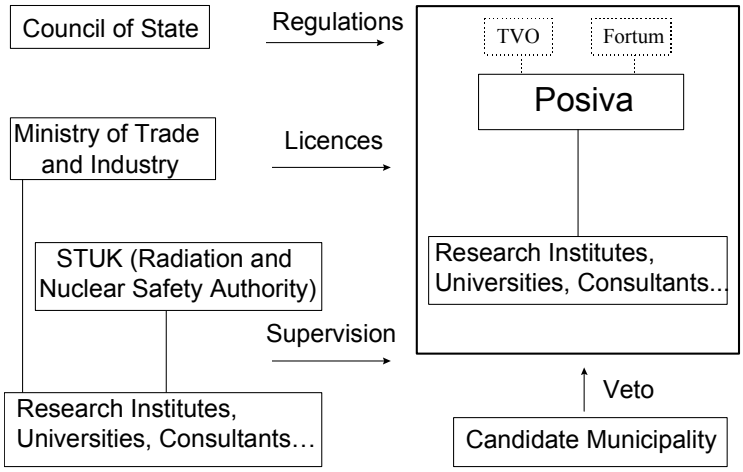

Figure 1. Main actors in Finnish nuclear waste management

The decision making process for the final disposal of nuclear waste is complex (Figure 2). A decision in principle from the Council of State is required for the final disposal facility. In order to obtain a positive decision, STUK, the Radiation and Nuclear Safety Authority have to issue a favourable statement on the safety of the final disposal system, and the municipality in which the facility is to be constructed must also give their approval. The decision of the Council of State needs to be ratified by the Parliament before it is enforced. Apart from the decision in principle, separate construction and operating permits are needed for the encapsulation plant, and for the final disposal repository at a later stage.[7] (KTM 1998, 5; 1999, 9-10; Posiva 1999a,

[7] All transportation of radioactive material requires a permit from STUK, the Radiation and Nuclear Safety Authority. An environmental permit and permits granted by the Water Court, among others, are also required for the facility. The construction of power lines requires the permits specified in the redemption legislation and possibly also in the electricity market legislation. The construction of public roads requires a ratification decision as specified in the Road Act. In addition to national regulations, the final disposal of nuclear waste is also governed by several international agreements and recommendations. The national protection programmes and the decisions of the Council of State with regard to the protection of nature, the landscape, and the cultural environment also have to be taken into consideration. Landowners and interested parties have been consulted as of 7 April 1997 on the area limits specified in Natura 2000 (Posiva 1999b, 189; Posiva 2000).

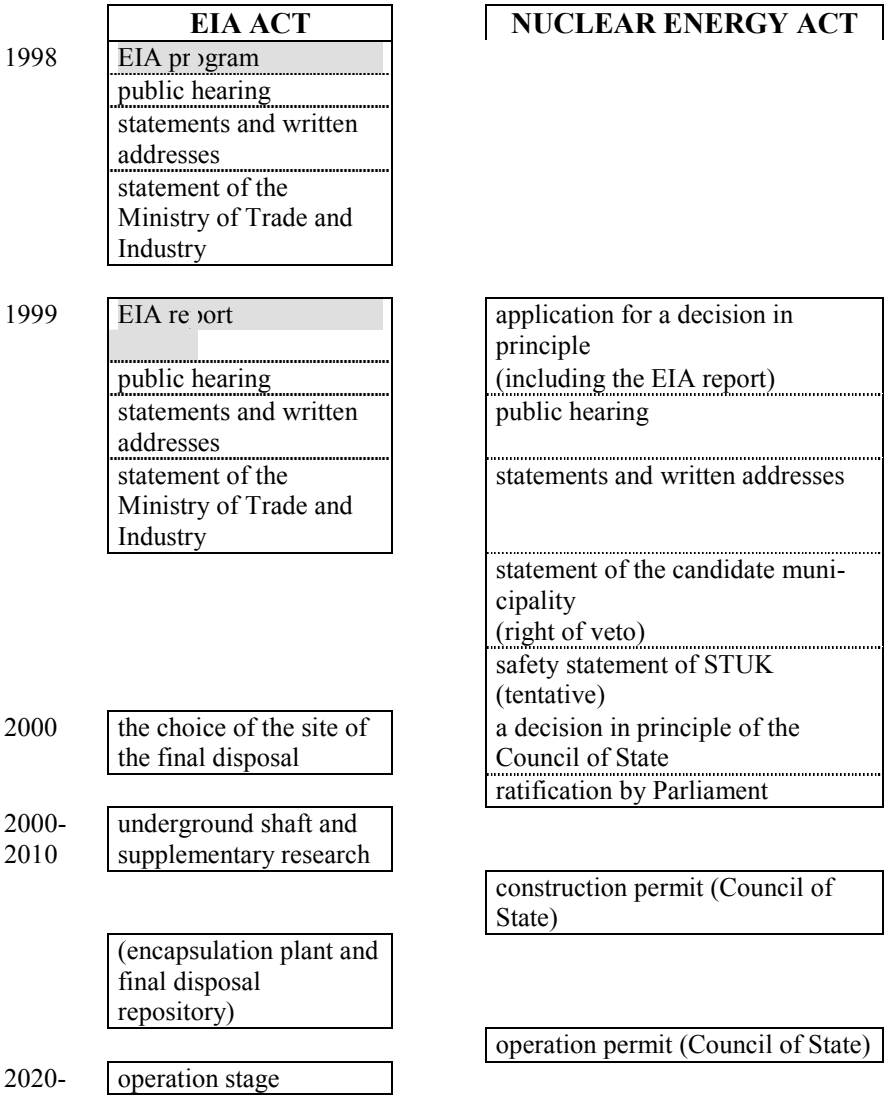

Figure 2. Decision making process of the final disposal of nuclear waste

6; 1999b, 189; Rasilainen & Vuori 1999, 16-18, 20.

On 10 November 1983, the Council of State took a decision in principle on preparations for the implementation of solutions for nuclear waste management. At that time, the aim was to "dispose of the spent f+uel abroad in an irrevocable manner" by contractual arrangements. Despite this, it was specified that the objective of

research activities, investigations and planning work related to nuclear waste management was that Finland should prepare for final disposal of spent nuclear fuel after about the year 2020. According to the Council of State's decision in principle, the selection and characterisation process of the site as a final disposal facility was to be completed by the end of the year 2000 (see Figure 2) (KTM 1998, 3; 1999, 8; Posiva 1999a, 5; 1999b, 8; Posiva 2000).

At the beginning of the 1980's explorations were carried out in different parts of the country to find areas suitable for final disposal. By 1987, field research had been started at five sites. Detailed further research was also carried out at a later stage in four areas: Romuvaara in Kuhmo, Kivetty in Äänekoski, Olkiluoto in Eurajoki and Hästholmen in Loviisa (Posiva 1999a, 11). The EIA process was also carried out in these four candidate municipalities. The EIA programme was completed at the beginning of 1998, and the EIA report submitted in May 1999. At the very same time however Posiva left open the application for the decision in principle to only one candidate municipality, Eurajoki. According to the Nuclear Energy Law however, a positive decision in principle requires both the approval of the host municipality and a supporting statement on safety from the STUK.

A favourable statement on safety has now been issued by STUK concerning the final disposal system (STUK published its evaluation in January 2000). As far as STUK are concerned, the decision in principle can now be taken given that the safety criteria have been met. Olkiluoto is, in their opinion, suitable for the safe disposal of spent nuclear fuel. The municipality of Eurajoki took a decision supporting the selection of Olkiluoto as a repository site on January 24, 2000. The votes in the municipal council were 20 in favour of a supporting statement and 7 against (Posiva 2000). Thus, Eurajoki is the very first municipality in the world to approve of the final disposal of high level nuclear waste within its own boundaries.

The KTM is preparing the decision in principle documents for the decision-making of the Council of State. In February 2000 two appeals were made to the Administrative Court against the decision of Eurajoki Municipality. The court dismissed both appeals in May of that year, not finding any errors in the decision making process of the Eurajoki Municipality. A new appeal against the decision of the municipality was however made to the Supreme Administrative Court in June 2000. After the Supreme Administrative Court passes its ruling, the decision-making process can proceed to the Council of

state (Posiva 2000).

Table 1. Timetable of Finnish nuclear waste management

1983	Explorations carried out in different parts of the country
1986	Preliminary site investigations
1993	Detailed site characterisation
1998	**EIA**
2000	**Selection of final disposal site**
2000	**Decision in principle of the Council of State**
2000	Underground shaft and supplementary research
2010	Construction stage (encapsulation plant and final disposal repository)
2020-	Operation stage

After selection of the final disposal site, and the decision in principle of the Council of State, an underground shaft will be constructed at the selected final disposal site. Construction of the actual final disposal facility will begin after the year 2010, with the facility becoming operational in 2020. The service life of the Olkiluoto and Loviisa plants is at least 40 years. The final disposal facility will accommodate all the spent fuel from both the plants. If Finland decides to build new nuclear power plants, the spent fuel from them could also be entombed at the selected site (Posiva 1999a, 6, 15; 1999b, 29).

In order to protect society's interests and to ensure compliance with the "polluter pays" principle, the funding required for waste management is to be forthcoming when the technical measures become available. The funds required for nuclear waste management must be raised during the plant's service life, and must also be included in the price of electricity. Finnish legislation has adopted a provision system in this regard. That is to say that the power company pays an annual contribution to the State Nuclear Waste Management Fund, which operates under the auspices of the KTM. This provision covers all future measures: conditioning, storage and disposal of spent fuel and reactor waste, as well as the dismantling of the plant itself. The overall estimated costs of final disposal are 4.3 billion FIM (see further Table 2). As a whole, the overall costs of the Finnish nuclear waste management programme are about 10 billion FIM (Nuclear Energy in Finland 1997, 16; Posiva 1999a, 36; 1999b, 41; Rasilainen & Vuori 1999, 21-22).

Table 2. Cost estimate of final disposal (price level as of December 1997)

		FIM million
CONSTRUCTION		1200
URL shaft	(70)	
Encapsulation plant	(540)	
Final disposal repository	(590)	
OPERATION		2820
Canisters	(1220)	
Encapsulation plant	(840)	
Final disposal repository	(760)	
DECOMMISSIONING		270
Encapsulation plant	(40)	
Final disposal repository	(230)	
TOTAL		4290

Source: Posiva 1999a, 36.

Alternatives in the management of nuclear waste

One of the most important dimensions of Finnish nuclear waste management is the question of alternatives. In fact in this case however we can more properly talk of the lack of alternatives. Indeed the tightly drawn boundaries of Finnish nuclear energy legislation necessarily prevent the use of alternatives.[8] In the Nuclear Energy Act the export and import of nuclear waste material is prohibited. According to the Nuclear Energy Act (1420/1994, 6 a §) nuclear waste is to be disposed of in Finland and in a permanent manner. Despite the lack of real alternatives (given the legislation) several environmental organizations, citizen's movements and individuals in Finland, as well as in other countries, are worried about the safety of the final disposal (see e.g. Kojo 1999a; Kojo & Suominen 1999; Richardson & Simes 1998; Simes 1999). Debates in Finland and abroad have seen the same

[8] Sandberg (1999) analyses in greater detail the influence of nuclear energy legislation upon the alternatives of nuclear waste management.

concerns emerge in relation to this issue.

The issue of the lack of alternatives also has a significant impact on the EIA process itself, as one of the foremost tasks of EIA process is to offer alternatives and to facilitate public discussion. Indeed throughout the EIA process the simple lack of alternatives precipitated critical attitudes towards the plan and towards the EIA process itself for curtailing public participation and decreasing interest. Though the Finnish model was "showcased" by holding the selection of the site for final disposal between four candidate municipalities, the Finnish model of the nuclear waste management itself was not at issue in the subsequent EIA.

Questions relating to technical alternatives to current methods of disposal in nuclear waste management would perhaps also benefit from being approached from an ethical standpoint, which would in essence move discussion away from the current over reliance on narrow technocratic concepts and concerns. Simply put, who should make choices and decisions in this area, and upon what criteria should such decisions be based? Can we trust to the capability of future generations to solve the problem of nuclear waste? Or should we, in the present, assume the responsibility given that it was the present generation who used nuclear energy? Rasilainen & Vuori (1999, 11) assume that the question of spent fuel can be approached from two distinct "philosophical" directions. In the first one, spent fuel is seen as a raw material, which nuclear energy plants can use through massive and expensive systems of recycling. This is a philosophy centred on the reprocessing spent nuclear fuel. In the second scenario the spent fuel is seen as waste. This is the philosophy of (direct) final disposal. Most of the "small" nuclear energy countries, such as Finland, have chosen the latter alternative. In reality the difference between these two philosophies is not great, as reprocessing produces radioactive waste, which is then returned to the country that sent the spent fuel to the reprocessing plants. The waste material produced during reprocessing itself needs final disposal in any case. In principle, there are three alternatives for the model of final disposal: 1) interim storage, 2) reprocessing and 3) transmutation.

For some environmental organisations, no safe and final method of processing or storing nuclear waste is currently available. Other environmental organisations feel that the spent fuel should be retained within the power plant areas, either deep underground, or in near surface storage structures. This concept incorporates the notion of continued monitoring until mankind invents a method of making

nuclear waste harmless. On the other hand interim storage does not lead to any transportation of nuclear waste, which is one main concerns for opponents of the industry. (Posiva 2000; Richardson & Simes 1998; Simes 1999.) From the viewpoint of the EIA process, interim storage at the power plant areas is not a so called "zero-option". Non-implementation of this plan means the continuation of water pool storage of nuclear waste in the power plant areas (for more about the dilemma of implementation and non implementation see e.g. KTM 1999, 2-3; Posiva 1999b, 53-56.)

From the viewpoint of supporters of final disposal, the most significant drawback connected to indefinite interim storage is that it assumes that future societies will remain stable and capable of maintaining the security of such stores. This however cannot be guaranteed *ad infinitum*. Moreover, societies have a natural tendency to become used to the existence and presence of storage plants and forgetting that constant vigilance is required. Complacency may therefore play an important role by encouraging deficient monitoring and maintenance of the stores. (Posiva 1999a, 26-27; 1999b, 53-56, 173-179; Rasilainen & Vuori 1999, 26-27.)

The reprocessing of spent nuclear fuel refers to a chemical process in which the remaining uranium and the plutonium created in the spent fuel are separated from the actual radioactive waste. Uranium and plutonium can be re-used as fuel. In Europe, reprocessing plants are in operation in France and Great Britain.

Russia also undertakes the reprocessing of spent fuel. Reprocessing it should be remembered however does not eliminate the need for waste management, as the high level reprocessing waste is solidified in glass and has then to be disposed of in the same way as spent fuel. (Posiva 1999a, 28-30; 1999b, 11-12, 15; Rasilainen & Vuori 1999, 23, 26.)

It has also been suggested that the particular atoms hazardous to health could be destroyed by transmutation. Transmutation means that the long-lived radio nuclides are transformed into shorter-lived or stable nuclides by means of nuclear reactions generated by neutrons. In practice however it should be noted that transmutation could not destroy all long-lived radioactive waste to the extent that provision for final disposal is no longer required. Transmutation is possible in principle but requires several decades of development, reprocessing and sorting of materials, as well as considerable investment. It should be remembered however that transmutation would not eliminate the need for final disposal. In addition, the influence of the transmutation

process on overall safety is at present unclear. (Posiva 1999a, 31; 1999b, 13-14; Rasilainen & Vuori 1999, 27-28.)

The EIA process concerning the final disposal of nuclear waste

The EIA process in Finland

The Finnish Parliament enacted the EIA Act in 1994[9]. Finland was one of the last countries in Europe to do so. The process of drafting the law gave rise to many political conflicts[10]. As in other Nordic countries in Finland too the EIA model used was an imported one. The political and economic integration of the country into the European Union launched the preparation of the EIA Act in Finland and finally forced its introduction. Without pressure from the EIA Directive and from the Commission, enacting the EIA Act might have taken even longer (Sairinen 2000, 173; Ympäristöministeriö 1995, 3).

The aim of the EIA Act (267/1999, 1 §) as so stated is to improve the assessment and integrated consideration of environmental impacts in planning and decision making, as well as to increase public information and public participation. In other words, the aim of the Act encompasses two different dimensions: an environmental act, and a democratic act. The EIA can thus be viewed in two complementary ways, as a planning tool and as a procedure for policy making. The notion of the EIA as a planning tool has to do with the methodologies and techniques for identifying, predicting and evaluating environmental impacts. Viewing the EIA as a procedure for policy making highlights the importance of mechanisms for environmental analysis and their influence on the decision-making process

Both characteristics reflect an understanding of the EIA as a tool for preventive environmental policy (Sairinen 2000, 156). In this sense, the EIA process can be seen as part of a broader movement in public administration as a whole towards a more open and transparent policy-making and planning process. A process moreover, that is not closed off from the realm of civil society. From that standpoint alone

9 The amendments to the EIA Act and the EIA Decree were made in 1999.

10 For more about the political process of drafting the EIA Act see e.g. Sairinen (2000, 155-176).

the EIA can be seen as an instrument of interactive planning in the environmental policy arena.

In Finland, the EIA Act was successful in attaining this aim by introducing a comprehensive assessment procedure that also includes future needs regarding social impact assessment, strategic impact assessment and wide participatory practices. This type of reform in environmental governance suggests the normalisation and intensification of public and expert discourse on environmental impacts. On the other hand, the EIA Act also had a major impact on the content of local democracy and the role of citizens' organisations in planning procedures. The importance of the democracy argument can be illustrated by the fact that the media treated the EIA reform primarily as an issue of participatory democracy, and the environmental dimension was given only secondary importance (Sairinen 2000, 176).

It is an interesting issue for political science to evaluate the tension between the representative system and civil society. From a critical perspective however the EIA process occupies a problematic position with regard to participatory models of democracy. The EIA process is a governmental creation, not a creation of civil society. Despite this however expectations that the EIA process will lead to an increase in public participation as an instrument of civil society are high. Despite the central position of the concept of "participation" in this debate, no agreed definition exists. Public participation is understood as a self-evident and trouble-free part of democracy within the EIA process. The EIA process complements the representative use of power such as voting in a local government election or in a consultative municipal referendum[11]. The effectiveness of direct participation in the planning system is an example of a macro-level change in society.

The implementation of the EIA in the case of final disposal

The Nuclear Energy Act (990/1987) stresses that the final disposal of nuclear waste is an issue of such importance, with regard to the overall interest of Finnish society, that it requires a decision in principle from the Council of State. According to the nuclear energy legislation, the EIA report should be included in the application for the decision in principle. The EIA process, in accordance with the EIA

[11] For more about the use of consultative municipal referenda in the case of the final disposal of nuclear waste see e.g. Ponnikas (1998); (1999); (2000); Sutela (1999).

Act is thus one part of the overall assessment of safety and environmental impact of the plan. The EIA process concerning final disposal includes all phases of the plan, i.e. research, construction, operation and decommissioning. (KTM 1998, 3-4; 1999, 8-9; Rasilainen & Vuori 1999, 19).

As with all plans to which the EIA Act is adapted, the environmental impact of the final disposal of nuclear waste is assessed (Environmental Impact Assessment Decree 268/1999, 6 §). This entails the environmental impact assessment of the direct and indirect impacts of the plan on 1) human health, living conditions and comfort, 2) soil, water, air, climate, vegetation, organisms and biodiversity, 3) construction of the community, buildings, landscape, townscape and cultural heritage, 4) the utilization of natural resources and 5) the interaction between factors named in paragraphs 1-4 (Environmental Impact Assessment Act 267/1999, 2 §; Rasilainen & Vuori 1999, 19).

Posiva's EIA for the final disposal of nuclear waste covers the four candidate municipalities, Eurajoki, Kuhmo, Loviisa and Äänekoski, where the possibilities of final disposal of spent fuel were being investigated. The implementation of the EIA was a comprehensive process in many ways, when considering the previous history of the EIA process in Finland[12]. For almost three years the candidate municipalities were subjected to what can only be described as an "EIA road show " as the process impinged upon most aspects of life in these communities. The realities and implications of the plan itself were disseminated to the local people through the information activities and meetings included in the EIA.

The Main actors

In such sensitive issues as nuclear energy and nuclear waste management, the roles of the main actors necessarily became emphasized over and above lesser players. Given the particular circumstances of the issue in question however the role of the party concerned (i.e. the developer) it can be argued, is somewhat troublesome. Understandably it is rather difficult to credibly sustain a position of neutrality when the EIA process itself begins to impinge upon major economic and political interests.

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12 See e.g. Impakti 1/2000 regarding amounts and e.g. Karvinen (1997) and Turtiainen (2000) regarding the implementation of the EIA processes in Finland.

The developer [13] of the EIA process for the final disposal of nuclear waste is *Posiva Oy*. Posiva is responsible for the EIA programme and the EIA report on the final disposal of nuclear waste. The role of the developer in this context is quite large, as the developer effectively has a free hand to conduct the process as it sees fit, as well to carry out the information tasks and participatory actions. The general question regarding the role of the developer in the EIA process is, can the position of the developer become too dominant? In the particular case in question here, criticism of the status of Posiva by civil movements and environmental groups has been consistent throughout the EIA evaluation process (see e.g. Rosenberg 1999).

Throughout the process Posiva operated in a number of capacities.[14] Its head office is located in Helsinki, whilst local offices, founded before the EIA process started, were set up in all four candidate municipalities Posiva's operational exposure was very prominent throughout the process, which was thus marked by the status of the developer. Posiva's policy amounted to interaction with as many actors as possible in the sphere of influence of the plan. It sought to participate in the discussions of councils, local authorities, local civil movements and groups as well in those of the municipal inhabitants themselves. The aim of the EIA process, notwithstanding the already strong emphasis on participation, information and interaction, was to increase the likelihood of the plan gaining acceptability, and to bind important actors to the EIA process and to the plan itself. Posiva arranged public meetings, small group encounters, information sessions and discussion meetings for the councils, collaborative or follow-up groups for public and association officials, as well as staging exhibitions, and conducting, municipal inquiries and thematic interviews, regional administration-based discussion meetings, central administration-based seminars, and discussion through the columns of the local and national newspapers (Posiva 1999b, 57).

As distinct from the "normal" practices concerning EIAs in Finland, the competent authority for the EIA process for the final disposal of nuclear waste is the Ministry of Trade and Industry (KTM) (EIA Decree 268/1999, 2 §). Usually the competent author would be the regional environment centre (EIA Decree 268/1999, 4 §), but in all

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[13] See more about the tasks of the developer in EIA Act 267/1999, 2 §, 5.

[14] There is no public information available concerning the costs of the EIA process.

situations where the Nuclear Energy Act is invoked, the competent authority is the KTM. This fact alone adds a special quality to the case in question. Sairinen (2000, 118-120) describes the differences between the various administrative sectors, and lays out the aims of the environmental authorities (e.g. Ministry of Environment, Finnish Environment Institute and regional environment centres) as well as those of the KTM and other industrial actors. Different administrative sectors have substantially different approaches to environmental policy, and these are sustained through often quite separate discourses. Sairinen goes on to develop a typology of Finnish environmental policy discourse in which the actors have been divided into four groups: 1) productionists, 2) conformers, 3) compromise makers and 4) visionary oriented. In his typology the KTM represents the group known as productionists.

With this typology in mind it is not surprising that the KTM is regarded with suspicion by other actors, and that its competence and neutrality are questioned. Environmental groups and civil movements understandably criticize the role of the KTM for these reasons. For them the connection between the KTM and the nuclear energy companies is not conducive to fair-play, or indeed to the proper functioning of the EIA as a process (see e.g. Rosenberg 1999, 267-269). On the other hand, it is important to remember that the KTM has emphasized its own supervisory role. The Public Administrated Nuclear Waste Research Program (JYT) for example, financed and coordinated by the KTM, is independent of the goals set by the power companies (Vuori 1997, 9).

Even though the *Radiation and Nuclear Safety Authority (STUK)* retains an important status in nuclear waste management in general, its role in the EIA process is minimal. It is one of those authorities from whom the KTM asks for statements regarding the EIA programme and report. After the EIA process, in the decision in principle phase, the role of the STUK became much more prominent., This is so because the safety issue is attached to the decision in principle.

In the case of the final disposal of nuclear waste, the role of *the candidate municipalities* is emphasized. So far the debate on nuclear waste has been confined to the local level. After Posiva concentrated the site investigations on four candidate municipalities, Eurajoki, Kuhmo, Loviisa and Äänekoksi, the main focus of the discussion on nuclear waste turned to these municipalities. At national level, public discussion has been muted, and the amount of media time devoted to

it has been quite small. In the candidate municipalities themselves however the question of final disposal has become highly controversial. Given the unconditional right of veto each candidate municipality holds, it has been very important for Posiva therefore to use the EIA process as an instrument of acceptability. In practice, the municipal decision is made by the local council, thus the members of the council became primary targets for the information and lobbying operation mounted by Posiva as during this phase of the EIA process local decision making bodies are in a key position.

In practice, the municipalities have participated in the EIA process in many ways. They have given statements regarding the EIA program and report, they have had held collaborative or follow up group meetings with Posiva, they have taken part in designing the public nuclear waste research program (JYT), they have their own EIA contact persons etc. In fact, the EIA process has functioned as the administrative instrument through which the municipalities to commit themselves to the plan.

Finally, the inhabitants of candidate municipalities have had a very important role in the EIA process. According to the EIA Act, the main aim of the EIA process is to draw inhabitants and other participants into the participation process, and to encourage them to voice their concerns. The role of such citizen based civic movements, and ways in which they have developed modes of public participation are analysed in more detail in section "Public participation in the EIA."

Procedural steps

In the preparatory phase of the EIA process, during the autumn of 1997, Posiva arranged four public meetings in each candidate municipality. There was one open meeting first, followed by two meetings for representatives of local associations, and finally one further open meeting (see also section "The case study"). The aim of the meetings was to gauge local opinion regarding the impact of the plan. Posiva was especially concerned with finding information on the impacts that the local inhabitants felt to be most important so that they could be included as reference points in the EIA process. Thus it could be said that, Posiva embarked upon the EIA process in a positive and forthright manner, in the hope that they could quickly allay any fears over the decision lurking within the communities.

Formally speaking, the EIA procedure began in February 1998, when Posiva submitted its assessment programme on environmental

impact to the competent authority, i.e. the KTM. The public hearing on the EIA programme lasted from 23 February to 23 April 1998. KTM put the EIA program on public display in each of the candidate municipalities and in the adjacent municipalities (of which there were 27 in total). The existence of a public hearing was announced in 16 newspapers. The competent author asked for statements regarding the EIA programme from 54 other competent actors. In the summer of 1998, the KTM issued its own statement on the programme to Posiva, based on statements made to the Ministry by those, such as technical experts and the representatives of various civic groups, invited to do so beforehand. In this statement the competent authority considered the EIA programme to be extensive enough and thus that it provided a good basis for assessment. It should however be noted that the competent authority suggested that the alternatives within final disposal merited a wider investigation than they were currently receiving under the current EIA program. Furthermore, extensive investigations should be undertaken with regard to the radiation impacts in all phases of the plan. Moreover, questions relating to the image of the candidate municipalities, to the community economies and to the predisposal of the inhabitants of the target municipalities should be evaluated with due care and attention when considering the social impacts of the plan (Posiva 1999b; 2000; KTM 1998).

Posiva investigated the likely environmental impact in compliance with the programme and in light of the comments made by the KTM. The EIA procedure continued with the production of the EIA report, which is the other main EIA document. The EIA report was completed in the spring of 1999. The EIA report assesses the feasibility of the various alternatives. It suggests action that will prevent or restrict any harmful impacts relating to final disposal. The report also contains a proposed follow-up programme for the project (Posiva 1999b; 2000).

The EIA report was put on public display from 21 June to 20 August 1999, giving citizens an opportunity to express any further opinions that they may have had on the project. KTM called for statements from the same parties as those that had contributed to the EIA programme, and announced through the newspapers that a public hearing would take place. The EIA report was attached to the application for a decision in principle, which was submitted to the Council of State in May 1999 (KTM 1999). For that reason the EIA process and the political process concerning the decision in principle were operating at the same time. This led to much confusion and to a

decrease in public participation.

The EIA report was reviewed in accordance with Finnish EIA law. The EIA procedure was completed when the competent authority, the KTM, issued its statement on the EIA report in November 1999. Briefly, the Ministry considered the EIA report to be sufficiently comprehensive and detailed. According to the Ministry, the report fulfils the necessary legislative requirements as well as the goals of the EIA programme published by Posiva in 1998, and was subsequently complemented in accordance with the authorities' comments (Posiva 2000).

It should be noted however that the so called "Vuojoki-agreement" had already been concluded between the municipality of Eurajoki and Posiva in May 1999. This agreement was perhaps the most significant related event to occur outside the EIA process itself during this time. The agreement guaranteed financial compensation to the municipality of Eurajoki if the attitude of the local authority and the citizens of Eurajoki were positive towards the projec. The agreement is therefore rightly seen as the final, and perhaps most important factor in the selection process of candidate municipalities. It simply removed the other three candidates from the final disposal "competition" as much as six weeks before the EIA report public hearing or the application for the decision in principle took place. Naturally, this caused much bitterness in the other municipalities, particularly in Loviisa, where "official" opinion was openly critical. As such, many actors simply felt that the agreement was not in accordance with the EIA's "rules of the game" (Kojo 2000b; Rosenberg 1999, 278; Silvàn 2000, 4-8).

Contents of the assessment: why Eurajoki?[15]

According to Posiva, there was little to choose between the candidate municipalities.[16] Analysis showed that the environmental impacts of the plan were similar across all sites. Indeed, according to the EIA report all candidates were, in principle, suitable for the handling of final disposal. Despite this however Posiva, obviously favoured

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15 The research results introduced in this chapter are based on the EIA report made by Posiva (Posiva 1999b).

16 If we consider factors falling outside the bounds of that which can be labelled "natural and technical issues," we can see that a number of major differences between the candidate municipalities were discernable.

Eurajoki. Why was this so? Perhaps the most obvious reason was existence of the Vuojoki agreement, though issues such as local acceptance and social convenience were also important factors in this decision.

The fact of the matter however is that there are no technical or scientific reasons that point to Eurajoki as a better alternative over and above the other candidates. The only significant advantage of using the Eurojoki site relates to the issue of transportation. When this issue is taken into consideration it obviously does make sense to dispose of the waste where it was produced. It is an undisputed fact that in Eurajoki the attitude of the inhabitants, as well as that of the politicians is most favourable to the project as a whole, as indeed Eurajoki already has a nuclear power plant. Perhaps for this reason, the local community is already attuned to living with the benefits as well as the hazards of nuclear power, thus plans for the final disposal of nuclear waste in the area are, on average, viewed by the inhabitants of the community in a more pragmatic fashion than perhaps was the case in the other candidate municipalities.

It is important to note that the studies and evaluations contained in Posiva's EIA report concentrate on the features of the candidate sites and on the differences between them. As regards the Nuclear Energy Act, there was no need to analyse alternatives to nuclear waste management in more detail than that which had already been done in EIA itself.

Assessment of the impacts of the project was set to last for its entire lifespan, from the investigation phase to the period of post-closure. In evaluating environmental impacts, it is prudent to consider not only those effects which can be anticipated but also the possible ramifications resulting from environmental accidents (see the summary of the EIA studies Appendix 1) (Posiva 2000).

According to Posiva, the environmental impact remains minimal in respect to all siting alternatives. Differences in regard to bedrock conditions are merely limited to siting along the coast or inland. Both have their own intrinsic advantages. Solely on the basis of safety analysis therefore it is not possible to resolve which site would be most favourable. Final disposal can be implemented within the bedrock of each and every one of the investigation sites. Spent fuel is stored at the power plants. In the event that the final disposal facility is built at Äänekoski or in Kuhmo, the amount of required fuel transport will be double that of the power plant localities.(Posiva 2000.) Considerable benefit is derived from final disposal in terms of

the municipal economy. Due to the municipalities' tax revenue levelling system, the net benefit regarding the municipal economy of Kuhmo would, however, be smaller than that of the other localities. On the other hand, the effects on employment levels would be the greatest in Kuhmo. Criteria affecting municipal economies in this regard include, real estate, municipal, value-added and corporate tax, increasing employment, population change, general State shares, and tax revenue compensatory levelling. Kuhmo gains disproportionately in terms of this last issue, where each mark in taxation brought in by business activity has the effect of reducing State subsidies. In the case of Kuhmo, the net benefit for Kuhmo, derived annually in respect of the municipal economy would be, at a maximum, FIM 1–2 million, whilst in the other localities it ranges from FIM 7–9 millions (Posiva 2000).

The level of anxiety and fear is much less apparent in the power plant localities than in Kuhmo or Äänekoski. Indeed, questionnaires and interview-based research, indicate that the residents of the nuclear power plant localities – Eurajoki and Loviisa – voice fewer worries and fears than the people of Kuhmo and Äänekoski. A representative opinion survey was conducted on the views of the inhabitants of the respective nominee municipalities. It found that majorities in Eurajoki and Loviisa would approve of final disposal in their municipalities, whilst this would not be the case in Äänekoski or Kuhmo. Furthermore the municipality of Eurajoki had already taken an official decision to support the plan (Posiva 2000).

Public participation in the EIA[17]

Forms of public participation

In the context of the present study, participation is understood as an action that takes place as part of a wider process in which the participant is not merely the *passive object* of the information activities of other actors in the EIA process. When evaluating levels of public participation it is rather difficult to distinguish between its active and passive forms. For example, it is clearly an active action to take part in a public meeting, though the person in question does not

[17] This chapter is based on Hokkanen's (1999) article "Harvoille paljon, monille vähän. Kansalaisosallistuminen ydinjäte YVA:ssa" ["Much for few and little for many. Public participation in the EIA of the final disposal of nuclear waste"].

actually take part in the discussion during the meeting. The distinction between participation and observation is therefore ambiguous (see e.g. Harisalo et al. 1992, 60). In this paper, participation is always seen as an *action with aims*. Participation is connected to interests, and to the realization of goals.

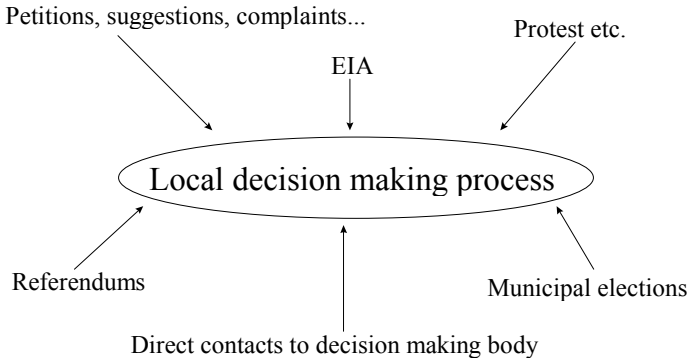

Figure 3. Types of political participation

As shown in Figure 3, there are many avenues of public participation available at the local level. Some are "direct" and some "representative" in nature. Each approach simply reflects a choice over strategy. For example, in the case of the final disposal of nuclear waste, local inhabitants have had a number of opportunities to take part in and to influence the ongoing process. It is important to realize that the EIA represents only one avenue of influence, and it should be noted that it may not be in all cases the most effective one. For opponents of the project in particular, the EIA process carried out by Posiva may have been a rather inadequate way in which to participate. It should also be noted however that the EIA does include a number of separate ways in which to participate across the different stages of the process. In this paper however analysis is focused on participation in the EIA process.

The Environmental Impact Assessment Act, and in particular the spirit of the legislation, underlines the desirability of public participation. It is however justifiable to ask whether in reality the EIA process was used more as a political instrument by Posiva than as a tool of democratic participation. Is the EIA process therefore central to the legitimation of such projects, or a means to democratise the planning and decision-making processes? Kaskinen (1998, 150) for one, suggests that public participation is organized to fulfil the

legislative conditions relating to planning. Similarly, it is legitimate to question whether such active participation as does occur, has a direct or discernable impact on policy making. In this regard, Karvinen (1997, 59) opines : "EIA and everything OK?" and in so doing poses the question whether the EIA is simply a mechanism or device facilitate broad acceptable among the general public of such projects. It is self-evident that there are big differences between different EIA processes. The most important factor in this regard is the actual implementation of the EIA. The developer of the plan is at liberty to comply with the aim of the EIA Act in a number of ways. If the only goal is to fulfil the conditions set down by the legislation in this area, or to legitimatise the project, it is unlikely that either public participation, or the EIA process itself will have any notable effective on the wider decision-making process.

In practice, the EIA is carried out under the influence of local political traditions and within the local framework of participation. Political and structural differences between the candidate municipalities can be seen, for example in the propensity for local associations to become involved in the process, (see Hokkanen & Kojo 1998a; Kojo 1999a) and in the local history of the planning of the plan itself (see Litmanen 1994; Suominen 1998; Kojo 2000).

The case study

There were three "official" ways to participate in the EIA process on the final disposal[18]: 1) public hearings (and other meetings) before and after the EIA programme and report, 2) written addresses to the competent authority (i.e. the KTM) after the EIA programme and report and 3) direct contact with EIA contact persons in the candidate municipalities. Activity outside the EIA process is analysed in 5.4.

Written addresses

According to the EIA Act the competent authority should ask for statements and written addresses regarding both the EIA programme and the EIA report. In the EIA process of the final disposal of nuclear waste the competent authority, the KTM, asked for statements from all candidate municipalities, the municipalities adjacent to those of the candidates (27) and other actors, i.e. ministries, provincial

18 Posiva introduced participation into the EIA process in the EIA programme (Posiva 1998, 68-73) and in the EIA report (Posiva 1999b, 57-60).

governments, safety and environment authorities etc (23 in relation to the EIA programme, and 32 with regard to the EIA report itself). Statements were also requested from various individual experts from Sweden, Russia and Estonia who were authorities in their own fields. KTM received 56 such statements in relation to the EIA programme and 41 statements with regard to the EIA report itself (KTM 1998; 1999).

At the same time as these statements were being delivered, individual citizens and civic associations also had the chance to submit written addresses concerning the EIA programme and/or the report. Written addresses are the only way in which the public can participate in the EIA legislative process. At the public hearing stage of the EIA programme the competent author received 21 written addresses from associations and/or companies. In addition, individual citizens submitted 104 written addresses. Public participation was at its most active in Kuhmo and the surrounding areas (61). Whereas only 8 such written addresses were received from Eurajoki. It can clearly be seen that the candidate municipalities without a nuclear power plant, namely Kuhmo and Äänekoski, were more active, in terms of written submissions, than Eurajoki and Loviisa. Almost all written submissions included critical opinions of, and arguments against the plan in particular, and the EIA process in general. The salient issues arising out of the consultation process concerned 1) lack of alternatives to the plan, 2) social impact assessment and the methods used in assessment, 3) impact of final disposal relating to questions of image, 4) safety issues (especially the safety of waste material transportation), 5) methods of defining expected impacts, 6) technical details of final disposal, 7) questions relating to the bedrock, 8) general safety issues concerning radiation and 9) the credibility of the EIA process (KTM 1998, 7-9, 36-58; Kojo 2000b).

It was also at this time, in May 1999, that Posiva submitted the EIA report, and made the application for the decision in principle. The application for the decision in principle includes only one candidate site (Eurajoki) for final disposal, which was an important reason for the collapse of the activity regarding the EIA process. During this stage of the EIA report phase of the public participation process, public activity, in particular, the amount of written submissions, declined substantially. Only 15 submissions were received regarding the EIA report, whilst the EIA programme itself generated only 125 responses (KTM 1999, 12-36, Kojo 2000b).

The registered change in the level of public participation during

this period is thus a clear and indeed, important finding. Contrary to submissions relating to the EIA programme, at this stage of the process, the highest levels of activity were to be found in Eurajoki. The reason for the change is clear. As Posiva included only one municipality in the application for the decision in principle, it is obvious that public participation and activity increased in the other candidate municipalities. Perhaps an even more important reason for this was the so-called Vuojoki agreement (see also section Procedural steps). For many in Kuhmo, Loviisa and Äänekoski the final outcome of the selection process was at this stage already clear.

The issues covered in the written submissions were similar to those found at the previous stage of the EIA programme. As on that occasion, the most critical views came from individual citizens and from civic associations. It could also be seen that such written submissions that were received at this juncture tended to be of a more critical nature, especially in their attitude towards the EIA process itself, than was the case with verbal statements made at public meetings. It is obvious that both citizens and local associations were particularly displeased with the credibility, reliability and the implementation of the EIA process (KTM 1999, 12-36) to final disposal of nuclear waste was through the designated EIA contact persons in the candidate municipalities. Their task was to act as a link between the municipality, residents, Posiva and other key actors in the plan. EIA contact persons were local officials selected at the beginning of 1997, that is to say, *before* the EIA process was officially in motion. The initiative for this idea came from Posiva, though all municipalities selected *EIA contact persons.*

One way in which the public could participate in the EIA process relating their own contact person (Hokkanen & Kojo 2000, 6).

The basic idea behind this initiative was for Posiva to create a permanent institutional actor in each of the candidate municipalities who would serve the information needs of the inhabitants, and crucially act as a funnel for interaction between the municipality and Posiva itself. EIA contact persons thus provided for the possibility of participation in the schematic "EIA organisation" that Posiva had designed. The attainment and maintenance of local acquiescence in the plan was one of *the* major challenges facing Posiva. The creation of EIA contact persons was therefore one particularly effective way of achieving this aim. As "impartial" actors, contact persons were useful given their ability to chart the progress of the plan, and its current level of acceptability (Hokkanen & Kojo 2000, 38).

Public perception of the operation of contact persons was however rather different, as such, they were thought to suffer from 1) an undefined job description, 2) weak visibility and 3) a lack of public accessibility. As such, it is plain to see that EIA contact persons failed to raise the level of public participation in any candidate municipality. As seen in Table 3, few contacts took place during the public hearing of the EIA programme. Indeed, the total number of contacts was 12 (inclusive of all four candidate municipalities). The situation declined further during the public hearing stage of the EIA report where no contacts at all took place in any municipality. Thus we can safely say that, regarding the issue of public participation, EIA contact persons were insignificant actors. Given Posiva's original aims however, and the institutional framework that it adopted for this process, it is ever more apparent now that in all municipalities, the most important task of the designated contact person was communication with Posiva. For Posiva the contact persons were key to guiding the organisations of candidate municipalities through the process as a whole. (Hokkanen & Kojo 2000, 28-32, 38.)

Table 3. Contacts to the EIA-contact persons during the public hearing of EIA programme[19]

	Eurajoki	Kuhmo	Loviisa	Äänekoski	Total
Private persons	2	-	1	1	4
Associations	-	-	1	1	2
Politicians	-	-	-	1	1
Officials	-	-	3	-	3
Media	-	1	-	-	1
Companies	-	-	-	1	1
Total	2	1	5	4	12

Source: Hokkanen & Kojo 2000, 28

Episodes of public participation simply by-passed the office of EIA contact person. Public activity was instead directed towards participation in public meetings (see e.g. Hokkanen 1998; Hokkanen & Kojo 1998b; Leskinen et al. 1997) and to the submission of written questions and comments to the competent authority (KTM 1998; 1999). Public activity also focused on issues and actors that lay strictly

[19] Public contacts were gathered in line with the diary method during the public hearings of the EIA programme and report.

outside of the "official" EIA process. Individual inhabitants and civic associations contacted local politicians, local and national authorities and Posiva directly (Kojo 1999a; 1999b; Kojo & Suominen 1999). Moreover, perhaps the most visible way of participating in the process was through the writing of letters to the local newspapers (see e.g. Pirttikoski 1996; Raittila 2000; Seppälä 2000). (Hokkanen & Kojo 2000, 40.)

Public hearings and meetings

When examining levels of participation in EIA public hearings in a purely quantitative fashion, it can easily be seen that activity was low. Absolute levels of participation in public hearings in the stage leading to the preparation of the EIA programme[20] are shown in Table 4, whilst the number of participants at the first public hearings, in proportion to the population of the candidate municipalities, are shown in Table 5. Both the absolute and the proportionate numbers of public hearings in the stage after the EIA programme, are shown in Table 6. Participation levels were particularly poor in Äänekoksi, notwithstanding the fact that participation trends declined across all municipalities during the lifetime of the EIA process (Hokkanen 1998, 12-14; Hokkanen & Kojo 1998, 25-32).

As Table 4 illustrates, particularly in the third meeting there were so few people that the atmosphere itself became a factor. Indeed, the number of representatives from Posiva, research organisations and the media combined was greater than that of the local inhabitants. On the other hand, the participants represented local associations thus participation was both direct and representative.

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20 Posiva organized four meetings in each candidate municipality at the preparatory stage of the EIA programme in the autumn of 1997. The first and the fourth were "open" meetings, whilst the second and the third were designed for the representatives of local associations. The "official" public hearing (and the meeting) of the EIA programme was organized after the EIA programme was completed in the spring of 1998.

Table 4. Participation in public hearings during the preparation stage of the EIA programme

	Meeting 1	Meeting 2	Meeting 3	Meeting 4
	(open)	(representatives of local associations)	(representatives of local associations)	(open)
Eurajoki	46	17	10	41
Kuhmo	70	24	20	25
Loviisa	58	22	7	27
Äänekoski	18	20	5	25

Source: Hokkanen & Kojo 1998, 26-30

Table 5. Participants at the first public hearings in proportion to the population of each municipality

	Participants in meeting 1	population (only inhabi-tants over 15 years old)	ratio (%)
Eurajoki	46	4 907	0.94
Kuhmo	70	9 908	0.71
Loviisa	58	6 522	0.89
Äänekoski	18	11 084	0.16
Total	192	32 421	0.59

Source: Hokkanen & Kojo 1998, 25

Table 5 illustrates that in terms of representation, the number of participants were very small. Even at its height (in Eurajoki), the number of participants was under one per cent of the local population over the age of 15. In Äänekoski, levels of participation were even lower. The fact that participatory activity, during the EIA process, was so low certainly raises alarming questions as to the effectiveness of the whole public participation strategy. Undoubtedly, the most effective forum for interactive participation is the public meeting. Whilst other forms of participatory activity remain useful however they cannot provide an adequate substitute for such direct face to face contacts.

Table 6. Participants at the EIA programme public hearings proportioned to the population of the municipalities

	Participants in meeting	population (only inhabitants over 15 years old)	ratio (%)
Eurajoki	32	4 907	0.65
Kuhmo	14	9 908	0.14
Loviisa	44	6 522	0.67
Äänekoski	11	11 084	0.09
Total	101	32 421	0.31

Source: Hokkanen 1998, 12

As shown in Table 6, after the EIA programme was completed, participation activity levels decreased still further. The ratio, at its height, was under one per cent. To achieve such pitifully low levels of participation reflects a certain lack of representativeness thus seriously bringing into question the credibility of the public participation process as a whole. Furthermore, notwithstanding participation levels themselves, it is also important to take into consideration the quality and versatility of such activities.

A further interesting dimension of public participation in this respect is illustrated by the notion of *accumulation*. Given the unequal division of resources available to participants,[21] it is often the case that the same individuals participate on numerous occasions (see e.g. Paldanius 1992, 55). Thus it is clear that, as the number of participants is small, and general resource levels dedicated to facilitating the participation of the general public are inadequate, it is possible then to see the emergence of *an elite* group of participants in direct participation process, that is to say, a kind of oligarchy emerges. As seen in Figure 4, it is usually the political stratum who take part in such processes as the EIA[22]. People in the political stratum are active in general, they operate in many arenas and they have many ways of participating and of exerting influence. It is obvious therefore that this political stratum has a disproportionate ability to influence policy making at the planning stage.

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21 For more on participatory resources
see e.g. Paloheimo & Wiberg 1997, 70-73; Paldanius 1992, 33-35.

22 The division in Figure 2 was originally made by Dahl (1971, 151).

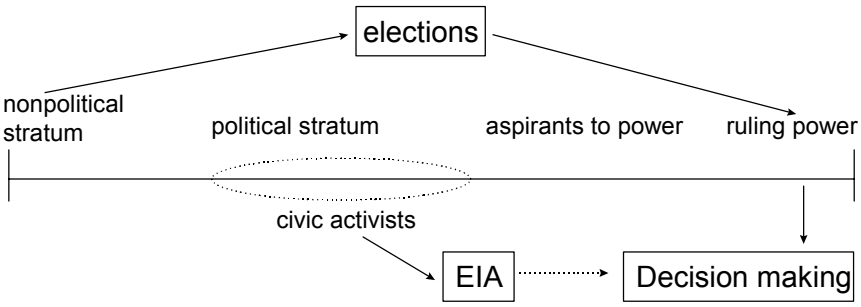

Figure 4. Accumulation of political participation

The essential point encapsulated by Figure 4 is that the group of participants in the EIA process is so formulated that the extreme groups of a segment of a line does not meet each other. As it stands, the EIA process is one in which elite groups interact to the practical exclusion of ordinary people. This is neither sensible nor satisfactory. At its best, the EIA process should act as a direct forum for interaction, the exchange of ideas and information, and legitimation between public opinion and decision makers.

Studies investigating EIA public hearings on final disposal have revealed that participation levels were high among local activists. Moreover, in the public meetings, it tended to be the case that the same individuals debated the issues as occurred in the other arenas. A survey detailing the identities of participants in the meetings revealed that such people were active members or executives of local associations (Hokkanen 1998, 30-32). It should also be remembered that in this particular EIA process, in addition to the open public gatherings, meetings were organized exclusively for local politicians and officials. Thus it can be claimed with some justification that the function of participation in EIAs in general is directed specifically towards those who already wield representative power.

Much for few and little for many

Why was participatory activity in the EIA process so low, with episodes of participation centred on such a small group of individuals? Good conditions surely existed for a wide level of participation: an exceptionally interesting project of great importance to local inhabitants, Posiva itself offered many different ways for interested parties to participate and publicized them well. Indeed, in every respect the EIA process was carried out to a better degree than the

minimum standards required by the EIA Act itself.

The reasons for the low levels of participation can be condensed into six factors. (1) The tradition of public participation has historically been based on representative democracy in Finland. There is little or no tradition of direct participation in Finland, especially in planning processes. (2) As an instrument of participation, the EIA is thus still a novel form of political engagement. As such, the intricacies of the process are not well known by the general public. Only small groups of particularly active citizens are therefore able to use the EIA process effectively. (3) In general, the EIA process is felt, by the general public to be ineffective. The effectiveness of EIA based "policy making" is indirect, and the relationship between the EIA and the decision making process as a whole is often unclear, at least for the general public. It is probable that the EIA is viewed by the public as merely the formal part of a long process, where the purpose of participation and interaction is only to legitimate the project, thus acquiescing to the attitudes of the developer. Many people therefore feel that it is pointless to participate in the EIA itself, as other citizen based forms of activity often provide more meaningful and significant ways of participating, albeit from outside of the official EIA process itself. (4) The final disposal of nuclear waste is an exceptionally long process. For example in Kuhmo, planning process lasted over ten years. Activity fatigue is clearly therefore one reason for the declining levels of public activity. The fact that the local inhabitants of these communities had to endure an ongoing series of examinations, surveys and reports, often containing difficult technical information side by side with thinly veiled "recommendations" on how to proceed, generated by elite level interactions, undoubtedly led to increased passivity in the citizen base. It is clear that a single participation if done with sufficient effectiveness should be enough to fulfil the needs of public participation in the representative sense. Indeed, this level of activity is generally regarded as preferable to that of multiple or continuous interventions, over the period of a number of years, by the majority of the general public. On the other hand, one should not discount the fact that the continuous visibility of the project and the ability to conduct repeated interventions may in itself activate some citizens. (5) The long duration of the process itself, the holding of public meetings, and the massive information campaigns all increased to local knowledge on nuclear waste management in general, and on the final disposal of nuclear waste in particular. So much so in fact that many citizens may feel that their knowledge is of a sufficient

standard to enable them to formulate their own opinions on the subject. In such a situation people may feel that it no longer becomes neces to take part in the EIA process, at least not repetitively. (6) Participation levels may also be explained by varying levels of access to the resources associated with participation, and with the tendency towards the accumulation of interventionary acts among certain groups of individuals. EIA participants are in a sense self-selecting, thus the basis for participation narrows and tight-knit groups of activists emerge as a result.

Concluding on the issue of participation, it is essential to understand the national status of EIA's in the context of their specific national planning and decision-making systems. Consideration of the resource levels dedicated to participation, and the more amorphous nature of the functioning of national 'power constructions' in this context, are also apposite here. Berndtson (1993, 138) reminds us that it is not possible to maintain democracy if all citizens are equally politically active. High levels of interest leading to maximal levels of participation in social questions would lead not just to the emergence, but the dominance of sharp and irreconcilable differences across society, and by extension, to rigid fanaticism. Thus it is perhaps not unreasonable to expect minimal levels of participation from most actors in the process. If the focus of discussion is to be the need to increase public participation, it is important to consider what exactly this means. Participation should always been grounded in notions of "effectiveness," though it has to be said that in the EIA process as a whole, the effectiveness of the public participation segment of the process is difficult to gauge.

The role of EIA in the planning and decision making process

The EIA in relation to decision making

The EIA process provides an example of open and interactive planning. The special feature of the EIA is that it is purely a planning tool. No decisions are made in the EIA report, and no new systems of policy making are created. As an instrument of planning, the EIA is merely a part of the existing mechanism of planning and decision making. The EIA provides a way in which public opinion may be integrated with traditional decision making processes, though it should be noted that the EIA process is not the creation of citizens themselves

(cf. the model of civil society). As such, it should be obvious that the EIA cannot be used as a replacement model for representative democracy, rather it is a process sustaining the tradition of the representative use of power. Debate over the superiority of direct or representative democracy cannot therefore be solved through invocation of the EIA process. The EIA is simply an instrument of planning, and as such should not be viewed as a process in which decisions are taken, no matter what rhetorical model of democracy is in use.

The problem, at least in Finland, is that the status of the EIA relative to that of traditional forms of representative power and mechanisms of policy making, remains low. The EIA is not an arena for policy making or for political yes and no choices. In practice, the EIA process is simply one of plan adjustment, where public participation is used as a way of collecting local opinion relating to the project. Neither should the EIA process be seen however as one simply of conciliation and negotiation. It is also debatable whether it is better to attempt to extend public participation in the process, or to concentrate on making the content of the EIA more versatile. In the latter case, the number of participants is not automatically a decisive factor. It is also important to note that participation is not an unchangeable variable. Across the different stages of the EIA process, actor participation and intensity levels may vary greatly.

It is very difficult to evaluate the effectiveness of public participation. In the EIA case however two levels of effectiveness can be determined. It is possible to analyse the effectiveness of public participation "inside" the EIA, and the sense of participation, noticed from the documents made in the process, the EIA programme and the EIA report. On the other hand the focus of analysis could be the EIA process as an entity when the goal is to discover the effectiveness of the EIA, including the effectiveness of its public participation aims, on policy making. According to Karvinen (1997) citizens does not highly rate their own ability to influence the EIA process. The main problem for them being the lack of transparency and the inability to demonstrate immediate effectiveness. The distance between the EIA as an event, and policy making as a general process is too long for people to experience at first hand the influence of their participation, even where such interventions may in fact have had an impact.

The first significant finding concerning the EIA process on the final disposal of nuclear waste is that of the overall complexity of the planning and decision making process, one with an extensive system

of permits etc. It is quite obvious that the aim of the EIA can become easily lost in the complicated phases of the plan. Often, it is only with great difficulty that the EIA is connected to policy making. The conceptual distance between public participation in the EIA process and the final decision making of the Council of State is so large that the meaning of the EIA often becomes confused. The contribution of the EIA to decision making therefore seems to be minimal in the case of final disposal.

According to the tentative results of studies made by the University of Jyväskylä (Heikka & Litmanen 2000) members of the municipal council and leading officials in Eurajoki see economic reasonsing as most important when making decisions at the local level with regard to the issue of final disposal. For them, the EIA represented a somewhat undetermined entity of studies. In the final phase of individual attitude formation and decision making, neither the EIA nor the assessments of environmental impacts themselves were given prominence. Instead, the decision makers interviewed in the research, emphasized he importance of economic reasons and the Vuojoki agreement made previously with Posiva. They saw the EIA as an open and democratic arena for public participation, but there was no mention made of the opinions and attitudes of citizens when estimating the significance of the contribution made by the EIA to decision making on the project.

A practical problem, at least for decision makers in Eurajoki, was the huge amount of raw information available. It was felt by a number of actors in this municipality that there was insufficient time available to familiarise oneself with the research results, which were sometimes rather complicated and difficult for the layperson to understand. Comments regarding the presentation of results, through the extensive use of scientific jargon, were also made. Paradoxically, local decision makers were supplied with all relevant information available, though the final outcome was a flood of raw information and research results, where perhaps a more user-friendly approach was required.

As the process leading to the decision in principle in the Council of State has yet to begin, it is impossible, at this time of writing, to undertake a final evaluation of the role of the EIA in that particular decision making process. Moreover, after the decision in principle is reached, the ratification of Parliament is still necessary. It is however assumed in knowledgeable circles that the impact of the EIA will be fairly small. The basis for this pessimistic conclusion can

be found in the nature of the plan itself. There are no listed alternatives to the basic plan outlined in the EIA report. As an appendix to the application for the decision in principle, the likely impact of the EIA report is thus uncertain. For decision makers at the national level, i.e. ministers and members of Parliament, the question of nuclear waste is an issue with significant political and economic implications as well as one that is fundamental to the future direction of energy policy. As we have seen however, legislation in this area makes the political room for manoeuvre fairly narrow. The plan formed in the Decision of the Council of State in 1983 still acts as the predominant factor guiding the behaviour of policy makers in this area.

The Legitimacy of the EIA, and the acceptability of the plan

Although the *legality* of the EIA process is undisputed, questions over its *legitimacy* remain. The basis of legitimacy differs depending on the actor asked. In the case of the final disposal of nuclear waste, many actors, mainly opponents of the plan, felt that EIA legitimacy was impossible to achieve both because of the dominant status of Posiva, and given that the competent authority was the KTM. The lack of any real alternatives, and the weakness of the EIA in relation to other actors and/or processes in the Finnish policy making system, can also be regarded as having contributed to the perceived legitimacy crisis. Valve (1999, 140) reminds us that the EIA process is only meaningful if it has a discernable input into policy outcomes. This means that environmental assessments are about examining different policy alternatives. If just one planning alternative is considered, as in the case of final disposal of nuclear waste, future development is shown as being more or less inevitable and thus unalterable.

For the developer one way to legitimise the EIA process is to highlight its public participatory elements. Public participation may however rather cynically, and with little difficulty, be changed into an instrument of politics. The "naturalization" of the issues discussed, combined with the pretence of democracy (process not outcomes) thus become highly effective strategies for the maintenance of legitimacy and the gaining of credibility. Through the use of a "populist" participation strategy Posiva achieved its goal of making the EIA programme appear as if it was grounded in local opinion and argument. In point of fact, developers will primarily draw up each EIA programme in accordance with their own interests. The genuine opinions of the general public may of course be included, though the

thrust of the analysis here is that, more often than not, developers grasp the opportunity to use public participation as a political instrument to legitimise the EIA process (Hokkanen 1999, 152-153).

On the other hand the EIA can be seen as an instrument to legitimise the plan itself. As stated above, the acceptability of the plan is probably the most important question in Finnish nuclear waste management. The technical solution to the problem is probably easier to attain than the achievement of psychological and social acceptability for it in the community. Thus it should be obvious that the struggle for acceptability is *the* critical element in the social construction of the nuclear waste management issue. Furthermore, given that local acceptability has a decisive impact on the implementation of the plan, social acceptability by candidate municipalities becames the most important social task of the plan. (Litmanen, Kojo & Hokkanen 1999, 288.)

Hukkinen (1997) thus takes the view that the EIA is not a suitable instrument to deal with the problem of acceptability. According to him, problems regarding acceptability can be based on much more profound disagreements and fundamental opinions. Kojo (2000b) analyses attitudes in relation to EIA acceptability, even though the aim of the EIA is to gather information on the impact of the plan itself. Particularly with plans such as the final disposal of nuclear waste, where contradictory views on acceptability are the norm, public discussion is not limited to the impacts of the plan alone.

Conflicts

Although environmental awareness has increased and the importance of environmental protection has become widely recognized, this does not automatically mean that single environmental management projects are perceived as acceptable. For some actors, the Finnish model of nuclear waste management is a large scale environmental investment, though it should be noted that not all citizens think that the proposed solution to the problem of high-level nuclear waste is a good one (Litmanen, Hokkanen & Kojo 1999). The final disposal of nuclear waste is an emotional issue capable of arousing strong emotions. The inhabitants of the municipalities have set up movements, both in favour of final disposal (the Pro Loviisa Movement, and the Kuhmo with possibilities Movement) and against (the Loviisa Movement, the Romuvaara Movement, and the Kivetty

Movement).[23] In addition, several individuals have actively expressed their positive or negative opinions concerning final disposal in their own municipality (Posiva 2000).

Thus, it is obvious that there are major disagreements or conflicts over the plan itself, for example, over the base alternative and alternatives to it, regarding the timetable, and also concerning various technical details etc. In accordance with the initial research problem outlined at the beginning of this study, no detailed analysis of these issues is undertaken here. Instead, analysis concentrates on the points of conflict in relation to the EIA process itself, and in particular to the interaction of the main actors. It should however be noted from the outset that no large conflicts occurred during the EIA process. The demeanour of actors from all sides remained calm throughout, and the process of interaction could easily be seen to fall into line with general Finnish traditions of public and/or civic protest (see e.g. Kojo 1999a; 1999b; Kojo & Suominen 1999; Suominen 1998).

The reasons such conflicts occurred can be condensed down into three factors. First, and perhaps most visible and important, was the status of Posiva as a developer. For opponent actors, i.e. environmental groups, civic movements and individual inhabitants of the various municipalities, this was clearly the most important obstacle to the credibility of the EIA. Critical opinions demanded that the role of developer be assumed by an environmental authority. Given the status of the developer therefore many actors expressed little confidence in the EIA process, and in assessments made regarding the plan. A case in point here centres on the way in which various meetings were conducted, in particular, the presence of Posiva at these meetings was a major bone of contention, as opponents suggested that the presence of Posiva prevented open discussion of the issues, and increased the likelihood of being "marked down" by Posiva who had the luxury of being able to pick and choose between the candidate municipalities.

Secondly, there were many critical opinions and arguments over the issue of the competent authority. As described in 3.2.1, it was unusual that the competent authority was the Ministry of Trade and Industry. Both the KTM and the STUK were seen as compromised actors with visible connections to the nuclear energy companies (see

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[23] The original Finnish names of the civil movements mentioned are: Loviisan puolesta ry, Mahdollisuuksien Kuhmo ry, Loviisa-liike, Romuvaara-liike and Kivetyn puolesta ry.

e.g. Rosenberg 1999). The third reason for conflict was the existence of the "Vuojoki agreement" (see also 3.2.2). It is interesting to note that actors on both sides, e.g. in Loviisa, were embittered by this. The agreement was understood to be the result of unfair and hidden practices on the part of Posiva and Eurajoki Municipality. Rosenberg (1999) describes the EIA process as a theatre with roles and script fixed in advance. Implementation of the EIA process as such could thus be viewed as background scenery designed to cover the bare realities of the situation, namely: the fundamental, moral and political choice between the alternatives of nuclear waste management. Furthermore, actions such as the "Vuojoki agreement" inevitably provoked conflict between the competing municipalities.

Questions raised and disagreements emerging with regard to the plan are on occasion difficult to deal with because of problems inherent to the planning process. It is important to note that the EIA is not a trouble-free instrument for citizen based or civic participation. Participation in the EIA necessitates a particular consideration of values and meanings. In fact, the EIA merely represents one possible route to participation and possible influence for different actors. In addition, the EIA process itself precipitates numerous social impacts which are themselves not assessed in the EIA process.

Activities occurring outside the EIA process

Even though the main focus of the study is the EIA process, it is necessary briefly to analyse public activities outside of the EIA. For example, it was not at all obvious how actors opposed to the project should take part EIA (Kojo 1999a; 2000b; Rosenberg 1999). Participation was in some cases encouraged by Posiva as a gesture on their part simply to legitimise the EIA process and, by extension, the plan. Furthermore, the EIA process is hardly the most effective way for opponents to exert influence, as it is quite formalised, and dominated by the developer.

For this reason, many incidents of activity took place outside of the formalised process of the EIA itself. For example, letters to the editor, complaints, initiatives and direct forms of civic activity were used (see e.g. Kojo 1999a; 1999b; Kojo & Suominen 1999; Litmanen 1994; Pirttikoski 1996; Suominen 1998). In Kuhmo and Äänekoski, the issue of nuclear waste found its way into the local government election campaign in 1996 (Hokkanen & Kojo 1998a). In other words, even though the plan was predominantly seen through the lens of the EIA process in all candidate municipalities, all key actors continued

with the day to day functions of normal civic and political 'life' outside of the formal EIA process.

The most immediately visible activity occurring outside of the EIA process was naturally the Vuojoki agreement. This in itself illustrates how important it is to understand the whole context of the plan. For both parties to the agreement, Posiva and the municipality of Eurajoki, the Vuojoki agreement was much more effective than participation in the EIA and the gaining of influence through it. In the case of the final disposal of nuclear waste, it can be said that activity occurring outside of the formal EIA process was, in general, were more effective when it came to understanding the relationship between planning and policy making (see also 5.1). This is not to imply that that the EIA was needless or useless, rather it indicates where the most important mechanisms of policy making in such big development projects are to be found.

Tentative research results suggest that participation levels and modes, and the use of power more generally, in such non-EIA forums follows a similar pattern to that which occurs in the EIA process itself. In actual fact, a rather small network of municipal councillors are interested in the question of nuclear waste. The active members and executives of local associations are also active when evaluating their contacts with municipal councillors or local officials. In other words, a special "nuclear waste network" of interaction is discernible in all candidate municipalities (Hokkanen 2000).

Conclusions

As a plan, the final disposal of nuclear waste is very complicated. Consideration has to be made of the co-existence and reactivity of the technical and social dimensions of nuclear waste management, maintaining the dynamic nature of the plan. The issue of nuclear waste is a controversial political question, which involves a myriad of general economic, environmental, and political interests as well as the more practical concerns of the energy producers themselves. At the local level, concerning site locality, the plan is notable from an economic, political and social sense. For all key actors the question of nuclear waste is very sensitive. It provokes strong emotions as well as precipitating a rhetorical struggle over "the facts". The main challenge for nuclear waste management is the control of social factors. An essential element in the implementation of the plan is therefore the political struggle over its acceptability.

The plan was lodged within the EIA process for almost three

years. The EIA, in this sense, provided a kind of "shop window" for the plan in all the candidate municipalities. The importance and the visibility of the EIA process were so overwhelming that expectations probably rose beyond realities. In particular, inhabitants of the candidate municipalities expected the EIA to be an instrument of policy-making and direct influence. For those actors opposed to the plan, the EIA merely presented a last chance to influence its implementation. It is also undoubtedly the case that given the novelty of the EIA process many actors simply did not understand its aim and limitations. The nature of the planning and decision making system may also have confused a number of participants in this respect. Furthermore, as Koskiaho (1997, 240) reminds us, the EIA may in practice become a forum for quasi-planning if the expectations bundled up within it are not realised.

The EIA, as an instrument of participation and influence, is rhetorically located in new ground between the traditional model of statist administration and governance and the "ideal type" model of a fully functioning civil society. The reason that problems with the EIA process in general emerged, and that expectations became unrealistic, may both be found in this enduring reality. Obviously the actors are unlikely to mentally situate the EIA within such a typology, where society is divided into two separable elements, namely state and civil society (see e.g. Berndtson 1993, 44). As an institution, the EIA is a creation of the state, but the form of participation is direct, a trait which is usually connected with civil society. The EIA can be seen as a product arising from pressure to increase public participation and influence. The EIA thus contains elements both of participation, and of the use of power. It is not justifiable to pressurise civil society with the hardened structures of the state, or to fuse state and civil society, as either would endanger the operation of democracy. In practice, the EIA process has however, since its inception, adapted itself to the pressures exerted by these two often contravening pillars of society. In considering the status and problems of the EIA process from the viewpoint of public participation, we come very close to fundamental questions on the meaning of democracy and of the separation between civil society and the state.

On the question of whether the EIA process, as it related to the final disposal of nuclear waste, could be said to be a success or not, the jury remains out. There were, as usual, pros and cons to the EIA process. On the plus side it should be said that the assessment process itself was wide enough and that the impacts of the plan in the four

candidate municipalities were extensively evaluated. It is however another question altogether to suggest that the impact assessments had any significant contribution to make as regards the fundamental alternatives facing. Finnish nuclear waste management policy. The various information activities, and the interactions between the actors concerned with the plan were also conducted in a proper fashion. Additional meetings in all candidate municipalities, and at regional and national level, were held to accommodate the views of different groups of actors. Naturally the four candidate municipalities were kept closely connected to the ongoing EIA process in a number of ways. Moreover, it should also be noted that the EIA did play an important role in securing public participation. Furthermore, from a practical standpoint, the EIA enabled Posiva to advance the plan, and it should also be said that it offered a surfeit of information to decision makers.

Even if the quality of the EIA report was generally considered good, and the EIA on final disposal was *successful as a planning tool,* correctly identifying, predicting and evaluating the likely environmental impacts of the plan, there were however obvious problems with the role of the EIA as a tool of policy making. Firstly, the national importance of the plan itself simply dwarfed, in a political sense, the practical recommendations of the EIA. The national importance of the issue at hand, the plethora of economic and political interests to contend with, and the fact that the base alternative and its timetable were decided in advance, made the context so difficult that the issues finally included in the EIA were of a lower level of concern. In short, the EIA was not politically robust enough to function effectively in this highly charged and controversial environment. Furthermore, the planning and decision making timetable was simply not favourable to the EIA. Moreover, the lack of alternatives, and the temporal connection between the EIA process and the Government's decision in principle, added to the confusion. The complex process of decisions in principle and individual permits merely bloated the EIA process. The final blow was the instigation of the Vuojoki agreement. In other words, the whole EIA process could be viewed as somewhat symbolic, as many of the most important decisions were made outside of the formal process whilst the EIA was carried out to legitimate the plan and decisions *ex post*.

It seems obvious, in projects such as the final disposal of nuclear waste, that an SEA (Strategic Environmental Assessment) should be undertaken. Discussion of fundamental questions relating to the basic alternatives should be included in the SEA, which itself

should be conducted before the EIA. Although the EIA provided a good knowledge base for planning and decision-making, and there was a sufficient level of interaction between key actors, the final impression left by the EIA was not positive. The upshot of all this was that the power of national EIA legislation was decreased because the actual decisions were taken before the EIA phase of the plan even commenced.

As the present study suggests, there were several problems with the EIA process. Public participation was slight when evaluated in a quantitative fashion. Moreover, participation levels decreased throughout the process. In the municipalities, the designated EIA contact persons remained under utilized. Furthermore, the levels public participation that did occur were themselves predicated on a small number of multiple contributors. This group of people formed what essentially became an elite group of direct participants. What was perhaps even more concerning was the fact that inhabitants and policy makers from each of the candidate municipalities did not met during the EIA process. There were so many arenas of participation potentially available that the EIA was not always the most effective forum in many cases. Activity outside of the formal EIA process was thus important for all actors. This was especially so for those who opposed the plan, as the logistics of the EIA process was complicated to say the least. On the one hand it could be argued that, it was important to use such an instrument, though on the other, it is obvious that a lack of both understanding of, and confidence in the process existed.

At this stage there is little to be gained in entering into recriminations over the quality of the EIA or of Posiva's implementation strategy. It is more important that questions surrounding the nature of EIA legislation, and the role of the EIA in big development projects – as well as the relationship between planning and decision-making – be adequately addressed. It would be unfair to blame the EIA for the final disposal of nuclear waste. Even if the EIA had been conducted in some other way, it is not obvious that the final outcome would have been any different.

The present case study can be concluded with the question: what significance did the EIA process have for different actors? Who benefited? Who was disappointed? Moreover, if we examine the EIA as an input to decision making, whose voice was heard?[24]

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[24] For more on the concept of input and output in policy systems see Easton

For Posiva, the EIA was evidently a success. The EIA process on the final disposal of nuclear waste was carried out predominantly in their interests. The environmental impacts of the plan were identified as was assumed in the EIA legislation. For Posiva, the EIA was also effective on the information front, as well as in the fields of interaction and lobbying. Through the EIA process, Posiva was given the ability to vocally support its own plan throughout the competing municipalities and beyond. The EIA was thus almost used as an instrument of propaganda in the search to gather "acceptance" for the plan. On the question of site selection, the EIA also played an important role for Posiva. The EIA process has already indicated to Posiva the nature of local attitudes toward the plan in the candidate municipalities. In Kuhmo and Loviisa particularly conflicts emerged regarding the EIA. If disagreement was going to occur at such an early phase of the planning cycle with regard to both the implementation of the planning and decision system, and to the plan itself, then it became obvious that such municipalities were not likely to be suitable. Throughout the EIA process Posiva obtained the information it needed concerning public attitudes and the positions of local politicians. In other words, social factors such as local suitability, were evaluated in the EIA.

When evaluating the EIA from the viewpoint of the decision makers involved, it is very difficult to really grasp how they themselves viewed the process. Thus far the process of decision in principle remains incomplete. Nevertheless, for decision makers in Eurajoki the EIA produced a large amount of data on the environmental impacts of the plan. Decision makers in Eurajoki therefore viewed the EIA as a democratic arena for public discussion for the inhabitants of their municipality. They also viewed the EIA as providing a solid basis of decision making for themselves, although the information produced by the EIA was not always accurate.

For citizens and civic movements in general, the EIA was only one means of participation. For opponents to the plan in particular questions of emphasis had to be answered, as each arena of participation offered up the potential of different forms of influence. Many alternatives were indeed available, such as written addresses, public and private meetings, and interactions through the office of the EIA contact persons. Although the general publics' opinions regarding the most important environmental impacts were probably reflected in

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(1965).

the EIA programme, it remains difficult to adequately chart the effectiveness of such public participation, particularly in relation to the decision making process. It is quite obvious for example that the EIA reflected the fundamental interests of Posiva, and that the decisions in Eurajoki were based on economic reasoning, and in particular on the "Vuojoki-agreement" to a much larger extent than on the scientific findings of the EIA, or on public opinion. On the other hand, Kojo (1999b) reminds us that the EIA did provide a useful mechanism for controlling and alleviating the worries, hopes and of the citizens, and an efficient route for disclosing them to the authorities and the developer.

In general we can say that the EIA serves the interests of industry and administration by regulating contradictions and reducing the number of appeals (Litmanen, Kojo & Hokkanen 1999, 292-295), though from the point of view of those who opposed the plan at the local level the EIA hampered action rather than offered a way to exert influence on the project (see Rosenberg 1999).[25] For the general public then, the EIA offers a way to exert influence, albeit at a very late stage in the process. It is for this reason that we should remember that local movements concerned with this issue have been active ever since the end of the 1980s (Litmanen 1994; Suominen 1998; Kojo & Suominen 1999; Veijalainen 1999).

The conclusions above may seem quite paradoxical given the stated attitudes of environmental actors during the drafting phase of the EIA Act in Finland. In the early 1990s, criticism of the EIA was mainly based on rather practical considerations. The industrial organisations considered the separate EIA procedure to be overly bureaucratic, and believed that it would slow down the processing of environmental permits and generate additional costs. From the industrial perspective, the preparation of the EIA Act was an unfortunate exception to the national corporatist law drafting model. With regard to EIA law, the agricultural policy networks also took a very critical stand, although the direct effects on these policy areas were minor. Indeed, environmental organisations supported the proposal of the EIA Act as early as 1982. In the early 1990s, the EIA Act advanced without much pressure from the environmental groups. Later on however, the environmental groups sought to tighten the law with respect to ecological objectives and public participation.

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[25] On the other hand, e.g. the Romuvaara-movement utilized written addresses in the phase of EIA program widely.

(Sairinen 2000, 260-261.)

In other words, it seems that in large scale development projects the EIA is mainly utilized by the industrial organisations and companies, i.e. the developers of the EIA processes (see e.g. Kantola 1999, 114). In this light, the most critical opinions regarding the EIA process come from environmental groups and individuals opposing the plans. It seems that the EIA process has grown into a political instrument used to administer complicated plans with strong underlying political and economic interests. When a developer has such a free hand to implement the EIA process, if can be used as an instrument to gather and maintain public acceptance of the plan and to garner legitimacy simply by association with the EIA process itself. For the general public and environmental groups the EIA represents a formal and regulated way of participation governed by the developer.

Bartlett (1988, 74) has said: "…impact assessment can be, and is, a powerful tool making policy, but a tool whose users must be sensitive to its requirements and to the political and cultural context in which it is being used." From the experience of the EIA on the final disposal of nuclear waste, it seems that the EIA functions as an environmental planning tool, though it remains necessary to discuss the political suitability of the EIA model for large development projects. The nature of the projects themselves, as well as the political context in which they are formulated, may create requirements that the EIA is simply institutionally unequipped to satisfy. This is particularly so when evaluating the democratic criteria related to the implementation of the EIA. Thus it is important to reconsider the concept of public participation and the effectiveness of such participation to a larger extent than has previously been the case, as well as the relationship between the EIA and policy making in general.

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Appendix

EIA studies

A summary of the issues assessed in the EIA procedure related to the final disposal facility of spent nuclear fuel. The impact is assessed and documented in the EIA report, which was completed in the spring of 1999.

1. Impact on nature

Soil and bedrock
Location of plant buildings and roads as well as utility lines and the changes brought about by them; location, shape and size of blasted and crushed stone heaps; location, shape and size of underground facilities; buildings and structures left on ground surface after decommissioning, landscaping; objects, structures and materials left in underground facilities after decommissioning; warming up of bedrock after decommissioning.

Surface and groundwater
Changes brought about by surface- and groundwater intake, treatment and conduct into environment; changes in flow conditions of surface water; changes in level and flow conditions of groundwater; impact of emissions of radioactive and other materials on water quality.

Air
Impact of emissions of radioactive and other materials on air quality.

Organic nature
Changes in protection value and diversity of nature, ecological

fragmentation of nature; restoration of nature after decommissioning; impact on human beings and built-up environment.

2. Human health

Health hazards and impact on health of emissions of radioactive and other materials, radiation emitted by radioactive materials, noise and traffic accidents.

3. Community structure

Changes in population and population structure, impact on employment, impact on production and business activities, impact on infrastructure, impact on the economy of municipality and inhabitants as well as impact on the image of municipality.

Source: Posiva 2000