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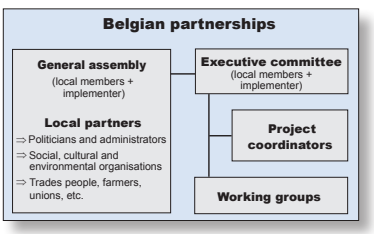
Partnering for Long-term Management of Radioactive Waste

Evolution and Current Practice in Thirteen Countries



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FOREWORD

The Forum on Stakeholder Confidence (FSC) was created in 2000 under a mandate from the OECD Nuclear Energy Agency's Radioactive Waste Management Committee to facilitate the sharing of international experience in addressing the societal dimension of radioactive waste management (RWM). It explores means of ensuring an effective dialogue amongst all stakeholders and considers ways to strengthen confidence in decision-making processes. The FSC has documented a wealth of experience through topical sessions and studies, and in particular through its national workshops and community visits. Summaries and proceedings are available online at www.nea.fr/html/rwm/fsc/.

In 2004, the Forum synthesised countries' experience of relationship-building in the report Learning and Adapting to Societal Requirements for Radioactive Waste Management. Partnership approaches were cited as effective in achieving a balance between the requirements of fair representation and competent participation. They were also found to contribute to the desirable combination of a licensable site and management concept with host community support. Finally, partnership arrangements help ensure a balance between compensation, local control and development opportunities.

Elements of the partnership approach have been incorporated into the RWM strategy of most OECD countries. Such an approach to decision making, to jointly own both the problem and the solution, is increasingly implemented with success worldwide. This report documents how the approach to partnering has been or is being implemented in 13 countries, namely: Belgium, Canada, the Czech Republic, Finland, France, Hungary, Japan, Korea, Spain, Sweden, Switzerland, the United Kingdom and the United States. In this context, it should be mentioned that the waste management programmes considered in the report are at very different stages and actual experience in implementation reflects participatory measures during the stage of designing the siting procedure or first siting steps. It is to be expected that within the coming years there will be growing experience as well as application to the full waste management cycle. This publication may aid future assessments of subsequent evolution and progress and can be consulted now for ideas and insights into transversal findings.

Acknowledgements

This publication is based on a study prepared in 2007 by the UK Nuclear Decommissioning Authority (NDA) which reviewed the partnership approach in ten countries. The NDA gracefully accepted the FSC proposal to augment and disseminate its study. Special thanks are due to Dr. E. Atherton, an FSC member from the United Kingdom and the NDA Head of Stakeholder and Community Engagement for Radioactive Waste Management.

Prof. A. Vári and Dr. C. Pescatore augmented the original "Overview and transversal findings" with an analysis of the last decade of progress. These materials were reviewed and adopted by the FSC members. The latter contributed the texts on their own country experiences. Ms. C. Mays served as the editor of the present text, aided by Ms. K. Sazama and Ms. M.-L. Peyrat. Ms. W. Sabbah assured the French translation.

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OVERVIEW AND TRANSVERSAL FINDINGS

The search for sites for radioactive waste management (RWM) facilities attracts attention from implementers, government bodies, local communities and the public at large. Facility siting processes, in general, tend to be marred by conflicts, disagreements and delays. In response a shift has taken place, in the RWM area, from a more traditional "decide, announce and defend" model to one of "engage, interact and co-operate." The essence of the new attitude is an approach of co-operation or partnership between the implementer and the affected communities, involving dialogue between experts and citizens, mutual learning, and public involvement in the process of decision making. National ministries and authorities have also been called to play a more visible role. The intensity and degree of partnering may vary from country to country and in different phases of project development.

In its first phase of work, the Forum on Stakeholder Confidence (FSC) synthesised countries' experience in its report "*Learning and Adapting to Societal Requirements*" [1]. Partnership approaches in Belgium, Canada and Finland were cited as examples of helping achieve a balance between the requirements of fair representation and competent participation. Other advantages of the partnership approach were linked to helping to achieve a combination of licensable site and management concept with host community support and helping to achieve a balance between compensation, local control and development opportunities. Those observations are still valid today.

It is a fact that key elements of the partnership approach have been incorporated into the RWM strategy of most OECD countries and that these approaches to decision making, to jointly own both the problem and the solution, are increasingly implemented with success worldwide. A great variety of approaches exists according to the legal and institutional arrangements within each given country, their political and cultural traditions, the economy of the affected communities and the characteristics of the relevant national RWM programmes. The present volume documents how the approach to partnering has been or is being implemented in thirteen countries, namely: Belgium, Canada, the Czech Republic, Finland, France, Hungary, Japan, Korea, Spain, Sweden, Switzerland, the United Kingdom and the United States. In this context, it should be mentioned that the waste management programmes that are considered in the report are at very different stages and actual experience in implementation reflects participatory measures during the stage of designing the siting procedure or to first siting steps. It is to be expected that within the coming years, there will be growing experience as well as application to the full waste management cycle.

Components of the partnership approach

Voluntarism, right of veto formally or informally ensured to the affected communities, collaboration with local stakeholders in facility design and implementation, and the provision of community benefits packages are the main components of the so-called *partnership approach.*[1]

1. It should be noted that, in some countries, processes without voluntarism and veto power have also taken place.

By "voluntarism", we refer to the local government representatives of a community expressing an interest in participating in a process to determine the suitability of siting a radioactive waste management facility within the boundaries of their community. Such an expression of interest may be in response to an invitation by the waste management organisation or by government or it may be an unsolicited offer.

By "right of veto", we mean that community is allowed to withdraw from consideration within a certain period.

Collaboration with affected communities may take a variety of administrative formats relying on legally binding agreements or on less formal arrangements. Sample bodies seen to participate as partners for the community side include non-governmental organisations, associations, ad-hoc groups, committees or informal networks with participation of identified stakeholders or their representatives. The composition of the relevant working bodies, tasks to be carried out, tools to be applied, fact finding and decision-making mechanisms may also vary widely.

Community benefits are key components of the partnership approach. Social and economic benefits are aimed at recognising that a community that hosts a facility is volunteering an essential service to the nation. Engagement packages are designed to enable the affected communities to meaningfully participate in the partnership and in the decision-making process.

Practical implementation

Voluntarism

In most volunteer processes, waste management organisations or national government invite all municipalities in a given country to participate in a siting exercise. Sometimes, before searching for volunteers, a preliminary screening is carried out based on desirable technical and/or socio-economic characteristics. There exist cases where municipalities themselves initiate discussions with the implementer or government on hosting radioactive waste facilities. This is more likely to happen in communities that are *de facto* hosts of the waste. Case examples presented in this volume confirm the earlier FSC finding that prospects for both successful facility siting and partnering are enhanced if nuclear communities are involved [2].

Among the cases in this volume, it is usually the municipal government of a single community who expresses the interest to have their area investigated, but there have been cases where two neighbouring municipalities have volunteered jointly. Local governments apply a variety of methods (e.g. public consultations, opinion polls, local referenda) in order to determine if there is willingness in the community to participate in the siting process.

Municipalities often set a number of conditions for continued participation. These may include continued favourable public opinion; empowerment measures, e.g. possibility of preparing community's own studies and reports, especially with regard to safety; possibility for reviewing the studies performed by the implementer; hiring independent experts; improving the local infrastructure, e.g. road upgrades; emergency preparedness and response; monitoring activities, e.g. by both the implementer and the municipality; and community benefits.

Right of veto

Veto powers are exercised at well-defined stages in the decision-making process, and there is usually a point in time where the community expresses its final decision on whether to host a facility. In some countries, the final veto right is exercised when the waste management organisation submits its

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environmental impact assessment, but (in the case of deep repositories) before detailed underground investigations are undertaken. In these cases a "yes" decision is conditional on regulatory approval of the facility and the fulfilment of other conditions set by the community. In some countries, communities can use their veto right until construction begins.

It is usually the municipal government who exercises the right of veto. In some countries the law may permit the local veto to be overridden by a higher decision-making authority or the national government. Case studies in this volume confirm the FSC observation that the granting of a veto right to host communities, even on an informal basis, is an important factor for opening the way to enduring local support [1].

Mechanisms for collaboration within the partnership

The setting up of the partnership may be prescribed by law. Partnerships can also be established on the basis of the decision of certain actors (e.g. local government or implementer), or in response to a citizens' initiative. Their operation is usually governed by regulations or formal agreements but there are examples of partnership working bodies functioning on the basis of informal agreements, as well. Partnerships may be set up for the duration only of the site selection process, but there are also examples of extension of partnership to additional periods of detailed site investigations, facility construction and operation. In the case of such an extension, the aims, tasks and composition of the relevant working bodies may be modified in keeping with changes in the communities' needs and concerns.

Community representation may be assured through the participation of local interest groups, civil society organisations (CSOs), authorities, scientific bodies, local politicians and/or neighbouring communities, amongst others. Representatives of the implementer may be voting members of the partnership, or may participate as external experts without voting rights. In some cases, representatives of the central government, typically regulators, are also involved as experts.

Depending on the given mandate, the partnership can enable the local community to undertake many tasks, e.g. building their own understanding and expertise of RWM issues; influencing the implementer's work in developing the RWM concept; providing inputs into site selection, construction, operation and closure; raising community issues and concerns and ensuring that they are addressed; developing a socio-economic package that will benefit the community; gathering, assimilating and disseminating information on RWM and on the implications of implementing a facility in the reference area; carrying out consultation activities with the inhabitants; and monitoring other players' performance.

Most often, the partnership plays an advisory role to the municipal government. This is particularly significant in the case of voluntarism, where the municipal government has to decide at various stages if the process should be continued or halted. Usually the partnership's working bodies participate in the preparation of these decisions. It should be noted, however, that there are situations that are not characterised either by voluntarism or by the right to veto, yet the partnerships still work in the interest of finding solutions best suited to the needs of the communities (like facility design or benefits package).

Community benefits

The countries' chapters in this volume show that several types of benefits have been offered by the waste management organisation or government, or requested by the local communities. These benefits can be classified into community empowerment measures, social benefits, economic benefits and intergenerational funds.

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Community empowerment measures are aimed at enabling communities to participate in the decision-making process and influence its outcome. These may include funds to enable public information, liaison, consultation and engagement, to hire own experts and advocates, and to cover the operational costs of the partnership working bodies. In some countries, local movements organised by the opponents of the facility are also entitled to funding, as long as they operate within the partnership framework.

Social benefits are designed to offset potential social impacts (e.g. stigma effects) associated with hosting a facility. These typically include guarantees of property value, employment for local people, support of local service industries, local training and investment in public services (e.g. new roads, hospitals). Social benefits may also serve for the development of local knowledge and technical competencies, e.g. new research centres, education programmes related to nuclear technologies and environmental protection.

Economic benefits are aimed at increasing the well-being of the inhabitants and stimulating local/regional development. Such benefits include taxes, jobs and financial incentives, among others.

Finally, intergenerational funds are established to support the long-term sustainability of the local community. Case studies indicate that there are no well-drawn boundaries between the various categories of community benefits. The same measures may serve for both social and economic purposes, in the short, medium and long terms.

As far as timing is concerned, some benefits are made available throughout the siting process, others only during construction and/or operation. In most cases, financial incentives are not made available before the facility is developed, but there are countries where they are used during the site investigation process as well. Typically, partnerships are actively involved in developing and negotiating the community benefits package.

Advantages and challenges in partnering

Working in partnership with potential host communities enables all pertinent issues and concerns to be raised and addressed. Co-operation creates an opportunity for developing a relationship of mutual understanding and mutual learning between the implementer and the affected communities, which in turn builds reciprocal respect and confidence. Involving local actors in the development of facility design and community benefits is likely to result in solutions that will add value to the host region and the community. Thus, participating in a partnership builds social capital, members of the community can develop new skills through their participation as well as increase their knowledge base about their community, its aspirations and its environment. Networks, norms and trust are built up, equipping the community to face other decisions and issues [3]. According to O'Connor [4], "political/economic partnerships, permitting to mobilise the relevant knowledge and resources for the implementation of an agreed societal solution [for] the disposal and watching over the wastes" are among the most important components of radioactive waste management strategies.

The partnership approach implies facing some challenges as well. To promote communication and collaboration between various stakeholders and specialists, effective expert-citizen interactions are of great importance. Methodological problems of facilitating such interactions have to be addressed, e.g. with regard to conflicting views on long-term safety [5] or other key concepts.

International experience shows that the adoption of a partnership approach requires that RWM institutions open up and improve their outreach and communication activities. This in turn is likely to lead to profound changes in their organisational culture [6]. The partnership approach necessitates organisation on the side of local communities as well: local members of the working groups need to

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represent the diversity of the local population's views; mechanisms need to be devised to enable scrutiny and challenge of the institutional actors, e.g. the implementer; and significant time, material and human resources need to be available in order to enable meaningful and successful local participation.

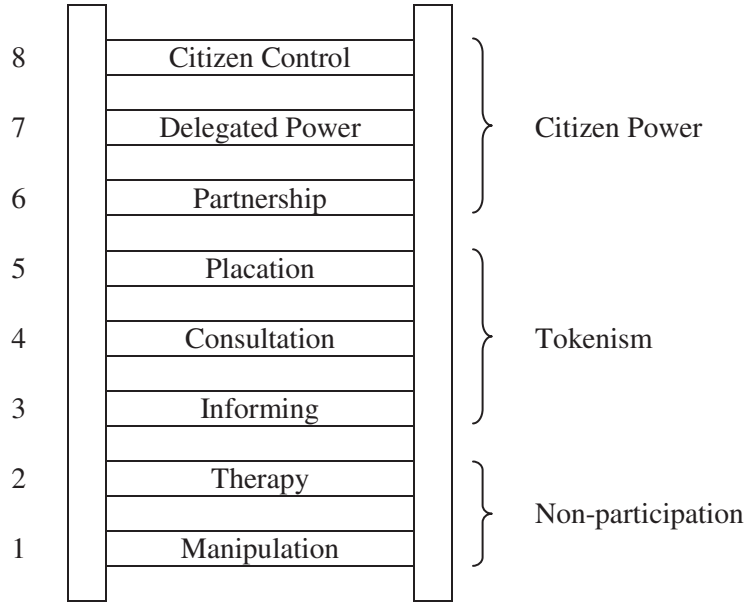
Public participation in radioactive waste management programmes: evolution in the last decade

For the purpose of analysing the trends in stakeholder involvement in the past decade it is instructive to compare the national contributions in the present study to those that were reported in a similar survey [7] of OECD countries that was carried out in the 1999-2002 time frame.

Ten years on: a leap from tokenism to real participation

The "ladder of citizen participation" proposed and elaborated by Arnstein [8] in 1969 provides a relevant framework to compare approaches or study evolution in public involvement (Figure 1).

Figure 1. **Arnstein's eight-rung ladder of citizen participation**



The bottom rungs of the ladder are identified as (1) Manipulation and (2) Therapy. Both rungs describe levels of "non-participation", whereby the real objective is only to enable decision makers to "educate" or "cure" the public.

Rungs 3 and 4 (Informing and Consultation) increase the level of "participation" to that of "tokenism", whereby the public is allowed to hear and have a voice. Under these conditions, however, citizens still lack the power to ensure that their views will be taken into consideration. Rung 5, Placation, is a higher level of "tokenism" in that citizens are allowed to give advice but there is no guarantee that their ideas will have an influence on the decisions.

Further up the ladder are levels of citizen involvement with increasing degrees of decision-making power. Citizens can enter into a Partnership (Rung 6) that enables them to engage in negotiations with decision makers. At the highest levels of citizen participation, Delegated Power (Rung 7) and Citizen Control (Rung 8) refer to situations where citizens carry a majority stake in the decision or, even, full managerial power.

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With reference to the Arnstein ladder, it can be observed that the focus on *partnership* in the present 2008-09 survey is two rungs higher on the participation ladder than the focus on *information and consultation* in the 1999-2002 survey, and it represents an important leap from tokenism towards real participation. At this current rung of the ladder, power is reapportioned through negotiation between citizens and decision makers. They agree to share planning and decision-making responsibilities through such structures as joint policy boards, planning committees and mechanisms for resolving impasses. Partnership may work most effectively when the citizens' group has the financial resources to pay its leaders reasonable honoraria for their time-consuming efforts and when the citizens' group has the resources to hire (and fire) its own experts (technicians, lawyers, etc.).

Additional comparative findings

The 1999-2002 survey investigated generic elements required to gain credibility of waste management organisations and effective means of communicating with technical and non-technical audiences. Openness, transparency, technical competence and procedural equity were identified, among others, as key conditions for public acceptance of radioactive waste management programmes. The role of national authorities was also analysed, with special attention to the regulator.

The present 2008-09 survey defines the basic components of the partnership approach, which includes voluntarism, the right to veto, collaboration with communities – with attention given to the administrative formats of such collaboration – and community benefits. The latter include community empowering measures, such as financial resources to pay the expenses of collaboration and to hire the communities' own experts, and socio-economic benefits aimed at compensating for potential losses and making host communities better off [9-10].

In the following text, we try to answer the question of whether the partnership approach has come to the foreground only during the last decade or whether some of its elements had already appeared in the late 1990s.

Voluntarism

At the time of the 1999-2002 survey, site selection processes based on voluntarism had already been launched in several countries, for example in Belgium, France and Sweden. However, as the site selection processes were only in their initial phase it was not clear if this approach would eventually lead to the identification of suitable sites. Based on the present survey results it can be stated that voluntarism has been applied in the majority of the investigated countries and that it has been successful in most cases.

Right to veto

The 1999-2002 survey investigated the impacts of formal veto rights granted to local or regional governments (e.g. Finland, Sweden and Switzerland) and observed that such rights are likely to increase public confidence. The 2008-09 survey also analyses such cases where veto power was assured on only an informal basis to volunteer communities. The report concludes that the granting of a formal or informal veto right is an important factor for local support.

Collaboration

At the time of the 1999-2002 survey many countries reported the establishment of local citizen committees, e.g. local information and monitoring committees and local liaison committees. Their main tasks included conveying information to the inhabitants, raising community concerns and providing input to the decision-making process. In general, such committees had little influence on the decisions regarding site, waste management concept or facility design.

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The current survey informs us that a variety of partnership organisations (e.g. non-governmental organisations or NGOs, local government associations, units within or around local/regional governments) have been or are being set up in an increasing number of countries. Most often such organisations build their own expertise and influence the implementer's work. They also collect, process and disseminate information on the facility and its impacts, monitor other players' performance and advise local governments. Usually, the result of collaboration is mutual learning on the part of the community and the decision makers.

Community benefits

The 1999-2002 report did not explicitly address the issue of community benefits, although in some cases it did give information about community empowerment measures (e.g. the funding of collaborative research in the United States). In contrast, the current survey reports a wide range of community benefits and it stresses that these benefits have to be integrated and adjusted to the needs of the host community. It is also emphasises that community benefits have to ensure the sustainable development of the affected region.

Overall findings and trends

Important changes have taken place in citizen participation for radioactive waste management in the past decade. They can be summarised as follows:

- Shift from information and consultation towards partnership, i.e. from token involvement to citizen influence and power.
- Shift from passive to active role of local communities: from resigned acceptance to collaboration, volunteering and veto.
- Development of a great variety of administrative formats for collaboration.
- Recognition of the need for, and legitimacy of, community empowerment measures and socio-economic benefits.
- Emergence of new ideals and bases for collaboration including: mutual learning, adding value to the host community/region and sustainable development.

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INTRODUCTION

The Forum on Stakeholder Confidence (FSC) began with the observation that society must be assured that every decision taken for radioactive waste management (RWM) is a considered one, and that governments and RWM institutions must act accordingly. A decision-making process providing opportunities for participation, comment and input from the affected public and interested groups is needed to move RWM programmes forward and ensure the desired high level of protection for the long time scales involved. This process should include rigorous technical reviews as well as the discussion of topics of the public's choice, including the advantages and disadvantages of alternative waste management strategies. Ultimately, governments are responsible for providing the framework within which the necessary actions can be taken and for making decisions that meet with an appropriate level of societal support.

Since its inception in 2000, the FSC has fostered the sharing of practice across countries to consider how these ideals can be met. The major report *Stepwise Approach to Decision Making* [2] found, based on research and actual transnational experience, that three principles are essential for building broad societal support in any potentially controversial, socio-technical area:

- Decision making should be performed through iterative processes, providing the flexibility to adapt to contextual changes, e.g. by implementing a stepwise approach that provides sufficient time for developing a competent and fair discourse.
- Social learning should be facilitated, e.g. by promoting interactions between various stakeholders and experts.
- Public involvement in decision-making processes should be facilitated, e.g. by promoting constructive and high-quality communication between individuals with different knowledge, beliefs, interests, values and worldviews.

In its first phase of work, the Forum synthesised its main findings and recommendations in *Learning and Adapting to Societal Requirements* [1]. Partnership approaches in Belgium, Canada and Finland (where FSC had held national workshops) were cited as examples of helping to achieve a balance between the requirements of fair representation and competent participation.[2] Other advantages of the partnership approach were linked to its role in helping to achieve a combination of licensable site and management concept with host community support. Finally, partnership arrangements are very useful to construct appropriately balanced compensation, local control and development opportunities.

The Forum has pursued its study of relationships built up among stakeholders – particularly between institutional actors and local ones. By 2009, national workshops and community visits have been held in Finland [11], Canada [12], Belgium [13], Germany [14], Spain [15], Hungary [16] and France [17]. The FSC learned in these settings about the history and development of the national programme and the role of the actors. Throughout the interactive workshops, FSC members and a

2. Namely, decision making is improved and more sustainable when it can rely on a balanced process between one extreme where all technical choices are made by experts, and another extreme where everything is open and can be changed by the national or local community.

broad representation of national and local stakeholders contributed their knowledge about how societal dialogues on RWM may be built and developed, and deepened understanding of the issues and themes that must be addressed.

The report *Fostering a Durable Relationship Between a Waste Management Facility and its Host Community* [3] examines how both community quality of life and the sustainability of a RWM solution may be improved. Participating in a partnership provides communities with a mechanism to influence the institutional decisions that could affect their area. The partnership enables the range of stakeholders to undertake joint resolution of community concerns. Moreover, it enables local stakeholders to contribute to facility design, monitoring and other follow-up. As well, it builds social capital[3] in an area. Members of the community can develop new skills through their participation as well as increase the knowledge base about their community, its aspirations and its environment.

FSC activities have emphasised that adopting a co-operative approach and working in partnership with potential host communities enable real progress to be made. Such observations have been seconded by other bodies and authors, notably in Belgium [18-19], Canada [20] and Sweden [21-22]. The partnership approach has also been advocated by the COWAM international research project [23-24] as well as by a number of national bodies, such as NuLeAF [25][4] and CoRWM [26][5] in the United Kingdom, based on their reviews of international practice. In several countries, across a range of political governance models, national policy has officially outlined a framework for implementing local or regional partnership. The United Kingdom "Managing Radioactive Waste Safely" Policy [27] provides one example, as does the Sectoral Plan in Switzerland [28].

Today, a new opportunity has come for the Forum on Stakeholder Confidence to share experience on "community partnership". The present publication has grown out of a study prepared in 2007 as part of the United Kingdom consultation on Managing Radioactive Waste Safely. The Nuclear Decommissioning Authority (NDA) requested input from experts from ten countries outlining their waste management programme and the specific elements of partnership that have been applied. Later that year, the NDA accepted the FSC proposal to leverage – augment and disseminate – the study. Each country report has been revised and updated by the relevant FSC country delegates in consultation with their appropriate stakeholders, and three new countries have been added. The present publication includes one report each from Belgium, Canada, the Czech Republic, Finland, France, Hungary, Japan, Korea, Spain, Sweden, Switzerland and the United Kingdom, and two reports from the United States.

Box 1 shows the elements of each country chapter. The precise order of these elements and the amount of detail provided by each country vary across chapters, reflecting, in part, differing implementations or degrees of partnership experience.

The present report takes its place in the FSC library of data gathering and benchmarking publications. The country chapters document, in a factual manner, the background to the approach taken in each setting and the state of partnership affairs at today's point in time. This trace could aid future assessments of subsequent evolution and progress. The publication – notably the "Overview and Transversal Findings" – can be consulted now for ideas and learning.

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3. Social capital has been variously defined as social energy, community spirit, informal and formal individual or community networks, social bonds, civic virtue, extended friendships, community life, social resources, good neighbourliness and social glue.
4. The Nuclear Legacy Advisory Forum is a special interest group of the Local Government Association in England looking at decommissioning and radioactive waste management.
5. CoRWM is an advisory body set up by the United Kingdom Government to look at long-term radioactive waste management.

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Box 1. **Country chapter elements**

Historical background

- On the national RWM programme.
- On the particular local sites concerned in various ways by facility siting.

Typical features of partnership

- Voluntarism.
- Veto.
- Working groups.
- Community benefits, among which:
  - Empowerment (including information).
  - Social benefits.
  - Economic benefits (including recompense).
  - Intergenerational funds.
- Formal agreements.

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BELGIUM

A partnership approach has been put in place in Belgium to develop proposals for facilities for the long-term management of low-level and short-lived intermediate-level waste (LILW) [18]. This means that the local community is directly involved in developing both the facility design and a socio-economic package for their area. Initially, three such partnerships were set up, leading eventually to two neighbouring municipalities (Dessel and Mol in the province of Antwerp – Flanders region) expressing an interest in hosting a repository facility. In June 2006, the Federal government decided on surface disposal in Dessel as the final destination for Belgian short-lived LILW. Since that decision, the remaining partnerships (STORA in Dessel and MONA in Mol) have both been closely involved in the development of the integrated repository project.

The following sections outline some of the main elements characterising the partnerships.

Voluntarism and local veto

In 1994, ONDRAF/NIRAS, the national radioactive waste management organisation, prepared a long list of potential site areas for the development of a surface LILW repository. At that time, it was the agency's intention to reduce this to a shortlist of technically suitable sites, based on "objective criteria" [29]. However, the social and political turmoil in communities featuring on the long list following its publication led ONDRAF/NIRAS eventually to abandon its approach and to move from trying to find the optimum "technical site" for a given concept to finding a suitable site from a combined technical, ecological, socio-political and economic point of view.

After formally rejecting prolonged interim storage as a long-term management option, the government[6] on 16 January 1998 instructed ONDRAF/NIRAS to start a new siting process for a LILW repository (for either surface or deep disposal) and to invite volunteer municipalities from among existing nuclear communities, as well as among any other interested communities. With the support of two university teams, ONDRAF/NIRAS then developed a new programme introducing the idea that communities had to declare themselves, through a municipal council decision, willing to study and discuss the possibility of hosting a LILW repository. It was made clear that engagement in this site investigation phase did not mean an immediate agreement to actually hosting the facility. This gave the municipalities a *de facto* right of veto, as it would be up to them to stipulate the conditions under which they would be willing to become a host community.

All 589 Belgian municipalities were invited to participate in the partnership approach to site investigation. An information day was held in Brussels to launch the new programme and to explain the partnership concept to representatives of interested communities (elected officials and civil servants) and the press. Only a handful of municipalities, all already hosting some nuclear activity, showed any interest in discussing options for LILW disposal in their territory.

At the beginning of 1998, the municipality of Beauraing came forward as a candidate with the idea of using the military site of Baronville (no nuclear activities) for hosting the facility. In June 1998, the municipality organised a referendum (95% of voters voted against volunteering), after which the municipality withdrew from the process.

6. Government in this case always refers to the Belgian federal government.

Four municipalities responded positively to the ONDRAF/NIRAS invitation, leading to the formation of three local partnerships which enabled members of the public, representatives of local organisations (non-governmental organisations, local community groups, socio-cultural and socio-economic organisations), local business representatives and elected officials to take part in the development of technical options and potential community benefits. After wide consultation within each community, a proposal on mission, structure and composition of their local partnership was drafted by the accompanying university teams. This was given for approval to the municipal council concerned and to the Board of directors of ONDRAF/NIRAS. A memorandum of association, signed by each member of the partnership General Assembly (see **Running the partnerships**) forms the written expression of the agreement between ONDRAF/NIRAS, the municipal council and the local organisations involved.

Three partnerships were subsequently set up: STOLA[7] in Dessel (September 1999), MONA[8] in Mol (February 2000) and PaLoFF[9] in the Walloon municipalities of Fleurus and Farciennes (February 2003).

The new siting programme granted the municipal councils the right to support the development of a facility in their area or to reject it. Although there is no legal basis for such a local veto right, ONDRAF/NIRAS have always stated that they would uphold the "gentleman's agreement".

The proposal for a repository facility with local benefits presented to the council was that developed by the partnerships in their local community. The partnerships' proposals would only go to government to be considered if their associated municipal councils approved them. All the proposals also contain conditions for the ongoing involvement of the local community.

All three partnerships recommended that repository development should take place. The Municipal Councils of Dessel and Mol supported the recommendation of their partnerships, and their proposals went forward to be considered by the government. Note that the two municipalities are situated side by side, and the terrain selected by Dessel is situated close to Mol. The third partnership (PaLoFF) submitted favourable advice to the Municipal Councils of Fleurus and Farciennes (as the proposed facility would be partly situated in both municipalities). However, one of the councils (Fleurus) said "no", so the partnership's proposal was not considered by the government. The partnership there consequently discontinued in Spring 2006. After considering the proposals from the remaining partnerships and taking advice from ONDRAF/NIRAS, in June 2006, the government announced that by decision of the Federal Council of Ministers (on June 23):

- Surface disposal is the option to be implemented for the long-term management of LILW waste.
- The repository facility will be built on the territory of the municipality of Dessel, on the site indicated by STOLA and accepted by the municipal council.

Setting up the partnerships

The partnership process was developed and co-ordinated by the Universities of Antwerp and Liège. The university research teams did an extensive survey of each community involved, interviewing various representatives of different stakeholder types and identifying the variety of interests and opinions regarding the siting of a LILW repository. This helped to identify who the community wanted to be involved in the partnership and the structure of the partnership that they wanted. Particularly at the

7. STOLA stood for "Study and Consultative Group on Low-Level Waste – Dessel".
8. MONA originally stood for "Mol's Negotiation Platform on Nuclear Waste – Category A". In 2005, the extension "Category A" was dropped.
9. PaLoFF stood for "Local Partnership for Fleurus and Farciennes".

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beginning of the process the universities acted as the independent facilitators for each of the partnerships. Throughout, their role has been to monitor and advise from a neutral standpoint on the overall process.

Continuing the partnerships

One of the conditions for volunteering to host a LILW repository according to each of the partnerships' proposals was to continue and further develop the involvement of the community in the radioactive waste management decision making. Both STOLA and MONA had stated in their conditions for acceptance that they considered the continuation of the participative process and the central role of the partnerships to be vital for the realisation of the integrated project. ONDRAF/NIRAS thereupon extended the partnership agreement with the two remaining potential host communities. In both cases, the partnership bylaws were adjusted to the new tasks. STOLA also changed its name, and as of 2005 the partnership in Dessel was named STORA.[10] In its decision of 23 June 2006, the Council of Ministers confirmed the partnerships' demands for continued involvement. Government commissioned ONDRAF/NIRAS to develop the integrated project for surface disposal proposed by STOLA and thereby maintain the participation process. As both communities had invested much time and thought in the partnership proposals, and because the municipality of Mol would continue to be affected by the repository development, upon request from elected officials in Mol it was decided to continue to associate that municipality partnership in the development process. The waste management agency also confirmed its clear wish to develop the project further, with all the conditions set out by the agreed municipality proposal, in close co-operation with STORA and MONA.Through the signing of a declaration of intent, the principles of co-operation and consultation between ONDRAF/NIRAS, the partnerships of STORA and MONA and the municipalities, applied during the preliminary design phase, will now be continued. The co-operation is made concrete on two levels:

- An administrative level of integrated decision making and project orientation by means of a common ONDRAF/NIRAS-STORA-MONA steering group, with an advisory role for the mayors of Dessel and Mol.
- An operational level of preparatory discussions, monitoring and implementation of studies and action through the working groups of the STORA and MONA partnerships.

Running the partnerships

In Belgium, ONDRAF/NIRAS funds the partnerships with an agreed lump sum each year to cover each partnership's expenses, including salary for one or two full time co-ordinators, experts' fees for presentations, commissioning studies, etc.

The community partnerships are structured as not-for-profit organisations. Such organisations have a sound legal basis and long-standing tradition in Belgian civil society and local community life. The framework offers a relatively flexible structure with which many people are familiar. In practice the community partnerships consist of:

- General Assembly (GA) – made up of representatives of all interested local organisations, the GA acts as guardian of the decision-making process. Members decide on/approve the main framework within which the other bodies of the partnership work and the final concept for the project that is recommended to the municipal council.
- Executive Committee (EC) – takes intermediate decisions on budget, co-ordinates working groups, supervises project co-ordinators. They do the day-to-day management of the partnership.

10. STORA stands for "Study and Consultative Group on Radioactive Waste – Dessel".

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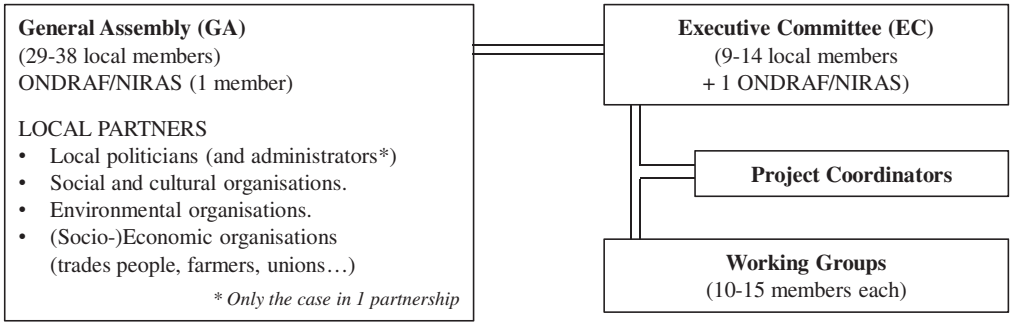
- Project Co-ordinator(s) – look after administration and communication tasks, organise and support working groups. This has been a full time role.
- Working Groups – discuss different aspects of the project in detail. In the siting phase, they considered current research, commissioned extra research and talked to experts. Each working group had an assigned contact person from ONDRAF/NIRAS who attended working group meetings to discuss proposed options and suggested alterations by the local participants. It was also the contact person's role to provide feedback (or bring in colleagues to assist) on questions raised and information requested. The working groups presented their work to the Executive Committee and then the General Assembly. While the General Assembly is almost solely composed of representatives from local civil society, politics and economic life, the working groups are also open to individual citizens that wish to participate. In the period now completed (development of the repository proposal), approximately 30% of the members of the working groups in each partnership were individuals not representing a particular local interest group.

The working groups have looked at:

- Implementation and design.
- Safety.
- Public health and the environment.
- Local development.

After the siting decision, new working groups have been set up to continue the active involvement of the local partners in the development of the project. In each partnership, three working groups are currently active: one focuses on matters related to the totality of the nuclear activity in the Mol-Dessel area; two others follow closely the development of various aspects of the integrated project.

The structure of the Belgian partnerships



Decision making

ONDRAF/NIRAS has a decision-making role in the partnerships as follows:

- 1 vote in each working group (insofar as there is voting at that level).
- 1 vote in the Executive Committee.
- 1 vote in the General Assembly.

In the siting phase, ONDRAF/NIRAS also had an implicit veto for the technical aspects of the project to ensure that a safe and implementable proposal was put forward.

ONDRAF/NIRAS furthermore had an implicit veto given some of the clauses in the bylaws that underpin the partnerships (see **The bylaws underpinning the partnerships**):

- ONDRAF/NIRAS remains at all times responsible for the tasks imposed on it by law.

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- The duration of the association (the partnership) is restricted to the duration of the studies to develop an integrated project proposal. ONDRAF/NIRAS will notify the partnership of the end of the studies.
- If ONDRAF/NIRAS resigns from the partnerships, the association will be dissolved.

The last two clauses today are no longer in the bylaws.

A "tailor made" repository design

The view of ONDRAF/NIRAS in describing their technical work for the partnership programme is that they have developed a generic (or methodological) repository design as a basis for establishing feasibility without pre-judging implementation at a particular site. This approach means that the generic design can be tailored to meet the specific requirements of:

- The waste.
- The geological setting.
- The social/community context.

ONDRAF/NIRAS see that their role is to:

- Provide justification for the reference concept.
- Build local acceptability, including with the regulators.
- Orient the research and development appropriately.

The generic design was discussed intensely with the local partners. As it was the partnerships' mission to "study the possibility of hosting a LILW repository" and to "develop an integrated project proposal", the partnerships became the drivers of the site investigations and repository design. Up until a partnership had reached a conclusion and presented it to the municipal council, the partnership was the sole forum to discuss the options for developing a LILW repository in the community [19].

Critical reflection in the partnerships' working groups did not lead to a rejection of ONDRAF/NIRAS basic proposals, but it did provoke some changes to the generic design. The proposed concept by STOLA, for example, that was chosen by the government, contains a cave or basement to serve as a monitoring area and a "drip-tray" in case water comes in. This replaced the originally proposed elevation to preserve the repository from rising groundwater (given the height of the groundwater level in that part of the country). STOLA also preferred a fixed steel roof to cover each module and protect against changeable weather conditions during construction and waste emplacement, while ONDRAF/NIRAS proposed a moveable one [30].

The role of the partnerships

An important aspect of the partnership approach was the introduction of the notion of an "integrated repository project" and the idea to jointly study and develop this project. This means that during the siting phase the partnerships did not only advise their municipal councils on the repository concept and where it should (or should not) be located. Through the partnership, the local community was also to propose what it considers to be the necessary conditions (technical, environmental, aesthetic, etc.) for such a repository. Furthermore, within the partnership, a socio-economic package was developed, in the form of an accompanying local project that seeks to bring added value to the community. The final outcome of the discussions in the partnerships was therefore expected to be either a "thanks, but no thanks" (i.e. based on all the information gathered, the community decides against the repository project for technical, safety or other reasons) or a mutual integrated repository project, supported by both local stakeholders and ONDRAF/NIRAS.

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The integrated repository project involves the development of the repository design for a particular site and the accompanying local project that seeks to add value to the community in socio-economic and other terms.

The output of these integrated projects was that each partnership prepared a document containing its proposals. This was submitted to the municipal council who made a decision about whether they were willing to proceed with the proposals. If the municipal council said "yes", then the proposal went to the government for their consideration. As outlined earlier two municipalities endorsed their partnership's proposal and the government has chosen Dessel as the site for implementing the facility.

During the project development phase, the role of the partnerships has shifted to one of watchdog over the way ONDRAF/NIRAS further develops the integrated project of surface disposal in Dessel.

Another role of the partnerships was and remains to communicate with the local population, to supply them with information about the partnerships' activities, as well as about related issues, and to invite the local population to contribute to the debate. This communication is set up through both formal and informal channels. On the formal side there are newsletters, a website, contributions to the municipal news bulletin, press releases to both the local and national media and presentations for local clubs, associations or companies.

On the more informal side, first and foremost all partners or local people involved in the partnerships can be seen as little networks, "spreading the news" and bringing back input from their friends, family and club members. Some participants discuss partnership activities on a regular basis within their associations. Additionally, the partnerships also participate in local events like fairs, or trade markets to "promote" the partnership's name and mission and to attract more people to join the working groups.

Community benefits

No community benefits have been made available to date. However, the funding for the partnerships has enabled the local communities to participate in the debate and develop their integrated project proposal.

Along with local demands concerning repository design, safety issues and a *"continuous follow-up of technological and/or scientific developments"* [30], the partnerships have also outlined the socio-economic package they wanted alongside the facility.

Empowerment measures

Each partnership was provided with 250 000 each year, for four years, for its normal operation (employees, expenses, invited speakers, site visits and other study trips, etc.). In two partnerships, this was the case for four consecutive years. However, both partnerships ran for about a year longer, but had to manage on the budget provided for the first four years. The third partnership ran for only three years. Each partnership also received a one-time payment of 74 000 to undertake socio-economic studies and a further 74 000 for "visualisation of the technical project." Thus, including the one-time payments, each partnership received an average of about 200 000 per year. Members of the local community who participated in the partnerships have not been paid for their time.

As explained above, after the municipal councils in Mol and Dessel made their decisions their partnerships evolved and received annual funding of 125 000. Since the government decision on the site for the repository STORA is provided with 250 000 and MONA with 200 000 each year for its normal operation (employees, expenses, invited speakers, site visits and other study trips, etc.).

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Concerning empowerment measures, both STOLA [30] and MONA [31] set out a number of conditions for acceptance of a LILW repository:

Monitoring and control

Both partnerships asked for a *"continuous follow-up of the environmental, safety and health effects"* [30].

Monitoring safety

STOLA

- Appointment of a contingency officer assisting the mayor in his administrative duties.
- Supporting the fire brigades from the area with a specialised intervention team.
- Maintaining the nuclear expertise in the area.
- Continuous duty to inform the public about the presence of a disposal facility.

MONA

- Optimisation of the nuclear emergency plan, the means available to the emergency services to intervene in the case of a nuclear incident, and the medical infrastructure in Mol.
- The building of a test disposal module or vault (in the case of near surface disposal). This was not originally part of the ONDRAF/NIRAS design, but is now considered a valuable addition to the control programme.

Monitoring health

STOLA

- Health monitoring: follow-up of a pilot study (carried out in 2002-2003 for both STOLA and MONA) looking into deaths, cancers and congenital defects.
- Annual check-up, free of charge, for all inhabitants of Dessel.
- Inclusion of Dessel in future health and environmental research ordered by any governmental body.

MONA

- Health monitoring: follow-up of a pilot study (carried out in 2002-2003 for both STOLA and MONA) looking into deaths, cancer and congenital defects.

Monitoring the environment

STOLA

- Detailed and frequent measurements of the air, surface water and groundwater quality: follow-up of a baseline study carried out on behalf of STOLA in 2002-2004.
- Regular follow-up and control of all companies with a class I environmental licence in Dessel and neighbouring municipalities (to include monitoring of possible external sources).
- Strict control on environmental impact assessment (EIA) compliance and correct updating of the EIA report.
- Regular information for the local population on the results of the radiological and non-radiological measurement programme.

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MONA

- A control programme to measure the radioactivity level on the repository site, in the larger nuclear zone and in the community, starting with a baseline measurement campaign before the building of the repository.

Minimising environmental impact

Conditions relating to minimising the environmental impact of the facility set out by the partnerships are:

STOLA

- The supply of materials and the removal of soil and clay should be done as much as possible by inland barge along the canal.

MONA

- Any damage to the natural environment should be avoided and in the case of any environmental damage full compensation must be made available.
- A "green screen" of trees should be planted around the repository site to counter the visual impact of a surface repository.[11]
- The installation of infiltration basins to allow for the collected rainwater from the repository to gradually penetrate the soil.

Ongoing local participation and communication

STOLA specified in their report that they wanted an ongoing forum for community involvement in issues relating to radioactive waste management. STOLA (Study and Consultation Low-level Waste Dessel) has since developed into STORA (Study and Consultation Radioactive Waste Dessel). STORA is now:

- Following up the proposal to dispose of LILW in Dessel.
- Discussing the current management (transport, processing, storage…) of all nuclear waste in Dessel.
- Informing the population about all nuclear matters.

STORA will continue to evolve as the LILW disposal facility is implemented.

MONA also set out their requirements for continued participation in the repository project, including collaboration with Dessel and STOLA in the future. MONA also asked the government to read the MONA and STOLA reports as "one single document", thereby implying that whichever side of the border the repository is sited, all the conditions set by both candidate municipalities should be taken into account. MONA also requested that local participation be maintained and extended to the management of all nuclear waste in the area (including the activities of the underground research laboratory in Mol and the future decommissioning of all nuclear plants in the area when they reach the end of their life).

For this purpose MONA changed its bylaws, so that the organisation could continue:

- Following up the decision making concerning LILW (including the conditions set in the MONA report).

11. After coverage the modules or vaults will be approximately 24 metres high; the landscape in the area is very flat, therefore mitigation measures are needed to minimise the visual impact of the facility.

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- Communicating with the public and continuously involving local citizens in all nuclear activity in the area (the nuclear zone of Mol-Dessel).

A structure was negotiated to incorporate MONA in the participation process for the further development of the repository project to be based in Dessel. Awaiting that outcome, MONA decided to continue working under its current bylaws until December 2007. The new arrangements were then terminated and as of 2008/9 MONA is doing the same work as is STORA. The co-operation is made concrete on two levels:

- An administrative level of integrated decision making and project orientation by means of a common ONDRAF/NIRAS-STORA-MONA steering group, with an advisory role for the mayors of Dessel and Mol.
- An operational level of preparatory discussions, monitoring and implementation of studies and action through the work groups of the STORA and MONA partnerships.

Social benefits

STOLA specified that they wanted measurable and recognisable benefits to the Dessel community alongside the repository itself, i.e. tangible added value in the short, medium and long terms. The aim of the benefits is to develop a broader basis for the acceptability and community-wide integration of the disposal project. They want the integration to take place across all stages of the disposal project and to ensure accessibility and linkage to socio-cultural, tourist and other events. STOLA proposed several initiatives brought together in a communications centre which could also be used for local community initiatives and become a meeting place for the Dessel population. The communications centre would include a:

- Contact and support centre
  This will be the forum for all nuclear matters including:
  – Providing information.
  – Setting up an ombudsman service.
  – Library service.
  – Assembling all local services relating to nuclear activities.
- Digital and interactive network
  This would involve the provision of technology to each family in Dessel to enable them to create a citizens' network, retrieve information and submit questions or comments.
- Radioactivity theme park
  The Dessel area has been involved in nuclear activities for 50 years. To boost tourist activities in the area STOLA proposed setting up a theme park reflecting the special local history and expertise, focusing on radioactivity. It would include interactive animations, scientific exhibits and workshops.

MONA were also keen to maintain the nuclear know-how in the area in the long term (in particular regarding radiation protection and waste processing).

Economic benefits

STOLA outlined a need for opportunities for environmental planning to enable the municipality to develop. Three initiatives were proposed:

- Changing the status of the village to enable additional small and medium enterprise (SME) zones to be developed, to release existing housing development areas and to create additional building lots.

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- Linking up the south of Dessel with the small-town area of Mol to expand the existing SME zones.
- Developing the N118 Motorway into an access road for traffic to reduce heavy traffic in the centre of Dessel, for transport to and from the SME zone, the nuclear zone and the disposal facility. This development would also ensure faster evacuation in the case of a nuclear incident.

Intergenerational funds

As part of their socio-economic package both partnerships proposed the installation of a fund to contribute to the advancement of community life and to improve the quality of the living, housing and working conditions of the inhabitants in their municipalities. They envisage it being used for various projects: social, economic, cultural, environment-oriented, health, welfare, etc.

In its decision of June 2006, the Belgian government approved the proposed integrated project put forward by STOLA and thus also the suggestion to set up an intergenerational fund. However, neither partnership suggested a figure estimating the expected amount of money to be put in such a fund. The government therefore asked ONDRAF/NIRAS to prepare detailed estimates on the total cost for social and economic benefits. This would again be done in close collaboration with the people from STORA (and MONA).

At time of finalising this publication, figures were available for only some of the subprojects. A complete overview of the integrated project is targeted for late 2009/2010.

STOLA put forward the following basic features for its intergenerational fund:

- Aim: To support or develop, on its own initiative, projects that improve the quality of the life, housing and working conditions of the people of Dessel. The fund should offer opportunities for adding social, cultural and economic value beyond what the repository itself can offer.
- Financing:
  - The fund should be financed by the federal government.
  - It should be completely independent from the taxation of nuclear companies in the municipality's territory.

The suggestion by MONA contained the following characteristics:

- The fund should support projects that improve the quality of life for the people in the larger Mol-Dessel area.
- Projects should be spread over the following areas: welfare, community life, local economy, culture, improvement of the natural environment, human health and knowledge development.
- Projects should be sustainable and realise long-term positive effects, thus creating a clear added value which could otherwise not have been realised.
- The fund should be managed by an independent and autonomous body that should be representative of both communities.

The bylaws underpinning the partnerships

This section outlines the main features of the bylaws that underpin the Belgian partnerships [32-33].[12] The local partnerships of MONA, STOLA/STORA and PaLoFF were set up as non-profit organisations. Therefore the legal agreement they were founded on used the format for such organisations as required by Belgian law. Both MONA (retaining its name) and STOLA (changing its name to STORA) adapted their

12. As translated for Nirex by Anne Bergmans.

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bylaws [34-35] to cover the next phase of their work. Unless otherwise noted, the information here focuses on the partnership bylaws that were in place prior to the government making their decision.

The role of the partnership in relation to the municipal council was set out in papers prepared by the University of Antwerp [18,36]. The papers stipulated that the partnerships would present proposals to the municipal councils who would make the decision about whether to support the development of the facility on behalf of the community as a whole. The papers together with the bylaws were approved by the municipal councils before the partnerships were formed and the bylaws were signed.

The following issues were covered in the bylaws of MONA and STOLA/STORA:

- Founding members
  The founding members and the organisations they represent (the founding members constitute the core of the General Assembly).
- Registration of the partnership
  The name and registered office of the partnership.
- Duration
  The duration of the partnerships is set out in the bylaws in these terms: "the duration of the studies needed to develop a proposal for an integrated disposal project for LILW (category A)." It was furthermore stipulated that "ONDRAF/NIRAS will announce the end of the studies."
- Purpose
  Stage 1 (siting phase): "The purpose of the organisation is to conduct studies and develop an integrated project proposal for the disposal of LILW that can be presented to the federal government. In this respect, the organisation becomes the core for a thorough investigation of the site, the community and (if applicable) also the larger region. This investigation will be carried out through studies covering technical and safety issues, ecological, socio-economic and socio-cultural issues, as well as studies in the field of urban planning. The organisation will serve as a platform for structured project negotiation and local deliberation. The organisation will also ensure communication with and provide information to the local public on all its activities and all relevant studies carried out by NIRAS."[13-14]
  Stage 2 (project development phase): the purpose of the partnerships is to involve local residents in the management of the radioactive waste that:
  – is being transported, processed, or stored on the municipality's territory and which possibly in the future will be disposed of there (STORA);
  – has real or potential impacts on the municipality and its neighbours (MONA).
  This implies in the first place the monitoring of the low-level waste disposal file and the disposal project developed by STOLA-Dessel. For other aspects of radioactive waste management (including high-level waste) and other nuclear activities on the nuclear site of Mol-Dessel-Geel, the partnerships act as well as both a forum and a sounding board.
  The partnerships keep their population informed about all these affairs and formulate advice with a view to municipal policy. They furthermore keep in touch with regional, national and international organisations or companies and if necessary and if possible, ways of collaboration are set up. (See also: *www.stora.org* and *www.monavzw.be*.)

13. The MONA bylaws also stated that: "This platform can also serve for discussing other aspects of the management of radioactive waste. For this particular purpose, the organisation will seek collaboration on the regional level."
14. The STORA bylaws now also stipulate that: "none of the organisation's communication activities can relieve other bodies, authorities or companies of their responsibilities regarding the (public) communication of their own activities."

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- Membership
  "The organisation has active (voting) and associated or advisory members representing institutions, organisations or government bodies. No member can be held personally responsible for any commitment by the organisation. NIRAS remains at all times responsible for its tasks laid down by law." The bylaws also outline which organisations can have active and associated members and the voting mechanism to allow them to join the partnership. The bylaws outline that membership is not limited in time and stipulate the procedure for resignation and the conditions and procedure for exclusion as a member.

- Budget
  The bylaws outline the annual budget for the partnerships made available by ONDRAF/NIRAS and stipulate that there is no membership fee to participants for participation.

- Structure of the partnership
  The bylaws outline the roles of the different entities within the partnership especially the General Assembly and the Executive Committee including their composition (see **Running the partnerships**). The bylaws also stipulate the minimum number of meetings per year, the procedure for agenda setting and calling members to the meeting, and the conditions for a valid meeting and vote.

- Dissolution
  The bylaws stipulate that "in the case of dissolution, all net assets of the organisation will go back to ONDRAF/NIRAS."

Development of the integrated project

Since the governmental decision all aspects of the integrated project must be refined further in detailed studies: technical aspects, safety aspects, financial and legal aspects, drawing up a safety report and an environmental impact report, application for the necessary permits, etc. The measures that must ensure a positive impact on the local community and added social, economic and cultural value in the short, medium and long terms will also be developed further. Work will continue according to two principles:

- A *project-based approach*; to this end ONDRAF/NIRAS has set up a project team in Dessel that must ensure that all objectives are achieved on time. This multidisciplinary team consists of personnel from ONDRAF/NIRAS, supplemented with people from local companies and expert consultants. The design phase will run from 2007 to 2011. An interim milestone is planned for 2009, when a detailed description of the integrated surface disposal concept, including cost estimate and financing conditions, will be submitted to the federal government. After that comes the construction and execution phase, which will run from 2012 to 2016. Operation is planned to start in 2016.

- *Co-design;* during the development of the various project components work will proceed in an open spirit of "designing together". The final result of the co-operation between ONDRAF/NIRAS and all the local parties involved must be such that it will get the approval of the partnerships and municipalities.

Integration of all sub-projects

The complete integrated project has been subdivided into a number of sub-projects for the further studies and implementation. Each sub-project consists of actions and studies that form a logical whole and will therefore be studied and developed together. All sub-projects are however mutually interconnected. All components of the integrated project (the repository, all auxiliary buildings, the

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communications centre, the spatial planning aspects, etc.) form a single whole. Thus, among other things, there will be:

- A common architectural approach sketched out for the whole of the site and for each of the sub-projects.
- A carefully considered environmental plan made for the project (location of the various buildings and installations, connection roads, etc.) so that the feeling of a coherent whole is reinforced.
- A plan developed for the connection and accessibility of the various functions and components of the project.
- Through the development of a "master plan" for the integrated project, all the sub-projects will take shape starting from a single common vision. Through this the various sub-projects will be integrated into a coherent whole that has a clear image and a genuine added value for the region. The master plan for the integrated project will also enable the various functions (touristic, educational, social, economic, etc.) to link with one another and be maximised for all the sub-projects.

The sub-projects

Repository design, including safety, permits, control and emergency planning

This sub-project embraces the further specification of the repository design, the storage modules and the roofing structure of the repository, the monolithic blocks, the buildings for the production of the monolithic blocks, the protective covering and test tumulus, several auxiliary buildings, etc. This sub-project also covers all forms of monitoring of the repository, including emergency planning. The required permits, as well as the studies (environmental, health, radiological safety) necessary to prepare these permit applications, are also part of this sub-project.

Employment and preservation of nuclear know-how

In this sub-project, an investigation will be made of which measures are necessary for the preservation of the nuclear knowledge in the region. This can be done, among others, by investing in the training of future employees and by developing new activities and research fields in the nuclear sector. An investigation will also be carried out as to which reconversion measures are possible for the complete or partial wind-down of nuclear activities, such as re-purposing of areas, the timely radiological clean-up of buildings and ground, and the stimulation of compensatory economic activity. The aspect of employment and maximising the employment impact for the construction and the operation of the repository are also part of this sub-project.

The communications centre

One of the conditions that will ensure a positive impact on the local community and the realisation of added social, economic and cultural value in the short, medium and long terms is the setting up and operation of a communications centre. This centre will be developed as a reference and focal point for all information concerning radioactivity and as a meeting place for the local population. The communications centre will include the physical integration of:

- A contact and reception centre for all nuclear matters.
- A digital and interactive network.
- A theme park/science park about radioactivity.

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The local development fund

To be able to create genuine added value and thus foster the widest possible public acceptance of the repository, resources will be needed. Setting up a fund for local development can cater to the changing needs of society and also give future generations the possibility of determining their own priorities. The purpose of the fund is to support or realise projects that contribute to the improvement of the quality of life as well as of the living and working environments of the local population. The projects can be diverse in nature: social, economic, cultural, focused on the environment, health, or welfare and so on. This sub-project includes the detailed development of all aspects of such a fund.

The spatial planning opportunities

This project focuses on traffic management and on the possibility of using the Bocholt-Herentals canal as a supply route for materials. Other aspects are also part of this sub-project, such as changing the spatial structure plan to allow expansion of the local small and medium business area or to free up additional construction sites.

The maintenance of consultation and participation

Alongside monitoring and taking part in decision making concerning the concrete development of the integrated disposal project up to the point of the permit applications, a look ahead will be made into how consultation and participation can be given shape in the construction and operating phases. Thus attention will be given to which management structures can be set up for the various project components, not only for the disposal site, but also, for example, for the communications centre and for the local development fund.

Timescales for running partnerships

Table 1 outlines the duration of the different stages of the Belgian process for setting up and running partnerships.

Table 1. **Timing of Belgian partnership process**

Date	Event
December 1998	ONDRAF/NIRAS invites communities to volunteer.
December 1998	Communities of Dessel and Mol show an interest in the partnership programme.
1999	A fund for the long-term management of radioactive waste (FLT) is put in place.*
December 1998 – June 1999	Social study of the community of Dessel (final report "scenario for establishing a LP in Dessel" handed in beginning of June and approved by the council before the summer recess).
December 1998 – October 1999	Social study of the community of Mol (final report "scenario for establishing a LP in Mol" handed in late October and approved by the council before Christmas).
Early 1999 – Early 2000	Social study of the communities of Fleurus and Farciennes.

* The financing of the disposal programme is different depending on whether the integrated disposal project is in a project phase or has reached the implementation stage. In the implementation phase costs for the technical operations will be financed by the FLT. This fund accumulates provisions to cover the costs for the building, operation and closure of final repositories for both LILW and HLW. The funding is based on cost estimates for a surface repository for LILW and a deep clay repository for HLW. The preliminary project (from 1998-2006) and project phase (2006-2011) was and will be financed by agreements between ONDRAF/NIRAS and the major waste producers. The funding of the partnerships was and will be part of these agreements.

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Table 1. **Timing of Belgian partnership process** (Cont'd)

Date	Event
July 1999 – September 1999	Practical arrangements and preparations for setting up the partnership STOLA: i.e. getting the offices ready, selecting collaborators, meetings with stakeholder groups to have pre-agreement on members of the executive committee, finding presidents for working groups, etc. (initiative taken by the Municipal Executive, with help of ONDRAF/NIRAS and the University of Antwerp).
December 1999 – February 2000	Practical arrangements and preparations for setting up the partnership MONA (initiative left to ONDRAF/NIRAS and the University of Antwerp, with occasional help of Municipal Executive).
September 1999	STOLA partnership is founded in Dessel. The partnership works on their proposal between Sept 1999 and Nov 2004 i.e. four and a quarter years.
2000	A technical follow-up and local information committee is set up in Fleurus and Farciennes.
February 2000	MONA partnership is founded in Mol. The partnership works on their proposal between February 2000 and January 2005 i.e. ~ 4 years.
End 2001 – Beginning 2002	Continuation of the social study in the communities of Fleurus and Farciennes in view of the founding of the partnership.
February 2003	PaLoFF partnership is founded in Fleurus and Farciennes. The partnership works on their proposal between February 2003 and December 2005 i.e. ~ 2 years.
November 2004	STOLA publicly presents its repository proposal for LILW to the Dessel Municipal Council.
January 2005	(Dessel) Municipal Council decision: Dessel becomes an official candidate to host a LILW repository (~ 2 months between the presentation and the decision). MONA publicly presents its repository proposal for LILW to the Mol Municipal Council.
April 2005	(Mol) Municipal Council decision: Mol becomes an official candidate to host a LILW repository. (~ 3 months between the presentation and the decision).
December 2005	PaLoFF publicly presents its repository proposal for LILW to the municipal councils of Fleurus and Farciennes.
February 2006	Fleurus Council decides not to proceed with the proposal (so Farciennes Council does not put it to the vote).
May 2006	Final report by ONDRAF/NIRAS inviting government to decide on the continuation of the disposal programme.
June 2006	Government decision to proceed with surface disposal in Dessel (and continuation of the participatory process and involvement of Mol).**
November 2007	Signing of collaborative agreement.
December 2008	Intermediary report to government on state of affairs in development integrated project.

** The government decision included a request that ONDRAF/NIRAS develop an additional financing mechanism to cover all the non-technical parts of the project (e.g. mechanisms for public participation, a local development fund, etc.).

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CANADA

Two processes are underway in Canada, one for legacy low-level waste (LLW) from historical uranium processing and one for operational waste from nuclear power production (low- and intermediate-level waste, designated as operational LILW).

The legacy LLW project is being run by the Low-Level Radioactive Waste Management Office (LLRWMO),[15] which is a government agency that was established in 1982 to carry out the responsibilities of the Federal government for the management of historic low-level radioactive waste in Canada.[16] The Office is operated by Atomic Energy of Canada Limited through a cost-recovery agreement with Natural Resources Canada, the federal department that provides the funding and establishes national policy for low-level radioactive waste management.

The operational LILW project is being run by Ontario Power Generation (OPG), which is a commercial company principally involved in electricity generation, including nuclear.

The following sections outline the mechanisms that are being used in both cases.

History

Legacy low-level waste (LLW) – Port Hope

When a previous process to site and develop a long-term facility for legacy low-level waste failed, the three communities where the wastes are located came forward with local solutions for the management of the wastes. This process involved resolutions passed by each of the municipal councils to begin discussions with the government of Canada. The resolutions captured the municipalities' interest in initiating discussions and acting as catalysts to the development of a long-term management solution in each municipality that reflected municipal interests [20].[17] The project is called the Port Hope Area Initiative (the "Initiative") and it initially involved the development of three community-proposed waste management facilities – one in each of the local communities – for the wastes in each respective community (Port Hope, the Township of Hope and Clarington). The initiative is underpinned by an "Agreement" signed by the municipalities and the federal government [37].

In the year the Agreement was signed, two of the municipalities were consolidated to form a single municipality (the Town of Port Hope and the Township of Hope were amalgamated into the municipality of Port Hope in 2001), thereby leaving the government to work with only two rather than three municipalities. The community approaches are being assessed as two projects – the Port Hope Project and the Port Granby Project – based on current municipal boundaries and reflecting local decision-making authority under the Agreement.

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15. www.llrwmo.org/en/news/NewsAboutThePHAI.html, accessed 2006.
16. www.llrwmo.org/en/faq/index.html.
17. www.llrwmo.org/en/porthope/history.html and www.llrwmo.org/en/porthope/index.html, accessed 2006.

Operational low- and intermediate-level waste (LILW) – Kincardine

In 2001, the Municipality of Kincardine expressed an interest in discussing with Ontario Power Generation (OPG) long-term plans for the management of low- and intermediate-level waste arising from their operations. The basis for the expression was the positive relationship developed during the operation since the 1960s of the Bruce nuclear plants and waste management facilities also located at the Bruce site. That the waste is stored on an interim basis at OPG's Western Waste Management Facility (WWMF) in Kincardine also contributed to the municipality's interest. In 2002, a Memorandum of Understanding (MOU) was signed by the Kincardine Municipal Council and OPG. The purpose of the MOU was for OPG, in co-operation with Kincardine, to assess the feasibility of long-term management of low- and intermediate-level waste at the WWMF located on the Bruce site.

The work plan included a review of the technical feasibility, potential environmental, social and economic effects, and a review of American and European methods for long-term management of low- and intermediate-level waste. Following this review, the Kincardine Council passed a motion, in April 2004, to support a deep geological repository.

Veto

Legacy LLW – Port Hope

Each community has a veto on the development of the low-level radioactive waste management facility to be developed in its area. This is set out in a legal agreement between the government and the municipalities that contains the terms and conditions under which the initiative would proceed [37]. The legal agreement contains provisions to ensure that the municipalities and the public are fully engaged in the Initiative, in the environmental assessment of the projects developed within the Initiative, and that the municipalities maintain control over whether the Initiative proceeds past the environmental assessment stage [20]. The waste management concepts developed by the communities (see **Working groups**) formed the basis for the agreement. The legal agreement signed in 2001 was part of the process of the community voicing its opinion on the development of a facility in their area.

The concepts put forward by each of the communities were subjected to alternative means evaluations to determine the preferred option for long-term waste management in each community. Once the best option was determined for each municipality's wastes, the municipal councils were asked to provide their official support to the identified option for their community. Each option was then subjected to a detailed environmental assessment. In accordance with the legal agreement, municipal consent is required prior to submitting the environmental assessment study report to the government, and, if through its screening of a project, the government changes the alternative submitted, the municipality has 90 days to veto the project.

The detailed environmental assessment study for the clean-up and new waste management facility in the Municipality of Port Hope was completed in 2004 and in April 2005, the municipal council passed a resolution supporting the results of the environmental study and provided its consent to it being referred to the government for preparation of its environmental assessment screening report. Based on its screening, in March 2007, the government made its decision that the Port Hope Project could proceed, and the municipality supported this decision, waiving its 90-day veto period in April 2007.

The studies relating to the clean-up of wastes and the waste management facility in the Municipality of Clarington were completed in 2006 and the municipal council there passed a similar resolution in June 2006. As at the end of 2008, with required additional technical input, the government is preparing its environmental assessment screening report for public consultation.

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Operational LILW – Kincardine

In October 2004, a Hosting Agreement was signed between OPG and the Corporation of the Municipality of Kincardine. The terms of agreement are based on experience in Port Hope and in other jurisdictions including Europe. The agreement included a condition requiring the community consultation to be completed in February 2005 and to demonstrate community support for the project. A telephone poll of all residents 18 years and older was completed. Participation rate was 72%. The consultation with Kincardine residents showed that 60% of those polled were in favour of developing the facility. The facility still has to receive regulatory approvals before it can be built. The hosting agreement includes milestones related to the regulatory approvals process.

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Working groups

Legacy LLW – Port Hope

In each community with low-level waste a local citizens' committee was set up to develop its own local solution to the waste problem. The government facilitated each committee's work by guiding the discussions and by providing financial support for the committees to hire their own consultants to assist them. Through the discussions and with the assistance of their consultants, the committees examined management concepts for dealing with the wastes in their community, evaluated the concepts according to criteria each had developed, identified in each case the committee's preferred concept and recommended the preferred concept to their respective municipal council. At the end of the process, all three municipal committees had each put forward their own local solution to the waste issue in their own municipality. Each solution was subsequently endorsed by the respective municipal council [20]. The communities' preferred options were at the conceptual level and the communities recognised that a further study (an environmental assessment) was necessary to ensure that they were technically, environmentally and socially acceptable. These concepts formed the basis of the legal agreement which was signed in 2001.

Operational LILW – Kincardine

For the low- and intermediate-level waste deep geological repository (LILW DGR) a Community Consultation Advisory Group was established. The objectives of the group are:

- For OPG to provide status updates on a periodic basis to representatives from local municipalities on project developments and milestones.
- To provide a forum to identify emerging issues related to community concerns.
- To provide suggestions for establishing and carrying out community consultation activities during the regulatory review phase.[18]

The group is made up of representatives from OPG and municipal government representatives from Bruce County, Kincardine and its neighbours Saugeen Shores, Huron-Kinloss, Arran-Elderslie and Brockton. The expenses for running the group are provided for by OPG.

18. Community Consultation Advisory Group (undated), *Terms of Reference for the Community Consultation Advisory Group.*

Community benefits

Empowerment measures

Legacy LLW – Port Hope

The Port Hope Area Initiative is funded by the government and it provides reimbursement for municipal costs incurred to ensure their continued engagement in the process, including project-related administrative costs, external communications costs and costs for consultants to review and advise the municipalities on technical and other studies associated with the Port Hope Initiative. Members of the community who participate in working groups do so on a volunteer basis and are not paid for their time.

Most importantly, each of the municipalities has hired an independent consultant to assist them in their efforts to review and comment on documents produced by the proponent and act in an advisory role to the municipality and its council. These consultants also assist the municipalities in addressing public concerns about the Initiative, assessing those concerns, meeting with local citizens and raising issues with the project proponent as necessary [20].

Other engagement mechanisms

The LLRWMO has proactively made information available to the public and sought public input. It has established a main street public information exchange, published a quarterly bulletin and included a regular column in the local newspaper on the Initiative. It has also engaged the public and key stakeholders in information sessions, workshops, and various other opportunities for discussion.

The LLRWMO meets at least every six weeks with representatives of the municipal councils and their staff to chart progress and discuss issues. Lines of communication have been maintained between the municipalities and government representatives.

Operational LILW – Kincardine

For the low- and intermediate-level waste DGR project at Kincardine,[19] the municipality receives money to cover their expenses in relation to conducting consultations in the community, hiring consultants, peer reviewers and lawyers. This is part of the CAN$35 million package that they will receive over the next 30 years.

Social benefits

Property valuation programme

Property valuation schemes have been set up in Canada for both the low-level waste clean-up in Port Hope[19] [20] and for the low- and intermediate-level waste repository at Kincardine.[19] If residents believe that they have been unable to rent or sell their property at the market rate as a result of the initiatives, they may apply for an independent evaluation to be undertaken. The Property Value Protection programme provides for compensation for actual losses that must be confirmed by a Qualified Assessor.

The Kincardine DGR Hosting Agreement makes provision for compensation for actual losses as a result of diminution of property values occasioned by contamination from radioactivity at the DGR site.

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19. *Agreement between Ontario Power Generation Inc. and the Corporation of the Municipality of Kincardine*, 2004.

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Local training

In Kincardine, for the low- and intermediate-level waste repository, there is support for the concept of a nuclear centre of excellence, trades and vocational schools and international tours. Kincardine is already well established as a centre of nuclear excellence and it is envisaged that the DGR will strengthen the reputation.

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Economic benefits

Legacy LLW – Port Hope

Fund

Under the Port Hope Area Initiative, each of the three communities involved in the development of waste management facilities received $10 million as compensation for hosting the facility. Each municipality was required to place the money in its own separate investment fund. Interest from the fund can be used by the municipality in the manner it sees fit. The principal money, however, may not be used until such time as Canada's nuclear regulator issues a licence for the construction of the proposed long-term radioactive waste management facility in that municipality [20].

Tax revenue

If one of the municipalities can show that they have received a decrease in their tax revenue because of a decrease in property values as a result of the initiative they may claim compensation from the government through the Project. The agreement sets out the limits on the claims that may be made in any one year as follows:

Town of Port Hope	CAN$	50 000
Township of Hope	CAN$	15 000
Clarington	CAN$	5 000

Project costs

The government is responsible for covering the project costs associated with the development including:

- Surveys for contamination and if required, clean-up and restoration of roadways, infrastructure and properties where there is reason to believe that historic LLW may exist.
- Improvements to infrastructure required for the construction and operation of the facility including:
  - Capital costs for road improvements to and from the facility.
  - Capital costs for improvement of other services to the site including sewage, water and lighting.
- Development of the facilities in the manner reflected in the conceptual design, including post-closure recreational elements.
- Establishing an ongoing communications programme to fully inform residents about the project.

In Clarington, the project costs included four additional investigations associated with one of the alternative facility designs that had been considered.

Operational LILW – Kincardine

The hosting agreement for the low- and intermediate-level waste DGR provides for Kincardine and the surrounding communities (Saugeen Shores, Brockton, Huron-Kinloss and Arran-Elderslie) to receive a total of CAN$35 million. This is split into lump sum and annual payments over 30 years and is subject to meeting key milestones.[19] The payment schedule is as follows.

- One-off payments: these are associated with key milestones and are outlined below.

One-off payments associated with the Kincardine repository development

Date	Milestone	Community				
		Kincardine	Saugeen Shores	Houron Kinloss	Arran Elderslie	Brockton
2005	Community support established	CAN$1.3m	CAN $500k	CAN $140k	CAN $80k	CAN $80k
~2013	CNSC issues DGR construction licence approval	CAN $1.3m	CAN $500k	CAN $140k	CAN $80k	CAN $80k

- Annual payments will also be made to the municipalities between 2005 and 2034 as follows.

Annual payments associated with the Kincardine repository development

Community				
Kincardine	Saugeen Shores	Houron Kinloss	Arran-Elderslie	Brockton
CAN$650k	CAN$250k	CAN$70k	CAN$40k	CAN$40k

It is also estimated that the project during its construction peak will generate up to 300 new jobs and will result in expenditures of about CAN$800 million over the lifetime of the project. The DGR may also create opportunities for tax reductions in the area.[20]

Agreements underpinning waste management facilities

Legacy LLW – Port Hope

The Federal government (Minister of Natural Resources) and the Corporations of the Town of Port Hope, Hope and the Municipality of Clarington signed an agreement for the clean-up and long-term safe management of the LLW situated in the Town of Port Hope, the Township of Hope and the Municipality of Clarington [37] in 2001. The key elements of the agreement are [20]:

- The background to the project, definition of key terms, including what the project will achieve and the parties involved.
- The terms and conditions under which the government and the municipalities agreed to pursue a process for the local long-term management of the low-level radioactive wastes.
- The government's commitment to local participation including a comprehensive communications programme to provide information to the public and receive public input.
- A commitment of the parties to work together to expedite the successful completion of the initiative.
- Provisions for the reimbursement by the government of municipal costs incurred to ensure their continued engagement in the process, including project-related administrative costs, external communications costs and costs for consultants to review and advise the municipalities on technical and other studies associated with the Initiative.

20. *www.opg.com/ops/NwasteIAS18b.jpg*, accessed 2006.

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- The host community fees and the funds set up in relation to these.
- The property value protection programme.
- Protection for diminished municipal tax revenue.
- Processes for addressing public complaints and for resolving disputes among the parties.
- Requirements for the environmental assessment (EA) and regulatory review process including:
  - The proponent must obtain municipal feedback on the various alternative means considered through the EA process.
  - The proponent must obtain municipal consent on the preferred alternative means that emerged through the alternative means evaluation process prior to submitting that preferred alternative to the government for its considerations.
  - Should the preferred alternative submitted to the government be varied through the government's environmental assessment, the municipalities have the option of vetoing the proposal.

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Operational LILW – Kincardine

In October 2004, the Kincardine Hosting Agreement[19] was signed between OPG and the Corporation of the Municipality of Kincardine.[21] The key terms in the hosting agreement are:

- OPG will seek regulatory approvals to construct the proposed Deep Geologic Repository and Kincardine will support OPG's applications.
- Kincardine and the surrounding communities will receive CAN$35 million (2004 dollars, inflation protected) in lump sum and annual payments over 30 years subject to achieving key milestones:
  - Positive Community Consultation in Kincardine.... 2005
  - Environmental Assessment Guidelines..... 2007
  - Environmental Assessment Approval..... 2010
  - Construction Licence 2013
  - Operating Licence 2017
- The surrounding communities are Saugeen Shores, Brockton, Huron-Kinloss and Arran-Elderslie.
- The facility can be used for all low- and intermediate-level waste produced during existing reactor operations and for waste from decommissioning all 20 OPG reactors, approximately 200 000 m^3.
- There is provision to negotiate repository expansion for additional low- and intermediate-level waste from any new-build reactors in Ontario.
- No used fuel will be placed in the proposed deep geologic repository.
- OPG will locate new jobs associated with the facility at the WWMF.
- OPG will provide property value protection.
- OPG and Kincardine will support the concept of a nuclear centre of excellence, trades and vocational schools, and international tours.
- Prior to OPG moving to the regulatory approval stage, Kincardine Council will formally consult with Kincardine residents to determine if they support the council resolution favouring the Deep Geologic Repository option.

21. OPG and the Municipality of Kincardine (2004), *Background for Deep Geological Repository Proposal.*

Prior to proceeding to the regulatory review phase, Kincardine Council assisted by OPG undertook a public dialogue to determine the level of community support for the proposals. The consultation consisted of a telephone poll of all Kincardine residents aged eighteen and over and a mail follow-up for those not reached by phone: 60% replied yes, 22% no and 18% neutral or do not know. 72% of eligible residents participated in the consultation.

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Time frame

Table 2 outlines the events and time frames preceding the Port Hope Initiative, the activities completed under the initiative and the estimated timelines of the future stages. Table 3 outlines the Kincardine process.

Table 2. **Timescale of Port Hope Initiative**

Date	Event
1988-1996	Between 1988 and 1996 the Siting Task force attempts to locate a permanent long-term waste management facility for the low-level waste from the Port Hope area. This initiative is unsuccessful.
1997-1999	Hope Township initiates a community proposal to construct a long-term waste management facility. In 1998 Port Hope and Clarington develop similar proposals. The local concepts are developed over a two-year period.
2000	Principles of understanding are developed between the government and the local communities.
March 2001	The legal agreement between the government and the local communities is signed and the Port Hope Area Initiative begun.
Nov 2001	The environmental assessment process begins.
July 2002	Scope of the environmental assessments are finalised by the government after consultation with the public.
Sept-Oct 2004	The Qualified Concepts for the Port Hope and Port Granby Projects receive municipal agreement.
April 2005	The Preferred Option for the Port Hope Project and its submission to federal decision makers for consideration receive municipal consent.
July 2006	The Preferred Option for the Port Granby Project receives municipal consent.
March 2007	Federal EA decision that the Port Hope Project may proceed.
April 2007	Municipality of Port Hope accepts federal EA decision and waives its option to veto.
~ Summer 2009	Federal EA decision that the Port Granby Project may proceed.
~ Fall 2009	Submission of documentation in support of a licence for the Port Hope Project.
~ Spring 2010	Submission of documentation in support of a licence for the Port Granby Project.

Table 3. **Timescale of Kincardine Programme**

Date	Event
1960s	A commercial nuclear power station, Douglas Point, is built on the Bruce site within the Municipality of Kincardine.
1970s	Ontario Hydro, OPG's predecessor, initiates construction of further nuclear units at the site. A radioactive waste facility is established on the site for storing low- and intermediate-level waste from all of Ontario Hydro's reactors.
80s, 90s	Various environmental assessments completed with respect to staged expansions at the waste facility (additional storage structure, incinerator). Facility operates with a very good safety record. Capacity is not an issue and OPG has put aside funds for a waste disposal facility but is not actively seeking site for LILW.
2001	The Kincardine Municipality expresses an interest in discussing long-term plans for management of low- and intermediate-level waste.
2002	Memorandum of Understanding (MOU) signed by Kincardine Municipal Council and OPG.

Table 3. **Timescale of Kincardine Programme** (Cont'd)

Date	Event
2002-2004	An Independent Assessment Study is undertaken to jointly review options for the long-term management of low- and intermediate-level waste. Three options are evaluated in detail and found to be feasible – enhanced processing and storage, surface concrete vault, and deep geologic repository.
April 2004	Kincardine Council passes a resolution that requests OPG to pursue the deep geologic repository option at the Bruce site. A significant factor is that it has the highest margin of safety of all the options.
October 2005	OPG and Kincardine enter into a hosting agreement. Agreement includes confirmation of support of Kincardine residents.
January-February 2005	Telephone poll conducted to determine community support for the project. 60% come out in favour of the development.
December 2005	OPG files a Project Description with the Canadian Nuclear Safety Commission (CNSC), which initiated the Environmental Assessment (EA) process under the Nuclear Safety and Control Act and the Canadian Environment Assessment Act. This is expected to take 6 to 8 years.
August 2007	OPG submits its application for a Site Preparation and Construction Licence to the CNSC.
January 2009	The CNSC and the Canadian Environmental Assessment Agency issue final Environmental Impact Statement Guidelines and Joint Review Panel Agreement establishing how the panel will function and its terms of reference.

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CZECH REPUBLIC

The Czech Republic has two nuclear power plants (the Dukovany NPP with four WWER type nuclear reactors of 440 MWe, and the Temelín NPP with two WWER type reactors of 1 000 MWe). Dukovany units have been in operation since 1985; the commissioning of the first reactor unit at Temelín started in 2000. Both NPPs assume the extension of their lifetime to 40 years. Construction of a new nuclear generator (probably at the Temelín site) is often discussed and it has political support from most political parties.

The fundamental framework for radioactive waste management is formed by the Atomic Act (No. 18/1997 Coll.) and regulations of the State Office for Nuclear Safety. According to the Act the state is responsible for the safe disposal of all radioactive waste. To ensure the related activities, the Radioactive Waste Repository Authority (RAWRA) was established in 1997. There are three LILW repositories in operation in the Czech Republic. All relevant current activities are aimed mainly at increasing operational and long-term safety and optimising the whole system.

The long-term policy of the state is formalised in a basic strategic document "Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic". According to the concept, construction of a deep geological repository for the direct disposal of spent fuel and other high-level waste is considered as the only realistic option for a final solution based on the current state of knowledge; yet this decision on further development could be revised by a new evaluation of management options, expected in ten years' time. In compliance with the concept, two suitable sites should be selected before 2015 and included in area development plans. In 2030, construction of a confirmatory underground laboratory should be started. According to the concept, construction of the disposal facility should be started only after 2050, and operation is targeted for 2065.

Siting of a deep geological repository based solely on geological criteria began as early as 1991 (resulting in a recommendation of eight sites). The screening stage of the site selection process was repeated according to a complex array of safety (geological) and administrative criteria and completed by RAWRA in April 2003. This process aimed to achieve transparency and to provide some aspects of public involvement. Eleven potentially suitable sites were initially identified: seven in granite, three in metamorphic and one in sedimentary rock formations. According to the current level of knowledge, these sites met all the relevant requirements and no exclusion factors that might rule out the construction of a deep geological repository were identified. The next stage applied additional criteria (identifying potential advantages and disadvantages related e.g. to landscape character, transport options, environmental impact, etc.). This stage retained six sites, all in granite rock formations. The objective of the siting process at the subsequent stage was to narrow down the number of potential sites for the location of a geological repository. Aerial geophysical measurements were completed in November 2003 at all six recommended potentially suitable sites with a total area of 240 km^2, comprising nearly 50 individual communities. At the end of 2005, areas of approximately 10 km^2 at all six sites were selected for geological landscape and borehole survey and for further characterisation based on the data obtained and expert recommendations.

Many communities protested against these developments and demanded, among other things, the strengthening of their role in the siting process (the right of veto). Between 2003 and 2005, local referenda were held in many communities; voters rejected the construction of a repository in their vicinity, and also awarded local representatives a mandate to apply all the legal measures at their disposal to oppose preparations for the construction of a repository. Due to public opposition and in compliance with governmental decision, RAWRA postponed all its activities at these sites for at least five years. On the request of government, from the end of 2008 RAWRA also undertook the analysis of geological data on the Czech Republic's five existing military training areas. The desk study showed potentially suitable geological conditions in two of these. Currently, the moratorium on geological works at the six sites is coming to an end. Further geological research work will require the permission of the Ministry of the Environment. Before re-introduction of the exploration works, RAWRA aims to acquire the consent of the respective communities.

Currently the document "Spatial Development Policy" – a kind of regional land use development plan – is nearing the end of its approval process. The policy is binding upon communities and regional authorities. In the field of RWM, the policy "reserves" six potentially suitable sites with the aim to ensure protection of the sites against any changes in their utilisation which would adversely affect repository construction in the future. The policy was the subject of public hearings (22 July 2008 in Prague, 17 September 2008 in Brno) organised by the Ministry for Regional Development and of consultation with neighbouring states (June-September 2008). Approval by the government however has been postponed (as government earned a parliamentary vote of no confidence in March 2009).

Public involvement and voluntarism

Generally, it can be said that a volunteer process in return for economic benefits is rarely (if ever) used in the industrial field in the Czech Republic. The siting process of a deep geological repository was not based on a volunteer approach, as the sites that were proposed for further survey were identified according to pre-selected geological and safety criteria. The main reason for the chosen approach might be that sites compliant with the safety criteria are very rare in Czech and Moravian geological conditions and that volunteering communities (if any) might turn out to be unsuitable, which might stop the whole process. Nevertheless, to achieve local public acceptance and to gain the support of the local elected councils and representatives was from the beginning the goal of RAWRA activities. The next step, i.e. application by RAWRA to the Ministry of Environment for the establishment of exploration areas according the Act N. 62/1988 on geological works, can hardly be achieved without community support: the parties to the procedure are the applicant, the municipality and civic associations. According to the Programme Declaration of the previous government (17 January 2007), "the government will take further steps in the selection of sites for an underground repository for spent nuclear fuel in a transparent manner; the consent of municipalities concerned will be an essential criterion."

Right of veto

Local settlements do not have a right of veto in the Czech Republic. The local referendum exists, but issues coming under state administration cannot be the subject of local referenda. Such a referendum dealing with a facility of nationwide importance would be invalid and seen as a kind of public opinion poll. Some local communities and environmental associations proposed recently an amendment to the Atomic Act to grant the right of veto in regard to a deep geological repository, but this step has not gained wide support as it is seen as an exceptional rather than a systematic approach. As mentioned above, some communities organised referenda and awarded local representatives a mandate to apply legal measures to oppose preparations for repository construction. It is extremely difficult to open dialogue with these communities as their representatives see the referendum result as binding.

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Communication

Since its establishment, RAWRA has striven to maintain good relations particularly with the local population of areas around operating repositories, and is also keen to establish good relations at the sites considered to be potentially suitable for further research. Since the identification of the sites significant efforts have been concentrated on communication and mutual understanding with local communities, with RAWRA activities focusing on dialogue with local representatives and on providing comprehensive information to local people through public meetings, information leaflets, offer of study trips to nuclear facilities, etc.

The task of RAWRA is complicated by the fact that no existing nuclear sites are included among the preselected sites, so the potential partners are unfamiliar with the technical aspects of radiation, safety and so forth. Another handicap is that the operation of the repository is foreseen no earlier than 2065, meaning that potential benefits related to a repository appear to be in too distant a future (see **Compensations**). While currently there is only limited public support at some sites for continuing the geological survey including drilling of boreholes, still some positive steps have been achieved aiming at partnership and co-operation with communities.

Information is considered a necessary prerequisite for dialogue on nuclear issues. That is why RAWRA started to assist small communities with reconstruction of local libraries and established small RAWRA information centres in several villages (Lubenec, Rohozná, Dolní Cerekev, Milíčov; further villages may be served). These projects were financed by RAWRA and aim to facilitate the availability of up-to-date information on RW disposal as well as to substantially improve the operation of the libraries themselves. One advantage for local communities was access to internet, but with the advent of other governmental programmes this aspect of co-operation with RAWRA lost part of its attraction. Another attractive way to provide information is to organise visits of nuclear facilities related to final disposal or interim storage. RAWRA organised several excursions to low-level waste repositories or the interim store at the Dukovany NPP site. Participants in these visits are usually not the convinced opponents. Contrary to public meetings, the discussion during these visits, indicative of issues of local interest, is usually quite technical. It seems that surprisingly people are more afraid of the construction period than of the operational period. RAWRA has also organised a series of excursions abroad (2004 – Gorleben, Germany; 2005 – Grimsel Test Site, Switzerland; 2006, 2007, 2008 – Sweden; 2009 – Finland planned). The number of participants in these visits is about 50 and they are mostly local elected representatives, teachers, etc. The advantage is that they usually have an opportunity to meet local representatives at nuclear sites and directly discuss with them issues of interest. This information is better trusted than indirect information passed on by RAWRA.

Memorandum of understanding and the Argona project

Postponement of the geological works lifted pressure and afforded time to overcome the "stalemate situation" and open a dialogue among stakeholders, with local communities in particular. On 29 September 2004, a memorandum of understanding was signed between four communities around Dolní Cerekev and RAWRA. In this memorandum, the communities declared that they recognise the need for safe final disposal and declare their preparedness to be involved in discussions about the ways to develop a safe and locally acceptable disposal facility. Nevertheless some citizens of these communities saw the signing of the memorandum as an erroneous indicator of local approval for the repository. Pressure on their representatives led to gradual withdrawal of three communities from the agreement.

A neutral platform for discussion among a broader spectrum of stakeholders was needed, which would be trusted by all participants. A very significant step towards this aim was made within the

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framework of the EC 6th Framework part-funded research project Argona (Arenas for Risk Governance). Argona is a step towards a proposed long-term process of "European Transparency Arenas", foreseen as an interface between scientists and politicians in particular. In the Czech Republic, the RISCOM model, developed within the EC Riscom I and II Projects, is being applied with the aim of development of a decision-making process with the active involvement of stakeholders including the local and general public. A so-called reference group was established, whose members attend regular meetings and work together on the identification of conditions for involvement of stakeholders in the deep geological repository development process. Representatives of the local communities, the Ministry of Industry and Trade, the Ministry of the Environment, the State Office for Nuclear Safety, Calla Association, the Institute of Sociology of the Academy of Sciences and RAWRA are among its members, meaning that the group involves representatives of practically all different stakeholder interests. The leading role in all activities is taken by employees of the Institute of Nuclear Research in Řež near Prague (NRI Řež), thereby guaranteeing a neutral scientific organisation. RAWRA provides logistic support. Meetings are held about four times per year. The members signed an agreement on co-operation. According to this document, a condition for membership is the willingness to participate in open and critical discussions without a hidden agenda. Activities involve a search for methods to incite interest in high-level waste management; investigating siting processes characterised by transparency and active involvement of the general public in decision making; identifying possibilities and methods for the application of the Swedish RISCOM models in the Czech Republic in compliance with its legislative, social and historical background; considering means for mutual open communication among all stakeholders and information channels for transferring objective information to the general public (including seminars, public meetings, etc.); defining possible solutions for controversial issues and identifying consensus-building techniques. Most discussions are facilitated by an experienced mediator and observed by Swedish researchers.

Some participants participated in the Argona End Users Conference held in March 2009 in Uppsala, Sweden, where they had the opportunity to share directly their experience with stakeholders of other nationalities including participants in the CARL and COWAM in practice projects. The first major event of the Argona project in the Czech Republic was a public hearing focused on the deep geological repository site selection process, organised at the neutral site of chateau Stirin on 23 May 2009 with the participation of many state and non-governmental institutions. Participants listened to a mediated panel discussion and then expressed their ideas and comments. The Argona project will be terminated at the end of 2009 and the reference group considers that it is very important to find ways to prolong its activities into the future.

Compensations

The term "compensation" is rarely used in the Czech legislation and other documents. The communities with disposal facilities in operation are entitled according the Atomic Act to receive fees. The fees can be spent only on public works projects. Currently, according to government decision, the fee is limited to 1.5 million CZK/year. As the operation of the repository is foreseen no earlier than 2065, fees connected with the operational period (even if they may be set at a higher level at that date) do not appear to play at present any role of incentive. According the Act on geological works, there are some fees connected with the establishment of exploratory areas (depending on the size of the area), but these are very limited and would be nearly negligible in the community budget. That is why the community Lubenec, the first that expressed conditional approval of a geological survey of their territory, requests the determination of compensation (amount, rules of usage, etc.) during the geological survey stage. A decision of this kind is possible only at government level, but currently such a decision has not been prepared nor included in governmental plans.

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FINLAND

When the Finnish Parliament amended the Nuclear Energy Act by prohibiting export and import of nuclear waste, it became evident that the owner of the Loviisa power plant Imatran Voima Power (Imatran Power-IVO) had to deal with the waste within the Finnish borders. In practice, the only acceptable solution was final disposal, so Teollisuuden Voima Oy (TVO, a nuclear power operator) and IVO jointly established the company Posiva for taking care of spent fuel disposal.

Site investigations in Finland were originally overseen by TVO. In 1995, Posiva Oy was established as an expert organisation responsible for the final disposal of spent nuclear fuel, research into final disposal and for other expert nuclear waste management tasks. Posiva is owned by Teollisuuden Voima Oy (TVO) (60%) and Fortum Power & Heat Oy (40%), both of which share the cost of nuclear waste management. Posiva took over the site investigations when they were established.

Voluntarism

In 1983, TVO drew up a list of 101 potential sites for hosting a repository and undertook a consultation process with the affected communities. This resulted in the identification in 1985 by TVO of five potential "volunteer" sites at which more detailed investigations were carried out. In 1992, TVO announced that further investigations would only be carried out at Romuvaara in Kuhmo, at Kivetty in Äanekoski and at Eurajoki (near the Olkiluoto nuclear site). Interim reports on these sites were produced at the end of 1996. Following indications by sectors of the local community in Loviisa that they too wished to be included, that site was also added to the list. As part of the fuel was stored in Loviisa, it was logical that this site also be studied as a potential site for final disposal.

Veto

Finland has what is called the Decision in Principle (DiP) process [11]. Under the requirements of the law, a positive decision by the local municipality and a supporting statement by the regulator, based on its preliminary safety appraisal of the disposal concept, were required before a government decision on whether to build a repository in an area.

In Finland, the municipal council had the right of veto and decided whether to support the development of the repository. The final decision by the Eurajoki Council was taken after Posiva had submitted the application for the DiP and the EIA report to the government, who requested statements from the regulator and the municipality. The regulator, STUK, did not have to give a definite conclusion on the safety of the proposed disposal concept. They had only to state that nothing had been found which would raise doubts about the possibility of achieving the required safety standards. When the regulator did not find objections in terms of safety of the project at this stage, it was also possible for the municipality to be in favour of the Decision in Principle. After STUK made their statement, the local council voted in favour of the facility. This happened after the detailed site investigations were undertaken at the site.

After hearings, review and court processes, the Finnish government approved Posiva's application in 2000.

The final requirement of the process was the ratification by the Parliament of the DiP, which occurred in 2001. All the decisions are conditional on the regulator's approval of the potential site when Posiva have submitted the results of their detailed investigations of the site. Posiva is now performing underground site investigations before applying for a licence to construct the facility.

Working groups

In Finland, co-operation and follow-up groups were set up between Posiva and the municipality officials and elected officials. The groups dealt with issues concerning final disposal, its planning and environmental impact assessment (EIA). Representatives from the municipalities and Posiva took part in the activities of the groups. Each group also included a separately appointed EIA contact person. The groups met approximately once every other month.

Municipal councils were informed about the progress of the assessment through regular information meetings organised for the councils. The main officials in regional administrations were informed and negotiations were held with them during the drafting stage of the programme. Seminars were organised for central administration representatives during the environmental assessment.

After the site selection in 2001, the co-operation group between Posiva and the municipality has continued to convene in several meetings annually. The issues in the agenda of the meetings have dealt with Posiva's site investigations in Olkiluoto, construction of ONKALO (the rock characterisation facility at Olkiluoto), R&D related to the technical concept of final disposal and the development of the Vuojoki Manor (see below).

In 2008, Posiva started an Environmental Impact Assessment (EIA) procedure for the extension of the final disposal facility in Olkiluoto to house up to 12 000 tU of spent fuel. In this context, an EIA coordination committee, consisting of the relevant stakeholders in the region (Eurajoki and all the neighbouring municipalities, authorities, etc.) was set up in order to facilitate interaction between Posiva and the interest groups and to review the reporting during the course of EIA. The coordination committee convened twice in 2008.

Community benefits

Social benefits

In Olkiluoto, an old peoples' home was housed in an historic mansion. Posiva loaned money to the municipality for it to construct a new home for elderly people. Posiva also partially financed the restoration of the mansion; complementary funding was contributed to the restoration by the municipality and the European Union. The historic building is now partially used as Posiva's offices while the rest of the building is open to the public and is used as a local resource. Posiva has rented the mansion on a forty-year lease and will pay all the rent over the first twenty years. With the rent income, the municipality will cover the construction loan from Posiva.

Economic benefits

No incentives or compensation are paid directly by the government. However, nuclear facilities pay a local property tax at the highest rate of 2.5% while the average rate is 0.4-1.0%. This property tax is seen as the most obvious benefit for the local community. The money goes straight to the municipality without any restrictions on its use.

As reported in the 1999 EIA report [38], the direct effect of such increases in tax revenue from siting a facility (income, property and corporation) may be partially offset by "national tax revenue equalisation".

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FRANCE

The waste management organisation in France is ANDRA, the national radioactive waste management agency. It was established as a commercial and industrial public body under the provisions of the Waste Act of 30 December 1991.[22] This Act was integrated in the Environment Code, which was then updated by the 28 June 2006 Planning Act on the Sustainable Management of Radioactive Materials and Waste.[23] ANDRA operates near-surface disposal facilities for low- and short-lived intermediate-level waste at Centre de la Manche (now closed and not considered further here) and at Centre de l'Aube; in addition it operates the very low-level waste (VLLW) disposal facility at Morvilliers (near Centre de l'Aube) and is investigating the Bure "transposition zone" for a potential deep geological repository as part of its research on the long-term management of high-level waste (HLW) and long-lived intermediate-level radioactive wastes [17].

Voluntarism

Volunteer sites in return for economic and social benefits are common in France for a wide range of industrial activities including nuclear power plants. A volunteer process has also been used for radioactive waste management facilities [39].

Low- and short-lived intermediate-level waste – Centre de l'Aube

The site selection process for the near-surface repository at Centre de l'Aube, which commenced operation in 1992, began in 1985. ANDRA predecessor organisation identified five potential sites, from which the Aube site was selected as the preferred one. The original shortlist included a number of sites where the local mayors had volunteered their communities to be considered by ANDRA, but none was eventually deemed geologically acceptable.

High-level waste and long-lived intermediate-level waste disposal

The 1991 Waste Act on HLW R&D redirected the French deep site investigation process following the abandonment of an earlier HLW programme (that programme sought to identify promising disposal sites primarily by reference to geological criteria). The Act contains several parallel provisions:

- A fifteen-year research programme covering:
  - Separation and transmutation of long-lived radionuclides in waste, conducted principally by the Commissariat of Atomic Energy (CEA).
  - Deep disposal studies "through the creation of underground research laboratories" (URLs) by ANDRA.
  - Long-term surface storage techniques – principally by the CEA.
- At the end of the 15-year programme (in 2006) the preparation of a report (by a National Review Board) together with a draft law to be submitted to Parliament for a decision on the creation of a deep disposal facility at one of the URL sites.

22. Law of 30 December 1991 Relating to Research on the Management of High-level, Long-lived Radioactive Waste (1991).
23. Planning Act of 28 June 2006 on the Sustainable Management of Radioactive Materials and Wastes (2006).

- A requirement that local officials and members of the public from the affected sites be consulted before any site investigations begin preliminary to URL construction.

Based on the results submitted by ANDRA and CEA, and on the results of reviews and of a national public debate, a new law was passed in 2006 which updates the 1991 Act and outlines the research activities for the next period. Work will continue on the research programme outlined above. The aims in each area will be:

- Separation and transmutation: to enable an assessment in 2012 of the industrial prospects of reactor designs and develop a prototype for operation before the end of 2020.
- Reversible disposal in deep geological formations: to achieve an application for authorisation of a disposal facility in 2015 and operation of the facility in 2025.
- Storage: to create new storage facilities or modify existing ones to meet future needs by 2015.

The following work will also be undertaken:

- Development of disposal solutions for graphite wastes and radium-containing wastes, so that the corresponding disposal centre can be set in operation in 2013.
- Development by 2008 of storage solutions for tritium-containing wastes allowing a reduction of their radioactivity before disposal at the surface or at a small depth.
- Finalisation by 2008 of processes allowing the disposal of spent sealed sources at existing or planned centres.
- An appraisal in 2009 of the short- and long-term management solutions for wastes with enhanced natural radioactivity, proposing new solutions, if applicable.
- An appraisal in 2008 of the long-term impact of the disposal sites of uranium mining wastes and implementation of a strengthened radiological surveillance plan at these sites.

The underground research laboratories

A mediator – Christian Bataille MP – was appointed under the 1991 Act and was specifically tasked with leading public involvement prior to the selection of URL sites. His mediation mission took three objectives: information provision to the public, open dialogue and decision facilitation.

The siting process for the URLs began in January 1993. By December of that year, some thirty territorial administrative units had volunteered for consideration, based on a decision by the local elected authorities (in this case, for a district, the general council). Ultimately, Mr. Bataille recommended four sites considered potentially suitable from the point of view of societal feasibility (based on Bataille's criterion of "sustainable consensus" to be found within local governance structures). Two were subsequently merged so that three locations were then under consideration: a clay geology in north-eastern France on the border of the Meuse and Haute Marne Districts (the Bure site); a clay geology close to the Marcoule nuclear site in the south of the country in the Gard District; and a granite geology in the Vienne District in western France. Surface-based investigations at these sites, which comprised drilling two to four boreholes plus geophysical measurements, were completed in April 1996.

In May 1996, the Council of Ministers authorised ANDRA to submit requests for the installation and operation of URLs at each of the three sites. Authorisation of the URLs was scheduled to be completed in 1998, following review of the submissions by DSIN (the nuclear regulator) and Ministry of Research, together with public hearings and other forms of local consultation. Public hearings at the sites ran from January to May 1997. Results of votes conducted within the official liaison committees (including elected representatives of the local communities, the districts and the regions) were positive at the three sites.

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In December 1998, the government confirmed that two sites should be investigated: the Bure site and a granite site to be newly selected.[24] A decree was issued in August 1999 allowing ANDRA to commence construction of the URL and the establishment of a local information committee at Bure, and to launch the consultation exercise to select the granite site.

A mission implemented by the government was not able to identify a granite site and therefore ANDRA has undertaken work at international granite underground research laboratories.

Veto

The communities do not have a veto power in France. A public inquiry process results in government decrees directing ANDRA to undertake particular work.

Working with the community

A local information and oversight committee (CLIS) was set up in Bure according to the 1991 Act. The CLIS has over ninety members made up with representatives from the state, from regional, district and local governments, from the Parliament, from environmental groups and trade unions and from ANDRA, etc.

The CLIS meets three to four times a year; all meetings are open to the public and media. It also has a Board of some sixteen members which meets monthly.

The CLIS also has several commissions drawn from the CLIS membership. These have looked at a number of issues in more detail including health, project tendering, the research programme and geothermal energy.

The CLIS has two offices: an administrative one in Bar-le-Duc in the Meuse Prefecture building and one in Bure itself including a public reading room.

The CLIS is only a consultee in the decision-making process. However, it has to be consulted on all operations-related matters that may affect the environment and the region. The CLIS can also commission independent expertise; this possibility was used before completion of the final report by ANDRA prior to the 2006 Act, "Dossier 2005".

Under the Planning Act of 28 June 2006 concerning the sustainable management of radioactive materials and wastes, a reversible geological repository is now under consideration in France, targeting operation, if authorised, in 2025. The final location is to be determined within a 250-km^2 transposition zone surrounding the Meuse/Haute-Marne underground research laboratory situated at Bure. The CLIS has received a new mandate and now includes all the municipalities situated inside the transposition zone. It has been in place since June 2008 and is preparing a new work programme.

As well as the CLIS, a Public Interest Group (GIP) exists for each of the Meuse and Haute-Marne districts; its roles as set out in the 2006 Act are to:

- Manage equipment that promotes and facilitates the installation and operation of the laboratory or of the disposal centre.

24. "Government rejected the Vienne site on grounds that the CNE had questioned the quality of its granite. The Gard site was also rejected ostensibly on scientific grounds, but observers attribute its elimination to the strong opposition mounted by regional winegrowers. These feared that media focus on a waste facility would place a stigma on their commercial product (…). The political consensus sought by Bataille had proved unsustainable here." [39]

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- Conduct, within the limits of its district, territorial planning and economic development actions, especially in the zone – whose precincts are defined by decree adopted after consultation with the general councils concerned – close to the underground laboratory or the disposal centre.
- Support training programmes and the development, mobilisation and dissemination of scientific and technological knowledge, especially in the fields studied at the underground laboratory and in new energy technologies.

The new statutes of each GIP, directly inspired by the 2006 Act, state its mission as to:

"…manage the equipment in such a way as to promote and facilitate the setting up and running of the URL, and to manage, within the confines of the district, any activities which would develop/improve that area; to manage its economic development, in particular of the area immediately adjoining the URL, and to support any training activities as well as any activities encouraging the development, promotion and diffusion of scientific and technological knowledge, especially in the specific fields studied within the URL and of those related to new energy technologies."

The public interest groups set up in the Meuse and the Haute-Marne have seen their base extended to include all the municipalities situated within a zone of proximity defined through socio-economic criteria (more than 300 communes as opposed to 33 before).

Community benefits

Empowerment benefits

The CLIS has a budget of 300 000 per year. The budget of the CLIS is agreed by the Parliament (through an annual financial law) and allocated, via the districts' GIPs, by the Ministry of Industry. The CLIS can commission independent reviews of the programme and hire experts to advise it. Unspent funds can be carried over from one year to the next.

Socio-economic benefits

Two taxes paid on nuclear facilities are paid to the communities: an economic development tax and a technology diffusion tax. The money is used to fund the GIPs. Both Meuse and Haute-Marne each received 9.1M per year from 1999 to 2006 for their Public Interest Group. The figure was developed to be in line with the local taxes raised by nuclear power plants. The aim of this money is to promote the local economy and employment. This is treated as an additional income over and above what the two districts receive from the annual state budget.

There are strict rules under which the community benefits can be spent in each district, including the EC rules on state aid and the Amsterdam Treaty on helping private firms with public money. The GIP can only allocate up to 80% of a project's budget; others (Europe, state, region or district, proposers) have to come up with the other 20%, which can be difficult in such a poor region. Examples of projects which have received funding include:

- Road improvements.
- Schools.
- Protection of water supplies.

The 2006 Act also stated that a part of the 20M (about 14%) will be directly allocated to the communities that are within a 10-km radius of the perimeter of the laboratory. The communities will be free to spend this money however they wish.

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From 2007 until a decision about whether to implement deep disposal in the area is made (expected in 2015), each GIP will receive 20M each. A licensed repository will be classed as a "basic nuclear installation" (INB) and will be subject to the special tax system for that type of facility. The repository is a new category of INB; therefore there will be discussions about the rate of the tax and how much should be provided to the community.

The 350 workers on site come from within a 10-15 km radius. The workers are made up of ANDRA employees (68) and the main drilling contractor (240) during the mining phase; the rest are ancillary workers. There is also a Mission Co-ordinator for the URL; he is a government appointee. His task is to develop the local economy and assist ANDRA and other local companies in finding employees during the construction phase. He also reports on the local socio-economic impact of the URL. The visitors' centre attracts about 40 000 visitors a year; this also brings revenue into the area.

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HUNGARY

Introduction[25]

Hungary has had nuclear activities since the early 1960s. The four reactor units of Paks Nuclear Power Plant (Hungary's only commercial NPP) commissioned between 1982 and 1987 form the most significant waste source today. Two research and training reactors also contribute to the generation of spent fuel. In each case, fuel waste is temporarily stored on the respective site. Finally, about 2 000 institutions using radioactive isotopes contribute to waste production.

In the late 1980s and early 1990s, attempts were made to find a site for a repository to dispose of the LILW generated by the Paks NPP. The top-down approach taken failed due to vigorous public opposition. In 1993, a new site investigation programme was initiated using a significantly different approach. Site selection criteria included not only technical and geological factors, but also local acceptance to be taken into consideration. A voluntary siting process was launched, in which public information and financial incentives played a crucial role. The LILW siting process resulted in the selection of a site (Bátaapáti) in the granite. In July 2005, a local referendum was held in Bátaapáti which approved the repository and in November 2005 the national Parliament voted to establish the facility.

In Hungary, another project started in 1993 with the aim of identifying suitable host rock for disposal of spent fuel and/or high-level waste (HLW). The exploration tunnel excavated in the Mecsek Uranium Mine reached the claystone formation in 1994, and the on-site underground data acquisition began in this area. Between 1995 and 1998, a short-term project was launched to characterise the rock mass known as the Boda Claystone Formation. In 1999 however, a decision was made on closure of the uranium mine that led to termination of the project. In this situation, the national radioactive waste management agency, PURAM, worked out a new strategy and a programme to be accomplished in the coming years and decades. The surface-based exploration programme in the same area (Western Mecsek Mountains) restarted in 2004. PURAM aim is to designate a location for an underground research laboratory where exploration of the claystone could be accomplished. The HLW repository project is rather complex as no final policy has been approved and different options are kept open.

Radioactive waste management is currently governed in Hungary by the 1996 Act on Atomic Energy. According to this law, in order to regularly provide information to the population of the communities in the vicinity of the facilities, the licensee of an NPP or a RWM facility shall *promote the establishment of a public oversight and information association and can grant assistance to its activities*. Consequently, the law established the legal basis for providing financial incentives to the supportive group of municipalities. Funding provided for the associations can be used for public information and oversight activities, as well as for regional development purposes.

Making use of this possibility – and in some cases even before the law – public oversight and information associations were established. Today there are four Public Information Associations, each established in the vicinity of a working storage or disposal facility, construction site or investigation

25. This text was developed from information contained in [16].

area. The "Isotope Information Association" (ITT) is established for Hungary's only operating site, the near surface LILW repository at Püspökszilágy. The "Local Public Control and Information Association" (TETT) is active for the new LILW repository under construction in Bátaapáti. The "Social Monitoring and Information Association" (TEIT) was created in connection to interim storage for spent fuel at Paks NPP. Finally, the candidate siting area of a HLW repository in the Mecsek Hill around Boda benefits from the "West Mecsek Public Information Association" (NyMTIT).

Voluntarism

Bátaapáti, a settlement of 450 residents, got in touch with Paks nuclear power plant in 1990. Following an unsuccessful attempt, new exploration work had been launched to find a suitable site for the construction of a disposal facility for the low- and intermediate-level wastes of the power plant. The leadership of Bátaapáti was open for dialogue: if exploring local granite for an underground repository and subsequent implementation resulted in mutual advantages (employment, local taxes…), they could allow exploration to start.

A referendum was held in 2005 in Bátaapáti regarding whether or not to host a repository. Mayor Krachun credits good communication with the result that 75% of the population took part in the referendum, and 95% of this number voted for the construction of the facility. In Autumn 2005, the Hungarian Parliament approved with 339 yes, 4 no and 8 abstention votes a resolution on the preliminary approval in principle to initiate activities of preparing for the establishment of a radioactive waste repository.

Veto

It was specified in Bátaapáti's consent to feasibility studies for the LILW repository that the settlement was entitled to terminate, in any phase of the exploration and without any justification, the agreement made with the Paks plant. Bátaapáti stipulated as well that settlements should be kept informed of all exploration-related issues, without any taboo.

As far as the HLW repository is concerned, up to now no similar agreement has been concluded with the West Mecsek Public Information Association; as the site for the underground laboratory has not yet been designated, consequently no host community can defined.

The local public in each case has a final vote regarding siting and financial packages.

Working groups

In 1997, the Social Control and Information Association (TETT) was set up regarding the exploration in Bátaapáti with the involvement and joint leadership of seven neighbouring settlements in all. The intent was to relieve what the mayor termed the strong fear, the opposition of the population and tension that were typical to the region at the time. These neighbouring settlements were involved in the control activities from the start. The association decided to call on professionals capable of controlling the exploration work and guaranteeing in this way the quality of the technical site selection. To ensure transparency TETT leaders thought that the experts should not be invited directly by the association; instead they asked the chairman of the Hungarian Academy of Sciences to assign an expert committee. Three scientists thus perform the technical control while settlement leaders are responsible for economic policy issues and "getting the best" for their communities.

The public is continuously kept informed of the work that is carried out. Settlement mayors carry home information from regular association meetings. A regional monthly is delivered to 15 settlements

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and a monthly TV programme entitled TETT News is broadcast by the seven member settlements through their cable TV networks. As well, many citizens of the settlements work in the exploration programme which is the area's second largest public works contract. These citizens know exactly what kind of activity is conducted and thereby provide assurance that nothing "secret" could be kept apart. There is confidence among the actors in the safety of the repository undertaking and in their ability to solve problems together. It is based too upon the 15-year friendly relationship with the Paks NPP, and later with the new implementer, the Public Agency for Radioactive Waste Management (PURAM). Example is a bypass road which was constructed on the request of the locals in order to mitigate the effects of the heavy trucks carrying the waste packages. When the head of the repository built and moved into a house in the settlement the locals felt it as a gesture.

The West Mecsek Public Information Association, today comprising nine settlements, is located in the investigation area for the HLW repository and serving a total of 7 500 persons. The main task of the NyMTIT is familiarising the public with the underground exploration and research programme. As well, the association maintains an environmental monitoring network and fosters the protection, restoration and replanting of areas affected by investigation activities.

The association maintains a public information office where all documentary materials can be found. Meetings are held in each settlement, and a road show lasting one month visited eleven locations, providing information and establishing personal contacts. "Information parks" have been constructed; historic information is displayed on panels placed alongside walking paths. Schools visits to sites are organised in order to familiarise future decision makers with waste management activities. A quarterly newspaper, the West Mecsek Compass, is issued to each household free of charge. Each town also has its own monthly publication. Each one reports local news and developments from schools or institutions, along with the agenda of scientific and other meetings. This information is available on line. A cable TV network serves all these settlements, allowing real-time monitoring of the investigation sites.

Because civil society needs information from reliable experts to participate in waste management, the association contacted the Hungarian Academy of Sciences to provide input, including translation of the technical issues into everyday language and double-checking of environmental measurements.

International involvements are pointed to as valuable. NyMTIT representatives participated in the EC-sponsored COWAM 2 programme. Because the association has been active since 1996, they were able to make a particular contribution to the COWAM 2 publication "Roadmap for Local Committee Construction" [23]. Two local organisations have become full members of the GMF, the European grouping of nuclear host communities and already hosted their visits. GMF acknowledged Hungarian efforts by holding its presidium meeting in NyMTIT headquarters in the very first year of their joining. Local residents have made study trips and attended GMF conferences in several countries.

The NyMTIT gained access in 2006 to the lobby group of the Parliament of the Hungarian Republic. In this way the association can study and comment on new legal regulations before they are debated and explain local positions to national politicians.

Community benefits

Hungary's 1996 Act on Atomic Energy carries a requirement that fundamental information on science, technology and risk be passed on to the public. The segregated Central Nuclear Financial Fund (CNNF) is based on contributions from the NPP during its operational lifetime and guarantees that all foreseeable costs for long-term management will be covered. In particular, this fund supports local communities and their Public Information Associations. The Act foresees through this fund that the licensee of RWM facilities will promote, support and assist these associations, whose primary role is to provide information to the population.

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A 2005 amendment gives detailed guidance on how the associations may employ information and incentive funds. Each one signs a contract with PURAM setting out respective responsibilities. The financial assistance provided by project promoters can be used for dissemination of information (including through the operating budget of municipalities), but also for "social monitoring and control" of a facility, and finally for regional or municipal development (the latter through separate associations if necessary).

The amendment also rectified the former rule according to which the local oversight associations received significant budgets for "information and communication" while basic village infrastructure needs went unmet. Parliament voted that the funds can be used for operational costs and regional and town development.

Information and control associations and their connection to a radioactive waste management facility, construction or investigation site; financial assistance provided to each association in 2005 and 2006

"Social Monitoring and Information Association" (TEIT) – 13 member settlements	"Isotope Information Association" (IIT) – 7 member settlements	"Local Public Control and Information Association" (TETT) – 7 member settlements	"West Mecsek Public Information Association" (NyMTIT) – 9 member settlements
Interim Spent Fuel Storage Facility (Paks)	Radioactive Waste Treatment and Disposal Facility (Püspökszilágy)	LILW Repository under construction (Bátaapáti)	HLW URL site selection (Mecsek Hill)
270/240 M HUF (1.1/0.9 M Euro)	125/210 M HUF (0.5/0.8 M Euro)	183/388 M HUF (0.7/1.5 M Euro)	130/60 M HUF (0.5/0.2 M Euro)

Community empowerment measures, including information

Empowerment is at the basis of the terms of "*social monitoring*" and "*local public control*" which are part of the names of two information associations. This refers to active participation by members of civil society in the technical monitoring of activities. Each municipality carries out monitoring and control of the nuclear installations. The highest level of control is seen at operating facilities. At both the Paks NPP and the Püspökszilágy repository, a trained municipal group performs regular control of incoming materials and carries out other measurements.

Local groups have received training to perform this monitoring for the two future repositories. For instance, waste transport from the Paks NPP to the LILW installation at Bátaapáti started in 2008. Simultaneously with the start of the transport, a civic body set up for controlling the waste shipments started to function. The year-long training gave members of the community expertise to be able to scrutinise the facility and thereby play an effective role as a guardian of the future safety of the repository. The community thus has a role in the working of the facility and the means to be reassured that everything is working as planned.

The members of the Bátaapáti control committee are delegated from civil society organisations based in the settlements and trained for the job of inspection. They are to be responsible for randomised, on-demand radiological control measurements of waste packages. They are to compare resulting data with the expected data as recorded in the waste register or "passport" accompanying the transported waste drums. PURAM has the ability to open and verify drum content.

Each local oversight association is active in involving both the community and its neighbours in discussing issues with PURAM and raising their concerns. From a formal perspective, PURAM must provide access to desired technical and planning information. A large range of media is used to allow residents to gather information and monitor PURAM activities: visitors' centres, exhibitions, local cable TV, newspapers and newsletters, study tours abroad, regular meetings with PURAM personnel, and environmental monitoring devices.

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NyMTIT provides an example of the instruments concentrated in a local association in order to ensure community leverage. The basic activities of the association include environment protection, communication about the exploration work in view of HLW facility siting, civil defence, regional development, the establishment of international relations, exploration-related training, contracting with PURAM, co-ordination of the use of the received funds, representation of the settlements' interests and the involvement of civil society organisations in communication.

The associations lend special attention to facilitating citizen involvement by making sure there is good mutual understanding between dialogue partners. This facilitation may involve, for example, clarifying the actual terminology used in RWM. NyMTIT signed an agreement with MTA (Hungarian Academy of Sciences) to provide for the co-operation of three well-known scientists in communication to the public; they translated the research documents and data written in professional jargon into a more understandable form. These scientists take part in and give presentations in public forums and review professional documents submitted to the association.

Another facet of ensuring mutual understanding is to verify that the information and control associations are effectively in touch with and can transmit local concerns. For instance, contractual arrangements for communication, co-ordination and organisation work were concluded between NyMTIT and two local civil society organisations (Zsongorkő Friends and the Zöld Völgy minor-region association). The mayor of Boda observed (NEA, 2009) that the dialogue with the public is much more direct with the involvement of these stakeholder organisations. He calls such arrangements "the most important component of establishing and maintaining the communication relationships," since messages can quickly be transferred to the concerned group of population through these relays and with the help of the media. The feedback to NyMTIT then "can only be direct, quick and authentic." This feedback is used to fine-tune public opinion polls by which NyMTIT gathers views among the broader population.

Social benefits

In Bátaapáti, the LILW repository facility and associated visitors' centre are to be constructed as a "green field" project in the Duna-Dráva National Park. The installation will be placed within a reservation area, in close vicinity to walking paths and near the venue of active leisure programmes (hunting, fishing, orienteering competitions), within sight of the settlement. While these latter aspects are not under PURAM responsibility, they signify that the company has to "think larger" and find the means to "live with and treat this living region well."

The hilltop selected for the site of the visitors' centre and the outlook tower provide a good view for visitors over these components of the land and, in fine weather, as far as the seven TETT settlements. On site, the design of the building, the wood and stone materials used for the construction, and the orderly maintenance of the numerous environmental monitoring stations must all suggest that the radioactive waste repository adapts itself to the land in an environmentally friendly manner. The main guideline adopted by PURAM for building the facility is "openness". Visitors have to see clearly how well managed the site is. PURAM is building fences through which people can see all outdoor processes (e.g. waste transportation to the site and into the chambers). At the same time, the installation must convey that it is safe, and that the protective barrier guarantees that no unauthorised persons can enter. Most importantly, there must be no interchange between the waste and surrounding nature over the period of protection sought. All these aspects of safety are important for the local people.

These principles will guide the very design of the visitors' exhibition, constructed in the round. Information regarding the generation, the packaging and the disposal of the waste, the operation of the facility, environmental monitoring, and the interrelations between the geological environment and the social system is provided in the centre of the show area. This information due to visitors will be encircled by the presentation of local flora and fauna. A small spring, called "the Mother" in local

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legend, was preserved during the exploration work and water can still be drunk from the well. A demonstration path with outlook tower, an open-air resting place and fireplaces with barbecue grills will also be provided for the visitors to allow them to enjoy a full day in the area should they wish it.

The Bátaapáti visitors' centre is conceived of as a leisure resource for families, as a cultural focal point for the region and as a venue for scientific conferences. This investment has as its direct goal to show today's visitors what happens regarding LILW management. The centre will have a long-term information function as well in the context of high-level waste management. As such the centre will be a good learning platform and window onto West Mecsek Public Information Association (NyMTIT) activities. This area on the hilltop has one task: openness, and in this goal it shall not reflect any isolation.

Economic benefits (or recompense)

As discussed above, the 2005 amendment of the Act on Atomic Energy authorised the information and control associations were to apply support funds to local infrastructure and development needs.

The information and control associations also have roles that contribute indirectly to local socio-economic development. For instance, Bátaapáti community representatives advocate on behalf of local young people, recognising that they will need job opportunities and will need to develop corresponding skills and qualifications for those jobs. The community looks for assurances that its youth will receive job and training opportunities to enable them to benefit from the presence of the facility.

The 2005 amendment stipulates that if any additional risk or burden is imposed on a waste facility hosting community, then the proponent has the obligation to provide additional compensation for that. There should be no decrease in property values in the affected settlements, and environmental quality should be comparable throughout the region.

From a historical viewpoint, after the political changes in Eastern Europe of 1990 there was a shift in Hungary from a technocratic to a "market" approach to siting. The new emphasis lay on negotiated agreements between the implementer and local players. Financial incentives (as distinct from compensation) have been major instruments in this approach.

Incentive payments and risk perceptions played a role too in local responses to the Bátaapáti siting for a LILW subsurface facility. The sociological context was characterised by complex socio-economic differences among ethnically divided populations. Of the settlements involved, six decided early in the repository project to cooperate and formed the TETT, while some others opposed the facility. While they refused incentive payments, these communities considered that they should still benefit from identical levels of compensation because they shared the risk.

Another case is that of the spent fuel interim storage facility in Paks, planned when as of 1990 the shipment of spent fuel back to the supplier (formerly the Soviet Union) broke down. Local economic inequity fuelled conflict, with opposition to the proposed facility joined by calls for price concessions on electricity for all local residents, even for those not employed by the nuclear plant. TEIT was able to bring together the affected communities and provided incentive payments negotiated between the NPP and the municipal government. (These incentives are typically higher than what the implementer PURAM alone is in a position to pay.)

A final case is that of plans for establishing a HLW repository in Boda. Here again, as of 1996 the creation of NyMTIT allowed PURAM to channel incentives and information. With technical research phases started or stopped according to political changes, local concerns appeared to centre on the stability and transparency of not only incentive payments arrangements, but also national strategy.

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Intergenerational funds

While not directly based in RWM considerations, it is instructive to look at the "good neighbour" actions of the Paks NPP. These take the long view on local development and create synergies. Looking beyond its legal obligations to society, the plant has responded over the years to requests of financial support for projects ranging from laying pavement to building kennels, but as of 2005 sought opportunities for providing realistic sustainable support to the region. The municipalities and settlements today can meet their needs with formal tenders; they need backing to participate in the EU funding competition. The Paks NPP thus provides the backing share for neighbouring municipalities so they can participate in the EU regional grants. For every euro provided, municipalities gain 4 or 5. To build regional competence, Paks Ltd. also funds training courses on the EU membership, venture start-up techniques and environmental protection.

To maximise regional gain, the NPP created a leverage fund exemplary in Hungary, aimed at development of the broad area and open to participation by municipalities, settlements, economic and civil society organisations. Paks Ltd. in course of five years will provide two million euro per annum to this fund. All organisations within the 12-km radius are eligible within limits set by yearly thematic criteria and objectives. This special fund received 174 requests in 2006 and 95 grant winners brought seven million euro into the region, a record in Hungary.

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JAPAN

Voluntarism

NUMO, the waste management organisation in Japan, is a non-profit organisation approved by the government. It has been undertaking a volunteer site selection process since December 2002. NUMO volunteer approach is based on [40]:

- Respecting the region's independent long-term vision and needs.
- Harmony with broad regional development (if necessary, co-ordination with the prefecture's plans).
- Consideration of environmental protection.
- Support to preserving regional culture.

NUMO developed the information package to be sent out to all municipalities in Japan. The package contained the following:

- Instructions for application – Basic guidelines and requirements for volunteering as a candidate to explore the feasibility of constructing a final repository for HLW, e.g. an application form, application method, etc.
- Repository concepts – Information needed to understand the features of a repository including engineering design, construction, operation and safety.
- Siting factors for the selection of primary investigation areas (PIA) – Siting factors that must be considered in selecting PIAs and the criteria used for their assessment based on the result of a Literature Survey.
- Outreach scheme – Interaction between NUMO and volunteer communities along with regional development, information exchange and so forth.

NUMO published technical reports (NUMO call them "level 3 reports") [41-43] to provide the scientific and technical basis to support the safety messages in the information package.

NUMO invited volunteers from all municipalities in the country. Before conducting the literature survey, it will confirm whether or not the volunteered area satisfies the geological conditions set out for excluded areas regarding active faults and volcanic activity. If the results of this prior confirmation show that the area does not satisfy the geological conditions, the area will not be included in the literature survey. The result of the prior confirmation will be provided to the mayors in the volunteer municipalities.

Stepwise approach

There are three stages of activities in selecting a repository site in Japan. NUMO will pursue these activities in close consultation with municipalities, providing detailed information to every interested party in the form of reports, explanatory meetings, etc.

NUMO will get comments from the residents in each stage. In compliance with the Act, the government will have to ask for and consider comments from the governors and mayors of relevant municipalities in each stage.

The stages in the programme and the original timetable are:

- Initiation stage
  - The information package sent out by NUMO.
  - Communities volunteer.
  - NUMO confirms geological conditions in the community.
  - Prior confirmation of geological conditions.
- First stage
  - Literature survey for selection of preliminary investigation area.
  - Comments from authorities of municipalities and governors of prefectures.
  - Preliminary investigation areas selected.
- Second stage
  - Surface based investigations including drilling, etc.
  - Comments from authorities of municipalities and governors of prefectures.
  - Selection of detailed investigation areas (2011-2015).
- Third stage
  - Investigation in underground investigation facility.
  - Comments from authorities of municipalities and governors of prefectures.
  - Selection of repository site (2026-2030).

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In 2007, the Mayor of one community (Toyo town) officially applied to host a candidate site for the Literature Survey (LS). However, the residents, some members of the town council, prefecture governor and neighbouring communities were not happy with the Mayor's decision. On 22 April 2007, a mayoral election of Toyo town was held. The mayor who applied for the LS lost and the new mayor is opposing the application for the LS. He has made an announcement calling for the LS to be stopped immediately.

NUMO stopped the preparation of the LS for Toyo Town and continues its call for other municipalities to apply as volunteer areas for exploration.

Building public understanding

In order to promote the development, NUMO will engage with the public through activities such as national public relations or round table discussions. NUMO aims to increase understanding and will actively go to an area which has an interest in disposal. By implementing an interactive activity or visitor tour of nuclear facilities, NUMO will focus on enhancing people's understanding in the area.

- NUMO will promote the development and build up public relations through national and local newspaper articles and actively using the mass media in areas such as local stations. In addition, to bring the development to the attention of opinion leaders, boards of trade and local community-related boards, NUMO will produce in-house magazines for local community-related boards, send NUMO magazine "NUMO-NOTE", and provide information such as NUMO activity report on a regular basis.
- In order to increase public understanding about disposal, NUMO will continue to hold round-table discussions throughout Japan. These involve local residents, experts or opinion leaders and aim to inform people about the project and enable them to learn about the consequences.
- In order to build understanding in local residents, NUMO will continue to respond to all inquiries about the facility, for example relating to the necessity for final disposal, safety and potential community development, etc. NUMO will also provide summary information about the project, take people on tours of related facilities and present the community model programme.

After NUMO identify volunteer communities it will be essential to build and maintain confidence within the communities. NUMO will try to provide information that reflects a wide range of views and opinions on final disposal operations by working with various stakeholder groups and interacting with local residents.

- NUMO will establish a local management office in volunteer communities to interact with the communities and surrounding areas. NUMO will also jointly host community events. NUMO will try to enhance local understanding about final disposal operations by setting up interactive activities with the community and taking people to visit related nuclear facilities.
- In order to build public support in the communities and surrounding areas, NUMO will plan community development to enhance local conditions in the area by working with the local residents.
- In order to develop understanding about the final disposal project, NUMO will provide detailed information through mini advertisements in newspapers, on the television and in shoppers' magazines in the volunteer communities or surrounding areas.
- NUMO will hold forums and roundtable discussions and exchange opinions with local residents, experts and opinion leaders to inform people about the project and its consequences.

Community benefits

Socio-economic benefits

The following benefits are predicted from the development of the facility over about 60 years [43]:

- production inducement effect ~1.7 trillion yen (~ 11.0 billion).
- local orders in the area with the siting municipality ~740 billion yen (~ 4.9 billion).
- employment creation effect ~130 000 workers (~2 200 workers per year).
- fixed property tax revenue 160 billion yen (~ 1.1 billion).

The National Power Source Grant Programme would also provide:

- 1.0 billion yen/year/site during the literature survey (~ 6.7million); grant limit for the period: 2.0 billion yen (~ 13.3 million).
- 2 billion yen/year/site (~ 13.3 million) (grant limit for the period: 7.0 billion yen, ~ 46.7 million) during the preliminary investigation period.
- Government discussions about subsidies for the detailed investigations, the repository construction and the operation period are scheduled.

This subsidy can be used for activities to promote understanding; examine regional development; activities to enhance local welfare and promote regional industries.

NUMO also aims to maximise the economic benefits of the facility to the community by:

- Transfer of headquarters operations to the municipality.

  On receiving an application from a volunteer area, NUMO will establish a contact office where discussions can be held with local residents. In addition, at a later stage, the headquarters operations will be transferred to the area before construction of the repository starts and NUMO staff will live in the siting municipality. NUMO will conduct operations together with the municipality as a member of the same local community.

- Promotion of regional employment and utilisation of regional industry. NUMO will actively employ local workers and use related regional industry.

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- Creation of business opportunities and fostering of companies
  - NUMO will create opportunities for businesses in the area, such as supply of the materials necessary for the construction and operation of the repository. NUMO will work to foster companies that serve as the economic base of the area.
  - In order to generate understanding of the final disposal project, NUMO will actively "open" the repository. Through having people visit the facilities, NUMO will work to revitalise the municipality's tertiary industry.
- Transfer of operational know-how. NUMO will actively transfer know-how relating to geological disposal technology and management to the municipality, to promote the development of regional industries.

Other projects being considered to enhance the benefit the community gains from the facility are:

- Research and educational facilities using surface and underground space.
- Regional environmental preservation and research, including surrounding areas.
- Research and educational facilities aimed at preserving and communicating long-term observations and information.
- Research and educational institutes and/or companies providing advanced technology and knowledge.

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KOREA

The information in this chapter is taken from the Korean second national report under the IAEA Joint Convention on the safety of spent fuel management and on the safety of radioactive waste management [44] and the presentation given at the IAEA review meeting to discuss submissions. Korea has 20 operating nuclear power plants (NPPs). Six further plants are now under construction and two additional units are planned. Korea has a national radioactive waste management policy created in 1998 and amended in 2004. The key elements in it are:

- Safety is the top priority.
- Direct control by the government.
- Minimisation of waste generation.
- The "polluter pays" principle.
- Transparency of the siting process.

The implementation plan[26] for waste management is described below.

Management of LILW

The LILW is stored at the radioactive waste storage facilities on NPP sites or at the radioisotope storage facilities and then will be disposed of in a near surface repository or rock cavern repository.

The construction and operation licence of a LILW radioactive waste disposal facility (near the Wolsong NPP) has been obtained. Construction is in progress and operation is to start in 2010. Final capacity of up to 800 000 drums is expected.

Management of SF

SF is currently stored at NPP "At Reactor" (AR) sites until the national policy is decided in the view of the domestic and international technology. The options being considered are direct disposal or recycling. The national policy will be decided through Public and Stakeholder Engagement (PSE) taking into account the time restriction of 2016 when the SF storage capacity gets filled up. In 2007, the Korean PSE Task Force Team (TFT) was created holding some thirty meetings to discuss principles and to review the current situation and technologies. The TFT submitted its recommendation report to the Ministry of Knowledge Economy (MKE) and it was later accepted. The main PSE is proposed to take place in three steps: introductory, main and recommendation phases. The introductory phase starts from December 2008 for five months. The tasks are divided into four groups; recognising the problems of spent fuel arising, developing a potential scenario list composed of feasible options with time plans, consulting with key public and stakeholder groups, and integration. After this the main phase will begin from the middle of 2009. All PSE efforts will be based on the deliberative approach among citizens, stakeholders, policy makers, local communities and scientists.

26. *LILW and SF Management Implementation Plans, as decided at the 253rd Meeting of the Atomic Energy Commission*, December 17, 2004.

Nuclear power plants are operated by a public entity KHNP. In line with the Electricity Business Act, KHNP has estimated the liability cost for radioactive waste management. KHNP has been laying aside money to provide for LILW management, SF management and decommissioning costs of its NPP.

The KHNP has identified the costs below as an in-house liability (total approx. US$6.9 billion) since 1986: US$3.76 billion for decommissioning; US$3.00 billion for spent fuel management and US$0.13 billion for LILW disposal.

The organisation responsible for fuel fabrication has also been setting aside funds to deal with waste management in line with the quantity of wastes it has generated. The funds also cover the cost for institutional management after radioactive waste management facilities are closed.

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Milestones of LILW Projects

In 1986, Korea started a LILW repository siting programme. The key steps are outlined below:

1986: Commencement of radioactive waste disposal site selection by MOST/KAERI.
1997: Radioactive waste disposal site selection project transferred to MOCIE/KHNP.
2005: Special law for financial support for local community (March 2005).
2005: Standard on siting criteria for LILW disposal facility set.
2005: Application of Gyeongju, Gunsan, Pohang and Yeongdeok (August 2005).
2005: Selection of Gyeongju based on the highest vote rate in favour of hosting (November 2005).

The basic principles for identifying potential sites are:

- Suitability of the site decided by an independent site selection committee based on business conditions, site investigations and pre-determined safety criteria.
- Voluntary participation of local government.
- Democratic and open procedures for public acceptance.
- Financial support programmes for local communities.

The lessons learnt from the past which were applied to the new process were:

- Safety aspects
  - To include only LILW in a repository and to have a separate SF facility.
  - To perform preliminary geological investigations to confirm the potential suitability of sites before putting the issue to a public vote.
- Transparency and open process
  - To organise an independent site selection committee to oversee the entire procedure.
  - To announce fair site selection criteria in advance of starting the siting process.
  - To design a siting procedure in which local communities compete to host the facility.
- Incentives to hosting community
  To enact a special law to provide such incentives as diversification funds, revenues from the facility including a hosting fee, relocation of KHNP headquarters, etc. Funding was also provided to communities that volunteered to take part in the selection process.

Voluntarism

The Korean site selection process for LILW is based on communities volunteering to host the facility. The head of the local government applied (sent a letter of intent) to host the facility to the Ministry of Commerce, Industry and Energy (MOCIE) after the consent of the local congress. An

assessment of the site was then conducted alongside stakeholder consultation to look at the safety of the potential site and the conditions for facility implementation.

The Korean government made a special law that provides financial support for local communities hosting a site in March 2005 and accepted volunteers until August 2005.

Four local communities (Gyeongju, Gunsan, Pohang and Yeongdeok) had applied to host a facility by August 2005. Had no communities come forward the government had powers to be able to choose a suitable site(s), however, these did not have to be used.

Veto

The suitability of the volunteer site had to be confirmed by the site selection committee based on site safety, business conditions and degree of resident support. Their assessment was passed to the local government, prior to a local vote in the area to determine local support for hosting the facility.

Prior to the local votes the MOCIE, currently reorganised as MKE, was required under the Special Act to implement public hearings or presentation meetings for local residents in relation to site selection.

A vote was held in November 2005 in each of the communities that volunteered and the site with the highest local support was selected. The vote was effectively a local veto right. Gyeongju was chosen: 71% of the electorate voted and the support for the facility was 89.5%. The percentage of people in support of the facility in other communities was Gunsan: 84.4%, Yeongdeok: 79.3%, Pohang: 67.5%. The vote was the final opportunity for a community to accept or reject the development of the facility.

The minimum standards set to show local support for the facility were:

- More than 1/3 of the residents voted.
- More than 50% of the voters were in favour of the facility.

Following the vote, the successful community was designated by the MOCIE.

Working groups

All nuclear power plants in Korea have local community liaison committees and it is likely that the repository will be included within the remit of the Gyeongju NPP committee.

The Gyeongju community has already had an influence on the design and type of LLW facility to be built. The KHNP preferred the vault type design because they believed it was the most cost effective. However, the local community strongly preferred the silo type of facility and urged the government to implement it. The government has decided to implement a silo facility, at least for the first phase of the project.

Community benefits

The host community, Gyeongju has received a one-off payment of $300M (~£150 Million). They will also receive $8.5M (~£4.25 Million) in disposal fees each year of the operation of the facility (estimated to be 50 years); the fees will be determined by the amount of waste brought to the facility. The LLW facility will be constructed in phases. Initially the facility will be developed to have a 100 000 drum capacity; ultimately the capacity will be for 800 000 drums.

The financial assistance scheme is underpinned by national law.

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The headquarters of KHNP will also be moved to the community within 3 years from the date on which the electricity development project plan is approved.

The special supporting funds will be made available before the operation of the disposal facility. They will be provided to, and controlled by, the local government. The rate at which money is placed into the support fund falls under the general supervision of the supporting committee for the local county, which is chaired by the Prime Minister. The local government must account for its use of the support fund to this committee.

The support fund is to be used for:

- Local development.
- Tourism promotion.
- Expansion of cultural facilities.
- Projects to enhance income, stable livelihood, environment and welfare.
- Other projects prescribed by presidential decree for local development and improvement in local living standards.

As long as the money is spent on public projects, the national government will approve the expenditure.

When the facility is operational a portion of the disposal fees (to be decided by presidential decree) will be used by the local government and facility operators to support or subsidise:

- Electricity, public communication, education, or environmental or safety management.
- Farming, fishery and tourism.
- Other projects as required for the development of the local county.

Other incentives may include:

- An increased national subsidy for approved local projects.
- Preferential treatment for local businesses bidding for contracts worth less than £2.7M.
- Preferential employment of local residents.

The Korean law forbids the location of a repository for spent nuclear fuel in the same county as the LILW repository.

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SPAIN

The radioactive waste management agency in Spain, ENRESA (Empresa Nacional de Residuos Radiactivos, S.A.), was set up by Royal Decree in 1984 to manage radioactive wastes generated in Spain and to dismantle the nuclear power plants. ENRESA is a state-owned corporation and is a non profit-making company whose shareholders are the Centre for Energy-Related, Environmental and Technological Research (CIEMAT) and the State Industrial Holding Company (SEPI).

ENRESA operates a near-surface disposal facility for low- and intermediate-level short-lived waste in El Cabril in the municipality of Hornachuelos (Province of Córdoba). A very low-level waste disposal facility has been built in the same site and is operating since July 2008.

ENRESA is also responsible for the decommissioning of all NPPs in Spain. Presently, it is in charge of the site of the former NPP Vandellós 1, which was previously dismantled to level 2 of the IAEA and will be brought to complete decommissioning after a 25-year period of dormancy. ENRESA will also be in charge of the decommissioning of the NPP José Cabrera, most likely in 2009.

Following the strategy set for HLW and SF in the General Radioactive Waste Management Plan, Spain is focusing on trying to identify a site for a centralised spent fuel temporary storage facility (CSF) for the dry storage of spent fuel and high-level waste until a long-term waste management facility is available. There is no specific law requiring public involvement when siting radioactive waste management facilities in Spain, however there are requirements in the Strategic and Environmental Impact Assessment legislation and the licensing process. Specific legislation has also been passed relating to the CSF which has set the principles for public involvement in the process, and which will orient any further siting attempt for any other kind of RWM facility. This legislation consists of the Royal Decree 775/2006 of 23 April 2006 that establishes an Inter-ministerial Commission to lead all the siting process and specifically take care of the public participation aspects. This piece of law came out as a consequence of several decisions both on the Parliament and government sides:

- The Resolution (Statement) of the Commission of Industry of the Congress (December 2004) after the presentation of the Annual Report of the Consejo de Seguridad Nuclear (Regulatory Body), point 9 stated that:

  The Commission urges the government to develop jointly with ENRESA the necessary criteria for the implementation in Spain of a Centralised Storage Facility (CSF) for SF, in accordance with the mandates of the National Plan for Waste, and to develop its co-operation in research on partitioning and transmutation of high-activity, long-lived radionuclides. The Ministry of Industry, Tourism and Commerce (MITYC) is also urged to propose to the government the revision of the General Radioactive Waste Management Plan, in one year, to update the strategies taking into account the evolution of the conditions that frame the present Plan and specially those concerning the start-up of the CSF.

- There was a motion by the Commission of Industry of the Congress (March 2006). Main components of this proposition which was finally approved on 27 April 2006 were to require the Spanish government to establish an inter-ministerial commission to set the criteria for any site suitable to host the CSF. The Commission would also define an information and public participation process to invite those municipalities willing to host the CSF. The

preamble of the Proposition pointed out that any process directed to the siting of the CSF must "be based on a previous wide political, institutional and social consensus both at the national and local level." Thus the principle of voluntarism was included.

- The 6th General Radioactive Waste Management Plan was approved by the Council of Ministers on 23 June 2006 [45]. This stated that the CSF is adopted as a government policy and mandates ENRESA to carry out the work.

Finally, the Royal Decree 775/2006 of 23 April 2006 that establishes the Inter-ministerial Commission was passed. The Decree addresses all the issues raised by the Congress. The Inter-ministerial Commission's role is to develop the site selection process, including the criteria for evaluating potential sites.

In parallel with all this political and legislative activity, there was the elaboration of the report of COWAM Spain[27] by AMAC.[28] The report from the project provided the basis for most of the Recommendations of the Congress which were subsequently included in the Royal Decree.

The work of the Inter-ministerial Commission started in June 2006. As of June 2008, the Commission had held a total of nine meetings.

Voluntarism

The siting of the CSF will be based on a volunteer approach; communities will be asked to express an interest in hosting the facility.

Veto

The idea that a community could withdraw from the siting process and veto the development of the CSF in their area is inherent to the principle of voluntarism in Spain. One of the roles of the Inter-ministerial Commission is to outline how long communities will maintain the power of veto in the site selection process.

Working groups

According to the Law, a committee for information and follow-up must be established at each nuclear power plant site, both the operational and decommissioning ones. It is envisaged that similar mechanisms will be used for the CSF.

Community benefits

Social benefits

Social benefits for municipalities hosting a disposal facility are not regulated in Spain. Nevertheless, it has been a key policy of ENRESA since the beginning of the Agency to provide social benefits to those communities in the vicinity of the facilities for radioactive waste management. Thus, the siting process of El Cabril and the work carried out in Vandellós 1 brought specific actions to improve the social welfare of the people living around. This point is explained in detail below.

27. COWAM Spain was part of the work of the COWAM EC-part funded research project (*www.cowam.com*). It brought together Spanish stakeholders to identify what steps needed to be put in place to enable waste management facilities to be implemented in Spain. See [15].
28. AMAC is the Association of Municipalities in the Vicinity of Nuclear Power Plants.

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Concerning the CSF project, some specific features of this policy of promoting social benefits have been anticipated:

- According to the Inter-Ministerial Commission [46], the CSF installation will be designed for receiving, conditioning and storing spent fuel. The plan is to make it part of a technology park with a research centre and business park associated with it. The aim is that the site will become a genuine focus for generating knowledge and technology on the different ways to manage spent fuel and highly-active radioactive waste, and serve as a base for the development of other areas of interest in the given locality or community.
- The estimated cost of developing the project and the construction of the installation is ~ 540 million, 25% of which will be invested in civil works, 50% in mechanical components (storage capsules, cranes, etc.) and the remaining 25% in equipment of other systems, engineering, supervision and starting up.
- The plan to develop a Technological Centre alongside the CSF is to ensure development of the research and development (R&D) plan and support for other ENRESA installations and activities, including the availability of the necessary knowledge and technology for the final management of spent fuel from the nuclear installations. Training of personnel and the infrastructure that the Centre will rely on will also enable development of other national and local R&D projects. The Centre will take approximately 4 to 5 years to build and it is estimated it will cost some 50 million, including equipment.
- To support the CSF installation and the Technological Centre, necessary infrastructure will be put in place in order to gain support from interested companies. The aim is to provide a nursery of companies that, managed by the town council, serves as a support for local business initiatives.
- The Business Park has been planned as an area that can be extended by developing the infrastructure, with the introduction of different R&D projects of other companies and institutions that have shown an interest in the project. It is estimated that a large number of companies of different sizes and levels of qualification in the construction, civil works, assembly and installation, manufacturing, transport, supply and technical services, hotel sectors, etc. could take part.

Economic benefits

The money that goes to the municipalities around waste management facilities is regulated by law [47]. It comes from the Fund for Nuclear Waste and the amount of each payment is established by the MITYC according to the formula described below and the amounts of waste handled annually. After the Resolution of MITYC, ENRESA sends the money to the accounts of the municipalities involved.

The money goes directly to the municipalities who decide how to use the funds. Municipalities use some of the money for community empowerment to enable community involvement in the decision-making processes. The total amount for a certain area is a function of the type of facility and the total amount of waste handled during a year. There are variables that determine the distribution of the total fund among the concerned municipalities: the distance to the facility (the closer you are the more money you receive), number of inhabitants, the type of waste stored, etc.

A study undertaken to evaluate the uses to which the money provided to municipalities was put [48] found that over the last 15 years, the funds from ENRESA have enabled municipalities to invest in social development projects such as education and cultural facilities and social equipment and basic services.

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In some areas, the funds have been used to stabilise the population through different social projects such as:

- The creation of schools in order to retain children in the villages.
- Nurseries.
- Music schools.
- Sporting facilities, etc.

The money has also been used to provide basic services and address priorities for villages, such as:

- Lighting and asphalting streets.
- Urban development projects.
- Developing green zones.

The money has also been used to encourage rural tourism and industrial parks in some nuclear areas.

Subsidies from national or regional budgets for investment projects are sometimes only awarded to a community if the local authority contributes a certain percentage of the whole budget. Some municipalities have used the economic resources from the fund for nuclear waste to provide the local authority contribution to subsidised projects. This has made it possible for local authorities to carry out certain projects, such as:

- Infrastructure development.
- Purchase or renewal of equipment.
- Development of local facilities.

The following sections outline the calculations used to allocate funds to municipalities [48]. Funds are paid to municipalities with the following categories of facilities:

1. Nuclear power plants storing spent fuel generated by them on their own site, either in a pool, or under dry conditions by using storage casks.
2. Centralised temporary storage facilities, understood to be facilities storing spent fuel from several nuclear power plants and which also allow for the storage of high-level or long-lived radioactive waste.
3. Nuclear power plants not storing spent fuel generated by them on their own site, which are in the process of being dismantled.
4. Centralised storage facilities for low- and intermediate-level waste.

For Categories 1 and 2, the following municipalities are entitled to funds:

- Those that have the facility in their territory or part of their territory within the area defined by a circle with a radius of 10 km where the facility is in the centre.
- Those not considered in the preceding paragraph, provided that they have some population nucleus, whether or not the main one, whose distance to the centre of the facility is no more than 20 km.

For Categories 3 and 4, the following municipalities are entitled to funds:

- Those that have the facility in their territory or part of their territory within the area defined by a circle with a radius of 8 km where the facility is in the centre.

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- Those not considered in the preceding paragraph, provided that they have some population nucleus, whether or not the main one, whose distance to the centre of the facility is no more than 16 km.

A population nucleus is considered to be the nucleus of a city, village, place, hamlet and other population entity, as outlined by the National Statistics Office in Spain:

- Any municipal area in whose boundary the facility is based will be allocated the following percentage of the fund: 5% for category 1 facilities, 10% for Categories 2 and 4 and 25% for Category 3.
- The remainder of the fund will be distributed among all municipal areas entitled to funding, including the one where the facility is based, in proportion to the following equation:

  $C_i = 0.6 \times S_i + 0.4 \times (h/d^2)_i$

  Where S_i = Percentage of surface area occupied by municipal area i in the circles defined above for each category of facility.

  And $(h/d^2)_i = \dfrac{H_i / D_i^2}{\sum (H_i / D_i^2)}$

  where: $H_i = \sum H_j =$ The number of inhabitants of municipal area i belonging to those population nuclei j whose distance from the facility is no greater than 20 km or 16 km, subject to whether it involves Categories 1 and 2, or Categories 3 and 4 facilities, respectively, under the classification cited [48]. H_j = The total number of inhabitants of population centre j.

The number of inhabitants of a population nucleus is taken to include those of the conurbation associated with the nucleus. When the conurbation is associated with several population nuclei, the number of inhabitants will be distributed among the nuclei in proportion to the nuclei's inhabitants.

$D_i = \dfrac{\sum H_j D_j}{\sum H_j}$ = weighted average distance of such population

Where: $\sum H_i$ = nuclei of municipal area *i*, from the facility. D_j = distance from population nucleus *j* to the centre of the facility.

No municipal area receives more than 20%, 40% or 50% of the fund, subject to whether the facility is of Category 1, Category 2 or Categories 3 and 4, respectively.

Amount accrued

The amount accrued in the funds every year depends on the facility category as follows:

- Category 1
  - Fixed term, T_f = 1 714 526.
  - Variable term, T_v = 21 211 per ton of heavy metal by which storage of spent fuel increases in the year.
- Category 2
  - Fixed term, T_f = 1 714 526.
  - Variable term, T_{v-1} = 21 211 per ton of heavy metal by which storage of spent fuel increases in the year.

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– T_{V-2} = 3 009.5 per cubic metre of radioactive waste by which the volume of stored waste increases in the year.

- Category 3
  – Fixed term, T_f = 481.5.

- Category 4
  – Fixed term, T_f = 617 229.
  – Variable term, T_V = 671.7 per cubic metre of radioactive waste entering the facility in the year.

Maximum guaranteed amount

For category 1 and 2 facilities, for as long as there is spent fuel at the site, a minimum payment of 60 per inhabitant a year will be guaranteed for municipal areas within a 10-km radius, and a minimum amount of 30 per inhabitant a year for those municipal areas where, while not meeting the previous requirement, the weighted average distance of all their population nuclei to the centre of the site is less than 15 km. The amount earmarked to guarantee these minima shall be no greater than 210 668 per municipal area, in compliance with the percentage thresholds specified earlier.

Allocation of funds

Allocation of funds will commence:

- For category 1, 2 and 4 facilities, from the time authorisation for the operation is granted.
- For category 3 facilities, from the time authorisation for dismantling is granted.

Category 1 facilities

For the transfer of spent fuel off site, the relevant weight of heavy metal of removed fuel will be subtracted from the variable term for each year.

Once the shutdown of the facility has been declared, if all the spent fuel has been removed from the site, the facility will be treated as a category 3 facility, until the facility is completely dismantled.

For as long as spent fuel is held at the site, even following dismantling of the power plant, the fixed term of the fund relevant to category 1 facilities will be used.

Category 2 facilities

For the transfer of spent fuel or radioactive waste off site, the relevant weight of heavy metal of the fuel or volume of waste removed will be subtracted from the variable term for each year.

Once shutdown of the facility has been declared, if the spent fuel or radioactive waste have been removed from the site, the facility will be treated as a category 3 facility until the facility is completely dismantled.

Cessation of funding

The payment of funds ends for category 1 facilities once all fuel is removed from the site and the facility has been completely dismantled. For all other facilities, once the facility has been completely dismantled the funding will end.

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Funds will also cease due to stoppage of activity for which the facility was conceived for longer than one year and provided that it is due to causes other than:

- Those provided for under section 2.2.d of the Nuclear Safety Council Formation Act 15/1980 of 22 April.
- Voluntarily by the facility's operating company.

Every year the General Directorate of Energy sets, by Resolution, allocations to be distributed for each facility subject to the criteria and calculations outlined above, and will review the amounts specified based on information from the National Statistics Office.

The ENRESA Foundation

As mentioned before, enhancing the social and economic conditions of surrounding populations has been a pivotal strategy of ENRESA. A good example concerns the activities carried out in El Cabril since the site was designated as potential repository for LILW in 1987. Besides the actions financed with the funds allocated by law (see ***Economic benefits***) the following co-operative activities could be highlighted in this particular facility:

- Employment. ENRESA personnel: 120 persons (long-term contracts). Subcontracting during the construction of the LILW facility: 1008 persons (40% of this workforce were local workers).
- Training courses (during construction and start of operation). At the start of the operation of the LILW facility there were specific training courses for ENRESA's personnel lasting 3 full months. The training package to local subcontractors was 39 000 man-days.
- At the start of El Cabril (1992), ENRESA agreed with the local authorities to help repair two roads that provided direct access to the facility. Besides helping secure emploment for workers, the total amount of investment from ENRESA was roughly 1.5 M.

On 27 December 1990, ENRESA set up, for an indefinite period of time, a mixed, non profit-making charitable social welfare foundation [49]. The ENRESA Foundation's main purpose is to provide social services to promote and develop social welfare in the municipalities within the area of influence of ENRESA facilities. ENRESA contributed 1.3 million to the Foundation in 2007.

The ENRESA Foundation is subject to the guardianship of the Ministry of Health and Social Policy. The Foundation is governed by Law 49/2002 on the *Taxation system applicable to non-profit entities* and by the *Foundations Act,* Law 50/2002, as well as by the regulatory enactment embodied in Royal Decree 1270/2003.

More specifically, the objective of the Foundation for those populations affected by radioactive waste management is the development of welfare, educational and other aspects of general interest, including support for programmes and activities in the fields of culture and the environment as well as contributing to the social and cultural welfare and the maintenance, conservation, and dissemination of environmental heritage.

To deliver these activities the Foundation works with:

- Representative corporations (Town Halls, Provincial Councils, Autonomous Community governments).
- Bodies, institutions and other entities active in an area with the same purposes and objectives as the Foundation.
- Various initiatives and projects including congresses, workshops, seminars and different associations and groups.

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Agreements have been made with each of the municipalities around El Cabril and some other local bodies with supra-municipal functions. By means of these agreements the ENRESA Foundation allocates funds to help improve the social and economic conditions of the populations. The funds are given to the town councils according to a list of projects that are previously assessed by local representatives and the Board of directors of the Foundation. Among others, funding for the following activities has been provided:

- Build up of a new Red Cross Medical Centre in Peñarroya.
- Financing of local schools.
- Co-operation with the municipality of Hornachuelos in the development of the Natural Park of the Sierra de Hornachuelos, close to El Cabril. Main activities were helping organising the visitors' centre of the Park as well as financing some training activities for the personnel.
- Collaboration with the University of Córdoba in using El Cabril's estate to carry out some R&D concerning the behaviour and response to environmental conditions of local species of wild fauna (mainly deer and vultures).

Currently, the Foundation has established cooperative agreements with six municipalities in the area of El Cabril, four municipalities in that of Vandellós 1 as well as with two Associations of Villages (Mancomunidades) in Córdoba and Guadalajara and with the Provincial government of Córdoba (Diputación de Córdoba).

ENRESA Foundation provides sponsorship to three university chairs devoted to environmental studies in the Universities of Córdoba, Cataluña and Extremadura.

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SWEDEN

The Swedish Nuclear Fuel and Waste Management Company (SKB) is responsible for identifying a site for and building a geological repository for the spent nuclear fuel in the country. SKB has used a staged, volunteer process to identify potential sites since the beginning of the 1990s. The initial phase involved feasibility studies at eight sites. Two sites were then selected for site investigations to identify whether they are suitable for implementing a repository. The site investigations started in 2002 and ended in 2007. SKB plans to announce their site selection in the summer of 2009. For many years, the two main regulators involved in the process were the Swedish Nuclear Power Inspectorate (SKI) and the Swedish Radiation Protection Authority (SSI). However, on 1 July 2008 these two authorities were merged into a new authority, the Swedish Radiation Safety Authority (SSM).

Voluntarism

In October 1992, SKB sent a letter to all 286 municipalities in Sweden. It introduced the work of managing and disposing of nuclear waste and stated that the first stage of the process was *feasibility studies* to establish which municipalities were the most suitable hosts for a final repository. If any municipality wanted to know more about nuclear waste management or would be prepared to allow SKB to carry out a feasibility study, they were asked to get in touch with SKB. The letter was openly worded, and it was pointed out that a display of interest would not mean a future commitment; it also pointed out that communities could opt out of the process if they did not want to proceed.

The turn to voluntarism in 1992 by SKB was an explicit turn away from geology as the overriding siting factor for deep disposal. Feasibility studies were designed to be undertaken prior to site investigations which in turn would consider the geology of the sites (including drilling boreholes). The focus was to be on political geography rather than physical geology – who is prepared to learn more about the challenges of high-level nuclear waste management? Feasibility studies were partly exploring the feasibility of a working partnership between local communities and SKB. The purpose of the feasibility studies was to collect information about the general suitability of the potential sites (e.g. environment, infrastructure/transport, socio-economic status, local industries, geology). The aim was to gather existing knowledge about the areas, not to conduct much new research. Only if a workable local partnership between the community and SKB could be established and the feasibility studies showed that the area could be suitable would the option of a site investigation be offered.

Voluntarism as it was first launched was not very successful. Few communities volunteered nationally and those that did turned out to be unsuitable. Municipal leaders may have been more or less enthusiastic, but broad community-wide support for siting a major waste facility in areas that had no previous experience of the nuclear industry was not forthcoming. In 1993, two municipalities in the northern part of Sweden, Storuman and Malå, decided to allow SKB to carry out feasibility studies. In September 1995, after the completion of such a study, the residents of Storuman voted in a local referendum against participating further in the siting process for a deep repository (71% voted against). Two years later, the residents of Malå did the same (54% voted against).

Existing nuclear communities ignored the SKB letter as they did not see it as directed towards them. Thanks to the existing waste facilities, CLAB and SFR, Oskarshamn and Östhammar already had an established relationship with SKB. Politically speaking, it was already feasible to site major waste facilities in these communities. These communities were already stakeholders in the radioactive waste management debate, but with little existing influence over the nuclear activities in their area.

After the first attempt to find volunteers failed, SKB decided that they should focus on existing nuclear communities. It is the opinion of SKB that much of the bedrock in Sweden is suitable for hosting a repository and this makes it possible to approach municipalities on a voluntary basis. However, it should be noted that this opinion was, and still is, questioned by other groups. SKB approached the existing nuclear communities to find out whether they would be willing to participate in the feasibility studies. Several of them agreed to take part, knowing that they could opt out of the studies and that they were not agreeing, at this time, to hosting the repository. Altogether, eight sites were investigated in the feasibility studies to identify sites to be considered in the site investigation stage. SKB investigated sites near Forsmark and Oskarshamn nuclear power stations; a single site, in Östhammer, was finally selected on 3 June 2009.[29]

At the outset of the process, Östhammar municipality took just four weeks to say yes to a feasibility study, through a vote in the municipal council. The Oskarshamn municipality took over one year to consider whether the municipality should accept or reject a feasibility study before the council took the decision, also by a large majority, to accept it. In his final recommendations, the mayor pointed out to the council that a feasibility study was not to be taken lightly, but as a significant step towards a repository; he also outlined that there were two factors that would definitely stop a repository:

- Compromised safety.
- A majority of citizens in Oskarshamn saying “no”.

During this period around 70% of the public, according to opinion polls, supported a feasibility study.

Veto

Chapter 4 of the Law on Natural Resource Management [50] and replacing this in 1998, Chapter 17 of the Swedish Environmental Code [51] have granted Swedish municipalities powers of veto over the siting of new developments which they consider environmentally unacceptable. These powers of veto are unconditional except in relation to particular specified cases including the siting of facilities for the interim and final storage of nuclear substances and waste. In these cases national government is allowed to override local powers of veto as the siting decisions concerned must be viewed as taken firstly in respect of the interest of the nation as a whole.

However, according to the legislation the overriding of the veto does *not* apply, if an alternative location for the facility in question can be shown to exist in another municipality which is potentially more willing to accept it. Furthermore, the veto override does not apply if it can be persuasively shown that a more appropriate site than the one proposed for the facility in question might possibly exist elsewhere in the country [52].

This means that the council decision could be overridden by the Swedish government, but this would only happen if SKB appealed to the government to override the municipal council’s decision. SKB have stated that they would not do this, which is in line with the approach they took in the

29. Consult http://www.skb.se/default____24417.aspx and http://www.osthammar.se/en/slutforvar/Final-repository-to-Osthammar-Municipality/.

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previous feasibility studies where they stopped studies in the communities of Malå and Storuman when the communities said no to the development of a repository in their area.

The staged decision-making approach used in Sweden has given the municipal councils several occasions on which they can express their willingness to participate in the site selection process or withdraw from it:

- Prior to the feasibility studies being undertaken.
- Prior to detailed site investigations being initiated.
- Before construction of the deep repository.

The municipalities also retain power through the EIA process. Furthermore the municipalities have a planning monopoly and their council has to approve new plans in the municipality.

SKB publicly announced its choice of sites for site investigations on 15 November 2000. The government decision approving SKB choice of sites for site investigations was taken on 1st November 2001.

Shortly after the government decision, Östhammar agreed to host a site investigation. A decision on the matter was taken on 4 December when the municipal council voted 43 to 5 in favour of hosting an investigation. Shortly afterwards a contract with SKB was signed where the municipality set down 22 separate conditions for their ongoing participation (See **The Östhammar conditions for participation**).

The municipal council in Oskarshamn voted to allow SKB to carry out a site investigation in March 2002. They set out 13 conditions which frame their agreement to host a site investigation; these conditions affect SKB, SKI and SSI (See **Statements and conditions underpinning Oskarshamn's involvement**). An opinion poll taken in Oskarshamn prior to the municipality agreeing to the site investigations showed 80% of those polled supported the investigations.

Working groups in Oskarshamn

In Oskarshamn, a project office called Local Competence Building (LKO) was formed early on in the process, with a full-time project manager. The reference group for the LKO project is the municipal council. The elected representatives are the decision makers in Oskarshamn. The roles and responsibilities of the LKO and its elements are set out in a paper on the background to the municipal council decision [53] and in an online presentation of the LKO. The LKO has adapted and changed over time [54-56].

The main task of the LKO project was to prepare a comprehensive, basic documentation for the municipal council's decision, should the nuclear power industry suggest the siting of a final repository and/or an encapsulation plant in Oskarshamn. The work was undertaken within the EIA framework.

The role of LKO during the siting process was to:

- Continuously follow the safety issues and SKB site investigation in Oskarshamn.
- Control that the conditions set up by the municipal council are fulfilled by SKB, the authorities and the government.
- Initiate investigations on issues which arise during the site investigation stage.
- Enhance the competence of the citizens within the nuclear waste area.
- Gather questions and points of view from the municipal inhabitants and the neighbouring municipalities.

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- Maintain international contacts in order to follow the development of other countries' nuclear waste programmes with the emphasis on local participation.

The municipal council was responsible for agreeing the organisational structure for the LKO project. The following steps were involved in setting up the framework:

- The municipal council decided the assignments and structure of the organisation.
- The municipal council discussed and decided on its own role as the organisation's assigner.
- The municipal council indicated the number of politicians who should participate in the working groups.
- LKO recruited members to the working groups in accordance with the directions of the council and suggested a composition which was confirmed by the municipal council board.

To follow the studies being undertaken and promote discussion in the municipality, originally six working groups were set up to look at [56]:

- Safety and geosciences.
- Technology.
- Environment.
- Social science.
- Encapsulation.
- Local information.

These then developed into four working groups:

- Safety group – responsible for looking at safety and radiation protection during encapsulation, transport and final disposal.
- Municipal group – responsible for issues concerning spatial planning, infrastructure and socio-economic investigations and a co-ordinating responsibility for the EIA.
- Society group – responsible for sociological issues; co-operation with the neighbouring municipalities; highlighting regional issues in the site investigation programme. The group also followed up the results from opinion polls and enquiries and followed up the national issues.
- Misterhult group[30] – designed to represent those living in the immediate vicinity of a planned repository, responsible for the definition of the Misterhult local development programme and participating in the implementation and follow-up of it as well as local environmental issues in the EIA. An important aim of this group is to ensure that local development takes place with or without the repository being built in their area.

In June 2006, the LKO organisation evolved again into three working groups. Two groups, the Safety group and the Misterhult group, had the role of scrutinising SKB work. The third one, Future Perspectives, was looking at development possibilities connected to the waste management facilities that might be built in the area. This change of work structure emphasises the fact that the partnership and its composition must be able to adapt to changes in focus in the programme, as well as the issues that the community feels are most important.

The groups have included:

- Council members / politicians.
- Municipal civil servants.

30. Misterhult is the name of the area investigated in Oskarshamn.

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- Landowners.
- Representatives from various associations.
- Representatives of local environmental groups.
- Interested local citizens.
- Neighbouring inhabitants.
- External experts.

The working groups were also each tasked with policing several of the conditions laid down by the municipality in their decision to participate in the site investigations (see **Statements and conditions underpinning Oskarshamn's involvement**). The municipal council also outlined the responsibilities for the working groups. The groups met about one day a month. All working group minutes are open and are available on request or via the Internet. Each working group had an assigned contact person from SKB who partially attended the working group meetings and provided information on plans and results. The working groups often invited SKB, the regulator (SSM) and other experts to give presentations and answer questions.

The focus of the working groups depended on the phase of the programme and included:

- Focusing on their own competence building.
- Reviewing various plans and results presented by SKB.
- Arranging seminars.
- Carrying out dialogue with the public using various mechanisms.
- Talking to special interest groups and neighbours.

The working groups were also responsible for preparing reports for the council every six months and, when there was a major decision to be made, the working groups provided advice to the council.

The work of the working groups was coordinated by a Strategy Group chaired by the Mayor with participation of the working group chairs, Deputy Mayor, the LKO project manager and experts on various aspects of nuclear waste management employed by the LKO organisation.

The Strategy Group and the LKO project leadership are directly accountable to the board of the municipal council and the municipal council itself.

The Strategy Group has the following tasks:

- Continuously informing the municipal board on the site investigation work and presenting necessary basic documents for decision to the municipal board, when the need arises.
- Participating in the co-ordination of the working groups through regular pre-meetings (a week ahead of time) prior to the Environmental Impact Assessment (EIA) forum meetings.
- Participating in the regional EIA Forum and feeding in the concerns and questions raised by the various working groups.
- Discussing ongoing LKO activities and suggesting changes and amendments. If necessary these changes should be discussed in the municipal board and/or the municipal council.
- Maintaining contacts with the authorities, SKB and the Östhammar municipality.
- Maintaining international contacts and evaluating developments in the nuclear waste area in particular with respect to local participation.
- Deciding on participation in European Union projects.
- Developing the decision process.

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- Preparing briefings on issues to be considered by the authorities.

The LKO was managed by a project leader appointed by the executive council and supported by the secretariat (alternatively deputy project leader) and experts working on a consultancy basis. The management role includes:

- Financial responsibility for the project and establishing an activity plan, a budget and an operational account with a balance sheet with an agreed work plan and budget for each of the working groups.
- Maintaining the web site of the project and co-ordinating the content of the web site with the groups concerned.
- Supporting working group arrangements and supplying expert support to the groups.
- Maintaining contacts with SKB and SSM to ensure co-ordination of work.
- Tracking reviews and considerations undertaken by the national authorities, etc.
- Tracking seminars and other general meetings and consulting with the working groups about participation.

The Östhammar working groups

During the feasibility study phase (1995-2000) of the site selection process, a Consultative Group was set up by the municipality in Östhammar with representatives from all the political parties on the municipal council. The stated aim of this group was to follow, review and inform people about the feasibility study, in the most transparent way possible. A working group of four local civil servants was also formed to administrate the municipality's role in the feasibility study process. No additional groups were established by the municipality meaning that no local associations or non-governmental organisations were initially given the opportunity to directly participate in the feasibility study. The judgement was that the Consultative Group covered a sufficiently broad spectrum of political interests within the local community not to require the formal inclusion of others in the municipality [52].

During the course of the feasibility study, the Consultative Group in Östhammar organised a series of public meetings and seminars with participation from SKB, SKI and SSI. They also distributed an information brochure to all the households in the municipality, including the summer residents, after the preliminary results of the feasibility study had been presented.

In 1997, a local group critical to the feasibility study was formed – Opinion for Safe Disposal (Oss). They organised several public meetings of their own and were offered financial assistance to do so by the municipal council drawing on funds available from the Nuclear Waste Fund. In response to Oss, a small local group positive to the feasibility study also formed called Energy for Östhammar. They also received some financial assistance from the municipality [52].

In 2002, when the site investigations started, a Nuclear Waste Repository Project and further groups were set up in Östhammar to engage in the repository discussions. The municipality has always put measures in place to ensure that work relating to the repository development is handled professionally. The following groups are currently working on the repository issue:

- Project administration

  The municipality has strengthened its core of civil servants working on repository issues. It has a team of four people working on the issue called the Nuclear Waste Repository Group (NWR). The group consists of a project co-ordinator who holds a PhD in biology and is the municipality's special investigator in environmental issues; a biologist who focuses on

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environmental impact issues; the former municipality Head of Environment and Health and an assistant/secretary. A repository safety expert who is an active researcher (associate professor) in Earth Sciences worked with the group for two years. This group supports the political bodies in all fields related to the potential repository development. Together with the politicians it also investigates reports and work done by SKB and prepares statements and reviews for SKB and the authorities. The NWR Group is funded by the Nuclear Waste Fund.

- The planning group

  The planning group[31] works on all sorts of planning issues and EIA issues. It consists of the town manager and civil servants working on construction planning and environment, the project administration, leading politicians from the municipal board and others from boards related to planning issues.

- The working group

  The working group works on information and safety related issues and consists of selected politicians and civil servants from the project administration.

  Both these latter bodies are working under the municipal board and preparing issues for the board.

- The consultative group

  The present day consultative group works under the working group. Representatives from local non-governmental organisations (NGOs) and neighbouring municipalities are invited to join the consultative group under the same conditions as members of the local council. All the consultative group's meetings, approximately 5/year, are open to the public. Each meeting consists of talks/presentations on important issues such as social science, the status of the site investigations, earthquakes and climate change, public organisations' work on the repository issue and safety reports.

  The consultative group consists of a broader body of politicians from the municipality and members from local organisations working on the repository issue. It is assisted by civil servants in the project administration.

  The municipality has also continuously published articles about a geological repository for radioactive waste and during the last year has produced a small magazine containing six pages of information on the current status of repository issues. Since 2005, an annual half-day seminar has also been held for high school pupils. A newsletter is also produced, usually bimonthly, for people employed within the municipality. A communication plan, to create and distribute increased information and knowledge about a geological repository, was also accepted in 2006.

The EIA fora

The EIA is being used as the framework for the decision-making process in Sweden as this is seen to provide early and continuous public involvement, openness and consideration of alternatives.

All members of the Oskarshamn Strategy Group attend the meetings of the EIA Forum in Kalmar County, now called the EIA Forum in Oskarshamn, which was chaired by the Lt Governor of the County administration until 2007. Since 2008 it is chaired by SKB. The parties of the Forum are SKB,

31. The Planning Group and Preparation Group are the two main political bodies working on the repository issue in Östhammar.

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SSM, the County administration and the municipality of Oskarshamn. The EIA Forum meets about four times per year and detailed minutes are published. The EIA Forum serves three main functions:

- It is part of the formal EIA process.
- It is used to reach agreements on what needs to be included in an application.
- It is used to update all parties on the progress of the work within each respective organisation.

The Oskarshamn EIA Forum is not used to reach any decisions on what conclusion should be taken by the parties – each party is free to take its own decisions outside the forum. So far the forum has proved very useful to the municipality because it has enabled it to introduce issues for investigation or resolution both to SKB and to the regulators [54]. The aim is to develop the best possible basis for future decisions that may have to be taken by the municipality in relation to licensing if SKB applies for a repository. The forum is chaired by Kalmar County Council who also receives funding from the Nuclear Waste Fund.

In 1995, Östhammar municipality asked Uppsala County Council to organise a regional EIA forum in relation to SKB feasibility study. Such meetings were held roughly twice a year. Participation gradually expanded as feasibility studies were also initiated in two neighbouring municipalities to Östhammar.

Östhammar municipality is represented at the regional EIA meetings by members of the municipality Executive Board, the Working Group and the Project administration. Once a year, members of the Uppsala EIA forum and the Kalmar EIA forum meet together.

The Oskarshamn model

The municipality of Oskarshamn summarise their approach as the "Oskarshamn Model" [54,56] which has the following elements:

- Total openness and participation.

  Public insight and involvement requires total openness from all parties involved. The procedures used must ensure that this happens. Thorough documentation of all meetings is an important element of this.

  Participation can only be achieved if there is real influence. Nobody has an interest to participate if all the decisions have already been made. Full participation may lead to a majority of people being against a certain project, and therefore it is stopped. Even if this is a setback for the implementer it must be recognised that it is not the goal of the decision-making process to work for a certain outcome. A good decision-making process could result in a "no" to a certain facility.

- The EIA process.

  The EIA process provides the structure under which other activities take place. Participation by all key stakeholders, while maintaining integrity and independence is crucial. A well planned working schedule for the EIA Forum, publicly available records from the meetings and defined milestones where other interested parties are invited to review the products of the work in the Forum are also important components.

- The municipal council as the client.

  The municipal council is the client for the LKO project. Therefore, local politicians get involved, their knowledge increases and they are prepared for the forthcoming decisions. The municipality therefore uses the established form for representative democracy in this critical issue.

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- Local involvement.

  High quality decisions in regard of the nuclear waste problem must include the concerned citizens. They should therefore get involved early in the EIA process. In today's society however, it is not always easy to actively engage citizens in public affairs. The key is that they must see their involvement in a concrete way. Therefore, the municipality has stressed that SKB in the feasibility study should identify places for a possible repository, entrance tunnel, areas for the preparatory drilling programme, etc. This will help to stimulate public involvement.

- Regulatory involvement.

  The regulators must be independent, with the power to review the safety assessment of the waste management organisation. However, for the municipality there is also a need to bring in the regulators early in the process and to maintain their involvement. Firstly, they should have the role of the "people's experts" since the municipality cannot build up its own independent expertise. Secondly, it is important that the regulators can explain their regulations and other requirements and what they mean in concrete terms.

- Participation by environmental groups.

  On a local level environmental groups have been invited to participate in the working groups. Some organisations have accepted, but some have made the decision to work outside the municipality structure. Most groups have participated in local seminars and workshops. In many seminars the local groups have also invited their experts e.g. from national environmental groups. Such participation has been paid for by the municipality project funding from the Nuclear Waste Fund [57].

- Transparency and stretching of the organisations involved.

  The framework for transparency used is built on three blocks: facts, values and authenticity. In a transparent process it must be possible to evaluate factual claims, value-laden issues and the authenticity of experts and stakeholders in the decision-making process.

  Stretching means that the procedures ensure that the waste management organisation's environment is sufficiently demanding and that questions are put forward from different angles and that these questions will be answered. Stretching must take place at all levels of the decision-making process, in this context, this is the total nuclear waste management system, the site selection process and the individual feasibility studies in specific communities. Stretching tests the efficiency (soundness) of the proposed technical solution, the authenticity (trustworthiness) of the waste management organisation's team and the legitimacy of their actions. This requires stakeholder engagement at each level of the decision-making process.

Community benefits

Empowerment measures

Originally, the reimbursement of costs was provided to the municipalities of Storuman and Malå directly by SKB. However, Oskarshamn and the other municipalities involved in the feasibility studies successfully influenced the national government and in 1995, the Act on Nuclear Activities was changed so that funding for the municipalities' involvement was paid directly through the Nuclear Waste Fund (a fund contributed to by the nuclear operators to cater for radioactive waste management and decommissioning activities).

The Nuclear Waste Fund is an authority managed by a board. The distribution of funding is partly managed by the regulator (SKI). Initially, the funding was restricted to the local municipalities and waste producers. However, since 2005, non-profit organisations can also receive money from the fund

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to participate in the EIA process. Resources have also been made available to regional authorities and communities which are neighbours to the potential host communities.

The money made available to stakeholders through the fund is outlined in an annual report, the following figures are taken from the report for 2005 [58] and historical records.

During the feasibility studies, each of the eight municipalities involved received 2 million SEK per year (~ 200 000); the studies ran for about four years. During the site investigation studies the two municipalities (Oskarshamn and Östhammar) involved received 4 million SEK per year (~ 400 000). The studies started in 2002 and ended in 2007. SKB will announce their site selection during 2009. As Oskarshamn is also being considered to host the encapsulation plant they receive an additional SEK1.5 million per year giving a total of SEK5.5 million (~ 547 000). The municipalities are accountable for the funds and are subject to an annual audit to ensure that the money is only spent to enable involvement in the debate about long-term radioactive waste management.

The complete LKO project in Oskarshamn, including the project manager, outside experts and the working group efforts, as well as the participation of local politicians, is covered by the money provided to Oskarshamn from the National Waste Fund. Members of the community who participate in the working groups are paid for their time. The payment system is based on that used by the municipal council for people who have to take time off work to attend council meetings. Participants receive two times their hourly salary for each hour they spend in a meeting. This enables them to do an hour of preparation for each hour of the meeting, for example reading reports, preparing papers, etc. This is felt to be important to enable members of the public to participate in the discussions.

In Östhammar, the following arrangements are in place to reimburse people for attendance at the various meetings associated with the project. The arrangements are the same as those used to pay elected politicians. If a participant has to be off work to go to a meeting they get compensation for lost earnings. For each meeting participants also get a payment (honorarium). For the first hour of a meeting the honorarium is SEK249 (~ 25) and for the second hour it is SEK108 (~ 11). The idea is that the rate for the first hour includes preparation time before each meeting. In order to receive the compensation a participant must represent a group engaged in the nuclear waste issue (for example a NGO). If there is an additional meeting (for example a seminar related to the repository work) the ordinary members of the Reference Group (one for each of the organisations on the group) get compensation for lost wages, travel expenses, plus the normal meeting honoraria to participate.

The engagement process has also developed to the regional level in both Oskarshamn and Östhammar during the years the site investigation has been undertaken. The regional council in Kalmar County (where Oskarshamn is) has received funding since 2005 to enable its involvement in the nuclear waste management debate, ~SEK1 million a year (~ 100 000). The regional council are the co-ordinating body for Kalmar County's local authorities and the county council and they co-ordinate regional development issues for example, bringing in new initiatives that will benefit several municipalities, looking at regional infrastructure etc (*www.regionforbundet.se*). Their main task in the radioactive waste management debate is to work with the other municipalities in the region, as well as Oskarshamn, and to encourage their involvement in the process. The council also scrutinises the work of SKB from a regional perspective, for example focusing on health and safety issues. Kalmar Regional Council has employed an information professional/communicator to work on the disposal project.

Östhammar municipality and the other seven municipalities in Uppsala county, together with the county council, constitute the Uppsala Regional Council. Important goals for the development and the future of the region, are, for instance, stimulating vigorous and competitive trade and industry and developing appropriate skills for the labour market. If a facility for the final storage is to be sited at Östhammar, it will affect the entire Uppsala region.

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The process of planning how to store spent nuclear fuel is well under way and there is much to discuss: everything from ethical standpoints to technical solutions. Uppsala Regional Council takes a transparent and democratic approach and therefore provides information on the waste management project and on societal issues involved. The council also has the ambition to create forums for discussions, such as an Internet discussion forum (*www.finaldisposal.com*).

The final repository project offers development potential in the Uppsala region. There is considered to be great potential for facilitating positive spin-off effects in the region, if the storage facility is sited in Östhammar. It is important to get people to know the final repository project is under way and make them aware of the potential implications for the region in the long and the short term. It is Uppsala Regional Council's aim to create the best possible conditions for positive effects. That is done by providing information, performing essential studies, analyzing impacts, monitoring developments in the surrounding world and arranging meeting venues. A project leader works full time with this.

The county administrative boards in Kalmar and Uppsala received 1.9 million SEK in 2008 (~ 189 000) to pay for the extra work they did on disposal and to cover the costs for information and participation relating to the disposal project.

In 2004, the rules relating to who could receive money from the Nuclear Waste Fund changed to enable non-profit organisations to access the fund. This change implied that a total of SEK3 million (~ 300 000) was available to non-profit organisations (with at least 2000 members or a coalition between several organisations) from the fund each year between 2005 and 2008 (the original timetable for the site investigations). A new decision was taken in 2008 to prolong this possibility for non-profit organisations to access the fund up to one year after SKB has submitted their licence application to the Environmental Court. This decision also states that only 1 000 members are required. Other characteristics the organisations need to show include for example that they have a board and a yearly meeting for all members.

The funding is available to enable organisations to:

- Participate in the extended (EIA) consultation process.
- Follow and evaluate issues concerning the disposal of radioactive waste and its effect on the environment and people's health.

The funding cannot be used to finance information activities directed towards the general public, apart from in relation to the extended (EIA) consultations.

In 2008, three national, not-for-profit associations received funding from the Nuclear Waste Fund. Two of them are collaborations between national environmental NGOs, traditionally critical of the use of nuclear power. MKG (Miljoorganisationernas karnavfallsgranskning) received SEK 1 925 000 (~ 191 000) and MILKAS (Folkkampanjen Miljororelsernas karnavfallssekretariat) received SEK 925 000 (~ 92 000). An association of groups working with energy issues in Sweden SERO (Sveriges Enerigiföreingars RiksOrganisation) received SEK 150 000 (~ 15 000).

Both municipalities can send observers to some of the consultations between SKI/SSI and SKB. This gives them insight into the actual work that is being undertaken, as well as being important for confidence building and transparency.

Statements and conditions underpinning Oskarshamn's involvement

The basis for the municipality council decision to allow SKB to commence site investigations in Oskarshamn is set out in a municipal council paper [60]. The paper sets out:

- The LKO project.

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- The overall goals for the LKO project during the site investigation stage.
- The establishment of the organisation and recruitment of the working groups.
- An organisational chart for municipal participation.
- A summary of the elements of the organisational chart.
- Recruitment.
- A description of the organisational chart including the participants and the roles of:
  - The citizens in the municipality and the region.
  - The working groups.
  - Co-ordination.
  - EIA-Forum in Kalmar County.
  - The Development Group.
  - LKO.
- The role of the municipal board.
- The role of the municipal council.
- Finance and planning for LKO.

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The Oskarshamn council's decision to accept site investigations in 2002 contained 13 conditions:

1. Full economic compensation for the municipality participation.
2. The repository is only for Swedish spent fuel according to the volumes presented by SKB.
3. A deepened dialogue with the local public on behalf of SKB, as well as SKI and SSI, concerning criteria and safety analysis.
4. An active regulatory follow up of the site investigations and reporting to the municipality after each step in the site selection process.
5. SKB must present how the safety analysis, site selection criteria and the site investigations are coupled and relate to each other.
6. Presentation of an acceptable total system description and analysis including how all parts of the system (CLAB, the encapsulation plant, transport and the final repository) are linked to each other.
7. A systematic compilation by SKI and SSI of research that does not agree with the results or conclusions presented by SKB.
8. A statement by the authorities, or by the government, about whether a condition can be set in a possible municipality decision to allow construction of the encapsulation plant, but that operation with active material must not begin until there is approval of the siting for the final repository.
9. Access to private land is subject to volunteer agreements with the private landowners.
10. A complete site specific investigation programme including a social science programme must be presented to the municipality council for approval.
11. A scoping report for the environmental impact assessment (EIA) must be developed in broad consultation and be presented to the municipal council for approval.
12. The alternatives to KBS-3 presented in the EIA must be subject to broad consultations as stipulated by the government.
13. The issue of who has the long-term responsibility for a final repository must be regulated in Swedish law.

As outlined earlier, these conditions are being monitored by the working groups, who provide regular reports to the council about them.

The Östhammar conditions for participation

Östhammar Municipal Council set down 22 separate conditions for their participation in the site investigations. These formed the basis of a contract between SKB and the municipality [55, 61]. The conditions include that:

1. The intention of SKB is to undertake a site investigation for a final repository for spent nuclear fuel in Östhammar municipality.
2. The municipality has through a decision of the council allowed SKB to perform a site investigation.
3. The site investigation shall be undertaken in accordance with the SKB proposal "Programme for Site Investigations at Forsmark", December 2001. Questions that the municipality finds important (Municipal Council 1999-11-16) shall be answered during the course of the site investigation. The municipal board might suggest changes and additions during the site investigation.
4. SKB is solely responsible for the realisation of the site investigation.
5. The municipality has the right to continuous information and insight into the work and to influence the completion of the site investigation.
6. This contract does not commit either SKB or the municipality to continuing the site investigation/studies of the municipality as a site for a final repository for spent nuclear fuel.
7. All material from the site investigations shall, in completeness, be made available to the municipality and the public.
8. The main reports of the site investigation shall be presented to the municipality for review. Technical reports shall be summarised so that the results are understandable by local citizens.
9. The company has a site manager at the investigation at Forsmark. The municipality's contact person is the town manager.
10. The company shall continuously report on the site investigation work to the municipality-appointed reference group.
11. The reference group's main task is to communicate to a broad public knowledge about an eventual nuclear waste repository's effects on people and the environment.
12. The reference group have, from a municipality perspective, to follow the site investigation in such a depth that detailed information can be given to the public and people affected.
13. The reference group shall also make inputs into the site investigation including comments and ideas.
14. The reference group shall also, on special assignment from the municipal board, review presented reports.
15. The municipality will assist SKB by providing local investigative competence for the preparation of basic data and information for the site investigation.
16. SKB has responsibility for ensuring that the co-operation and information flow between the company and the municipality, including the municipal board, the municipal council and other boards is continuous.
17. SKB shall maintain a high level of ambition to inform local citizens about the progress of their site investigation paying special attention to young people, summer residents, those living close to the proposed repository site and owners of nearby property. The citizens of the municipality shall periodically be informed through advertisements in the local press.

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18. SKB shall, during the site investigation, have a local office at Forsmark. SKB will aim to employ local people wherever this is appropriate, in line with the company's purchasing rules and policies.
19. SKB is responsible for all costs associated with the site investigation and for the municipality's costs related to Condition 12.
20. Both parties are working under the assumption that all costs for actions associated with Condition 11 shall be reimbursed by the Swedish Nuclear Power Inspectorate from the Nuclear Waste Fund.
21. This contract is valid from 1 January 2002 until the site investigation is finalised and the final report has been presented to the municipality and they have completed their review, but not later than 31 December 2008.
22. Two copies of this contract will be produced and signed by both parties, each party keeping one copy of the signed contract.

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Timescale of Swedish programme

The table below outlines the timescale of the Swedish programme.

Timescale of Swedish Programme

Date	Event
1992	SKB send invitation to all municipalities seeking volunteers.
1993	Storuman and Malå agree to host feasibility studies.
1995-1997	1995 Storuman decided to withdraw from the process, 1997 Malå decided to withdraw from the process the decision was based on referendum.
1995	SKB focus on existing nuclear communities and seek volunteers.
1995-1999	Communities volunteer to participate in the feasibility studies (Östhammar took 4 weeks and Oskarshamn took 17 months to decide to volunteer). Some communities were invited to volunteer later in the process (Tierp joined the process in 1998 and Älvkarleby at the beginning of 1999). Other communities investigated were Tierp, Nyköping and Hultsfred.
1993-2000	Feasibility studies at 8 sites (including Storuman and Malå), the studies took between 2 and 4 years, depending on when the sites entered the volunteer process.
November 2000	SKB publicly announce the choice of sites for detailed investigation (Oskarshamn, Östhammar and Tierp).
Dec 2001	Östhammar accept the site investigations.
March 2002	Oskarshamn accept the site investigations.
April 2002	Tierp reject the site investigations.
2002-2007	Site investigations at 2 sites (Oskarshamn and Östhammar).
2009	The site – Forsmark or Oskarshamn – is selected.
2010	Application for permit for siting and construction.
2010-2012	Review of application in the Environmental Court and by the regulators, etc.
2012-~2020	Detailed characterisation and construction leading into operation.

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SWITZERLAND

In the 1990s, the Swiss radioactive waste management agency (Nagra) was investigating a site for short-lived radioactive waste at Wellenberg (Canton of Nidwalden). A local implementing organisation (GNW) was founded in 1994. The siting community of Wolfenschiessen signed an agreement with GNW which outlined the rights and obligations of the community with respect to the planned repository. The siting community approved the project in 1994, but progress was blocked in 1995 based on the outcome of a cantonal referendum. A further stepwise attempt to develop the site was made in 2000. This was again blocked by cantonal referendum in 2002, despite local community support. The site was then abandoned and a new siting process for all waste types has been developed in Switzerland, based on the Nuclear Energy Act of March 2003.[32]

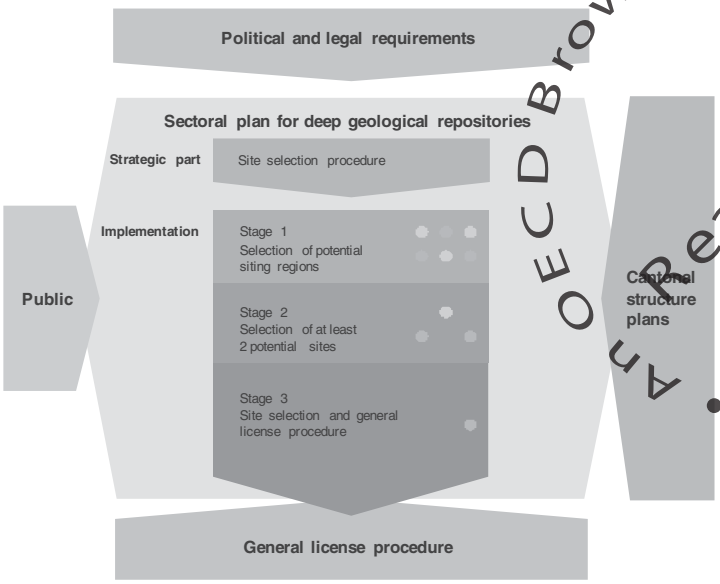
According to the Nuclear Energy Act, all types of radioactive waste must in principle be disposed of in deep geological repositories in Switzerland. Long-term safety of the repository must be assured without the need for active post-closure monitoring or control. The site selection process for the deep geological repositories for low- and intermediate-level waste (LILW) and for high-level waste (HLW) is defined in a so called *sectoral plan procedure* according to the spatial planning legislation. Site selection is based primarily on technical criteria, with the main emphasis on safety, but must also address land use planning and socio-economic aspects. The conceptual part of the sectoral plan for deep geological repositories defining the process in detail was prepared by the responsible federal authorities under the leadership of the Swiss Federal Office of Energy (SFOE), submitted to several rounds of consultation in 2006-2007 and approved by the Federal Council in April 2008. This document specifies that selection of geological siting areas and sites for deep geological repositories in Switzerland will be conducted in three stages (see Figure 1).

Regarding this site selection process, on 17 October 2008, the National Co-operative for the Disposal of Radioactive Waste (Nagra) submitted its proposals for suitable geological siting areas for the repositories for HLW and LILW to the SFOE. On 6 November 2008, the SFOE presented the siting proposals at a media conference. At nine public events, the SFOE explained to the population of the siting areas the selection procedure, while representatives of the cantonal governments, the Federal Nuclear Safety Inspectorate (ENSI) and Nagra outlined their respective roles in the process, stated their own positions and together with the SFOE answered questions from the audience. The federal government's decision on the siting areas is expected in 2011, after completion of the review by the authorities and extensive public consultation.

Nagra proposed for disposal of LILW the following six geological siting areas (in alphabetic order): Bözberg (canton of Aargau), Jura-Südfuss (canton of Solothurn and canton of Aargau), Nördlich Lägern (canton of Zurich and canton of Aargau), Südranden (canton of Schaffhausen), Zürcher Weinland (canton of Zurich and canton of Thurgau) and Wellenberg (canton of Nidwalden and canton of Obwalden). All the proposed host rocks are argillaceous formations and include Opalinus clay, brown Dogger, Effinger beds, and Palfris marl.

32. www.bfe.admin.ch/radioaktiveabfaelle

Figure 1. **Overview on the site selection procedure for LILW and HLW repositories**



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Nagra proposed for disposal of spent fuel, HLW and long-lived ILW the following geological siting areas (in alphabetic order), all of which are in Opalinus clay host rock: Bözberg (canton of Aargau), Nördlich Lägern (canton of Zurich and canton of Aargau) and Zürcher Weinland (canton of Zurich and canton of Thurgau).

Voluntarism

The participation of citizens, the affected public, organisations and parties in Switzerland is made possible by the instruments of direct democracy (polls, referendums, initiatives, elections) and/or by legal procedures (hearings, consultations, right of objection and complaint). The requirements for involving the different actors can be found in nuclear energy and spatial planning legislation. Spatial planning law, in particular, calls for co-operation and participation in the sectoral plan procedure already at the stage of basic definition of objectives, problem definition and structuring of the procedure. The co-operation and hearing processes defined in spatial planning legislation are suitable tools and methods for allowing those affected by projects to bring their interests and values into the decision-making process.

Before the formal hearing process according to the Spatial Planning Act starts at the end of each stage, there is close co-operation between the federal government and the affected cantons and neighbouring countries on both a technical and political level. Further, the sectoral plan regulates the flexibility within the spatial planning legislation in terms of co-operation as follows.

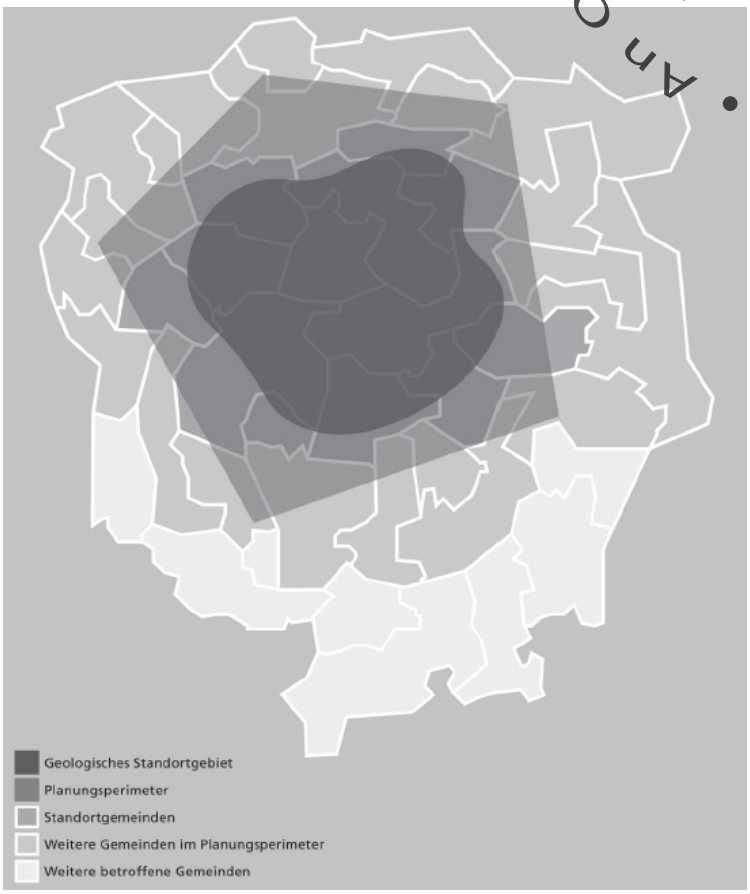
Stage 1

In Stage 1, a cantonal commission ensures early coordination among government representatives of the affected cantons and supports collaboration between the cantons and the federal government. If neighbouring countries are affected by the proposed siting areas, they have a right to a place on the commission.

Further, the structures for a participation process starting in Stage 2 in the siting regions are built up. This is done under the leadership of the SFOE in close collaboration with the respective siting cantons and communities. The aim is to ensure that the interests, needs and values of the siting regions are duly taken into account in the sectoral plan procedure.

First it has to be clarified which communities make up the *siting region* and are therefore to be included in the participatory process. The first criterion is the geology; communities lying above the proposed geological regions are part of the siting region and will therefore be part of the participation process. The next criterion is the planning perimeter (Figure 2). The planning perimeter delineates the geographic area that is defined by the extent of the geological siting area, taking into account the possible configuration of the installations required at the surface. Communities that lie within the planning perimeter are considered to be affected and are also part of the siting region. The siting region is thus made up of the siting communities and communities that lie fully or partly within the planning perimeter.

Figure 2. **Definition of the siting region according to the conceptual part of the sectoral plan**



Communities outside the planning perimeter can be part of the siting region if they are affected in a particular way. In justified cases, additional communities can thus form part of the siting region if they directly border communities within the planning perimeter and

- are affected by the local construction site traffic, local delivery traffic and other infrastructure such as unloading stations, etc., or
- they belong to the immediate region from the perspective of naturally occurring boundaries such as ranges of hills or bodies of water, or
- they are strongly linked in terms of regional economy with the siting communities through, e.g. labelled products, key tourist attractions, etc.

During the build-up phase in Stage 1, a process moderator nominated by the SFOE together with the siting communities supports the siting regions in organising regional participation. In establishing

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this participation, it has to be ensured that there is a balanced representation of the different interests and involvement of the affected communities and the public. The siting regions are supported by experts they select themselves, by the SFOE and by the siting cantons. If required, representatives of the federal government, the siting canton and the waste producers can take part in meetings and events held as part of regional participation. The tasks of the participation are defined in the conceptual part of the sectoral plan. The costs are borne by the waste producers, with the approval of the SFOE.

Stage 2

In Stage 2 at the latest, the communities of the siting region take over the organisation and implementation of regional participation. Within the framework of this participation, they work together with the federal authorities and the waste producers and represent regional interests. The siting regions discuss proposals and express their views on the design, placing and accessing of the surface infrastructure.

Stage 3

In Stage 3, the siting region proposes measures and projects for implementing the regional development strategy and draws up the basis for any compensation measures. Other tasks of the siting region relate to issues of preserving knowledge and exchanging information with the public.

Veto

Before the Swiss Federal Nuclear Energy Act entered into force on 1st February 2005, licences for deep geological repositories required cantonal and municipal approval. In accordance with the new Nuclear Energy Act, licences for nuclear facilities (e.g. nuclear power plants, deep geological repositories) now require approval on the federal level: the general licence for such facilities is granted by the Federal Council and must be approved by Parliament. It is then subject to an optional referendum which implies that the final decision is left to the Swiss population.

Working groups

The Federal Department of the Environment, Transport, Energy and Communications (DETEC) steers and monitors the site selection process. In this role, it is supported by the Federal Nuclear Safety Commission (NSC), a Waste Management Advisory Council and an internal departmental steering committee. The Advisory Council is set up by DETEC and, given its independence and its situation on a national level, is expected to bring an outside viewpoint into the process. The steering committee monitors the site selection process in terms of top level coordination between the federal government and the cantons and ensures that the time schedule is observed.

The lead in the sectoral plan procedure lies with the Swiss Federal Office of Energy (SFOE), which is responsible for project organisation and planning. In its project management role, it appoints working groups and thus ensures that its activities are coordinated with those of the cantons and the waste producers. The SFOE also coordinates the involvement of the relevant authorities of the affected cantons and neighbouring countries in the process and ensures that the public in the siting regions can participate in the decision-making process. The SFOE leads and coordinates the review by the authorities and prepares and updates the results reports and object sheets that are submitted to the Federal Council for approval following a participatory and consultation phase.

After the announcement of the proposed geological areas, the SFOE built up a cantonal commission whose role is to ensure co-operation between government representatives of the siting cantons and affected neighbouring cantons and countries and to support the Federal government in

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implementing the selection procedure. Working groups have been established in order to co-ordinate the collaboration with the involved actors in the areas of safety, spatial planning, information and communication. Representatives of the federal, cantonal and communal authorities and representatives of the waste producers participate in these working groups.

In the areas of spatial planning and environmental protection, the SFOE is supported by the Federal Office of Spatial Development (ARE) and the Federal Office for the Environment (FOEN). ENSI works together with its advisory body the Commission for Radioactive Waste Disposal (CRW) on safety-related questions and evaluates safety aspects. Various experts inside and outside the federal administration are brought in to address individual aspects of the project. For example, the Federal Office of Public Health (FOPH) looks at health aspects within the general licence procedure, Swisstopo supports ENSI on geological questions and experts from various institutes of the ETH (Swiss Federal Institute of Technology) are represented in various technical groups. The Paul Scherrer Institute (PSI) also plays a central role in research on waste management in Switzerland.

An important role is played by the cantons. They work closely with the involved federal offices and are responsible for the formal implementation of the public participation process. The SFOE supports the cantons in the areas of information and participation of the public by providing relevant materials and setting up a Technical Forum on Safety. Under the lead of ENSI, the Forum receives, discusses and answers technical questions relating to the sectoral plan procedures from the public and other stakeholders. The Forum is made up of technical experts from the authorities (ENSI, Swisstopo), commissions (NSC, CRW) and the waste producers. In agreement with the SFOE, and on the request of actors involved in the sectoral plan process, further technical experts may be included in the Forum.

The cantons and neighbouring countries have numerous opportunities to express their opinions and to participate when they are affected by the process. The communities can become involved in the formal hearing phase, and the communities of the siting regions can also take part in the regional participation phase.

The main task of the waste producers is to propose, in three stages, geological siting areas and then sites and to justify these proposals in reports addressed to the responsible authorities.

Summarised under the term “society”, the interested population and organisations, political parties, associations, etc. can participate at every stage and express their views on the drafts of the results reports and object sheets as part of the official consultation phase. The voting public also has the opportunity to express its views in the event of an optional national referendum on the site for a geological repository.

The main activities of the involved federal offices, waste producers and other actors in the site selection process (Waste Management Advisory Council, siting cantons, other cantons, cantonal commission and cantonal expert group on safety, local communities in the siting regions) are explained briefly in the following.

Swiss voters	May call for an optional national referendum and thus decide on the general licence for geological repositories.
Federal Assembly	Approves the general licence.
Federal Council	At the end of the three stages, approves the results reports and object sheets and grants the general licence.
DETEC	Monitors and guides work on the sectoral plan.
NSC	Advises ENSI, DETEC and the Federal Council on fundamental aspects of safety and prepares opinions on the evaluations made by ENSI in the three stages.

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Waste Management Advisory Council	Advises DETEC on implementing the site selection process for geological repositories.
SFOE	Lead authority for implementing the sectoral plan process. Prepares and updates results reports and object sheets.
ENSI	Reviews and evaluates the siting proposals of the waste producers from a safety viewpoint and advises the SFOE on safety issues.
Technical Forum	Discusses and answers technical and scientific questions on safety and on safety geology within the framework of the sectoral plan process.
CRW	Advises ENSI on geological aspects.
swisstopo	Supports ENSI on geological questions.
ARE	Reviews and evaluates spatial planning aspects.
FOEN	Reviews and evaluates environmental aspects.
Other federal offices (e.g. FOPH, PSI)	Support the SFOE in specific technical areas.
Waste producers	In accordance with the requirements specified in the conceptual part of the plan, search for geological siting areas and finally sites for disposal of HLW and LILW, evaluate these sites and propose that they be integrated into the plan. They are responsible for preparing and submitting the general licence application together with the necessary supporting documentation.
Siting cantons	Work together with the Federal government and support it in carrying out the site selection process; coordinate the procedure for modifying the cantonal structure plans and ensure co-operation with the communities in the siting region.
Cantons	As part of the official hearing process, express opinions on drafts of the results reports and object sheets and participate in the process as specified in the Nuclear Energy Act and Spatial Planning Act.
Cantonal commission	Ensures co-operation between government representatives of the siting cantons and affected neighbouring cantons and countries and supports the Federal government in implementing the selection procedure.
Cantonal expert group	Supports and advises the cantons in evaluating safety-related documentation
Communities in siting	Work together with the SFOE in organising and implementing regional regions participation and represent regional interests.
Neighbouring countries	Express opinions on the results reports and object sheets as part of the hearing process and participate in accordance with conceptual part of the sectoral plan.

Community benefits

The hosting regions may receive benefits of two kinds: compensation and compensation measures. The allocation system is defined in the conceptual part of the sectoral plan.

There is no legal basis for compensation. Based on experience within Switzerland and abroad, it can be assumed that a siting region will receive compensation. The conceptual part of the sectoral plan specifies that decisions on compensation should be transparent and not detached from the sectoral plan process. Compensation will be negotiated in Stage 3 and paid by the waste producers only when a valid general licence exists. A siting region is thus compensated for a service it performs to solve a national issue. The siting region prepares proposals for the distribution and application of the compensation and submits these to the affected cantons and communities of the siting region. The siting cantons regulate together with the siting regions and the waste producers the question of compensation in Stage 3.

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Compensation measures are applied when the planning, construction or operation of a deep geological repository are found to have negative consequences for a region. The compensation measures are developed in co-operation with the siting region and canton and are financed by the waste producers. According to the conceptual part of the sectoral plan, in Stage 3 the siting regions propose projects for regional development and prepare the background information for deciding on any compensation measures and for monitoring of socio-economic and environmental impacts. Compensation measures will be negotiated and made transparent in Stage 3.

Formal agreements

The Nuclear Energy Act regulates the licensing procedure. Licences for geological investigations in potential siting regions, a general licence, and licences for construction, operation and closure of the repositories are required.

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UNITED KINGDOM

Introduction

In 2001, the United Kingdom government and devolved administrations in Scotland, Wales and Northern Ireland initiated the Managing Radioactive Waste Safely (MRWS) programme [62] with the aim of addressing long-term radioactive waste accumulated from a variety of different nuclear programmes, both civil and defence related. The aim was to find a practicable solution for the United Kingdom's higher activity wastes that:

- Achieves long-term protection of people and the environment.
- Does this in an open and transparent way that inspires public confidence.
- Is based on sound science.
- Ensures the effective use of public monies.

The first stage of the programme considered the scope of the problem and how stakeholders wanted to be engaged in the programme.

The second stage involved government setting up an independent committee, Committee on Radioactive Waste Management (CoRWM) [33] to look at potential long-term waste management options. CoRWM made its recommendations in July 2006 [26]. As part of a package of recommendations, CoRWM recommended the implementation of geological disposal preceded by interim storage. The second stage ended in October 2006 when the United Kingdom government and the devolved administrations published a response to the recommendations made by CoRWM. In its response, the government accepted CoRWM's main recommendation that geological disposal, preceded by safe and secure interim storage, was the way forward for the long-term management of the United Kingdom's higher activity radioactive wastes.

The government consulted on the framework for implementing geological disposal in Stage 3 of the Managing Radioactive Waste Safely Programme[34] [63]. The consultation focused on the process for implementing geological disposal in the United Kingdom. The government analysed the responses to the consultation and published a White Paper in June 2008 [64]. The White Paper sets out the framework for the future implementation of geological disposal, including:

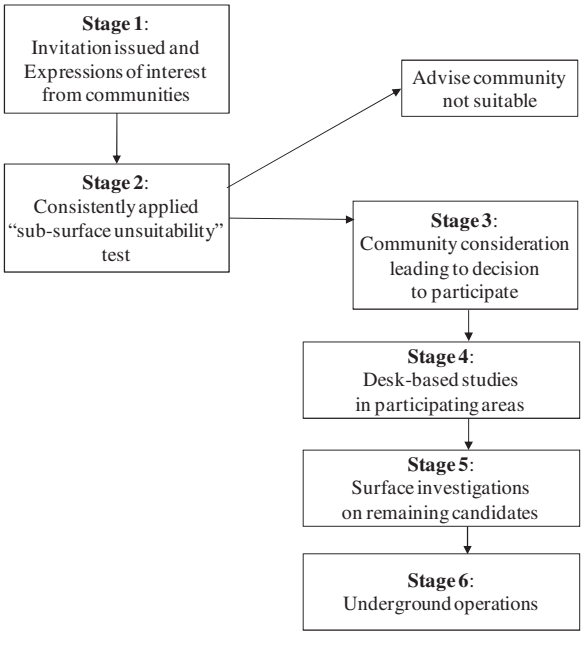
- The approach to compiling and updating the United Kingdom Radioactive Waste Inventory (UKRWI) and using it as a basis for discussion with potential host communities.
- The Nuclear Decommissioning Authority's (NDA) technical approach for developing a geological disposal facility, including the use of a staged implementation approach and ongoing research and development to support delivery.
- The arrangements to ensure sound regulation, scrutiny and control of the geological disposal facility development.

33. www.corwm.org.uk.
34. The Scottish Government decided not to participate in Stage 3 of the MRWS programme and is pursuing interim, near surface, near site storage as its waste management option. See end of section.

- How relevant planning processes might be addressed as the programme proceeds.
- The definition of "community" for the purposes of the site selection process.
- The process for issuing invitations and providing information to communities.
- How a partnership arrangement can be used to support a voluntarism approach.
- The use of affordable and value for money Engagement and Community Benefits Packages as part of the voluntarism and partnership approach.
- The initial sub-surface screening criteria and the way in which the government will apply these criteria.
- A refined set of criteria for assessing and evaluating candidate sites and details of further consultation on the way in which these criteria should be applied.

Stages foreseen for the siting process are shown in Figure 1.

Figure 1. **The stages in the United Kingdom site selection process**



The White Paper outlines three definitions of community:

- Host community – The community in which any facility will be built can be termed the "host community". The "host community" will be a small geographically defined area and include the population of that area and the owners of the land. For example, it could be a town or village.

- Decision making body – Local government will have decision-making authority for their host community. There are different local authority structures in different parts of the United Kingdom. For example, in England local authorities include district councils, county councils, metropolitan district councils and London Boroughs whereas in Wales, local authorities are unitary. Such a body will be termed "decision making body".

- Wider local interests – Outside the host community, there are likely to be other communities that have an interest in the development of a facility in the host community, and there needs to be a mechanism that allows them to become involved in the process. Such a community might be the next village, a neighbouring district or a community on the local transport routes to the host community. Such communities will be termed "wider local interests".

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The following sections are based on the White Paper.

Voluntarism

The White Paper sets out that the site selection process for a geological disposal facility for higher activity wastes will be based on a voluntarism and partnership approach. The White Paper sets out that:

> "…an approach based on 'voluntarism' means one in which communities voluntarily express an interest in taking part in the process that will ultimately provide a site for a geological disposal facility. Initially communities will be invited to express an interest in finding out more about what hosting a geological disposal facility would mean for the community in the long term."

At the same time as publishing the White Paper, the government invited communities to express an interest in opening up without commitment discussions on the possibility of hosting a geological disposal facility at some point in the future. The Department for Environmental, Food and Rural Affairs (Defra) Secretary of State wrote personally to every local authority in England to tell them about the invitation. The letter went to the Chief Executive of district, borough, county, metropolitan and city councils in England. The Welsh Assembly government also wrote to all their county and borough councils.

The government is not prescriptive about who could initiate local discussions about an expression of interest, but expects the local decision-making body (or bodies) to be involved in an approach to the government. There may be initial interest from a local authority, a parish council or from organisations or landowners within an area. A community might make an initial approach to the government before identifying a specific site. The government would expect any parish council, organisation or landowner that wanted to be considered in the siting process to contact its local authority in the first instance to discuss putting forward an expression of interest to government. If discussions stall at this stage, the government may be interested in entering into discussions with relevant parties to provide further information and to focus on any questions or areas of concern about the siting process and geological disposal.

Should a community within Wales wish to put forward an Expression of Interest it should do so to the Welsh Assembly Government (WAG). If this were to happen the WAG would at that point consider its position in respect of the geological disposal programme and the specific expression of interest. Should a community in Northern Ireland want to respond to the invitation, it should contact the Department of the Environment in Northern Ireland. Should a community in Scotland want to respond, United Kingdom government would refer it to the Scottish government through the appropriate devolution mechanisms.

Before making an expression of interest, the government suggests that the local authority should have canvassed opinion, for example, through existing local strategic partnerships[35] or specifically convened meetings with potential local partners. These partners might include parish/town councils, local community, business and environmental stakeholder groups and neighbouring local authorities. An expression of interest must be made in writing and the government would expect it to outline the actions taken to gather opinion and arrive at the expression.

The government recognises that there is no reason why two or more local authorities should not submit a combined expression of interest as, in practice, the initial area of investigation could cross local authority boundaries or involve two tiers of local government.

35. A "local strategic partnership" is a non-statutory partnership that brings together at a local level the different parts of the public sector as well as the private, business, community and voluntary sectors so that different initiatives and services support each other and work together.

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An expression of interest will enable without commitment discussion between local communities and government to begin. At the same time, the British Geological Survey (BGS) will be asked to apply sub-surface screening criteria in order to eliminate from the process any area that is obviously geologically unsuitable.

Government expects that the decision making body will take the lead role in initiating further discussions with potential local partners and organising community engagement. Government will want to be satisfied that a decision to participate is credible. Credibility might be demonstrated on the basis of a local consultation process applying established local good practice. Credible local support would be expected amongst organisations likely to form a community siting partnership, should a decision to participate be taken, as well as among the local community.

Engagement should seek to identify the extent of local support for participation, any issues of concern about participation, and the reasons for any opposition to participation.

The decision to participate should be accompanied by a report setting out the approach taken to engagement, the outcomes of that engagement and making clear the basis of the decision.

Right of withdrawal (equivalent to a veto)

The government believe the Right of Withdrawal (RoW) is an important part of the voluntarism approach intended to contribute to the development and maintenance of community confidence. Up until a late stage, when underground operations and construction are due to begin, if a community wished to withdraw, then its involvement in the process would stop. As with other key local decisions in the siting process, the decision making body will be responsible for exercising the RoW, based on advice and recommendations from the community siting partnership (see below).

Information from site investigations and in particular from a surface-based investigation programme will be needed to assess the prospects for an acceptable environmental safety case, facility design and planning decision. A post borehole RoW could be exercised only in circumstances where, despite the best efforts of all parties, one or more of the community siting partnership's objectives is not going to be achieved.

In order to minimise financial risk and uncertainty, before the NDA delivery organisation embarks on a borehole survey programme the circumstances in which a post borehole RoW might be exercised should be identified and agreed with the government through discussion and negotiation within a community siting partnership and with decision making bodies. The government will expect the formal agreement that establishes the community siting partnership to set out a commitment to undertake this work.

The requirement to define these circumstances before a borehole programme is likely to be both challenging and beneficial: challenging because it will involve matters of judgement; and beneficial because the definition will focus discussion, enhance understanding and make criteria for a RoW decision explicit before extensive work has been undertaken.

The White Paper outlines the decision making process that will occur at the end of Stages 4 and 5 of the site selection process. The Stage 4 assessment will be reviewed by the independent regulators and subject to independent scrutiny by CoRWM. On the basis of these assessments and reviews:

- The community siting partnership would make recommendations to local decision making bodies about whether to proceed to the next stage of the site selection process.

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- The decision making bodies would decide whether to proceed to the next stage of the site selection process.
- Government would then decide on one or more candidate sites to take forward to Stage 5.

Government proposes that once more detailed assessments have been completed in Stage 5, they be reviewed, as at the previous stage, and that then:

- The community siting partnership would make recommendations to its local decision making bodies about whether to proceed to the next stage of the site selection process.
- The decision making bodies would decide whether they wish to proceed to the next stage of the site selection process.
- Government would make an informed decision on a preferred site.

Community siting partnerships (equivalent to working groups)

Following a decision to participate, the government recognises that the site selection process and in particular the development of the facility, will require considerable engagement with communities. Whilst it does not propose to be prescriptive about how this engagement is undertaken, the government favours a partnership approach**.**

By a partnership approach, government means the setting up of a formal community siting partnership such that the host community, decision making bodies and wider local interests will work with the NDA delivery organisation and with other relevant interested parties to achieve a successful outcome. This could be by ensuring that questions and concerns about the geological disposal facility siting, construction, operation, closure and post-closure are addressed and resolved as far as reasonably practicable and that the project contributes to a community's further development and well-being.

The operation of a partnership

Government published guidance that should be taken into account by community siting partnerships. This suggests a partnership adopt a formal mission statement, for example:

> "The mission of a community siting partnership is to ensure that: all the questions and concerns of potential host communities within its area and its wider local interests about the geological disposal facility siting, construction, operation, closure and post-closure are addressed and resolved as far as reasonably practicable; and that the project contributes to a community's development and well-being."

It is proposed that the stated objectives of a community siting partnership include seeking to develop partner and local community confidence that:

- There is a good prospect for developing an acceptable environmental safety case.
- The potential development is likely to be able to address the planning requirements of the planning authority.
- A community benefits package will be agreed such that the overall balance of benefits and any perceived detriments will reflect the needs of local communities and their future generations.
- The question of potential retrievability of wastes has been adequately considered taking account of regulatory constraints.

It is envisaged that a community siting partnership will regularly review progress towards fulfilling its mission and objectives and address and resolve difficulties as they are identified.

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In order to fulfil its mission and objectives, the government envisages that the role of the partnership will include:

- Developing advice and recommendations for decision making bodies.
- Consideration of, and contribution to, the work the implementing organisation and delivery organisation are undertaking to design, construct and operate a facility.
- Obtaining specialist advice or commissioning research to inform its advisory role, address community concerns or identify ways of developing community well-being.
- Ensuring that the siting process for a facility within a potential host community is effective and focused on making progress.
- Provision of public information about the activities, views and recommendations of the community siting partnership.
- Engagement or consultation with potential host communities and wider local interests.
- Identifying and addressing divergent views within those communities.
- Liaison and discussion with local bodies with remits related to the mission of the community siting partnership (e.g. local strategic partnerships or site stakeholder groups).
- Building the capacity of its membership to enable it to effectively carry out these roles.

Participants in a partnership may wish to adopt additional formulations of their role, as related to the mission of the partnership.

Who might be involved in the partnership

Government expects a community siting partnership to be a partnership of local community interests, with members identified and recruited locally to enable its mission to be fulfilled. The NDA delivery organisation would be a member of the community siting partnership but would not be directly involved in decisions on community-related issues or in finalising Partnership advice to decision making bodies, other than when asked to provide a view or technical input. There will, however, need to be ongoing interaction between the NDA delivery organisation and other members of the partnership, and the government believes this involvement will allow them to be exposed directly to community concerns and allow real-time feedback of information in both directions. It is hoped this will assist in achieving the most efficient and open engagement, allowing unhelpful misunderstandings to be avoided wherever possible. Of course, the NDA delivery organisation will remain responsible throughout for ensuring compliance with technical and regulatory requirements.

The relevant local authority/ies are likely to have a lead role in setting up the community siting partnership. Members of the community siting partnership might include representatives of:

- Local authorities (elected members and non-elected officers).
- The local Member of Parliament.
- Local public services (fire, police, health trust etc).
- Local residents or resident groups.
- Established local organisations (for example, local non-governmental organisations).
- Wider local interests.
- NDA delivery organisation.

Although not a member of a partnership, the government could participate in the work of the community siting partnership as and when required. This might be as an associate member, or on an ad hoc basis depending on the requirements of a particular stage in the process. Regulatory bodies will also be involved, for example by providing advice to the community siting partnership, although regulators

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will need to have a strictly defined role and remit that does not compromise their independence. The role of the national bodies could include:

- The pro-active provision of timely information and advice, including the presentation of proposals, advice and research findings.
- Participation in partnership discussions, working groups and studies.
- Responding to partnership requirements for further information and advice.
- Involvement in wider community engagement and consultation initiatives as organised by the partnership, hearing community views directly and providing information as required.
- Assistance with building the capacity of partnership members to fulfil its mission and objectives.

Government recognises that the nature and extent of a community siting partnership, including its membership, may vary at different stages in the process. Government also anticipates that, because of the scale and importance of the issue, such a partnership would be specific to this issue alone and not be a component part of another Partnership.

Government does not want to be prescriptive about the form of a community siting partnership although guidance in the White Paper, providing example objectives, roles and responsibilities, should be taken into account by interested parties.

Decision-making authority

Although a community siting partnership would be able to take decisions about how it undertakes all elements of its role, it would not have powers to usurp the decision-making responsibilities of other bodies, including the Nuclear Decommissioning Authority (NDA) as implementing organisation, the NDA delivery organisation, the regulators and local and national government. A partnership is expected to play a crucial part in ensuring that the decisions of those bodies are well-informed and robust, particularly regarding community concerns.

The leadership role and democratic accountability of local government means that it should be responsible for major local decisions within the siting process. Local government will be termed the "decision making body" and will take decisions relating to:

- Continued participation at key stages, or exercising a right of withdrawal.
- The local acceptability of proposals for community benefits packages.
- The local acceptability of the sites within an area that are proposed for field surface-based investigations.
- Whether potential retrievability of wastes has been adequately considered.

In each case, the decision making body would take careful account of advice and recommendations from the community siting partnership.

Costs and funding

To achieve its mission and fulfil its roles effectively, a community siting partnership will need adequate funding. Government will make available an agreed level of funding as part of the engagement package.

Subject to overall budget approval and audit arrangements agreed with government, it will be for a partnership to decide exactly how – in seeking to fulfil its mission – it spends its funding.

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Government expects that a local authority member of the community siting partnership will be the budget holder and employing organisation for the partnership. Therefore the partnership will be accountable to the local authority for the management of its budget and will be subject to local authority budget management rules as well as the agreed audits.

Based on the role of a community siting partnership, government anticipates that such funding might cover:

- Public information.
- Liaison, consultation and engagement.
- Salaries and associated costs of partnership staff.
- Office costs and overheads.
- Organisational costs of running the partnership and any working groups it might establish.
- Commissioning specialist advice.
- Capacity building of members.
- Reimbursement for out of pocket expenses of partnership members.
- Process evaluation.

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Timescales

It is envisaged that potential partners would begin to work together in the steps leading up to a local decision to participate in the siting process. If a decision to participate is taken, the formal community siting partnership would then be established. The partnership must be able to develop, evolve and respond to change over a period of decades to enable it to fulfil its mission and objectives.

Establishing the community siting partnership and early steps

The United Kingdom experience of local strategic partnerships highlights the importance of enabling prospective members of a partnership to develop a shared vision about its mission, objectives, role and the way they will be delivered. Discussion will need to address organisation and procedures, access to specialist knowledge, external communications and engagement, training and skills, funding and resources, and evaluation of progress. Government expects prospective members of the Partnership to develop recommendations in each of these areas that will form the basis of a formal partnership agreement. Government and the NDA delivery organisation will need to be able to sign up to the agreement.

A very early task of a community siting partnership will be to develop a detailed local implementation plan for the Partnership's work, building on the national implementation framework. This should enable the partnership to work with the NDA delivery organisation to integrate the requirements of the partnership approach with the technical programme, resulting in a shared understanding of the way forward and a plan that is owned by all key players at national and local levels.

Community benefits

The government has decided that an engagement package and a community benefits package will form part of its voluntarism and partnership approach, subject to them being affordable and offering good value for money. This would recognise that a community which expressed an interest in hosting a facility should be enabled to participate in the selection process; and that a community that hosts a geological disposal facility for higher activity radioactive wastes will be volunteering an essential service to the nation. A community will want to ensure that the impact of a geological disposal facility on their long-term social and economic prospects is understood and that the needs of future generations are addressed appropriately.

Engagement package

The costs of local community engagement in the process will be funded, either partly or wholly, through government to assist communities in considering the issues. What support, and the point at which it is available, will be something to be considered in the scope of initial discussions following an Expression of Interest.

Communities that have taken a decision to participate will incur costs in setting up and operating a community siting partnership and so the work of a Partnership will also be supported through the engagement package.

Subject to overall budget and programme approval, and audit arrangements agreed with government, it will be for a community siting partnership to decide exactly how it spends its funding in seeking to fulfil its mission.

Government expects that a local authority will be the employing organisation for the community siting partnership and a local authority member of the community siting partnership will be the budget holder. Therefore, the partnership will be accountable to the local authority for the management of the budget and will be subject to local authority budget management rules as well as the agreed audits referred to above.

Community benefits package

Construction and operation of a geological disposal facility will be a multi-billion pound project that will provide skilled employment for hundreds of people over many decades. It will contribute greatly to the local economy and wider socioeconomic framework. There could be spin-off industry benefits, infrastructure benefits, benefits to local educational or academic resources, and positive impacts on local service industries that support the facility and its workforce. It is also likely to involve major investments in local transport facilities and other infrastructure, which would remain after the facility had been closed.

As such, hosting a geological disposal facility is likely to bring significant economic benefits to a community in terms of employment and infrastructure, maintained over a long period.

Any community that ultimately hosts a geological disposal facility will be keen to understand and agree the nature of these benefits, and will expect government and the NDA to ensure that the project contributes to its development and well-being.

In addition, there may be other benefits which may be commensurate with developing the social and economic well-being of a community that has decided to fulfil such an essential service to the nation. Government acknowledges that it could be at least a century until final closure of an entire facility is possible and so the development and operation of a geological disposal facility is an intergenerational issue. The local needs arising from the development are also likely to have an intergenerational element. This point was raised by a number of consultation responses and an approach needs to be identified that recognises and addresses the potential impact on a community over the long timescales involved.

Accepting that delivery mechanisms to achieve this will be developed as discussions progress, and without wishing to pre-judge what these might be, the following could be some of the overarching objectives for the investment that a community might benefit from as a result of hosting a geological disposal facility:

- Improved local training/skills development/education investment.

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- Increased business for local service industries.
- Improved public services/infrastructure/housing/recreational facilities.
- Improved transport infrastructure.
- Better local healthcare to meet the increased needs of the community.
- Local environmental improvement.

This list is illustrative rather than exhaustive, as short and long-term local needs may vary depending on the community that hosts the facility.

Government does not believe it sensible to specify at this stage what specific mechanisms could be used, or to define the level or nature of benefits. Government remains open-minded, believing that any benefits packages should be developed between communities, the government and NDA as discussions progress, taking into account local needs, affordability and value for money considerations.

As potential host communities and Community Siting Partnerships work with the NDA and government, they should begin a dialogue about the local needs arising from hosting a geological disposal facility. Final agreement on a package that delivers appropriate investment in the host community may take time, and possibly some years, as the precise nature and means of delivery of the geological disposal facility become clearer.

Formal agreements

It is envisaged that agreements will be put in place between the members of the community siting partnerships and the government. These could cover:

- A description of the facility being proposed.
- The mission, aims and objectives of the partnership.
- The roles of the parties involved.
- Requirements for community involvement.
- Funding arrangements for the partnership.
- Who the partnership is responsible to and how that responsibility is managed.
- How the partnership's work and accounts will be scrutinised.
- Right of withdrawal.

Oversight of the process

Government is committed to ensuring strong independent scrutiny of the proposals, plans and programmes to deliver geological disposal. Accordingly, the Committee on Radioactive Waste Management (CoRWM) has been reconstituted, with modified terms of reference and expertise. The role of the committee is to provide independent scrutiny and advice to United Kingdom government and devolved administration Ministers on the long-term radioactive waste management programme, including storage and disposal. CoRWM primary task will be to provide independent scrutiny of the government's and NDA proposals, plans and programmes to deliver geological disposal, together with robust interim storage, as the long-term management way forward for the UK higher activity wastes.

CoRWM will undertake its work in an open and consultative manner. It will engage with stakeholders and it will publish advice (and the underpinning evidence) in a way that is meaningful to the non-expert. CoRWM will undertake ongoing dialogue with the UK government and the devolved administrations, the NDA, local authorities and stakeholders, and will liaise with appropriate advisory and regulatory bodies to provide annual reports of its work.

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Scotland

Since its decision in June 2007 not to endorse the MRWS consultation, the Scottish government has been engaging with stakeholders to develop a more detailed statement of policy. The intention is that the detailed statement will provide a framework to enable waste producers to manage their wastes and regulators to regulate them and enable stakeholders and local communities to participate in the process. This engagement has identified the need for greater clarity on the specific radioactive wastes arising in Scotland, in turn leading to consideration of alternative treatment and packaging approaches. A workshop with stakeholders was held in June 2009 to assist in the development of a consultation document to be published later in 2009 with the goal of publishing a detailed policy statement in mid 2010.

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UNITED STATES – WASTE ISOLATION PILOT PLANT (WIPP)

The United States has an operating geological disposal facility for transuranic wastes (broadly equivalent to long-lived ILW). The facility has operated since 1999 and is managed by Washington TRU Solutions, Limited Liability Company (LLC) on behalf of the Department of Energy (DOE).

Voluntarism

With the decline in the potash market in the 1960s the residents and leaders of Carlsbad, New Mexico lobbied to be considered as a potential site for a transuranic waste repository, the Waste Isolation Pilot Plant (WIPP). Congress authorised the project in 1979 (*www.cityofcarlsbadnm.com*).

Veto

The State of New Mexico did not have the power of veto, but had a "consultation and co-operation" agreement which ensured the following [65]:

- The DOE would consider and address the state's concerns before deciding to proceed with construction or transport waste to the facility.
- The state had the right to seek judicial review of departmental actions regarding WIPP.
- Preparation of reports summarising studies on the stability of the WIPP underground storage rooms and passages.
- A framework for the state to review the department's work in 3 separate periods.
- The state had the ability to go back to court to stop the project if it was dissatisfied with any of the above.
- The DOE set up a state-federal task force to address state concerns about road upgrades, accident liability, emergency preparedness, monitoring waste shipments, health studies and post operation monitoring.

This effectively gave the state mechanisms with which it could scrutinise and influence the project and a route to stop the project through the courts if needed.

Community benefits

Empowerment measures

The following empowerment measures were put in place to enable the community to influence the project.

Independent oversight of WIPP

Funded by the DOE and operated by New Mexico Tech (a state educational institution for higher learning), the Environmental Evaluation Group (EEG) provided independent technical evaluation of the WIPP to ensure the protection of public health and safety, and the environment of New Mexico

from 1989-2004. After several decades of operation, EEG suspended operations and was replaced by PECOS Management Services Inc. which provides independent technical evaluation of WIPP. This company's WIPP-related efforts are also funded by the DOE and they work independently of DOE under a contract.

Cooperation and Consultation Agreement (June 1981)

The Cooperation and Consultation Agreement between the DOE and the State of New Mexico formalised the role of the State of New Mexico and included the negotiated settlement of key off-site concerns, especially as related to transportation (e.g. emergency response, highway upgrading, transportation monitoring and accident liability). Agreement was reached on funding for necessary road upgrading, ongoing emergency preparedness and emergency response, assistance in conducting baseline health studies of inhabitants in communities near the WIPP site, and post-operation monitoring of the site.

Supplemental stipulated agreement (1982)

The DOE and the State of New Mexico signed a Supplemental Stipulated Agreement in 1982 covering the following:

- Emergency response and public information.
- Assistance for the State to obtain technical support and emergency response funding and equipment through other federal agencies.
- Agreement by the DOE regarding direct financial assistance or "in-kind" assistance to the State if the State's emergency response preparedness requests are not satisfied by other federal agencies.
- Transportation monitoring.
- Radiation monitoring.
- Upgrade of state highways.

Environmental oversight and monitoring agreement (1990)

The DOE and State of New Mexico entered an agreement providing for oversight, monitoring, remediation and emergency response in relation to environmental issues.

Tribal agreements

The DOE also entered into cooperative agreements with Native American tribes located in New Mexico along waste transportation corridors concerning transportation, emergency response and outreach.

Corridor training

The DOE provides elective emergency responder training to local and state emergency responders (police, fire-fighters, hazardous materials crews) located along WIPP transportation corridors. The DOE has also funded limited emergency response equipment for many of these emergency response organisations.

Hazardous waste facility permit

The State of New Mexico's Environment Department (NMED) regulates the non-radioactive hazardous constituents of the transuranic waste disposed at WIPP through the WIPP hazardous waste facility permit. The NMED authority to oversee the WIPP activities derives from the Resource

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Conservation and Recovery Act regulations. The DOE has provided funding for some of these activities, as well as for the NMED to review and process modifications to the hazardous waste facility permit.

Public hearings

Before acting upon any major changes to the WIPP hazardous waste facility permit requested by the DOE, the NMED conducts multiple public hearings at which the public is allowed to testify. Public testimony is considered by the NMED in making permit modification decisions. Similar opportunities for public involvement exist if the DOE requests EPA approval for changes that may affect EPA's compliance certification of the WIPP.

Radioactive waste disposal standards

The US Environmental Protection Agency (EPA) regulates the radioactive constituents of the transuranic waste disposed at WIPP. Every five years during disposal operations, the EPA must certify WIPP's continued compliance with the radioactive waste disposal standards as set forth in the WIPP Land Withdrawal Act (P.L. 102-579, as amended).

Social benefits

Carlsbad has received several social benefits from the WIPP programme; these are outlined in the following sections.

Carlsbad environmental monitoring and research centre

The DOE funded the establishment and operation of the Carlsbad Environmental Monitoring and Research Centre (CEMRC) on the campus of New Mexico State University-Carlsbad. A unit of the New Mexico State University College of Engineering, the CEMRC operates out of a multi-million dollar, 26 000 square foot facility, which has environmental, radiochemistry and separation laboratories, plutonium-uranium and counting laboratories, an *in vivo* bioassay facility, and a mobile bioassay laboratory. The CEMRC projects include environmental and radiation work, characterisation, monitoring, feasibility studies, training and education, nuclear energy, and Homeland Security issues. The CEMRC conducts a WIPP environmental monitoring programme and Washington TRU Solutions; LLC has co-located much of its WIPP environmental monitoring staff and activities in the CEMRC facility.

Advanced manufacturing and innovation training centre

The Advanced Manufacturing and Innovation Training Centre (AM&ITC) is a large, state-of-the-art training facility and business incubator. The DOE provided the majority of funding for construction of the AM&ITC, which is owned and operated by the Carlsbad Department of Development. Washington TRU Solutions, LLC provided a senior manager to serve as construction superintendent. Since its opening, the AM&ITC has been used to conduct technical and academic training and education and business incubation, as well as to serve as office space.

Environmental/hazardous materials education and training programmes

The DOE and Washington TRU Solutions, LLC helped establish environmental/hazardous material education and training programmes at three local colleges:

- Bachelors degree in environmental management programme at College of the Southwest – Washington TRU Solutions, LLC provided funding, curriculum development, instructors and students.

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- Associates degree in hazardous materials at New Mexico State University-Carlsbad – DOE and Washington TRU Solutions, LLC helped develop the curriculum and provided instructors and students.
- Hazmat training programme – Washington TRU Solutions, LLC helped establish the curriculum and provided funding.

In addition, Washington TRU Solutions, LLC recruited a private university to open a branch in Carlsbad, so its employees and other people in Carlsbad would be able to earn business degrees.

Grant writing

With DOE's funding and approval, Washington TRU Solutions, LLC offered grant writing courses to a host of educational and not-for-profit organisations located in Southeast New Mexico. Washington TRU Solutions, LLC also helped organisations to write grants, most of which were successful, bringing millions of grant dollars into the region.

School equipment and curricula

DOE, Washington TRU Solutions, LLC and other WIPP partners donated a large amount of excess computer and office equipment to local public schools. In addition, DOE funded the development and distribution of turn-key science curriculum packages to schools in the region. Washington TRU Solutions, LLC also donated equipment and money to local schools.

Records centre project

Through Washington TRU Solutions, LLC, the DOE is funding the establishment of a Centre in Carlsbad designed to archive transuranic waste records not only from WIPP, but also from the DOE transuranic waste generator and storage sites located across the country. This facility will ultimately employ 50 people.

Centre for hazardous waste management excellence

With the DOE funding and support, the City of Carlsbad is establishing a Centre for Hazardous Waste Management Excellence. The Centre will serve as a think tank and consultancy for hazardous waste issues.

Community giving

In addition to the social benefits described above, DOE, Washington TRU Solutions, LLC and other WIPP partners donate hundreds of hours to various civic projects, ranging from the construction of playgrounds to the conduct of such events as Christmas on the Pecos. It would be difficult to find a civic or charitable organisation in Carlsbad which does not have representation from WIPP. In addition, in its 20 years in Carlsbad, Washington TRU Solutions, LLC has donated more than $4 million (~ 3.2 million) to charitable and civic organisations in the region.

Economic benefits

The Carlsbad area has also received several economic benefits from hosting the WIPP facility. These are outlined in the following sections.

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Jobs

The largest economic impact on Carlsbad from WIPP comes from approximately 1 000 high-paying jobs that WIPP directly created. The vast majority of WIPP employees live and shop in Carlsbad. More than ¼ of the Carlsbad workforce is directly or indirectly employed by WIPP and more than ⅓ of Carlsbad's wages are directly or indirectly paid by WIPP.

Local procurement

As WIPP's management and operations contractor, Washington TRU Solutions, LLC is committed to using local suppliers as much as possible. Washington TRU Solutions, LLC aggressively recruits local suppliers, helping them understand and meet procurement requirements through seminars and training. In 2005, Washington TRU Solutions, LLC purchased $22 million (~ 17.6 million) in goods and services from local suppliers, which represented 1/3 of all company expenditures. WIPP spends nearly half of its procurement dollars in the State of New Mexico.

Funding from the Land Withdrawal Act (1992)

Passed by the U.S. Congress, the WIPP Land Withdrawal Act provided the State of New Mexico with the following:

- Emergency response training and equipment: $7.9 million (~ 6.3 million).
- Economic impact funding of $20 million (~ 16 million) per year (plus inflation) for 15 years (the State uses the funding for highway improvement): $166.9 million (~ 133.3 million).
- Construction of transportation relief routes around the New Mexico cities of Santa Fe, Roswell and Carlsbad: $51M.
- Independent evaluation (Environmental Evaluation Group): $23.4 million (~ 18.7 million).

Business development projects

Washington TRU Solutions, LLC helps Carlsbad recruit and expand businesses. The following are examples of the business development projects:

- Valor Telecommunication Centre – Valor was looking for a place to locate a call Centre, but Carlsbad did not have a building that would meet Valor's needs. Washington TRU Solutions, LLC closed the deal by agreeing to spend $2 million (~ 1.6 million) of its own money to renovate a building to meet Valor's needs. Valor employed up to 200 people at the call Centre during its five years of operation.
- Adobe Precision Gear – DOE and Washington TRU Solutions, LLC helped to encourage this gear manufacturer to move to Carlsbad and mentored the company to grow its business.
- Engineered Products Department (EPD) – EPD is a Washington TRU Solutions, LLC-owned waste shipping container manufacturer, which builds containers for WIPP and others.

Technology transfer programme

WIPP's Technology Transfer Programme transferred (at no cost to the receiving organisation) WIPP-developed organisational tools, training materials and software to more than 300 organisations in 50 communities throughout New Mexico.

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UNITED STATES – PROPOSED GEOLOGICAL REPOSITORY AT YUCCA MOUNTAIN, NEVADA

In June 2008, the DOE Office of Civilian Radioactive Waste Management (OCRWM) submitted an application to the US Nuclear Regulatory Commission (NRC) for a licence to construct a geologic repository for high-level nuclear waste and used nuclear fuel at Yucca Mountain, Nevada. The application was prepared by the OCRWM. In September 2008, the NRC accepted the application for review. Upon completion of a comprehensive technical review, the NRC will conduct formal adjudicatory hearings. Based on the results of the licensing review and the formal hearings, the NRC will decide whether to authorise construction of the Yucca Mountain repository.

Voluntarism

When the original 1982 Nuclear Waste Policy Act (NWPA) was amended in 1987, the Office of the Nuclear Waste Negotiator was established, by Section 402, to "attempt to find a State or Indian Tribe willing to host a repository or monitored receivable storage facility at a technically qualified site…". The negotiator was not successful in finding any such volunteers.

Veto

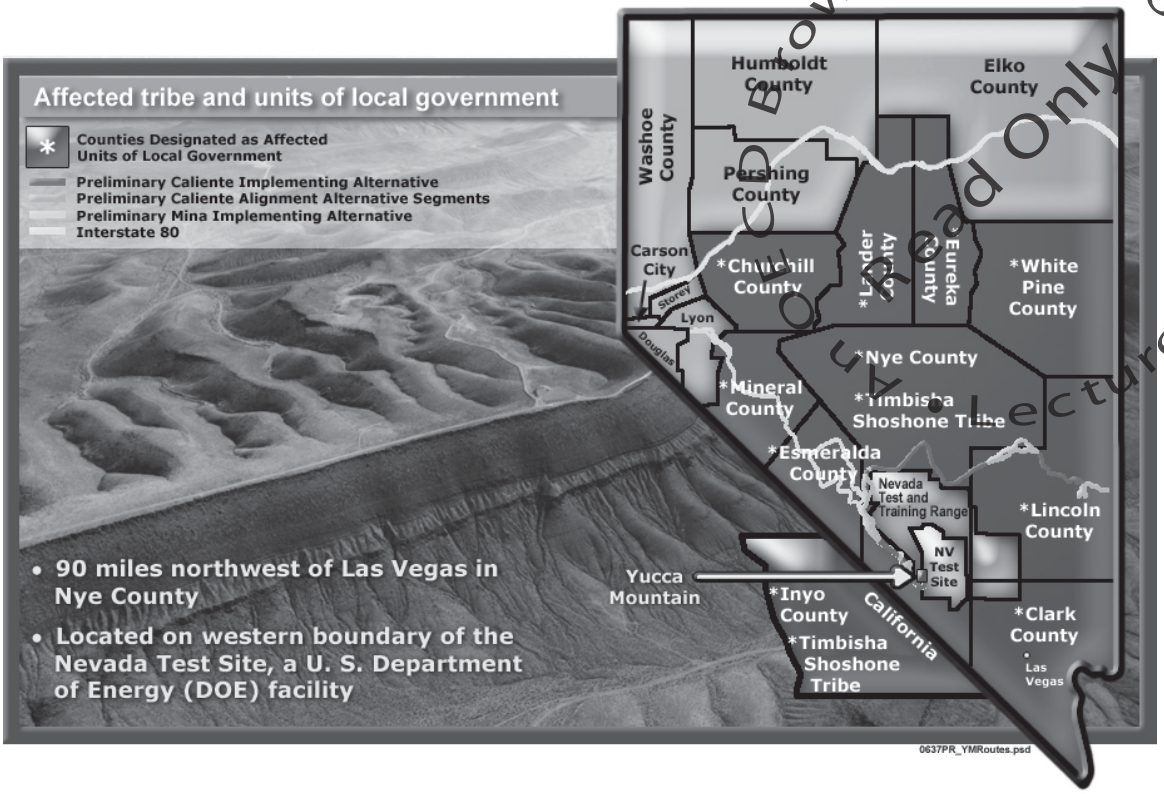
Section 116 of the NWPA included a provision for the Governor or legislature of a state, in which a repository site was recommended to Congress by the President of the United States, to submit a "notice of disapproval." In April 2002, Governor Kenny Guinn of Nevada submitted such a "notice" to the Congress. That disapproval was overridden by the Congressional decision to approve the Yucca Mountain site's recommendation to be a repository site, in April 2002 by the US House of Representatives and in July by the US Senate.

Working groups

The NWPA designates the state of Nevada and Nye County as "Affected Units of Government". The Secretary of Energy may designate local governments contiguous to Nye County as affected (see map below). The Timbisha Shoshone Tribe with Tribal lands in Nye County, Nevada, and Inyo County, California, has been designated as an "Affected Tribe" by the Secretary of the Interior. Additionally, the OCRWM established the Native American Interaction Programme (NAIP) in 1987, to foster ongoing interactions with 17 tribes and organisations having cultural and historic ties to the Yucca Mountain area (see attached list of organisations). OCRWM has regular meetings with these groups, to inform them of the repository Programme status and exchange information.

If the NRC grants a construction authorisation, repository construction could start as early as 2012. With plans for repository construction underway, the OCRWM has started discussions with local governments about forming Mitigation Boards that would be involved in minimising potential construction impacts.

Figure 1. **Affected tribes and units of local government**



Affected tribes include:

1. Benton Paiute Tribe
2. Bishop Paiute Tribe
3. Big Pine Paiute Tribe
4. Fort Independence Tribe
5. Lone Pine Paiute/Shoshone Tribe
6. Timbisha Shoshone Tribe
7. Yomba Shoshone Tribe
8. Duckwater Shoshone Tribe
9. Ely Shoshone Tribe
10. Pahrump Paiute Tribe
11. Las Vegas Indian Center
12. Las Vegas Paiute Tribe
13. Moapa band of Paiutes
14. Chemehuevi Tribe
15. Colorado River Indian tribes
16. Kaibab Paiute Tribe
17. Paiute Indian tribes of Utah

Community benefits

General

A 2003 study by the University of Nevada, Las Vegas determined that "if Yucca was discontinued, economic losses, relative to the current economy, would be substantial." It concluded that the Yucca Mountain Project (YMP) contributed more than $200 million annually to the state's economy and that if the repository were approved, it would be "a significant source of economic activity independent of the vagaries of the financial markets and economic cycles."

Economic

For more than two decades, the Yucca Mountain Project has significantly impacted the Southern Nevada economy, employing thousands of individuals and providing millions of dollars in procurement opportunities.

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There are currently over 100 contractor companies and agencies providing a wide variety of services to the YMP, including scientific, technical, legal, engineering, programme management and procurement.

Wage and salary payments to YMP employees residing in Nevada during FY 2005 (the latest year these data were collected) included an estimated $125 370 600 (~ 100 million as of November 2008) to employees residing in Clark County, an estimated $4 205 595 (~ 3.4 million) to Nye County residents and employees residing in other parts of Nevada received an estimated $499 091 (~ 403 000).[36]

Cumulative amounts

The Affected Units of Government (Nevada counties and Inyo County, California) and the Nevada university system have received economic benefits from the DOE since the early 1980s. Because states and municipalities cannot tax the federal government as they tax private firms, the Nuclear Waste Policy Act made provisions for payments by the DOE "equal to taxes" it would have paid if it could have been taxed. Total payments, from 1983 through February 2008, can be found in the table shown below. The numbers do not include payroll, payroll taxes, or procurements within Nevada.

Table 1. **Total "equal to taxes" payments by the DOE, 1983-2008**

	Year initiated	Total to date (US$, actual)
Affected Units of Local Government* – Oversight	1989	$109 710 275
State of Nevada – Oversight	1983	$92 616 609
Payments Equal to Taxes	1983	$141 722 155
Nevada System of Higher Education	1984	$113 654 839
Clark County, NV Transportation Grant	2004	$2 000 000
Inyo County, CA – Death Valley Regional Ground Water Monitoring Programme	2002	$2 839 750
Nye County, NV Science and Verification Programme	1996	$31 416 868
Nye County, NV Transportation Cooperative Agreement	2004	$430 000
Total Funding to the Affected Units of Government and the Nevada System of Higher Education since 1983	All Years	$504 811 684

* The affected units of government are the state of Nevada and the ten counties designated "affected" by the Nuclear Waste Policy Act or the Secretary of Energy.

Formal agreements

Since the mid-1990s, the OCRWM has a number of formal agreements with state and local government entities, as well as the Nevada System of Higher Education. These include:

- A Programmatic Agreement with the Nevada State Historical Preservation Office (SHPO) to consult with them regarding cultural resource surveys of the Yucca Mountain site.
- Cooperative Agreements with:
  - Nye County, NV for conduct of an independent Science and Verification Programme, Transportation Studies, and Public Safety. As part of that agreement, OCRWM has transferred use of three emergency response vehicles to Nye County, which is allowed to use the vehicles in exchange for regularly maintaining them.

36. These numbers reflect funds before payroll deductions (i.e. gross wages and salaries), for all work performed on YMP or other Programme activities.

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- Inyo County, California for conduct of an independent Death Valley Regional Ground Water Monitoring Programme.
- The Nevada System of Higher Education for a variety of science, engineering and economic investigations.

Additionally, in developing the Environmental Impact Statement for the repository, issued in 2008, OCRWM invited Nye County, Nevada, where the Yucca Mountain Site is located, to act as a "cooperating agency". Nye County possesses special expertise on the relationship of the proposed repository at Yucca Mountain to Nye County's regional and local land use plans, policies and controls and the County's current and planned infrastructure, including public services and traffic conditions.

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