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Version 1

Community Benefits and Geological Disposal: An International Review

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Report History

This document has been prepared by Galson Sciences Limited for the west Cumbria MRWS Partnership under the terms of the Letter of Appointment dated 30 August 2010. A draft was presented for discussion to the Partnership Steering Group on 13th October 2010. This version takes account of that discussion and subsequent review by the Community Benefits Working Group.

Community Benefits and Geological Disposal: An International Review				
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Executive Summary

If the West Cumbria MRWS Partnership agrees to recommend one or more councils to go forward to the next stage of the MRWS process, it may wish to agree with government a common understanding upon which the provision of community benefits would be based. The Partnership therefore commissioned Galson Sciences Ltd (GSL) to draw together the most up to date overseas experience in order to determine whether there are model or benchmark principles that might form the basis of future agreements on community benefits.

The review comprises updates of existing GSL information together with the inclusion of new data where possible. It has been collected through contact with individuals in the relevant countries from various organisations, including government departments, waste management agencies, local authorities and researchers. The information presented is as accurate as possible given the short timescale for the work (several weeks).

The information is presented in tabular form where practical, in order to allow for easy comparison between country examples. Explanatory text is also included, discussing the information in respect of the issues identified as of interest, to provide context. Monetary amounts are presented in UK Sterling, using exchange rates as of mid-September 2010.

Community Benefits and Radioactive Waste Disposal

It is becoming common in countries where geological disposal facilities for radioactive wastes have been proposed, developed or in some cases operated to offer some form of 'mitigation' measures to offset perceived fears amongst the host community and any potential financial impacts, should they occur, in addition to other measures designed to compensate for real impacts.

Work carried out by GSL and others to examine the use of community benefits in association with radioactive waste repository siting recognises a broad tripartite division: 'Cash Incentives', 'Social Benefit' measures and 'Community Empowerment' measures. It is common for communities to be offered packages containing payments and benefits of several different types, depending on the development stage of the project. It is also important to appreciate that not all types of benefit or payment are included in every process.

Latest Information

The latest information concerning the provision of community benefits associated with proposed or operating radioactive waste management facilities is presented in two separate tables. One table indicates for each project the benefits involved under the three main types noted above, together with estimates of the local population affected by the scheme. The second table indicates the relevant legal instrument or formal agreement (where applicable) under which benefits exist or are proposed. In the case of agreements, the relevant parties are identified. Copies of a range of these instruments or agreements have been obtained where English versions are available.

Discussion

The various benefits and agreements are discussed in terms of a number of factors related to their payment, distribution and means of determination. This discussion responds to the issues identified by the Partnership in the brief for this review. The factors are:

Staging of Payments and Benefits

The available data clearly show that it is common, albeit not universal, for cash payments and other benefits to be made contingent on satisfactory progress in terms of various permissions and approvals. These usually include the various stages of community agreement followed by more formal regulatory milestones. The intention of this linkage is to ensure smooth forward momentum in the development of the facilities and to assure both sides that benefits are not to be seen as separate from this. These payments are additional to the provision of support for engagement and participation in the process.

Benefits Laid Out in Legislation

There are several examples where specific benefit amounts and associated social and empowerment measures are laid down in legislation. In some cases it is just the general principle of community benefit provision that is cited, and specific amounts are left for subsequent negotiation between the developer and potential and/or final siting communities.

Benefit Amounts Linked to Disposal Volumes or Inventory

In a number of examples the annual payments available to host and affected communities (however these are defined) are dependent on the volume of wastes emplaced in the facility on an annual basis.

Benefits Linked to Local Population Levels and Distance

Financial benefits are sometimes distributed amongst host and neighbouring communities based upon the relevant population and the distance from the facility. This tends to be more typical of those systems that are specified in legal instruments, although not all include this methodology.

Benefits as Part of Negotiated Integrated Projects

It has become more common in recent years for the overall benefits and compensation package offered to potential host communities to involve a range of features, not just the purely financial. In recognition of the long-term, transgenerational nature of repository development, operation and closure, integrated sustainable development projects are being agreed, often through negotiation with the host community or regional authorities. The development of structured development plans, comprising support industries, specialist services and linked research facilities can be seen in numerous programmes. Whilst the actual monetary value of these projects cannot

always be quantified, the associated benefits in terms of jobs, taxes, improvement in local services and standard of living are expected to be appreciable.

Benefits Assessed in Terms of 'Added Value'

It is now common for packages to be developed in such a way that their value is linked to demonstrable benefits to communities in terms of the added value that they introduce into the local economy, usually expressed in terms of jobs, additional inward investment and improvements in the well-being of the community. There are frequently specific measures by which this value can be calculated.

Benefits in Relation to Normal Developmental Income

One of the arguments raised against provision of various community benefits by some is that they are merely 'sweeteners' or bribes, intended to overcome opposition by buying support. There are a few examples of where communities see the benefits as a way of obtaining funds for social projects that they would otherwise not receive, or to replace dwindling community income, but also a few where the benefits are specifically additional to normal state support for such projects. Some Funds are specifically separated from normal community budgets, and are only available after scrutiny by management boards and must conform to specific guidelines. Others have no real controls at all.

Benefits to Offset Impacts or Encourage Participation

It is possible to distinguish in some programmes those benefits that are intended to *mitigate* likely impacts that will arise from facility construction and operation. For example, if the community hosting the facility is largely rural and does not contain an industrial infrastructure, it will be necessary to improve current roads and rail links or even construct new ones. In addition there may be a need to develop additional health and social facilities for the influx of construction workers. Such impacts can generally be anticipated and mitigation measures developed to reduce their effects.

Other benefits can be seen to act more as *compensation* for potential impacts that may occur. These can be more difficult to quantify and often include perceived impacts, such as local stigma, property blight, and devaluation of local agricultural produce by association with the facility. Such benefits may actually never be realised if no impacts can be demonstrated.

Other benefits are seen more as *incentives* to a community to become involved, without commitment, in a facility siting process.

Miscellaneous Benefits

A number of benefits do not easily fall into any of the other groupings discussed. While all programmes stress to potential host communities the positive impacts that facility development would have in terms of employment and improvements in the local economy, the incorporation of integrated sustainable economic development initiatives clearly act as attractive additional community benefits.

Fund Management Processes

There is a variety of ways in which community benefit funds identified in this review are managed or are proposed to be managed. These vary from direct transfer of funds to the relevant local government body with no further controls on their use through to complex management boards with representation of all parties to the benefit agreement and which decide on fund allocation and expenditure based on detailed suitability criteria.

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Community Benefits and Geological Disposal: An International Review

1 Introduction and Project Objectives

If the West Cumbria MRWS Partnership (hereafter 'the Partnership') agrees to recommend one or more councils to go forward to the next stage of the MRWS process, it may wish to agree with government a common understanding upon which the provision of community benefits would be based. The Partnership has therefore commissioned Galson Sciences Ltd (GSL) to draw together the most up to date overseas experience in order to determine whether there are model or benchmark principles that might form the basis of future agreements.

In the Letter of Appointment for this work, dated 30th August 2010, the Partnership requested, where possible, the following types of information in addition to the general details already held by GSL:

- Waste type concerned, specifically including a breakdown of volumes and radioactivity of materials.
- Monetary value of financial benefit components and the formulae used for calculating them where these exist.
- Identification of any non-financial benefits.
- Timing of the provision of benefits in relation to the siting process (including prior to decisions being made) and the value of benefits at each identified stage.
- Whether benefits are designed to compensate for real or potential impacts or whether they are intended as incentives to become involved.
- The distribution of benefits between different communities or areas affected.
- Method of benefit transfer and type of fund management employed or proposed (where applicable).
- Parties to any formal agreements (i.e. government or developer).
- Form of legal agreements on community benefits (copies supplied where available) and the views of local communities as to how immune these are to future changes in policy.

- Type of community receiving the benefit, including details of immediate and local population density and in particular the estimated level of resident population within 30kms of the facility (local estimate accepted).

- Information, if available, on whether the communities have taken measures to ensure that the provision of community benefits will lead to a consequent reduction in other forms of public funding.

This review therefore comprises updates of existing GSL information together with the inclusion of new data where possible. It has been collected through contact with individuals in the relevant countries from various organisations, including government departments, waste management agencies, local authorities and researchers. The information presented is as accurate as possible given the short timescale for the work.

The information is presented in tabular form where practical, in order to allow for easy comparison between country examples. Explanatory text is also included, discussing the information in respect of the issues identified as of interest, to provide context. Monetary amounts are presented in UK Sterling, using exchange rates as of mid-September 2010.

Information regarding facilities includes details of the type of radioactive waste for which facilities are currently in operation, for which sites have been selected and are under development, or for which sites are still being sought.

It is important to point out that it is by no means the case that every disposal facility development is accompanied by one or more of the various benefits described in this report. No benefits were made available, for example, in association with the Morsleben repository in the former East Germany; none (over and above jobs) are planned in association with the Konrad repository, also in Germany, and currently under development; no additional benefits are associated with the several LLW repositories in the Czech Republic, or with any of the numerous facilities in operation in Russia.

1.1 Report Structure

Section 2 of the review introduces the types of benefits that have been identified in different repository siting programmes internationally and provides a brief description of their features. This is intended to assist the understanding of the tables and discussions in later sections.

Section 3 presents the latest information that we have been able to gather in the time available for this study. This includes information already in our possession together with new data obtained from a range of sources. These include contacts within national government departments, implementing agencies and local community government bodies. It is presented as two complementary tables.

Section 4 is a discussion of the information presented in Section 2 in terms of the issues identified by the Partnership Community Benefits Working Group as being of prime interest.

Section 5 lists the references and sources used (including those in the tables).

2 Community Benefits and Radioactive Waste Disposal

It is becoming common in countries where geological disposal facilities for radioactive wastes have been proposed, developed or in some cases operated to offer some form of 'mitigation' measures to offset perceived fears amongst the host community and any potential financial impacts, should they occur, in addition to other measures designed to compensate for real impacts. Such measures have also been offered not to compensate for risk or impact, real or imagined, but in recognition of the community's participation in an activity that is perceived as being 'in the national interest'.

Not least amongst these measures has been the offering of specific benefits packages to the community, by way of compensation, not necessarily for bearing an increased risk, but simply for allowing itself to be considered. It is now generally the case that such benefits comprise a mixture of financial payments and measures designed to assist the community to take part and ensure enhanced well-being over and beyond the lifetime of the facility in question.

Work carried out by GSL and others to examine the use of community benefits in association with radioactive waste repository siting [Richardson 1998; UK Nirex 2005] recognises a broad tripartite division: 'Cash Incentives', 'Social Benefit' measures and 'Community Empowerment' measures. It is common for communities to be offered packages containing payments and benefits of several different types, depending on the development stage of the project. It is also important to appreciate that not all types of benefit or payment are included in every process.

These benefit types are described briefly below in order to place the review in context.

2.1 Cash Incentives

These tend to be exactly what the title implies: they are an incentive to a community to either become involved in a process, or to allow a development to continue, or both. Some examples of this type are fixed and not subject to negotiation, having been laid down within some pre-existing legal instrument, whilst others are often open to negotiation after the initial expression of interest has been registered, as a way of maintaining community interest.

- **Lump Sums -** These are payments made directly to the affected community in order to encourage participation. In many cases there are few controls on what the money may be used for; in others, conditions are attached. It is not uncommon for the payments to be made in instalments, dependent upon achievement of project milestones.

- **Annual Payments -** In many cases agreements or incentive packages contain details of regular payments that are available, enabling local communities to

estimate the benefit they could receive. The level of payments can vary depending on certain factors, such as the volume or activity of the waste emplaced, and whether regulatory approvals are forthcoming. In some instances the amounts are specified within legal instruments.

- **Expert Support Packages -** In some programmes, support packages are offered to assist communities to commission reviews by independent experts. This is seen as an important way of demonstrating transparency in the way in which information is supplied to the community during a project. In many cases these funds are paid as part of the support provided as 'Community Empowerment', described in more detail below.

- **Tax Benefits -** In some cases, special taxes are payable to the local community as an additional incentive for involvement.

- **Trust Fund for Future Generations -** These are funds established with the aim of supporting the community in the long-term, in case the facility operation affects local economic development. Funds can also be established to provide capability to carry out any necessary potential remediation in the future in situations where the original site operator is no longer in existence. Although there are currently few examples of these funds, they are starting to feature more in local negotiations and are being recognised as an excellent way of providing intergenerational equity in view of the long-lived nature of the potential hazard from the wastes.

- **Profit Sharing -** It has been proposed in some instances to allow the host community to benefit from facility operation by some form of profit-sharing scheme. In some cases this is paid as a levy directly to the relevant local government entity.

2.2 Social Benefit Measures

These are any compensatory measures, financial or otherwise, which are intended to offset any stigma, perceived or actual, regarding either the community's participation in any stage of the siting process, or associated with the actual location, development and operation of the facility within the community or area.

Included within this group are measures such as guaranteed property prices and guarantees of local hiring. Improvement to infrastructure such as roads and other services can also come under this heading. In many cases, some details of benefits and payments are available from the start because they are laid down within legal instruments, and these include things such as emergency preparedness training, and payments-equal-to-taxes (PETT). As before, some only become available after disposal operations actually begin.

- **Employment -** In many cases the enhanced employment opportunities that will result from a facility development are advanced as potential benefits

designed to encourage communities to become involved. This has to be carefully balanced so as not to appear as if a proposal is targeting an area with high unemployment. It can also be perceived as a major disruption to an established employment profile. If suitably qualified workers are not available in the community, an influx of outsiders can often be seen as a major detriment.

- **Infrastructure Improvements -** It is generally recognised that development of a nuclear waste repository will have a number of impacts upon a local community, especially one where no nuclear facilities have previously existed. In many cases these impacts are perceived, rather than actual, especially at the beginning of a siting process. There is sometimes a blurred distinction about where such developments become pure incentives designed to attract a community in which nuclear facilities may be absent or poorly developed, rather than offset a perceived or actual impact.

- **Property Value Protection -** There is a common perception that the presence of a nuclear waste facility can reduce house prices, encourage an influx of lower income families to the immediate vicinity and reduce the overall economic profile of a region. It is therefore not uncommon for benefit packages to include some form of property price protection, whereby funds are put aside to compensate claimants for demonstrable decreases in value. It is notable, however, that there are few examples of large payments having been made.

- **Integrated Development Projects and Miscellaneous Facilities -** It is becoming more common for community benefit packages to comprise integrated projects designed to benefit the community not only during the immediate siting process and subsequent facility operation, but long into the future (similar to Trust Funds). The development of structured development plans, comprising support industries, specialist services and linked research facilities can be seen in numerous programmes. Whilst the actual monetary value of these projects cannot always be quantified, the associated benefits in terms of jobs, taxes, improvement in local services and standard of living are expected to be appreciable. It is normal that such benefits only become available following local agreement to host a facility and the granting of the necessary construction permits and regulatory authorisations. In some cases, funds are distributed through a local management board set up to involve community and operator representatives.

- **Relocation of Developer -** As part of the benefits offered to local communities for agreeing to host a repository, it is becoming increasingly common for the facility operator to offer to relocate its main operational headquarters to the locality. Whilst this can be seen as a potential benefit in terms of increased local taxes, improved employment opportunities and similar, the commitment is often seen as a vote of confidence in the safety of the facility itself. It is also sometimes the case that the safety regulator

establishes offices in the community to assist in the long-term monitoring of the facility. Recently there have been examples of agreements being developed to include siting of associated manufacturing facilities adjacent to the repository, such as a waste canister factory or similar.

- **Discounts -** In some countries it is recognised that when a community fulfils a role considered to be in the national interest, there should be some tangible compensation, often in terms of reduced utility fees. In addition, schemes to incorporate regular monitoring of community health and environmental well-being are becoming more common.

2.3 Community Empowerment Measures

These types of measures can also be regarded as a form of incentive, designed as they are to allow a community to develop a degree of control over the siting, development and even operation of the facility. They usually include such things as establishment of local monitoring or review groups, especially where the community is a volunteer participant, but vary as to the extent of real power which is actually available.

Examples now exist of siting processes where these various payments and support structures are developed in partnership with the prospective host community. Both local representatives and proponent join together in formal or semi-formal partnerships which examine the potential of the community to site a facility, and develop integrated socio-economic projects designed to benefit the community in the long-term.

- **Local Involvement in Decision Making -** It is now becoming common for community partnerships to be established, involving local elected bodies, interest groups, citizen groups and so on. Such partnerships are often given the opportunity to influence the details of the project, sometimes (rarely) including technical design, but more frequently regarding associated integrated economic development projects.

  In many cases the local community possesses a right of withdrawal from a process, or a veto at certain defined points in the decision-making process. This can sometimes involve referenda or other forms of plebiscite.

  The local community partnership often receives financial support to allow it to oversee the project and ensure that local views and concerns are taken into account.

- **Capacity Building -** This is somewhat similar to the above, but includes measures designed to allow the oversight group or partnership to become more knowledgeable about the issues involved. This can include organisation of meetings, discussions with independent experts, and visits to operating facilities. It can also assist a community to develop the capability to cope with additional demands on health and other services that may be required. It can also include support for other groups to allow them to be involved.

- **Development of a Local Partnership to Oversee Project -** It is becoming common for community partnerships to be established in a repository siting process, in order to allow a degree of ownership and control to be developed locally. They are usually based on a contractual agreement between the local community and either government or the implementer.

2.4 Involvement Support Packages

The various payments and funding arrangements described above are sometimes amalgamated into a single agreement, designed to support the participation of local communities in a siting process. These packages can therefore include items discussed already, such as secretarial support, use of experts, and management costs for partnerships. They can be available during site selection as well as during facility construction and operation once a site has been selected.

3 Latest Information

The latest information concerning the provision of community benefits associated with proposed or operating radioactive waste management facilities is presented below in Tables 3.1 and 3.2. Monetary values are given in UK Sterling using conversion rates as of mid-September 2010.

The information is based on existing data held by GSL and from discussions with individuals in the various countries concerned as necessary to check the validity of our interpretation.

Table 3.1 indicates the benefits involved under the three main types as described in Section 2, together with estimates of the affected local population. Details of the waste type involved and the estimated facility inventory are also provided where applicable. Waste volumes are expressed in terms of cubic metres (m^3) or, as is the case for spent fuel, in Metric tonnes of Uranium (MtU) equivalent.

It should be pointed out that not all countries apply similar waste classification systems as that used in the UK, namely **Low Level Waste (LLW)** as '*radioactive waste having a radioactive content not exceeding four gigabecquerels per tonne (GBq/te) of alpha or 12 GBq/te of beta/gamma activity*' and **Intermediate Level Waste (ILW)** as '*wastes with radioactivity levels exceeding the upper boundaries for low-level wastes, but which do not require heating to be taken into account in the design of storage or disposal facilities*'. **High Level Waste (HLW)**, resulting from reprocessing of spent fuel, is defined as '*heat-generating wastes in which the temperature may rise significantly as a result of their radioactivity, so that this factor has to be taken into account in designing storage or disposal facilities*' [DEFRA 2007.

The International Atomic Energy Agency (IAEA) instituted a revised waste classification system in 1994 that takes into account both qualitative and quantitative criteria, including activity levels and heat content, along similar lines to the UK definitions. The reader is directed towards the relevant publications [IAEA 1994; 2009] for further details.

Wastes under consideration in the Managing Radioactive Waste Safely Process correspond to long-lived ILW and HLW as used elsewhere. Note that spent fuel is not currently regarded as a waste in the UK, whereas it is in those countries that do not reprocess. It is however expected that spent fuel from Sizewell and any future new nuclear power stations will require interim storage and subsequent disposal following the cessation of reprocessing in the UK. Also note that defence-related ILW in the United States is referred to as Transuranic (TRU) Waste.

Table 3.2 indicates the relevant legal instrument or formal agreement (where applicable) under which benefits exist or are proposed. In the case of agreements, the relevant parties are identified. Copies of a range of these instruments or agreements (**highlighted in bold**) have been obtained where English versions are available.

Table 3.1: Overview of Main Benefit Types

Country	Waste Type	Facility (Proposed) **Selected**	Local Population Local	<30 Km	Cash Benefits Lump	Annual	Other	Social Benefits	Empowerment Measures	Notes
Australia[1]	LLW <10,000 m^3	(Muckaty Station) Surface	0	40	£6 M staged £120,000 on acceptance of nomination	Initial sum followed by six monthly payments if site selected	-	£0.6 M Educational grants	-	Payments staged. Initial payment has been made
Belgium	LLW 70,500 m^3	**Dessel** Near-surface	8,700[2]	>80,000[3]	£77-86 M (Local Fund)	-	-	Misc. local initiatives, theme park, communication centre, and other added value[4]	~£216,000/a to partnership during siting process. Fund management supported	Benefits staged
Canada	LLW (Historic) 1 million m^3	**Port Hope** **Clarington** Surface	16,390[5]	120,000[6]	£5.6 M x3	-	Diminished tax revenue will be compensated	Property Value Protection Plan	Related activities funded by government	One licence approved
	LLW 78,000 m^3 plus ILW 28,000 m^3 (max 200,000 m^3)	**Kincardine** Deep Repository	12,000[7]	~30,000[8]	£1.3 million, repeated when construction licence issued[9] plus £1 million to Kincardine	£0.5 M	-	Property Value Protection Plan	Support for participation and hiring experts from OPG	Cash benefits are linked to agreed project milestones

Country	Waste Type	Facility (Proposed) **Selected**	Local Population Local	<30 Km	Cash Benefits Lump	Annual	Other	Social Benefits	Empowerment Measures	Notes
	Spent Fuel approx 72,000 MtU	(TBD) Deep Repository	-	-	-	-	-	To be negotiated	Development of Centres of Expertise in potential siting communities	Benefits to be negotiated
Finland	Spent Fuel 12,000 MtU	**Olkiluoto** Deep Repository	50[10]	150,000[11]	-	-	Additional 2.5% property tax	Renovation of old people's home funded by Posiva	-	Rental of Posiva offices to offset loss of local taxes
France	VLLW 750,000 m^3	**Morvilliers operational** Surface	267[12]	~200,000	£2.5 M for local projects[13]	-	-	Funded from fund established with lump sum	CLI support	-
	LLW 1 million m^3	**Soulaines operational** Surface	267[14]	~200,000	£4.3 M for local projects	-	-	Funded from fund established with lump sum	CLI support	-
	HLW 6,000 m^3	(Bure) Deep Repository	1-5000[15]	~100,000	-	£17 M for GIP	-	£55 million local support programme	£260,000/a for CLI in each Département	GIP support renegotiated at siting stages
Hungary[16]	LLW (institution) 3450 m^3	**Püspökszilágy operational** Surface	730	13,000	-	£631,000	-	TEIT funds also available for local projects	Annual sum for local groups	TEIT-Information

Country	Waste Type	Facility (Proposed) **Selected**	Local Population Local	Local Population <30 Km	Cash Benefits Lump	Cash Benefits Annual	Cash Benefits Other	Social Benefits	Empowerment Measures	Notes
	L/ILW 40,000 m^3 wastes not separated; includes decomm.	**Bátaapáti** Deep Repository	460[17]	11 364[18]	-	£1.25 M[19]	-	As above	As above	-
Italy	LLW ~60,000 m^3 ILW ~2000 m^3	(TBD) Surface	-	-	-	Based on annual disposal volume	-	Accompanying technology park to be developed	-	Benefit package under development; currently delayed
Japan	HLW approx 6000 m^3	(TBD) Deep Repository	-	-	-	Initial £1.6m /yr[20] plus £15 m/yr during siting	Property tax estimated at £20 M/yr	NWMO HQ will transfer to host area	Funds to be used for 'outreach'	Payments staged between desk studies and investigations
S Korea[21]	LLW 400,000 m^3	**Gyeongju** Near-surface	4,000	>100,000	£163 M	£5.4 M	-	Science park to be co-located	-	-
Poland	LLW 4 million m^3 institutional	**Rozan operational** Surface	4596[22]	71/km^2	-	-	£1.4 M (tax)	-	-	Calculation of tax laid down in legislation
Slovenia	LLW 18,000 m^3	**Krsko** Surface	10[23]	>250,000	-	£4.3 M[24]	-	-	-	Payments subject to Spatial Plan

Country	Waste Type	Facility (Proposed) **Selected**	Local Population Local	<30 Km	Cash Benefits Lump	Annual	Other	Social Benefits	Empowerment Measures	Notes
	Spent Fuel N/A	(TBD) Deep Repository	-	-	-		-	-	-	As above
Spain[25]	LLW 176,000 m^3 VLLW 130,000 m^3	**El Cabril operational** Surface	0	4678	-	related to disposal: ~£1 M in 2008	£345,000 from Enresa Foundation	Local roads were upgraded etc.	-	Normal benefits only paid after site licensing
	Spent Fuel Storage	(TBD)	-	-	-	£9.5 M[26]	-	Technology Centre[27]	-	As above
Sweden	Spent Fuel 12,000 MtU	**Östhammar** Deep Repository	~100	21,500[28]	20% of total before start of operation ~£26 M	-	-	£130 M total for 'value added projects'	£187,000/a for review groups (site selection) plus £140,000 for admin now	Benefit allocation between licensing stages
Switzerland[29]	LLW; ILW HLW and Spent Fuel Storage	**Wuerenlingen operational**	4000	30,000	-	£0.95 M	-	-	-	Benefit only available for 20 years, subject to local approval
	LLW 77,000 m^3 ILW 900 m^3 HLW 7500 m^3	(TBD) Deep Repository x2	-	-	-	-	-	To be developed in partnership[30]	Meetings and hearings funded by government	Siting process now in progress for both LLW and HLW repositories

Country	Waste Type	Facility (Proposed) **Selected**	Local Population Local	<30 Km	Cash Benefits Lump	Annual	Other	Social Benefits	Empowerment Measures	Notes
Taiwan	LLW >50,000 m^3	(TBD) Surface	-	-	-	-	-	£88 M[31]	-	Benefits as 'feedback subsidies'
United States	LLW	**Barnwell Hanford Clive operational** Surface	250[32] <100 0	N/A <100 >1000		-	£1.1 M £135,000 £2.2 M	Taxes are used for local projects, schools etc.		Local Counties levy disposal taxes
	TRU (ILW) 175,564 m^3	**WIPP operational** Deep Repository	1 ranch	~30,000[33]	-	-	-	£14 million/a for roads etc. from 1997-2011[34] plus £2 M in 2003/4 £3 M annual Acceleration Fund	Environmental Evaluation Group funded by DOE	WIPP Acceleration Funds subject to annual approval by the US Senate

[1]Davoren, P., 2010
[2] STOLA, 2006
[3] Hooft, E., 2010
[4] NIRAS/ONDRAF, 2010
[5] Alhaydari, D., 2010
[6] Stickley, S. 2010

[7] Alhaydari, D., 2010
[8] Bergmans, A., 2010
[9] Specified in the Kincardine Agreement, (2004)
[10] Hiito, H., 2010
[11] Hiito, H., 2010 (includes city of Pori within 30 Km)
[12] Bergmans, A., 2010
[13] Solente, N., 2010
[14] Bergmans, A., 2010
[15] Bergmans, A., 2010 and Reaud, C. et al, 2009
[16] Balázs, M., 2010
[17] Balázs, M., 2010
[18] Ormai, P., 2008
[19] Balázs, M., 2010
[20] NUMO, 2002
[21] Details as specified in the 2005 Waste Law
[22] Tomczak, W., 2010
[23] Zeleznik, N., 2010
[24] As specified in Compensation Law (2000) amended 2009
[25] Bergmans, A., 2010
[26] Ministerio de Industria, Turismo Y Comercio, 2006
[27] Government of Spain, 2009
[28] Bergmans, A., 2010
[29] Bergmans, A., 2010
[30] SFOE, 2008
[31] Government of Taiwan, 2006
[32] Wikipedia; http://en.wikipedia.org/wiki/Snelling,_South_Carolina
[33] Wikipedia; http://en.wikipedia.org/wiki/Carlsbad,_New_Mexico
[34] WIPP, 1996

Table 3.2: Legal Instruments and Agreements

Country	Waste Type	Facility (proposed) **selected**	Legal Instrument outlining siting process **(bolding indicates copy obtained)**	Benefits specified in legal instrument	Negotiated Agreement with Implementer **(bolding indicates copy obtained)**	Parties to any Agreement
Australia	LLW 10,000 m^3	(Muckaty Station)	**Commonwealth Act (2005)**	No	Muckaty Site Nomination Deed (Confidential)	Government Ngapa community
Belgium	LLW 70,500 m^3	**Dessel**	No	Value of Local Fund to be specified in 2011	**Category A Masterplan**	ONDRAF/NIRAS Mol and Dessel
Canada	LLW (Historic) 1 million m^3	**Port Hope**	No	-	**Port Hope Agreement (2000)**	AECL (Govt) Port Hope and Clarington
	LLW 78,000 m^3 plus ILW 28,000 m^3 (max 200,000 m^3)	**Kincardine**	No	-	**Kincardine Agreement (2004)**	OPG Kincardine Municipality Adjacent Municipalities
	Spent Fuel 72,000 MtU	(TBD)	Nuclear Fuel Act (2002)	No	Planned	NWMO (utilities) Host community
Finland	Spent Fuel 12,000 MtU	**Olkiluoto**	-	-	Vuoki Agreement (1999) not available	Posiva (utilities) Eurajoki Municipality
France	VLLW 750,000 m^3	**Morvilliers operational**	No	-	Yes	ANDRA Local Communities
	LLW 1 million m^3	**Soulaines operational**	No	-	Yes	ANDRA Local Communities

Country	Waste Type	Facility (proposed) **selected**	Legal Instrument outlining siting process **(bolding indicates copy obtained)**	Benefits specified in legal instrument	Negotiated Agreement with Implementer **(bolding indicates copy obtained)**	Parties to any Agreement
	HLW 6000 m^3	(Bure)	**Waste Planning Act (2006)**	Yes	TBD	ANDRA Local Communities
Hungary	LLW 3450 m^3	**Püspökszilágy operational**	No	-	-	Not applicable
	L/ILW 40,000 m^3 wastes not separated; includes decomm.	**Bátaapáti**	No	-	-	Not applicable
Italy	LLW ~60,000 m^3 ILW ~2000 m^3	(TBD)	**Nuclear Decree (2010)**	Yes, but Sogin to develop proposed value	To be developed	Sogin Local government
Japan	HLW approx 6,000 m^3	(TBD)	**Radwaste Disposal Act (2000)**	No	-	NUMO Host community
S Korea	LLW 400,000 m^3	**Gyeongju**	Waste Bill (2005)	Yes	No	KRMC (Govt) Gyeonju
Poland	LLW 4 million m^3	**Rozan**	Compensation Law (2000)	Yes	No	
Slovenia	LLW 18,000 m^3	**Krsko**	Compensation Law (2008) only in Slovene	Yes	-	Not applicable

Country	Waste Type	Facility (proposed) **selected**	Legal Instrument outlining siting process **(bolding indicates copy obtained)**	Benefits specified in legal instrument	Negotiated Agreement with Implementer **(bolding indicates copy obtained)**	Parties to any Agreement
	Spent Fuel N/A	(TBD)	Compensation Law (2008)	Yes	TBD	Not applicable
Spain	LLW 176,000 m^3 VLLW 130,000 m^3	**El Cabril operational**	**Government Decree (1998)**	Yes	Yes, under the terms of the Enresa Foundation	Enresa Local municipalities
	Spent Fuel Storage	(TBD)	**Government Decree (1998)**	Yes	-	-
Sweden	Spent Fuel 12,000 MtU	**Östhammar**	Act on Nuclear Activities (1984)	No	Added Value program (2009) only in Swedish	SKB (utilities) Östhammar Municipality Oskarshamn Municipality
Switzerland	LLW; ILW HLW/Spent Fuel storage	**Wuerenlingen**	No	No	Linked to electricity prices	Operator and 2 local communities
	LLW 77,000 m^3 ILW 900 m^3 HLW 7500 m^3	(TBD) x2	**Sectoral Plan (2008)**	In principle	TBD	NAGRA (utilities) Host community canton
Taiwan	LLW >50,000 m^3	(TBD)	**Sites Establishment Act (2006)**	Yes	Government to specify conditions for allocation of feedback subsidies	Government Host Community
United States	LLW	**Barnwell Hanford Clive**	Local State laws	No	Negotiated Locally	Operator Local Community

Country	Waste Type	Facility (proposed) **selected**	Legal Instrument outlining siting process **(bolding indicates copy obtained)**	Benefits specified in legal instrument	Negotiated Agreement with Implementer **(bolding indicates copy obtained)**	Parties to any Agreement
	TRU (ILW) 175,564 m^3	**WIPP**	**Waste Isolation Pilot Plant Land Withdrawal Act Amendment (1996)**	Yes	Agreement to earmark WIPP 'Acceleration Funds' (2002)	DOE City of Carlsbad
	Spent Fuel HLW >70,000 MtU	Yucca Mountain	**Nuclear Waste Policy Amendment Act (1987)**	Yes	Project cancelled	-

4 Discussion

Tables 3.1 and 3.2 present the various benefits that are available or proposed in the national programmes examined in this review, with details of financial values, waste volumes and other factors. In order to better place these in an overall context and illustrate the different controls and constraints under which they exist, the discussion below examines these in terms of the main issues identified by the Partnership as of particular interest.

4.1 Staging of Payments and Benefits

The available data clearly show that it is common, albeit not universal, for cash payments and other benefits to be made contingent on satisfactory progress in terms of various permissions and approvals. These usually include the various stages of community agreement followed by more formal regulatory milestones. The intention of this linkage is to ensure smooth forward momentum in the development of the facilities and to assure both sides that benefits are not to be seen as separate from this. These payments are additional to the provision of support for engagement and participation in the process, as described in Section 2.4 above which are normally available from the start, and may even often continue beyond the lifetime of the facility.

- In **Australia**, an initial payment (£120,000) was made when the Muckaty Station was accepted by the federal authorities as a volunteer. A further, unspecified, payment will be made when the site is formally named as the selected site, and the remainder of the agreed £6 million cash payment will be paid into a trust fund every 6 months or until the project is cancelled [Commonwealth of Australia, 2007].

- In **Belgium**, the development of the Local Fund (LF) is linked to the granting of the construction and operating authorisations. It will be resourced from the so-called Medium Term Fund (MTF) which will be established by a legal instrument and specify its minimum value. The MTF will be resourced through taxes levied on the waste producers, and will begin within 3 months of the granting of the facility construction licence, currently estimated to be sometime in late 2013. The legally mandated value of the MTF must be reached within 3 months of the granting of the operating licence, expected in 2016, after which money will begin to be transferred to the LF [NIRAS/ ONDRAF, 2010].

- In **Canada**, £5.6 million was paid into a separate Fund for each of the three local communities (two of which have since merged and are referred to simply as Port Hope) under the terms of the Port Hope Agreement (PHA). These were placed in trust in separate bank accounts in accordance with Schedule 7 and 8 of the PHA. In accordance with Schedules 7 and 9, the interest from the funds is made available to the Municipalities of Port Hope and Clarington until the two facility licences are granted, when all liability to return funds to the

government is removed. If not, the principal must be returned to the government. The Port Hope licence was issued in late 2009, so nothing now needs to be returned. The Clarington funds will be held in trust until such time as that licence is issued [Stickley, S., 2010].

- Also in **Canada**, £1.3 million was paid to Kincardine and the four Adjacent Municipalities (scaled with distance from the facility) when community consultation activities (including a plebiscite) demonstrated local support for the facility (with Kincardine, the immediate host, receiving an additional £1 million). The Agreement then required the local authorities to support the project as appropriate, with further payments contingent on reaching agreed project milestones. These include regulatory approval and granting of a construction and operation licence, when a further £1.3 million will be paid, scaled as before [Kincardine Agreement 2004].

- In **France**, details of the funding for the Public Interest Groups (GIP) around the potential underground laboratory site at Bure was negotiated between the waste producers and district level local government, initially prior to site identification and then again prior to licensing. This was as laid out in the 1991 Waste Act, which was superseded by a new Act in 2006. The funding arrangements were then renegotiated under the terms of this legislation [Bergmans, A., 2010] and increased from £8.5 million to £17 million per GIP. A siting process is now underway for a deep repository, and there will again be negotiation of the GIP funding arrangements, subject to licence approval.

- In **Japan**, the 'Outreach' scheme proposed by NUMO in their Open Solicitation in 2002 includes payment of £1.6 million per year to an interested community during an initial literature and desk study stage, followed by up to £15 million per year during detailed site investigations (up to a maximum of £52 million in total), ceasing when underground investigation and confirmation begins [NUMO, 2002]. These funds should be used to identify and support development of a range of research and educational facilities that will operate throughout and beyond the life of the repository. They are made under the terms of the 'Regional Acceptance Enhancement Grant for Planning-stage Electric Power Plant' system.

- In **Slovenia**, an annual £4.3 million compensation payment for 'limited land use' associated with the siting of the LLW repository is dependent on adoption of a revised National Spatial Plan, which follows the site selection. For the Plan to be adopted, approval is also required for the siting decision and the repository design [Zeleznik, N., 2010].

- In **Spain**, where the level of community compensation is formally enshrined in legislation and subject to specific algorithms, nothing is made available during either the pre-siting or pre-licensing phases other than some possible support for local services, schools or the like. Only after licensing are contractual agreements made concerning funding allocations [Bergmans, A., 2010].

- In **Sweden**, 20% of the £130 million 'added value' funds from the 2009 SKB Agreement must be allocated before 2013, when a construction licence is expected for the repository in Östhammar. 75% of this goes to Oskarshamn, which was not selected as host community [Engström, S., 2009]. This means that around £26 million will be available over the six years, including some £13 million for a new ferry terminal in Oskarshamn. No further money will be available unless an operating licence is issued, sometime around 2023.

- In **Switzerland**, the 2008 Sectoral Plan [SFOE, 2008] consists of 3 specific stages, each characterised by various studies into the development of sustainable economic development designed to offset negative impacts and develop positive benefits from the repository development. It will be possible for additional compensation payments to be negotiated between the host canton and the implementing agency in the final stage, and these will be dependent on regulatory approval.

4.2 Benefits Laid Out in Legislation

There are several examples of where specific benefit amounts and associated social and empowerment measures are laid down in legislation. In some cases it is just the general principle of a community benefit provision that is cited, and specific amounts etc. are left for subsequent negotiation between the developer and potential and/or final siting communities. The legal instruments commonly include details of the staged processes described above or of the methods to be used for calculating ongoing payments that will be available during the life of a facility, as described in Sections 4.3 and 4.4.

Comments on the likely continuation of such legislation and its immunity to change are also included where this has been possible to assess.

- In **France**, the funding support available to the Public Interest Groups (GIP) around potential deep repository sites was laid out in the 1991 Waste Law. When Bure was selected for development of an underground laboratory this was amended by Government Decree in 2000. The 2006 Waste Law increased the amount again and the role of the GIP was restated [Republic of France 2006]:

  - *managing any equipment designed to favour or facilitate the implementation and operation of the underground laboratory or repository*

  - *performing, within the boundaries of the relevant district, any regional or performing, within the boundaries of the relevant district, any regional or economic development actions, particularly in the proximity zone of the underground laboratory or of the repository, the perimeter of which has been set by decree after consultation with the relevant general councils*

- *supporting training initiatives as well as actions relating to the development, including business-wise, and diffusion of scientific and technological knowledge, notably in the fields investigated within the underground laboratory and in the framework of new energy technologies.*

Other supporting training initiatives as well as economic development support initiatives around the Bure site have been negotiated over the years between the district level authorities and ANDRA and the utilities. Around £55 million has been invested to date [EDF, 2006].

- In **Italy**, the 2010 Decree specifies that '*in order to optimise the socio-economic, employment and cultural impact of the development of the technology park, the locality surrounding the site is entitled to a financial benefit in relation to the radioactive waste*' [Republic of Italy 2010]. The amount of financial benefits available will be proposed by the implementing agency, Sogin, as part of the repository implementation plan that is currently under development.

- In **Slovenia**, the 2003 Compensation Decree specified an exact amount of compensation for the resulting 'limited land use' that would be available to the LLW repository host community. The Decree was amended in 2008 and the amount available was increased to £4.3 million. However, there are some in the community who feel that there is no guarantee that the legislation could be changed again in the future, possibly reducing the amount [Petan, B., 2010].

- In **South Korea** the 2005 Waste Bill specified the cash amount that would be available to a potential host community as an incentive to become involved, as well as the fact that the implementing body (now KRMC) would transfer its headquarters to the community and that a science park and proton accelerator development unit would also be established.

- In **Spain**, as detailed in Sections 4.3 and 4.4, a Government Decree in 1998 lays out in considerable detail the methods by which the annual payments to communities hosting various facilities are calculated [Government of Spain, 1999]. The justification for these payments is clearly stated in the Decree: '*Drawing up of the present Order is undertaken with account given to the appropriateness of guaranteeing certain minimum income for those municipal areas which, due to their being located close to nuclear installations or to their population being located close to such installations, are required to withstand their existence and the corresponding infrastructure to a larger degree, and to the need to contemplate new situations such as the dismantling of nuclear power plants*'.

- In **Taiwan**, the 2006 Act on Sites for Establishment of Low Level Radioactive Waste Final Disposal Facility [Government of Taiwan, 2006] specified that the amount to be made available as 'feedback subsidies' to the final host community should not exceed £88 million, and that the responsible

government department would decide the uses to which this could be put. There does not appear to be much room for negotiation. No subsidies will be available until the selection of the site is approved by the central government (the Executive Yuan).

4.3 Benefit Amounts Linked to Disposal Volumes or Inventory

In a number of examples, detailed below, the annual payments available to host and affected communities (however these are defined) are dependent on the volume of wastes emplaced in the facility on an annual basis. One example is also given of where payments can be renegotiated should wastes from 'new build' facilities be involved at a later date.

- In **Canada**, the Kincardine Agreement includes the possibility for the parties to the Agreement to renegotiate the various payments should the developer wish to dispose of wastes from new reactors that may be developed in the future.

- In **Italy**, the 2010 Decree specifies that in developing the compensation scheme for local communities, Sogin should take account of the overall volume and radioactive content of wastes consigned to the facility on an annual basis. The final details are still under development.

- In **South Korea**, the 2005 Waste Bill stipulated that in addition to the initial lump sum that would be payable when a site was selected, an annual payment of around £5.5 million would be paid as a so-called 'carrying in' fee [KHNP, 2005], based on the amount of wastes emplaced.

- In **Spain**, annual payments according to the 1999 Government Decree include a multiplier based on the volume of wastes emplaced in a disposal facility or held in a storage facility (around £2000 per m^3). This is part of the overall calculation, which allows considers local population levels as detailed in Section 4.4.

4.4 Benefits Linked to Local Population Levels and Distance

Financial benefits are sometimes distributed amongst host and neighbouring communities based upon the relevant population and the distance from the facility. This tends to be more typical of those systems that are specified in legal instruments, though not all include this methodology.

- In **Canada**, the Kincardine Agreement specifies how the various benefits associated with the ILW repository are to be distributed. Although they are paid to 5 municipalities in total, Kincardine receives by far the largest share. The others receive proportionally less, based on their proximity to the facility.

- In **France**, the benefits associated with the underground research laboratory at Bure, available through the GIPs, are distributed according to the population of the community concerned. Since 2006, a total of some 312 municipalities within a so-called 'proximity zone' have been involved [NEA, 2010]. In the past each community receiving funding for a project had to provide 20% matched funding for any proposed project. This is now around 50%. Thirty-three municipalities within a 10 km radius of the underground laboratory receive an annual per-capita sum (around £400), although given the small size of many of these municipalities, it is often difficult for them to utilise the funds as they have little themselves with which to provide the matched amounts [Reaud, C., et al., 2009].

- In **Italy**, Article 30 of the 2010 Decree specifies in detail the way in which the annual compensation payments resulting from operation of the LLW facility should be distributed amongst the local communities. 40% is to be paid to the relevant local government bodies and 60% to residents and local businesses within a 20 km radius of the facility. The latter will receive the benefit in the form of reductions in various taxes (energy, refuse, property and income).In **Spain**, the Government Decree in 1999 laid out in considerable detail the way in which the annual benefits payable to communities surrounding nuclear facilities should be calculated. This varies in relation to the radioactivity of the material involved, the distance of the community from the facility and the population of the community. The funds themselves are also subject to detailed specifications regarding their distribution.

  For facilities where spent fuel is stored, including operating reactors (Category 1) or centralised facilities (Category 2) any community with a part of its territory within 20 km is eligible for annual payments. The Funds are distributed as follows:

  - 5% for Category 1
  - 10% for Category 2

  Payments associated with sites being decommissioned (Category 3) or centralised facilities for storage or disposal of LLW (Category 4) are calculated in a slightly different way, with communities within a maximum limit of 16 km receiving payments:

  - 25% for Category 3
  - 10% for Category 4

  In the case of El Cabril this means that payments are made to the host municipality and three neighbouring ones.

The actual sums are calculated according to the following scheme [Government of Spain, 1998]:

$$C_i = 0{,}6 \times S_i + 0{,}4 \times (h / d^2)_i$$

where

S_i = Percentage of the surface occupied by the municipal area i in the circle defined in section 1 for each category of point three.

AND,

$$(h / d^2)_i \quad \frac{H_i D_i^2}{(H_i / D_i^2)}$$

where

$H_i = H_j$ = Number of inhabitants in the municipal area i belonging to those population areas j whose distance to the centre of the installation does not exceed 20 or 16 kilometres, depending on whether the installations are of categories 1 and 2, or 3 and 4, respectively, of point 3.

H_j = Total number of inhabitants in population area j. For these purposes, the number of inhabitants of a population area shall include those of outlying areas associated therewith according to the Technical Vocabulary. Where the outlying areas are associated in the said vocabulary with various population areas, the number of inhabitants of the said outlying areas shall be distributed among these population areas proportionately to the inhabitants of each.

$D_i \quad \frac{H_j D_j}{H_j}$ Average weighted distance of the said population areas of municipal area i to the installation

where D_j = Distance of population area j to the centre of the installation.

The community which hosts the centralised spent fuel store (ATC) will also receive annual payments calculated according to the 1999 Decree. The latest estimate for this is around £11 million per year [Ministerio de Industria, Turismo Y Comercio, 2006].

No municipal area may receive more than 20% or 40% of the total fund, depending on which category it is in. Whilst the host community is guaranteed a special 10% share of the annual amount, the calculation depends on the population and the percentage of the municipality's territory that lies within the 8 km radius.

- In **Switzerland**, all communities within a 2 km radius of the storage facility in Würenlingen (the communities of Würenlingen, Döttingen, Villigen, Böttstein and Stilli) receive annual payments of around £900,000), of which 58% goes to the host community.

4.5 Benefits as Part of Negotiated Integrated Projects

It has become more common in recent years for the overall benefits and compensation package offered to potential host communities to involve a range of features, not just the purely financial. In recognition of the long-term, transgenerational nature of repository development, operation and closure, integrated sustainable development projects are being developed, often by negotiation with the host community or regional authorities. Agreements on structured development plans, comprising support industries, specialist services and linked research facilities can be seen in numerous programmes. Whilst the actual monetary value of these projects cannot always be quantified, the associated benefits in terms of jobs, taxes, improvement in local services and standard of living are expected to be appreciable.

- The Category A Waste (LLW) Masterplan in **Belgium** provides extensive details of the associated projects that will be developed alongside the LLW repository in Dessel. These will include a Communication Centre, which will incorporate a visitor centre, a nuclear-focused theme park, meeting facilities for the community and a digital interactive network [NIRAS/ONDRAF, 2010]. These are in addition to the projects that will be developed with support from the Local Fund, details of which are given in Section 4.6.

- In **France**, around £55 million from EDF, AREVA and CEA has been allocated to the Meuse and Haute-Marne regions for an economic support programme in the area around the proposed deep repository between 2000 and 2006. It covered four thematic areas [EDF, 2006]:

  1. Development of regional excellence in electricity generation using biomass (involving investment of more than £17 million).

  2. Making the region a pilot for new energy conservation measures, for which £15 million has been provided between 2006 and 2010.

  3. Improvements in local industrial development, especially in metallurgy.

  4. Support for local groups and establishment of new businesses, including a £13 million archiving operation by EDF.

  The funding was additional to the GIP support mentioned elsewhere, which from 2006 results from two special taxes created by the Waste Act: an ‘Accompaniment Tax’ and a ‘Technological Diffusion Tax’ paid by the waste producers.

- In **Italy**, the 2010 Decree specifies that the benefit package to be developed by Sogin in its planning for a LLW repository will include a technology park which will provide facilities for scientific research and technology development associated with the management of radioactive waste and radiation protection.

- The 2005 Waste Bill in **South Korea** included the specification that the host community for the LLW repository would also be the site of a science park, incorporating research facilities intended to develop a new proton accelerator. Up to 20,000 jobs are predicted to be created.

- In **Spain**, the operator of the El Cabril LLW repository established a Foundation following siting of the facility. Agreements were negotiated with the local municipalities that resulted in funds of around €300,000-400,000 per year. These are used for infrastructure, tourism and similar specific projects, agreed on a regular basis with the Foundation [Molina, M., 2010].

- Also in **Spain**, the proposal for a centralised storage facility for spent is intended to be accompanied by major inward investment in the volunteer host community. It is proposed to develop a Technological Centre and an associated Enterprise Park. The complete project is estimated to be worth in the order of £600 million. £470 million of this is the cost of the storage facility, with the operator, ENRESA, also providing £40 million for the Technological Centre. It is intended to fund the remaining £90 million cost of the Enterprise Park through investments by various regional bodies [Molina, M., 2010].

- The 2008 Sectoral Plan in **Switzerland** [SFOE, 2008] contains a staged process for siting repositories for all types of radioactive wastes. The stages are also characterised by requirements for a series of studies, to be performed by the local authorities and intended to develop a range of sustainable economic development initiatives to be enacted in the area and region that is selected for a repository. Although the nature and scale of these projects is not specified at the present time, they are seen as an integral part of the repository development process.

4.6 Benefits Assessed in Terms of 'Added Value'

It is now common for packages to be developed in such a way that their value is linked to demonstrable benefits to communities in terms of the added value that they introduce into the local economy, usually expressed in terms of jobs, additional inward investment and improvements in the well-being of the community. There are frequently specific measures by which this value can be calculated.

- In **Belgium**, the Category A Waste Masterplan [NIRAS/ONDRAF, 2010] describes the LLW repository project as '*combining a technologically feasible solution with socio-economic added value for the region*'. The added-value projects are regarded as recognition of the contribution the Dessel (immediate host) and Mol (immediate neighbour and previous candidate) communities are making to the Belgian population as a whole. Although not quantified in the Master Plan, these are intended to include the Local Fund and the projects that will be supported through it, which should '*positively impact prosperity and well-being in the region, not only today, but also in the faraway future*'. The

added value is also considered to include the positive impact on local employment that the projects will result in.

- In **France**, the allocation of funds through the GIP around the Bure site is assessed in terms of the 'leverage' that a particular project or activity can bring to the area in terms of jobs created, number of businesses affected and so on [Varnusson, M., 2010].

- In **Slovenia**, the 2008 Compensation Decree specifies that the local community that receives compensation for the 'limited land use' due to the development of the LLW repository must ensure that it is used for improvements to the municipality infrastructure and services designed to enhance the quality of life for the inhabitants. These are specifically identified in the legislation as added value deriving from the project.

- In **Spain**, the Enresa Foundation was established in 1990 to '*partially address socio and cultural demands of the communities*' around the El Cabril site [Molina, M., 2009]. The projects supported in the rolling 4-year programmes are the result of negotiations between the Foundation and the local municipal governments.

- In **Sweden**, the agreement signed between SKB and the two candidate repository sites in 2009 is based around the principle of introducing added value to the communities, beyond that anticipated to derive from the facility development. As explained in Section 4.1, the agreement is unique in that it specified that whilst both communities would benefit from the £130 million available, the community that was not selected would actually receive 75% of the benefit. The monies allocated according to the agreement, which is referred to as the 'Added-Value Programme' (AVP), will be managed through a specially created locally-based company, (SKB NU AB), involving a Board, with 5 representatives, one from each community and 3 from SKB [Engström, S., 2009]. Proposals for specific projects will be made by special working groups in each community. There will be a strict methodology for determining the amount of money that any proposal will receive from the Fund. A project will be assessed in terms of its added value to the community. This will include such things as whether the project will generate local income, whether third party funding is available that would otherwise not be and the value of additional jobs generated through the project etc. The Board will take all these into account when evaluating proposals and requires a majority of at least 4-1 for approval [Spangenberg, J., 2010].

  A range of issues are expected to be covered by the AVP, including:

  - Education
  - Spin-off / support for innovation systems
  - Business development

- Infrastructure
- Visitor/information site
- Broadening and diversification of the labour market
- Investments in the energy sector
- Head office functions (SKB)
- Further development of SKB's laboratories (Oskarshamn)
- Canister manufacturing plant
- Annual compensation to the municipalities

4.7 Benefits in Relation to Normal Developmental Income

One of the arguments raised against provision of various community benefits by some is that they are merely 'sweeteners' or bribes, intended to overcome opposition by buying support. There are a few examples of where communities see the benefits as a way of obtaining funds for social projects that they would otherwise not receive, or to replace dwindling community income, but also a few where the benefits are specifically additional to normal state support for such projects. Some Funds are specifically separated from normal community budgets, and are only available after scrutiny by management boards and must conform to specific guidelines. Others have no real controls at all.

We have found no clear evidence to date of instances where benefits associated with facility siting and development have been offset by deductions from normal community development funding.

- In **Australia**, as described in Section 4.1, the Ngapa Group appear to regard the possible development of the LLW repository at Muckaty Station as a way of obtaining governmental funds that they would otherwise probably never receive. The additional educational grants are also regarded as important support for future prosperity.

- In **Canada**, Schedule 8 of the PHA outlines some complex procedures a trustee must follow to deal with both the interest and the principal of the fund in the former Township of Hope. Schedule 8 was amended in November of 2003 to include an investment counsellor as the potential guardian of the Township of Hope Fund (since merged with Port Hope). Port Hope and Clarington interest from the funds is used as general revenues, or reinvested with no restrictions. Hope Township interest was used according to the agreement to defray lower tier taxes or was re-invested (restrictions apply).

- In **Finland**, the Vuoki Agreement was initiated by concern in the municipality that tax revenue from the existing nuclear site would diminish over time, and realisation that this could be offset by a new development. It was also agreed that revenue from real estate taxes on the repository would be exempt from those parts of existing tax legislation designed to offset state subsidies to those communities receiving large amounts from the nuclear and other industries. The municipality had to repay around £1 million to the reactor operator TVO following an appeal over earlier real estate tax payments, but in the event, TVO actually loaned the municipality some £1.75 million to assist it in managing its diminishing budget.

- In **France**, the money channelled through the GIPs around the Bure laboratory and in the potential repository siting area is included in the relevant Département budgets for investment in new economic and infrastructure development projects. It has been shown that this has resulted in almost twice the normal investment budget as compared to Départements of a comparable size [Reaud, C. et al., 2009] due to additional inward investment by other bodies. However, the limitations on use of the GIP funds are such that not every municipality receives support (due to proximity limits) and any new project has now to be supported by a 50% contribution from the relevant community. Given the small size of some communities, and the fact that funds are allocated on a per capita basis (£400 per head), this has caused much concern. It appears that much of the money supports projects in larger communities distant from the laboratory and the repository zone.

- In **Japan**, in addition to the provisions of NUMO Outreach Scheme, providing support for increased communication capabilities in potential host communities, the Japanese government agreed to extend the 'Regional Acceptance Enhancement Grant for Planning-stage Electric Power Plant' to include the HLW repository, thereby opening the way for a community to receive supplementary development funding [NUMO, 2002].

- In **Spain**, the 1998 Decree clearly states that '*It should, furthermore, be pointed out that the allocations deriving from application of the present Order should be understood as being without prejudice to those amounts which might correspond to the municipal areas as a result of their internal agreements*' [Government of Spain 1998] .

- In **Sweden**, it is understood by the local communities that the SKB Agreement is completely separate from any other normal development funding available from the national or regional government. This belief is based on long-standing trust in regional co-operation [Spangenberg, J., 2010].

4.8 Benefits to Offset Impacts or Encourage Participation

It is possible to distinguish in some programmes those benefits that are intended to *mitigate* likely impacts that will arise from facility construction and operation. For

example, if the community hosting the facility is largely rural and does not contain an industrial infrastructure, it will be necessary to improve current roads and rail links or even construct new ones. In addition, there may be a need to develop additional health and social facilities for the influx of construction workers. Such impacts can generally be anticipated and mitigation measures developed to reduce their effects.

Other benefits can be seen to act more as *compensation* for potential impacts that may occur. These can be more difficult to quantify and often include perceived impacts, such as local stigma, property blight, and devaluation of local agricultural produce by association with the facility. Such benefits may actually never be realised if no impacts can be demonstrated.

Other benefits are seen more as *incentives* to a community to become involved, without commitment, in a facility siting process.

Mitigation

- In **Canada**, the PHA specifies that the federal government is liable for improvements to infrastructure required for the construction and operation of the various facilities including:
  - *'all reasonable capital costs related to road improvements, including extensions, widenings, replacements, and resurfacing of roads required for the development and operation of the site;*
  - *all reasonable capital costs related to providing or improving other services to the site including sewage, water, and lighting;*
  - *survey and, if required, cleanup and restoration of roadways and properties where there is reason to believe that Historic Low-Level Radioactive Waste may exist'*

- In the **United States**, there have been extensive improvements to the transport infrastructure around the Waste Isolation Pilot Plant (WIPP). Much of the more than £10 million funding for this has come through the provisions of the WIPP Land Withdrawal Act, to mitigate any possible impact that may be created from facility operation, which began in 1999. Other funding has arisen as so-called 'WIPP Acceleration Funds' designed to mitigate the impacts due to the predicted early closure of the facility.

Compensation

- In **Canada**, both the Kincardine Agreement and the PHA include a Property Value Protection (PVP) programme. These are intended to reassure local residents that should the project impact negatively on the value of their homes, they will be compensated for this. The Agreements include detailed processes by which independent valuations can be requested. Since the beginning of the PVP programme in Port Hope, some 22 claims have been made. Fourteen of

these have been accepted with 6 rejected and others still under consideration [Herod, J., 2009].

- Also in **Canada**, the PHA commits the federal government committed to pay the local municipalities compensation for any diminished property tax revenues as a result of the possible reduction of the assessed value of properties caused by the project. The Parties agreed that the maximum amount of compensation that the government may be required to pay to a municipality for any one year was limited as follows:
  - Town of Port Hope (£21,500)
  - Township of Hope (£6,400)
  - Clarington (£2,100)

Incentive

In general, the provision of benefit packages can be described as an incentive to become involved, in that none would be available if the community was not involved. That said, there are some specific examples of where a clear desire to gain some benefit can be seen.

- In **Australia**, it is likely that the offer by the Ngapa Group to host the national LLW repository on Muckaty Station is in no small way due to the chance to negotiate support for the members. In addition to the staged payments already referred to in Section 4.1, the potential benefits include around £600,000 in educational grants, which would otherwise not be available.

- In **Finland**, although there were no specific benefits ever proposed for association with the development of a deep repository, as the siting process reached its conclusion in the late 1990s an incentive for involvement developed. The communities hosting nuclear facilities in Finland had traditionally received tax revenue based on certain valuation criteria. These lead to a reduction in tax income over time as the reactors age. The municipal council in Olkiluoto saw an opportunity to replace this revenue by agreeing to host the repository and negotiated an agreement (the Vuoki Agreement) with the developer, Posiva, which led to its selection as host site, to the annoyance of another nuclear locality at Loviisa [Kojo, M., 2009].

- In **Spain**, 11 communities have responded to the call for volunteers to host the ATC interim storage facility for spent fuel. Many of these see the opportunity as a way of obtaining investment and funding where none is currently available, a fact to which they happily agree in press interviews. However, the regional governments have in most cases objected and vowed to block the development.

4.9 Miscellaneous Benefits

A number of benefits do not easily fall into any of the groupings discussed above. While all programmes stress to potential host communities the positive impacts that facility development would have in terms of employment and improvements in the local economy etc., the incorporation of integrated sustainable economic development initiatives clearly act as attractive additional side effects. The increasing tendency to include the transfer of the implementer's headquarters functions to the chosen locality is also seen by many to be a positive attribute. This has already taken place in **Finland** and in **South Korea**, although it has not necessary met with unanimous approval by the staff involved, where they have been required to transfer from a capital city to a more rural location. It is also proposed under the terms of the Outreach Scheme in **Japan** and the SKB Agreement in **Sweden**, where it is also proposed to site the canister construction facility in the 'losing' community of Oskarshamn.

In the **United States**, the decision to encourage technical staff working at WIPP to move to nearby Carlsbad, instead of commuting from cities further north, has been shown to have had a positive effect on the local economy through increased house prices and improvements in the quality of local services due to increased demand [Hogue 2004].

The safety regulator often also establishes a local office specifically to manage oversight of facilities.

4.10 Fund Management Processes

There is a variety of ways in which community benefit funds identified in this review are managed or are proposed to be managed. These vary from direct transfer of funds to the relevant local government body with no further controls on their use through to complex management boards with representation of all parties to the benefit agreements and which decide on fund allocation and expenditure based on detailed suitability criteria. Examples are given below illustrating this range.

- In **Belgium**, the Local Fund proposed in the Category A Waste Master Plan will be managed equally by the Dessel and Mol community partnerships that were established during the siting process (STOLA [now STORA] and MONA). The Fund will be structured as two sub-funds, managed by a Foundation subject to the Articles of Association that are currently under development and expected to be finalised in 2011. The Foundation will be managed by a Board of Directors consisting of up to eight directors, appointed as follows:
    - Both STORA and MONA will each appoint three directors of the foundation, on the understanding that:

- one of these directors must be a member or representative of the municipal council of the relevant municipality;
- one of these directors must be a member or representative of, or otherwise connected with a typical business operating in the relevant municipality;
- one of these directors must be a member or representative of, or otherwise connected with another typical social organisation (e.g. of a socio-cultural or ecological nature) operating in the relevant municipality

- In **Canada**, there are no controls whatsoever on how the lump sums and annual payments that Kincardine and the adjoining municipalities receive through the Kincardine Agreement. They pass directly into the relevant municipality council budget and are spent as they see fit [Kraemer, L., 2010].

- In **France**, Public Interest Groups (GIPs) were established in both Meuse and Haute-Marne Départements in 2000 under arrangements specified in the 1991 Waste Law, to manage funds paid in association with the siting of the Bure underground laboratory. A management board has been appointed which supervises the allocation of funds according to a calculation per head of population amongst local communities within a 10 km radius (this averages £400 per inhabitant).

  The GIP Management Board consists of a range of local and regional representatives:

  - President: President of General Council (Département)
  - Director
  - Governing Board members who serve 3-year terms:
    - President of Governing Board (President of General Council)
    - Representatives of State/Government (Prefect)
    - President of regional council
    - Representative of 15 local town Mayors (10km radius)
    - Representatives of ANDRA
    - Representatives of EDF
    - Two department councillors designated by general meeting

- Representative of "Pays Barrois" (community of municipalities within proximity zone, Law of 2006)
- Representative of "Haut Val de Meuse" (community of communes within proximity zone, Law of 2006)

In addition, there is an Executive Committee comprising:

- President of Governing Board (casting vote)
- Representative of the State (1 vote)
- Representatives of General Council of Meuse and Haute-Marne (1 vote for each representative)
- Representative of Community of municipalities (1 vote)

There are also six permanent employees.

Funds are allocated according to a set of strict guidelines. Project areas covered (community must supply 50% of total cost) include:

- Promoting economic development and employment
- Sustainable development
- Alternative energy sources
- Improvements to local infrastructure
- Roads
- Water supply
- Schools
- Strengthening of partnerships with industrial organisations
- Assistance to local metallurgical companies

- In **Sweden**, a Joint Management Board was established in September 2009 by formal agreement between SKB and the two municipalities, to oversee the funds available under the AVP. The Board consists of 5 members:
  - Chair of SKB Board
  - Vice-chair of SKB Board
  - SKB president

- Chair of Östhammar Municipal Board
- Chair of Oskarshamn Municipal Board

Both communities will establish local organisations to support the Board, for which £140,000/yr will be provided.

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