



*International Association for
Environmentally Safe Disposal of Radioactive Materials*

REPORT

ON

RADIOACTIVE WASTE OWNERSHIP AND MANAGEMENT OF LONG-TERM LIABILITIES IN EDRAM MEMBER COUNTRIES

June 2005

EDRAM REPORT ON RADIOACTIVE WASTE OWNERSHIP AND MANAGEMENT OF LONG-TERM LIABILITIES IN EDRAM MEMBER COUNTRIES

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PREFACE

This report has been prepared by an ad-hoc Working Group (WG) formed by ANDRA (France), NUMO (Japan), NAGRA (Switzerland) and ENRESA (Spain) in May 2003, after the EDRAM meeting held in Valencia to study the situation in the different EDRAM member countries regarding the treatment of radioactive waste ownership and management of long-term liabilities.

The first objective of the report was to analyse how the ownership of radioactive waste is addressed in each EDRAM country. As this issue is quite isolated, the WG considered it worthwhile to analyse also how long-term liabilities are treated, taking into account that, for both issues, the first step was to outline the distribution of responsibilities among the main actors involved in spent fuel and radioactive waste management.

The starting-point of the report was the preparation of a set of tables aimed at collecting information concerning: the role of different actors involved in radioactive waste management, decommissioning and R&D activities, how the responsibilities are split between producers and the radioactive waste management organisation (RWMO), who has the responsibility over the waste, how the financing schemes are established and how the long-term liabilities are treated.

After receiving the answers from the EDRAM members, the WG found that the tables contained much more useful information than expected and that it would therefore be interesting to analyse the different data provided. The WG started the preparation of this report as an extension of the "matrix type" document that was originally intended.

The report reflects the status in EDRAM member countries as of May 2005. It was approved as an official EDRAM report for open publication at the EDRAM Spring Meeting 2005, held in Switzerland.

The persistent effort of the main editors, Álvaro Rodríguez Beceiro and Elena Vico del Cerro of ENRESA is gratefully acknowledged; Linda McKinley of NAGRA also contributed to the final editing of the report.

1. INTRODUCTION

The concept of future financial liability, according to the NEA/OECD study "Future Financial Liabilities Arising from Nuclear Activities" (1996), is defined as the costs an organisation or a company will have to cover as a consequence of its current activities. They arise whenever systems and procedures are not in place to complete immediately or in the short term any action needed to satisfy licensing and other regulatory requirements related to environmental burdens in the broader sense.

Liabilities fall into two main categories: those arising from the operation of nuclear facilities, such as radioactive waste management (including disposal), and those arising from their shutdown. In some countries, there is a third category of liability, historical liability, generated in the past when no adequate provisions were set aside to cover corresponding future costs.

The magnitude of liabilities varies from country to country, depending on the size of the nuclear industry and also on the standards and regulations adopted by each country with regard to radioactive waste disposal and decommissioning. The nature and timing of nuclear facility decommissioning and radioactive waste disposal lead to some uncertainty in estimating the amounts of money that will be required to provide for future discharge of liabilities.

Securing the long-term financing of decommissioning and the management of spent fuel and radioactive waste has become an important issue in many countries today. One of the reasons for this is that waste management programmes are taking longer to implement than originally anticipated.

A special feature of radioactive waste management is the timescale over which there will be a need to ensure the availability of adequate financial resources for the proper discharge of obligations. The basis for financing radioactive waste management, including disposal, is usually the "polluter pays" principle, certainly within the EDRAM countries.

Estimating the costs associated with decommissioning and waste management is a crucial step. In view of the existing political, legislative and practical requirements, it is essential to define a waste management concept and disposal programme, and to determine the necessary financial resources for subsequent implementation.

Governments and the nuclear industry have taken different measures to ensure that funding will be available for spent fuel and radioactive waste management, including disposal and decommissioning, even if the activities which generated the liabilities are not producing revenues at that time. The various schemes and mechanisms implemented within the EDRAM countries aim at ensuring compliance with the principle of the “polluter pays”, securing financial resources in a manner that is both socially and politically acceptable.

Moreover, the Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management (IAEA, Vienna, September 5, 1997) requires signatory governments to take a number of measures to ensure the safety of spent fuel and radioactive waste management facilities and, more precisely, to take the appropriate steps to ensure that adequate financial resources are available to support the safety of these facilities during their operating lifetime, for their decommissioning and for required measures and actions following the closure of a disposal facility.

All of the EDRAM countries have signed and ratified or otherwise approved the Joint Convention, and have adopted basic financing principles aimed at avoiding burdens for future generations and ensuring that sufficient funds are available for the proper discharge of liabilities.

2. DISTRIBUTION OF RESPONSIBILITIES

The governmental role at the back-end of the nuclear fuel cycle has probably intensified in the past decade, as increasing attention is paid to decommissioning of nuclear facilities and the longer-term management of spent fuel and radioactive wastes. Since there are very large and very long-term liabilities associated with radioactive waste management, and since it can be an area of intense public controversy, governments appear to be moving cautiously. They are simultaneously trying to deal with the technical and economic issues involved, while also addressing the public concerns about social and ethical issues, and about health, safety and the environment.

In general, governments are now very conscious of the liabilities associated with radioactive wastes and aim to ensure that the costs of managing any wastes generated now or in the future will be paid by, or recovered from, the waste producing organisations, and that funding mechanisms are in place that will cover those costs.

2.1. Radioactive waste management

Governments generally have the responsibility to define national policy on radioactive waste and responsibility for overseeing the decommissioning of nuclear facilities and the long-term management of arising wastes. This includes the responsibility to ensure that suitable financial resources will exist when they are needed. While most funds will come from the waste producers, governments have direct responsibility for their own wastes, including wastes generated previously by government companies that have been privatised, by hospitals and by public research organisations. Governments should design processes for siting and approval of waste management facilities that respond to public concerns, and balance technical advice with social and ethical inputs.

In EDRAM member countries, governments, through their competent departments, are generally responsible for defining policy, which is implemented in the legal framework via laws, decrees, etc. approved by parliament or via other administrative measures (as in the Spanish case, through the General Radioactive Waste Plan). A common feature is that all countries discharge the responsibility for implementation through the creation of an implementing body or Radioactive Waste Management Organisation (RWMO), in particular to take care of the long-term aspects of radioactive waste management. For spent fuel (SF) and/or high-level waste (HLW), two different approaches in the way these responsibilities are discharged may be distinguished. On the one hand, there are countries where the responsibility is clearly assigned to the waste producers, which have set up implementing bodies to undertake these tasks on their behalf (Canada, Finland, Sweden and Switzerland). On the other hand, there are other countries where the government has decided either to create public companies (Belgium, France, Japan, Spain and United Kingdom) or to assign this responsibility to a government department (Germany, USA). When including low- and intermediate-level waste (L/ILW), some countries' approaches are different in certain respects at this stage from the above-mentioned scheme. While in Belgium, France, Germany, Spain, Sweden and Switzerland the same RWMO maintains responsibility for all types of wastes, in Japan a different RWMO (created by the waste producers) is responsible for the long-term management of L/ILW. In Canada, Finland and USA, this obligation lies with the waste producers. In the UK, the Nuclear Decommissioning Authority (NDA) has responsibility for dealing with LLW at the Drigg facility. No options have been selected yet by the government for dealing with ILW and HLW/SF, although historically Nirex has been responsible for undertaking research activities regarding ILW disposal and is also involved in providing advice on long-term options for dealing with all radioactive wastes and materials.

The pre-disposal management steps are predominantly carried out by the waste producers themselves. For the post-closure tasks, there is a trend for the government to become responsible in those countries where this responsibility has been already assigned, while in other countries there is still no assignment for this step.

Although no common rule can be established for the different schemes of responsibilities in EDRAM member countries, it can be generally said that governments or parliaments are responsible for defining policy, the waste producers are responsible for undertaking the pre-disposal management steps and RWMOs, either private or public, have been assigned with responsibility for the long-term management aspects.

2.2. Decommissioning of nuclear facilities

Similarly to radioactive waste management tasks, governments and/or parliaments are generally responsible for defining decommissioning policy and establishing the related legal framework. However, the tasks of undertaking decommissioning and dismantling activities generally remain with the owners of nuclear facilities, except in Belgium and Spain. In Belgium, ONDRAF/NIRAS is in charge, through its nuclear inventory mission, of assessing whether sufficient provisions are established by the various nuclear facilities operators in order to guarantee the financing of their dismantling, while in Spain, ENRESA is the responsible organisation for the dismantling of nuclear facilities.

2.3. Research and development

In most cases, governments and/or parliaments establish R&D policy regarding radioactive waste management. Exceptions are Belgium and Switzerland, where the RWMO is responsible. The implementation of the R&D activities is carried out in general terms by the RWMO (Belgium, Spain, Switzerland, UK and USA). However, in other EDRAM member countries, the R&D activities rely on both the RWMO and some research institutions (France, Japan), on the RWMO and the producers (Finland) or the producers on their own (Canada).

3. RADIOACTIVE WASTE OWNERSHIP

In most civil legal systems, ownership is an absolute right that gives the one with title to a good not only the possession and right of use, but also the right of disposition of the good owned, including the possibilities of selling or leasing it. This right is very limited in the case of nuclear material due to the need for control over it in terms of safeguards, physical protection, safety, etc. In particular, radioactive waste and spent fuel ownership may have important consequences for the assignment of long-term financial responsibility and legal liability for the safe management of such material. It is important to note that waste management does not necessarily imply ownership, as waste owners may delegate the task of its management to other bodies, namely the RWMOs.

The purpose of the survey was to identify the legal waste owners within EDRAM countries in order to determine possible long-term financial implications of such ownership, as well as other possible responsibilities derived from it, including legal liability.

The ownership system varies from an approach establishing private ownership of the spent fuel and radioactive waste to state ownership, with some hybrid systems between these.

In EU Member States, although the nuclear operator has an unlimited right of use and consumption over fissile material, the controlling power remains with the Euratom Community, which is officially the *owner* of the material. Following the provisions of the Euratom Treaty¹, the Community is the owner of waste and spent fuel if it is categorised as fissile material and subject to Euratom safeguards. Non-fissile waste, not owned by the Euratom Community, may then be owned by producers (e.g. France), by Member States or by management operators. Delivery to repositories determines the state's ownership in the case of Germany, while in Finland the state becomes owner with the closure of the repository.

In other EDRAM member countries, the situation varies from producers' ownership (e.g. Canada and Switzerland) to state ownership after the waste is accepted for disposal (e.g. USA).

To conclude this section, it is worth noting that answers to our questions have not always been given with certainty. While current legislative systems establish sufficiently the tasks and institutions in charge of waste management, the waste ownership issue appears not to be fully clarified in some countries (e.g. Japan).

¹ Art. 83 Euratom Treaty in conjunction with 197 (definition of fissile material).

4. FINANCING SCHEMES AND LONG-TERM LIABILITIES

There is a considerable variation in the financing schemes adopted by different member countries. This has arisen not because of any fundamental deviation from the "polluter pays" principle as such, but rather as a result of particular circumstances in individual countries and because of the wide scope for variety in putting the principle into practice.

An earlier study on financing schemes undertaken for the European Commission and published in 1999 (ref. 7) noted that the key financial objectives of a financing mechanism for radioactive waste management are normally to ensure long-term adequacy of funds, to allocate the costs fairly and to optimise value-for-money for the waste producer. Unfortunately there is no agreement about what criteria are appropriate for judging whether these objectives are being met. Furthermore, these three objectives tend to conflict and not to be mutually achievable.

The study further remarked that the financing mechanisms should provide the necessary funds in order not to impose undue burdens on future generations and to cover the costs of short- and long-term liabilities.

Each individual scheme has unique characteristics, although it is possible to group into general categories the financing mechanisms in operation in the EDRAM member countries. A very general comparison based mainly on the data presented in the tables has been performed and the results are summarised below.

4.1. Radioactive waste management

The principle applied in all EDRAM member countries is that the waste producers pay for the management of their wastes. The main differences among the selected systems are based on how to collect the necessary money, how it is estimated and how it is managed.

Most countries collect the financial provisions for radioactive waste management in a fund (Belgium – in the case of long-term management, while current waste management activities are financed on the basis of tariffs; Canada, Finland, Japan – only for HLW; Spain, Sweden, Switzerland – only for expenses occurring after nuclear power plant operation; USA). In some other cases, the waste producers establish their own provisions (France), or they pay directly the corresponding annual costs (Germany, Switzerland – during operational lifetime of nuclear power plants; UK). Those

countries with a fund have established a regulated system in order to control the payments to be made by the waste producers and how often the financial needs are revised. The government, or some department, administration committee or parliament, have the responsibility to control the payments to the fund. In these countries, the RWMO or the producers, in the case where they are responsible for some management steps or types of radioactive waste, estimate the financial needs generally on a yearly basis.

In the case of Canada, France, Germany and Switzerland, the waste producers are responsible for maintaining and estimating the annual provisions or reserves for covering the estimated costs of managing their radioactive wastes. Concerning the situation in France, the definition of the future trends for the financing mechanisms and setting up terms of reference for future financial tools are being reviewed due to the recently announced evolutions in the European and French energy sectors.

Concerning the payment mechanism into the fund, one system is to establish a fee on nuclear electricity or on electricity billing (Finland, Japan, Spain, Sweden, USA) to cover the costs associated with the management of L/ILW, HLW and, in some cases, SF. The other approach is based on periodic payments by the waste producers (Canada, Germany, Spain, Switzerland, UK – where the NDA is responsible for the waste). A special mechanism has been established for treating institutional radioactive wastes. In this case, the producers must pay a tariff or fee at the time of delivery to the RWMO or the government in charge of their management.

The body or bodies (government departments, waste producers or the RWMO) responsible for implementing the policy on radioactive waste and SF management use the funds in order to cover their current and future costs. For long-term liabilities, such as the disposal of HLW and/or SF, the current RWMO costs are, in a number of cases, controlled and approved by a government department (Canada, Germany, Japan, Spain, Sweden, USA).

The magnitude of liabilities is estimated in each country on the basis of actual experience whenever available. For activities that have not yet been implemented at the industrial level, such as disposal of HLW and/or SF, projected costs are used. The scientific, technical and economic knowledge acquired so far provides a sound basis for estimating future financial liabilities arising from nuclear activities. The cost depends on the type of repositories chosen and the expenditure schedule for discharging these liabilities.

In some EDRAM member countries, legal references exist to long-term liabilities (Canada, Japan, Switzerland, USA); in other countries this issue is under discussion (France). In Finland, Spain and Sweden, the current legal provisions on the financing system permit, to some extent, covering future long-term liabilities based on continual revision of the projected and foreseen costs. However, this has to take into account that, once the waste producers cease operation of their plants, it is intended that the financing system will stop collecting money from them; the fund for financing radioactive waste management should therefore have sufficient resources at that time to cover the future costs.

There are several examples of how liabilities are considered. In Switzerland, the new Nuclear Energy Act establishes that the very long-term responsibility lies with the federal state. In the case of Japan, the Final Disposal Act foresees that the government will take the appropriate measures if NUMO is unable to implement its final disposal project. In Sweden, the Act on Financing of Future Expenses for Spent Nuclear Fuel establishes a system of guarantees from the waste producers in order to compensate future possible deviations in the total costs.

4.2. Decommissioning of nuclear facilities

Those countries having established a fund to cover long-term radioactive waste management costs have also established the same or some other fund to cover decommissioning costs, except in the case of Japan and the USA where the utilities have to create their own provisions.

Regarding the estimation and control of financial needs, countries with a fund have the same procedures as for covering the waste management costs. Those countries without funds have not defined any control and evaluation system.

To estimate the future costs of decommissioning, key factors include the regulations and schedule adopted in each country for dismantling and decommissioning nuclear facilities.

In Canada, Finland, Spain, Sweden and Switzerland, there is a government department or body responsible for controlling the right to use the funds.

4.3. Research and development

Current R&D activities related to the disposal of radioactive waste are normally financed by the waste producers and/or from the state budget. Only in Canada, Finland, Spain and Sweden does the fund cover the associated R&D activities performed by the RWMO. The financial needs for covering the future costs of these activities are not very well defined, controlled and regulated in EDRAM member countries.

Where relevant, the money from the funds dedicated to R&D activities is controlled and approved by the responsible body.

5. REFERENCES

Besides the information collected via the tables prepared by the EDRAM Working Group and completed by the members and included at the end of the document as chapter 7 Annex, other documents used as references are:

1. Information provided during the topical session on "Liabilities identification and long-term management at national level" within the annual meeting of the Radioactive Waste Management Committee (RWMC) of the NEA. Paris, 12-14 March 2003.
2. "Radioactive waste management and sustainable development", by J. Lang-Lenton León. NEA News 2001 - No. 19.1.
3. "How current are Euratom provisions on nuclear supply and ownership in view of the European Union's enlargement?", by A. Bouquet. Nuclear Law Bulletin, no. 68, December 2001, NEA, OECD.
4. "The Euratom Supply Provisions on nuclear supply and ownership", by A. Bouquet. Nuclear Law Bulletin, no. 68, December 2001, NEA, OECD.
5. "Study on the Development of Methodology for Cost Calculations and Financial Planning of Decommissioning Operations" - Overall Approach - EUR 20165 EN. December 2001.
6. "Schemes for financing radioactive waste storage and disposal". Report EUR 18185 EN. 1999.
7. "Future financial liabilities arising from nuclear activities", by E. Bertel. NEA Newsletter, Spring 1996 (Volume 14, no. 1).

6. LIST OF ACRONYMS AND ABBREVIATIONS

ACNW:	Advisory Committee on Nuclear Waste (USA)
AEC:	Atomic Energy Commission (Japan)
AGNEB:	Interagency Working Group on Nuclear Waste Management (Switzerland)
ANDRA:	National Agency for Radioactive Waste Management (France)
BE:	British Energy
BfS:	Federal Office for Radiation Protection (Germany)
BMBF:	Ministry of Education and Research (Germany)
BMU:	Ministry of the Environment, Nature Protection and Nuclear Safety (Germany)
BMWA:	Ministry of Economy and Labour (Germany)
BNFL:	British Nuclear Fuel Limited (UK)
BNG:	British Nuclear Group (UK)
CEA:	Atomic Energy Commission (France)
CIEMAT:	Research Centre for Energy, Environment and Technology (Spain)
CNSC:	Canadian Nuclear Safety Commission (Canada)
CNE:	National Evaluation Commission (France)
COGEMA:	Compagnie Générale des Matières Nucléaires (France)
comm:	commercial (waste)
CoRWM:	Committee on Radioactive Waste Management (UK)
DBE:	Company for Final Disposal of Radioactive Waste (Germany)
decom:	decommissioning (waste)
Defra:	Department of Environment, Food and Rural Affairs (UK)
DETEC:	Department of Environment, Transport, Energy and Communication (Switzerland)
DOE:	Department of Energy (USA)
DOE-EM:	DOE Office of Environmental Remediation and Waste Management
DOE-NE:	DOE Office of Nuclear Energy

DTI:	Department of Trade and Industry (UK)
EDRAM:	International Association for Environmentally Safe Disposal of Radioactive Materials
EDF:	French Electricity Company (France)
ENRESA:	Radioactive Waste Management Organisation of Spain
EPA:	Environment Protection Agency (USA)
EURATOM:	European Community for Atomic Energy
EWN:	German nuclear facility decommissioning service company
GNS:	German company producing transport and dry storage equipment
GRWP:	General Radioactive Waste Plan (Spain)
HLW:	High-Level Waste
HSK:	Nuclear Safety Inspectorate (Switzerland)
IAEA:	International Atomic Energy Agency
JAERI:	Japan Atomic Energy Research Institute (Japan)
JNC:	Japan Nuclear Cycle Development Institute (Japan)
JNFL:	Japan Nuclear Fuel Limited (Japan)
KNE:	Commission on Nuclear Waste Management (Switzerland)
KSA:	Commission for Safety of Nuclear Installations (Switzerland)
L/ILW:	Low- and Intermediate-Level Waste
LLW:	Low-Level Waste
METI:	Ministry of Economy, Trade and Industry (Japan)
MEXT:	Ministry of Education, Culture, Sport, Science and Technology (Japan)
MINEFI:	Ministry of Economy, Finance and Industry (France)
MIR:	Waste from medicine, industry and research
Nagra:	National Cooperative for the Disposal of Radioactive Waste (Switzerland)
NDA:	Nuclear Decommissioning Authority (UK)
NEA:	Nuclear Energy Agency of the OECD
NEL:	Nuclear Energy Law (Switzerland)

Nirex:	United Kingdom Nirex Limited (UK)
NPP:	Nuclear Power Plant
NRCan:	Natural Resources Canada.
NRC	Nuclear Regulatory Commission (USA)
NSC:	Nuclear Safety Commission (Japan)
NUMO:	Nuclear Waste Management Organization of Japan.
NWMO:	Nuclear Waste Management Organization of Canada
NWPA:	Nuclear Waste Policy Act (USA)
NWTRB:	Nuclear Waste Technical Review Board (USA)
OCRWM:	Office of Civilian Radioactive Waste Management (USA)
OECD:	Organization for Economic Cooperation and Development
OFA:	Ontario Financing Authority (Canada)
ONDRAF/NIRAS:	National Agency for the Management of Radioactive Waste and Enriched Fissile Materials (Belgium)
ONFA:	Ontario Nuclear Funds Agreement (Canada)
P:	Producers
POSIVA:	Radioactive Waste Management Company in Finland
RWMO:	Radioactive waste management organisation
SF:	Spent Fuel
SEPI:	National Holding for the Privatization of Public Companies (Spain)
SKB:	Nuclear Fuel and Waste Management Company (Sweden)
SKI:	Swedish Nuclear Power Inspectorate
SYNATOM:	Syndicate for design of large nuclear power plants (Belgium)
TRU:	Transuranic waste
TVO:	Teollisuuden Voima Oy (Finland)
UKAEA:	United Kingdom Atomic Energy Authority
VLLW:	Very Low Level Waste

7. ANNEX

Information in the tables attached has been revised as of May 2005. Note that, as from October 1st 2005, JNC and JAERI have merged to form the Japan Atomic Energy Agency (JAEA). The abbreviations JNC and JAERI are nevertheless used in the tables. The titles of the tables are listed below:

- 7.1. Role of different actors
- 7.2. Responsibilities for radioactive waste management activities
- 7.3. Radioactive waste ownership
- 7.4. Financing responsibilities and funding schemes
- 7.5. Expenditure and long-term liabilities

7.1. Role of different actors [1/2]

EDRAM countries	Role of actors							
	RWM			Decommissioning			R&D	
	Policy		Implementation	Policy		Implementation	Policy	Implementation
	Policy-maker	Legal framework		Policy-maker	Legal framework			
Belgium	Federal Government	Laws and royal decrees	ONDRAF/ NIRAS	Government	Law	P (decom of nuclear installations) ONDRAF/NIRAS (management of decom waste)	Federal Government P ONDRAF/NIRAS	ONDRAF / NIRAS
Canada	Government (fuel only)	Ministry of Natural Resources	NWMO - Fuel P – L/ILW	CNSC	CNSC	P	P	P
Finland	Government	Parliament	P and POSIVA	Government	Parliament	P	Ministry of Trade and Industry	P and POSIVA
France	Government and MINEFI	December 1991 Radioactive Waste Act	ANDRA and P in some cases (storage)	Government	N/A	P	Government (December 91 Waste Act)	ANDRA/CEA
Germany	Federal Government	BMU	BfS / DBE	Federal Government	BMU	NPP owners	BMWA, BMU, BMBF	PTE (Project Management Organisation) on behalf of BMBF and BMWA, BMU and BfS *

N/A: Not applicable

Germany: * The Federal Government funds what is considered "basic research", i.e. all generic research on waste management and disposal which is not directly related to a given repository project. Money from the Federal Budget is channelled to the research institutions (e.g. to DBE) via a management organisation (PTE) set up at the Karlsruhe nuclear research centre. There is a procedure to set up research programmes with involvement of all stakeholders. PTE evaluates R&D proposals and assigns the funds. Research necessary to implement a given repository project, e.g. a HLW repository at Gorleben, is funded by the waste producers. The implementing organisation is BfS, that has to make public calls for proposals for the different research projects.

7.1. Role of different actors [1/2] – Cont.

EDRAM countries	Role of actors							
	RWM			Decommissioning			R&D	
	Policy		Implementation	Policy		Implementation	Policy	Implementation
	Policy-maker	Legal framework		Policy-maker	Legal framework			
Japan	Government (AEC)	METI	NUMO (HLW) JNFL (LLW)	Government (AEC)	METI	P (dismantling work), JNFL (management of decom waste)	METI, MEXT	JNC, etc.
Spain	Government	Ministry of Industry, Tourism and Trade (General Radioactive Waste Plan)	ENRESA	Government	Ministry of Industry, Tourism and Trade (General Radioactive Waste Plan)	ENRESA	Ministry of Industry, Tourism and Trade	ENRESA
Sweden	Government	Parliament	SKB	Government	Parliament	SKB and P	Government	
Switzerland	Preparation: (DETEC). Decision: Federal Parliament (or Government for less important issues)		P & for disposal facilities: Nagra (on behalf of P)	Recommendation: DETEC. Decision: Federal Parliament (or Government for less important issues)		Owners of nuclear facilities	Nagra (for disposal facilities)	Nagra (for disposal facilities)
UK	Government	Defra (currently Command 2919 but under review)	NDA for LLW Under review for other wastes Nirex (long-term management of ILW / certain LLW and other wastes and materials)	Government	DTI (Managing the Nuclear Legacy)	NDA	DTI Office of Science and Technology	End-user of R&D (Nirex for long-term management of all but VLLW/LLW)
USA	Federal Government: Administration & Congress	NWPA 1982 and Amendment, Energy Policy Act 1992 for HLW, SF; LLRWPol.Act 1980 for L/ILW; EPA sets standards, NRC sets regs, DOE sets guidelines	DOE/OCRWM, EM for SF, HLW P for comm SF, LLW	NRC for comm, DOE for DOE decom	NRC & EPA	NRC for comm, DOE for DOE decom	DOE	DOE

7.1. Role of different actors [2/2]

EDRAM countries	Role of actors			RWMO features		
	Review committee(s)			Status of RWMO	Shareholders	Links to Government
	Status	Role	Membership			
Belgium	Ministry of Energy & supervisory committee of RWM fund and decom fund	Supervision & advice on the investment policy for funds	Ministry of Energy - representatives of the main producers and the Federal State in supervisory committees of the funds	Government-owned	Federal State	Ministry of Energy
Canada	N/A	N/A	N/A	100% P	100% P	Reports to NRCan
Finland	N/A			100% P	TVO 60%, Fortum Power & Heat 40%	Ministry of Trade and Industry
France	CNE created by the December 1991 Waste Act	Review of long-lived HLW R&D programme	13 experts including 2 foreign members	ANDRA : Public organisation independent from waste producers	Public	3 supervising Ministries : MINEFI, Research and Environment
Germany	(Supervisory Board of DBE)	Supervises company business	Shareholders, representatives of BMU, BMWA, BMBF, representatives of DBE's employees, representatives of the workers' union IG BCE	BfS is a body of the Federal Government, in the portfolio of BMU. DBE is a public limited liability company	Not applicable for BfS. DBE originally owned by the Federal Government, currently 75% utilities, 25% an industrial group	BfS reports directly to BMU. DBE has members of BMU, BMWA and BMBF on its Supervisory Board. The management of DBE reports to the Supervisory Board
Japan	Nuclear Safety Commission (NSC) [This organisation is under the direct control of the prime minister; head office part of Cabinet Office; Commissioners are elected through Diet approval]			Public (HLW)* Limited company (LLW)	No capital fund (HLW)** P (ca.70%), etc. (LLW)	METI

Japan: * NUMO was established by P and authorised by the Final Disposal Act. ** : Operating costs are covered by a fund that is collected from P on a yearly basis.

7.1. Role of different actors [2/2] – Cont.

EDRAM countries	Role of actors			RWMO features		
	Review committee(s)			Status of RWMO	Shareholders	Links to Government
	Status	Role	Membership			
Spain	N/A			100% public	CIEMAT (80%) SEPI (20%)	Ministry of Industry, Tourism and Trade
Sweden				100% P	P	Ministry of Environment
Switzerland	Several supervisory authorities / advisory committees: HSK, KNE, KSA, AGNEB			Cooperative	Electric utilities (BKW FMB Energie AG, KKW Gösgen-Däniken AG, KKW Leibstadt AG, NOK, Energie Ouest Suisse) and Federal Government for MIR waste	N/A (private company)
UK	Advisory to Defra	CoRWM [recommendation on option(s) for long-term management of wastes (due mid 2006)]		I) NDA for decommissioning and LLW disposal – public II) Nirex for other wastes and materials – limited company	I) Public body created by Energy Act Wholly owned by Company Limited by Guarantee, in turn owned by DTI and Defra	I) DTI II) DTI, Defra
USA	NWTRB, ACNW	NWTRB advises Congress and DOE Secretary; ACNW advises NRC	President appoints	DOE/OCRWM is an office of the DOE (Federal Cabinet Agency)	No shares; 100% govt under DOE	DOE Cabinet-level Dept. - reports to President

N/A.: Not applicable

7.2. Responsibilities for radioactive waste management activities [1/2]

EDRAM countries	L/ILW (fuel cycle facilities)					HLW (fuel cycle facilities)				
	Treatment / Conditioning	Transport	Storage	Disposal	Post-closure	Treatment / Conditioning	Transport	Storage	Disposal	Post-closure
Belgium	ONDRAF/N or P	ONDRAF/N	ONDRAF/N	ONDRAF/N	ONDRAF/N	ONDRAF/N or P (SF)	ONDRAF/N or P	ONDRAF/N	ONDRAF/N	ONDRAF/N
Canada	P	P	P	P	P	N/A	N/A	N/A	N/A	N/A
Finland	P	P	P	P	Government	N/A	N/A	N/A	N/A	N/A
France	P	ANDRA/P	P	ANDRA	ANDRA	P (EDF & COGEMA)	P	P	ANDRA, once disposal decided	NA
Germany	P	P	P	BfS/DBE	No activities necessary, since all deep geological disposal	P	P *	P **	BfS/DBE	No activities considered necessary
Japan	P	P	JNFL*	JNFL (TBD for TRU)	TBD	JNFL**	P***	JNFL**	NUMO	TBD
Spain	P	ENRESA	P	ENRESA	State after expiry of period of closure statement	P	ENRESA	P	ENRESA	State after expiry of period of closure statement
Sweden	P	SKB	P	SKB	TBD	N/A	N/A	N/A	N/A	N/A
Switzerland	P	P	P	Nagra for planning of facilities (on behalf of P)	Federal State (after closure & monitoring phase)	P	P	P	Nagra for planning of facilities (on behalf of P)	Federal State (after closure & monitoring phase)
UK	P	NDA for LLW, subcontracted to BNG / TBD for ILW. Nirex has developed standard transport containers	P	NDA (LLW), policy review on management of ILW	TBD	P (NDA)	TBD	P	Policy review on management of HLW	TBD
USA	P for comm/DOE-EM	P for comm/DOE-EM	P for comm/DOE-EM	P for comm/DOE-EM	DOE	P/DOE-EM	OCRWM	DOE-EM	OCRWM	OCRWM

N/A: Not applicable; TBD: To be defined

Japan: * Not including waste from R&D bodies. ** JNC operates treatment/conditioning and storage facilities mainly for the purpose of R&D. *** Transport between storage and disposal.

Germany: * Spent fuel transport to interim storage or reprocessing facilities and HLW transport back to Germany done on behalf of the electricity utilities exclusively by the German Federal Railways. ** Vitrified HLW storage carried out at the Gorleben interim storage facility by GNS on behalf of the electricity utilities

7.2. Responsibilities for radioactive waste management activities [2/2]

EDRAM countries	SF				Institutional Waste			
	On-site Storage	Centralised Storage	Disposal	Post-closure	Treatment / Conditioning	Transport	Storage	Disposal
Belgium	P	P	ONDRAF/N	ONDRAF/N	ONDRAF/N	ONDRAF/N	ONDRAF/N	ONDRAF/N
Canada	P	NWMO	NWMO	NWMO	P	P	P	P
Finland	P	N/A	POSIVA	Government	Government	Government	Government	Government
France	EDF	COGEMA	N/A	N/A	P/ANDRA	ANDRA	P/ANDRA	ANDRA
Germany	P	P ***	BfS/DBE	No activities considered necessary	P/Collection depots of the Federal States	P	BfS/DBE	BfS/DBE
Japan	P	P	- ****	- ****	P	P	P	P
Spain	P / ENRESA	ENRESA	ENRESA	State after expiry of period of closure statement	ENRESA	ENRESA	P / ENRESA	ENRESA
Sweden	P	SKB	SKB	TBD	Studsvik	Studsvik/SKB	Studsvik	SKB
Switzerland	P	P	Nagra for planning of facilities (on behalf of P)	Federal State (after closure & monitoring phase)	Federal State (Paul Scherrer Institute)	Federal Office of Public Health	Federal State (Paul Scherrer Institute)	Nagra for planning of facilities (on behalf of P)
UK	P	NDA	SF not categorised as a waste		P/NDA (UKAEA)	P/NDA (UKAEA)	P/NDA (UKAEA)	NDA (BNFL) (LLW)
USA	P for comm/DOE-EM	P for comm /DOE-EM	OCRWM	OCRWM	P/DOE-EM	P/DOE-EM	P/DOE-EM	P/DOE-EM

N/A: Not applicable

TBD: To Be Defined

Japan: **** In Japan, all SF must be reprocessed.

Germany: *** By GNS on behalf of the utilities at Ahaus and Gorleben, by EWN at Greifswald on behalf of the Federal Government

USA: OCRWM responsible for transport of SF from commercial and DOE facilities to repository; P represents all non-DOE waste producers (private companies, utilities, other government agencies, etc.). In some cases, like LLW, it is not clear at this time whether the U.S. Government may eventually need to step in and provide utilities and other industrial waste producers with support and/or direction.

7.3. Radioactive waste ownership

EDRAM countries	Existing legal framework	When is ownership transferred and to whom?			
		L/ILW (fuel cycle facilities)	HLW (fuel cycle facilities)	SF	Institutional Waste
Belgium	Royal Decree	Transfer of ownership to ONDRAF/NIRAS after acceptance; P remain responsible for fifty years for hidden defects			
Canada	Nuclear Safety Act/ Nuclear Fuel Waste Act	P own all wastes at all times			
Finland	Nuclear Energy Law	P, transferred to Government when repository closed		P, transferred to Government when repository closed	Government
France	Existing framework is complex and not specific to radioactive waste	P keep responsibility and ownership of waste even when disposed of in an appropriate facility operated by ANDRA for time being (possible changes in the future). Monitoring phase (Manche L/ ILW facility) is still funded today by main P			
Germany	Atomic Energy Act	Upon delivery to the repository - to the Federal Government	Upon delivery to the repository - to the Federal Government	Upon delivery to the repository - to the Federal Government (Note: fissile materials are always owned by Euratom. See Euratom Treaty, Art. 86)	Upon delivery to the collection depots for interim storage it becomes owned by the Federal State where the depot is located / Upon delivery to the final repository for disposal, ownership passes to the Federal Government
Japan	-	RW ownership not clearly established in the current legal framework *			
Spain	Royal Decree Law 5/2005	The state will accept waste ownership after definitive disposal			
Sweden	Act on Nuclear Activities	P	N/A	P	
Switzerland	New Nuclear Energy Law (NEL). Nuclear Energy Liability Law	P are responsible for the waste until it is (a) emplaced in a geological repository and sufficient financial provisions exist for the monitoring phase and closure of the repository (Art. 31 of NEL) or (b) transferred to a repository abroad; the responsibility for the waste will then be with the owner of the repository. For case (a): the Government will, at the end of the monitoring phase, order the closure of the repository if safety for man and the environment is ensured. After, the Government can require an additional period of monitoring until the repository is "released" from the Nuclear Energy Law and responsibility for the repository & the waste is transferred to the Federal State. (Art. 39). However, the Government can take over responsibility for the management of the waste at the costs of the P at any time if the P are unable to bring the disposal operation to completion (Art. 33). After repository closure, the Government is responsible for any damage caused by the repository (Nuclear Energy Liability Law).			
UK	Before transfer, waste is under ownership of P as it is part of their process	LLW – NDA, BNFL (Drigg)	Waste is owned by customer for reprocessing services	Not declared as waste	If to Drigg then NDA, BNFL
USA	NWPA as amended, other standards and regs.	Comm LLW transferred to repository host state and eventually to DOE on site closure; DOE for DOE LLW	DOE has title to existing DOE HLW; comm HLW will transfer to DOE on acceptance for disposal	Title for comm SF transfers to DOE upon acceptance for disposal; DOE has title to existing DOE SF	

Japan: * According to the basic environment law (general law), waste producers have in principle the responsibility to manage the wastes. On the other hand, according to the nuclear regulation law (special law), companies/organisations commissioned to carry out disposal by waste producers have the responsibility to manage the waste during their commission period.

7.4. Financing responsibilities and funding schemes [1/2]

EDRAM countries	Financial provisions			How are financial needs evaluated?			How are financial needs regulated?		
	RWM	DECOM	R&D	RWM	DECOM	R&D	RWM	DECOM	R&D
Belgium	Fund	Fund	Budget according to 5-year plan	ONDRAF/NIRAS calculates tariffs	SYNATOM proposes a funding plan to the supervisory committee	ONDRAF/N sets up a 5-year program and evaluates the needs to be covered by contract with P	Ministry of Energy	Supervisory committee of decom fund	Contract with P
Canada	Fund	Fund	Fund	NRCAN, CNSC, OFA-ONFA			Financial guarantee provided to regulator. Segregated funds for nuclear waste and decommissioning regulated		
Finland	Fund	Fund	Fund	POSIVA calculates the financial needs on a yearly basis. The estimate is reviewed by Ministry of Trade and Industry			Government decides on payment on the basis of calculation		
France	Only EDF and COGEMA through balance sheet provisions, nothing at CEA			P*	P*	ANDRA/CEA	No general scheme set up so far		
Germany	Polluter pays. Repository development pre-financed by the Fed. Gov., costs invoiced to P at year's end	Paid by reactor owner. Provisioning in the utilities accounts for this purpose	Generic RWM and disposal R&D paid by the Fed. Gov. R&D specific to Konrad or Gorleben paid by P	Costs of RWM other than disposal responsibility of P. Costs of waste disposal estimated by BfS/DBE	Estimated by P. Decom waste disposal costs estimated by BfS/DBE	Generic RWM R&D in the portfolios of the Min. of Economy and of Education and Research. R&D for Gorleben/Konrad managed by BfS	Provisioning in the accounts of P to finance RWM at their discretion. Financing authorities committed to avoiding excessive provisioning	Provisioning in the accounts of P to finance RWM at their discretion. Financing authorities committed to avoiding excessive provisioning	Provisioning in the accounts of P to finance RWM at their discretion. Financing authorities committed to avoiding excessive provisioning

France: * The reserves set aside by EDF in 2002 amounted to about 16,500 M€ for spent fuel and nuclear waste management and to about 12,000 M€ for site clean-up and dismantling costs. These reserves are defined on the basis of evaluations made of the cost of waste processing and final disposal, in connection with the operation generating the waste, namely burn-up in reactors.

7.4. Financing responsibilities and funding schemes [1/2] – Cont.

EDRAM countries	Financial provisions			How are financial needs evaluated?			How are financial needs regulated?		
	RWM	DECOM	R&D	RWM	DECOM	R&D	RWM	DECOM	R&D
Japan	Fund (HLW and reprocessing-related LLW*) Covered by the operating accounts of each utility (other LLW)	Provision in utilities' accounts	Government budget	METI calculates financial needs on a yearly basis (HLW and reprocessing-related LLW*) Utilities calculate financial needs on a yearly basis (other LLW)	Utilities calculate financial needs on a yearly basis	R&D bodies calculate financial needs and the government assesses them on a yearly basis	METI sets a fee via ministerial decree (HLW and reprocessing-related LLW*) METI approves financial needs calculated by utilities via ministerial decree (other LLW)	METI approves financial needs calculated by utilities via ministerial decree	-
Spain	Fund			ENRESA calculates financial needs on a yearly basis and in accordance with the hypothesis of the GRWP in force			Government establishes the rate to be applied and a fee on electricity tariffs via Royal Decrees, taking into account cost calculations made by ENRESA		
Sweden	P and fund	Fund	Fund	SKB make cost estimates for review by SKI			Government establishes fees and guarantees		
Switzerland	During the operational phase of nuclear facilities, costs (esp. for R&D) are covered by the operating accounts of each facility (Art. 82 of NEL). After closure of nuclear facilities, costs are covered by the Decommissioning Fund and Waste Management Fund (Art. 77 of NEL)			Financial needs are calculated by the utilities and - for disposal facilities - by Nagra (on behalf of P). Cost estimates should be revised at least every 5 years. Cost estimates are reviewed by the cost committee of the Waste Management Fund			Cost estimates are reviewed by the cost committee of the Waste Management Fund. The Commission of the Waste Management Fund decides on the payments to be made by P		
UK	NDA – each P. RWMO (Nirex) receives financing from P according to its budget. Contributions in proportion to amount of waste to be "disposed" of	NDA BE Fund	Each P or RWMO funds its own research	Budget agreed with Nirex CLG (and NDA)	Responsibility of the NDA	Based on customers own or RWMO's own estimates	BE has its own fund NDA fund	BE has its own fund NDA fund	R&D not regulated
USA	OCRWM Nuclear Waste Fund (NWF): financed by fee on utilities for comm SF, govt funding for DOE waste; P for comm LLW	P & DOE-EM	DOE/OCRWM, EM, NE	Annual DOE budget request reviewed by Congress; NWF fee adequacy assessed by DOE annually	P & DOE-EM	P & DOE/OCRWM, EM, NE	Congress approves annual budget; DOE proposes required changes to fee	NRC reviews fee adequacy for private decom sites; Congress approves funds for DOE facilities	Congress approves funding for DOE R&D

Japan: * The Act on Creation and Management of Reserve Funds for the Reprocessing of Spent Fuel from Nuclear Power Stations (the Reprocessing Fund Act) was enacted in May 2005.

7.4. Financing responsibilities and funding schemes [2/2]

EDRAM countries	Who pays?			Payment mechanism					
	RWM	DECOM	R&D	L/ILW	HLW	SF	Institutional waste	DECOM	R&D
Belgium	P	P	P	P	P	Payment collected in the price of nuclear electricity and later transferred to RWM fund of ONDRAF/N	Payment collected in the price of nuclear electricity and transferred to specific funds of ONDRAF/N	Payment collected in the price of nuclear electricity by SYNATOM	P
Canada	P	P	P	From P revenues					
Finland	P	P	P	Payment collected in the price of nuclear electricity	N/A	Payment collected in the price of nuclear electricity		Payment collected in the price of nuclear electricity	Payment collected in the price of nuclear electricity
France	No funding mechanism exists yet								
Germany	P	P	Specific R&D for a given repository: P Generic R&D: Federal Government	Up-front payment for actual repository construction costs invoiced to the utilities yearly. Fee for waste disposal when repository in operation	Up-front payment for actual repository construction costs invoiced to the utilities yearly. Fee for waste disposal when repository in operation	Up-front payment for actual repository construction costs invoiced to the utilities yearly. Fee for waste disposal when repository in operation	Fee paid by P on delivery at collection depot	Decom work paid by P. Up-front payment for repository construction by waste producer. Disposal fee paid upon waste delivery	P pays actual R&D costs for a given repository, invoiced to P yearly. Government pays generic disposal R&D
Japan	P	P	Government	Included in electricity billing	Included in electricity billing	-	-	Included in electricity billing	Government budget
Spain	P	P	P	Invoice/fee on electricity billing			Tariffs	Invoice/fee on electricity billing	

7.4. Financing responsibilities and funding schemes [2/2] – Cont.

EDRAM countries	Who pays?			Payment mechanism					
	RWM	DECOM	R&D	L/ILW	HLW	SF	Institutional waste	DECOM	R&D
Sweden	P	P	P	P	N/A	Fee on electricity production		Fee on electricity billing	
Switzerland	P	P	P	The Commission of the Waste Management Fund decides on the payments to be made by P, who are then required to make the corresponding annual payments. In the case of institutional waste, the small producers pay, at the time of delivery of the waste, a fee to the government, who then takes full responsibility for the waste. The government has no specific fund for financing eventual disposal and the running costs (conditioning, storage, etc.) are covered by the annual budget					
UK	P	P	P/RWMO	LLW – Drigg disposal fee / cubic metre and radioactivity content. ILW not yet disposed of, mechanism has to be determined but each producer pays RWMO in proportion of amount to be disposed of if a repository existed. May change in future with Nirex independence	Not yet disposed of. No organisation yet responsible. Storage charges paid for by reprocessing customers	Not declared a waste	For LLW customer pays NDA/BNFL	Provision in accounts. BE decommissioning fund	Incorporated in budget of RWMO
USA	P for comm, federal taxpayers for govt facilities	P for comm, federal taxpayers for govt facilities	P and federal taxpayers	P for comm., federal taxpayers for eventual long-term repository site control	P for future comm HLW, federal taxpayers for DOE wastes	P for comm SF through utility fees to Nuclear Waste Fund, federal taxpayers for DOE wastes	P & DOE	P through required decom funds, appropriation of federal funds for DOE	Appropriation of federal funds for DOE R&D

N/A: Not applicable

7.5. Expenditure and long-term liabilities [1/2]

EDRAM countries	Who requires funding?			Who approves expenditure?			Who controls the right to use the funds?		
	RWM	DECOM	R&D	RWM	DECOM	R&D	RWM	DECOM	R&D
Belgium	ONDRAF/NIRAS	SYNATOM (only NPPs)	ONDRAF/ NIRAS	Federal Ministry of Energy	Supervisory Committee of decom fund	Federal Ministry of Energy	Supervisory Committees of RWM funds	Supervisory Committee of decom fund	P according to R&D contracts
Canada	NWMO/P/managers			Federal Government (NRCan) and Provincial Government*	Provincial Government (OFA) through ONFA		Federal Government (NRCan) and Provincial Government*	Provincial Government (OFA) ONFA	
Finland	P and POSIVA	P	POSIVA	P			Ministry of Trade and Industry		
France	No funding mechanism exists yet								
Germany	RWM: P, disposal: BfS/DBE	Decom: facility owner, disposal: BfS/DBE	Generic R&D: Federal Government. R&D for Konrad/Gorleben: BfS	Disposal: Ministry of the Environment	Disposal: Ministry of the Environment	Generic: Min Economy, Min Education and Science; site-specific: Min Environment	Disposal: Upper Financial Authority	Disposal: Upper Financial Authority	Generic: Min Economy, Min Education and Science; site-specific: Upper Financial Authority
Japan	NUMO (HLW)* Utility (reprocessing-related LLW)**	Utility (stipulated in the Electricity Utility Law)	-	METI	METI	-	METI	Audited by METI	-
Spain	ENRESA	ENRESA	ENRESA	Ministry of Industry, Tourism and Trade			Ministry of Industry, Tourism and Trade		
Sweden	SKB	P	SKB	SKI			SKI		
Switzerland		P	Nagra	During the operational phase of the utilities: P (for Nagra: the shareholders). In the post-operational phase, the funds cover the costs which arise from the management of the wastes. Management is still the responsibility of P (see also answers above)			Administrative Commissions of Decommissioning Fund / Waste Disposal Fund		
UK									
USA	P (L/ILW) and OCRWM	P & DOE-EM	DOE/OCRWME M, NE	P (L/ILW) and Congress	Congress	Congress	P (L/ILW) and Congress	P (comm. facilities) & Congress (for DOE facilities)	P and Congress

Canada: * Provincial approval for Ontario Province, where 90% of the waste is produced, is carried out via Ontario Financing Authority. However, for the New Brunswick and Quebec Provinces (producing 5% each), the process is not so formal, so it is appropriate to include Fund Trustees/Producers instead of the Provincial Government.

Japan: * Stipulated in the Final Disposal Act. **Stipulated in the Reprocessing Fund Act.

7.5. Expenditure and long-term liabilities [2/2]

EDRAM countries	Existing legal framework on long-term liabilities	How is it assured that financial needs are covered?
Belgium	Laws and Royal Decrees	Polluter pays + legal obligation of financial balance of RWM funds
Canada	Nuclear Safety Control Act/Nuclear Fuel Waste Act	Canadian Nuclear Safety Commission/NRCan review
Finland	Nuclear Energy Law (payments in annual decisions)	Reviews. Fund and additional guarantees
France	No funding mechanism exists yet	
Germany	Liabilities (Morsleben, Greifswald NPP, Wismut uranium mines taken over by the Federal Government) *	P liable for all costs of waste management and disposal. No specific mechanism in place for bankruptcy **
Japan	Article 74 of the Final Disposal Act *	Stipulated in the Final Disposal Act that NUMO has the right to force P to make payment to fund
Spain	Royal Decree 1349/2003 and Royal Decree Law 5/2005	Funding reviewed according to needs in an iterative approach.
Sweden	Act on Nuclear Activities	By fund and additional guarantees
Switzerland	Nuclear Energy Law & Nuclear Energy Liability Law (under revision)	Cost estimate studies: Periodical evaluation of financial reserves. If financial provisions do not cover the expected costs, P must contribute additional funds (Art. 80 of NEL)
UK	Energy Act 2004	
USA	NWPA 1982 and Amendment, Energy Policy Act 1992 for HLW, SF; LLRWPol. Act 1980 for L/ILW	Through taxes and utility fees

Japan: * : Article 74 (summary): - In the event that NUMO is unable to continue to carry out its final disposal project due to significant fluctuations in the economy, natural disaster and so on, measures shall be established by law. Until the measures are established, the Minister of METI shall carry out all or part of the project in accordance with a government decree.

Germany: * A number of liabilities resulting from German re-unification, i.e. the decommissioning of the Greifswald and Reinsberg NPPs as well as the huge reclamation work at the former uranium mining and milling sites of Wismut are covered in a historic liabilities fund paid by the Federal Government. Decommissioning of the Hamm-Uentrop high temperature reactor is partly financed by the government of Rheinland-Westphalia upon failure of the operator.

** No mechanism in place to safeguard from bankruptcy of NPP operators.