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COMMISSION STAFF WORKING PAPER

SEVENTH SITUATION REPORT
RADIOACTIVE WASTE AND SPENT FUEL MANAGEMENT
IN THE EUROPEAN UNION

1. INTRODUCTION

The present report is the seventh in the series of reports on radioactive waste management in the European Union (EU). The Situation Reports were first developed as a part of the 'Community plan of action in the field of radioactive waste'[1], which was further extended in 1992[2], in particular the requirement to 'carry out continuous analysis of the situation' of spent fuel and radioactive waste management in the EU. Today, although the Plan of Action is no longer in force, the need for these Situation Reports remains as relevant as when they were first conceived.

The European Commission has the commitment to inform the European citizens in response to their concern about radioactive waste. The most recent Eurobarometer survey on radioactive waste[3] showed that EU citizens mostly feel that they are not well informed in this matter. Furthermore, most of the citizens would welcome harmonised strategies supervised by the European Union in order to set up management policies for their radioactive waste.

In a similar way, in a public consultation conducted in the context of the Impact Assessment for the Council Directive on the Management of Spent Fuel and Radioactive Waste[4], the majority of the respondents perceived the lack of transparency as a main challenge related to the spent fuel and radioactive waste management in their countries.

This Situation Report is a response to such demand. Further information about the inventories, installations, management strategies and financing issues of the EU Member States can be found in the international context through OECD-NEA and IAEA documents as well as the national reports for the Joint Convention[5]. However, not all of the relevant information is accessible to all stakeholders.

Promoting public information and participation in radioactive waste management is also one of the objectives of the said Directive. The Directive establishes a Community framework ensuring the responsible management of all types of spent fuel and radioactive waste, stemming from or managed within civilian activities, from generation to disposal, and promotes public information and participation. According to this Directive, Member States have to provide for appropriate national arrangements for a high level of safety in spent fuel and radioactive waste management, including the establishment, implementation and updating of national programmes for the management of spent fuel and radioactive waste. Member States would have to communicate such national programmes to the Commission. This obligation, as well as the reporting on the main achievements to the Council and the European Parliament, would further help the European citizens in obtaining detailed information on how radioactive waste is being managed in their countries.

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[1] Council resolution of 18 February 1980 on the implementation of a Community Plan of Action in the field of radioactive waste

[2] Council resolution of 15 June 1992 on the renewal of the Community Plan of Action in the field of radioactive waste

[3] Special Eurobarometer 297 (2008)

[4] Open Public Consultation on Approaches for a possible EU proposal on the Management of Spent Fuel and Radioactive Waste, http://ec.europa.eu/energy/nuclear/consultations/2010_05_31_fuel_waste_en.htm

[5] The reports under the Joint Convention are submitted in a 3 year term. The last reports were drafted in 2008 and submitted for the Third Review Meeting which took place in Vienna from 11 to 20 May 2009. Some of them are publicly available at the IAEA's webpage, http://www-ns.iaea.org/conventions/waste-jointconvention.asp

Similar to the previous report [6], this report presents the status concerning waste generation, inventories and disposal capacities in the EU Member States, mainly in tabular form. The reference date for generation and inventories is end 2007, in line with the data available in the latest National Reports provided by Member States under the Joint Convention. All other information on policies, financing schemes, etc. is based on most recent statements (December 2010). Additionally, the report considers the likely evolution of waste quantities over the coming years (to 2040), as well as the disposal capacities up to 2070.

As the report should be accessible, in terms of readability, to as broad a range of stakeholders as possible, it is restricted in this context to a presentation of the overall radioactive waste quantities and policies. For this purpose, the structure of the previous report has been taken into account. In addition to the tables present in the previous report, new information has been requested, such as the foreseen saturation date of the storage capacities, planned new disposal capacities and best estimates for disposal capacities.

2. SOURCES OF INFORMATION

The information in the present report has been provided by the competent authorities of the Member States. When needed and for the purpose of verification or a better understanding of the data provided, public sources have been used such as national Joint Convention reports or IAEA databases, such as PRIS[7] and NEWMDB[8]. Every effort has been made to ensure the validity of the data, although the exact degree of accuracy is occasionally difficult to ascertain, especially regarding precise volumes of lower level wastes for which there are a variety of possible conditioning and treatment techniques. An additional difficulty is that the estimates of waste generation and disposal capacities may be conditioned by political decisions which might change in the coming years.

3. CATEGORIES OF RADIOACTIVE WASTE AND SPENT FUEL REPORTED

The reporting categories correspond as closely as possible to those in the 1999 Commission Recommendation on waste classification[9]. The most updated classification of radioactive waste, as set out in the IAEA Safety Guide issued in 2009[10], has not been taken into account since the reference date for the inventories is 2007. In addition to the types of waste of the said Commission Recommendation, the category of Very Low Level Waste (VLLW) has been introduced as was done during the Sixth Report.

Quantities refer only to solid and solidified waste and not to effluents that are discharged to the environment as part of authorised practices under the supervision of the regulatory body. In some cases, amounts of liquid waste have been provided by the Member States, and they have been noted additionally in the cell "comments" of the tables. Uranium mining and

6 Sixth Situation Report – Radioactive Waste Management in the Enlarged European Union, COM(2008)542 final and accompanying document SEC(2008)2416 final/2.

7 http://www.iaea.org/programmes/a2/

8 http://newmdb.iaea.org/

9 Commission Recommendation of 15 September 1999 on a classification system for solid radioactive waste, 1999/669/EC, Euratom

10 "Classification of Radioactive Waste", General Safety Guide, IAEA, Vienna 2009.

milling residues are not included as they are covered by a separate Commission Staff Working Document[11].

The categories of waste reported are:

- VLLW: The management of this waste requires consideration from the perspective of radiation protection and safety, but the extent of the provisions necessary is limited in comparison to the provisions required for waste in the higher classes (LILW or HLW). This waste category does not necessarily exist in all Member States. The reasons for this are that it may not be cost-effective to demonstrate compliance with clearance levels or there may be issues of public concern regarding the release of such materials.

- LILW-SL means short-lived low and intermediate level radioactive waste. This waste contains mainly radionuclides with half-lives of less than 30 years and for which there is negligible heat generation as a result of radioactive decay. The disposal of this category of waste typically takes place in engineered surface or near-surface repositories.

- LILW-LL, or long-lived low and intermediate level radioactive waste, also produces negligible thermal power but has a concentration of long half-life radionuclides above the limit for classification as short-lived waste. Disposal would normally not take place in near-surface, but in deeper repositories.

- HLW means high-level waste, and refers to waste for which the thermal power must be taken into consideration during storage and disposal. Most HLW results from the reprocessing of spent fuel (SF) and is in the form of vitrified residues. Spent fuel is also considered as HLW when it is to be disposed of directly. Disposal would normally take place in deep geological repositories.

Spent fuel (SF) is also considered in its entirety, whether it might be intended for reprocessing or not. For a number of Member States, it appears that no definitive spent fuel management policy exists at the present time.

Not all Member States follow this classification, but it is normally possible to make an approximation of the relationship between the national classification scheme and this one.

4. SOURCES OF RADIOACTIVE WASTE

The greatest source of radioactive waste is the production of electricity in nuclear power plants and other associated activities, including the decommissioning of NPPs. However radioactive waste is also generated as a result of non-power uses of radioactive materials, such as the manufacture of radioactive materials for use in medical and industrial applications, or research facilities such as laboratories, research reactors, etc. Thus, radioactive waste is generated in all Member States, even though the quantities involved are often very small compared to countries with nuclear activities.

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[11] SEC(2011 340 final), 11.03.2011

5. HIGHLIGHTS CONCERNING MEMBER STATES DATA

5.1. Evolution of Nuclear Power in Member States (Table A)

Nuclear power generation and its associated processes e.g. fuel manufacture, reprocessing, etc. are the largest generators of radioactive waste. It is therefore important to consider the possible evolution of nuclear power in the short- to medium-term, as this will ultimately affect the amount of waste generated from operational and ultimately decommissioning activities. It will also affect the timeframe for their generation, although this also depends on decisions concerning the timing and duration of decommissioning. It is evident that the recent accident at the Japanese Fukushima plant might have a significant effect on national policy making and nuclear investments in the EU.

A number of Member States currently already have official phase-out policies, such as Germany, or a de facto phase-out situation where no replacement capacity is planned as current NPPs are closed, such as Spain. Three Member States (Finland, France and Slovak Republic) are constructing new nuclear power plants. Bulgaria, the Czech Republic, Lithuania, the Netherlands, Romania and the United Kingdom are planning the construction of new units; while also Hungary, Italy, Poland, Slovenia are considering proposals for new build. Some of the nuclear power plants commissioned during the 1960's are approaching their initially approved licensing terms and decisions are to be taken on possible prolonged operation or closure.

Any decision concerning long-term operation or the construction of new NPPs will of course need to take into account the effect this will have on the overall radioactive waste situation, since this will lead to the generation of additional operational and decommissioning wastes. Such an assessment will require the consideration of both the technical and financial resources required to deal with these wastes. There may also be political considerations where ownership of the reactors (and therefore also the responsibilities on the waste generated) is proposed to be shared amongst several Member States. Such a situation already concerns one Member State, Slovenia, through its joint ownership of the Krško NPP with Croatia. A similar situation may exist in the future with Estonia, Latvia, Lithuania and Poland.

5.2. Summary of Radioactive Waste Quantities – Actual and foreseen (Tables B-E)

In this section the total wastes already disposed of or in storage awaiting disposal are considered. These totals outlined for the different categories of waste cover the 27 Member States considered in the report, and are reported in tables B, C and D. All quantities are approximate and have been rounded.

When comparing the data of this Seventh Report with the data provided for the Sixth report, the data are generally consistent. On occasions, however, there are some slight deviations due to reasons such as the introduction of new classification systems, affecting in particular the ratio between LILW and VLLW; successful programs of volume reduction, the decommissioning of nuclear installations; shipments of waste for reprocessing; etc.

One issue which deserves special mention, is the large quantities of LILW-LL reported by the UK which exceed those reported by other Member States such as France. Discussions are ongoing with the UK to better understand this issue.

In table C, the newly introduced columns indicating the origin of the waste reflect clearly the very different situation of the Member States in the generation of radioactive waste. In some cases, the main streams of wastes arise due to the decommissioning of nuclear installations; while in other cases it originates mainly from the current operation of nuclear power plants. Other sources can for example be reprocessing activities in France and the UK, or even the decontamination of old sites.

In table D, the current quantities of stored waste are compared with the available capacities and an estimate is provided as to when these storage capacities will be saturated. From these data, it can be observed that the need for an increase in storage capacities is a very urgent issue in some countries; while others still appear to have sufficient medium term capacities.

Best estimates are given in table E for 2020, 2030 and 2040. Most of the Member States have provided these data assuming their current prospects for life-time of NPPs and these data might change depending on policy decisions.

(1) Radioactive waste disposed of by the end of 2007 (Table B):

The total quantity of waste that has been disposed of to the end of 2007 equals **2,149,200 m^3**. This consists almost entirely of LILW-SL, most of which has been disposed of in the United Kingdom and France. Additionally, for the other 14 countries that operate or have operated NPPs, only six (Czech Republic, Finland, Hungary, Slovakia, Spain and Sweden) currently have operational waste repositories for the wastes generated from NPP operation, although it is expected that this situation will change in the coming years.

A number of countries (both with or without NPPs) have small disposal sites for institutional waste, but these are very limited in respect of the wastes they can accept, and some of these sites have required considerable refurbishment in recent years to ensure they meet acceptable standards of safety.

In some cases, the disposal of waste undertaken in the past in several sites is now being reconsidered and there are plans for the retrieval of the waste disposed of several decades ago.

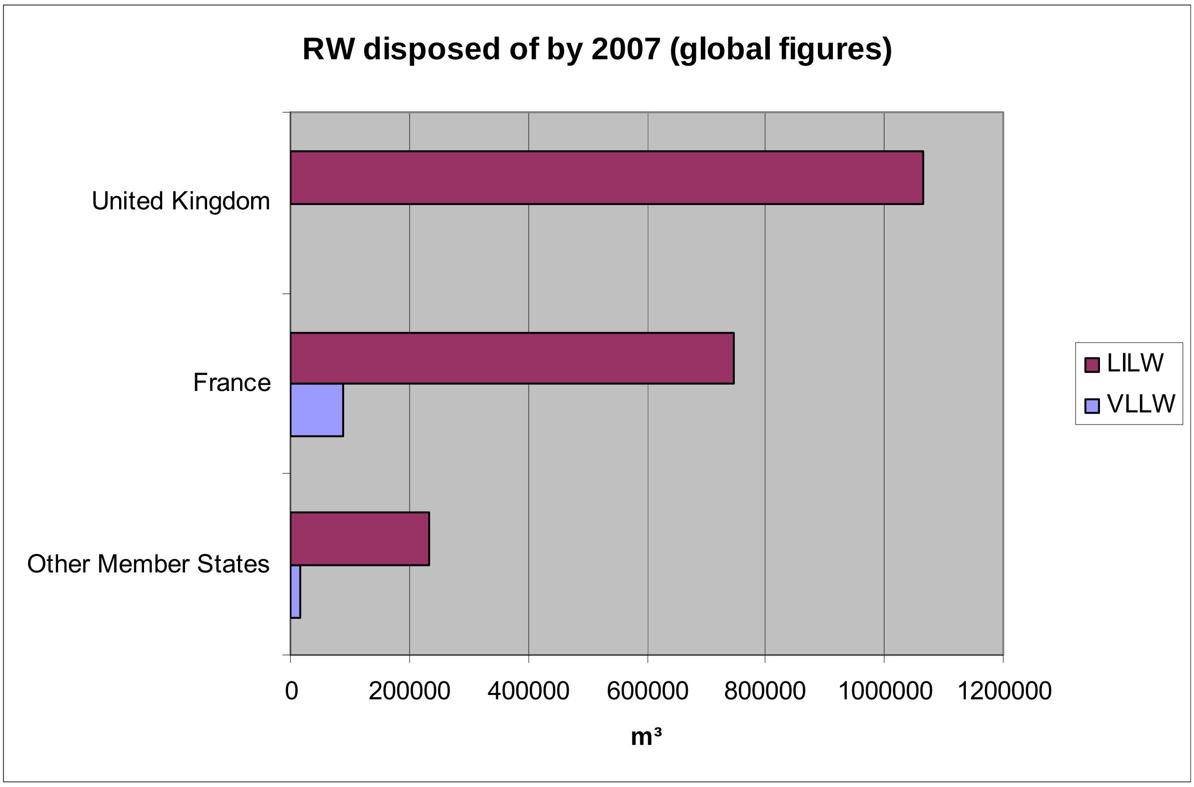

RW disposed of by 2007 (global figures)
United Kingdom
France
Other Member States
0
200000
400000
600000
800000
1000000
1200000
m³
LILW
VLLW

Figure 1

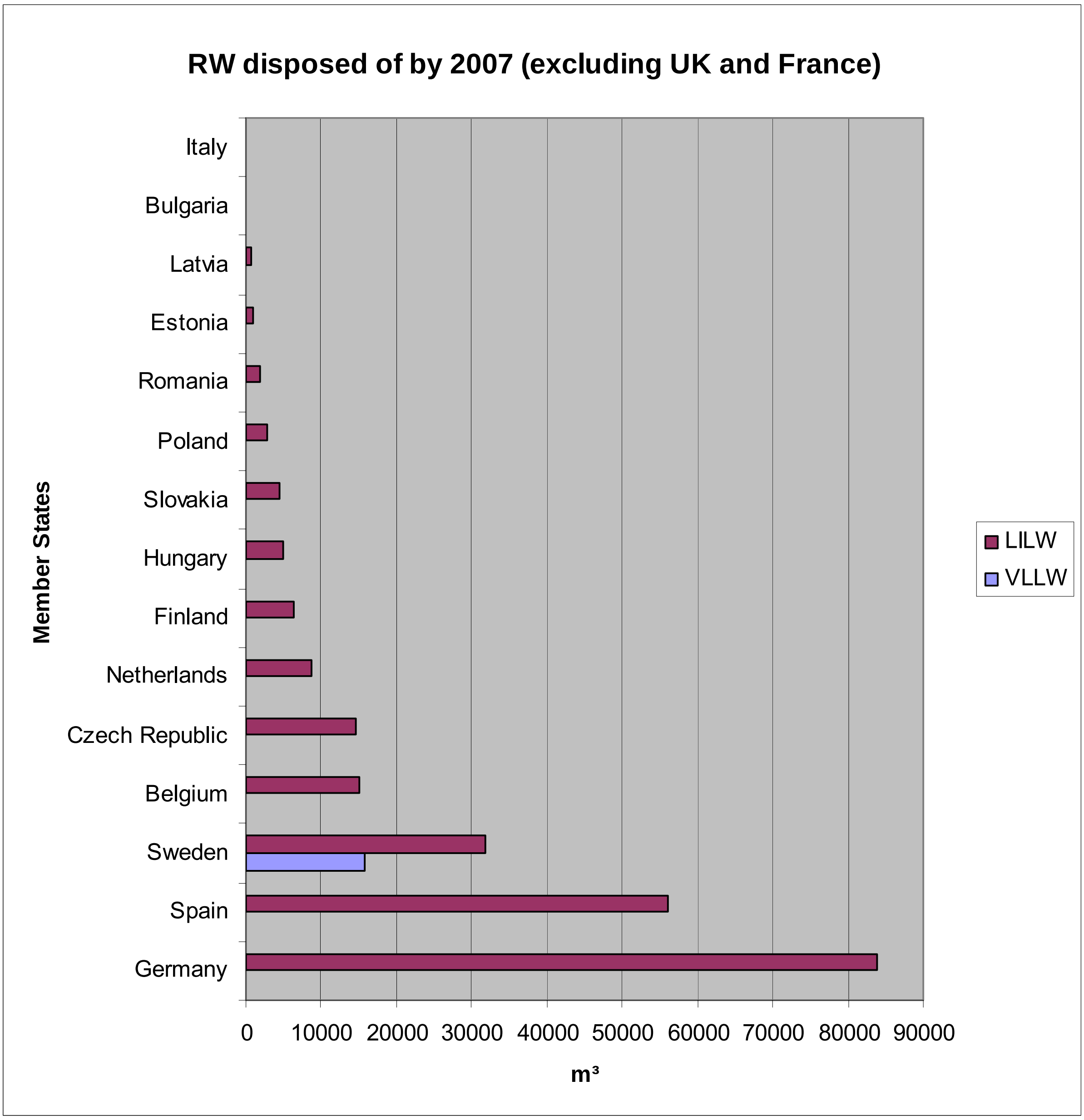


Figure 2

(2) Annual generation of radioactive waste and spent fuel (2007 figures; table C):

The following figures can be mentioned as annual generation of radioactive waste and spent fuel in 2007.

VLLW: **ca. 30 700 m^3** – most of which arises and is disposed of in France. (It should be noted however that several Member States have not reported about this category of waste. This is in particular the case for the amounts of waste in UK).

LILW-SL: **ca. 40 900 m^3** – of which almost 70% is routinely disposed of at sites in France and UK.

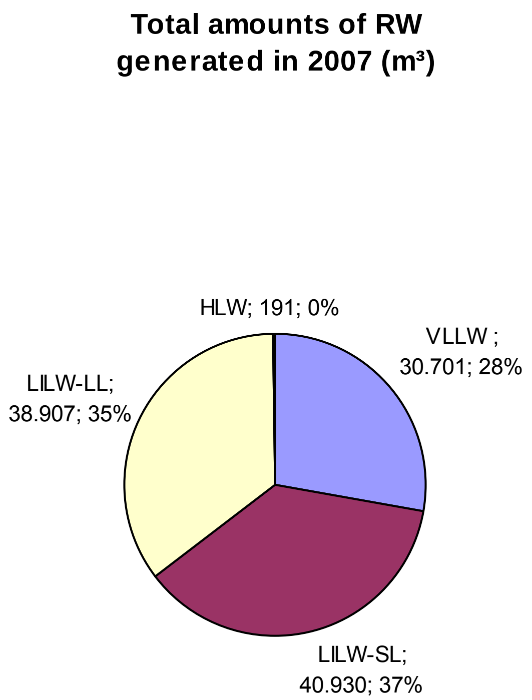
LILW-LL: **ca. 38 900 m^3** – which is conditioned for long-term storage with only minor amounts disposed of. As shown in the figure below, 36 400 m^3 or 93 percent of this waste has been generated in the UK. The totals provided for in the Sixth Report were significantly lower (5 100 m^3), assuming that a major part of the UK waste would be disposed of in a near-surface repository in line with the requirements for LILW-SL waste. In this Seventh Report, and following further discussions with the UK, this differentiation has not been made. According to the information submitted by the UK authorities, "*the UK information submitted for this report was taken from the 2007 UK Radioactive Waste Inventory (UKRWI) reports. The UK categorises LLW and ILW as LILW-SL or LILW-LL solely for reporting in the EU Situation Report, based on agreed criteria that satisfy the IAEA definition*. *The convention in the 2007 UKRWI, where a key criterion for LILW-SL is defined as* ‘wastes that do not contain any beta/gamma emitting radionuclides with half-lives greater than 30 years’, *results in ~90% of UK LILW being categorised as LILW-LL, even though we anticipate that 90% of LILW will be LLW and thus could meet the waste acceptance criteria at the UK’s Low Level Waste Repository. The UK plans to conduct a review of how we categorise LILW as SL and LL. This could result in a change to the approach used for the 2013 UKRWI so that the LILW-SL and LILW-LL categories better reflect the expected long term waste management approach".*

Germany normally does not distinguish between SL and LL waste, but does so on a heat- and non-heat generating waste basis. It therefore reports both categories under LILW. For the purpose of these calculations, all the LILW declared by this country has been regarded as LILW-SL.

HLW: **ca. 190 m^3 –** all of which goes into long-term storage; no repository exists yet.

SF: **ca. 2 500 te Heavy Metal (HM)**, which might either be sent to reprocessing or be stored for subsequent direct disposal in a deep geological repository, depending on national policies and/or decisions of individual electricity companies.

Figures of Radioactive Waste generated in 2007, and some examples of distribution among Member States:



Please note that this table ***excludes spent fuel****. Therefore and for a better understanding of these amounts, the generation of spent fuel in the same year should also be considered (figure 8)*[12].

Figure 3

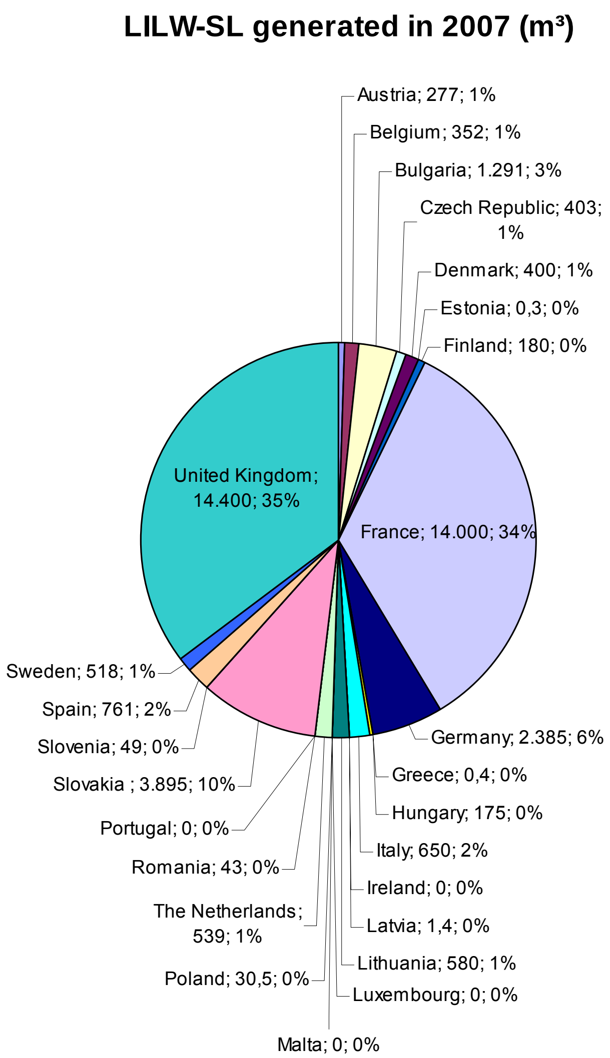


Figure 4

12 UK has a specific classification system as regards SL and LL LILW (see comment on page 8).

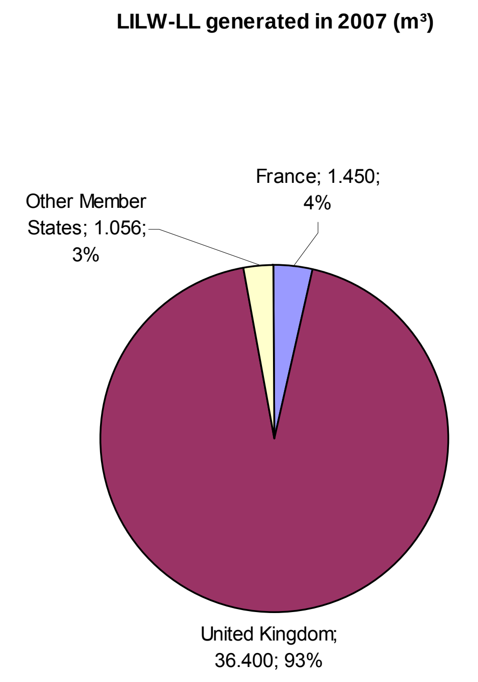


Figure 5 [12]

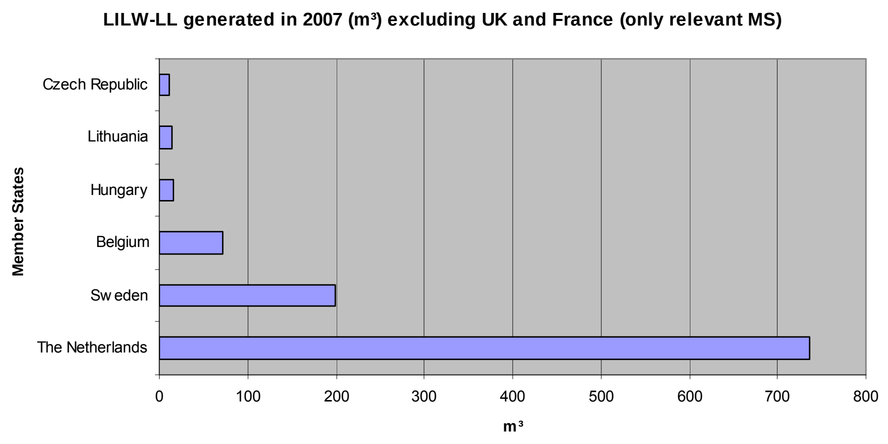


Figure 6

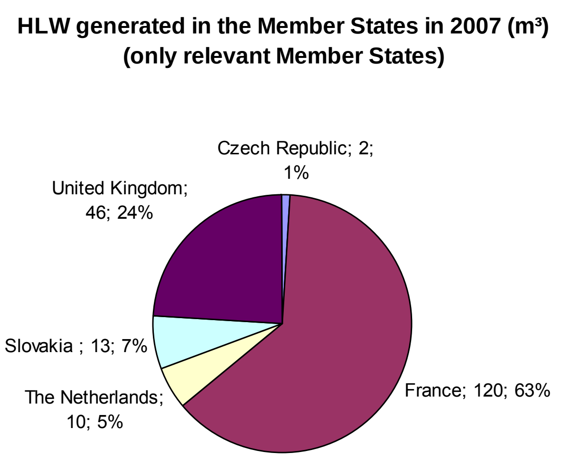


Figure 7

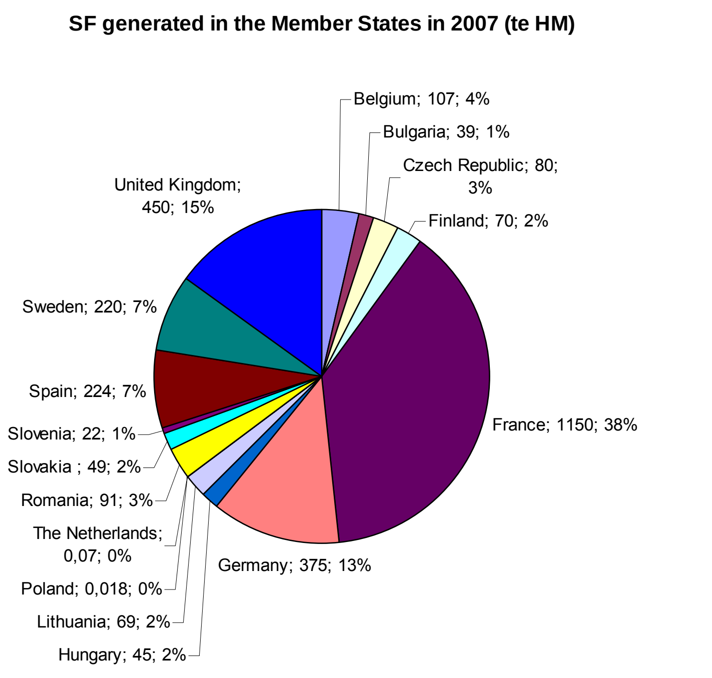


Figure 8

Therefore, in total, some **2 500 te HM of spent fuel and 110 700 m^3 of radioactive waste are generated in the EU each year**, ca. 65% of which is VLLW and LILW-SL and 35% LILW-LL (when using the LILW-LL quantities strictly as reported by the UK[12]).

If this table is compared with that of the Sixth Situation Report, it can also be observed that new information has been introduced specifying the origin of the waste. This illustrates the role that the operations of decommissioning have in every Member State, as well as that of the operation of nuclear installations and other activities, such as reprocessing. In those countries with active decommissioning programmes, it can be clearly seen that decommissioning is the main activity generating radioactive waste (e.g. Denmark, Italy, Latvia, Spain). In other cases, the waste is mainly generated during the operation of nuclear power plants (e.g. Finland), or there is a balance between such operation and other kind of activities such as the reprocessing of waste (e.g. France)

(3) Total of radioactive waste and spent fuel in storage at the end of 2007 (Table D):

The following figures have been provided for radioactive waste and spent fuel in storage at the end of 2007:

VLLW: **ca. 32 400 m^3 –** of which ca. 65% comes from Lithuania - it must be said that France undertakes the direct disposal of VLLW in Morvilliers, and that the UK does not report this kind of waste.

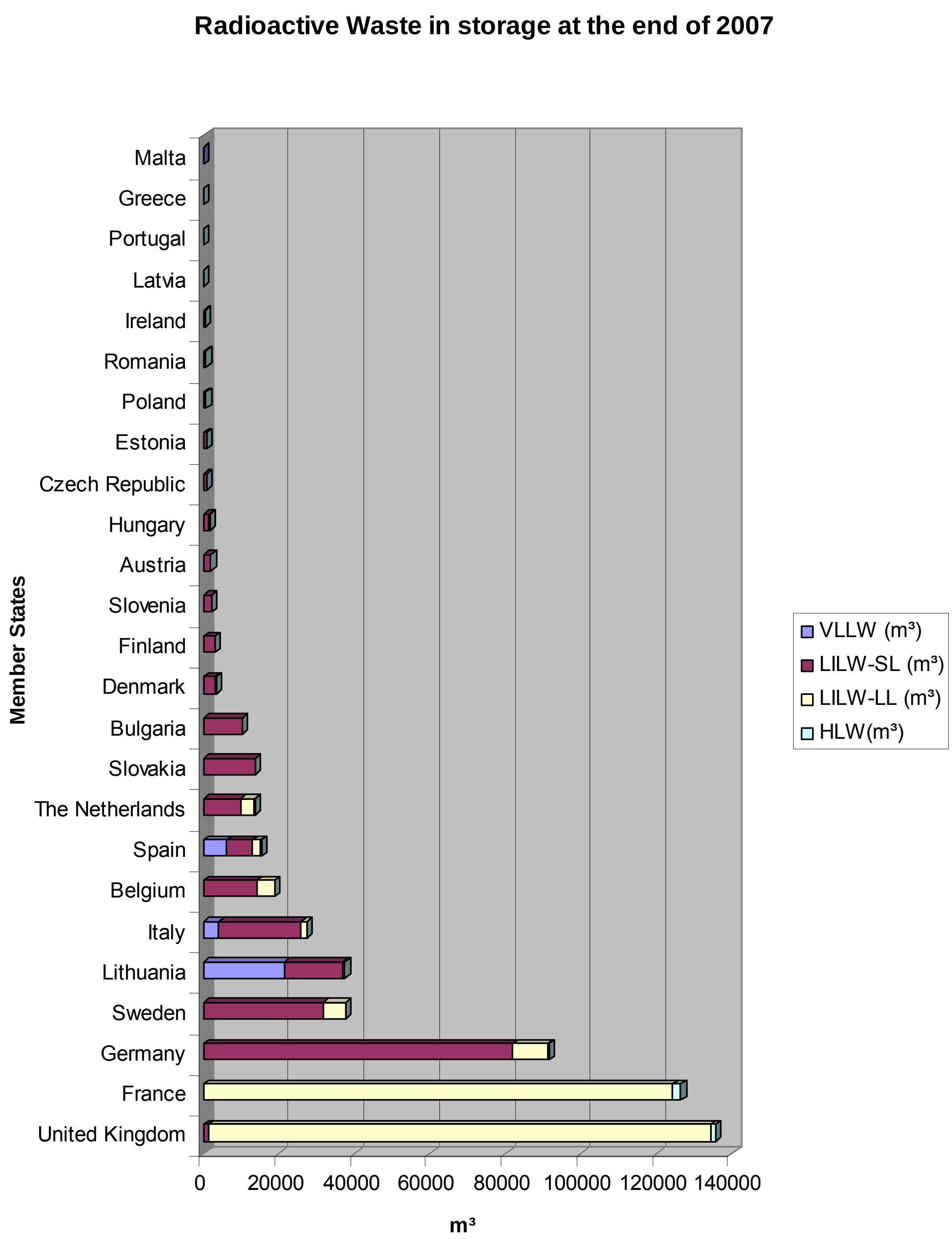
LILW-SL: **ca. 221 500 m^3**

LILW-LL [12,13]: **ca. 287 000 m^3 –** for all of which there is currently no disposal facility in operation.

HLW: **ca. 4 100 m^3 –** the majority being vitrified waste from the reprocessing of spent fuel, for which there is currently no disposal facility in operation

SF: **ca. 44 600 te (HM) –** of which one part will be reprocessed and one part will be placed in long-term storage for eventual direct disposal.

[13] Due to the classification system in force based on the distinction of heat generating and non-heat generating radioactive waste, Germany has not reported separated figures for LILW-SL and LILW-LL. For the above figures and upon the recommendation of the German authorities, assumption has been made to distribute the LILW in Germany in a ratio of 90% SL and 10% LL.



Radioactive Waste in storage at the end of 2007
Member States
Malta
Greece
Portugal
Latvia
Ireland
Romania
Poland
Estonia
Czech Republic
Hungary
Austria
Slovenia
Finland
Denmark
Bulgaria
Slovakia
The Netherlands
Spain
Belgium
Italy
Lithuania
Sweden
Germany
France
United Kingdom
0
20000
40000
60000
80000
100000
120000
140000
m³
VLLW (m³)
LILW-SL (m³)
LILW-LL (m³)
HLW(m³)

Figure 9

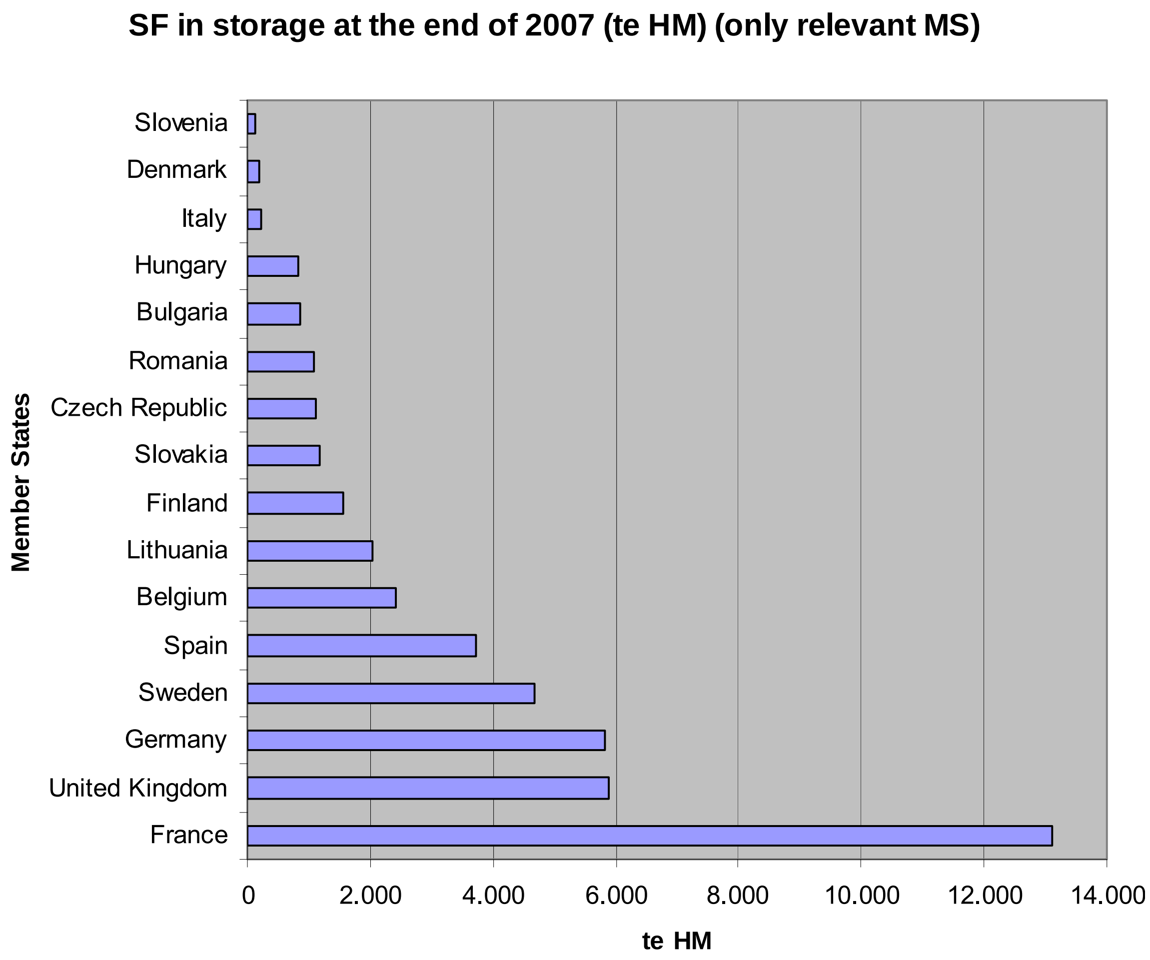


Figure 10

At this stage, there is still no disposal facility in operation available in the EU, or for that matter anywhere in the world, for the most hazardous radioactive waste i.e. that represented by the categories HLW and spent fuel to be disposed of directly. These materials remain stored in temporary surface and near surface storage facilities in those EU Member States with active or past nuclear power programmes. The above figures also show that there are significant accumulations of stockpiled waste in other less hazardous categories, including LILW-SL for which many countries still do not have access to disposal sites, even though disposal of this category has taken place routinely in engineered facilities for several decades now.

The total current capacities for storage of each type of waste are also indicated in the tables. In several cases, the point in time when the current storage capacities will be saturated are so close (eg. 2016 for VLLW, 2013 for LILW-SL, 2020 for LILW-LL, 2012 for HLW, 2011 for SF), that the increase of the capacities becomes an urgent matter. Several Member States show difficulties in estimating this point in time, and therefore the data provided should be considered rather as an indication than as a precise estimate.

(4) Additional radioactive waste and spent fuel arising from 2008 to 2020 and 2030 (table E):

The best estimates for additional waste are as follows:

VLLW: **481 500 m^3** in **2020**, increasing to **779 400 m^3** in **2030**.

LILW-SL: **891 800 m^3** in **2020**, increasing to **1 433 100** m^3 in **2030**.

LILW-LL: **575 300 m^3** in **2020**, increasing to **938 300 m^3** in **2030** (most of it arising from the UK, according to the information provided for this report[12]).

HLW: **2 300 m^3**in **2020,** increasing to **4800 m^3** in **2030**– the majority being vitrified waste from the reprocessing of spent fuel.

SF: **29 700 te HM** in **2020**, increasing to **41 300 te HM** in **2030**.

The tables also show some estimates to 2040, but these are not considered here, as several countries, including France, did not provide them.

These figures represent quantities of wastes and spent fuel generated additionally to those already existing at the end of 2007. As can be seen from the above figures, the waste generation in the VLLW and LILW will continue to increase in the short- to medium-term, with most of the increase coming from decommissioning activities. Especially in terms of LILW-LL, the UK is a special case which has to be clarified with the competent authorities.

The figures are somewhat speculative since they rely upon the assumption that certain decisions will be taken e.g. timing of decommissioning activities (immediate vs. delayed) and the lifetimes of the nuclear installations as assumed at the date of reporting by the Member States. However, whatever decisions are taken, these wastes will arise, and only the timing can be changed. It is feasible that further volume reduction is achievable through changes in waste conditioning techniques. This will not affect the overall radioactivity (and hazard) of the waste, but only the repository space that might be required.

What might change over the period is balance between reprocessing (HLW) and direct disposal (SF). For instance, the German legislation has forbidden the transport of SF to reprocessing plants from 2006 onwards, in line with the agreement on the phase-out of nuclear energy. Belgium is currently continuing with its moratorium on reprocessing, already in place since 1993. No further reprocessing contracts have been signed for UK domestic fuel, with reprocessing operations in Sellafield probably continuing for some years for both oxide and Magnox spent fuel. This means that, assuming the continuation of present policies continue, only four Member States, Bulgaria, France, Italy and The Netherlands, will reprocess their spent fuel, likely to be under 1 200 te HM annually.

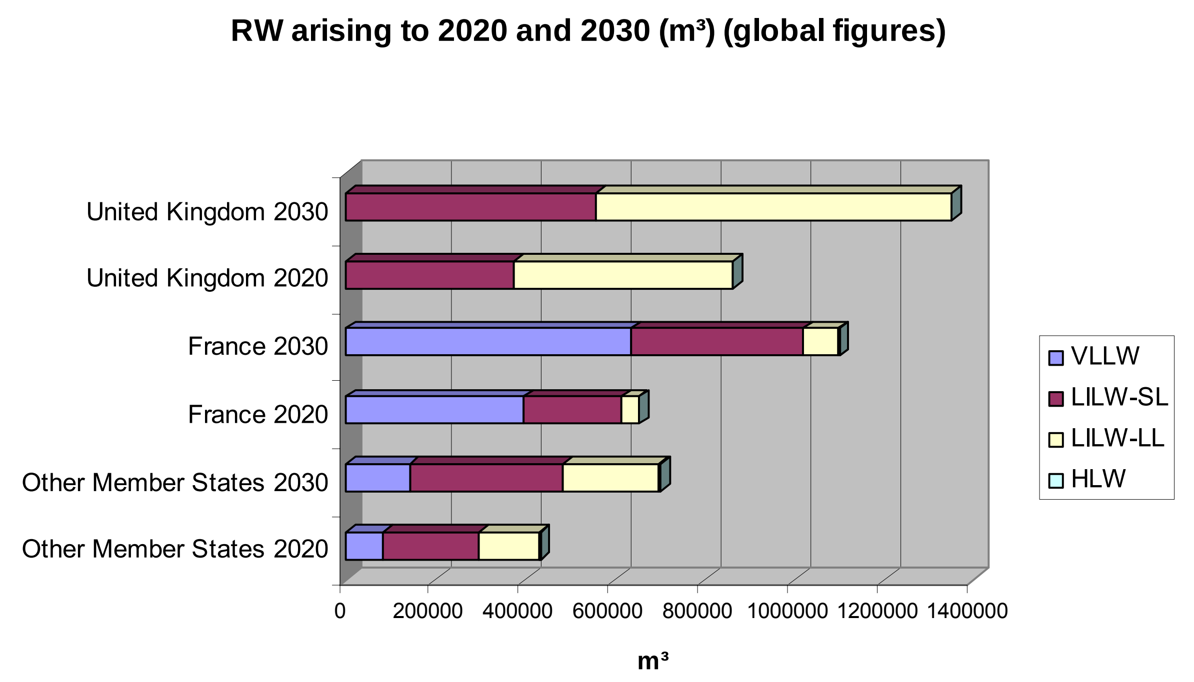

RW arising to 2020 and 2030 (m³) (global figures)
United Kingdom 2030
United Kingdom 2020
France 2030
France 2020
Other Member States 2030
Other Member States 2020
0
200000
400000
600000
800000
1000000
1200000
1400000
m³
VLLW
LILW-SL
LILW-LL
HLW

Figure 11

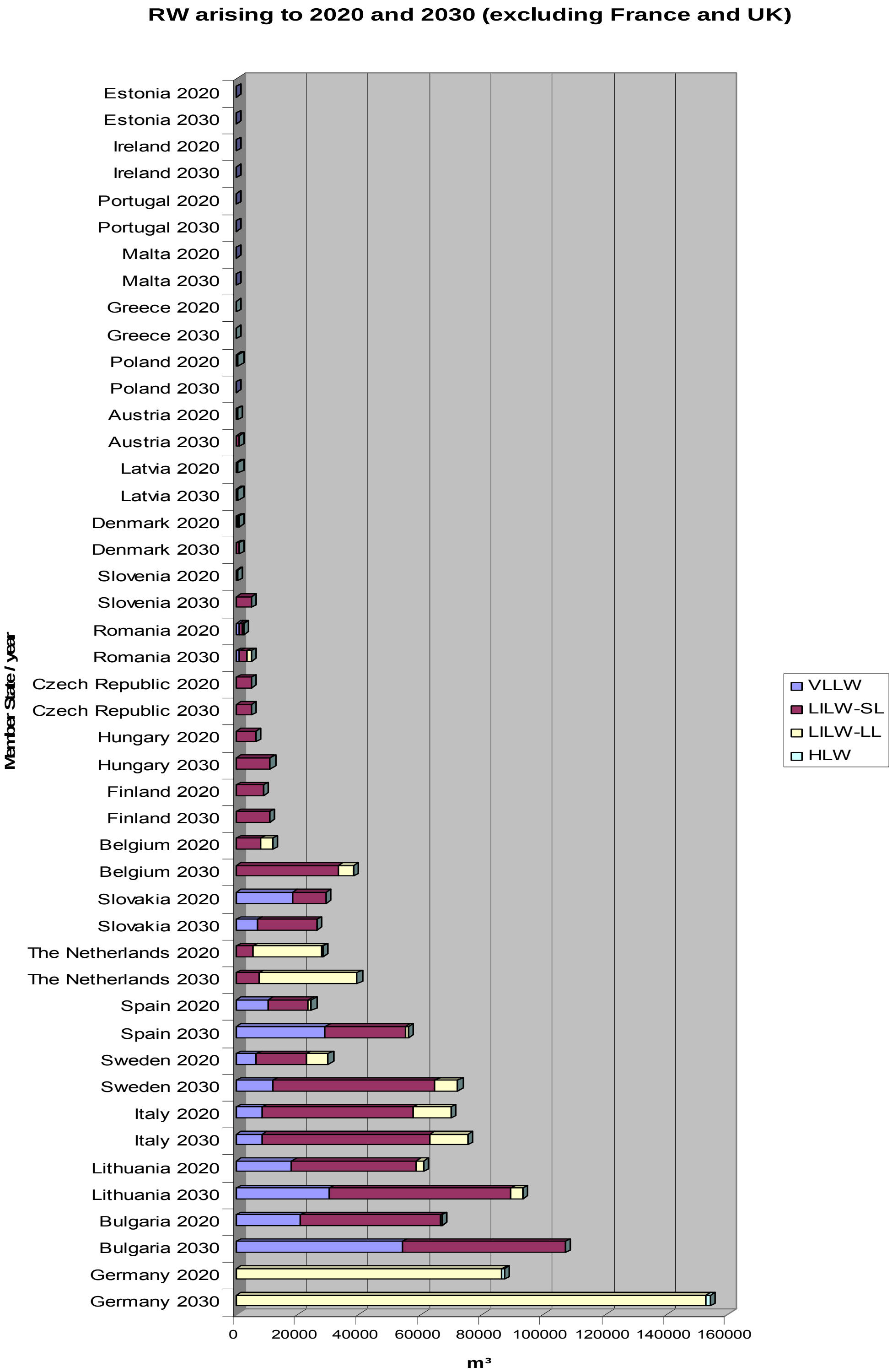

RW arising to 2020 and 2030 (excluding France and UK)
Estonia 2020
Estonia 2030
Ireland 2020
Ireland 2030
Portugal 2020
Portugal 2030
Malta 2020
Malta 2030
Greece 2020
Greece 2030
Poland 2020
Poland 2030
Austria 2020
Austria 2030
Latvia 2020
Latvia 2030
Denmark 2020
Denmark 2030
Slovenia 2020
Slovenia 2030
Romania 2020
Romania 2030
Czech Republic 2020
Czech Republic 2030
Hungary 2020
Hungary 2030
Finland 2020
Finland 2030
Belgium 2020
Belgium 2030
Slovakia 2020
Slovakia 2030
The Netherlands 2020
The Netherlands 2030
Spain 2020
Spain 2030
Sweden 2020
Sweden 2030
Italy 2020
Italy 2030
Lithuania 2020
Lithuania 2030
Bulgaria 2020
Bulgaria 2030
Germany 2020
Germany 2030
Member State / year
0
20000
40000
60000
80000
100000
120000
140000
160000
m³
VLLW
LILW-SL
LILW-LL
HLW

Figure 12

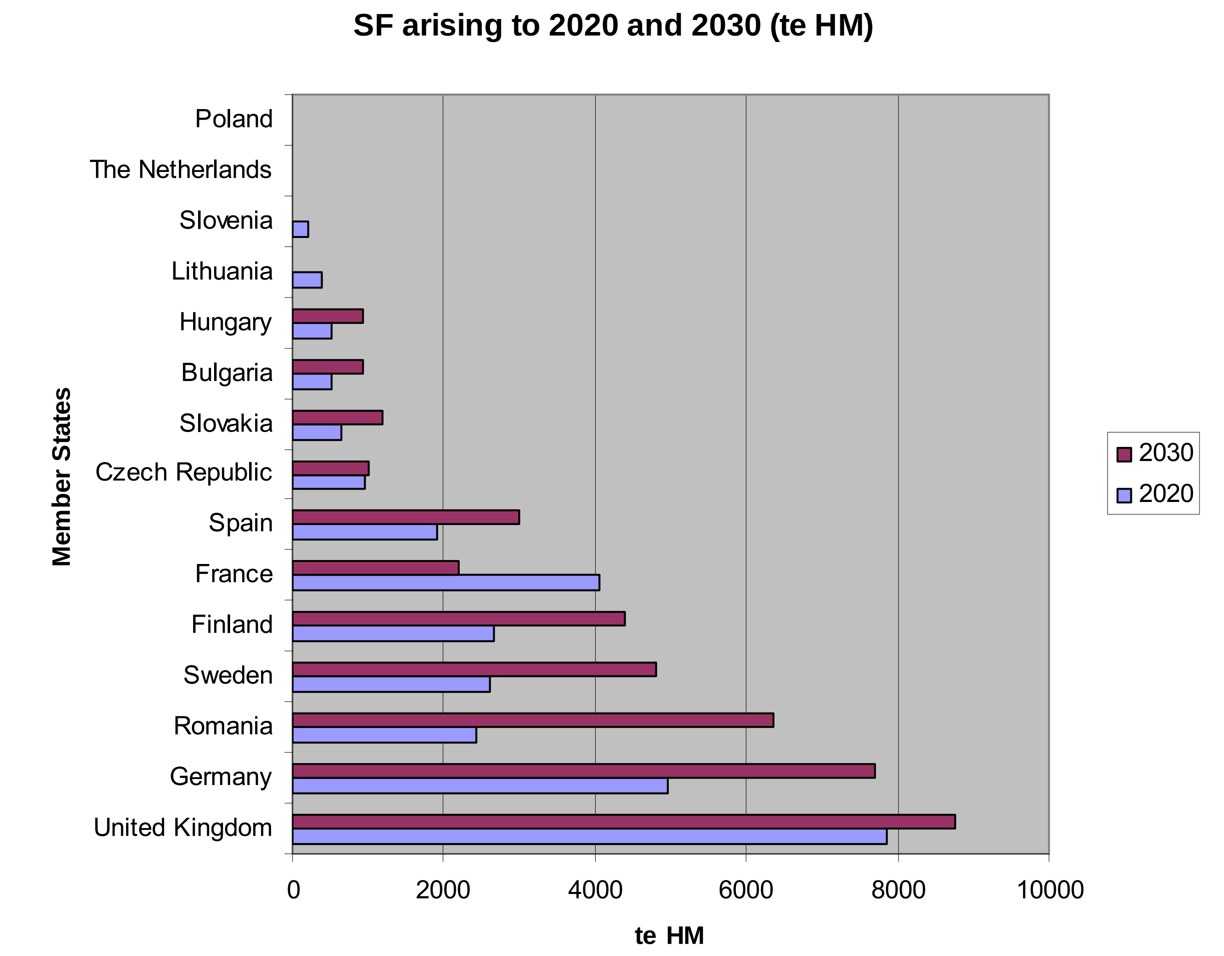


Figure 13

5.3. Radioactive waste disposed of (Tables F and G)

(5) Planned new disposal capacities (Table F)

Most Member States are planning disposal capacities for their wastes.

Eight Member States assume the construction of deep geological disposal facilities for their **HLW and SF** when regarded as waste: Finland, France, Germany, Hungary, Romania, Spain, Sweden and UK. Of these, only Finland, France, Germany and Sweden have already selected (or are investigating) a site and plan to start operation before 2040.

The plans for the disposal of **LILW** are more developed and rely on shorter deadlines. Several Member States are planning new disposal facilities for either **VLLW**, **LILW-SL** or **LILW-LL**. Of these:

UK refers to grouted containers in multi-barrier disposal vaults located in Cumbria and Dounreay.

Belgium, Lithuania, Slovakia, Spain and the UK plan the surface disposal of VLLW and/or LILW-SL up to 2016. Poland and Italy have also announced the planned start of operation of the same type of facility by 2020, though a site has not as yet been selected.

Bulgaria, Lithuania, Romania and Slovenia plan the near-surface disposal of LILW-SL in different timeframes up to 2017.

Latvia plans an enlargement of the existing Radon disposal site for LILW-SL and LILW-LL by 2013

Hungary plans the intermediate depth geological disposal of LILW-SL of NPP origin to be operational by 2012. Germany expects to commission its deep geological repository for non-heat generating waste by 2019.

Finland plans the use of new capacities in its near-surface repository for LLW by 2012. Sweden also plans an extension of its existing repository for LILW-SL by 2020; site selection for the disposal of LILW-LL will be started in about 2035, aiming at repository operation in 2045.

(6) Best estimates for total disposal capacities (Table G)

For **VLLW**, the best estimate for disposal capacities for 2020 is 818 000 m³. This figure will increase to 838 000 m³ in 2030.

For **LILW-SL**, the estimate for 2020 lies by 2 098 000 m³, increasing for 2030 at ca. 2 323 000 m³.

For **LILW-LL**, 304 000 m³ disposal capacity are estimated for 2020, increasing to 414 000 m³ for the next decade.

For **HLW** no disposal capacities were reported to be planned for 2020, but 12 000 m³ in 2030.

For **SF**, a disposal capacity of 8 500 te HM is foreseen for 2020, 10 200 te HM in 2030.

The Member States' reporting of SF and HLW depends on the national policy on reprocessing: for instance, Finland reports only the SF, planned to be disposed of directly as HLW; while France reports separately SF and HLW, generated during reprocessing.

Figures for 2040 and 2070 have been provided by only a few Member States and these are generally to be regarded as incomplete. They are therefore not contemplated in this text, but are included in the respective tables.

When comparing the planned disposal capacities with the estimates for the cumulated RW arisings in the coming years (table E), the following conclusions can be drawn:

In almost all the Member States generating VLLW, the disposal capacities for this type of waste seem to sufficiently match arisings. The only exceptions are Bulgaria, Romania and Sweden, which did not provide any estimation for VLLW disposal capacities.

In general terms, the estimated disposal capacities would be sufficient to cover the disposal needs for LILW-SL.

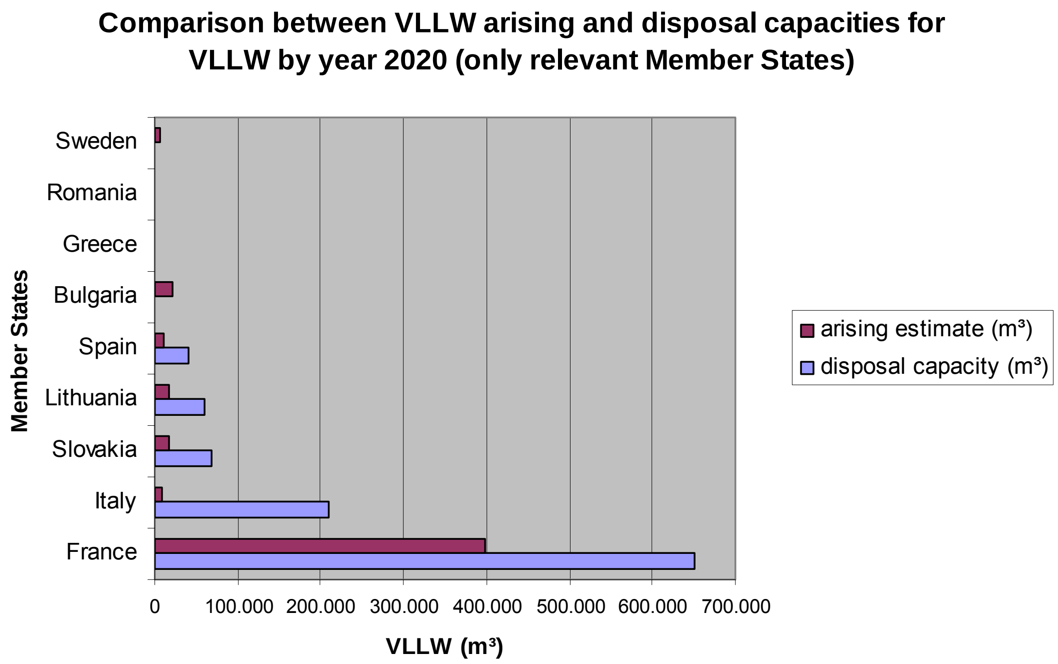


Figure 14

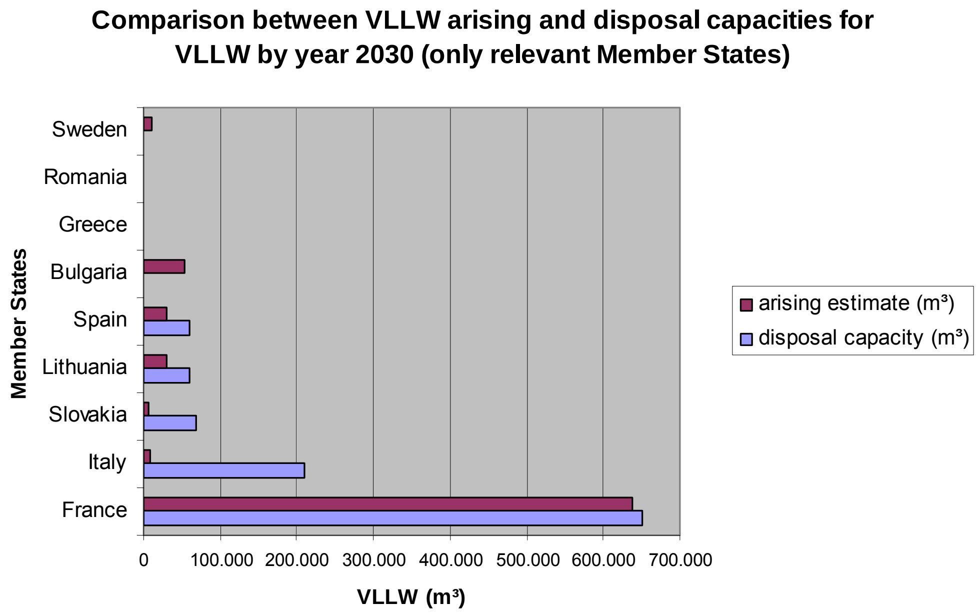


Figure 15

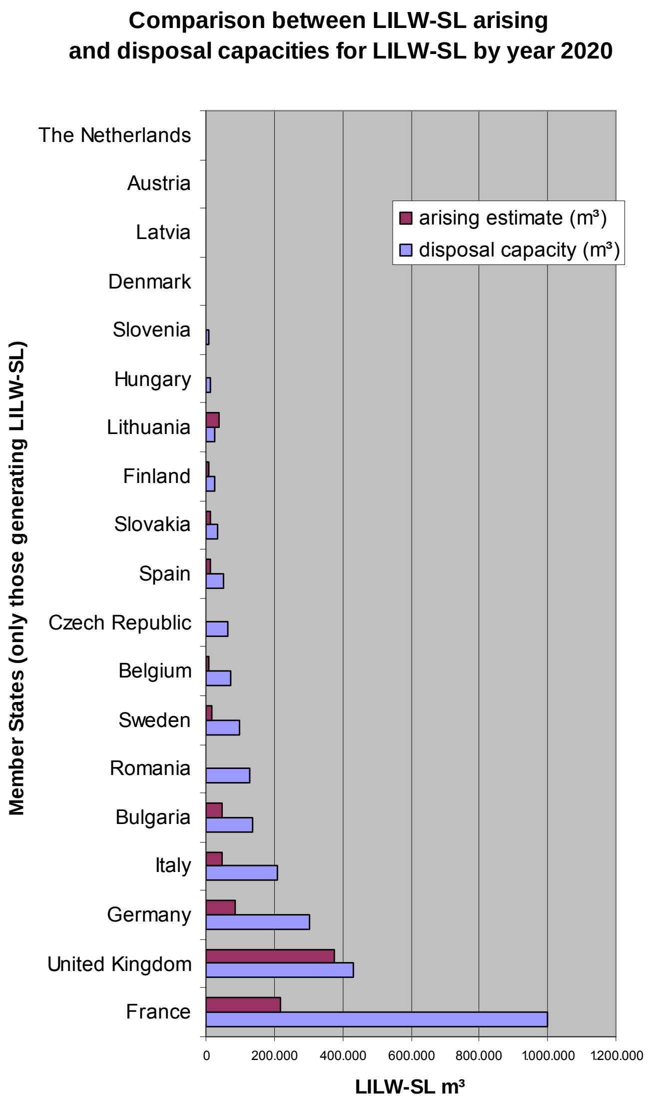


Figure 16

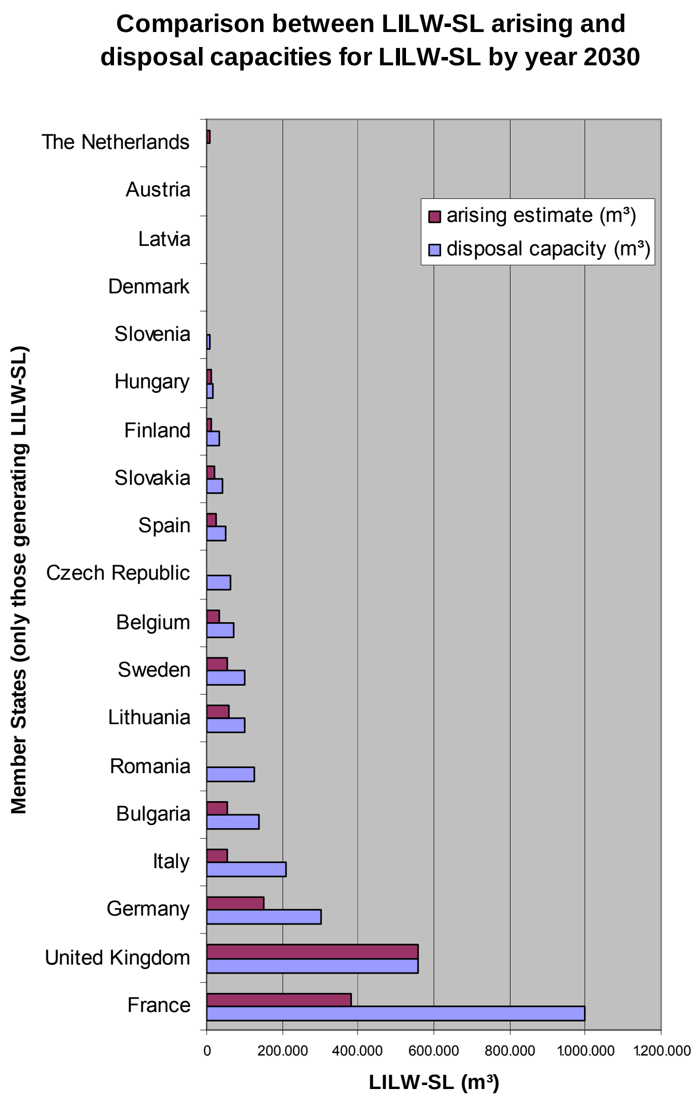


Figure 17

The situation is different as to the disposal of LILW-LL. Of a total of 15 Member States generating significant amounts of this type of waste[14], only 6 have sufficient capacities to dispose of it when the needs arise: the Czech Republic, Denmark, Italy, France, Germany and Latvia. In contrast, it appears that no sufficient disposal capacities will be available in Belgium, Bulgaria, Hungary, Lithuania, the Netherlands, Romania, Spain, Sweden (until 2070) and the UK[12].

[14] Austria, Malta and Poland produce only minor LILW-LL quantities; Austria 5 m³ (2020) and 10 m³ (2030); Malta 1 m³ (2020) and 1,5 m³ (2030); Poland, 12 m³ (2020) and 0 m³ (2030).

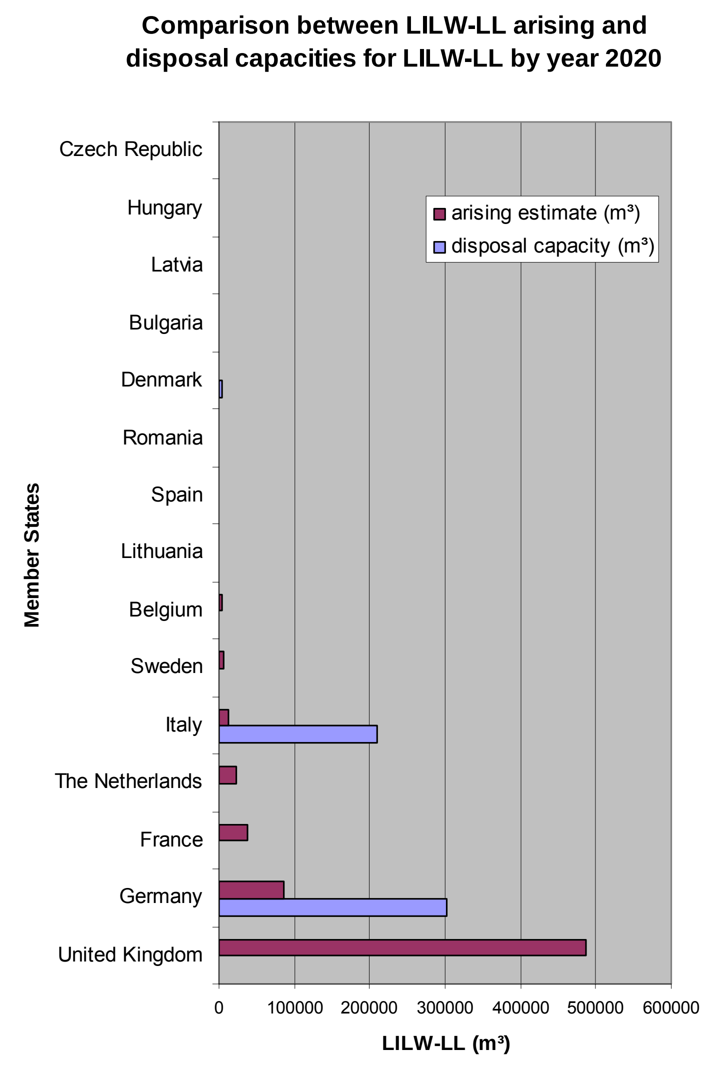


Figure 18

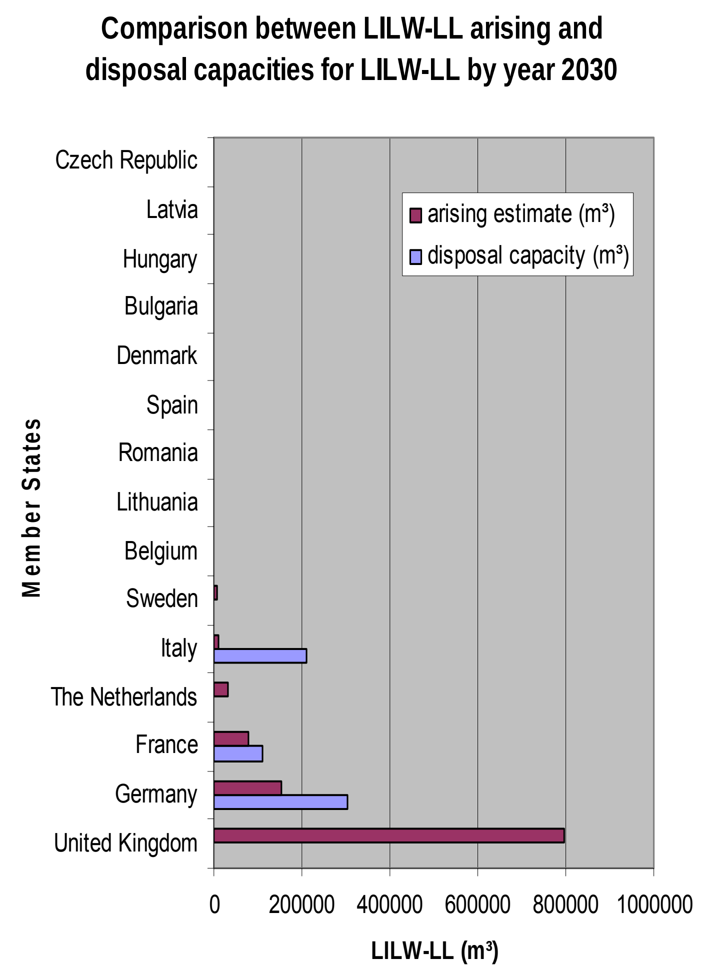


Figure 19

The same can be said for the disposal of HLW and SF. Finland and France are the only Member States where the disposal capacities will be available for the waste which is going to arise in the next two decades. Germany will only cover the needs for disposal from 2040, and Sweden from 2070[15]. The disposal capacities are insufficient to cover the RW arising in the coming decades in the rest of the Member States with present or past programmes of nuclear power generation.

15 In the case of Sweden, the disposal facility will be licensed for disposal of all spent fuel (i.e. 12000 Te HM); whereas the capacity of the repository will be continuously increased (300 Te HM/150 canisters per year) from the start in 2025 until 2070 (12000 Te HM/6000 canisters). The facility will be closed and sealed by 2065 (2070 in table G).

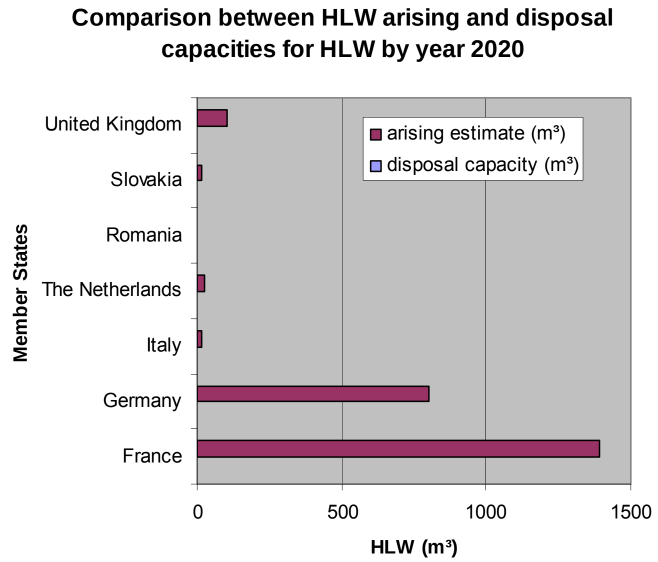


Figure 20

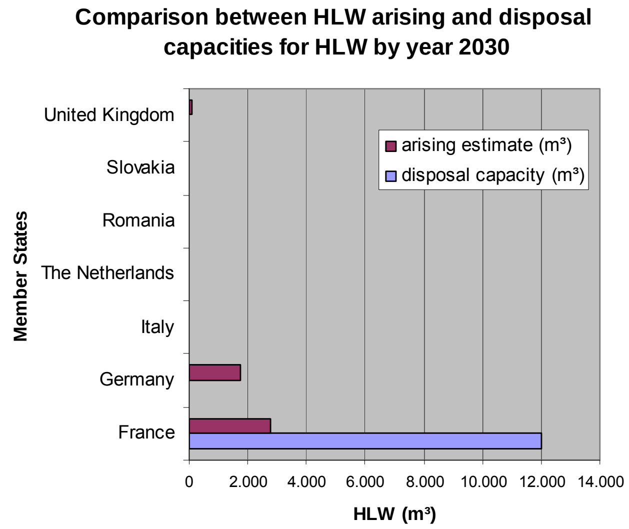


Figure 21

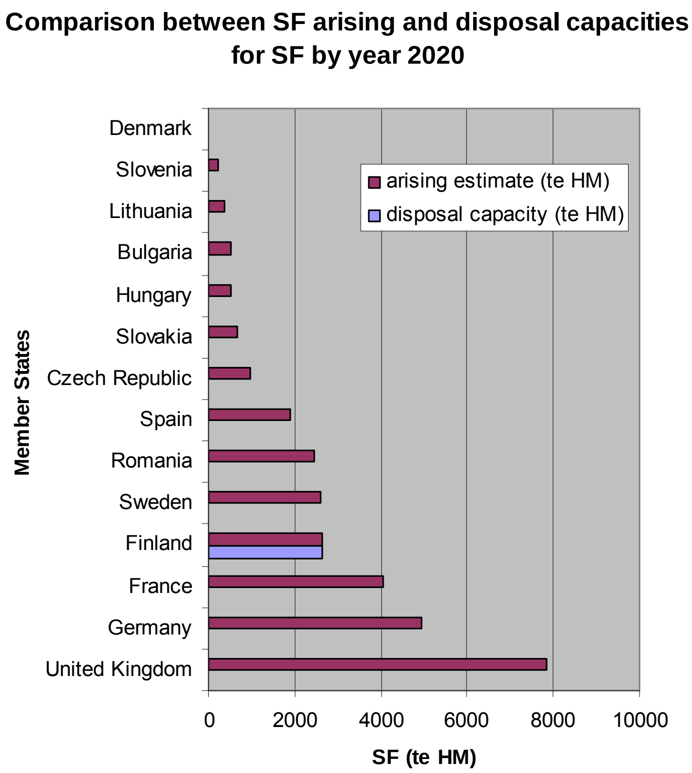


Figure 22

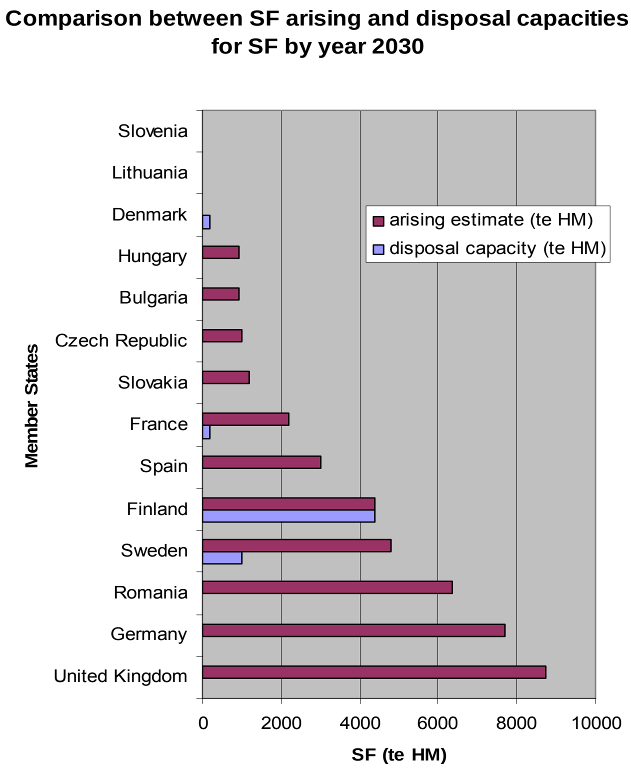


Figure 23

6. DEVELOPMENTS IN WASTE POLICIES AND PRACTICES (TABLES H-L)

In this section a general overview is given of Member States' policies and practices, together with financing aspects and the responsibilities concerning implementation.

6.1. Policies and Practices

6.1.1. Spent Fuel / High Level Waste

The first choice facing Member States is their choice of spent fuel management policy i.e. reprocessing or direct disposal. The first option will recover plutonium and uranium for possible re-use, but also generate HLW, LILW-LL and LILW-SL, all of which will require disposal. Currently five Member States make use of the reprocessing option; Bulgaria, France, Germany (in the case of the remaining spent fuel at reprocessing facilities), the Netherlands and UK. Italy has also concluded agreements to reprocess the remaining fuel from its closed reactors. According to its current policy, Germany will no longer reprocess fuel once the current contracts expire. The UK is still keeping open the option of new reprocessing contracts, but they would need Government approval. Belgium has a moratorium on new reprocessing contracts since 1993. In the past Spain exported a small amount of fuel for reprocessing, but has since stored all fuel at its NPPs, with small amounts of spent fuel resulting from reprocessing activities awaiting return from France (Spain is planning a centralised storage facility for HLW and spent fuel to be operational by 2015).

Where spent fuel is not to be reprocessed, the normal management option is an extended period of storage, at least 30 years, followed by deep geological disposal. For these cases, direct disposal of spent fuel forms the reference management scenario. Currently two Member States, Finland and Sweden, are actively pursuing this option. However in the majority of Member States a definitive spent fuel policy does not exist, other than arrangements to ensure a safe extended period of storage (50 – 100 years). Whatever the management route chosen, the only disposal option for HLW / spent fuel is deep geological disposal. Although most Member States are committed in principle to this option, it is likely that by 2025 only three Member States will have operational deep repositories for HLW / spent fuel: Finland, France and Sweden. Germany has a target date of 2040 following the lifting of the moratorium for Gorleben in 2010.

A number of countries consider the option of shared repositories following the experience of the SAPIERR project (Strategic Action Plan for Implementation of European Regional Repositories) under the Sixth Framework Programme. Based on the SAPIERR findings, a Working Group has been created in early 2009 to enable the establishment of a European Repository Development Organisation (ERDO)[16], which would contribute to develop the concept of a shared repository as a complement to the national facilities being developed. Currently, Austria, The Netherlands, Poland, Slovakia, Italy, Lithuania and Slovenia participate in this Working Group.

The Implementing of Geological Disposal of Radioactive Waste Technology Platform (IGD-TP)[17] was launched in Nov. 2009 by a core group of European WMOs. The vision of IGD-TP is that by 2025 the first geological disposal facilities for spent fuel, high-level waste, and other long-lived radioactive waste will be operating safely in Europe. Secretariat activities are fulfilled by the Euratom FP7 SecIGD project. During 2010-2011, the main tasks have been to draft and develop the Strategic Research Agenda (SRA) and the Deployment plan (DP). The main objectives of the first SRA and DP are to define, prioritise, initiate and carry out European strategic initiatives, including addressing the remaining scientific, technical, and

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16 http://www.erdo-wg.eu/ERDO-WG_website/Home.html
17 http://www.igdtp.eu/

social-political challenges to meet the 2025 vision. Online publication of the SRA is expected in July 2011 and the DP in 2012.

Some countries have only very small quantities of spent fuel originating from research reactors. Generally the management solution is covered by 'take-back' agreements, where the spent fuel is returned to the country of origin.

6.1.2. LILW-LL

Like HLW and SF, it is generally acknowledged that LILW-LL requires disposal in a geological repository. This category of waste arises largely through reprocessing operations and decommissioning. As the disposal route is the same as for HLW, it also follows that in general the progress in terms of disposal routes is similar. In some cases, HLW and LILW-LL can be co-disposed i.e. placed in the same repository. It should be mentioned however that the short-term hazard presented by conditioned LILW-LL is significantly less than that of HLW. The Konrad repository in Germany, planned to be commissioned by 2019, will host radioactive waste with negligible heat generation covering the country's needs for disposal of this type of waste and will, once in operation, be the first repository for this waste category in the EU.

6.1.3. LILW-SL

This category represents the largest volume of waste in all Member States. It is here that polices and practices are most developed. Disposal normally takes place in engineered surface or near-surface facilities. In the sixteen Member States with active or past nuclear power programmes, eight currently practice disposal in surface or near surface facilities. In addition a number of countries are at various stages of implementation from conception through to final construction. By 2020 it is likely that all the 'NPP states' with the exception of the Netherlands, will have an operational repository for these wastes. In addition, a non nuclear Member State, namely Latvia, should also have an operational repository by 2013.

6.1.4. VLLW

As already stated the concept of VLLW arose to deal with those wastes where the degree of isolation and confinement required is considerably reduced compared to LILW-SL. Currently France, Sweden and the UK carry out large-scale VLLW disposal. Lithuania and Spain have also constructed VLLW disposal facilities and it is likely that others will do so as the need to manage large volumes of decommissioning wastes arises in the future. Those countries that intend to use only deep disposal for their wastes, e.g. Germany, are unlikely to categorise any waste as VLLW, but instead will probably make use of the possibility of decontamination and clearance to enable wastes to be disposed of as conventional waste or recycled. France has decided against large-scale clearance of such wastes, on both cost and public perception grounds.

6.1.5. Other Wastes

Although not specifically discussed in this report there are radioactive wastes generated as a result of non-fuel cycle related activities: These include for example disused sealed-sources and radioactive waste arising from medical applications. Most countries now have arrangements in place whereby 'take-back' provisions must be incorporated into the supply contract. Nevertheless there are large numbers of historical sealed-sources not covered by such provisions. When disposal facilities become available for the full range of fuel-cycle generated wastes, they should also be able to take radioactive wastes from other activities. However for the smaller countries, that do not have sufficient waste to justify construction of a repository, solutions will still need to be found.

6.2. Financing (Table H)

It is not the intention to cover this aspect in detail, since the Commission already publishes detailed reports on the financing of decommissioning and waste management activities[18]. In 2006 the Commission published a recommendation concerning decommissioning and waste management funds[19]. It can be seen however from Table F that for all Member States where information is available, funding mechanisms are in place or are under preparation.

6.3. Organisational Responsibilities (Tables I, L1 and L2)

The safe management of spent fuel and radioactive waste requires the existence of qualified human resources, irrespective of the existence of nuclear power generation in a given Member State. At the same time, the needs and capacities for the waste manager are of a very different scope in Member States with present or past nuclear power programmes. Table I enumerates the different waste management organisations (WMO), while two additional tables, L1 and L2, explain the organisational responsibilities in nuclear and non nuclear Member States.

In some Member States without nuclear power programmes, the quantity of waste concerned might not justify the existence of a dedicated WMO. In these cases responsibility for such matters can be taken by a national research centre (eg. Austria, Greece), by a Ministerial department (eg. Luxembourg) or other body. In Cyprus and Ireland there is no distinct WMO in the field of radioactive waste.

Already among the Member States having a nuclear power program, it would seem that there is no single model for a successful WMO. The role of such organisations varies widely between Member States from those concentrating mainly on repository development and operation e.g. ANDRA in France, to those which have also responsibility for all historic liabilities including site operation, such as in the UK (NDA). Additionally the status varies from that of a public utility to a subsidiary of commercial NPP operators, as in Sweden (SKB) and Finland (Posiva). The main requirement would seem to be that responsibilities are clearly laid down in the national framework and that there are adequate financial arrangements.

7. INTERNATIONAL DEVELOPMENTS - JOINT CONVENTION (TABLE M)

The Joint Convention is considered here separately as it has become a significant contributor setting the principles for the management of radioactive waste and spent fuel in the EU. All Member States except Malta have acceded to the Convention, with Portugal (2009) and Cyprus (2010) having become a Contracting Party most recently. The Euratom Community being also a Party to it, this Convention has become a part of Community legislation. Along

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18 COM(2007) 794 of 12.12.2007 - Communication from the Commission to the European Parliament and the Council – Second Report on the use of financial resources earmarked for the decommissioning of nuclear installations, spent fuel and radioactive waste .

19 Commission Recommendation of 24 October 2006 on the management of financial resources for the decommissioning of nuclear installations, spent fuel and radioactive waste

with the individual national reports from Member States, a Euratom report was presented to the 3rd Review Meeting of the Convention in 2008.

Details of the review process and summary reports from the meeting can be found on the IAEA website[20].

With the objective to seek ways for the further improvement of the Joint Convention Process in the EU, the European Nuclear Safety Regulators Group (ENSREG), an expert body composed of senior officials from national regulatory bodies, has produced a paper on this issue[21].

These ideas have been taken into account during the drafting of the Directive on the Management of Spent Fuel and Radioactive Waste. It incorporates the principles and requirements of the safety standards developed by the IAEA and the provisions of the Joint Convention, going even beyond them in some particular aspects (e.g. requirement for detailed national programmes, public participation in the decision making). When this Directive is adopted, the principles and requirements of the Joint Convention will have the legal enforceability of Community legislation, which means that control mechanisms for ensuring the correct transposition and further implementation of the Directive will be in force. This will improve the current situation, where no sanction mechanisms are applicable for Contracting Parties who do not comply with their obligations towards the Joint Convention.

8. CONCLUSIONS

8.1. Waste Quantities

Annual generation of HLW / Spent Fuel, which generally depends on the size of the nuclear power programme, remains broadly constant, but some increases are seen or expected due to decommissioning activities.

Quantities of waste in storage have increased, especially HLW and LILW-LL as there are as yet no disposal facilities in operation available.

The validation process against the last report and international databases partly showed deviations and inconsistencies which could not always be fully resolved. It appears that more efforts are required at national and international level to ensure consistency in data recording and reporting. To this end, the Commission launched a dedicated study, the results and recommendations of which were published in 2009[22]. It appears useful to further discuss this issue with all relevant stakeholders in the EU in order to further improve the situation.

8.2. Developments in Waste Policies and Practices

In the case of VLLW and LILW-SL it is likely that almost all Member States with nuclear power programmes (and some 'non-nuclear power' States) will implement disposal solutions in the medium term i.e. by 2020.

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20 http://www-ns.iaea.org/conventions/waste-jointconvention.htm
21 http://www.ensreg.eu/sites/default/files/HLG_p(2009-08)_27.Better%20information_0.pdf
22 http://ec.europa.eu/energy/nuclear/studies/doc/2009_09_radiactive_waste.pdf

However, for HLW and spent fuel (for direct disposal) only a few Member States, i.e. those actively pursuing repository developments, can be said to have definitive policies in place. The same situation exists for LILW-LL, since for these wastes also the preferred solution is geological disposal, whether in the same repository as HLW /spent fuel or separately.

It is expected that Member States will take concrete decisions for the safe long-term management of spent fuel and radioactive waste, in implementing the Council Directive.

8.3. Organisational Responsibilities

In most of the Member States, the responsibilities concerning waste management seem to be clearly identified and assigned, with significant roles given to national waste management organisations. However, there is still place for improvement in some Member States who lack qualified infrastructures for the management of their radioactive waste.

8.4. International Developments

The Joint Convention to date appears to have been a driver in promoting and assuring improvements in the safety of waste management. Furthermore, the Directive on Radioactive Waste Management requires that Member States report to the Commission on the implementation of the Directive, taking advantage of the review and reporting cycles under the Joint Convention. It is expected that this measure will contribute to a better coordination of the Member States' participation at the review processes of the Joint Convention.

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TABLE A NUCLEAR INSTALLED CAPACITY (current and predicted)						
Country	Installed net capacity of commercial reactors August 2010 (Gwe)	Comments	Predicted capacity end 2020 (GWe)	Predicted capacity end 2030 (GWe)	Predicted capacity end 2040 (GWe)	Comments
Belgium	5,93	Installed capacity by 2009. There has been an increase in the net installled capacity since then, but this information has not been provided.	4,11 - 5,93	0	0	The range of the 2 figures for 2020 depends on the life-time extension of Doel 1, Doel 2 and Tihange 1 (either operative for 40 or 50 years). Agreement between Belgian Government and nuclear operator has not been to date translated into law.
Bulgaria	1,91		3,93	5,93	5,93	
Czech Republic	3,68	Units in NPP Dukovany are being uprated to 500 MW	5,00	6,00	to be defined	2 units 1000-1500 MW each in NPP Temelin are planned
Finland	2,72	1.6 GWe under construction	4,30	7,90	7,90	Construction of two new units
France	63,13		66,3	9,7 - 66,3	3,7 - 66,3	Installed capacity at 2030 & 2040 will vary depending on potential lifetime extensions of the current fleet of reactors; range of the 2 figures depends on the life-time extension from 40 - 60 years. No new NPP taken into account in calculations appart from the already planned ones.
Germany	20,48		13,4	9,6	0	
Hungary	2,00		2,00	2,00		
Lithuania	0	Both Ignalina NPP units are shut down. Unit 1 and Unit 2 were shut down on 31. Dec. 2004 and 31.Dec.2009 respectively	0,75 - 1,70	to be defined	to be defined	
Netherlands	0,5		max 3,0	max 3,0	max 2,5	Provisional figures: the licensing procedure of a new NPP is in an early stage.
Poland	0		1,5	4,5 - 6,0	15	

TABLE A NUCLEAR INSTALLED CAPACITY (current and predicted)						
Country	Installed net capacity of commercial reactors August 2010 (Gwe)	Comments	Predicted capacity end 2020 (GWe)	Predicted capacity end 2030 (GWe)	Predicted capacity end 2040 (GWe)	Comments
Romania	1,3		2,6	2,6	1,95	end 2020: 4 CANDU Units in operation end 2040: one CANDU Unit shut down
Slovakia	1,88		3,09	3,09	3,09	Assumption for operational lifetime of NPPs: 60 years
Slovenia	0,7		0,7	0,7	0,7	Operational lifetime until 2023, possible prolongation
Spain	7,5	Ref.: IAEA PRIS Database	7,33	0	0	Assumption for operational lifetime of NPPs: 40 years
Sweden	9,76		9,76	9,76	9,76	
United Kingdom	10,14		to be defined	to be defined	to be defined	Installed capacity at 2020, 2030 & 2040 will vary depending on potential lifetime extensions of the current fleet of reactors and the installation of new capacity from 2018. Decisions on life time extensions and development of new capacity are for the respective developers and it is not possible currently to provide accurate figures.
Total EU-27	131,63					

RW DISPOSED OF BY END OF 2007

Country	quantitiy (m³)	Period	Origin/type of waste	Type of disposal	Site(s)	Still in use?	Comment
Belgium	15.000	till 1982	LILW	ocean	North Atlantic	no	
Bulgaria	260	1964-94	institutional	surface	Novi Han	yes	In use but only for storage
Czech Republic	5.930	1994-present	NPP operational	surface	Dukovany	yes	
	330	1958-1965	institutional	mine (limestone)	Hostím	no	
	7.300	1964-present	institutional	mine (limestone)	Richard	yes	
	993	1974-present	institutional	mine (uranium)	Bratrství	yes	
Estonia	848	1997-present	institutional + D&D	surface	Paldiski	yes	
	110	1963-1995	institutional	RADON	Tammiku (Saku)	no	Under decommissioning since 2008. All radioactive waste from Tammiku disposal as well as decommissioning waste arising from Tammiku will be removed to the Paldiski interim storage
Finland	4.790	1992-present	NPP operational	rock cavern	Olkiluoto	yes	
	1.475	1998-present	NPP operational	rock cavern	Loviisa	yes	
France	9.900	1967-69	LILW	ocean	North Atlantic	no	
	527.000	1969-94	LILW-SL	surface	Centre de La Manche	no	
	208.100	1992-present	LILW-SL	surface	Centre de L'Aube	yes	
	89.300	2003-present	VLLW	surface	Morvilliers	yes	
Germany	96	1967	LILW	ocean	North Atlantic	no	
	47.000	1967-78	LILW	deep	Asse salt mine	no	
	36.753	1971-98	LILW	deep	Morsleben	no	The figure includes 6.617 sealed radioactive sources
Hungary	5.040	1976-present	institutional + formerly NPP operational	surface	Püspökszilágy	yes	The repository is full, but a safety enhancement programme has been started, which results free disposal capacity sufficent for disposal of institutional waste in the next several decades
Italy	23	1967	LILW	ocean	North Atlantic	no	
Latvia	800	1963-present	institutional	RADON	Baldone	yes	Very small scale disposal only
Netherlands	8.700	until 1982	LILW	ocean	North Atlantic	no	
Poland	2.800	1961-present	institutional	surface	Różan	yes	
Romania	1.869	1985-2007	institutional	mine (uranium)	Baita-Bihor	yes	
Slovakia	4.590	1999-present	LILW-SL	surface	Mochovce	yes	
Spain	55.988	1992-present	LILW-SL	surface	El Cabril	yes	
Sweden	31.768	1989-present	LILW-SL	rock cavern	SFR	yes	No waste have been disposed of in shallow land burials between 2004 and 2007
	3.929	1986-present	VLLW	surface	Forsmark (FKA)	yes	
	7.346	1986-present	VLLW	surface	Oskarshamm (OKG)	yes	
	3.471	1993-present	VLLW	surface	Ringhals (RAB)	yes	
	1.140	1988-present	VLLW	surface	Studsvik	yes	
United Kingdom	33.000	until 1983	LILW	ocean	North Atlantic and coastal waters	no	
	800.000	1959-1995	LILW-SL	surface	Near the village of Drigg	no	
	200.000	1995-present	LILW-SL	surface		yes	
	33.600	1959-2002	LILW-SL	surface	Dounreay	no	currently plan to retrieve this waste

TABLE C: RW and SF GENERATION IN THE YEAR 2007

Country	VLLW				LILW-SL (m³)				LILW-LL (m³)				HLW (m³)	SF (te HM)	Comments
	total (m³)	from decommis-sioning of NPPs & research reactors (%)	from operation of NPPs & research reactors (%)	from other uses (%)	total (m³)	from decommis-sioning of NPPs & research reactors (%)	from operation of NPPs & research reactors (%)	from other uses (%)	total (m³)	from decommis-sioning of NPPs & research reactors (%)	from operation of NPPs & research reactors (%)	from other uses (%)			
Austria	-	-	-	-	277	29	-	71	2	-	-	100	-	-	incoming raw waste (unconditioned) 2007; no VLLW, HLW and SF in Austria
Belgium	-	-	-	-	352	-	75	25	71	-	-	100	-	107	
Bulgaria	-	-	-	-	1.291	0,14	99,82	0,04	-	-	-	-	-	39	no LILW-LL have been generated
Czech Republic	-	-	-	-	403	-	84	16	11	-	-	100	1,8	~80	
Denmark	-	-	-	-	400	99	-	1	-	-	-	-	-	-	The category VLLW is not used in Denmark
Estonia	-	-	-	-	0,3	see comment	-	100 (institutional)	-	see comment	-	-	-	-	6 m3 arised from decommissioning of Former USSR Navy Training Center in Paldiski, but difficulties to characterize this waste.
Finland	-	-	-	-	180	-	100	-	2	-	100	-	-	70	
France	29.000	-	20	80	14.000	-	50	50	1.450	-	10	90	120	1150	These data come from a calculation of a yearly average over RW and SF generations in the period of three years 2005 to 2007 (based on extracted data from National Inventory of Radioactive Materials and Waste, 2009, Andra)
Germany	-	-	-	-	2.385	35	42	23	see comment	-	-	-	-	375	LILW classified as radioactive waste with negligible heat generation; only conditioned waste The figure for LILW-SL includes also LILW-LL.
Greece	2,6	100	-	-	0,4	-	100		0,1	-	-	100	-	-	
Hungary	-	-	-	-	175	-	89	11	17	-	100	-	-	45	This does not include 405 m³ NPP liquid waste.
Italy	400	-	-	100	650	100	-	-	-	-	-	-	-	-	
Ireland	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Ireland does not have nuclear power generating capacity. Any radioactive wastes produced in non nuclear activities are either discharged under authorisation or are returned to suppliers in the form of disused sources
Latvia	-	-	-	-	1,4	60	-	40	1	86		14	-	-	
Lithuania	248,3	-	100	-	580	-	100	-	14	-	100	-	-	69	
Luxembourg	< 0,1	-	-	100	< 0.1	-	-	100	< 0.1	-	-	100	-	-	
Malta	-	-	-	-	< 0.1	-	-	100	< 0.1	-	-	100	-	-	
Poland	-	-	-	-	30,5	-	18	82	0,45	-	-	100	-	0,018	This does not include 84,5 m³ of liquid LILW-SL, 99,5% of which comes from operation of NPPs and research
The Netherlands	-	-	-	-	539	-	36	64	736	-	36	64	10,2	0,07	
Portugal	-	-	-	100	-	-	-	100	-	-	-	-	-	-	
Romania	50	-	-	100	43	4,7	92	3,3	2,4	-	92	7,6	-	91	LILW-SL includes some LILW-LL (at Cernavoda NPP radwaste are not yet fully characterized)
Slovakia	-	-	-	-	3.895	13,8	86	0,02	-	-	-	-	13	49	In column HLW values are considered as a non disposal waste to RU RAO.This type of waste is not clasified from law as a HLW.
Slovenia	-	-	-	-	49	-	95	5,3	-	-	-	-	-	22	LILW-SL may contain some LIW-LL
Spain	-	-	-	-	761	53	40	6,4	-	-	-	-	-	224	Some LILW-SL could be classified as VLLW depending on acceptance.LILW-SL also can contain some LILW-LL
Sweden	1.000	-	90	10	518	-	88	12	200	-	70	30	-	220	Significant difference in respect of data provided at 6th SR due to volume reduction.
United Kingdom	-	-	-	-	14.400	<1	~1	98	36.400	21	7	72	46	~450	VLLW not recorded in national inventory. Waste and SF quantities are part actual and part estimate.
Totals	30.701				40.930				38.907				191	2.460	
	110.729													2.460	

Please note that HLW arises form the reprocessing of SF. Production of HLW therefore results in a reduction in SF stocks

TABLE D:

RW and SF IN INTERIM STORAGE AT THE END OF 2007

Country	VLLW (m^3)			LILW-SL (m^3)			LILW-LL (m^3)			HLW(m^3)			SF (tHM)			Comments
	currently in storage (m^3)	total current storage capacity (m^3)	estimated year current capacity is completely used	currently in storage (m^3)	total current storage capacity (m^3)	estimated year current capacity is completely used	currently in storage (m^3)	total current storage capacity (m^3)	estimated year current capacity is completely used	currently in storage (m^3)	total current storage capacity (m^3)	estimated year current capacity is completely used	currently in storage (te HM)	total current storage capacity (te HM)	estimated year current capacity is completely used	
Austria	-	-	-	2.036	3.000	2030	56	Same facility as for LILW-SL and therefore included there	2030	-	-	-	-	-	-	Conditioned waste in the interim storage, mainly in 200L drums.
Belgium	-	-	-	14.100	16.640	2017	4.800	9.120	-	70	106	-	2.420	-	-	The vitrified waste from the Pamela facility (195 m^3) has been requalified as LILW-LL.
Bulgaria	-	-	-	10.315	35.900	2015	98	200	2030	-	-	-	872	872	2010	The wet storage capacity is designed for 168 baskets.
Czech Republic	-	-	-	1.000	1.500	2070	10	50	2070	0	10	-	1.117	1.340	Current storage capacity is expected to be sufficient	
Denmark	-	-	-	3.200	5.100	Current storage capacity is expected to be sufficient	300	Same facility as for LILW-SL and therefore included there	-	-	-	-	180	200	Current storage capacity is expected to be sufficient	In addition there is 1.100 tons tailings.
Estonia	-	-	-	848	1.277	under estimation	2,5	see comment	see comment	-	-	-	-	-	-	Figure provided corresponds to Paldiski IS. National plan 2007-2018 foresees start with feasibility studies for decomissioning of reactor compartments in Paldiski site and estimation of the radioactive waste streams in Estonia. Based on the outcomes of the feasibility study the suitable options for repository will be chosen. Evaluation of radioactive waste streams is in process.
Finland	-	-	-	3.035	13.260	2039 (Loviisa site) / 2046 (Olkiluoto site)	-	-	-	-	-	-	1.570	2.140	2021	
France	-	-	-	-	-	-	124.300	-	-	2.220	2.839	2012	13.100	-	-	VLLW and LILW-SL : in-line waste conditioning for a purpose of disposal LILW-LL : storing capacities are enough until operation of the geological disposal, planned in 2025 HLW : operation of an extension of storing capacities is planned for 2012
Germany	-	-	-	81.972	see comment	-	9.108	330.000	never	550		never	5.831	26.835	never	LILW classified as radioactive waste with negligible heat generation; only conditioned waste. Therefore the data for LILW SL and LL have been provided jointly (total is 91.080 m^3). For the purposes of this table, it can be roughly estimated that 90% of the LILW corresponds to SL and 10% to LL. The storage capacities, also provided jointly, are not splitted in the same way. SF due to nuclear phaseout.
Greece	5,2	20	2050	40	60	2030	1	5	2040	-	-	-	-	-	-	
Hungary	-	-	-	1.667	1.830	2008	84	223	2035	-	-	-	828	1.137	the Hungarian ISFS is a modular type. Step by step extension according to the needs.	LILW-SL: 6245,6 m^3 liquid waste is not included into these data. The total storage capacity for liquid waste is 10.020 m^3, which will be exhausted in 2016. SF: Of the provided figure, 301,6 Te HM at reactor storage and 835,2 Te HM away from reactor.
Italy	4.085	under estimation		21.900	under estimation		1.415	under estimation		-	-	-	230 (post irradiation)	under validation		228 Te HM stored into the Trino, Caorso, Deposito Avogadro pools, to be shipped to the reprocessing plant. 1.7 Te HM stored into the ITREC pool, destined to the interim storage
Ireland	600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	See comments to table C. A quantity of old disused sources accumulated prior to the introduction of takeback agreements are held under licence at premises in the State awaiting either central storage or final disposal. 600 m^3 includes source conditioning.

TABLE D:

RW and SF IN INTERIM STORAGE AT THE END OF 2007

Country	VLLW (m^3)			LILW-SL (m^3)			LILW-LL (m^3)			HLW(m^3)			SF (tHM)			Comments
	currently in storage (m^3)	total current storage capacity (m^3)	estimated year current capacity is completely used	currently in storage (m^3)	total current storage capacity (m^3)	estimated year current capacity is completely used	currently in storage (m^3)	total current storage capacity (m^3)	estimated year current capacity is completely used	currently in storage (m^3)	total current storage capacity (m^3)	estimated year current capacity is completely used	currently in storage (te HM)	total current storage capacity (te HM)	estimated year current capacity is completely used	
Latvia	-	-	-	93	800	2060	82	200	2060	-	-	-	0,4	4	05.12.2008	SF from the research reactor at Salaspils has been moved out to Russia in May 2008.
Lithuania	21.392	23.561	2016	15.396	36.477	2018	803	1.378	2035	-	-	-	2025	2.263	2011	This does not include untreated liquid wastes. The years are provided taking into account current yearly amount of arising waste. A new facility for treatment and storage of solid radioactive waste is under construction, start of operation planned in 2012. For bituminised waste and cemented ion exchange resins, existing capacities completely cover the needs.
Malta	-	-	-	1,2	-	-	0,1	-	-	-	-	-	-	-	-	Sources currently held by individual organisation sites. Surface disposal facility planned consisting of dedicated building with basement. There is no intention to retrieve the waste but it can be retrieved if required. Facility planned to be operational by 2014, subject to the approval of the building permits.
Poland	-	-	-	-	-	-	801	1.760	2020	-	-	-	0,2	0,4	-	Wet storages. The total storage capacity for 2007 refers only to the following specific case of the SNF stored at this time: HEU-SNF of MR type with 80% enrichment (288 fuel elements) and LEU-SNF of EK-10 type with 10% enrichment (about 2500 fuel elements)
The Netherlands	-	-	-	10.005	22.200	2025	3.639	5.875	2025	25,3	45,8	2015	0,3	0,7	2015	
Portugal	-	-	-	95	-	-	44	-	-	-	-	-	-	-	-	
Romania	212*	1.330*	-	445**	2.066***	2027***	-	-	-	0	41	-	1.072	8.056	-	LILW-LL included in LILW-SL (radwaste not yet characterized). The data for HLW and SF correspond to Cernavoda NPP *These data correspond mainly to the IFIN HH site (taking into account total storage capacity on site) **Of these 445m³, 382 m³ are for Cernavoda NPP and 63m³ for IFIN HH *** These data correspond to Cernavoda NPP.
Slovakia	-	-	-	13.649	29.401	No during lifetime	12,4	21	No during lifetime	0	0	No during lifetime	1.180	1.515	2023	VLLW: Data differ from 6th Situation Report due to change in legislation; waste characterisation is now in line with IAEA standards
Slovenia	-	-	-	2.192	2.600	2013	-	-	-	-	-	-	131	226	2024	LILW-SL may contain some LIW-LL. The estimated capacity is provided for the storage at the NPP and not for the Central storage for institutional LILW
Spain	6.295	-	-	6.812	depending on start-up of Centralized Storage Facility in 2015		2.247	depending on start-up of Centralized Storage Facility in 2015		13	depending on start-up of Centralized Storage Facility in 2015		3.720	4.982	depending on start-up of Centralized Storage Facility in 2015	HLW and LILW-LL 666 m3 stored in France from reprocessing of Vandellos 1 NPP spent fuel. The rest of LILW-LL stored on site at Vandellos 1 NPP from its decommissioning. Regarding storage capacities for SNF and those RW that cannot be disposed of at the El Cabril LILW-SL disposal center, it is foreseen that the startup in 2015 of the CTS (Centralized Temporary Storage) facility will provide sufficient storage capacity for existing and forthcoming inventories, preventing the saturation of the pools of operating NPPs. There is the exception for Ascó NPP for which an Independent Storage Facility for SNF, similar to that one already in operation at Jose Cabrera NPP, will be in operation in 2011.
Sweden	-	-	-	31.768	6.300	2023	6.000	10.000	2050	-	-	-	4.676	8.000	2027	VLLW is disposed of in campains carried out at irregular intervals in shallow land burials at Forsmark, Oskarshamm, Ringhals and Studsvik sites. Thus it is not considered relevant to try to specify what was in storage by the end of 2007.
United Kingdom	-	-	-	1.450	-	-	133.000	-	-	1.270	-	-	5.900	-	-	LILW and HLW volumes include waste from reprocessing overseas spent fuel. The UK plans to return HLW to overseas customers. VLLW and storage capacities not recorded in national inventory.

TABLE E:

BEST ESTIMATES FOR ADDITIONAL WASTE AND SPENT FUEL ARISINGS UP TO 2020, 2030 AND 2040 (FROM 2008)

Country	Year	VLLW (m^3)	LILW-SL (m^3)	LILW-LL (m^3)	HLW(m^3)	SF (Te HM)	Comments
Austria	2020	-	450	5	-	-	conditioned waste in interim storage
	2030	-	900	10	-	-	
	2040	-	1.000	15	-	-	
Belgium	2020	-	7.800	3.900	-	-	Assumption: closure of all NPP after 40 years of operation. Current policy: moratorium on reprocessing of SF since 1993
	2030	-	33.000	5.200	-	-	
	2040	-	38.500	5.400	-	-	
Bulgaria	2020	21.000	45.640	98	-	527	quantitites estimated starting from 2008 taking into account the possible life extention of Units 5 and 6 up to 2032 and 2036 respectively
	2030	54.000	52.940	200	-	940	
	2040	69.000	66.880	290	-	1.105	
Czech Republic	2020	-	4.800	-	-	960	
	2030	-	5.000	50	-	1.000	
	2040	200	5.200	200	-	1.200	
Denmark	2020	-	730	300	-	-	
	2030	-	760	300	-	-	
	2040	-	790	300	-	-	
Estonia	2020	-	under estimation		-	-	National Development Plan for Radiation Protection 2007-2018 foresees start with feasibility studies for decomissioning of reactor compartments in Paldiski site and estimation of the radioactive waste streams in Estonia. Based on the outcomes of the feasibility study the suitable options for depository will be chosen. Evaluation of radioactive waste streams is currently in process.
	2030	-			-	-	
	2040	-			-	-	
Finland	2020	-	8.865	-	-	2.650	It is estimated that 99 % of LILW waste produced by NPP's is of short lived category. In SF figures, Olkiluoto 3 and 2 new reactors, assumed to be commissioned in 2020, are included.
	2030	-	10.865	-	-	4.400	
	2040	-	12.865	-	-	6.700	

TABLE E:

BEST ESTIMATES FOR ADDITIONAL WASTE AND SPENT FUEL ARISINGS UP TO 2020, 2030 AND 2040 (FROM 2008)

Country	Year	VLLW (m^3)	LILW-SL (m^3)	LILW-LL (m^3)	HLW(m^3)	SF (Te HM)	Comments
France	2020	398.000	217.000	37.300	1.390	4.060	no available data for 2040
	2030	638.000	382.000	78.600	2.780	2.200	
	2040	-	-	-	-	-	
Germany	2020	-	86.500	-	800	4.960	LILW classified as radioactive waste with negligible heat generation; only conditioned waste. Arising due to nuclear phaseout. Classification is not HLW but heat generating waste. As in table C, due to the classification system applied, the figure for LILW-SL includes also LILW-LL.
	2030	-	152.500	-	1.750	7.710	
	2040	-	181.500	-		9.020	
Greece	2020	30	-	-	-	-	
	2030	60	-	-	-	-	
	2040	90	-	-	-	-	
Hungary	2020	-	6.310	65	-	529	No liquid waste treatment/conditioning is taken into account. The indicated amount of LILW-SL contains (unconditioned) liquid and solid waste together. HLW will arise only during the decomissioning period between 2064 and 2080.
	2030	-	11.010	115	-	927	
	2040	-	13.460	140	-	1.292	
Italy	2020	8.300	49.000	12.500	18	-	Conditioned waste stored in the national repository HLR volumes arising from the reprocessing of Latina, Trino, Garigliano and Caorso NPPs spent fuel. (The volume arise from the total amount of the canisters)
	2030	8.300	54.500	12.500	67	-	
	2040	8.300	62.500	12.500		-	
Ireland	2020	-	-	-	-	-	Ireland does not plan to allow for accumulation of future wastes for current practices. As part of regulatory requirements sources will be returned to suppliers when they are no longer required. The estimated total volume requirements is 600 cubic meters (this includes source conditioning).
	2030	-	-	-	-	-	
	2040	-	-	-	-	-	
Latvia	2020	-	600	70	-	-	
	2030	-	630	80	-	-	
	2040	-	660	90	-	-	

TABLE E:

BEST ESTIMATES FOR ADDITIONAL WASTE AND SPENT FUEL ARISINGS UP TO 2020, 2030 AND 2040 (FROM 2008)

Country	Year	VLLW (m^3)	LILW-SL (m^3)	LILW-LL (m^3)	HLW(m^3)	SF (Te HM)	Comments
Lithuania	2020	18.000	40.538	2.450	-	382	
	2030	30.338	59.000	3.690	-	-	
	2040	-	-	-	-	-	
Malta	2020	-	0,1	1	-	-	
	2030	-	0,2	1,5	-	-	
	2040	-	0,3	2	-	-	
Poland	2020	-	700	12	-	0,18	The figures provided are for solid waste. In adition, there are currently 1.250 m³ of liquid LILW-SL. During current phase of implementation of Nuclear Power Program, it's yet impossible to assess any amounts of RW and SF of NPP origin. These estimates include and involve only up-to-date status, i.e. institutional RW and RR RW/SF.
	2030	-	-	-	-	0,36	
	2040	-	-	-	-	0,54	
The Netherlands	2020	-	5.274	22.728	25	0,7	
	2030	-	7.274	32.007	44	1,3	
	2040	-	8.874	32.436	63	1,9	
Portugal	2020	-	-	-	-	-	Information not available
	2030	-	-	-	-	-	
	2040	-	-	-	-	-	
Romania	2020	900	974	616	<1	2.438	
	2030	1.200	2.527	1.293	-	6.352	
	2040	2.000	3.922	1.970	-	10.266	
Slovakia	2020	18.130	11.034	-	15	657	VLLW: data differ from Sixth Situation Report due to change in legislation; waste characterisation is now in line with IAEA standards
	2030	6.850	19.217	-	22	1.179	
	2040	7.500	22.200	-	29	1.701	

TABLE E: BEST ESTIMATES FOR ADDITIONAL WASTE AND SPENT FUEL ARISINGS UP TO 2020, 2030 AND 2040 (FROM 2008)							
Country	**Year**	**VLLW (m³)**	**LILW-SL (m³)**	**LILW-LL (m³)**	**HLW(m³)**	**SF (Te HM)**	**Comments**
Slovenia	2020	-	576	-	-	206	LILW-SL may contain some LIW-LL
	2030	-	4.983	-	-	-	
	2040	-	7.201	-	-	-	
Spain	2020	10.500	13.000	1.000	-	1.912	Estimation covers additional waste to be generated from 1/1/2008
	2030	29.000	26.000	1.000	-	3.000	In order to optimise the available capacity at the El Cabril centre, efforts are being developed aiming at volume reduction, decontamination and clearance of materials.
	2040	83.000	52.000	1.000	-	-	
Sweden	2020	6.600	16.000	7.300	-	2.600	
	2030	11.700	53.000	7.300	-	4.800	
	2040	17.000	91.000	7.300	-	7.000	
United Kingdom	2020	-	376.000	487.000	103	7.850	LILW includes waste arising from the reprocessing of fuel for foreign customers. It is not currently possible to provide accurate figures for arisings from potential lifetime extensions of the current fleet of UK reactors or from the installation of new capacity from 2018. VLLW not recorded in national inventory.
	2030	-	557.000	796.000	103	8.750	
	2040	-	586.000	1.032.000	103	8.750	

TABLE F: PLANNED NEW DISPOSAL CAPACITIES						
Country	Type of waste	Capacity (m³)	Planned start of operation	Type of disposal	Site	Comments
Belgium	LILW-SL	70.500	2016	Surface	Dessel	The disposal capacity is based on the following assumption: closure of all NPP after 40 years of operation
Bulgaria	LILW-SL	138.000	2015	Near -surface	Radiana	Trench type
Finland	LLW	2.120	2012	near surface rock cavern	Loviisa	New capacity will be used in the initial phase as handling and sorting storage of LLW until used for disposal of decommissioning waste.
France	LILW-LL, HLW, SF	122.200	2025	Deep geological disposal	Meuse	Decision expected by 2015 with operation by 2025.
Germany	heat generating waste	≈ 60.000	by 2040	Deep geological disposal	Gorleben	Gorleben is currently being investigated as a repository site. The capacity is estimated by the reference concept using POLLUX-casks.
	waste with negligible heat generation	303.000	2013	Deep geological disposal	Konrad	Currently under construction.
Hungary	LILW-SL (NPP origin)	25.000*	2012**	intermediate depth geological	Bátaapáti	* Effective disposal capacity (volume of disposable waste packages). ** Planned start of operation of the first two disposal chambers. (The others will start operation stepwise until 2076)
	SF HLW LILW-LL	under estimation*	2064	Deep geological disposal	Mecsek Hills region	*In lack of detailed information on the host rock and other important parameters, capacity of the future repository cannot be determined now. Regarding HLW/SF repository, according to a reference scenario, the following steps are envisaged: 1) construction of an URL is scheduled from 2030 to 2037, 2) examination of the appropriateness of the host rock: 2038-2054, 3) construction of the repository: 2055-2063.

TABLE F: PLANNED NEW DISPOSAL CAPACITIES						
Country	Type of waste	Capacity (m^3)	Planned start of operation	Type of disposal	Site	Comments
Italy	LILW	210.000	by 2020	Surface		Repository currently under development to allocate 90.000 m^3 of conditioned LILW coming from: dismantling of old nuclear installation, operation of future nuclear power plants and other research, industrial and medical activities .
Latvia	LILW-SL LILW-LL	2.400	from 2013	Radon	Baldone	New repositories for disposal are not planned, except enlargement of the existing (see Table K)
Lithuania	VLLW	60.000	2013	Surface	Ignalina NPP	
	LILW-SL	100.000	2017	near-surface	Stabatiškė (Ignalina NPP)	
Malta	LILW-SL LILW-LL	12	2014 subject to permit approval	Surface		Surface disposal facility planned consisting of dedicated building with basement. There is no intention to retrieve the waste but it can be retrieved if required.
The Netherlands	-	-	-	-	-	-
Poland	According to up to-date legislation: disposal of L/ILW; storage of HLW		2020	Surface	yet unknown	A new surface disposal facility is planned, though due to early stages of implementation of Nuclear Power Program (e.g. no final decision about the amount and type of reactor units to be built), it's yet impossible to give planned capacity and other information.
Romania	LILW-SL	122.000	2014	near-surface	Saligny	under revision
	HLW, SF	conceptual design under development	2055	geological	yet unknown	The geological repository will accommodate about 20.000 te HM and other LILW/LL coming from operation, dismantling and refurbishment of Cernavoda NPP.
Slovakia	VLLW	68 000	2016	surface	Mochovce	
	LILW	10 800	2016	surface	Mochovce	
Slovenia	LILW	9.400	2016	near-surface	Near NPP Krško	Silo type. Status: siting completed
Spain	VLLW	120.000	2008	Surface	El Cabril	The capacity will be constructed in a modular basis as neeeded. See table G.
	SNF/HLW/LILW-LL	13.000	2060	Deep geological disposal	yet unknown	
Sweden	LILW-SL	200.000	2020	intermediate depth geological	Forsmark	Intermediate depth (50 m) - extension to existing repository for operational LILW (SFR)
	LILW-LL	10.000	2045	intermediate depth geological	yet unknown	Intermediate depth (250 m)
	SF	12 000 Te HM	2025	Deep geological disposal	Forsmark	About 500 meters depth.

TABLE F: PLANNED NEW DISPOSAL CAPACITIES						
Country	Type of waste	Capacity (m^3)	Planned start of operation	Type of disposal	Site	Comments
United Kingdom	LLW	110.000	2010	Grouted containers in multi-barrier disposal vault	Cumbria	Refers to Vault 9, a new vault at the UK LLW Repository in Cumbria. Presently only licensed for storage.
	LLW	292.500	Up to 2070	Grouted containers in multi-barrier disposal vault	Cumbria	Refers to Vaults 10 -12 at UK LLW Repository in Cumbria, subject to appropriate permitting and demand.
	VLLW and LLW	143.400	From 2014	LLW in grouted containers and demolition waste in nylon bags in multi-barrier disposal vault	Dounreay	A new facility adjacent to the Dounreay facility for the disposal of VLLW and LLW from Doureay and adjacent HMS Vulcan Naval Reactor Test Establishment.
	VLLW and lower end LLW	yet unknown	From 2011 onwards (subject to permitting)	Surface	Various	A small number of commercial waste management organisations in the UK are looking to provide VLLW and lower end LLW disposal services at existing and new landfill type facilities.
	ILW, HLW, SF and NM (England and Wales only)	480.000	2040	Deep geological disposal	yet unknown	Information based on MRWS: A Framework for Implementing Geological Disposal, June 2008. Includes capacity for spent fuel, plutonium and uranium.
	Higher Activity Waste	yet unknown	yet unknown	Long-term, near surface, near site disposal or storage facilities	yet unknown	Information based on Scottish Government Policy announced in 2007. A Detailed Statement of Policy is expected to be published by the end of 2010.

TABLE G:

BEST ESTIMATES FOR TOTAL DISPOSAL CAPACITIES IN 2020, 2030, 2040 and 2070

Country	Year	VLLW (m³)	LILW-SL (m³)	LILW-LL (m³)	HLW (m³)	SF (Te HM)	Comments
Austria	2020	-	-	-	-	-	
	2030	-	-	-	-	-	
	2040	-	-	-	-	-	
	2070	-	-	-	-	-	
Belgium	2020	-	70.500	-	-	-	No decision regarding long-term management option for LILW-LL, HLW and SF.
	2030	-	70.500	-	-	-	
	2040	-	70.500	-	-	-	
	2070	-	70.500	-	-	-	
Bulgaria	2020	-	138.000	-	see comment		Options for long-term in-country management of HLW and SF are being considered. Development planned of feasibility studies for geological disposal. Ongoing research of options to dispose of HLW from SNF reprocessing at international repositories. Construction foreseen of a long-term storage for HLW from the processing of SF. Commissioning of Stages 1 and 1A of the Dry Spent Fuel Storage Facility (DSFSF), capacity 5 700 assemblies from VVER-440. Constructuion of DSFSF for WWER-1000 fuel assemblies and long term storage on site.
	2030	-	138.000	-	-	-	
	2040	-	138.000	-	-	-	
	2070	-	138.000	-	-	-	
Czech Republic	2020	-	65.000	1.200	-	-	In operation Dukovany, Richard, Bratrství; Closed Hostím
	2030	-	65.000	1.200	-	-	In operation Dukovany, Richard; Closed Hostím, Bratrství
	2040	-	65.000	1.200	-	-	
	2070	-	65.000	1.200	1.000	10.000	
Denmark	2020	-	5.000-10.000		0	200	
	2030	-	5.000-10.000		0	200	
	2040	-	5.000-10.000		0	200	
	2070	-	5.000-10.000		0	200	
Estonia	2020	-	-	-	-	-	National strategy 2007-2018 foresees start with feasibility studies for decomissioning of reactor compartments in Paldiski and estimation of the radioactive waste streams in Estonia. Based on the outcomes of the feasibility study the suitable options for repository will be chosen. Evaluation of radioactive waste streams is currently in process.
	2030	-	-	-	-	-	
	2040	-	-	-	-	-	
	2070	-	-	-	-	-	
Finland	2020	-	26.000	-	-	2.650	Disposal and stepwise construction in the Onkalo SF disposal facility expected to start in 2020. Extension of Loviisa LILW repository to accommodate decommissioning waste. Extension of Olkiluoto LILW repository.
	2030	-	33.000	-	-	4.400	
	2040	-	33.000	-	-	6.700	
	2070	-	62.000	-	-	12.000	
France	2020	650.000	1.000.000	-	-	-	
	2030	650.000	1.000.000	110.000	12.000	200	
	2040	-	-	-	-	-	No available data for 2040 and 2070
	2070	-	-	-	-	-	

TABLE G:

BEST ESTIMATES FOR TOTAL DISPOSAL CAPACITIES IN 2020, 2030, 2040 and 2070

Country	Year	VLLW (m^3)	LILW-SL (m^3)	LILW-LL (m^3)	HLW (m^3)	SF (Te HM)	Comments
Germany	2020	-	-	303.000	-	-	LILW classified as radioactive waste with negligible heat generation. One repository for HLW and SF; HLW is classified as heat generating waste.
	2030	-	-	303.000	-	-	
	2040	-	-	303.000	60.000	15.000	
	2070	-	-	-	60.000	15.000	
Greece	2020	-	-	-	-	-	No estimations provided
	2030	-	-	-	-	-	
	2040	-	-	-	-	-	
	2070	-	-	-	-	-	
Hungary	2020	-	13.900	-	-	-	Data indicate the total effective disposal capacity. LILW-SL: two repositories are considered: Bátaapáti (NPP waste) under construction and Püspökszilágy (institutional waste) already in operation (5040 m3). No decision has been taken on back-end of the fuel cycle yet. Only rough estimates are available by 2070: approx. 400 m3 of HLW and LILW-LL plus 1300 Te HM SF are expected.
	2030	-	16.800	-	-	-	
	2040	-	24.200	-	-	-	
	2070	-	27.100*		400	1.300	*The total capacity need of 30.040 m^3 will be reached in 2076.
Italy	2020	210.000			-	-	
	2030				-	-	
	2040				-	-	
	2070				-	-	
Ireland	2020	-	-	-	-	-	Ireland does not currently have disposal plans
	2030	-	-	-	-	-	
	2040	-	-	-	-	-	
	2070	-	-	-	-	-	
Latvia	2020	-	4.080	200	-	-	The total disposal capacities consist of the planned new disposal capacities (Table F) and existing capacities (vaults´ volumes)
	2030	-	4.080	200	-	-	
	2040	-	4.080	200	-	-	
	2070	-	4.080	200	-	-	
Lithuania	2020	60.000	25.000**	-	-	-	*Planned to be commissioned in 2013. **Planned to be commissioned in 2017. This does not take into account bituminised waste.
	2030	60.000	100.000	-	-	-	
	2040	-	-	-	-	-	
	2070	-	-	-	-	-	
Malta	2020	-	-	-	-	-	Capacity of the surface disposal facility planned to be adequate for the LILW produced.
	2030	-	-	-	-	-	
	2040	-	-	-	-	-	
	2070	-	-	-	-	-	

TABLE G:

BEST ESTIMATES FOR TOTAL DISPOSAL CAPACITIES IN 2020, 2030, 2040 and 2070

Country	Year	VLLW (m^3)	LILW-SL (m^3)	LILW-LL (m^3)	HLW (m^3)	SF (Te HM)	Comments
Poland	2020	-	-	-	-	0,36	During current phase of implementation of Nuclear Power Program, it's yet impossible to assess any amounts of RW and SF coming from NPP origin. These estimates include and involve only up-to-date status, i.e. institutional RW and RR RW/SF.
	2030	-	-	-	-	0,36	
	2040	-	-	-	-	0,36	
	2070	-	-	-	-	-	
The Netherlands	2020	-	-	-	-	-	
	2030	-	-	-	-	-	
	2040	-	-	-	-	-	
	2070	-	-	-	-	-	
Portugal	2020	-	-	-	-	-	Information not available
	2030	-	-	-	-	-	
	2040	-	-	-	-	-	
	2070	-	-	-	-	-	
Romania	2020	-	127.000	-	-	-	VLLW will be disposed together with LILW-SL LILW-LL and HLW will be disposed together with SF
	2030	-	127.000	-	-	-	
	2040	-	127.000	-	-	-	
	2070	-	122.000	-	-	20.000	
Slovakia	2020	68.000	32.400	-	-	1.840	
	2030	68.000	43.200	-	-	2.361	
	2040	68.000	54.000	-	-	2.883	
	2070	68.000	77.400	-	-	4.022	
Slovenia	2020	-	9.400	-	-	-	
	2030	-	9.400	-	-	-	
	2040	-	9.400	-	-	-	
	2070	-	-	-	-	-	
Spain	2020	40.000	50.000	-	-	-	
	2030	60.000	50.000	-	-	-	
	2040	120.000	50.000	-	-	-	
	2070	-	-	13.000			The DGR would enter into operation around 2060 integrating the disposal of the LILW-LL, HLW and SF inventories

TABLE G: BEST ESTIMATES FOR TOTAL DISPOSAL CAPACITIES IN 2020, 2030, 2040 and 2070							
Country	**Year**	**VLLW (m^3)**	**LILW-SL (m^3)**	**LILW-LL (m^3)**	**HLW (m^3)**	**SF (Te HM)**	**Comments**
Sweden	2020	-	100.000	-	-	-	SF disposal facility to be continuosly constructed and operated. The numbers are based on very preliminary plans. Surface disposal facilities to be expanded when needed. No fixed plans exist.
	2030	-	100.000	-	-	1.000	
	2040	-	100.000	-	-	3.500	
	2070	-	200.000	10.000	-	12.000	
United Kingdom	2020	-	430.000	-	-	-	VLLW not recorded in national inventory.
	2030	-	560.000	-	-	-	All Lower Activity Waste is assumed to be LILW-SL and being disposed of at LLWR and Dounreay. VLLW not recorded in national inventory.
	2040	-	660.000	41.000	-	-	All Higher Activity Waste is assumed to be LILW-LL. In England and Wales it is being disposed of at the Geological Disposal Facility. In Scotland it will be managed in near site, near surface disposal or storage facilities. VLLW not recorded in national inventory.
	2070	-	760.000	358.000	-	-	Geological Disposal Facility is assumed to commence disposal of HLW/SF in 2075. VLLW not recorded in national inventory.

TABLE H: FINANCING SCHEMES FOR RADIOACTIVE WASTE					
Country	Mechanisms for financing longer term liabilities				Comments
	RW and SF from operation and decommissioning of nuclear installations	Legacy Wastes (or where operator does not longer exist)	RW from medical and industrial use	Waste from extractive industries	
Austria	No special decommissioning fund has been established; Austrian Government has taken over responsiblity for the costs of decommissioning of nuclear facilities which have been and are operated and owned finally by the Austrian State (research reactors and waste management facilities)	In case of orphan sources, the competent authority has to seize these sources and either arrange for a recycling or a disposal as radioactive waste. As a next step, the owner of the orphan source may be claimed for compensation of these costs. If an owner does not exist (anymore) the costs are to be borne by the State.	Treatment for this kind of waste is financed according to the polluter-pays-principle by the licence holder; when radioactive waste is delivered to NES for treatment and interim storage, a charge ("Vorsorgeentgelt") taking into account a risk premium ("Risikozuschlag") has to be paid	The costs for the treatment of radioactive waste or residues (both originating from handling of NORM) have to be paid by the polluter	
Belgium	RW from operation and decommissioning of nuclear installations has to be transferred from the producer or owner to the WMO. Upon transfer, the producer or owner pays to WMO the amount which covers the future management costs. These provisions are managed by the WMO.	Special mechanisms, such as the federal levy, exist for the financing of decommissioning and RW management arising from nuclear liabilities.	RW from medical and industrial use has to be transferred from the producer or owner to the WMO. Upon transfer, the producer or owner pays to WMO the amount which covers the future management costs. These provisions are managed by the WMO.	Not applicable.	Polluter pays principle applied: costs are waste category specific and proportional to the volume within each category.
Bulgaria	Funds "Radioactive waste" and "Decommissioning of nuclear facilities". Contributions are made at monthly basis by the operator of the nuclear installation during the period of operation. In the case of Units 1-4 of Kozloduy NPP activities are partially financed by KIDSF.	Following the provisions of the Ordinance on the Rules for the establishment, accumulation, disbursment and control of the resources of the Radioactive Watse Fund, legacy waste management is included in the annual program of the State Enterprise Radioactive Waste and is financed by the Radioactive Waste Fund within the annual budget of the SERAW.	Following the provisions of the Ordinance on the Rules for the establishment, accumulation, disbursment and control of the resources of the Radioactive Watse Fund legal and physical bodies who generate RAW from the use of nuclear applications contrubute to the fund the nessesary financila resources, determined by a methodology developed by SERAW and approved by the Board of Governors of the Fund. The methodology is based on the activity, volume, half-life of the sources declared as waste.	Uranium mining in Bulgaria is closed in 1992. Rehabilitation of the sites has been implemented with co-financing of PHARE program.	

TABLE H: FINANCING SCHEMES FOR RADIOACTIVE WASTE					
Country	Mechanisms for financing longer term liabilities				Comments
	RW and SF from operation and decommissioning of nuclear installations	Legacy Wastes (or where operator does not longer exist)	RW from medical and industrial use	Waste from extractive industries	
Cyprus			According to the law, the licensee has an obligation to take responsibility for all waste products and his facilities and any disused source shall be returned to the manufacturer/supplier after its useful life. Medical centers are the main source of radioactive waste in Cyprus and small quantities of short half-life isotopes produced enter directly the sewage system, whereas wastes from an oncology center where most of the I-131 therapies take place are temporarily stored for decay and then discharged into the sewage system. All practices involving ionising radiation including radioactive waste management are subject to licensing by the Minister of Labour and Social Insurance.		
Czech Republic	Producer fully responsible, for spent fuel disposal state special account (nuclear account at Czech National Bank)	Government responsible	Producer fully responsible (payment upon delivery)	Producer fully responsible	
Denmark	State obligation	State obligation	State obligation, but waste producers pay a fee for transferring of responsibility to Danish Decommissioning (DD)		
Estonia	State (RW from decommissioning of nuclear installations); SF n/a	State	source owner	extractive industry/operator	

TABLE H: FINANCING SCHEMES FOR RADIOACTIVE WASTE					
Country	Mechanisms for financing longer term liabilities				Comments
	RW and SF from operation and decommissioning of nuclear installations	Legacy Wastes (or where operator does not longer exist)	RW from medical and industrial use	Waste from extractive industries	
Finland	According to the Nuclear Energy Act the licence holder has an obligation to take responsibility for all nuclear waste management measures and their appropriate preparation (including decommissioning costs), and shall cover all the related expenses. This is done by gathering adequate funds for future investments in Nuclear Waste Management Fund operated by the Ministry of Employment and the Economy (MEE). To garantee against the insolvency of the nuclear utilities, they shall provide securities to MEE for the part of financial liability which is not covered by the Fund.	State responsibility (currently very small amounts)	Fee collected from waste producers to cover further liabilities (disposal state responsibility)	Small amounts of waste, responsibiliy of producer	
France	According to the Planning Act of June 26th 2006, nuclear operators have to constitute provisions corresponding to all their charges relating to the management of their spent fuel and radioactive waste. They allocate the required assets to the coverage of those provisions.	Andra is in charge with the management of legacy wastes. Government subsidies finance the associated specific charges on a yearly basis.	Andra is in charge with the management of RW from medical and industrial uses. The medical and industrial corresponding producers pay fees to Andra for this management on a price list basis.	Extractive industries store their Radioactive Materials and finance this storage by themselves by the time a management route or a process of reuse is designed for them.	
Germany	State-owned installations: Public funds. Private installations: Reserves built up during the operational phase.	Public funds	Fees payed by the waste producers	Waste producers	
Greece	operator	the new owner	operator	operator	

TABLE H: FINANCING SCHEMES FOR RADIOACTIVE WASTE					
Country	Mechanisms for financing longer term liabilities				Comments
	RW and SF from operation and decommissioning of nuclear installations	Legacy Wastes (or where operator does not longer exist)	RW from medical and industrial use	Waste from extractive industries	
Hungary	The Central Nuclear Financial Fund, a segregated state fund with an account in the Hungarian State Treasury, will cover all future waste management and decommissioning costs of nuclear facilities, legacy wastes, and radioactive waste from medical and industrial use. The Paks NPP contributes to the Fund through annual payments during the NPP's life-time. The payments are calculated so that by the time when the NPP is shut down the amount accumulated in the Fund will be able to cover all predicted costs arising in the future, including the cost of decommissioning. Annual payments into the Fund by Paks Nuclear Power Plant Ltd. are proposed by the Minister supervising the Hungarian Atomic Energy Authority (HAEA). Payments are based upon submittals prepared by the WMO (PURAM) and approved by the Hungarian Atomic Energy Authority and by the Hungarian Energy Office. The budget of the Fund (including the payments into the Fund) is approved by the Parliament and is part of the Act on the budget of the Republic of Hungary. The Government is responsible to make the necessary contribution for decommissioning of the state-run nuclear facilities (research and training reactors) when their decommissioning becomes due.	The Central Nuclear Financial Fund covers the cost of disposal of legacy waste.	The Central Nuclear Financial Fund covers the cost of disposal of radioactive waste from medical and industrial use, but these waste producers, including also research and training reactors, pay a fee into the Fund for disposing their wastes according an official tariff list set by ministerial decree.	At present there are no extracting industries in Hungary. The remediation of the site of the closed uranium mine has been financed directly by the Government.	In order to ensure that the Fund maintains its value, the Government contributes to the Fund with a sum that is calculated on the average assets of the Fund in the previous year using the average base rate of the central bank in the previous year.

TABLE H: FINANCING SCHEMES FOR RADIOACTIVE WASTE					
Country	Mechanisms for financing longer term liabilities				Comments
	RW and SF from operation and decommissioning of nuclear installations	Legacy Wastes (or where operator does not longer exist)	RW from medical and industrial use	Waste from extractive industries	
Ireland			Currently holders of radioactive wastes including disued sources are responsible for any financial liabilities arising. Special provisions for holders of high activity sealed sources have been introduced in accordance with European Union requirements.		
Italy	a) Decommissioning funds set aside by former monopolistic Italian operator (ENEL), former owner of all the italian NPPs, were transfered to the body responsible for decommissioning (SOGIN), state owned company created in 1999. b) Financial levy (so called "A2") collected on the consumers' energy consuption bill (on average 0,0017€ per KW/h of consumption)		Producers pay for disposal		
Latvia	State financing completely	State financing completely	Predisposal management -by operators according the concluded agreements, disposal - by the State	not applicable	According to the law "On Natural Resources Tax" and the law "On Radiation Safety and Nuclear Safety" - in the case of impor into the Latvia of radioactive substances that, after use thereof generate radioactive waste which needs to be disposed of in Latvia, a natural resource tax is payable on the import of such substances. These tax payments are transferred to the special environmental protection budget of such local government in the territory of which the radioactive waste disposal site is located (Baldone).
Lithuania	State Enterprise Ignalina Nuclear Power Plant Decommissioning Fund (ie. National Fund), Ignalina International Decommissioning Support Fund (Donors´contribution), Ignalina Programme (EU funds).				
Luxembourg	not applicable	state budget	licensee / state budget	not applicable	
Malta	not applicable	not decided	not decided	not applicable	

TABLE H: FINANCING SCHEMES FOR RADIOACTIVE WASTE					
Country	Mechanisms for financing longer term liabilities				Comments
	RW and SF from operation and decommissioning of nuclear installations	Legacy Wastes (or where operator does not longer exist)	RW from medical and industrial use	Waste from extractive industries	
The Netherlands	**Individual contracts.** Users of the COVRA's HLW and spent fuel storage facility (HABOG) have directly financed its construction according to the percentage of the volume reserved per producer. The operational costs of HABOG are borne by the users of HABOG. Some of the users pay the operational costs as an annual contribution; others made a down payment by which they paid off all future waste management costs.	**Waste Fees.** For small volumes of low and intermediate level waste (LILW) from many, different producers, standardized routes and prices per unit of waste are used. The fee to be paid for full transfer of LILW is mainly related to the treatment needed, to the resulting volume of the conditioned waste to be stored and to the final radiation level of the conditioned package. No direct account is taken of the activity content of the waste. Fees paid by waste producers to COVRA include all direct costs of transport, conditioning and storage and also all financial provisions for the costs of future storage and disposal.		**Individual contracts.** A few industrial and nuclear producers generate larger volumes of waste. The waste fees for these producers are based on individual contracts. Typically the contract entails that all investments are directly borne by the waste producers (building, fund for future costs); COVRA becomes owner of the building(s) and/or other infrastructure. In addition, the producer pay for operating cost in the form of a fee upon transfer of the waste to COVRA.	A capital growth fund has been established for disposal of the long-lived waste. All waste producers contribute to the fund, even if they produce only short-lived, low-level waste. During the long period of interim storage the fund has to grow to the desired level. Adequacy of the fund is analyzed every 5 years. The contributions of HLW and LILW are different. Of the required € 2 billion two-thirds are charged to the HLW and one-third to the LILW. The money is put in safe investments (e.g. government bonds), which have to be approved of by the Minister of Economic Affairs.
Poland	special funds created as a part of cost of energy prices	on behalf of the State budget	fix price to be paid by the owner of waste	fix price to be paid by the owner of waste	
Portugal	State Funding	State Funding	State Funding	State Funding	Producers pay a fee to ITN
Romania	for NPP's:earmarked funds constituted by NPP's contributions (fee/MWh produced) for Research Reactors: state budged	State budget	waste producers	State budget	GD1080/2007 regarding the establishment and the management of the financial resources necessary for the safe management of radioactive waste and for the decommissioning of the nuclear and radiological facilities.
Slovakia	RAW treatment and SF storage cost during operaton is financed by NPP operator. RAW generated from decommissioning, SF interim storage during decommissioning period and future deep geological desposal of SF/HLW are covered by National Nuclear Fund. Operator of power-generating nuclear facilitites is obliged to pay annually to National Nuclear Fund for decommissioning of NPP and all long-term liabilities.	Financing of the Legacy Wastes and Captured radioactive materials (where operator does not longer exists or is not known) management is guarantied from the state resources through National Nuclear Fund.	Financing of the Institutional radioactive waste management (from medical and industri es use) is guarantied from the waste producer's financial sources	Holder of the licence for extraction	
Slovenia	The Fund for the Decommissioning of the Krško NPP is financed through a levy on the kWh electricity production. The purpose of the Fund is to collect money as a levy on the produced electricity for future decommissioning and for the disposal of RW and SNF. The Fund operates as an independent entity and its work is overseen by Supervisory Committee.	No such RW. If existed, State shall pay the costs of manegment.	Small producers pay ARAO for services provided on the basis of a price list established by the government decree.	-	

TABLE H: FINANCING SCHEMES FOR RADIOACTIVE WASTE					
Country	Mechanisms for financing longer term liabilities				Comments
	RW and SF from operation and decommissioning of nuclear installations	Legacy Wastes (or where operator does not longer exist)	RW from medical and industrial use	Waste from extractive industries	
Spain	The basis for the fee is the gross electricity generated by each of the nuclear power plants in each calendar month, measured in gross kilowatt hours (kWh) and rounded off downwards to the next whole number. The fee to be paid throughout the operating lifetime of the facility shall be the result of multiplying the payment basis by the fixed unit tariff and the coefficient of correction set out depending on the type and the gross capacity (MWe) of the reactor.	The taxable event for the levy shall be the rendering of services relating to the management of the RW and SFgenerated at those NPPs whose operation has definitively ceased prior to January 1st 2010, along with their dismantling and decommissioning, the future costs corresponding to NPPs or fuel manufacturing facilities that, following their definitive shutdown, were not to have been contemplated during operation and those that might, where appropriate, arise from the events contemplated. Likewise, the taxable event shall be the management of RW arising from research activities that the Ministry of Industry, Tourism and Trade determines to have been directly related to the nuclear based generation of electricity, dismantling and decommissioning operations to be carried out as a result of uranium concentrate mining and production activities performed prior to July 4th 1984, the costs deriving from the reprocessing of spent fuel sent abroad prior to the entry into force of this Law and those other costs that might be specified by Royal Decree. The tax basis for the levy is constitued by the total amount collected as a result of the application of the tolls on transport and distribution activities referred in this Law.	There is a regulated system based on a definition of types of waste. The basis for payment of this fee shall be the quantity or unit of wastes delivered for management, measured in the corresponding unit applicable from among those included in such waste categorisation. The fee to be paid shall be the result of multiplying the payment basis by the rates for each type of waste.		The National up-front Fund for the activities contemplated in the GRWP is being done through fees collected during the facilities lifetime based on cost estimations. Also integrated in the Fund is the yield on its transitory financial investments. The performance of the system is subjected to revision by the Government
Sweden	Segregated funds to cover costs for managing and disposing of spent fuel and nuclear waste from commercial nuclear power reactors.	Segregated funds to cover costs for legacy waste from decommissioning of development and research facilities.	The licensee shall provide financial securities to cover future costs for managment and disposal of radioactive waste.	not applicable	The Act (2006:647) on Financing of Management of Residual Products from Nuclear Activities describes funding mechanism for nuclear industry and medical and industrial use. The Studsvik Act (1988:1597) decribes it for legacy waste.
United Kingdom	The Energy Act 2008 sets the framework which is aimed to ensure that operators of new nuclear power stations must have secure financing arrangements in place in order to meet the full costs of decommissioning and their full share of waste management and disposal costs.	The UK civil public nuclear liabilities (largely in decommissioning but including some operations) are funded from the public purse, through a mixture of direct grant and commercial income form the remaining operational businesses)	The UK is continuing end-of-life provisioning requirements for high activity sealed sources, in accordance with the HASS Directive (Directive 2003/122/Euratom). National legacy of redundant radioactive sources was addressed through the UK's Surplus Source Disposal Programme from 2004 to 2009.	None	

TABLE I: RADIOACTIVE WASTE MANAGEMENT ORGANISATIONS (WMO)				
Country	WMO	Private/public legal nature	Established in year	Comments
Austria	NES	Public/Private	2003	before 2003 part of research center Seibersdorf
Belgium	ONDRAF&NIRAS	Public	1980	
Bulgaria	SERAW	Public	2004	
Czech Republic	SÚRAO (RAWRA)	Public	1997	
Denmark	DD	Public	2003	
Estonia	A.L.A.R.A. AS	Public	1995	
Finland	POSIVA	Private	1995	
France	ANDRA	Public	1991	
Germany	BfS	Public	1989	
Greece	NCSR Demokritos	public		
Hungary	PURAM	Public	1998	
Ireland	There is no distinct radioactive waste management organisation			
Italy	SOGIN	Public	1999	
Latvia	LVĢMC	Public	2009	LVĢMC has obsessed all functions of the former national WMO "BAPA"
Lithuania	RATA	Public	2001	
Luxembourg	There is no distinct radioactive waste management organisation			
Malta	WASTESERV	Public / Private	2002	
Poland	RWMP	Public	2002	
The Netherlands	COVRA	Public	1982	
Portugal	ITN	Public	1994	Research Institute (see note)
Romania	ANDRAD	Public	2003	Starting with dec. 2009: Nuclear Agency and for Radioactive Waste (AN&DR)
Slovakia	JAVYS	Public	2005	
Slovenia	ARAO	Public	1991	
Spain	ENRESA	Public	1984	Law 11/2009 states that the management of radioactive waste, including spent nuclear fuel, and the dismantling and decommissioning of nuclear facilities is an essential public service corresponding exclusively to the State, in keeping with article 128.2 of the Spanish Constitution. The management of this public service is commissioned to the company Empresa Nacional de Residuos Radiactivos, S.A. (ENRESA), in accordance with the General Radioactive Waste Plan approved by the Government. In this respect, ENRESA is constituted as a vehicle and technical service of the Administration, responsible for carrying out whatever functions might be assigned to it by the Government.
Sweden	SKB	Private	1975	Swedish Nuclear Fuel and Waste Management Co
United Kingdom	NDA	Public	2005	

Note about Portugal: ITN at Sacavém has its origins in different institutions from the past, in different Ministries. RW management was always an attribution of the Sacavém campus, regardless the Ministerial responsibility. The first Institution was JEN (Junta de Energia Nuclear) that was established in the 50's under direct dependence of the Presidency of Council of Ministers. Then LNETI, National Laboratory of Energy and Industrial Technologies, was created in the 80's and Sacavém was part of it. Nuclear and Technological Institute, ITN, was created in 1994. ITN is now under Ministry for Science, Technology and Higher Education. The RW storage facilities, in their different stages, were always located at Sacavém.

TABLE J:
PRINCIPAL UNDERGROUND RESEARCH LABORATORIES (URL) AND EXPLORATORY MINES FOR HLW/SF

Country	URL	Operator	Details
Belgium	HADES	EURIDICE (cooperation of ONDRAF/NIRAS & SCK CEN)	Methodological and non site-specific URL in Boom clay (poorly-indurated) at ~ 230 m depth on SCK•CEN site at Mol; has been extended as part of ongoing PRACLAY project.
Finland	Onkalo	POSIVA	Under construction, disposal volume characterisation planned 2011 onwards at 420 m depth, planned to be incorporated into disposal facility with first disposal ~ 2020.
France	Bure	ANDRA	Callovo-Oxfordian clay (hard) at ~ 450 - 500 m depth. Meuse Department. Construction completed in 2006.
	Tournemire	IRSN	Sediments (hard clay), 250m depth; started 1990; former railway tunnel & adjacent galleries; methodological laboratory only.
Germany	Gorleben	BfS / DBE	Salt dome at 800 m depth. Exploration started in 1986. Moratorium from 2000 to 2010. Resumption of exploration work planned in autumn 2010.
Sweden	Äspö HRL	SKB	Granite, 200 - 500 m depth. Constructed during 1990-1995. Used for research activities as well as
	Stripa mine	SKB	Granite, former iron ore mine 360 - 410 m research from 1977 - 1991. Now closed.
Switzerland	Grimsel Test Site	NAGRA	Granite, reached through main access tunnel of hydro power company KWO ~ 450 m depth; operational since 1983.
	Mount Terri underground rock laboratory	SWISS FEDERAL OFFICE OF TOPOGRAPHY	Opalinus clay (hard), ~ 400 m depth; gallery off a road tunnel; started 1995.

TABLE K: NATIONAL MANAGEMENT STRATEGIES FOR RW AND SF		
Country	VLLW (if applicable) & LILW	HLW/SF
Austria	Interim storage of conditioned waste (LILW) at the site of Nuclear Engineering Seibersdorf (NES). Study in 2001 concluded that surface disposal was not an option in view of the presence of long-lived waste. However, in view of the small quantities an international co-operation (shared repository for radioactive waste) is the preferred option.	
Belgium	Interim storage of conditioned waste centralised at the Belgoprocess site in Dessel Surface disposal repository planned in Dessel, with construction commencing in 2012 and operation commencing in 2016.	At Belgoprocess site, storage of returned vitrified and compacted waste from reprocessing at La Hague and of SF from BR3-reactor of SCK•CEN. SF is now being stored in AFR facilities on NPP sites – current policy is a moratorium on further reprocessing contracts. However both open and closed fuel cycle scenarios are considered. Underground research continuing at the HADES facility at Mol concerning the concept of deep geological disposal in clay as the reference option for RD&D. No governmental policy regarding the future management of LILW-LL, HLW and SF. Public consultation procedure on Waste plan ended. Decision on policy expected on the base of a Waste Plan in finalisation.
Bulgaria	Processing of all waste. Construction and commissioning of a national near-surface repository for LILW-SL (both institutional and from NPP) by 2015.	Transfer of SF for storage and reprocessing in Russia with HLW return, under terms of 1995 agreement. SF can be declared waste if a disposal route is available. Storage of SF in reactor ponds and wet store at Kozloduy. Dry store to be commissioned around 2012. Bulgaria participated in the SAPIERR project.First HLW to be returned in Bulgaria not earlier than 2020. Construction of a surface long term storage for HLW with 100 years of administrative control is considered as optimal for the country at the current status of technologies development.
Cyprus	Only VLLW and LILW-SL waste are produced in Cyprus. According to the law, the licensee has an obligation to take responsibility for all waste produces and his facilities and any disused source will be returned to the manufacturer/supplier after its useful life. Medical centers are the main source of radioactive waste in Cyprus and small quantities of short half-life isotopes produced enter directly the sewage system, whereas wastes from an oncology center where most of the I-131 therapies take place are temporarily stored for decay and discharged to the sewage system. All practices involving ionising radiation including radioactive waste management are subject to licensing by the Minister of Labour and Social Insurance.	Not applicable
Czech Republic	Treatment and conditioning of all waste, disposal in one of the operation disposal sites or safe storage of waste that can not be deposited in the existing repositories.	Long term interim storage of all SF pending the availability of a disposal route. The national management strategy does not foresee a deep geological disposal site in operation before 2065. Six possible locations have been identified. It is anticipated a deep repository will accommodate all the waste that can not be deposited in near-surface repositories, SF once it is declared as waste and HLW from decommissioning.
Denmark	Interim storage of conditioned waste at Risø National Laboratory. Repository concept under development. "Basis for Decision" outlining development expected to be approved.	International solution being sought for small amount of SF remaining in line with earlier solutions regarding SF from research reactors.
Estonia	All waste from the decommissioning of Paldiski site and from institutional sources is conditioned for long-term storage at Paldiski pending the availability of a disposal route.	None (all SF from the Paldiski training reactors was returned to Russia)
Finland	Routine disposal of operational NPP waste in underground (intermediate depth) repositories at the two NPP sites.	SF stored in AFR facilities on NPP sites. The Decision in Principle by the Finnish Parliament in 2001 endorsed the selection of Olkiluoto as the site for the development of a deep disposal facility. The repository is planned to start operation in 2020. Construction of an underground research facility Onkalo is on-going on the same site.
France	Routine disposal of short-lived LILW at the Centre de l'Aube facility. Centre de Morvilliers opened in 2003 for disposal of VLLW. Long-term storage of conditioned LILW-LL pending development of disposal solution	Routine reprocessing of most, but not all, SF. Unreprocessed SF is stored at La Hague. Deep geological disposal of HLW, based on investigations in Bure underground laboratory. Decision on a site expected by 2015, with operation of a repository by 2025.

TABLE K: NATIONAL MANAGEMENT STRATEGIES FOR RW AND SF		
Country	VLLW (if applicable) & LILW	HLW/SF
Germany	In line with its objective to dispose of this waste in deep geological formations, the Federal Government is not pursuing any plans for near-surface repositories. Radioactive waste with negligible heat generation will be disposed of in the Konrad repository. The transformation of the former iron mine into a repository is underway.	Vitrified HLW resulting from the reprocessing of SF in France and the United Kingdom will be stored at Gorleben. This facility also houses some storage casks with SF from German NPPs. All new generated SF is placed in dry stores adjacent to NPPs until availability of deep geological repository. The Federal Government is aiming to build a repository in deep geological formations for the disposal of all kinds of waste, including spent fuel assemblies. Gorleben is considered as a possible candidate site. After a now ending 10-year moratorium, the exploration work to investigate the suitability of this site shall be resumed at the end of 2010.
Greece	Wastes are stored at the NCSR Demokritos and in users' premises under GAEC inspection. All imported sealed radiation sources are returned to the manufacturer abroad. All hospital radiation wastes are managed in situ.	SF return to supplier state.
Hungary	Institutional LILW-SL waste is to be disposed of at Püspökszilágy, in the Radioactive Waste Treatment and Disposal Facility. For the time being the repository is full, but there is an interim storage capacity until – as a result of the ongoing safety enhancement program – new disposal capacity will be available. An underground repository (200m) for NPP operational and decommissioning LILW waste is under construction at Bátaapáti. The surface facilities of this National Radioactive Waste Repository got a licence of operation in 2008. It accepts waste packages from Paks NPP for predisposal interim storage. The first underground disposal chambers will start operation in 2012.	SF of Paks NPP is stored in an AFR facility (the Interim Spent Fuel Storage Facility) pending the availability of a disposal route. The reference scenario - when calculating the costs to be covered from the Central Nuclear Financial Fund - is domestic direct disposal in deep geologic repository, although other scenarios are also kept open. The timing of the promising site selection programme in the Boda Claystone Formation (in Western Mecsek) is now under re-consideration, because Paks NPP Ltd. decided to extend the life time of the plant, and the examination of the possibilities for the closure of the fuel cycle was also put on the agenda. Thus the start of construction of an URL is scheduled now only for 2030.
Ireland	The small quantities of waste are stored on site by users. Government has established a high level group tasked with resolving legacy issues and an interim report and recommendations for further work has been adopted by government.	-
Italy	Wastes to be conditioned and stored at point of origin. A national disposal facility is foreseen for VLLW and LILW-SL. As yet no timetable for implementation, although the stated aim of decommissioning all facilities by 2020 will require the availability of a disposal option.	All remaining SF stored in NPP ponds will be exported for reprocessing. A centralised store for the HLW returned is envisaged. In principle HLW and any remaining SF will be disposed of in a deep geological disposal. Italy participated in the SAPIERR project and participates in SAPIERR II.
Latvia	There is planned enlargement of the repository "Radons" in the Baldone site - by constructing: a) two additional RW vaults with total capacity of 2.400 m3 for disposal of LILW-SL and LILW-LL, and b) an interim storage facility - capacity 100 m3- for storage of LILW-LL.	SF from the research reactor at Salaspils has been moved out to Russia in May 2008.
Lithuania	VLLW disposal facility currently under construction. Confirmed site for disposal of LILW-SL at Stabatiškė, in the vicinity of the Ignalina NPP. The design work started in 2009, the construction to be started in 2013, and the near-surface repository is to be commissioned in 2016.	SF categorized as radioactive waste. Storage in dry store for at least 50 years prior to disposal in deep geological repository. Participation in ERDO-WG
Luxembourg	The very small quantities of radioactive waste arising in Luxembourg are exported to Belgium for treatment and final storage according to a bilateral agreement.	-
Malta	Waste currently stored on sites of various organisations. Intention is for organisations to send their waste to a central storage area. Centralised surface storage facility planned for 2014 subject to planning permit process approval. No plans for permanent disposal facility.	Not applicable
The Netherlands	Interim storage of conditioned waste at the COVRA site in Borsele for at least 100 years. All waste is intended to be disposed of in deep underground geological disposal. The WMO is a member of ARIUS and participated in the SAPPIERR II project and in the ERDO-WG.	Dry interim storage of itrified waste from respressed SF and SF from Reserach reactor at the COVRA site in Borsele for at least 100 years. All waste is intended to be disposed of in deep underground geological disposal. The WMO is a member of ARIUS and participated in the SAPPIERR II project and in the ERDO-WG.

TABLE K: NATIONAL MANAGEMENT STRATEGIES FOR RW AND SF		
Country	VLLW (if applicable) & LILW	HLW/SF
Poland	Disposal of Institutional LILW at the Różan facility, together with interim storage of long-lived waste. Government is preparing national Waste management Plan. Some sitting activities have taken place for a replacement repository, but have stalled due to lack of local support at the concerned sites. The estimated closure time for Różan facility is set for 2020. Preparation of national RWM policy involves scheduling siting and construction of a new surface repository; up to year 2014 - finding the new site for repository; to 2020 - construction of a new repository. This demands taking into account Nuclear Power Program influnece as well, nevertheless as there's no definite decision made yet upon the type and amount of reactor units, it strongly affects the decision making in the new disposal facility area.	SNF comes exclusively from research reactors and it is placed in temporary pond storage at Swierk. Majority of HEU SNF has been recently shipped to Russian Federation under GTRI programme. It is also planned to ship the LEU of EK-10 type under a separate agreement. Currently there aren't any activities held in the area of geological disposal. HLW RW are stored in the Różan facility. Preparation of national RWM policy involves scheduling the beginning of siting of SF and HLW related disposal facilities after 2020.
Portugal	Interim storage at ITN, Sacavém: PAIRR (interim storage RW facility). ITN is the only central storage facility to storage RW with view to disposal and it is the only legal organization responsible for collection, conditioning and storage of RW in Portugal. Some spent and disused selaed sources are returned back to producer but that is not always possible.They are being dismantled, or not, conditioned in 200 L concrete drums and storaged at PAIRR/ITN. Heterogeneous wastes are conditioned in metallic or concrete drums.There is no national strategy for RW management, therefore, there is no RW management plan of action. In the Portuguese legislation there is no classification established for RW but ITN uses an operational classification based on IAEA classification and on the EU recommendations. There is no Independent Regulatory Body in terms of radiological protection and RW management. MCTES/ITN is a Competent Authority on this subject.CIPRSN (Independent Commission for Radiological Protection and Nuclear Safety) has competences on validating data to be sent to national and international organisations.	RPI is a research reactor of 1 MW located at ITN, Sacavém.Up to now,all RPI spent fuel has been returned back to the USA accordingly to an agreement between the two Countries.
Romania	Disposal of institutional short-lived waste at Baita Bihor site. NPP operational wastes to be disposed of in near surface repository, planned to be built till 2014 (this deadline is under revision). Conditioning of LILW-LL and storage minimum 50 years prior to deep geological disposal together with SF.	Open fuel cycle, SF considered as radioactive waste. Six years wet storage at NPP, followed by minimum 50 years in Spent Fuel Dry Storage. Deep geological disposal in a national repository that should be available around 2055. Regarding the SF from research reactors – return to the country of origin and/or deep geological disposal in the national repository.
Slovakia	All radwaste which are in compliance with acceptance criteria for disposal are sent to the Mochovce facility for disposal (institutional radioactive waste, operational waste and waste from decommissioning). VLLW disposal facility is planned. Wastes not suitable for Mochovce disposal will be temporary stored at Interim storage facility which is under development and consequently will be disposed into the deep geological repository.	SNF is planned to be stored for minimum 50 years and then will be disposed into the deep geological repository. Other alternatives are also considered. The Slovak management policy for back-end fuel-cycle was approved by Slovak government in 2008 in document "Nuclear energy back-end strategy". An updated proposal for back end fuel cycle policy is expected in 2012. As yet there is no timetable for repository development. Slovakia was represented in the SAPIERR study and is represented in SAPIERR II as well.
Slovenia	All waste currently being stored – mainly at Krško NPP – pending the availability of a national repository. The site is confermed in 2009. The start of operation is planining for 2016.	All SF is currently stored in the spent fuel pool at Krško NPP. The storage capacity is sufficient for the planned life time operation until the year 2023. The long term strategy for SF manegement foresees spent fuel storage in dry cask and will stored until 2065, when a deep geological repository is assured, although export is also considered. For SF from research reactor, Slovenia has an option to return spent fuel to the USA until May 2019.
Spain	Routine disposal RW at the El Cabril centre.(LILW-SL since 1993 and VLLW since 2008) LILW-LL stored pending availability of a deep geological repository.	The GRWP in force considers as a basic element of the reference scenario an open cycle strategy. All SF is currently stored in AR fuel ponds; additionally dry cask AR storage facilities are being operated at Trillo NPP (since 2002) and Jose Cabrera NPP -unit being decommissioned- (since 2009). Another dry cask AR storage facility is also foreseen at Asco NPP in 2012. Some HLW and LILW-LL is due to be returned from France (corresponding note in table B). GRWP assumes the availability of an AFR Centralised Temporary Storage facility around 2016 and a HLW / SF repository around 2060.
Sweden	Routine disposal either in surface facilities at nuclear sites (VLLW) or in SFR underground facility close to Forsmark NPP (LILW-SL). Planned disposal of decommissioning waste in an extension to SFR with operation in 2020. A repository for LILW-LL will be sited in about 2035 aiming at repository operation in 2045.	All SF is stored centrally in the CLAB facility at Oskarshamn. Based on results from detailed site investigation at two candidate sites, SKB has chosen to submit an application to construct a repository at the Forsmark site in the municipality of Östhammar. A license application is expected in March 2010, aiming at repository operation around 2025, pending approval by Government (based on regulatory review) and host municipality.

TABLE K:

NATIONAL MANAGEMENT STRATEGIES FOR RW AND SF

Country	VLLW (if applicable) & LILW	HLW/SF
United Kingdom	Solid VLLW and LLW from the UK nuclear industry will be managed in accordance with the recently published UK Nuclear Industry LLW Strategy. The UK government and devolved administrations are presently working on a strategy for the management of VLLW and LLW from the non-nuclear industry. The aim of the UK Nuclear Industry LLW strategy is to manage LLW in accordance with the waste hierarchy, with particular emphasis on reducing the amount of radioactive waste that needs to be managed and increasing the use of metal treatment and recycling. Where waste does need to be disposed of, the strategy notes that it should be done so in fit-for-purpose facilities, so as to ensure the best use of the Low Level Waste Repository (LLWR), only using it for wastes that require the high level safety, security and environmental protection provided by the site. The strategy for the management of ILW in the UK is to treat and package higher activity waste (HAW) and place it in safe, secure and suitable storage facilities until it can be disposed of, or be held in long-term storage in the case of a proportion of HAW in Scotland. Our priority is to expedite the retrieval of HAW currently held in ageing facilities. A critical management activity in support of the retrievals is to provide safe storage solutions without foreclosing long-term management options. HAW in England and Wales will ultimately be disposed of in a Geological Disposal Facility. In Scotland the policy for HAW is to manage the waste in long-term, near site, near surface storage or disposal facilities.	All remaining Magnox fuel will be reprocessed, this will take until 2016 or later. AGR reprocessing contracts will be fulfilled by 2020, leaving 3500 te AGR and 1200 te PWR fuel in storage. Since 2008, UK Government policy for HLW is deep geological disposal, together with the appropriate long-term storage.

TABLE L1:
BODIES WITH RESPONSIBILITIES IN THE MANAGEMENT OF RADIOACTIVE WASTE AND SPENT FUEL
(1) Member States with active or past Nuclear Power programmes

Country	Category of waste	Regulatory authority	RW treatment and / or conditioning	RW transport	Development and/ or operation of interim storage facilities	Development and/or operation of disposal
Belgium	LILW	FANC	WMO & waste producers	WMO	WMO	WMO
	HLW/SF				WMO (& industry for SF)	
Bulgaria	LILW HLW/SF	NRA	SERAW & Waste producers	Waste producer/SERAW	SERAW Industry	SERAW
Czech Republic	LILW	SÚJB	Waste producer	Waste producer/ Industry	Waste producer	WMO
	SF				NPP Operator	
Finland	LILW	STUK	Waste producers	Industry	Industry	Waste Producer
	SF					WMO
France	LILW & HLW/SF	ASN	Industry and WMO	Industry	Short-term interim storage: Industry R & D for long-term storage: Andra	WMO
Germany	LILW	BfS and State Authorities (depending on kind of waste and kind of management)	Waste producers	Waste producers	Waste producers and/or collecting depots (Landessammelstellen)	Third party (e.g. DBE) acting on behalf of BfS
	HLW/SF				Industry	
Hungary	LILW/HLW: If a HLW repository contains fissile material above a certain amount by the Hungarian legislation it is considered to be a nuclear facility, and falls under the regulatory authority of HAEA	NPHMOS (National Public Health and Medical Officer Service)	Waste producers	WMO	Industry and WMO	WMO
	SF	HAEA (Hungarian Atomic Energy Authority)	WMO			
Italy	LILW HLW/SF	ISPRA	NUCLECO for non-fuel cycle wastes	Commercial operators	NUCLECO for non-fuel cycle wastes	SOGIN
Lithuania	VLLW / LILW SF / HLW	VATESI (RSC for institutional waste)	Waste producers	Waste producers (WMO for institutional waste)	Waste producer	Waste Producer for VLLW & LILW WMO for SF
The Netherlands	LILW & HLW/SF	VROM (KFD)	WMO & waste producers	WMO	WMO	WMO
Romania	LILW & HLW/SF	CNCAN	Waste producers	Waste producers	Waste producers	WMO
Slovakia	LILW SF	ÚJD SR	WMO & waste producers	WMO	WMO	WMO
Slovenia	VLLW/LILW/HLW	SNSA	WMO & waste producers	WMO	WMO/waste producers	WMO
Spain	LILW & HLW/SF	MITYC & CSN & MARM	WMO & waste producers	WMO	WMO & waste produces	WMO
Sweden	LILW	SSM	Waste producer	Waste producer & WMO	Waste producer at own site	WMO
	SF		WMO		WMO for centralised facility	
United Kingdom	LILW	HSE (NII) for safety of nuclear installations. Enviroment Agency	Waste producers	Waste producers	Waste producers	WMO
	HLW/SF					

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TABLE L2:		
BODIES WITH RESPONSIBILITIES IN THE MANAGEMENT OF RADIOACTIVE WASTE AND SPENT FUEL		
(2) Member States without Nuclear Power programmes		
Country	Regulatory Authority	Waste Management Organisation
Austria	Federal Ministry of Agriculture, Forestry, Environment and Waster Management	Nuclear Engineering Seibersdorf GmbH (NES)
Cyprus	Radiation Inspection and Control Service of the Department of Labour Inspection of the Ministry of Labour and Social Insurance	
Denmark	National Institute of Radiation Protection under the National Board of Health and Danish Emergency Management Agency	Danish Decommissioning (DD)
Estonia	Ministry of the Environment within the limits of its competence through the Environmental Board and the Environmental Inspectorate.	A.L.A.R.A. AS
Greece	Greek Atomic Energy Commission	NCSR Demokritos
Ireland	Radiological Protection Institute of Ireland (RPII)	
Latvia	Since 01.07.2009 - Radiation Safety Centre of the State Environmental Service	Since 01.08.2009: the Public company "Latvian Environment, Geology and Meteorology Centre"
Luxembourg	Ministry of Health	Radiation Protection Department (Ministry of Health)
Malta	Radiation Protection Board / Malta Environment and Planning Authority	WasteServ Malta
Poland	National Atomic Energy Agency (PAA)	Radioactive Waste Management Plant (RWMP)
Portugal	Nuclear and Technological Institute, General Directorate for Health, General Directorate for Energy, Portuguese Environmental Agency and Independent Commission for Radiological Protection and Nuclear Safety	Radiological Protection and Safety Unit (UPSR) of the Nuclear and Technological Institute (ITN)

TABLE M: INTERIM STORAGE FACILITIES FOR VITRIFIED HLW			
Country	Facility / site	Period of operation	Comments
Belgium	Dessel, Belgoprocess, Building 129 Dessel, Belgoprocess, Building 136C	1985- 2000-	
Bulgaria	Kozloduy	2020 - 2120	to be constructed by 2020, feasibility studies planned
France	La Hague Marcoule	up to ~ 2050 up to ~ 2050	
Germany	BLG (Brennelementlager Gorleben) for HLW from France/UK ZLN (Zwischenlager Nord, Greifswald) for HLW from Karlsruhe	1996 - 2010 -	First shipment of HLW from France First shipment of HLW from Karlsruhe
The Netherlands	HABOG (COVRA site, Borssele)	2003 -	Storage for at least 100 years
United Kingdom	Vitrified Product Store, Sellafield	1990 -	

TABLE N:
INTERIM STORAGE FACILITIES FOR SPENT FUEL

NOTE: Only centralised stores, "away from reactor" stores at NPP sites and "at reactor" stores at shutdown reactors are listed. All operating NPPs also have some capacity for "at reactor" wet or dry storage. Some countries also have small sotres for SNF from research reactorsor combine the storage of research reactor SNF with the storage ofreporcessing waste (e.g. HABOG in The Netherlands)

Country	Facility / site	Facility type	Period of operation	Comments
Belgium	Doel NPP Tihange NPP Dessel	AFR dry cask AFR pool AFR dry cask	1995- 1997- 2001-	The AFR dry cask facility at Dessel is only for the spent fuel of the BR3-reactor of the SCK•CEN, which is under decommissioning
Bulgaria	Kozloduy NPP Kozloduy NPP	AFR pool wet storage dry cask	1987- 1990- 2012 -	
Czech Republic	Dukovany NPP Dukovany NPP Temelin NPP UJV Rez	AFR dry cask AFR dry cask AFR dry cask pool	1997- 2006- 2010- 1995-	
Finland	Loviisa NPP Olkiluoto NPP	AFR pool AFR pool	1978- 1979-	
France	La Hague	pool		Storage for reprocessing
Germany	Ahaus-BZA Gorleben-BLG Greifswald-ZLN 12 reactor sites Obrigheim	dry cask dry cask AFR dry cask AFR dry cask AR pool	1992- 1995- 1997- 2001- 1998-	Replaced former ZAB Dry storage applied for
Hungary	Interim Spent Fuel Storage Facility, Paks	AFR dry vault	1997 -	modular design
Italy	Trino NPP Caorso NPP Avogadro	AR pool AR pool AFR pool	1965 - 1981 - 2010 1971 -	
Lithuania	Ignalina NPP	AFR dry cask	1999 -	CASTOR- and CONSTOR-RBMK casks
			2011 (planned)	CONSTOR-RBMK 1500/M2 casks Facility is under construction
The Netherlands	HABOG (COVRA site, Borssele)	dry vault	2003 -	Storage of SF from Reserach Reactors for at least 100 years
Poland	Świerk RR	pool	1958 - 1971-	
Romania	Cernavoda NPP IFIN-HH RR SCN RR	AR pool AFR dry vault AFR pool AR pool	1996 - 2003 - 1980 - 1979 -	NPP: wet storage for at least 6 years followed by min. 50 years dry storage in MACSTOR type facility

TABLE N: INTERIM STORAGE FACILITIES FOR SPENT FUEL				
NOTE: Only centralised stores, "away from reactor" stores at NPP sites and "at reactor" stores at shutdown reactors are listed. All operating NPPs also have some capacity for "at reactor" wet or dry storage. Some countries also have small sotres for SNF from research reactorsor combine the storage of research reactor SNF with the storage ofreporcessing waste (e.g. HABOG in The Netherlands)				
Country	Facility / site	Facility type	Period of operation	Comments
Slovakia	Bohunice NPP	AFR pool	1986 -	
Spain	Trillo NPP	AR dry cask	2002 -	
	Jose Cabrera NPP	AR dry cask	2009 -	Unit under decommissioning
	Asco NPP	AR dry cask	Planned (2012)	Under licensing
	CTS (Centralised intermediate storage)	AFR dry vault	Planned (2016)	Also to store minor inventories of HLW (vitrified) and LILW-LL
Sweden	CLAB	pool	1985 -	Storage capacity increased in 2008-01-01 from 5000 Te HM to 8000 Te HM by extension of existing facility.
United Kingdom	Sellafield and NPPs Dounreay	pool pool, AFR Dry storage	Since 1950 Since 1977	Dounreay: pool, dry storage pending reprocessing

TABLE O: THE JOINT CONVENTION - RATIFICATION STATUS			
Country	Date of signature	Date of ratification, acceptance or approval	Date of entry into force
Austria	17/09/1998	13/06/2001	11/09/2001
Belgium	8/12/1997	5/09/2002	4/12/2002
Bulgaria	22/09/1998	21/06/2000	18/06/2001
Cyprus	-	24/07/2009	19/01/2010
Czech Republic	30/09/1997	25/03/1999	18/06/2001
Denmark	9/02/1998	3/09/1999	18/06/2001
Estonia	5/01/2001	3/02/2006	4/05/2006
Finland	2/10/1997	10/02/2000	18/06/2001
France	29/09/1997	27/04/2000	18/06/2001
Germany	1/10/1997	13/10/1998	18/06/2001
Greece	9/02/1998	18/07/2000	18/06/2001
Hungary	29/09/1997	2/06/1998	18/06/2001
Ireland	1/10/1997	20/03/2001	18/06/2001
Italy	26/01/1998	8/02/2006	9/05/2006
Latvia	27/03/2000	27/03/2000	18/06/2001
Lithuania	30/09/1997	16/03/2004	14/06/2004
Luxembourg	1/10/1997	21/08/2001	19/11/2001
Malta			
Poland	10/03/1999	26/04/2000	18/06/2001
The Netherlands	3/10/1997	5/05/2000	18/06/2001
Portugal	21/04/2009	accession, 15/05/2009	13/08/2009
Romania	30/09/1997	6/09/1999	18/06/2001
Slovakia	30/09/1997	6/10/1998	18/06/2001
Slovenia	29/09/1997	25/02/1999	18/06/2001
Spain	30/06/1998	11/05/1999	18/06/2001
Sweden	29/09/1997	29/07/1999	18/06/2001
United Kingdom	29/09/1997	12/03/2001	18/06/2001
Euratom		4/10/2005	2/01/2006