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**COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN
PARLIAMENT AND THE COUNCIL**

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installations, spent fuel and radioactive waste**

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1. INTRODUCTION

1.1. BACKGROUND

In October 2004, the Commission presented its first report to the European Parliament on the use of financial resources earmarked for the decommissioning of nuclear power plants¹. The 2004 report being generally well received led to an own-initiative report² from the European Parliament. It was acknowledged within this report that decommissioning was a complex issue and that more detailed reflection was required to understand the individual Member States' funding mechanisms.

In 2006, the Commission adopted a Recommendation³ on decommissioning funds following an extensive dialogue with Member State experts, taking advantage of its expertise in the field. In December 2007, it presented its second report to the European Parliament and the Council⁴, comparing EU nuclear operators' and Member States' funding practice with the criteria detailed in the Commission Recommendation.

One of the second report's conclusions was that more detailed and better structured information needed to be obtained from the Member States. The outcome of the process was the Guidelines and Questionnaire forming the basis of the present report, as described below in the next chapter.

The present report does not yet analyse the consequences of the Council Directive 2011/70/Euratom of 19 July 2011, which established a Community framework for the responsible and safe management of spent fuel and radioactive waste⁵ but is, as in the past, based on the continuous work carried out by the Member States and the Commission for the implementation of the Recommendation, in particular within the Decommissioning Funding Group. It aims to present a comprehensive overview of the situation in the Member States. In particular, it looks at the advances in the alignment of the national decommissioning and waste management financing regimes with the Commission Recommendation.

1.2. METHODOLOGY

In 2004 the Commission set up an ad hoc expert group, the Decommissioning Funding Group (DFG). The DFG was formally introduced by the Recommendation of 2006, with the task of assisting the European Commission in:

- Promoting a clear understanding of the decommissioning policies and strategies and the attendant tasks and activities;
- Providing up-to-date knowledge on decommissioning cost estimates and the management of the provisions/funds;

¹ Report on the use of financial resources earmarked for the decommissioning of nuclear power plants, COM(2004)719 final of 26.10.2004

² European Parliament resolution on the use of financial resources earmarked for the decommissioning of nuclear power plants (2005/2027(INI)), P6_TA-PROV(2005)0432

³ OJ L 330 (28.11.2006)

⁴ COM(2007) 794 final of 12.12.2007,

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0794:FIN:EN:PDF>

⁵ OJ L 199, 2.8.2011, p. 48, in the following called "Nuclear Waste Directive"

- Exploring possible ways ahead in terms of further co-operation and harmonisation at European level.

The DFG is the only body in the EU which brings together Member States and the Commission for common reflection and discussion of decommissioning funding issues. Therefore neither ENSREG (the European Nuclear Safety Regulators Group) nor ENEF, the European Nuclear Forum, have formed subgroups dealing exclusively with decommissioning funding issues.

The 2nd report's conclusions highlighted the benefits of exploring harmonised decommissioning funding methodologies in the EU, taking into account the differences in Member States' strategies.

The national experts at the DFG developed, together with the Commission, Guidelines exploring in detail the different aspects of decommissioning financing, in order to build a common understanding of the Commission's 2006 Recommendation³ on decommissioning funding. On the basis of these Guidelines, the DFG and the Commission elaborated a questionnaire for Member States.

The questionnaires were sent to all Member States in September 2010, and the majority of Member States sent their completed documents during the first months of 2011. A first discussion of the findings took place during the 2011 DFG meeting on 16 March 2011. The collection of answers continued during 2011. Some Member States were also asked individually to clarify or complete certain data which were considered unclear or missing.

During the DFG meeting of 12 March 2012, the first draft of the Commission Staff Working Document was discussed in detail. A majority of the countries who assisted in the meeting provided updates, corrections and additions to the draft document, in particular concerning the chapter describing their respective decommissioning funding systems in place.

In the following section, extracts from the 2006 Recommendation and the Guidelines are compared with the status of decommissioning financing in the Member States, as reflected in the answers to the questionnaire and the later information. The numbered paragraphs follow the logic of the 2006 Recommendation, summarising the information obtained from Member states, during the exercise, on the key provisions of the Recommendation.

2. CURRENT FUNDING PRACTICE IN VIEW OF THE COMMISSION RECOMMENDATION

2.1. DECOMMISSIONING OF NUCLEAR INSTALLATIONS

2.1.1. Decommissioning and Waste Management

All Member States agree with the principle that after permanent shutdown, nuclear installations should be decommissioned and the management of waste should be properly addressed. They have, however, chosen quite different routes to achieving this: Some Member States opt for immediate decommissioning while others prefer deferred decommissioning after an initial period of safe enclosure. Concerning the final state of the site, some aim at "Greenfield" and others at "Brownfield" end-states. As achieving "Greenfield" status is more expensive, it requires larger resources to be collected during the lifetime of the plant.

According to the Commission Recommendation of 2006, each nuclear installation should be covered by a Decommissioning Strategy aligned with a Decommissioning Policy. Both plans exist in most Member States. In some Member States, the strategy and plan are established in principle, while the exact details remain to be defined. Only detailed planning can ensure the collection of adequate funds.

2.1.2. Polluter pays principle

All Member States agree with the "polluter pays" principle. In those Member States having commercial nuclear operations, comprehensive systems have been set up obliging the licence holder to accumulate adequate financial means before the end of lifetime of the installations in order to assure that they are available when needed for decommissioning of their facilities.

For each nuclear facility the individual obligations must be clearly identified. In all Member States it is clear that the licence holder is responsible and also who the licence holder is.

Since the last report on decommissioning financing, there has been encouraging progress on the implementation of this recommendation. There is now common agreement on the objectives which will allow the Commission to address itself more to the details of the financing regimes in the future.

Recent examples of good practice:

- In the Netherlands, the latest revision of the Nuclear Energy Act, in force since April 2011, introduced a clear legal obligation to set up a decommissioning fund in order to fully cover the decommissioning costs. While there had been an understanding in the past that the polluter pays principle applies and funds had been set up on a voluntary basis, it is now a clear legal obligation.
- In France, where such legislation was adopted in 2006, there are now concrete plans to also set up a fund for the decommissioning of the State-financed research installations.
- In Spain, recent changes in law have further shifted the funding of decommissioning from a general fee towards licence-holder contributions.

2.1.3. *Completeness of Financial Resources (incl. Waste Management)*

Waste management costs must also be considered part of the decommissioning activities.

It can be said that the issue is addressed by all Member States and that separate calculations exist throughout the EU. In particular for the Member States with substantial commercial nuclear programmes, there are credible, robust costing methodologies in place which cover all aspects of decommissioning activities. The same can be said in principle for the costs of the management of nuclear waste, albeit with a higher degree of uncertainty given that most countries are at an early stage of preparation in respect of final disposal.

Some Member states have set up separate financing regimes for decommissioning and for waste management.

2.2. INSTITUTIONAL AND PROCEDURAL ASPECTS

2.2.1. *Article 41 of the EAEC Treaty: Proposal of Decommissioning Funding Regime*

The principle of notifying the decommissioning funding regime in the framework of the notification procedure set in Article 41 of the EAEC Treaty was generally respected in the most recent notifications to the Commission. However, the notification did not always contain a fully developed decommissioning funding regime incorporated in legislation. This would require a description of the investment projects and the planned decommissioning funding regime (amount, plan for constituting the assets in the fund, modalities of fund management...).

For all future Article 41 notifications, such a detailed description is expected, at least in the form of a draft law. This would make it possible to consult the DFG on the proposal.

This recommendation explicitly refers to and attributes a role to the DFG. It provides the basis for the work of the group: The Terms of Reference and criteria on which the DFG should give its opinion shall be worked out within the DFG based upon a proposal from the Commission.

2.2.2. *National Body*

The national body should possess both technical and financial expertise to perform its functions.

National bodies with expert knowledge exist in the large majority of Member States. In the most elaborate cases, a dedicated organisation was set up and entrusted with the task of independent control of the fund. In other Member States, the national body functions are performed by the competent Ministry or by highly specialised independent auditors.

In some cases, there is room for improvement with regard to clarity on the degree of independence from the operator and on the question of who actually performs the control functions independently of the fund. In general, the question of independence of the national body should be elaborated further in the future work of the DFG and future reports.

All national bodies have the authority to enforce corrective measures, in particular in case of a shortfall of resources. License holders in general have an obligation to fill any gap in resources discovered by the national body.

All national bodies exercise periodic controls of decommissioning costs estimates. The frequency of checks is at least every five years, while often there are more frequent controls.

The national body has an important role to play in reviewing the adequacy of the fund and the level of the decommissioning liabilities. Should the costs of decommissioning increase during the operational life of the facility, the operator is held responsible for these increased costs and should increase the fund accordingly. Member States already take this point very seriously. For increased confidence, it is recommended that the national bodies play an even more important role in this field (e.g. higher frequency of review or swifter implementation of corrective measures).

2.3. DECOMMISSIONING FUNDS

2.3.1. Adequacy and Origin of Funds

The systems in all Member States with commercial nuclear operations are based on the model of setting up adequate decommissioning funds on the basis of the revenues obtained from their activities during the lifetime.

In general, the rate of accumulation to date appears adequate. Most of the Member States with commercial nuclear programmes have collected substantial resources, and some are even approaching close to the necessary amount foreseen. Where the collected sums, as a proportion of the necessary total, lag behind that foreseen at this stage of the installations' lifetimes, this may be due to on-going negotiations on lifetime extensions. The expectation of a lifetime extension should however not lead to lower collection efforts.

The time frame for the build-up of funds typically extends over the whole expected exploitation period. Shorter periods are not excluded and represent a means of safeguarding against unforeseen cases such as early closure.

For cases of early closures due to political decisions, it is in general up to the responsible government to cover the resulting shortfall in the fund. In case of accidents, the international liability regime based on the respective international Conventions applies.

In some Member States, for historical reasons, there are exceptions to the rule that funds must be collected from revenues obtained from the nuclear activities: This may be due to an early shutdown (referendum after the Chernobyl accident), no existing funds prior to EU accession or bankruptcy of the operator. Where the European Union has set up a system of funds from which the decommissioning of the installations concerned is supported, it remains nevertheless the ultimate responsibility of the licence holder and the respective State to collect the funds for decommissioning and waste management. Additional efforts in this regard are required where funds are not sufficient to cover the total decommissioning costs.

Apart from the mentioned historical cases, for all other nuclear installations, the funding regime must be fully in line with the Recommendation and the Directive 2011/70/Euratom for waste management.

The decommissioning programme of the nuclear installations owned by the European Commission under the Euratom Treaty (the nuclear installations of the Joint Research Centre) is the subject of regular dedicated communications to the Parliament and the Council. Decommissioning funds are managed by the Joint Research Centre on the basis of a multi-annual schedule approved by the budgetary Authority.

Good practice example:

- Finland and Sweden could be mentioned here as examples for adequacy of the sums collected so far in a segregated fund.

2.3.2. *Fund Type, Control on Use and Review*

Member States adopted their models on the following basic types:

- The segregated internal fund, kept by the operator of the installation but as a separate budget which can only be touched for decommissioning and waste management purposes and under the control of the national body. Funds of this type exist for example in France, Belgium, and Czech Republic.
- The segregated external fund, meaning external to the operator of the installation, exists in Finland and Sweden, where it is also external from the state budget, and Hungary, Romania, Slovakia and Bulgaria. In those Member States, however, the funds are somehow within the State budget.
- Non-segregated internal funds exist in Germany, where the Commercial Law requires the companies operating NPPs to build up substantial reserves in their balance sheets for the future decommissioning and waste management costs.

While a segregated fund is the recommended option, a safe system can also be built with well-controlled non-segregated funds. Where the financial means collected by segregated funds are lent back to the licence holders, an increased degree of control by an independent body is necessary.

For its review, the national body must be fully independent of the operator and have the necessary authority to assure that any proposed corrective actions are implemented. Such authority might be put into doubt if representatives of the license holder have a right to nominate representatives to the board of the national body, as is the case in some Member States.

2.3.3. *New Nuclear Installations*

Member States without an existing and fully functioning funding regime who plan to build new nuclear installations, and in particular new nuclear power plants, should establish the laws to establish a robust decommissioning financing regime by the time of the decision to invest.

Most recent examples for new financing regimes:

- In the UK, an external and segregated fund will be created for future new build.
- Lithuania, which decided to build a new NPP close to former NPP's site, is currently developing a funding regime.
- Poland has recently adopted its legislation for the decommissioning funding regime, well ahead of the pending decision on the building of the planned NPP(s).

2.4. ESTIMATION OF DECOMMISSIONING COSTS

2.4.1. Separate Cost Calculations for Technical Decommissioning and Waste Management

The principle of separate cost calculations for decommissioning of the installation and waste management is accepted in all Member States, some of which have set up general, segregated but separate funds for decommissioning and waste management.

The calculations of waste management costs tend to have a higher degree of uncertainty than those for decommissioning, due to the early stage of planning of final repositories.

The transposition of Council Directive 2011/70/Euratom of 19 July 2011, which established a Community framework for the responsible and safe management of spent fuel and radioactive waste⁶, shall lead to substantial progress in financial planning for waste management costs.

2.4.2. Cost Calculations and Adequacy

As mentioned above, the Commission, together with the Nuclear Energy Agency NEA, has developed and proposed the "Yellow book" methodology to decommissioning costing to assist with the methodology for cost estimates. Albeit strongly recommended for calculating or benchmarking, this is not a mandatory procedure but could help to inform and reinforce the methodologies in some countries. Recently, the "International Structure for Decommissioning Costing" (ISDC), published by the OECD/NEA in 2012 (NEA No. 7088), has updated and replaced the "yellow book". There is as yet no equivalent for nuclear waste cost assessment.

Whether the national body reviews all cost estimates, which it should do, is not evident in all Member States. The Commission will continue to observe the situation.

2.4.3. Site-specific Cost Estimates

In relation to the term "site specific", and within the context of accuracy and transparency, the costs for multiple nuclear unit sites should be broken down to the unit level. A "fleet approach" to costs may be relied upon where appropriate.

There is a general tendency in the Member States to move from generic to site-specific cost estimates. Most Member States have already reached full compliance with this criterion, which is a very positive development.

2.5. USE OF DECOMMISSIONING FUNDS

2.5.1. Use for intended Purpose and Transparency

Decommissioning funds should only be used for the detailed purpose for which they have been established as defined in the final decommissioning plan and not for any other purpose. The national body retains an important function during the decommissioning phase, in monitoring and reviewing that the funds are used correctly.

On this point, the answers to both the questionnaire and to subsequent information requests are still not sufficiently detailed. This could possibly be due to the fact that the majority of funds have not yet reached their disbursement phase. The issue requires to be followed closely in the future.

⁶ OJ L 199, 2.8.2011, p. 48

Examples of good practice in this regard:

- In Sweden, where the national fund publishes a very detailed report containing all relevant information annually on its website in Swedish and English language: <http://www.karnavfallsfonden.se/>.
- The site of the UK's NDA, <http://www.nda.gov.uk/>, also contains similar information.

2.5.2. *Secure Risk Profile*

For a secure risk profile, low-risk assets should be preferred while not excluding high-risk assets but with constraints on the risk exposure. The management strategy should aim to match the full decommissioning cost and to ensure its availability at the time when it is needed, under the control of the national body.

A satisfactory return on the capital should be achieved without excessive risk: In some Member States the fund can lend a maximum of 75% of the capital back to the operator who must pay a government-fixed interest. In others, the fund must always cover the discounted provisions and eligible assets are defined by decree, but the operators decide freely on that basis. In one case, the fund also has restrictions concerning the eligibility of some assets and must aim for the highest possible return under these conditions. In a number of Member States, the fund is held or established by the State treasury. In these cases it is not fully clear from the answers to the questionnaire how the capital is invested.

Many Member states require funds to invest to a high degree in government bonds. Recent events in the financial markets having put serious doubts on the absolute safety of government bonds, it may be advisable to revisit the implicit assumptions underlying the existing legislation in this respect.

As a possible example of good practice in fund investment one could mention here France, where very detailed rules exist for the eligible asset classes and where a review is underway.

2.5.3. *Underperformance of Fund Management*

The identification of a shortfall between the value of the fund and the decommissioning liabilities should give rise to an immediate definition of corrective measures to be implemented in the short-term. In this respect, the annual review of the accumulated funds, as well as the review of the cost estimates by the national body, is of the utmost importance.

This principle is well implemented in all Member States which chose to set up internal fund regimes. In all cases, there is periodic control by the national body for this essential requirement.

2.5.4. *Non-Commercial Nuclear Installations*

The facilities addressed here are typically State-owned service facilities such as medical centres, research centres, isotope production facilities and particle accelerators. Being typically under state responsibility, their decommissioning is paid from the national budget. A final decommissioning plan detailing the scale of liabilities and associate costs should be drawn up nevertheless. All Member States possessing such installations have either set up decommissioning plans or are in the process of doing so.

3. CONCLUSIONS AND OUTLOOK

Since the presentation of the second decommissioning report in 2007, the legal environment in the field of decommissioning and waste management has changed significantly with the adoption of Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste⁷. This Directive, to be transposed in Member States' national law by 23 August 2013, foresees in its Article 9 that "Member States shall ensure that the national framework requires that adequate financial resources be available when needed for the implementation of national programmes referred to in Article 11, especially for the management of spent fuel and radioactive waste, taking due account of the responsibility of spent fuel and radioactive waste generators".

This principle, shared with the Recommendation, is now binding law to be transposed by all Member States. National spent fuel and radioactive waste programmes will have to cover all waste types and all management stages from generation to disposal as well as a sufficiently detailed basis for estimating long-term cost as input to accumulate adequate waste management funds. The obligation to cover all management stages from the generation of waste onwards means that a large portion of the decommissioning activities will also be covered.

The national programmes should provide a detailed cost estimate of all waste management steps up to disposal including the associated activities, such as research and development. It must also provide information on the financing.

Should a national programme consider only long-term interim storage, but no disposal, the amount of money saved risks allowing the operator to strengthen its market position in relation to competitors in Member States where funding a disposal facility is mandatory element. Such a situation could be seen as a clear distortion of competition. Some estimations come to a potential cost advantage in the order of 3.5-4.0 percent of the assumed total generating cost⁸.

The Directive also contains binding rules regarding financing schemes and transparency, which also reflect some basic principles of the Recommendation. Article 10 on transparency ensures public information and the right to have an opportunity to participate effectively in the decision-making process. Article 12 on national programmes includes an obligation to have cost assessment and national schemes in force, as well as a transparency policy or process.

Through the obligation on Member States to keep their national programmes updated and subject to peer reviews, the Directive increases the transparency and quality of the funding mechanisms of spent fuel and radioactive waste management and decommissioning.

⁷ OJ L 199, 2.8.2011, p. 48

⁸ COMMISSION STAFF WORKING DOCUMENT, Accompanying document to the revised proposal for a COUNCIL DIRECTIVE (Euratom) on the Management of Spent Fuel and Radioactive Waste IMPACT ASSESSMENT COM(2010) 618, Chapter 2.3.3.

The "Nuclear safety" Directive 2009/71/Euratom⁹ is relevant for decommissioning as it includes in its scope all civilian nuclear installations operating under a license, including licences to decommission a nuclear installation. It is a further, decisive step towards binding rules for the accumulation of adequate financial resources for decommissioning and waste management of nuclear installations. They form a strong basis for a common legal framework and a strong safety culture within the EU. Together with the Commission Recommendation of 2006, they will set the framework for the continuing work on further improving the situation in all Member States concerning the adequacy, availability and safety of the financial resources earmarked for decommissioning and waste management.

Even after the full transposition of the "Nuclear waste" Directive, the DFG will have to continue its work with the Commission to promote a clear understanding of the decommissioning policies and strategies by providing up-to-date knowledge on decommissioning cost estimates and the management of the funds and by exploring possible ways ahead in terms of further co-operation or even harmonisation.

Some further possible forward issues were discussed during the DFG meeting in March 2012: The reporting under the Recommendation and the "Nuclear waste" Directive should be aligned: After the first reporting under the "Nuclear waste" Directive, a reflection on the reporting under the Recommendation will be required. Another important point in this context will be the reflection upon the relation of the DFG to the "Nuclear waste" Directive, also in connection with the transposition process and the links to ENSREG and ENEF. A revised mandate of the DFG should be elaborated in co-operation between the DFG and the Commission.

An important point of the common reflection could be the lessons to be drawn from the recent banking and sovereign debt crises. A reaction to the turmoil in the financial markets during the last couple of years is needed in all Member States, and collaboration within the DFG could contribute to enhanced robustness of decommissioning finances in the future.

⁹ OJ L 172, 2.7.2009, p. 218