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The OECD Nuclear Energy Agency's Forum on Stakeholder Confidence, radioactive waste management and public participation

*A synthesis of its learnings
and guiding principles*

Marleen Brans, Gianluca Ferraro and Ulrik von Estorff
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European Commission
Joint Research Centre
Institute for Energy and Transport

Contact information

Address: Joint Research Centre, P.O. Box 2, 1755 ZG Petten, the Netherlands
e-mail: JRC-IET-ETRACK@ec.europa.eu

JRC Science Hub
<https://ec.europa.eu/jrc>

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Abstract

The OECD Nuclear Energy Agency's Forum on Stakeholder Confidence, radioactive waste management and public participation. A synthesis of its learnings and guiding principles.

This report offers a review of the major works developed in the past fifteen years by the Forum on Stakeholder Confidence (FSC) of the OECD Nuclear Energy Agency (NEA). It presents the key drivers of public trust in Radioactive Waste Management (RWM), based on an in-depth document analysis of FSC flyers and reports.

The FSC experience suggests that, in addition to technical requirements, societal concerns about risk and safety need to be addressed in order for public trust and confidence to develop. For non-experts, feelings of control and familiarity are important in establishing a feeling of safety. The FSC points to a number of confidence factors that need to be promoted in RWM, such as openness, transparency, technical competence and procedural equity. When these factors are present in everyday practice, public trust can be built. In the report, these factors have been used to build a framework with key drivers for public trust in RWM.

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Executive summary

Policy context

The 'Energy – Transparency Centre of Knowledge' (E-TRACK) is a joint initiative agreed between the Directorate-General for Energy (DG ENER) and the Joint Research Centre (JRC) of the European Commission (EC) for the promotion and enhancement of public participation in the implementation of energy policies. E-TRACK will conduct several projects on transparency and public participation in the implementation of policies on multiple energy sources. The first project of E-TRACK addresses public participation in the field of Radioactive Waste Management (RWM).

The E-TRACK project on RWM (E-TRACK/RWM) builds on the existing state-of-the-art in public participation in RWM. In this report E-TRACK/RWM offers a review of the major works developed by the Forum on Stakeholder Confidence (FSC) of the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD).

The Forum on Stakeholder Confidence (FSC) was established by the NEA Radioactive Waste Management Committee in 2000. Over the years, the FSC has developed insights about stakeholder dialogue and ways to develop shared confidence, consent and public approval of management solutions regarding RWM. In the review the key drivers of public trust in RWM are presented, based on an in-depth document analysis of FSC flyers and reports.

Key conclusions

The FSC experience suggests that, in addition to technical requirements, societal concerns about risk and safety need to be addressed in order for public trust and confidence to develop. For non-experts, feelings of *control and familiarity* are important in establishing a feeling of safety (NEA, 2013a). In this respect, the FSC points to a number of *confidence factors* that need to be promoted in RWM, such as *openness, transparency, technical competence and procedural equity*. When these confidence factors are present in everyday practice, public trust can be built. These factors have been used in the review to build a framework with key drivers for public trust in RWM at four levels.

The FSC findings are in line with the academic literature on stakeholder involvement in dealing with complex policy issues. These factors referred to by the FSC can be linked to the input, process and output legitimacy of policy-making. For policy to be (perceived as) legitimate by the public, not only the policy itself but also the policy-making process needs to be (perceived as) legitimate. *Input legitimacy* deals with questions of access to the policy-making process, whereas *process legitimacy* focuses on the quality of deliberation during the policy-making process. *Output legitimacy* deals with the outcome of the policy-making process. As for the key drivers that have been developed by the FSC (such as governmental commitment, enhanced citizen participation and a balanced decision-making process), these are again very compatible with the governance and public policy literature.

Main findings

There are confidence factors that need to be promoted in RWM in order for public trust and confidence to be developed. The review differentiates between four levels at which

factors such as openness and competence can be put into practice and specifies key drivers for public trust at these four levels.

The key drivers can be summarised as follows. At the level of RWM roles and structures there should be a *firm national commitment* combined with a *clear and widely supported policy framework*. *Trustworthy RWM institutions* have to be the committed driver of the policy processes, allowing for *enhanced citizen participation* and empowerment.

At the level of the decision-making process, there should be a *fair balance between values* that are sometimes competing and conflictual, such as participation, transparency, flexibility and accountability. The process needs to *facilitate (social) learning* and *allow for added value* for the communities concerned.

Moreover, at the level of the individuals and institutions involved in RWM, these must *demonstrate competence, transparency, and the willingness to listen* to and involve others. Finally, the local waste management facilities need to *demonstrate robustness, flexibility, transparency and added value*. Additionally, facilities should *allow for community oversight and stewardship*.

1. Introduction¹

The 'Energy – Transparency Centre of Knowledge' (E-TRACK) is a joint initiative agreed between the Directorate-General for Energy (DG ENER) and the Joint Research Centre (JRC) of the European Commission (EC) for the promotion and enhancement of public participation in the implementation of energy policies. E-TRACK will conduct several projects on transparency and public participation in multiple energy sources. The first project of E-TRACK addresses public participation in the field of Radioactive Waste Management (RWM). The E-TRACK project on RWM (E-TRACK/RWM) wants to build on the existing state-of-the-art in public participation in RWM.

In this framework, the present report offers a review of the major works developed by the Forum on Stakeholder Confidence (FSC) of the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD) during the past fifteen years. The purpose is to extract and present the major lessons learnt and the guiding principles. The report is based on document analysis of FSC reports and flyers. Table 1 provides a complete list of the works analysed.

The FSC was established by the NEA Radioactive Waste Management Committee in 2000. It aims to foster learning about stakeholder dialogue and ways to develop shared confidence, consent and public approval of management solutions regarding RWM (NEA, 2009). The FSC provides a setting for direct stakeholder exchange in an atmosphere of mutual respect and learning. Government policy and regulatory officials, R&D specialists, implementers and industry representatives from 18 NEA member countries are participating in this forum. The EC is also a member (NEA, 2014a).

After this short introductory section, chapter 2 presents guiding principles and confidence factors that need to be promoted in RWM in order to establish public trust and confidence: openness, transparency, technical competence and procedural equity. These factors need to be present in everyday policy practice. We distinguish four levels at which these factors can be translated into practice: roles and structures, decision-making process, individuals and institutions, and RWM facilities (chapter 3). We discuss the key drivers for public consent and trust regarding RWM solutions at these four levels. Chapter 4 then focuses on two specific approaches that have received attention from the FSC: the stepwise approach and the partnership approach. Both aim to combine key drivers for public consent and trust in an integral approach. Chapter 5 draws conclusions from this review, summarises the main findings and links these findings with the academic literature on public participation in complex policy issues.

¹ The authors would like to acknowledge the preparatory work for this report done by Dr. Jan Van Damme, Public Governance Institute, Leuven University.

Table 1: NEA documents analysed

Title	Year	R=Report F=Flyer
Learning and adapting to societal requirements for radioactive waste management. Key findings and experience of the Forum on Stakeholder Confidence.	2004a	R
Stakeholder involvement techniques: Short guide and annotated bibliography.	2004b	R
Decision-making for radioactive waste management: Principles, action goals, confidence factors.	2008a	F
Stepwise approach to the long-term management of radioactive waste.	2008b	F
Towards waste management facilities that become a durable and attractive part of the fabric of local community – Relevant design features.	2008c	F
About the Forum on Stakeholder Confidence.	2009	F
The partnership approach to siting and developing radioactive waste management facilities.	2010a	F
From information and consultation to citizen influence and power.	2010b	F
More than just concrete realities: the symbolic dimension of radioactive waste and its management.	2011	F
Geological disposal of radioactive wastes: National commitment, local and regional involvement.	2013a	F
Local communities' expectations and demands on monitoring and the preservation of records, knowledge and memory of a deep geological repository.	2013b	R
Stakeholder confidence in radioactive waste management: an annotated glossary of key terms.	2013c	R
The FSC national workshops.	2014a	F
Stakeholder confidence and transparency in radioactive waste management.	2014b	F
Implementing stakeholder involvement techniques.	2015	F

2. Lessons learnt about guiding principles and confidence factors

2.1. Guiding principles

Radioactive Waste (RW) may result from all phases of the nuclear fuel cycle in the production of electricity as well as from the use of radioactive materials in industry, medicine, research, education and defence. All RW must be managed safely and in a manner that protects humans and their environment.

In general, Radioactive Waste Management (RWM) is embedded in broader societal issues (e.g. risk management, environmental protection, energy policy and sustainable development) where the demand for stakeholders' involvement has increased over time. Because of changes in society and public sensitivity to all matters related to the environment, nuclear energy and radiation protection, any decision regarding RWM cannot be taken away from public examination and without an attentive involvement of the main stakeholders (NEA, 2004a). A stakeholder is any actor (understood as institution, group or individual) with an interest or a role to play in a societal decision-making process (NEA, 2015). In RWM, stakeholders include a wide spectrum of actors: Waste Management Organisations (WMOs), safety authorities and regulators, municipalities and local communities, elected representatives, technical experts, NGOs, etc.

In particular, the FSC stresses the strong international consensus about Deep Geological Disposal (DGD) as the appropriate ultimate route for handling High-Level Waste (HLW) and Spent Fuel (SF). However, DGD is not only a technical endeavour but also a societal one, with a debate about it spanning from the national to the regional and local level.

Public confidence, consent and approval of RWM solutions is far from being a given. As RWM is a controversial subject, the FSC stresses the importance of taking into account the subjective assessment of RW and its risks². The FSC experience suggests that, in addition to technical requirements, societal concerns about risk and safety should also be captured and addressed by RWM processes and their outcomes in order for public trust and confidence to be established. It is clear that the concept of safety is approached quite differently by non-experts and experts³. For non-experts from society, control and familiarity are important components of safety (NEA, 2013a)⁴. Therefore, not only 'objective', technical safety issues must be addressed. RWM needs to take into account also the 'subjective' evaluation of RWM issues by the different parties involved. The FSC indicates that provisions for stakeholder control and familiarity can also give positive feedback on the technical safety, e.g. due to new viewpoints being expressed. For technical experts, institutional control is vital for assuring safety in RWM. This control must be exercised by a national safety authority. However, according to the FSC, a part of the control can also be delegated to other parties from society in order to tackle the

² In this context, the FSC has pointed to the "symbolic dimension" of key concepts in RWM (NEA, 2011). Notions such as waste, long-lived nuclear waste, disposal and compensation typically have negative connotations. They seem to be connected with powerful industries, lack of transparency and power imbalances. More recently, national programmes for RWM have recognised the need to address the causes of such perceptions (NEA, 2011).

³ For example, for a large part of experts, passive safety is the goal in the case of DGD; communities tend, instead, to prefer active safety and prolonged stewardship including monitoring (NEA, 2013c).

⁴ A number of contextual variables have been identified that shape individual perception of risk and safety. These include familiarity with the hazard, voluntarism of risk taking, associated benefits and socio-cultural factors. In particular, feelings of being in control of the hazard and of being active in formulating the risk management strategy seem to play an important role in decreasing the perceived level of risk (NEA, 2004a).

societal component of safety in addition to the technical one. We can call this partial delegation of control "societal control"⁵.

In its 2004 summary of key findings and lessons, the FSC suggested three overarching principles for decision-making in RWM processes (NEA, 2004a): flexibility, social learning and public involvement.

Three overarching principles (NEA, 2004a)

1. "Decision-making should be performed through iterative processes, providing the flexibility to adapt to contextual changes, e.g. by implementing a stepwise approach that provides sufficient time for developing a competent and fair discourse. Competence will grow notably through discussing and exchanging on research and its independent assessment."
2. "Social learning should be facilitated, e.g. by promoting interactions between various stakeholders and specialists."
3. "Public involvement in decision-making processes should be facilitated, e.g. by promoting constructive and high-quality communication between individuals with different knowledge, beliefs, interests, values, and worldviews".

In its Annotated Glossary (NEA, 2013c), the FSC added accountability as another important principle for building trust.

2.2. Confidence factors

Some "confidence factors" have been recommended by the FSC in order to develop and enhance feelings of control and familiarity regarding RWM: *openness, transparency, technical competence and procedural equity* (NEA, 2010b). We will take these four factors as a starting point to build our analytical framework. The first two in particular have been discussed at some length in FSC publications.

Openness and transparency have been core confidence factors in RWM and have played a major role in the FSC discussions since its inception in 2000. The FSC observes that some WMOs still use the two concepts as interchangeable while, in reality, they are different. Openness refers to an attitude that includes a willingness to listen, to change and to adapt. Transparency refers to the process of making actions visible and enabling people to access and understand information. More precisely, transparency refers not only to public access to information ("passive transparency") but also to concrete efforts to provide information to the interested parties and unveil the logic behind decisions and processes ("active transparency") (NEA, 2013c). The FSC suggests that transparency should be embedded in three levels of decision-making: process, structure and behaviour. This means that plans and procedures should be visible, clear roles and responsibilities must be assigned, and individuals and institutions must be open, transparent and willing to involve others (NEA, 2013c).

⁵ Enhanced control and familiarity can be gained in the context of collaborative arrangements, which will be discussed in more detail later (NEA, 2013a).

The four confidence factors mentioned above are crucial in achieving confidence, trust and consent of stakeholders in RWM issues. In FSC publications, confidence and trust are often presented together but with different meanings. "Confidence" in the decision-making hinges on process dependability, based on evidence that can be provided through transparency. "Trust" in institutions and their representatives is related to the behaviour of individuals and organisations; there is trust when an actor is willing to be vulnerable and to give up a certain measure of control to another person or institution (NEA, 2013c). The third concept, i.e. "consent", has not been specifically defined in FSC publications; however, it is used to refer to a level of (public) acceptance of a specific policy solution. In the case of RWM, it is usually used to refer to the acceptance of a local community of a repository in its immediate environment. This acceptance can be quite passive.

The FSC also uses the concept of "ownership". It refers to the situation in which a local community is not and does not feel dispossessed of plans and implementation. Ownership may best be achieved if siting and constructing a facility is framed by officials and by community members as the development of a viable, long-term societal project in which the facility is embedded and seeks to add community value. Such a project should focus on the sustainable well-being of the host community and the region across generations (NEA, 2013c). Ownership is clearly seen by the FSC as more desirable than a mere passive acceptance or consent⁶, and as a goal of any siting process.

The FSC notes that it is important to balance the guiding principles (see above) at different levels, as they can sometimes be competing and conflictual. When different ethical principles clash, for instance regarding the fairness of the outcome of a decision, there is no encompassing theory that could help decide which of the competing views should be considered more important (NEA, 2004a). Another example is the tension between accountability and flexibility. Decision processes are accountable when decisions are clear, well-documented and readily justified. Processes relying on formalised procedures usually result in decisions with high accountability, but such procedures are likely to be weaker in terms of flexibility (NEA, 2004a). According to the FSC, management strategies that are able to meet these multiple ethical principles simultaneously have a better chance of gaining broad societal support. Such strategies may rely on fair processes in which stakeholders seek a compromise between divergent ethical principles (NEA, 2004a).

⁶ Other potential benefits of stakeholder involvement referred to by the FSC include better choices, better conflict management, better information to stakeholders, improved strategic capacity of policy-makers and reinforcement of democratic practices (NEA, 2004b).

3. Lessons learnt about key drivers for public trust in RWM

According to the FSC, confidence factors such as openness, transparency, technical competence and procedural equity are key in developing confidence, trust and consent in RWM (see chapter 2). These factors need to be applied in everyday practice. We distinguish four levels at which these factors can be translated into practice and we analyse them in the following sections:

1. Roles and structures;
2. The decision-making process;
3. RWM institutions;
4. RWM facilities.

The first three levels have been used by the FSC itself to organise key trust drivers (NEA, 2009). We have added the fourth level. Table 2 groups key drivers for confidence, trust and consent in RWM along these four levels. The following sections discuss them in detail.

Table 2: Key drivers for public trust in RWM

Confidence factors	Levels	Key drivers
Openness Transparency Technical competence Procedural equity	Roles and structures	<ul style="list-style-type: none">• National commitment• RWM policy framework• RWM organisation as committed driver• Citizens' participation and empowerment
	Decision-making process	<ul style="list-style-type: none">• Balanced process• Facilitating (social) learning• Allowing added value for host communities
	RWM institutions	<ul style="list-style-type: none">• Demonstrate confidence factors
	RWM facilities	<ul style="list-style-type: none">• Design• Community oversight and stewardship

3.1. Roles and structures

At the level of the roles and structures, there should be a firm national commitment combined with a clear and widely supported policy framework. Trustworthy RWM institutions have to be the committed 'driver' of the policy processes, allowing for enhanced citizen participation and empowerment.

3.1.1. National commitment

National commitment has been identified as an essential dimension for public consent for RWM, in general, and DGD, in particular (NEA, 2013a).

Demonstrating national commitment to delivering a deep geological repository can be supported by a national RWM framework for decision-making that is widely supported, and adhered to, by the relevant actors (NEA, 2013a).

3.1.2. RWM policy framework

RWM efforts (including facility siting) are more likely to gain public support when RWM is part of a broader and widely accepted nuclear energy policy framework. The FSC (NEA, 2008a) developed eight “action goals” which should be followed when identifying waste management solutions that can be considered legitimate. These were followed by several “action items” to be included in countries’ RWM frameworks (NEA, 2013a).

- Action goals (NEA, 2008a):
 - to have an open debate on the national policy regarding energy production and the future of nuclear energy, including the aspect of waste management;
 - to reach a common understanding that the status quo is unacceptable and that an important problem needs to be solved;
 - to clearly define the actors and goals of the waste management programme, including the source, type and volume of waste to be handled;
 - to define an iterative approach to match a suitable waste management method with a technically acceptable site;
 - to agree and apply a fair and open methodology to identify one or more site(s) that are both technically and politically acceptable;
 - to provide forums to enable communities to express their issues and concerns with the development so that they can be addressed;
 - to negotiate tailor-made benefits packages and community oversight schemes with both host and neighbouring communities to enhance their well-being and socio-economic situation, and to design facilities so that they will bring added value to the community;
 - to fully respect agreements when implementing decisions.
- Action items to be included in the RWM framework (NEA, 2013a):
 - a statement by the national government that the status quo is no longer acceptable and that there is a need to implement an integrative policy;
 - clarity about the link between RWM policy and planning and the role of nuclear energy in the country;
 - a national RWM plan explaining the volume, source and destination of the various RW streams;
 - well-known rules about the roles and responsibilities of the various actors in funding, driving, monitoring and implementing the national RWM policy;
 - clarity on long-term issues such as the ownership of the RW;
 - a site selection process whose goal is to identify not an “absolute technically best site” but, rather, a good combination of “safe and licensable site” and “waste management concept” that enjoys local and regional support;
 - sound local and regional development schemes focussed on community vision for long-term quality of life, beyond the endowment of immediate economic benefits, and the recognition that local interests may differ from regional interests.

The RWM framework should also clearly define the roles and rights of players. The financial responsibility for long-term waste management should be clear, and placed primarily on those who produce the waste. A driving role should be played by local communities (NEA, 2009). Interdependencies between involved actors should be made visible (NEA, 2008a).

There should be clear and agreed on principles and rules that the decision-making processes need to follow (NEA, 2008a). In some cases, e.g. in Environmental Impact Assessment (EIA), some of these rules have been legally established, for example regarding who is to be consulted, when and how. In other cases, there is considerable freedom to establish rules that best fit the specific policy situation.

3.1.3. RWM organisation as committed driver

Another essential element at the level of the roles and structures is the presence of a devoted and trustworthy RWM organisation or body that is responsible for the decision making process to keep things moving forward. This is the committed driver of RWM policy processes. A strong and long-term commitment of institutional actors is needed. Whilst the roles and responsibilities of various actors may change, institutional arrangements need to be robust and able to survive changes in political orientation (NEA, 2004a).

3.1.4. Citizens' participation and empowerment

Citizen participation and empowerment have been identified as key ingredients to the formulation of national policies as well as to their successful implementation in regional and local contexts. Large-scale technology projects are much more likely to be accepted when stakeholders have been involved in making them possible and have developed a sense of interest in or responsibility for them. Different stakeholders have different perspectives, perceptions, beliefs, interests and values. This complexity is best taken into account.

An essential dimension is enhanced stakeholder involvement at the regional and local level. Involving regional and local stakeholders starts with providing information and may include, by increasing degrees, consultation, active participation and shared decision authority. A driving role should be played by local communities. They should have an active role in developing and overseeing their own solutions with significant assistance from regulatory and decommissioning authorities and industry proponents. This includes planning and implementation when siting agreement is reached. The FSC stresses early involvement of stakeholders (NEA, 2015)⁷.

It is useful to have local liaison groups near potential sites facilitating public information, education and consultation (NEA, 2009). Different tools and techniques are available to facilitate citizen participation and empowerment. Guidelines have been developed to facilitate the choice of adequate stakeholder dialogue techniques for various types of decisions⁸ (NEA, 2004a). The technique suitable for a particular situation depends on the targeted stakeholders and the aims and objectives (NEA, 2015).

The FSC has identified quite a few key drivers that are related to enhanced empowerment of the local host community such as a voluntary site selection and

⁷ However, whereas early and intensive involvement of the relevant stakeholders is often desirable from the perspective of the initiator, stakeholders themselves may desire, expect or be entitled to a particular level of involvement. Preliminary discussion, contact with or observation of target stakeholder groups, as well as review of statutory requirements, can help determine the appropriate level (NEA, 2004b).

⁸ Criteria for technique selection include the purpose of the public involvement, the level of the decision, the phase of the decision-making process and the number of stakeholders (NEA, 2004a). Common techniques include public hearings, deliberative polling, citizen advisory groups, scenario workshops and consensus conferences (2004b).

negotiation and veto powers (NEA, 2008a). In 2010, the FSC observed that site selection processes based on voluntarism had been applied in the majority of the investigated countries and that in most cases it appears successful in bringing the siting process to a satisfactory close. This study also concluded that a veto right granted to a local or regional government, whether formal or informal, is an important factor in achieving local support (NEA, 2010b).

3.2. The decision-making process

The decision-making process should balance values that are sometimes competing and conflictual, such as participation, fairness, transparency, flexibility and accountability. The process needs to facilitate (social) learning and allow for added value for the communities concerned.

3.2.1. *Balanced process*

Today, decision-making is seen as an overall cautious process of examining and making choices. Procedures and plans for making decisions should be designed to balance different, sometimes opposing principles and values.

First, a balance needs to be found between fairness and competence. Competence refers to the technical focus and safety, whereas fairness refers to the societal focus and to involvement and participation. Research, policy-making and stakeholder input need to be linked in a cycle of shared learning. A methodology should be selected that allows the combination of technical analysis and societal deliberation. Actually, the fact that many implementing organisations have been focusing their efforts on a repository concept that incorporates retrievability can be seen as an example of trying to accommodate technical safety and societal control⁹.

Second, a balance needs to be found between transparency and flexibility. The procedures and plans for making decisions should be both clear and observable, for example in terms of the design of the process, its different stages and its implementation. At the same time, the approach should provide sufficient flexibility to adapt to contextual changes.

Such an approach will enable familiarity and control. If necessary, certain steps may be revisited and adjusted, within the limits of feasibility. It is important that rules are established in order to balance between the need to revisit decisions and the need to bank progress and move forward. Main stakeholders are involved at each step and also in review of the results of the decisions taken in previous steps (NEA, 2008b).

3.2.2. *Facilitating (social) learning*

The decision-making processes at different levels should allow for (social) learning. RWM, like other socio-technical issues, involves decisions that are value- and politically-laden. Cooperation between stakeholders, including politicians, and experts is needed in order to reach those solutions. Interactive processes need to allow sufficient time and resources to all actors for weighing or considering interests and options. Social learning takes place in such processes (NEA, 2004a). For example, this could help developing a

⁹ Retrievability is the ability to recover waste once it has been placed in a repository and implies making provisions in order to allow waste retrieval.

common understanding that the current status quo is unacceptable and that an important problem needs to be solved. Learning can also stimulate familiarity with the nuclear industry.

3.2.3. *Allowing added value for host communities*

The decision-making process should be organised so that communities can express their issues and concerns. These issues need to be addressed so that tailor-made benefit packages and community oversight schemes with host and neighbouring communities can be designed that bring added value to the community.

Such added value can include empowerment measures such as financial resources to pay the expenses of collaboration and to hire the communities' own experts, and socio-economic benefits aimed at compensating for potential losses and making host communities better off. The FSC emphasises that community benefits have to contribute to the sustainable development of the affected region (NEA, 2010b).

3.3. RWM institutions

Individuals and institutions involved in waste management must *demonstrate core values* such as competence, openness and transparency, willingness to listen to and involve others, respectfulness and responsiveness (NEA, 2008a). For example, these institutions need to fully respect agreements when implementing decisions.

In some countries, trust in operating or managing institutions has eroded. Since trust is easy to lose but hard to gain, building trust is a slow and incremental process.

Building confidence implies that the involved national-level, public or private institutions develop appropriate features in the areas of *organisation, mission and behaviour*. Organisational features include independence, clarity of role, public ownership, dedicated and sufficient funding, non-profits status, structural learning capacity, culture, high competence and cohesion. Mission features include a clear mandate and goals, a good operating record, etc. Behavioural features include respect for each other's roles, openness, transparency, consistency, willingness to involve others, devoted staff, etc. (NEA, 2004a). The above mentioned confidence factors need to be present and observable at the individual level as well.

3.4. RWM facilities

The local RWM management facilities need to demonstrate features such as robustness, flexibility, transparency and added value. Additionally, they should allow for community oversight and stewardship.

3.4.1. *Design*

Local RWM facilities need to be designed so that they can suit peoples' needs and ambitions, to the appropriate extent, including potentially those of future generations. This has also been called the "robustness" of the facility (NEA, 2004a). Robust systems may include provisions for flexibility, retrievability and monitoring.

When a facility fits in and adds value, it is more likely to be durably "adopted" by the members of the host community. A positive long-term relationship needs to be built between the facility and the host community. Such a relationship enables the community to assume a "guardianship" role which also enhances safety.

The facilities' design needs to stimulate feelings of safety, familiarity and controllability. The FSC has outlined specific *functional, cultural and physical design features*:

- functional design features help provide flexibility in the uses to which an installation may be put. Careful multi-functional design makes it possible to put the installation to other uses, both in the present and in the future, serving the interests of visitors and residents more directly.
- cultural design features help the installation to reflect and strengthen "the best" of a given society or community. Cultural features help to transmit an honoured legacy, to communicate symbolic meaning or to advance ideals.
- physical design features help preserve the attachment of people to the place and a feeling of familiarity and safety. The community can get the added value of amenity from an attractive, convenient and accessible site that is open and welcoming. Communities point out that if a licensed installation can be freely visited, walked through or enjoyed for other uses, it clearly must be safe.

The overall FSC message about RWM facilities is then "Do not hide these facilities. Do not keep them apart, but make them part of the community" (NEA, 2008c).

3.4.2. *Community oversight and stewardship*

The FSC has also pointed to the need for local communities to participate in facility oversight and stewardship of a deep geological repository. Such oversight refers to society "keeping an eye" on the technical system and the actual implementation of plans and decisions. The concept of "oversight" embraces both the monitoring and the preservation of Records, Knowledge and Memory (RK&M). Oversight can be exercised through different activities, like monitoring technical parameters, monitoring institutional provisions or even monitoring the implementation of agreements made with local hosts.

Such participatory oversight can be a means not only to preserve RK&M but also to build and sustain local confidence in the safety of the facility. As RWM repository and site will be a permanent presence in a host community for a very long time, a positive relationship must be established with those residing there, both now and in the future.

Oversight has a function ensuring safety as well as strengthening public confidence regarding the fact that the repository does not have any undesirable effects on human health and the environment. Oversight ensures not only feelings of safety but also contributes to technical safety.

Therefore, oversight – including monitoring – should not only be approached as a technical endeavour but also as a social one. While official responsibility for the preservation of records, knowledge and memory must remain with institutions, local communities can have an important pragmatic role in maintaining the memory of a repository. For example, local communities can build their own markers to replace old ones that have become obsolete or are fading away¹⁰. This is an example of how

¹⁰ Memorialisation is understood as a cultural feature, meaning that both physical and cultural measures are taken to mark the site and tell its story, so that people will grasp and remember what is there (NEA, 2013b).

oversight, including local control and familiarity, supports safety as well as a feeling of safety.

The FSC has observed that local communities see oversight and monitoring of the facility as an important means to follow up on health and environmental issues. Apart from monitoring health impacts, monitoring socio-economic variables, like property values or economic development, can also be considered important by local stakeholders. In practice, Local Information Committees play an important role in such monitoring. These local committees can foster learning and confidence, and can feed information to the community. It is nonetheless crucial to institutionalise such monitoring, i.e. provide the necessary resources and a legal framework (NEA, 2013b)¹¹.

Local communities in different countries have different viewpoints regarding the level of involvement of local stakeholders in monitoring and the actor that is responsible for interpreting monitoring results. For example, Swedish local communities believe that environmental courts and EIA procedures are sufficient to interpret monitoring results, whereas in France, independent auditors or specific monitors, chosen by local communities, are seen as being the most adequate (NEA, 2013b).

¹¹ Broad target areas for monitoring include environmental impacts and socio-economic factors, as well as health (in a minority of contexts) (NEA, 2013b).

4. Integrating key trust drivers in an overall approach

In chapter 3 we elaborated on key drivers for public trust in RWM. We also clarified that these key drivers are in fact related to confidence factors such as transparency, openness and competence (see chapter 2). More precisely, we stated that these confidence factors need to be present in everyday practice in order to develop a level of public trust in RWM. Over the years, the FSC has also developed specific approaches that combine different elements that can contribute to trust in RWM. In the next two sections we discuss the stepwise approach and the partnership approach. Such integrated approaches can increase the possibilities for public trust. They have been developed on the basis of successful practices in FSC member countries.

4.1. The stepwise approach

The FSC has promoted the so-called “stepwise approach” to decision-making in RWM. A stepwise approach to decision making involves “a plan laying out policy development and implementation by steps or stages that are, to some extent, reversible and adjustable, within the limits of practicality” (NEA, 2013c). Within each stage, problem definition and analysis, policy formulation, implementation and monitoring are carried out in turn, in a cyclical process. Finally, in a stepwise decision-making approach, main stakeholders are involved at each step and also in review of the results of the decisions taken in previous steps (NEA, 2013c).

The success of the stepwise approach is related to the fact that it allows stakeholders to gain familiarity with and a degree of control over RWM technologies and institutions. In particular, volunteering as a candidate host community is shown to be easier when communities can move through stages that allow them to become well informed and progressively more committed. Making choices by stages facilitates adaptation to inevitable changes in legal, economic, social, technical or political conditions.

The stepwise approach provides opportunities for various degrees of social and political review after identified steps and for reversing earlier decisions or modifying them, within limits of practicability. This is designed to provide reassurance that decisions can be reversed if experience shows them to have adverse or unwanted effects.

A stepwise approach to decision-making has thus come to the fore as being of value in advancing long-term RWM solutions in a societally acceptable manner. Stepwise decision-making has led to decisions that are viewed as legitimate and can be more easily sustained (NEA, 2013c).

However, when designing a stepwise process, trade-offs between social sustainability of the process and efficiency should be considered, as with every increase in the number of steps or the intervals between them the costs and duration of the process may also increase.

The main challenges in the formulation and implementation of a stepwise approach are:

- Agreement must be achieved on the desirability of the stepwise approach and on potential decision sequences. Clear roles and decision points must be established and agreed at the beginning of the process.
- Relevant stakeholders must be identified and interaction among them must be established. Room and time must be provided for non-institutional stakeholders to

learn new roles, build up knowledge, examine choices and communicate their constituencies.

- Platforms must be built to support the participation of all actors and reinforce their willingness to participate. This requires tools and research means and also commitment to consider inputs if they meet quality criteria.
- A “driver” must keep the process moving. The needed platforms and institutions must be protected and focus must be kept on the long-term goals and the decisions at hand.

The FSC observes that a stepwise approach to decision-making has been commonly adopted in NEA member countries. Nevertheless, the way the approach is handled varies from country to country in line with diverse national legal and democratic frameworks (NEA, 2008b). There is no one-size-fits-all solution, and even when staged programmes are designed, they may not be acceptable to all stakeholders, or partial failures to move forward may occur.

4.2. The partnership approach

Whereas the stepwise approach focuses on the different steps of the decision-making process, the partnership approach focuses on the relations between the different stakeholders in RWM.

According to the FSC, RWM institutions have progressively turned away from the traditional “decide, announce and defend” model and are learning to “engage, interact and cooperate”. The partnership approach is a practical method for effective collaboration with local communities and informed consent with regard to siting RWM facilities (NEA, 2013c).

The partnership approach contributes to transparency and accountability and reflects a determination to empower communities in decisions that may affect their future. In a partnership, power is redistributed through negotiation between citizens and implementers and/or competent bodies. They agree to share planning and decision-making activities. Instead of passive acceptance, the partnership supports active involvement by the community (NEA, 2010a; NEA, 2013c).

The partnership approach is a formal or informal arrangement between the RWM implementer and representatives of the local community to work together to assess technical and socio-economic issues. A formal agreement can make a partnership more sustainable. The regulator is usually aware of (if not part of) the partnership and is asked to brief the partnership from time to time or attend some of its initiatives (NEA, 2013c).

The main components of the approach are: *voluntarism, right of veto, collaboration with affected communities in facility design and implementation, and provision of community benefits*. Central in the approach is also the *empowerment* of local communities regarding decisions that may affect their future (NEA, 2010a). A dynamic and effective *dialogue* between the different stakeholders is crucial. Dialogue may help to find ways of creating constructive relationships among stakeholders and is necessary to reveal divergent understandings and values, as well as to build up and check those understandings and values which are shared. The procedure for dialogue and the selection of participants should be perceived as fair. The influence that dialogue will have upon decision-making should be clarified at the outset and feedback should be provided to participants (NEA, 2013c).

The partnership allows local communities to access, evaluate and disseminate information; consult experts of their choice and build up own expertise; design community benefit packages; deliberate and provide recommendations to higher authorities; make suggestions to facility design; stay abreast of research; and monitor performance of various players (NEA, 2010a). The previously mentioned *voluntarism* and *right of veto* gives additional margin of choice to the community.

An important challenge to the partnership approach is that it requires significant time, commitment, material and resources. Even more important is that implementers are required to open up, share some power and make available the necessary mechanisms and resources. Local community members need to keep in touch with and represent the diversity of local population's views, deeply immerse themselves (often on a volunteer basis) in the partnership dossiers to enable scrutiny and challenge the institutional actors to adapt to community needs. Finally, decision-makers on higher levels should respect the work of the partnership and take it into account in the decision-making process (NEA, 2013c).

The partnership approach, however, is likely to result in solutions that bring added value to the host community and it can develop social capital. Moreover, it provides continuity and mechanisms for addressing in a non-adversarial manner new issues as they arise (NEA, 2010a).

5. Conclusion

In this report we have offered a review of the major works developed during the past fifteen years by the Forum on Stakeholder Confidence (FSC) of the OECD Nuclear Energy Agency (NEA). We have presented the key drivers of public trust in RWM, based on a thorough document analysis of FSC reports and flyers (see chapter 1).

The FSC experience suggests that – in addition to technical requirements – societal concerns about risk and safety need to be addressed in order for public trust and confidence to develop. For non-experts, feelings of *control and familiarity* are important in establishing a feeling of safety (NEA, 2013a). In this respect, the FSC points to a number of confidence factors that need to be promoted in RWM: openness, transparency, technical competence and procedural equity. When these confidence factors are present in everyday practice, public trust can be built (chapter 2).

We have used these confidence factors to build a framework with key drivers for public trust in RWM at four levels: roles and structures; the decision-making process; RWM institutions; and RWM facilities (chapter 3). The first three levels have been used by FSC itself to organize key factors (NEA, 2009); we have added the fourth level. The key drivers can be presented as follows. First, at the level of the *roles and structures*, there should be a firm national commitment combined with a clear and widely supported policy framework. Trustworthy RWM institutions have to be the committed driver of the policy processes, allowing for enhanced citizen participation and empowerment. Second, the *decision-making process* should balance values that are sometimes competing and conflictual, such as participation, fairness, transparency, flexibility and accountability. The process needs to facilitate (social) learning, and allow for added value for the communities concerned. Third, *individuals and institutions* involved in RWM must demonstrate competence, transparency and the willingness to listen to and involve others. Fourth, local waste management *facilities* need to demonstrate core values such as robustness, flexibility, transparency and added value. Additionally, they should allow for community oversight and stewardship.

The report has also discussed the stepwise approach and the partnership approach. These approaches combine key FSC insights regarding developing public trust and confidence in RWM in a more integral approach (chapter 4).

The analysis conducted in this report calls for a final consideration. We have used the insights developed by the FSC in its reports and flyers and investigated to what extent these findings are in line with academic research on stakeholder involvement in complex policy issues. As a general conclusion, we acknowledge that the confidence factors and drivers for public trust in RWM identified by the FSC are in line with the existing academic literature. For example, studies from the field of public administration and political theory point out that confidence factors such as transparency, fairness and competence in complex policy-making need to be respected for good outcomes (such as trust) to be achieved.

The confidence factors referred to by the FSC can also be linked to the idea of input, process and output legitimacy of policy-making (Papadopoulos & Warin 2007; Van Damme & Brans 2012). For policy to be (perceived as) legitimate by the public, not only the policy itself but also the policy-making process needs to be (perceived as) legitimate. Input legitimacy deals with questions of access to the policy-making process, whereas process legitimacy focuses on the quality of deliberation (Who can deliberate? How do we deliberate?). Whereas input and process legitimacy focus on the policy-making process, output legitimacy deals with the quality of the outcome of the policy-making process, that is the quality of the policy itself.

Furthermore, the FSC notes that it is important to balance these confidence factors at different levels, as these can sometimes be competing and conflictual. One example is the tension between accountability and flexibility. Decision processes are accountable when decisions are clear, well-documented and readily justified. Processes relying on formalised procedures usually result in decisions with high accountability. However, such procedures are likely to be weaker in terms of flexibility (NEA, 2004a). And flexibility can be important in a complex policy environment. But, also other confidence factors may clash, for example inclusion, representativeness and competence. Which principle should guide stakeholder selection or inclusion? Should everybody who has an interest be included? Or everybody who is interested? Or should only specific key stakeholders be included (Van Damme & Brans 2012)?

As for the key drivers developed by the FSC, they, too, are in line with academic literature. For example, in the literature on interactive governance, the importance of intensive or adaptive process design and management is being stressed (Edelenbos & Klijn 2005; Kickert, Klijn & Koppenjan 1997; O'Toole 1988). Policy is developed through complex interactions between actors, which have to be actively managed in order to achieve interesting outcomes (Koppenjan & Klijn 2004). Processes are supposed to be tailor-made to fit policy situations and may be expected to obtain the best results when the design is well set up and there is active process management during the course of the process, in which the design is flexibly used. The tension mentioned by FSC between, on the one hand, transparency and having clear rules and roles at the outset of the process, and, on the other, the need for functional flexibility in order to adapt the process when needed, is clearly related to the governance perspective that there should be a clear design specifying the rules of the process, while at the same time allowing for the necessary flexibility. Other key drivers for public trust mentioned by FSC, such as a clear government commitment and framework, increased public involvement, and the need for high quality dialogue are other examples of success factors that can also be found in the literature (Van Damme & Brans 2012).

Stakeholder involvement in radioactive waste management issues will remain on the policy agenda. An initiative such as the Forum on Stakeholder Confidence has allowed developing key insights about stakeholder dialogue and ways to develop public trust of management solutions regarding RWM. However, some questions remain. For example, to what extent do the different drivers that have been identified play a role? What is the impact of local and/or national contexts? It appears that in the near future, more systematic evaluations of different local and national approaches to public participation is needed in order to build knowledge and capacity in this field.

References

FSC flyers:

- NEA, 2009, "About the Forum on Stakeholder Confidence", OECD/NEA: Paris.
- NEA, 2008a, "Decision-making for radioactive waste management: Principles, action goals, confidence factors", OECD/NEA: Paris.
- NEA, 2008b, "Stepwise approach to the long-term management of radioactive waste", OECD/NEA: Paris.
- NEA, 2008c, "Towards waste management facilities that become a durable and attractive part of the fabric of local community – Relevant design features", OECD/NEA: Paris.
- NEA, 2014a, "FSC national workshops", OECD/NEA: Paris.
- NEA, 2010a, "The Partnership Approach to Siting and Developing Radioactive Waste Management Facilities", OECD/NEA: Paris.
- NEA, 2010b, "From Information and Consultation to Citizen Influence and Power", OECD/NEA: Paris.
- NEA, 2011, "More than just concrete realities: the symbolic dimension of radioactive waste and its management", OECD/NEA: Paris.
- NEA, 2013a, "Geological Disposal of Radioactive Wastes: National Commitment, Local and Regional Involvement", OECD/NEA: Paris.
- NEA, 2014b, "Stakeholder confidence and transparency in radioactive waste management", OECD/NEA: Paris.
- NEA, 2015, "Implementing Stakeholder involvement techniques", OECD/NEA: Paris.

FSC reports/studies:

- NEA, 2013b, "Local communities' expectations and demands on monitoring and the preservation of records, knowledge and memory of a deep geological repository", OECD/NEA: Paris.
- NEA, 2013c, "Stakeholder confidence in radioactive waste management: an annotated glossary of key terms", OECD/NEA: Paris.
- NEA, 2004a, "Learning and Adapting to Societal Requirements for Radioactive Waste Management. Key findings and experience of the Forum on Stakeholder Confidence", OECD/NEA: Paris.
- NEA, 2004b, "Stakeholder Involvement Techniques: Short Guide and Annotated Bibliography", OECD/NEA: Paris.

Other references:

- Edelenbos, J. & Klijn, E.-H. 2005, "Managing stakeholder involvement in decision making. A comparative analysis of six interactive processes in the Netherlands", *Journal of Public Administration Research and Theory*, 16, 417-446.
- Kickert W.J.M., Klijn, E.-H., & Koppenjan, J. 1997, "Managing networks in the public sector: findings and reflections," in *Managing complex networks. Strategies for the public sector*, Kickert W.J.M., Klijn, E.-H. & Koppenjan, J. eds., Sage, London, 166-191.
- Koppenjan, J. & Klijn, E.-H. 2004, *Managing uncertainties in networks*, Routledge, London; New York.
- O'Toole, L. J. 1988, "Strategies for intergovernmental management: implementing programs in interorganizational networks", *International Journal of Public Administration*, 11[4], 417-441.

- Papadopoulos, Y. & Warin, P. 2007, "Are innovative, participatory and deliberative procedures in policy making democratic and effective?", *European journal of political research*, 46[4], 445-472.
- Van Damme, J. & Brans, M. 2012, "Managing public consultation: a conceptual framework and empirical findings from Belgian case studies", *Public administration* 90[4], 1047-1066.

List of abbreviations

DGD	Deep Geological Disposal (DGD)
DG ENER	Directorate-General for Energy
EC	European Commission
EIA	Environmental Impact Assessment
E-TRACK	Energy – Transparency Centre of Knowledge
FSC	Forum on Stakeholder Confidence
HLW	High-Level Waste
JRC	Joint Research Centre
NEA	Nuclear Energy Agency
OECD	Organisation for Economic Co-operation and Development
RW	Radioactive Waste
RWM	Radioactive Waste Management
SF	Spent Fuel
WMOs	Waste Management Organisations

List of tables

Table 1: NEA documents analysed

Table 2: Key drivers for public trust in RWM

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