



EC Sixth Framework Programme

CARD Project

A Co-ordination Action on Research, Development and Demonstration
Priorities and Strategies for Geological Disposal

FINAL REPORT

May 2008

EC CARD Project

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This final report on the CARD Project provides the foundation for a proposal for a European Technology Platform in the Field of Geological Disposal of Radioactive Waste. The basis for such a proposal has been built on a preliminary vision developed by the partners in the CARD project that was further developed to take account of inputs from waste management organisations, research providers and other stakeholders.

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EC CARD Project

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1. Introduction

The EC CARD (Co-ordination Action on research, development and demonstration (RD&D) priorities and strategies for geological disposal) Project was instituted under the European Commission's Sixth Framework Programme for Management of Radioactive Waste (FP6).

The aim of the CARD Project was to assess the feasibility of a Technology Platform (TP)¹ that would provide a European framework for networking and co-operation in the field of RD&D for geological disposal of radioactive waste in the EU, see reference [1]. Under the EC contract, the study sought inputs from radioactive waste management organisations (geological disposal implementers) and other potential participants in a TP. The project partners then analysed these inputs and, finding there is a sufficient level of support (meaning coherent support for a common proposal), developed the basis for a proposal for a TP.

The project participants from ten countries represent radioactive waste management organisations (WMOs) responsible for managing national research programmes related to geological disposal or, in one case, for a country not being represented by a WMO, a technical support organisation (TSO), see Table 1. In the case of a number of these organisations this responsibility is discharged in support of the development, planning or feasibility testing of a repository solution. In the CARD project they were charged with collecting and analysing views of key national stakeholders in the development of geological disposal facilities (WMOs, research organisations, regulators, local communities and other stakeholders) so as to develop proposals that could achieve an appropriate level of support.

The project participants met and discussed the objectives, structure and working methods of a TP on two occasions (November 2006 and May 2007). They prepared a preliminary vision for a TP and a detailed questionnaire on that vision, see Annex 1. The questionnaire was responded to by 82 national organisations, including Formal National Appointees², research providers, regulatory bodies, safety authorities and other stakeholders, see Table 2. The analysis of responses is documented in Annex 2.

The project participants judged that responses to the questionnaire did indeed demonstrate a sufficient level of support for a European TP in the field of RD&D for geological disposal of radioactive waste, see Section 2. Therefore they developed a draft proposal for the TP on the basis of their analysis of the responses to the questionnaire.

¹ The "Technology Platform" is an instrument devised by the European Commission to provide a framework for co-ordination of R&D activities in key technical areas with a view to assisting Europe to compete efficiently in the development of advanced and complex technologies, e.g. see http://cordis.europa.eu/technology-platforms/home_en.html.

² "Formal National Appointee" is a term used by the CARD project. It means an organisation that has been formally appointed by government, often under national legislation, or otherwise entrusted with the responsibility either for managing the development and/or implementation of deep geological repositories for radioactive waste in a given country (the WMO), or for providing technical support including RD&D and/or safety assessment capability (a Technical Support Organisation or TSO).

The organisations that had been invited to respond to the questionnaire were invited to an open workshop held in Brussels in March 2008 to share the findings of the Project and to give feedback on the proposals for the structure and operation of the TP. The workshop was attended by 54 participants from 11 countries, see Table 3. The high level of support for the proposed TP was confirmed and a high proportion of the participants contributed ideas on how the TP could be established and operated to meet the overall objective (of more efficient implementation of geological disposal in EU member states) and the associated needs of national programmes and of individual organisations.

Section 3 of this document provides a proposal for a TP, based on the preliminary vision developed by participants in the CARD project that was further developed to take account of responses from the questionnaire and of feedback from the open workshop.

2. Level of Support for a Technology Platform

All 10 organisations that have participated as partners in the CARD Project support the concept of a European TP in the field of RD&D for geological disposal of radioactive waste and believe it could have important benefits. Primarily, the benefits are:

- Increased confidence in the scientific and technical basis of geological disposal as a safe and feasible solution – provided by a coherent scientific and technical effort, through collaboration of WMOs and research providers (both TSOs and non-TSOs), and possibilities for other stakeholders to witness and influence that effort.
- Economic – through sharing costs of projects that address common RD&D goals and/or through better co-ordination of existing and future projects.

Reservations of the WMOs participating as partners in the project are:

- Cost and staff resource based – that participating in a TP must not impose a significant additional administrative load on organisations or their contracted research providers.
- Direction and control based – that shared projects are aimed at common goals, and that key RD&D resources directed to solving immediate issues within national programmes should remain focused on those immediate issues.

Responses from the questionnaire showed as follows.

All 13 WMOs that responded expect to participate. One gave a specific reservation related to control of key RD&D resources.

All 7 TSOs that responded also expect to participate. One gave a specific reservation related to dependence on the attitude of its national WMO.

The 38 non-TSO research providers responding gave mainly positive responses with at least 65% expecting to participate and only one direct no. The main reservations were concerning the resource or support to participate.

Among the 23 “other stakeholders” (i.e. regulators, government ministries and local community organisations) there was general encouragement for a TP as positive to confidence building. Many of the organisations, however, consider themselves “not competent” or interested to participate in a primarily technical forum. Only 9 (43%) judged it was possible to likely that they would participate. Regulators mentioned resources and independence. Social stakeholders mentioned lack of social dimension.

Thus, while support for a TP is high in all three groups, direct participation from other stakeholders – mainly ministry departments, regulators and social stakeholders – may be limited.

Feedback from the open workshop showed that there is a high level of support and interest with respect to the proposed TP. In line with the analysis of the responses to the questionnaire there was little participation from representatives of Government ministries (except in the case where the ministries themselves hold the responsibility for implementing the national RD&D programme) and of social stakeholders. However, the interests of social stakeholders were represented by participants in national and international initiatives concerning, for example, waste governance and education and training. Regulators and TSOs made proposals for the operation of the TP in a way that would meet their needs and objectives while not compromising their independence.

A number of key points emerged in the course of the workshop and these are summarised as follows:

- Greater clarity is required on the scope of the TP, i.e. what is included in geological disposal RD&D.
- The TP will represent a valuable source of guidance to the EC on the topics that should be included in its Framework Programmes.
- The TP represents a vehicle for co-ordinating education and training with respect to radioactive waste management; interface arrangements are required with related initiatives in the nuclear field. As such the TP represents an opportunity to ensure continuity in the expertise and knowledge over the extended periods of time needed in the development and operation of a disposal facility.
- Knowledge management should be a highly prioritised activity for the TP, involving the commissioning of books and reports on the state-of-the-art of relevant topics, effectively “handbooks” for radioactive waste management.
- Closely related to this proposal on knowledge management, the involvement of a wide range of stakeholders, including social stakeholders³, will enhance the value of knowledge management initiatives and inform their objectives.
- The value of a reference group for national programmes involved in defining or reviewing policy was emphasised and the TP was proposed as a means of providing the necessary expertise, when required in this role; the associated need for a method of communicating with the TP was recognised.
- The interfaces with other similar organisations, in particular the Sustainable Nuclear Energy Technology Platform (SNETP), need to be defined clearly: in the case of the SNETP, it will be important to specify the respective remits with respect to waste processing and packaging (i.e. conditioning).
- The TP will have an important strategic role to play, including the provision of inputs and feedback to the European Parliament.

³ It was noted that local communities involved in disposal facility siting programmes often rely on external technical experts and it is important that they can see convincing arguments and synergies with other existing activities.

- The scientific and technical community requires a network of personal contacts to operate effectively in achieving the co-operation envisaged: the TP must facilitate such networks.

Consequently, the CARD participants conclude:

- There is sufficient support for a TP in the field of RD&D for geological disposal of radioactive waste. This is based mainly on the different, respective needs and views of the WMOs, TSOs and other research providers. Other stakeholders are supportive but their direct participation may be limited.
- The organisations with a responsibility for commissioning and applying RD&D to the development of repository safety cases and repository designs or to the development of policy in national programmes must provide the driving input to establish and direct a TP, since it can only be of value if it serves these objectives. Therefore, the TP must work first as a cost-effective technical forum and mechanism for WMOs, TSOs and other research providers. It should also communicate to other stakeholders, holding open the possibility for increased participation in future.
- The Technology Platform should be developed in a staged fashion to ensure its focus and efficiency. In particular, to meet WMO reservations noted above, the costs and staff resources, and direction of the TP, must be monitored and well controlled. However, as also noted above, the WMOs see a potential for considerable cost savings through cost-sharing and co-ordination in a well-managed TP.

3. The Technology Platform

Conditions for success of a European TP for networking and co-operation in the field of RD&D for geological disposal have been identified and tested to the extent possible at this development stage. They are as follows:

- A shared vision of the TP by those participants having national programme responsibilities and a willingness to support a common strategic research agenda (SRA), i.e. an agreed set of goals for the RD&D most suitable for collaboration and needed to develop geological disposal to the level of practical implementation, and agreed time scales for their accomplishment (see Section 3.4.1).
- Sufficient authority and willingness of the WMO participants needed to commit resources to projects;
- Active and constructive support of all participants including a range of stakeholders;
- Appropriate structure and working methods to realise the general objectives and specific project goals efficiently.

Relevant aspects of the TP proposal are discussed in the following sub-sections.

3.1 General ground rules

The Technology Platform will be established and directed by the organisations that have national programme responsibilities for commissioning and applying RD&D in implementing or planning geological disposal, or in formulation of disposal policy (typically this will be a WMO) and be to serve their needs. The EC will take an interest as an observer, offer advice

in relation to its experience of similar ventures and provide some support for coordination activities of the platform. Organisations will decide for themselves whether or not to participate, and at what level of commitment, depending on the benefits they see in participation and on their own resources.

The Technology Platform can begin as an information exchange and discussion forum and is expected to develop as a vehicle for practical co-operation in specific RD&D projects. It is not intended to duplicate existing discussion fora (e.g. as provided by the NEA and IAEA) or existing multi-national or bilateral research agreements. It is expected that these latter agreements will be built upon for the benefit of the TP and that the TP will also benefit from the structured dialogues that essentially will continue to occur at the national level between WMOs and research organisations with responsibility for each national programme. Rather, the TP is to help identify RD&D needs that are common to at least some of the participants to offer practical solutions by which interested participants can co-operate in meeting those needs, and to provide a platform for open discussion and exchange of RD&D results.

It is not expected that participants will surrender control of their RD&D resources, rather, where there is a joint benefit, they will pool parts of their resources with others for the purposes of specific projects with joint agreed goals and timescales.

Questionnaire responses confirm that only a few per cent of funding for RD&D related to radioactive waste management comes via the EC and the bulk is committed directly by the WMOs for their national research programmes. An important proposed aim of a TP is to co-ordinate shared objectives and projects in the work programmes at the command of WMOs in topics and areas where a joint benefit of co-operation is seen. A subsidiary element in promoting such co-operation is that views expressed in the SRA and the direction of projects within the Technology Platform would be a valuable source of guidance to the EC in setting priorities in its Framework Programmes. This information coming out of the TP will be of value to focus support to the implementation of geological disposal in EU-member countries by identifying areas of highest added value to implementation by European cooperation.

3.2 Benefits and objectives

The following general benefits or objectives have been identified, which a TP should seek to realise:

- Gaining understanding of who is doing what RD&D and for what reasons, and thus to learn each others' planning strategy and underlying structure for planning RD&D activities and organising information (e.g. requirements management, knowledge management, strategic resource management).
- For advanced national programmes, supporting the implementation process (and strengthening the foundation of repository safety cases) through discussion on key issues and formulation of focused and efficient RD&D responses, also taking account of views from regulators and other stakeholders. There is also the prospect of sharing resources to tackle issues that may not be key to implementing geological disposal but nonetheless need to be handled in national programmes (e.g. 'exotic' wastes).
- For less advanced national programmes, giving advance insight on future requirements through the same processes and giving the opportunity to allocate resources to encourage early solutions and follow developments.

- Enhancing public acceptance and confidence through demonstrated openness of discussing problems and the RD&D requirements, and developing broadly-based technical consensus on the state-of-the-art of science and technology (as a part of knowledge management), allowing objective identification of the uncertainties that still remain.

Table 4 shows a list of possible benefits presented in the questionnaire and average scores allocated to each by formal national appointees, research provider and stakeholders. This demonstrates that the sharing of RD&D information is the most highly regarded benefit across all organisations. Exchange of information and experience on RD&D planning and management is highly regarded by the formal national appointees.

Table 5 shows a list of possible objectives and functions presented in the questionnaire and average scores allocated to each by formal national appointees, research provider and stakeholders. This demonstrates that establishing a forum and mechanisms for sharing of RD&D information and results is the most highly regarded objective across all organisations. Establishing a forum for discussion of RD&D issues and priorities amongst RD&D funders, managers and other stakeholders, and establishing mechanisms for co-ordinating RD&D on topics of shared interest between programmes is highly regarded by the formal national appointees

3.3 Structure

The TP structure must allow a level of access to all committed participants – to allow open discussion and exchange – but also provide a formal structure committed for efficient planning, management and reporting of projects or activities.

The basic structure proposed for a TP includes:

- A forum for exchange of information and discussion of RD&D needs, as well as results, in relation to implementation of geological disposal.
- A working programme controlled by an executive group that is supported by a secretariat.

Within the working programme would be:

- Working groups with specified mandates related to the TP (e.g. development of the SRA, development of supporting activities such as education and training).
- Collaborative projects and activities following agreed work plans and objectives.

The structure must accommodate the needs and constraints of:

- Organisations that are in charge of implementing disposal facilities and/or entrusted by their Government with developing radioactive waste disposal solutions.
- Research providers, with an interest in scientific co-operation as a means of providing input to and gaining information from research programmes;
- Other stakeholders with technical interests and concerns, for example, regulatory bodies, government ministries and involved municipalities, with an interest in information from, and influencing, European research programmes.

The proposed structure developed by the CARD participants is illustrated in Figure 1. This is a simplified outline developed to promote feedback from interested parties at the open workshop. The workshop participants were broadly satisfied that this is an adequate structure to act as a guide for initial development of the TP. An early task for the executive group and secretariat would be to review and add detail to this structure.

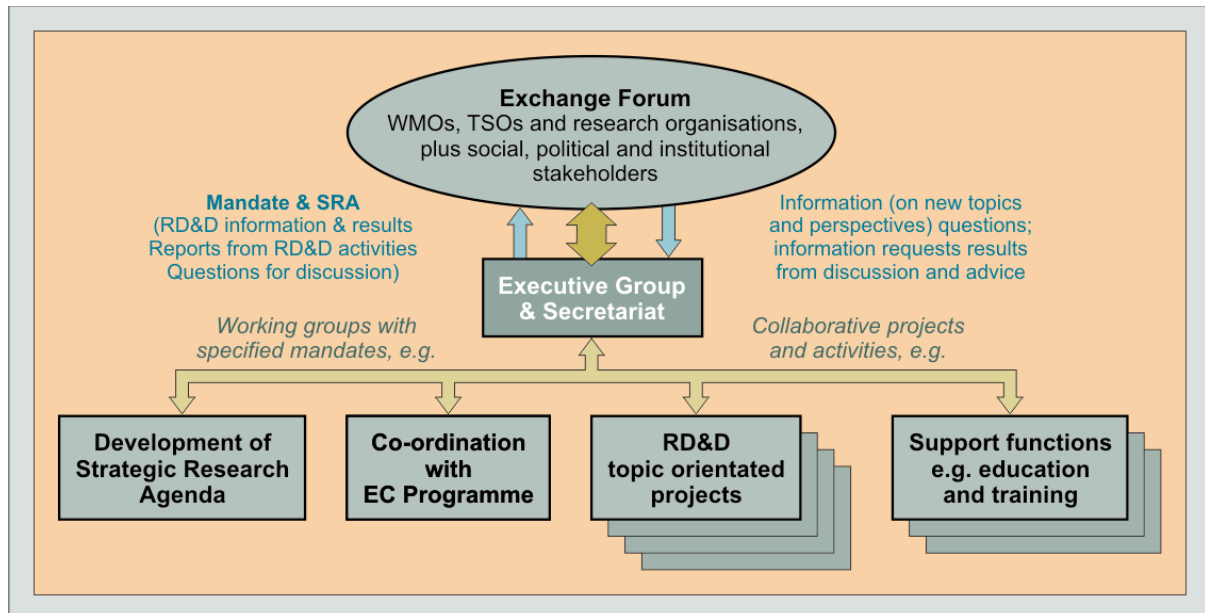


Fig. 1: Structure for the Technology Platform for RD&D for geological disposal.

A key issue in developing this structure is to determine the inputs that are required from different types of organisations or organisations with different responsibilities, and how best these can be made. This was the subject of considerable discussion within the CARD Project; the following points concerning organisational responsibilities are considered relevant.

Waste Management Organisations (WMOs)

In the majority of EU member states with a nuclear power programme a WMO has been created, having as one of its main responsibilities the implementation of geological disposal policy or providing support to the national government in development of policy. The progress of a WMO's programme towards implementation of disposal involves the development of repository safety cases and associated repository designs to meet the requirements of the different stages of the national licensing process. In a number of the more advanced programmes the RD&D issues that remain to be addressed are formally documented as a part of the evolution of the safety case. The identification of these issues typically includes inputs from review by scientific peers, regulatory bodies etc. Hence these programmes have a clear view of their RD&D requirements, arrived at by a sound, scientific process. Less advanced programmes may not yet have gone through such a process, but nevertheless can map their waste inventories, geological conditions etc onto the published work of the more advanced programmes. Therefore the WMO or, if none exists with the relevant responsibilities, an organisation charged with the equivalent responsibilities, is best placed to set the strategic objectives of RD&D in order to meet its national programme goals for implementation of geological disposal.

A range of geological conditions and repository concepts are under consideration across the EU member states. Nonetheless, there are sufficient synergies between programmes for a number of formal co-operation agreements between WMOs to function effectively. At a more

informal level, there is a marked willingness for WMOs to work together in discussing ideas and initiatives that they hold in common. Given this already significant level of co-operation, the extra commitment that will be necessary to ensure the effective operation of a TP will have to bring the extra benefits that are foreseen from it. In particular the TP will have to improve delivery against the strategic objectives of these organisations.

WMOs typically do not carry within themselves the RD&D capabilities required to deliver their programmes, but rely upon commissioning RD&D from suitably qualified organisations.

Technical Support Organisations (TSOs)

In a number of EU member states Technical Support Organisations (TSOs) have been established with a remit that includes providing the specialised scientific and technical information required in evaluating the scientific and technical output of WMOs for implementing geological disposal. In a few cases, when roles and responsibilities are clearly defined, a partnership exists between the national WMO and the one or more TSOs in the country.

In some cases TSOs provide support to the national regulatory body rather than the WMO and in this instance are more accurately referred to as Technical Safety Organisations. Their potential role is discussed under the following Regulators section. In a few cases the national government may rely directly on a TSO for the information required to develop disposal policy.

Therefore TSOs often provide an input of scientific and technical information required for a programme to progress and additionally have the capability of evaluating the status of scientific understanding in key areas. These inputs will need to be carried through into a TP if it is to be successful. TSOs and other research organisations will be needed for the TP to be able to identify and provide the means by which strategic scientific and technical objectives are achieved.

TSOs will also have their own, legitimate objectives for co-operation, for example information exchange or staff development and exchange, that are beneficial to the overall objective of delivering high quality support to implementation of disposal.

Regulators

Regulatory bodies with responsibilities for scrutinising proposals relating to geological disposal have been established in most member states with nuclear power programmes. The issues of independence and reserving of position are important in considering how regulatory bodies and, where relevant, its supporting Technical Safety Organisation might be involved in a TP. In order to maintain public confidence in its role, the regulatory body must be seen to operate independently of the WMO (or its equivalent) and not to be unduly influenced by the WMO's strategies. The regulatory body can only come to a formal view on the status of the scientific and technical arguments and any resulting needs for further RD&D when this information is presented in a safety case in progressing a specific national programme.

Nevertheless, the regulators will clearly find it helpful to obtain greater visibility of the international scientific and technical basis for geological disposal and may have their own requirements for greater scientific understanding in key areas. A valuable proposal made at the open workshop was that a separate stream of RD&D topic orientated projects could be established that are dedicated to the requirements of regulatory and Technical Safety Organisations, so providing independence from WMO activities.

3.4 Working methods

3.4.1 The Strategic Research Agenda

A key vehicle of other European TPs is the “Strategic Research Agenda” (SRA). For geological disposal RD&D this will be a document, arrived at by technical analysis and discussion between WMOs and TSOs and other research providers, taking account of the views of other stakeholders. It will lay out RD&D goals within the Technology Platform and time scales for their accomplishment. It will form a focus for ongoing discussion and will be subject to review and on-going development. In line with the planning that typifies national implementation programmes, it is suggested that this could be structured around short-term, medium-term and long-term objectives that take account of the planned implementation of geological disposal in a number of member states around 2020.

Once the SRA is agreed, it will form the high-level guidance for development of proposals and detailed plans of work within the TP. In the context of a TP in the area of RD&D for geological disposal, the SRA represents a shared view on the RD&D that is required in support of implementation of geological disposal in Europe and where international co-operation will enable or improve its quality or timeliness of delivery.

3.4.2 Dialogue and control

Dialogue would be generated primarily within the Exchange Forum, whereas control and monitoring of activities is achieved under the supervision of the TP executive group and secretariat, see Figure 1.

The Exchange Forum would use a range of methods to promote dialogue. These could include:

- Operation of a website with information on the TP programme, access to results, and proposals for review and comment (a pilot website www.cardproject.eu was developed within the CARD project).
- Meetings to discuss RD&D priorities, the SRA and the TP programme;
- Workshops on specific RD&D topics or functions and support activities.

For management efficiency, and to ensure that the organisations with national programme responsibilities for deploying research budgets (WMOs or their equivalent), retain control of their RD&D resources, the implementation of projects within the TP would be controlled by an executive group appointed by these organisations as a key part of establishing the TP. The appointment of the executive group would be on the basis of technical competence, covering the complete spectrum of their needs, and strategic-level management competence. This executive group, meeting regularly, would commission working groups to develop both the overall SRA and to assess and make technical plans for RD&D projects or development of TP functions. It would formally open RD&D projects and activities, monitor their performance, and close projects and activities on reaching their goals in accord with the SRA. It would develop reports on the activities and outcomes of the TP primarily as an efficient means of providing information to its Exchange Forum and stakeholders. It would actively seek views, and respond to views, developed by stakeholders, in particular within the Exchange Forum.

The executive group would be supported in its duties by a Secretariat, which would also provide support to activities of the Exchange Forum.

Individual RD&D projects and activities would be managed by management groups and methods suited to their structure and objectives, and under the control of participants in the individual RD&D projects and activities.

3.5 Implementation

It is proposed that the Technology Platform is implemented in a step-by-step manner.

Attention is first on obtaining the commitment of organisations to participate in the TP. In order to achieve this it is proposed that a TP "Vision Document" is drawn for distribution to prospective participating organisations for their consideration and signature.

The drafting of this document is an activity that will be undertaken on a free-will basis by organisations that are already strongly committed to the prospective TP. The Swedish Nuclear Fuel and Radioactive Waste Management Company, SKB, has expressed a willingness to lead this initiative, two other organisations involved in the CARD Project, Posiva and GRS, have formally expressed a willingness to support SKB, and a number of the participants in the open workshop notified that their organisations could be approached for support also.

In order to maintain the momentum that has been developed with the CARD Project and to build upon the good will and support shown by a number of organisations and stakeholders, it is agreed among the CARD partners that a target of November 2008 should be in mind for completing the Vision Document and obtaining a critical mass of organisations willing to commit to it.

Scope

Consistent feedback from the open workshop concerned the need for clarity on the scope of the TP in the Vision Document. In the light of discussions on this matter within the Project, it is proposed that the overall goal of the TP should be declared as practical implementation of member states' policies on the geological disposal of radioactive wastes. Such a policy is in place in a number of member states in respect of high activity, long-lived wastes and this is expected to be the focus for the TP.

The term geological disposal is taken to mean disposal at depth in suitable geological formations where the geology will contribute to the long-term isolation and containment of long-lived radionuclides. Therefore disposal of low-level wastes and short-lived intermediate-level wastes at or near the ground surface is not included in the scope of the TP. All types of potential host rock are to be included, in particular the classical categories of crystalline rocks, argillaceous rocks (including both indurated claystones and plastic clays) and evaporites (in particular rock salt).

The TP should include in its scope consideration of the conditioning of wastes to make them suitable for disposal. The Vision Document will need to comment explicitly on the interface that will be required with the SNETP to ensure that there is neither duplication nor significant omission of important activities in this area between the two TPs.

Content of the Vision Document

The feedback from the open workshop confirmed that much of the information required to be presented in the Vision Document is available in the material collected and analysed in the CARD Project. In particular the strongly supported benefits and objectives of the TP are clearly identified (see Tables 4 and 5). The vision of the Technology Platform is to establish:

- a forum for discussion of RD&D issues and priorities;
- a means for sharing RD&D information and results, including information and experience on RD&D planning and management;
- a mechanism for co-ordinating RD&D on topics of shared interest between programmes and group of organisations.

The Vision Document should contain proposals for achievement of these benefits and objectives. In addition to the identified strategic benefits and objectives, the development of books and reports on the state-of-the-art of relevant topics merits attention following the comments from the open workshop.

There appears to be general agreement on the principles underpinning the structure that has been proposed for the TP and the experience in the CARD Project has been that it is not helpful to attempt to be more prescriptive than is necessary for organisations to see how they would best participate to meet their own objectives. It will be important to establish methods of working and the development of personal networks and the capability to function as a reference group were specific points supported at the open workshop.

As noted by participants in the open workshop, it will be important to state clearly the proposed interactions of the TP respectively with national programmes, the EC, international organisations and other TPs and European initiatives (e.g. concerning education and training in the nuclear field).

Some of the information proposed to be included in the future Vision Document will guide the scope of a subsequent Strategic Research Agenda (SRA) and it is suggested that a proposed scope of the SRA could be included in the Vision Document. However, it will be for the organisations participating in the resulting TP to subsequently review and revise that scope and then develop the detailed content of the SRA.

Planned Actions

Once the Vision Document has been finalised and a critical mass of organisations have signified their commitment to supporting it, the TP should be launched at a workshop. This should be planned and designed to attract the participation of key decision makers and senior managers to emphasise the importance of the step that is being taken and the strategic aspects of the future operation of the TP.

It will of course be for the organisations participating in the TP to set priorities, but a clear early priority will be to develop the SRA for review and subsequent agreement.

The EC has signalled willingness in principle to support the provision of a secretariat at the early stage of operation of a TP. It is a prerequisite that this possibility should be pursued but it is also considered that the TP should develop a resource plan to ensure its sustainable operation over the long term. This should be done as soon as possible once the benefits of participation are apparent. Taking the Sustainable Nuclear Energy Technology Platform (SNE-TP) as an example such initial secretariat support may be the equivalent of 2 person-years.

As implied by the term "Vision Document", initially participating organisations will be committing to a vision of what the TP will achieve. However, co-operation in projects will demand commitments of resources and considerations of issues such as intellectual property rights and liabilities. The type of consortium agreement that is often associated with EC Framework Programme projects is recommended as a tried and tested model for use by

the participants in specific co-operation projects, not least because the legal departments of most of the likely participants are already familiar with its use.

4. Conclusions

4.1 The CARD Project has shown that a Technology Platform is a feasible method of providing a framework for networking and co-operation in the field of RD&D for geological disposal in the EU. In particular the proposed structure and methods of working can meet the identified requirements for networking and co-operation of those organisations that are central to implementation of geological disposal in Member States.

4.2 The CARD Project has established and tested the prioritised needs and objectives of potential participants in the Technology Platform. The resulting database of information provides the basis for production of a Vision Document for the Technology Platform.

4.3 There is a high level of support and good-will for the establishment of a Technology Platform and momentum should be maintained by moving as quickly as possible to its launch.

Reference

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- 1 Sixth Framework Programme Co-ordination Action, Proposal 036496, Co-ordination of research, development and demonstration (RD&D) priorities and strategies for geological disposal, Annex 1 – Description of Work, 11 May 2006.

Tables

Table 1: Participants in the 1st and 2nd meetings of the CARD project.

Project participants	
Alan Hooper	Nuclear Decommissioning Authority (NDA), United Kingdom (Project co-ordinator)
Philippe Lalieux	ONDRAF/NIRAS, Belgium.
Frantisek Woller	RAWRA, Czech Republic
Juhani Vira & Marjatta Palmu	Posiva, Finland
Patrick Landais & Gerald Ouzounian	ANDRA, France
Wernt Brewitz	GRS, Germany
Irena Mele & Metka Kralji	ARAO, Slovenia
Julio Astudillo Pastor	Enresa, Spain
Monica Hammarstrom	SKB, Sweden
Lawrence Johnson	Nagra, Switzerland
EC participants and observers	
Simon Webster	European Commission
Michel Raynal	European Commission (1 st meeting only)
Thomas McMenamin	European Commission (2 nd meeting only)
Bernard Neerdael	International Atomic Energy Agency, IAEA
Wilhelm Bollingerfehr	DBE, Germany
Support to the project co-ordinator	
Trevor Sumerling	Safety Assessment Management Ltd, UK

Table 2: CARD respondees by country and organisation type

	Formal national appointees (FNAs)		Stakeholders				Research providers		
	Implementor / WMO	Technical Support Organisation	Other WMO	Ministry Dept	Regulator	Social stakeholder	Other NRI	Univ. Dept.	Commercial contractor
Belgium	Ondraf			FPSEE-EA	(FANC)	(MONA) (STORA)	SCK.CEN GeoSurBel R.Obs.Belg EURIDICE	U-Liège KU-Leuven	
Switzerland	Nagra	PSI			HSK		Swisstopo		
Czech Republic	RAWRA						CzGeoSur Cz.NRI	CzTU(NSPE) CzTU(CEG)	
Germany ⁴	DBE BfS	GRS		BMW BMBF	BMU NMU-LSax		BGR, Helmholtz- Zenrum München (GSF) FZD-IRC FZK-INE FZJ	TU-Clausthal	TUV-Nord
Spain	ENRESA	CIEMAT					AITEMIN IES-CSIC	CIMNE-UPC	Enviros-Sp
Finland	Posiva	VTT	FPHOy	KTM	(STUK)	CeNS	GeoSurFin	TKK UHel(Rchem) HUTech-AES	
France	ANDRA	IRSN		OPECST DGRI (Min Env)			CEA ARMINES CNRS INERIS	UT-Troyes	

⁴ This table reflects the status of organisations responding to the CARD Project questionnaire. However, valuable information has been provided on the responsibilities for geological disposal in the German national programme in anticipation of its commitment and support for a future Technology Platform. The disposal of radioactive waste has been entrusted to the state by law (The Atomic Act). Therefore the lead responsibility for implementation rests with the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), in the discharge of which it is supported by the activities of BfS and of DBE. The deployment of a significant proportion of the relevant research funding is the responsibility of the Federal Ministry of Economics and Technology (BMW), through which the organisations GRS, BGR and PTKA are effectively positioned as TSOs in the German national programme.

	Formal national appointees (FNAs)		Stakeholders				Research providers		
	Implementor / WMO	Technical Support Organisation	Other WMO	Ministry Dept	Regulator	Social stakeholder	Other NRI	Univ. Dept.	Commercial contractor
Hungary	PURAM								
Italy		ENEA							
Netherlands	COVRA								
Poland			ZUOP						
Slovenia	ARAO				SNSA		JSI GeoSurSi ZAG		IBEConE
Sweden	SKB				SKI SSI	Östhammar (Oskarshamn)	SGU	KTH	Golders
United Kingdom	NDA					NuLeaf	BGS		Nexia Solutions

Key to Table 2

WMO = waste management organisation.

FNA = Formal National Appointee. That is, an organisation that has been formally appointed by government, often under national legislation, with the responsibility either for managing the development and/or implementation of deep geological repositories for radioactive waste in a given country (the WMO), or for providing technical support including RD&D and/or safety assessment capability (a TSO).

TSO = technical support organisation, i.e. an organisation that has been given responsibility by national government, and usually allocated direct budget, to provide RD&D support to the FNA (or in some countries the regulator).

Other NRI = Other national research institute or organisation that may provide RD&D support to the FNA or to the regulator, usually as a contractor but in some cases partly from institute budget.

Parentheses (blue) indicate statement response only, i.e. the questionnaire was not completed.

Table 3: Participants in the Open Workshop

Name	Organisation	e-mail contact
Alheid	BGR	alheid@bgr.de
Astudillo Pastor	ENRESA	JASP@enresa.es
Bacri	Recherche	charles-olivier.bacri@recherche.gouv.fr
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Duda	RAWRA	duda@rawra.cz
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Wikberg	SKB	peter.wikberg@skb.se

Table 4: Questionnaire responses on relative importance of benefits

	Formal national appointees	Stakeholders	Research providers
Exchange of information and experience on RD&D planning and management	4.2	3.6	3.5
Co-ordinated utilisation of Europe-wide RD&D resources & assets	3.5	2.9	3.3
Effective utilisation of your own or national RD&D resources & assets	3.4	3.2	3.5
Sharing of RD&D planning (e.g. identification of goals & topics)	3.4	2.9	3.3
Sharing of RD&D information and results	4.3	4.0	4.3
Networking among RD&D funders, managers and stakeholders	3.6	3.2	3.3
Identifying centres of competence and excellence in given topics	3.7	3.4	3.8
Influence on own national RD&D programmes	2.8	2.9	3.2
Influence on EC RD&D programmes	3.6	2.9	3.5
Open process of identifying joint research priorities	3.8	3.1	3.7
Up-stream co-ordination (longer-term forward planning)	3.7	3.1	2.8

Results show the arithmetic mean of allowed scores from 5, very important, down to 1, no importance.

Table 5: Questionnaire responses on objectives and functions

	Formal national appointees	Stakeholders	Research providers
Establishing a forum for discussion of RD&D issues and priorities amongst RD&D funders, managers and other stakeholders.	4.0	3.4	3.7
Establishing mechanisms for co-ordinating RD&D on topics of shared interest between programmes.	3.9	2.7	3.3
Establishing mechanisms for co-funding and co-managing RD&D projects of shared interest between programmes.	3.3	2.4	2.8
Establishing a forum and mechanisms for sharing of RD&D information and results.	4.2	3.9	4.4
Establishing mechanisms to identify and support centres of competence and excellence in given RD&D topics.	3.7	3.2	3.5
Providing RD&D funders and managers with a broad range of stakeholder views on RD&D priorities and programmes.	3.7	3.3	3.2
Providing stakeholders with a window to observe and influence RD&D programmes.	3.0	3.6	2.9
Up-stream co-ordination (longer-term forward planning)	3.7	2.6	2.6

Results show the arithmetic mean of allowed scores from 5, very important, down to 1, no importance.

Annexes

Annex 1: Questionnaire on the Development of a European Technology Platform in the Field of Geological Disposal of Radioactive Waste

EC CARD PROJECT

Questionnaire Sent to Prospective participants

EC Sixth Framework Programme

CARD Project

A Co-ordination Action on Research, Development and Demonstration
Priorities and Strategies for Geological Disposal

QUESTIONNAIRE FOR POTENTIAL PARTICIPANTS IN A TECHNOLOGY PLATFORM FOR GEOLOGICAL DISPOSAL RESEARCH, DEVELOPMENT AND DEMONSTRATION

This questionnaire was issued to CARD Project partners by the Project Co-ordinator, Dr. Alan Hooper (United Kingdom Nirex Limited) on 15 February 2007, having been developed on the basis of inputs from all partners.

Questionnaire on the Development of a European Technology Platform in the Field of Geological Disposal of Radioactive Waste

05 February 2007

The aim of this questionnaire is to obtain inputs from potential participants to assess the value and level of support for the development of a European Framework for networking and co-operation in the field of research, development and demonstration (RD&D) for geological disposal of radioactive waste.

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EC CARD Project

Questionnaire on the Development of a European Technology Platform in the Field of Geological Disposal of Radioactive Waste

Introduction

Aim

The aim of this questionnaire is to obtain inputs from potential participants to assess the value and level of support for the development of a European Framework for networking and co-operation in the field of research, development and demonstration (RD&D) for geological disposal of radioactive waste.

Background

The “Technology Platform” is an instrument devised by the European Commission to provide a framework for co-ordination of European R&D activities in key technical areas with a view to assisting Europe to compete efficiently in the development of advanced and complex technologies, e.g. see website: http://cordis.europa.eu/technology-platforms/home_en.html.

In the context of RD&D for geological disposal of radioactive waste, there is no driver of external competition, but there could still be significant benefits from implementation of a Technology-Platform-like instrument for such RD&D in Europe. Benefits might include: improved focus of RD&D priorities; sharing of RD&D resources and avoiding duplication; increased confidence in RD&D programmes and their overall and joint sufficiency.

The EC CARD (Co-ordination Action on research, development and demonstration (RD&D) priorities and strategies for geological disposal) project has been instituted under the EC Sixth Framework Programme for Management of Radioactive Waste.

The CARD project is aimed at assessing the feasibility of a Technology Platform that would provide a European Framework for networking and co-operation in the field of RD&D for geological disposal of radioactive waste in the EU. The project involves representatives from radioactive waste management organisations (WMO's) in Europe with an active interest in geological disposal.

The study will seek inputs from radioactive waste management organisations (disposal implementers) and other potential participants in the Technology Platform. The project will then analyse these inputs and, if there is sufficient level of support (meaning coherent support for a common proposal), develop a proposal for such a Technology Platform to be implemented in the EC Seventh Framework Programme.

The following section provides a preliminary vision for a Technology Platform in the field of RD&D for geological disposal of radioactive waste; this has been arrived at through preliminary discussions in the CARD project. At this stage, however, little is fixed. The objective of the CARD project is to consider and assess possibilities, and this questionnaire is to provide input to the consideration and assessment.

Preliminary Vision

We envisage that the conditions for success of a European Framework for networking and co-operation in the field of RD&D for geological disposal will include:

- a shared vision of those participants having national programme responsibilities and a willingness to support a common strategic research agenda, i.e. an agreed set of goals for the RD&D needed to develop geological disposal to the level of practical implementation and time scales for their accomplishment (also see p.6 below);
- sufficient authority and willingness of the disposal implementer participants needed to commit resources to projects;
- active and constructive support of all participants including a range of stakeholders;
- appropriate structure and working methods to realise the general objectives and specific project goals efficiently.

General ground rules and function

If a Technology Platform or Technology-Platform-like instrument is implemented it will be formulated by and under the control of the organisations that participate and be to serve their needs. The EC will take an interest as an observer, offer advice in relation to its experience of similar ventures and provide some support for coordination activities of the platform. Organisations will decide for themselves whether or not to participate, and at what level of commitment, depending on the benefits they see in participation and on their own resources.

The Technology Platform can begin as an information exchange and discussion forum and is expected to develop as a vehicle for practical co-operation in specific RD&D projects. It is not intended to duplicate existing discussion fora (e.g. as provided by the NEA and IAEA) or existing multi-national or bilateral research agreements. Rather, it is to help identify RD&D needs that are common to at least some of the participants and to offer practical solutions by which interested participants can co-operate in meeting those needs.

It is not expected that participants will surrender control of their RD&D resources, rather, where there is a joint benefit, they will pool parts of their resources with others for the purposes of specific projects with joint agreed goals and timescales.

At present in the EU, it is estimated that 5% of funding for RD&D related to radioactive waste management comes via the EC and 95% is committed directly by the waste management organisations (WMOs) responsible for their national research programmes (or, in some countries, partly by national research institutes (NRIs) or public authorities, eg. regulatory bodies). The primary aim of a Technology Platform would be to co-ordinate shared objectives and projects in the work programmes at the command of WMOs (and NRIs having research responsibilities delegated by the WMO) in topics and areas where joint benefit of co-operation was seen. A key element in promoting such advanced co-operation is that views expressed and the direction of projects within the Technology Platform would be taken into account by the EC to further support the implementation of geological disposal in EU-member countries by focussing its funding of RD&D in efficient ways on areas of highest added value to implementation by European cooperation.

Benefits and objectives

In preliminary discussions, the following general benefits or objectives have been identified, which a Technology Platform might seek to realise:

- gaining understanding of who is doing what and for what reason, and thus to learn each others' planning strategy and underlying structure for planning RD&D activities and organising information (e.g. requirements management, knowledge management, strategic resource management);
- having access to information and results from other organisations in very focused, precise areas;

- organising meetings to discuss the different planning strategies (see above) or to establish state-of-the-art in certain areas;
- effective utilisation of resources, e.g. URLs, high activity laboratories, training facilities;
- development and communication of a shared knowledge base;
- identifying and supporting European centres of competence and excellence in specific RD&D areas;
- discussion of RD&D priorities and focus on important common issues, and also on minor but common 'special' issues, e.g. related to particular waste types;
- obtaining consensus and alternative views and perspectives on RD&D topics;
- encouraging forward thinking about RD&D needs and enabling up-stream co-ordination of research programmes;
- for advanced national programmes, supporting the implementation and licensing process (and strengthening the foundation of national safety cases) through discussion on key issues and formulation of focused and efficient RD&D responses, also taking account of views from regulators and other stakeholders;
- for less advanced national programmes, giving advance insight on future requirements through the same processes and giving the opportunity to allocate resources to encourage early solutions and follow developments;
- enhancing public acceptance through demonstrated openness of discussing problems and the RD&D requirements, and developing broadly-based technical consensus on the adequacy of RD&D basis and where uncertainties still remain;
- advising the EC on gaps in RD&D coverage or most relevant topics for wide co-operation within EC programmes;
- up-stream coordination of international efforts and initiatives to avoid duplications and optimise WMO's resource utilisation in international cooperation;
- through the improved dissemination of results and information, more rapid responses to such new information in related RD&D programmes.

However, the nature of the Technology Platform may develop, e.g. starting with "exchange of information" type of work (competence mapping, sharing of databases, position on international cooperation ...) and later extending to identifying key priorities and joint projects.

Structure

The Technology Platform structure must allow a level of access to all participants – to allow open discussion and exchange – but also provide a formal structure for efficient planning, management and reporting of projects or activities.

The basic structure envisaged for a Technology Platform includes:

- a broad forum for exchange of information and discussion of RD&D needs in relation to implementation of geological disposal;
- a working programme controlled by an executive body that is supported by a secretariat.

Within the working programme would be:

- technical working groups with specified mandates related to the Technology Platform;
- collaborative projects and activities following agreed work plans and objectives.
- The structure must accommodate the needs and constraints of both:
 - potential partner organisations, that is the organisations that are in charge of implementing disposal facilities and/or entrusted by their Government with developing radioactive waste disposal solutions ;
 - other potential participants with technical interests and concerns (“Technical Organisations”), for example, regulatory bodies, research institutes and universities; and public authorities including involved municipalities, i.e. with an interest in gaining information from, and influencing, research programmes;

An indication of a possible structure is shown in Figure 1. It must be stressed that this is a simple outline to promote feedback from all interested parties on the principles of the operation of a Technology Platform. Within the working groups and collaborative projects and activities, participation would be determined on the basis of best meeting the specified mandate of each of these.

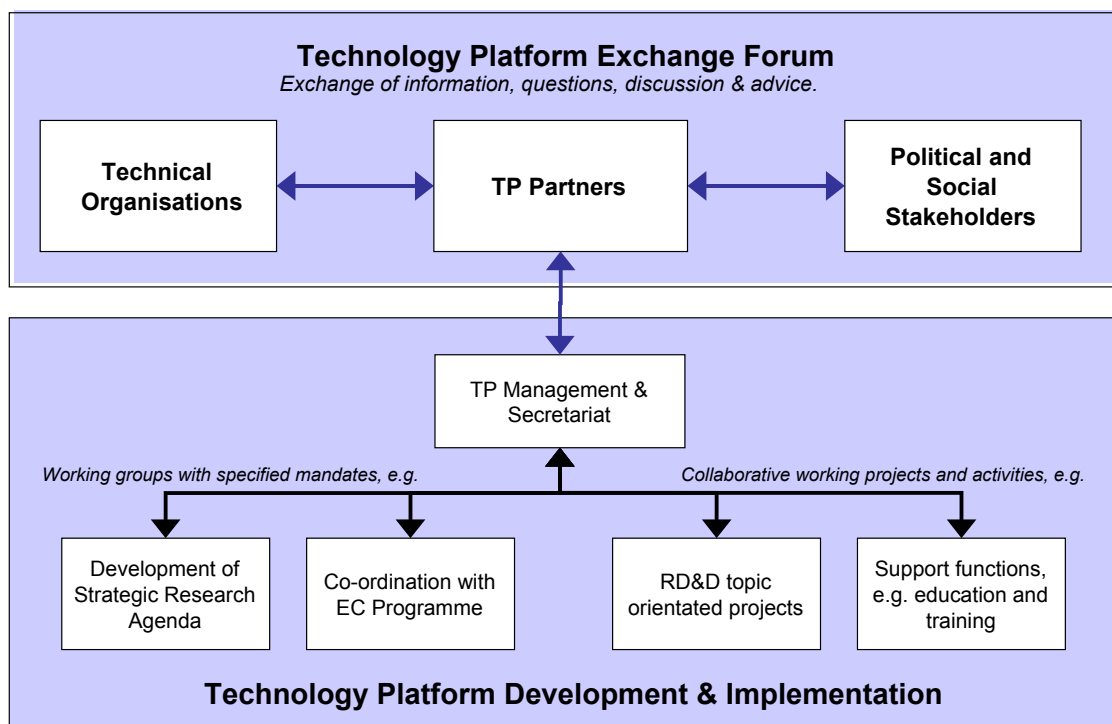


Figure 1: Indication of a possible structure for a Technology Platform in the field of RD&D for geological disposal

Working methods

The Strategic Research Agenda

A key vehicle of other European Technology Platforms is the “Strategic Research Agenda” (SRA). This is a document, arrived at by technical analysis and discussion between research funders and other stakeholders. It lays out RD&D goals within the Technology Platform and time scales for their accomplishment. It forms a focus for ongoing discussion and will be subject to review and on-going development. Once agreed, it forms the high-level guidance for development of proposals and detailed plans of work within the Technology Platform. In the context of a Technology Platform in the area of RD&D for geological disposal, the SRA represents a consensus document outlining the RD&D needs and priorities in support of implementation of geological disposal.

Dialogue and control

Dialogue would be generated primarily within the Exchange Forum, whereas control and monitoring of activities is achieved under the supervision of the Technology Platform management and secretariat, see Figure 1.

The Exchange Forum would use a range of methods to promote dialogue. These could include:

- operation of a website with information on the Technology Platform programme, access to results, and proposals for review and comment (a pilot website will be developed within the CARD project);
- general symposia to discuss RD&D priorities, the SRA and the Technology Platform programme;
- workshops on specific RD&D topics or functions and support activities;

For reasons of management efficiency and to ensure that organisations retain control of their RD&D resources, the implementation of projects within the Technology Platform would be controlled by an executive committee appointed by the Technology Platform partners on the basis of technical competence, covering the complete spectrum of their needs, and strategic-level management competence. This committee, meeting regularly, would commission working groups to develop both the overall SRA and to assess and make technical plans for RD&D projects or development of Technology Platform functions. It would formally open RD&D projects and activities, monitor their performance, and close projects and activities on reaching their goals in accord with the SRA. It would develop reports on the activities and outcomes of the Technology Platform to inform the Exchange Forum and stakeholders and actively seek views, and respond to views, developed by stakeholders, in particular within the Exchange Forum.

The executive management committee would be supported in its duties by a Secretariat, which would also provide support to activities of the Exchange Forum.

Individual RD&D projects and activities would be managed by management groups and methods suited to their structure and objectives, and under the control of participants in the individual RD&D projects and activities.

The Questions

Each organisation is responsible for ensuring that the answers given in the questionnaire properly represent the views of the organisation. It is suggested that responses need to be approved at an appropriate management level to ensure that is the case (e.g. Head of RD&D function or above).

We are seeking specific and well-considered inputs. The responses will be studied and analysed to help shape a proposal for a Technology Platform (TP) that could draw the widest support and provide greatest utility for partners and other participants.

It is important to bear in mind that the aims of the CARD Project are to **assess the feasibility** of, and to **develop a proposal** for, a TP. A decision on whether to proceed to implementation of TP will depend on the level of interest and support that is found. Further, the scope and format of any TP will be arranged to try to meet the expressed wishes of potential participants. Thus, it is important to give input at this stage that clearly expresses both the benefits that your organisation might seek through participation in a TP, and also the problems to be overcome, or constraints that you see, that would impact your organisation's participation in a TP.

In the questionnaire:

Question 1 asks for information about your organisation and resources.

Questions 2 to 5 ask about a possible shared vision (benefits, objectives, structure, working methods) for a Technology Platform in the field of RD&D for geological disposal of radioactive waste in the EU.

Question 6 seeks to identify specific benefits that would need to be delivered and constraints that would need to be observed in order for your organisation to participate and commit resources to such a Technology Platform.

Question 7 is an invitation to make additional remarks or comments.

Questions 2 and 3 request the use of importance scales, for clarity:

5 = very important

4 = important

3 = neither important nor unimportant

2 = not very important

1 = no importance

1. Organisation details, national role and RD&D role and resources

Please give the name of the organisation for which these responses are made and the name of the primary contact:

Please give the names of persons making these responses and contact information (in case clarifications are needed):

Please outline (c. 0.25 page) the national role of your organisation (this may be by reference to existing statements and documents):

Please outline (c. 0.5 page) the specific responsibilities and interest of your organisation in RD&D in the field of geological disposal (this may be by reference to existing statements and documents):

With respect to RD&D for geological disposal, please characterise your organisation's role or roles according to the following: (Please choose one or more category that best describes your role(s) or interest)

Organisation's role	Importance
▪ Funding RD&D	
▪ Specifying RD&D programmes or assets	
▪ Managing RD&D programmes or assets	
▪ Carrying out RD&D work to contract	
▪ Centre of expertise for specific RD&D	
▪ Reviewing sufficiency of RD&D programmes and products	
▪ General interest in sufficiency and relevance of RD&D programmes and products	
▪ Specific interest only in particular programmes or RD&D topics or applications	
▪ Other ?	

If applicable, outline (c. 1 page) the RD&D programmes and assets that your organisation funds, controls or manages (this may be by reference to existing statements and

documents). Please indicate, if possible, approximate staff resources and budget allocated to these programmes and assets (by programme/asset or in total):

From where does the budget come to support these RD&D programmes and assets?

What fraction of this budget relies on EC Framework Programmes?

2. Perceived benefits of a Technology Platform and indication of interest

Preliminary meetings and discussions have identified the following possible benefits from the implementation of a Technology Platform in the field of RD&D for geological disposal. Please indicate which, if any, you consider beneficial or important from your organisation's perspective (on a scale "5" *very important* down to "1" *no importance*), plus indicate any other benefits you see. Please expand on the reasons for your judgements if you wish.

<i>Possible benefit</i>	<i>Importance to you</i>
Exchange of information and experience on RD&D planning and management	
Co-ordinated utilisation of Europe-wide RD&D resources & assets	
Effective utilisation of your own or national RD&D resources & assets	
Sharing of RD&D planning (e.g. identification of goals & topics)	
Sharing of RD&D information and results	
Networking among RD&D funders, managers and stakeholders	
Identifying centres of competence and excellence in given topics	
Influence on own national RD&D programmes	
Influence on EC RD&D programmes	
Open process of identifying joint research priorities	
Up-stream co-ordination (longer-term forward planning)	
<i>Other benefits</i>	<i>Importance to you</i>

Significant reasons or preferences underlying your judgements:	
<p><u>Without commitment</u>, how likely is it that your organisation would participate in a well-formulated Technology Platform in this area?</p>	
<p>Would you consider your role in the Technology Platform primarily as:</p> <p>a potential partner, i.e. the nationally appointed responsible organisation? <input type="checkbox"/></p> <p>a stakeholder, i.e. with an interest in gaining information from, and influencing, research programmes ? <input type="checkbox"/></p> <p>a technical organisation, ie. with technical interests and concerns? <input type="checkbox"/></p> <p><i>Please tick one box</i></p>	

3. View on Technology Platform objectives and functions

Preliminary meetings and discussions have identified the following possible objectives and functions for a Technological Platform in the field of RD&D for geological disposal. Please indicate which, if any, you consider important from your organisation's perspective (on a scale "5" *very important* down to "1" *no importance*), plus indicate other objectives and functions that you consider worthwhile. Please expand on the reasons for your judgements if you wish.

<i>Possible objectives and functions</i>	<i>Importance to you</i>
Establishing a forum for discussion of RD&D issues and priorities amongst RD&D funders, managers and other stakeholders.	
Establishing mechanisms for co-ordinating RD&D on topics of shared interest between programmes.	
Establishing mechanisms for co-funding and co-managing RD&D projects of shared interest between programmes.	
Establishing a forum and mechanisms for sharing of RD&D information and results.	
Establishing mechanisms to identify and support centres of competence and excellence in given RD&D topics.	
Providing RD&D funders and managers with a broad range of stakeholder views on RD&D priorities and programmes.	
Providing stakeholders with a window to observe and influence RD&D programmes.	
Up-stream co-ordination (longer-term forward planning)	
<i>Other objectives and functions</i>	<i>Importance to you</i>
Significant reasons or preferences underlying your judgements:	

4. View on Technology Platform structure

The basic structure envisaged for a Technology Platform includes a broad forum for exchange of information and discussion of RD&D needs; a working programme controlled by an executive body.

Within that working programme would be:

technical working groups with specified briefs related to the Technology Platform;
collaborative projects and activities following agreed work plans and objectives.

Figure 1 in the opening text illustrates a possible structure. However, the nature of the Technology Platform may change over time, which will affect both the structure (this question) and working methods (see Question 5).

Please comment on the structure of an Exchange Forum and any particular features you think it should possess:

Please comment on the structure of the Working Programme and any particular features you think it should possess:

Please comment on the management and secretariat provision for the Working Programme and any particular features you think it should possess:

Please make any additional remarks on structure:

5. View on Technology Platform working methods

A wide range of working methods may be employed within the Technology Platform to facilitate communication, discussion, decisions, implementation, control, monitoring and review. These could include:

operation of a website with information on the Technology Platform programme, access to results, and proposals for review and;

general symposia to discuss RD&D priorities, the SRA and the Technology Platform programme;

workshops on specific RD&D topics or functions and support activities.

The Technology Platform could be controlled by an executive committee appointed by the

Technology Platform partners. This committee, would commission working groups to develop both the overall SRA and to assess and make technical plans for RD&D projects or development of Technology Platform functions. The executive management committee would be supported in its duties by a Secretariat, which would also provide support to activities of the Exchange Forum. Individual RD&D projects and activities would be managed by management groups and methods suited to their structure and objectives, and under the control of participants in the individual RD&D projects and activities. See also “Working methods” in the opening text.

Please comment on working methods you would consider should be applied to ensure the effectiveness of the Exchange Forum:

Please comment on working methods you would consider should be applied to ensure the effectiveness of the management of the Working Programme:

Please comment on working methods you would consider should be applied to ensure the effectiveness of communication between the Exchange Forum and the Working Programme:

Please make any additional remarks on working methods:

6. Specific expectations, constraints and level of commitment

Questions 2 to 5 have asked about a possible shared vision (benefits, objectives, structure, working methods) for a Technology Platform in the field of RD&D for geological disposal of radioactive waste in the EU.

This question is to identify any specific benefits that would need to be delivered and constraints that would need to be observed in order for your organisation either to participate in, or commit resources to, such a Technology Platform.

For some organisations, answers to the previous questions will have covered all the issues of interest at this stage, and no further remarks are needed.

For other organisations, there might be quite specific conditions to be fulfilled. This could be due to their official mandate and responsibilities, structure, allowed working arrangements, budget limitations, controls on budget use or other factors.

This is the opportunity to state any such conditions.

Specifically, what are the key benefits and expectations that would encourage your organisation to participate or determine your level of commitment?

Specifically, what are the drawbacks and the associated conditions that would have to be met for your organisation to participate or determine your level of commitment?

Without prejudice, what is the level of RD&D resource commitment (e.g. fraction of budget or specific resources) that you might initially be willing to contribute to a satisfactorily convened Technology Platform?

Without prejudice, what is the level of RD&D resource commitment (e.g. fraction of budget or specific resources) that you might, in the longer term (5-10 years), be able to contribute based satisfactory performance of a Technology Platform?

7. Invitation for additional remarks

Please make any additional remarks or comments you have that you feel are relevant and have not been covered in your answers to the previous questions:

Annex 2: Collation of Information and Analysis of Responses to the CARD Project Questionnaire

The analysis of responses was developed in the form of a PowerPoint™ presentation for ease of presentation and discussions. This was subject to several iterations between the CARD Project partners and the finalised analysis was presented as 'EC CARD project: Information Base' at the Open Workshop held in Brussels on 31 March 2008 (see Annex 3 for the relevant material).

As a first step in the analysis, the responses to the questionnaire were compiled onto a suitably structured spreadsheet. A separate spreadsheet was compiled for 'statement' responses from organisations that did not send full responses to the questionnaire. In the hard copy version of this report, these spreadsheets are made available on a CD-ROM.

Annex 3: Report on the CARD Project Open Workshop, Brussels, 31 March 2008

1. Introduction

Representatives of organisations that had been invited to respond to the CARD Project questionnaire or that had subsequently expressed an interest in a Technology Platform for geological disposal were invited to participate in an open workshop held at the Federation of Enterprise in Belgium, Brussels, on 31 March 2008. The objective of the workshop was to share the findings of the CARD Project with prospective participants in a Technology Platform for geological disposal and to obtain feedback on the proposed structure and operation of the Technology Platform.

The participants in the workshop are listed in Table 3 of the main report. The agenda for the workshop is given as Attachment 1 to this Annex and the presentations used in the workshop are given as Attachment 2.

This report summarises the main points raised at the workshop, which represent valuable inputs to the proposed development of a vision for the Technology Platform.

2. Presentations

Alan Hooper welcomed the interest and support of participants on behalf of the CARD Project and the EC, following which five presentations were given to provide the workshop participants with information on the concept of a Technology Platform and on the findings and proposals emerging from the CARD Project. These were as follows:

- Introductory presentation by Alan Hooper (CARD Project Co-ordinator).
- Research in Geological disposal – an EC view by Simon Webster (Head of Unit 'Fission', EC-DG Research).
- Set up of the Sustainable Nuclear Energy Technology Platform and current scope and activities by Henri Paillère (SNE-TP Secretariat).
- EC CARD Project: Information Base by Trevor Sumerling (Secretary to the CARD Project).
- Proposals for a Technology Platform for Geological Disposal by Alan Hooper.

2.1 Questions of clarification

The questions of clarification fell broadly into the two areas of Technology Platform governance and the scope and operation of the proposed Technology Platform for geological disposal.

It was noted that the need for a separate TP on geological disposal that is separate from SNE-TP had been discussed. Both the EC and SNE-TP agree that two Technology Platforms are required. This is because WMOs have a difficult role in maintaining a high level of confidence in stakeholders at potential disposal sites. A link with advanced nuclear power strategies would be potentially detrimental, therefore, national programmes prefer the concept of an independent WMO with a clear remit to manage the waste that has resulted from past activities and to consider objectively the requirements for management of wastes from future power generation.

A 'mirror group' that characterised a number of already established Technology Platforms, is probably not needed in a TP for geological disposal. The beneficial aspect of such a group is to ensure representation of national policy in relation to industry-based initiatives, but the

lead role in a TP for geological disposal would necessarily be taken by the organisations responsible for implementation of national policy.

In clarifying the legal status of a TP, it was noted that it is an organisation that is independent of the EC/EURATOM and owned and operated by its members in their own interests. It follows that, whereas the Strategic Research Agenda (SRA) of the TP is seen as a valuable potential source of information on what RD&D topics should be prioritised in a call for proposals in an EC/EURATOM Framework Programme, proposals would be judged objectively by the EC as under its existing arrangements.

More specific information was sought on the steps towards setting up the TP. It was clarified that the initial membership of the Executive Group was envisaged to be drawn from the WMOs that had participated in the CARD Project but that the important aspect is to ensure the group has the qualities and experience to deliver the identified objectives and benefits of the TP. The drafting of the Vision Document would include inputs from as many WMOs as possible but also ensure a broad range of inputs by seeking the views of other types of organisation.

The different levels of maturity of geological disposal programmes across the Member states was seen as a potential issue. It was considered important that all member states should have an input to the TP and that technology transfer is part of its remit. It was noted that national programmes that are close to implementation do not have much time to set aside to support this activity. It was also noted that advanced programmes are interested primarily in very specific results and projects.

It was queried whether the TP would be strictly limited to geological disposal itself or would cover other aspects of waste management. Other management aspects in relation to wastes from current and historical power generation programmes could fail to be covered either in this TP or in SNE-TP (with its focus being on Generation IV). It was felt that this issue is recognised but that it emphasises the need for a good interaction between the two TPs to ensure all relevant RD&D is covered. Another issue that requires careful consideration is the remit in respect of education and training to give enduring support to long-term projects, particularly in the face of the age profile of the current workforce. It was noted that this topic is recognised explicitly in the proposals for the TP.

In response to a question as to whether salt host rock was included in the scope of the envisaged TP it was clarified that all geological settings and repository concepts under consideration in European member states should be covered. More generally it was noted that the TP Vision Document should detail the scope very clearly.

It was noted that no timescale had been proposed for implementation of the TP. In response it was stated that, provided the appropriate resources were available to carry out the necessary work, there was an ambition to develop the Vision Document and seek commitment to it by November 2008.

A number of participants found the experience of SNE-TP, in evolving towards a successful set of governance arrangements, reassuring. It was generally agreed that there was no benefit in being highly prescriptive until organisations are in a position to review and commit to the Vision Document.

An important clarification was made on a distinction between Technical Safety Organisations and Technical Support Organisations. The Technical Safety Organisations have specific requirements for RD&D in their support of regulatory authorities and review of safety cases. These would need to be considered as part of the TP, particularly in relation to the participation of regulatory bodies.

3. Feedback from Workshop Participants.

With the agreement of the participants, feedback was structured around the four key questions proposed in the agenda.

3.1 What inputs are required from different types of organisations and how can these best be made?

The following points emerged:

- Account must be taken of research organisations that have allocated budgets and have an interest in contributing. There has to be an aim of greater prioritisation and more efficient use of existing skills and experience in research organisations. WMOs will provide the drivers for prioritisation but the engagement of research organisations is essential to the success of the TP.
- A key element of improving efficiency is to build on existing levels of co-operation and eliminate duplication of work across national programmes. The TP will have to provide a broad view of the RD&D work required across all participating national programmes.
- WMOs can identify challenges which require answers from RD&D and the TP should help with the organisation needed to achieve those answers. Safety authorities/Technical Safety Organisations need to do exactly the same but independently from the WMOs in order to assess the RD&D basis for a safety case. Therefore separate work streams could be envisaged under the TP framework.
- The value of the 6th Framework Programme in helping to define a sustainable research programme and in improving efficiency by taking stock of the results was noted. It was proposed that the outputs could be consolidated as key reference material. This was seen as having clear merit, but it was noted that the Framework Programmes represent a small proportion of the overall RD&D work on geological disposal. The totality of work would need to be captured to make the required contribution to knowledge management.

3.2 What, if any, interaction would the regulatory bodies require, consistent with maintaining independence?

The following points emerged:

- A range of views exists across the relevant regulatory bodies as to whether participation in the TP would compromise independence.
- In some cases a restriction would only apply in relation to RD&D involving the relevant national WMO; the TP would be extremely helpful in affording an opportunity for wider co-operation.
- In other cases there would be concern about steering RD&D that the regulatory body would have to evaluate later. However, it would still be valuable to identify missing RD&D topics, and then to observe and evaluate the outcomes.

3.3. How should the TP take account of societal requirements?

The following points emerged:

- The TP should not be a vehicle for public and stakeholder engagement, but rather provide civil society with the information it wants.

- Particularly communities local to a prospective disposal site welcome information from external experts. The TP could provide a source of convincing arguments from scientists in other, related but independent fields, noting that the TP will, by definition, be committed to implementation.
- Often society will ask a question that needs to be translated in order to provide the required technical information. This would suggest the need for some sort of contact point in the TP.
- The work of the OBRA project in evaluating an 'observatory' for waste management governance in Europe was noted. The need for knowledge and discussion as a basis for public acceptance was very clear.
- The model for societal engagement in Sweden was noted. The publication of RD&D reports (every 3 years) stimulates interest and promotes constructive interaction between the WMO, local communities and other stakeholders.
- The participants strongly supported the development of reference books or state-of-the-art reports as a key component of knowledge management.
- Knowledge management and preservation emerged as a strong societal requirement. Education, training and development were thus seen as a key topic for the TP to address. This positioning was demonstrated by an analysis conducted in support of the PETRUS initiative.
- There is a need to stimulate the interest of young people to come into the field. This requires both challenging research work and the resources (supervision, facilities, funding) to support the studentships.

3.4 What would characterise a suitable Strategic Research Agenda to guide the activities of a TP?

The following points emerged:

- The scope needs to be defined precisely, e.g. what is covered by 'geological disposal', the range of host rocks, whether retrievability is to be considered, the coverage of RD&D on wasteform.
- The relationship with SNE-TP needs to be clear (especially in respect of waste conditioning).
- The starting point must be a clear identification of what has been achieved and is understood to date. The SRA should cover those important issues that remain open and where work is still needed.
- There will need to be some structuring around the host rock types, repository concepts and safety-specific issues. However, there are significant cross-cutting topics. Also the significant achievements in one programme (having a specific host rock and concept) are often transferable to others.
- The SRA should be clear on areas where there are synergies with related topics, for example underground sequestration of carbon dioxide. It was agreed that the complementary or parallel areas of science are important and that the involvement of research organisations with broad remits would be helpful in ensuring this is recognised.
- The experience of SNE-TP is that it will be necessary to structure the SRA around short-, medium- and long-term goals (in its case 2012, 2020 and 2050 respectively).
- The strong advice of the EC is that the SRA should include the deployment strategy and this may be more challenging than the identification of RD&D priorities. Some TPs have taken more than two years to finalise the SRA; it is essential that the TP membership is identified since the members will define the SRA and the TP provides the framework for their activity.

3.5 Other Feedback

At the invitation of Alan Hooper, participants made two further points, as follows:

- There will need to be a clear identification of the individual people involved and their areas of responsibility; the TP offers the prospect of a highly effective network. As a starting point all the participants agreed that their names and e-mail addresses could be published.
- The final report on the CARD Project needs to be clear on the benefits of a TP over existing arrangements and on what happens next and when.

Finally, the workshop participants confirmed that they had made all the inputs that they wished to and that they were supportive of the proposals that had been presented and discussed.

4. Summing-up

Alan Hooper summed-up the outcomes of the workshop as follows:

- The workshop had not identified any major problems with the outline proposals and participants were supportive of the concept of a TP for geological disposal.
- There needs to be greater clarity on how to progress from here to implementation.
- It will be very important to be precise about the scope of the TP.
- The interfaces of the TP eg. with SNE-TP, international organisations, will require clear definition.
- There had been a strong emphasis on 'knowledge management' aspects of the TP.
- Good pointers had been obtained for the participation of regulatory bodies without compromising their independence and confusing national programme responsibilities.
- The distinction between Technical Safety Organisations and Technical Support Organisations will be clarified, along with the important roles both can play.
- Education and training is an important topic which needs to be taken forward while taking account of existing initiatives.
- Similarly there is an important interaction with current initiatives on governance in waste management.

Simon Webster responded with the following comments:

- It is important that the TP concept is understood: it cannot be entered lightly; there are clear benefits (as evidenced from existing TPs); it is crucial to develop the Vision Document around which the TP forms.
- The EC will offer to publish the Vision Document in order to raise the profile and encourage interest for the Launch Workshop.
- Firm commitments will be required from participants.
- This is a technical initiative but with public interest; it will be important to involve CSOs.
- Knowledge management is crucial in view of the long timescales and the TP can play an important role in improving knowledge management.
- The TP can establish a strategic profile, giving the opportunity for interaction at an appropriate level with parallel initiatives, creating the possibility of speaking at policy-forming level.
- Networking intra-TP is important but so is extra-TP.
- The EC can offer assistance, e.g. with meeting arrangements, support for the secretariat.

5. Close of Meeting

Alan Hooper wished to close with these positive comments from the EC. He thanked everyone for their high level of participation and for making thoughtful and constructive contributions to the future development and implementation of a Technology Platform for Geological Disposal.

Open Workshop of the CARD Project

Federation of Enterprise in Belgium (Brussels)

31 March 2008

OBJECTIVE:

The objective of the workshop is to share the findings of the CARD Project with prospective participants in a Technology Platform for Geological Disposal and to obtain feedback on the proposed structure and operation of the Technology Platform.

AGENDA:

- 09:30 Welcome and Introduction by Project Co-ordinator and EC
- 09:45 The Role of a Technology Platform – Simon Webster, EC DG-RTD
- 10:00 Set up of the SNETP – Henri Paillère, SNE-TP Secretariat
- 10:15 Summary of Findings of Project – Trevor Sumerling, SAM Ltd
- 10:40 Proposal for Technology Platform (TP) – Alan Hooper, NDA-RWMD
- 11:05 Coffee
- 11:20 Questions of clarification
- 11:35 Feedback from Workshop participants, based around key questions including:
- What inputs are required from different types of organisations and how can these best be made?
 - What, if any, interaction would the regulatory bodies require, consistent with maintaining independence?
 - How should the TP take account of societal requirements?
 - What would characterise a suitable Strategic Research Agenda to guide the activities of a TP?
- Lunch will be taken around 12:30, and afternoon coffee around 15:00, at suitable points in this agenda item
- 15:45 Summary of Workshop findings and proposed follow-up actions
- 16:30 Workshop closure

Attachment 2

Presentations:

- Introductory Presentation. Alan Hooper
- Research in Geological Disposal – an EC view. Simon Webster
- Set up of the Sustainable Nuclear Energy Technology Platform and Current Scope and Activities. Henri Paillère
- EC CARD Project – Information Base. Trevor Sumerling
- Proposals for a Technology Platform for Geological Disposal. Alan Hooper

• Co-ordination Action
• **CARD**

• **Co-ordination of Research, Development and
Demonstration (RD&D) Priorities and Strategies for
Geological Disposal**

• **Introductory Presentation by Alan Hooper**
• **CARD Workshop 31 March 2008, Brussels**



Participants

- **Nine National Waste Management Organisations (WMOs) as the principal 'end-users' and one Technical Support Organisation (TSO)**
- **Builds on experience from FP5 Net.Excel with added representation from small nuclear programmes**
 - **NDA-RWMD (UK), ONDRAF/NIRAS (Belgium), RAWRA (Czech Republic), Posiva (Finland), Andra (France), GRS (Germany), ARAO (Slovenia), ENRESA (Spain), SKB (Sweden), Nagra (Switzerland)**

Overall Objective

- **To assess the feasibility of a Technology Platform to provide a European framework for networking and co-operation in RD&D for radioactive waste disposal.**
- **Leading to:**
 - **definition of the structure, functions and practical requirements of a TP; and**
 - **proposal for implementation in FP7.**

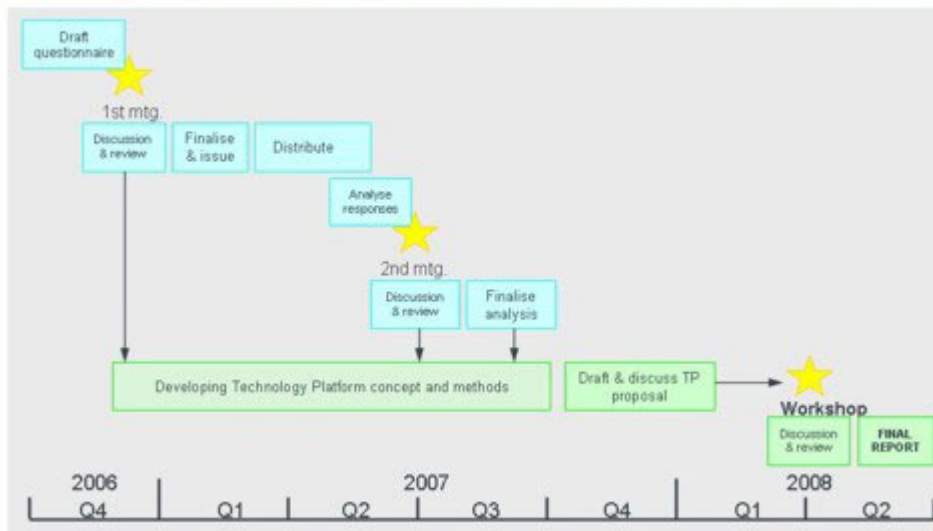
NDA

Key Elements of Project

- **Inputs from partners and stakeholders (regulatory bodies; national research institutes and/or universities; nuclear industry; public authorities; and affected communities)**
- **Evaluation of organisational structures and associated practicalities**
- **Draft Proposal for Technology Platform**
- **Workshop with prospective participants and stakeholders to discuss and enable finalised proposal to be made to EC**

NDA

CARD schematic project timeline and activities



NDA



Research in Geological Disposal – an EC view



Simon WEBSTER
Head of Unit "Fission"
DG Research
European Commission

CARD final workshop 31 March 08



Contents

- **Euratom support over the years**
- **...ERA, ETPs, SET-P and SNE-TP**
- **A TP in GD?**
- **conclusions**

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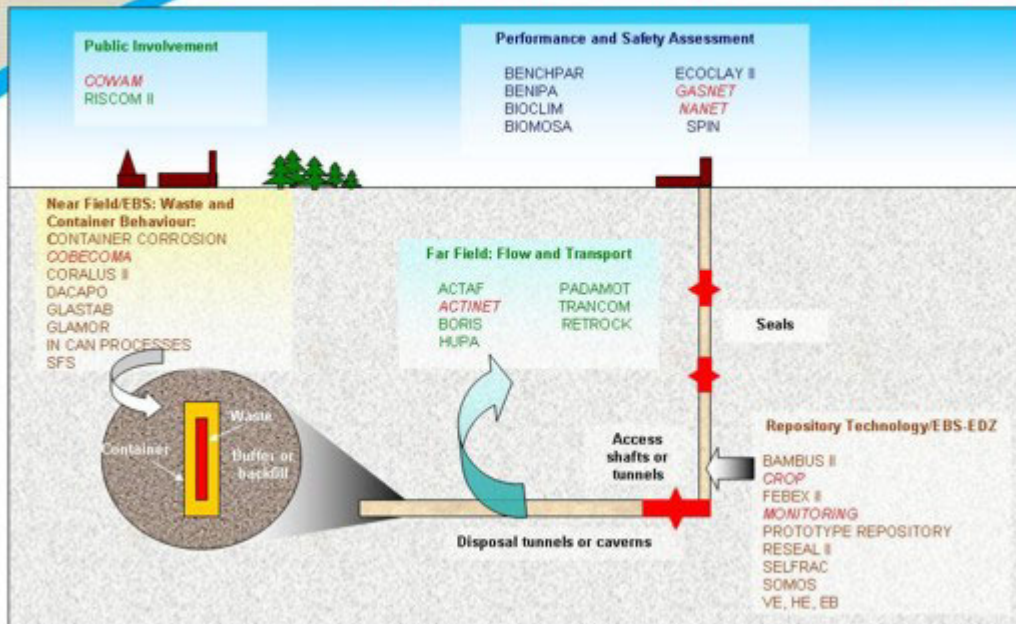


Euratom Programme: continuity of support over the years

- **FP1-FP5 ... c. €200M**
 - **Research on key processes / phenomenology**
- **FP6 c. €45M**
 - **major IPs: enhanced integration of key players / going beyond state of the art**
- **FP7**
 - **GD remains a priority**
 - **"implementation oriented"**



FP5 – Geological disposal Integration diagram of RTD projects



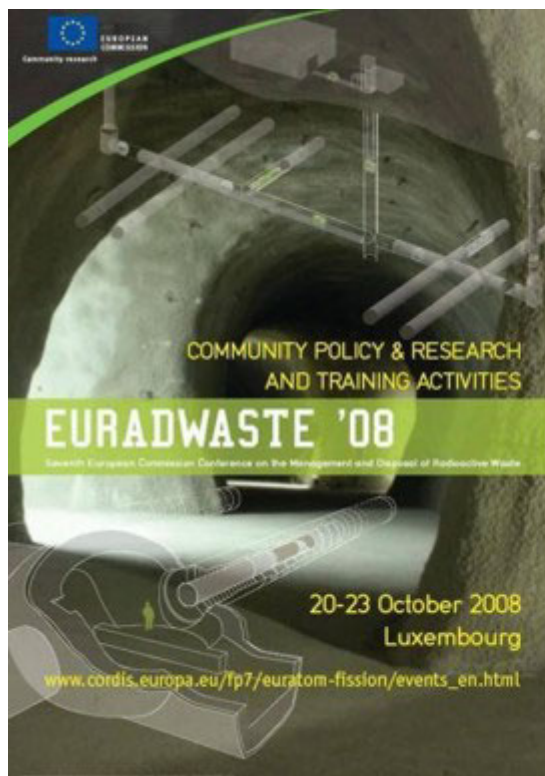
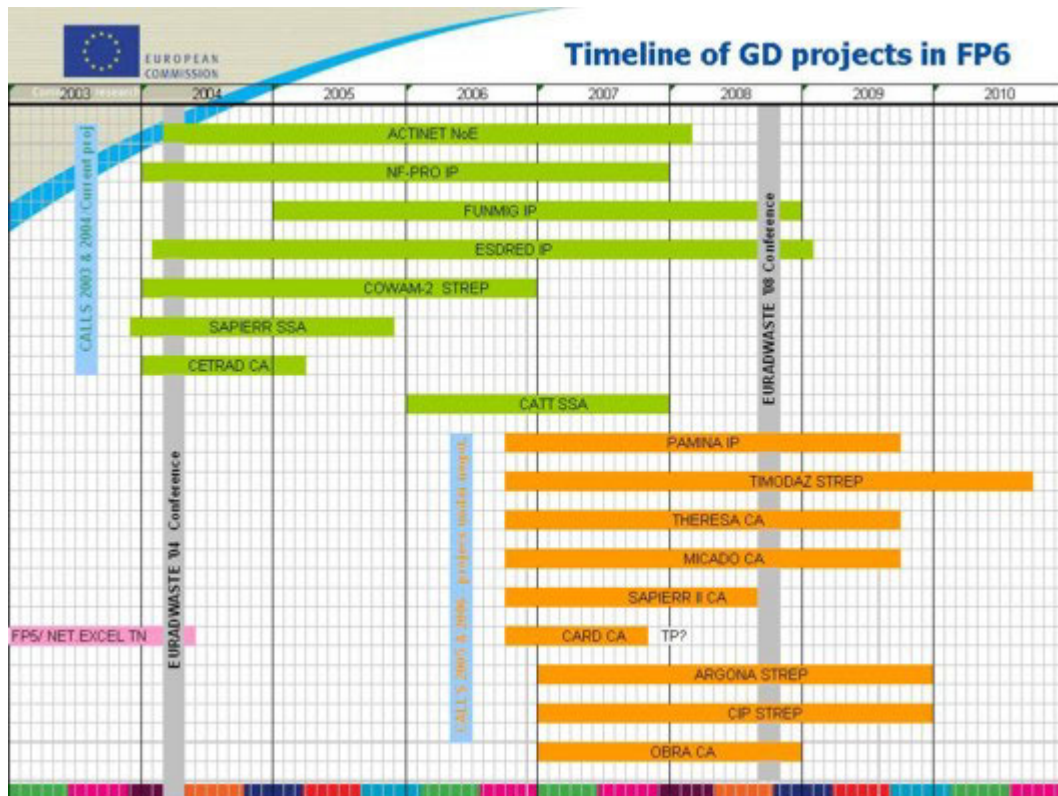
Testing & Demonstration in URLS
Development and structuring of research

Facility	Formation	1985-'89	1989-'94	1994-'98	1998-2002	2002-'06
EU countries	Asse (DE)	salt (dome)	HAW	Project Committee B1 HAW, MHW, DAM, AHE	"CLUSTER URL" "CLUSTER URL" BAMBUS-II RESEAL-II FEBEX-II + SELFRACT EB/VE/HE MODEX-REP OMNIBUS PROTOTYPE SOMOS/ SAFETI TN CROP Cluster Repository Project	INTEGRATED PROJECTS IP ESDRED IP NF-PRO
	Amélie (FR)	salt (layer)		CPPs		
	Mol (BE)	plastic clay	HADES	Project Committee B2*		
	Äspö (SE)	crystalline		ARCHIMEDE, BACCHUS, CACTUS, CERBERUS, PHEBUS...		
	Olkiluoto (FI)	crystalline				
	Bure (FR)	stiff clay				
Associate countries	Mt. Terri (CH)	stiff clay				
	Grimmel (CH)	crystalline				
	Lac du Bonnet (CND)	crystalline				
	WIPP (USA)	salt (layer)				

*Part B of Community Programme on "RWM in URLs"

The major FP6 projects on geological disposal

Project	partners / countries	Instrument & EU / total cost	Launch date / duration
ACTINET : Network for Actinide Sciences	27 / 13	NoE €6.35M / €10.5M	1/3/04 4 years
ESDRED : Engineering Studies and Demonstrations of Repository Designs	13 / 9	IP €7.32M / €18.1M	1/2/04 5 years
NF-PRO : Near-field processes	40 / 10	IP €8M / €16.8M	1/1/04 4 years
FUNMIG : Fundamental processes of radionuclide migration	51 / 15	IP €8M / €15M	1/1/05 4 years
PAMINA : PA Methodologies in Applications to Guide the Development of the Safety Case	25 / 10	IP €4M / €7.62M	1/10/06 3.2 years



OBJECTIVES and SCOPE:

- Present an overview of all recent European Commission (EC) activities in radioactive waste management (R&D, policy, strategic and socio-political aspects). Present Euratom FP6 project results in geological disposal and partitioning & transmutation.

THEMES:

- Community Policy (management of radioactive waste, research policy, future strategies)
- Socio-political aspects (governance and decision-making, public perception and acceptance, stakeholder involvement, sustainability issues)
- FP6 research programme (repository near-field processes, Engineered Barrier Systems; radionuclide migration in the far-field; engineering studies and repository technologies; Performance Assessment; co-operation, technology transfer and developments of options for shared repositories; co-ordination of national research programmes; status in P&T techniques and technologies)

VENUE: EC conference centre, Luxembourg

PROGRAMME: Technical sessions 3 days (20-22 Oct. 2008), URL technical visits: Bure, FR and HADES Mol, BE (23 Oct. 2008)

Further information and PRE-REGISTRATION on line

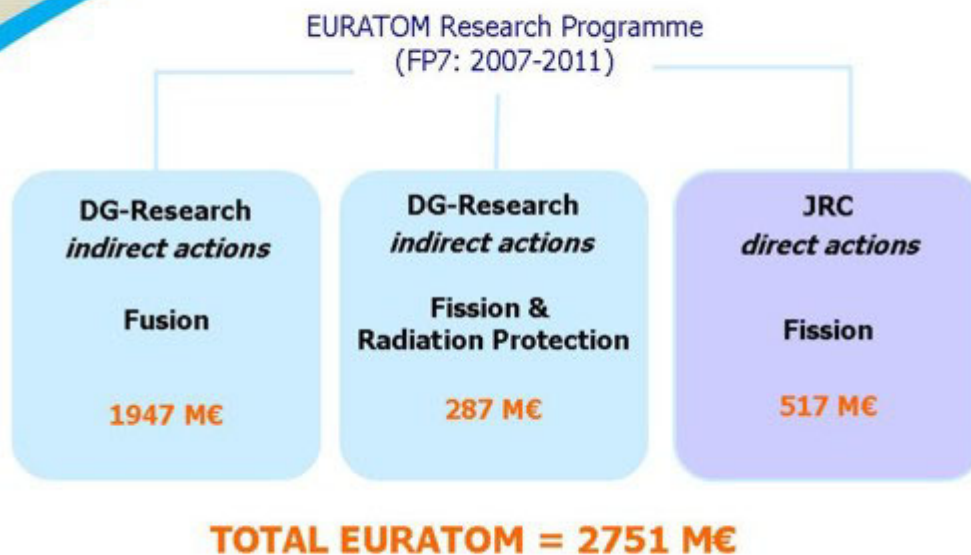


Information

- **Information on FP7 and access to programmes and calls:**
http://cordis.europa.eu/fp7/home_en.html
- **New fission home page on Cordis:**
http://cordis.europa.eu/fp7/euratom-fission/home_en.html



Euratom FP7





EURATOM FP7 *"nuclear research and training activities"*

- Council Decision 2006/976/Euratom of 19 Dec: Indirect actions in "Nuclear fission & radiation protection" & "Fusion energy research"

Objectives of "fission" programme:

- Establish a sound scientific & technical basis for the safe long-term management of hazardous radioactive waste
- Promote safer, more resource-efficient and competitive exploitation of nuclear energy
- Ensure a robust and socially acceptable system of protection of man & the environment against the effects of ionising radiation



FP7 Council Decision GD actions

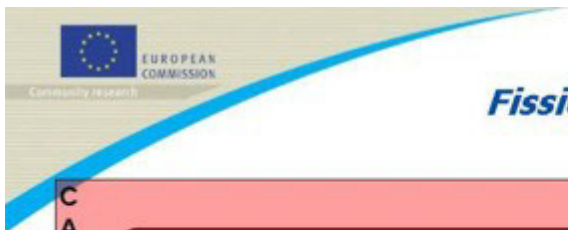
Implementation-oriented research and development activities on all remaining key aspects of deep geological disposal of spent fuel and long-lived radioactive waste and, as appropriate, demonstration on the technologies and safety, and to underpin the development of a common European view on the main issues related to the management and disposal of waste.



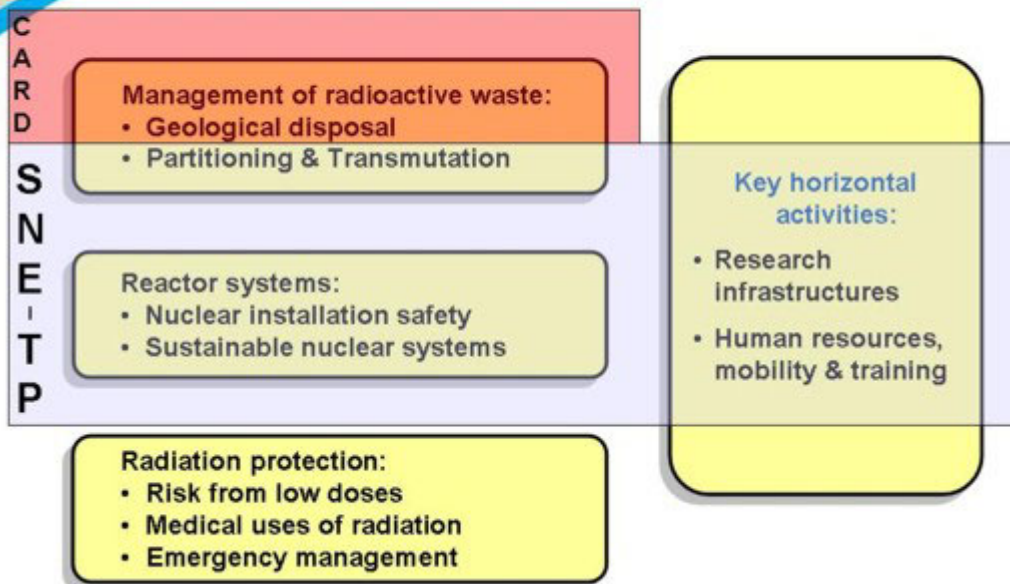


FP7 – Specific Programme Council Decision

RTD in the field of geological disposal of high-level and/or long-lived radioactive waste involving engineering studies and demonstration of repository designs, in-situ characterisation of repository host rocks (in both generic and site-specific underground research laboratories), understanding of the repository environment, studies on relevant processes in the near field (waste form and engineered barriers) and far-field (bedrock and pathways to the biosphere), development of robust methodologies for performance and safety assessment and investigation of governance and societal issues related to public acceptance.



Euratom FP *Fission & radiation protection*



Fission programme FP7 – *key issues for implementation*

- Programme must remain flexible to respond effectively to results of on-going research, emerging issues and political priorities
- Similar funding schemes to FP6 allow important continuity
- Enhanced coordination with national & industrial programmes essential
 - ➔ **“Technology Platforms” can build on the structuring effect of FP6 instruments & enable more effective use of FP funds**
- International cooperation a key overall policy objective



The Technology Platform model

- ETPs are proving to be successful in many R&D fields
- Key Stakeholders come together around a shared vision for the future of research in a field
- As end users of this research, industry usually has a role as driving force
- A TP defines and implements a Strategic Research Agenda, the SHs bringing their own human and financial resources
- A “mirror group” of national representatives is usually established
- The Euratom FP can benefit by using the SRA as a sources of topics for the annual WPs
- TPs can lead to spin-off “legal entities” to commercialise the research





 EUROPEAN COMMISSION
 Community research

Sustainable Nuclear Energy Technology Platform (SNE-TP)
www.sne-tp.eu
officially launched on 21 September 2007

H₂O




 EUROPEAN COMMISSION
 Community research

**EU Energy Policy
Key Targets**

AN ENERGY POLICY FOR EUROPE

- **By 2020 – the three 20s:**
 - 20% reduction in greenhouse gas emissions compared to 1990 levels (30% if global agreement)
 - 20% reduction in global primary energy use (through energy efficiency)
 - 20% of renewable energy in the EU's overall mix (minimum target for biofuels of 10% of vehicle fuel)
- **By 2050 : indicative 60 to 80% reduction in GHG**

energy for a changing world





(part of) the EU response ...

AN ENERGY POLICY FOR EUROPE

European Strategic Energy Technology Plan (SET-Plan)

'Towards a low carbon future'

COM(2007)723

of 22 November 2007

energy for a changing world



The need for a SET-Plan

- Technology is vital piece of the Energy Policy jigsaw
- Today we are falling short – BAU not working
- Intrinsic weaknesses in energy innovation
- Europe should lead the world in energy technologies
- Time is of the essence

Latest news...

- Council Summit of 13-14 March endorses Commission's proposal



Achieving the political vision: *the 2020 targets*

What COM(2007)723 says:

Key EU technology challenges for the next 10 yrs to meet the 2020 targets:

- ...
- ...
- ...
- **Maintain competitiveness in fission technologies, together with long-term waste management solutions.**



A TP in GD?

- "Safe geological disposal" is a shared vision for the future of research in this field
- Key stakeholders: WMOs, R&D institutes & organisations / TSOs / CSOs / NGOs
- The Strategic Research Agenda enables the vision to be realised; SH bring their own human & financial resources
- As end users of the research, WMOs have a role as a driving force
- If necessary, a "mirror-group" of national representatives can also be established
- The Euratom FP would use the SRA as a source of topics for the annual WPs





Future Euratom "fission" work programmes

"In future, the setting of priorities will take into account, inter alia, the SET Plan to be prepared by the Commission ... and the research agendas established by the Sustainable Nuclear Energy Technology Platform, the proposed platform on geological disposal and the High Level Expert Group on Low Dose Risk. Other specific initiatives will be considered in the context of fostering enhanced cooperation with third countries, in particular Russia and China."



one problem ... national programmes at different speeds

	Planning of program	Generic RTD	Strategic choice of policy, media etc	Def. of site requirements	Site invest.	Site decision licensing and pre-construction	Operat. phase and closure
SKB	Green	Green	Green	Orange	Red		
Posiva	Green	Green	Green	Green	Orange	Red	
Enresa	Green	Green	Red				
GRS	Green	Orange	Red	moratorium	moratorium	moratorium	
Andra	Green	Orange	Red				
Nagra	Green	Green	Orange	Red	Orange		
ONDRAF/NIRAS	Green	Green	Red				
Nirex	Green	Orange	Red				

Colour marking: **Red** Main focus for present work
Orange Substantial work going on
Green Areas that have reached an accepted standard





Other considerations ...

- The role of CSOs & NGOs ... could a TP contribute something to the socio-technical debate?
- ... communication strategy
- Knowledge management / technology transfer / education & training
- The international dimension
- Link with SNE-TP & nuclear technology
- The TP in the realisation of the European Research Area
- Link with other initiatives such as the HLG and ENEF



conclusions

- **Euratom has provided important GD research funding over many years, and this will continue in FP7**
- **The European R&D effort can remain effective and efficient by ensuring enhanced cooperation amongst all key R&D players**
 - **Better use of scarce resources**
 - **Best way to deal collectively with numerous cross-cutting issues**
- **A TP offers a flexible and adaptable model for such enhanced cooperation**





Set up of the Sustainable Nuclear Energy Technology Platform and current scope and activities

H. Paillère

SNE-TP Secretariat, secretariat@snetp.eu

<http://www.snetp.eu>

Open workshop of the CARD Workshop
Brussels, 31 March 2008

1



Outline

- Preliminary phase
- 2007, a favourable context to launch SNE-TP
 - SET Plan
 - Vision Report
- Launching event, 21st September 2007
- Structure of SNE-TP
- Interactions with other TPs & EU-bodies

Open workshop of the CARD Workshop
Brussels, 31 March 2008

2



Preliminary phase, ENFTP



- In 2005: 1-year Specific Support Action ENFTP “Towards a European Nuclear Fission Technology Platform?” [17 partners, including a Waste Agency, ANDRA].
- SSA aimed at creating a “Think Tank” to explore *all the potential ways* of achieving a more efficient and broader integration of R&D in fission energy
- Main conclusion: A *Sustainable Nuclear Fission Technology Platform* would be the Optimum Instrument for Consolidating and Coordinating the Medium- and Long-Term EURATOM Fission Research Activities. **Geological disposal not part of this TP** – but processing of waste is. Necessary interactions need to be developed.

Open workshop of the CARD Workshop
Brussels, 31 March 2008

3



Preliminary phase, SNF-TP



- 1st October 2006: 2-year Coordination Action SNF-TP [21 partners - no waste agency; no TSO]
- Objectives: to prepare the launch of a Technology Platform and to deliver the **Vision Report** of the TP, and technical road-maps as input to a future Strategic Research Agenda.
- SNF-TP consortium started writing the first draft of the Vision Report. But it soon appeared necessary to have more stake-holders represented (especially industry, TSO, academia)
- In January 2007, the political context changed with EC communication on energy policy & technologies
- Decision of SNF-TP consortium to “accelerate” the launch. Date set with Commission (DG RTD) on 21st September 2007. Target to produce the Vision Report and gather more stakeholders as future members of SNE-TP.

Open workshop of the CARD Workshop
Brussels, 31 March 2008

4



A new energy policy in Europe

- On the 10th January 2007, the European Commission proposed a package of measures to establish a new **Energy Policy for Europe**, to address 3 challenges:
 - Security of Supply
 - Reduction of Greenhouse Gas Emissions
 - Competitiveness
- The Commission proposed that the EU commits to cutting its greenhouse gas emissions by at least 20% by 2020, and to a low carbon energy system by 2050
- The European Council endorsed the proposal at its March meeting



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Brussels, 31 March 2008

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Strategic Technology Energy Plan

- EC also announced in January 2007 a European **Strategic Energy Technology Plan** to address two objectives:
 - to lower the cost of clean energy and to
 - put EU industry at the forefront of the low carbon technology sector
- To establish the SET Plan, the EC conducted hearings with **Technological Platforms** in the field of energy (wind, solar thermal, photovoltaics, CCS, H₂, biofuels)
- A hearing also took place (April 2007) with representatives of the future SNE-TP (and the CARD coordinator)
- The SET Plan was published in Nov. 07:
 - Nuclear fission for 2020 targets (competitiveness & long term waste management)
 - Nuclear fission for 2050 vision: Gen. IV technologies "sustainability"

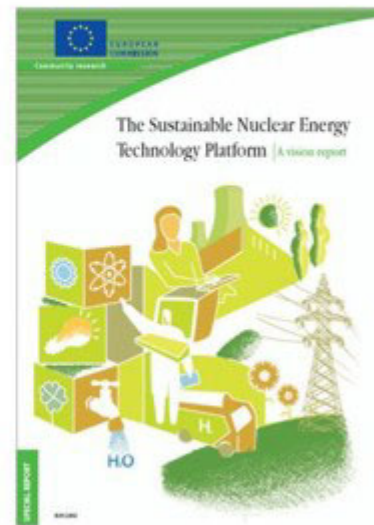
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The Vision Report: how? when?

- Drafting started Jan. 07
- Contributions from SNF-TP consortium, TSO, academia, new industry representatives (through FORATOM)
- A lot of cross-checking of facts & figures (OECD, IAEA, WEC, EC, etc...)
- Final text beginning of July.
- EC subcontracted editing, cover illustration & inside figures
- Ready by Mid-Sept. 07



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The Vision Report: Contents

- Foreword by J. Potocnik
- How nuclear fission provides answers to Europe's energy challenges & future prospects in Europe & world
- Vision on technical developments (LWR, Gen. IV, cross-cutting topics)



- Presentation of future structure of SNE-TP
- Preliminary road-maps (announces SRA)
- Recommendations
- Annex: list of 34 high-level representatives (industry, research, TSO, universities) who endorsed the Vision Report (~ future members of the Governing Board)

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Brussels, 31 March 2008

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Contributors & endorsers of Vision Report



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Brussels, 31 March 2008

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Launch Event: 21st September 07

- EC hosted the event in Brussels (Charlemagne Building)
- Prior to event, about 6 months of work from Organising Committee to secure list of speakers & practical details.
- Key speakers: Commissioner for Research, Commissioner for Energy, MEP, EIB representative, industry representatives (including users of electricity/heat – Aluminium, oil) and largest member organisations (industry, research, TSO) of SNE-TP
- Distribution & presentation of the Vision Report.
- Over 350 participants

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First months

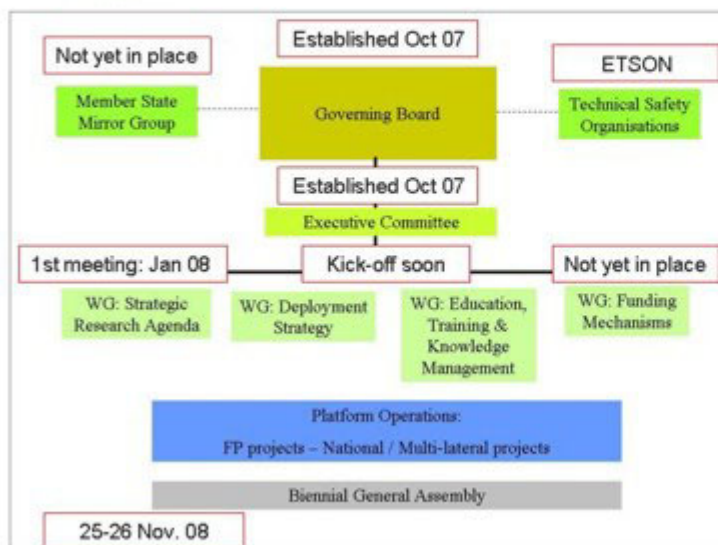
- Set up of “informal” secretariat (4 organisations + DG RTD)
- Date of 1st Governing Board set 30th October 07
- Proposal of members of 1st Governing Board by EC, informal contacts between SNE-TP organisations & EC to reach “balance”: 10 industry, 10 R&D, 2 TSO, ENS, FORATOM, ENEN, DG RTD, DG TREN
- Survey of other TPs: eg. HFP, Biofuels. How are they organised? What documents? Discussion with CCS TP
- Preparation of draft of a 1st version of “Organisation & Structure” for presentation at 1st Gov. Board.
- 1st Gov. Board: Election of Chair & Vice-Chairs, set-up of Executive Committee and 2 working groups (SRA, DS)
- Set up of web-site & internal workspace (domain name!)

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Structure of SNE-TP today (5 months after launch)



Document describing the organisation & structure of the TP, terms of reference of the different bodies

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Web-site & member work-space

The screenshot shows the SNETP website interface. The top navigation bar includes the SNETP logo and the text 'Sustainable Nuclear Energy Technology Platform'. Below this, there are sections for 'Launch Conference - 21st September 2007 - Brussels', 'SNETP', 'The Vision Report', 'Members', and 'Information'. A sidebar on the left contains a menu with items like 'Home', 'About', 'Platform Operations', 'Events', 'High Level Group', 'Member Forum', 'European Nuclear Education Network', and 'European TSO Network'. A search bar is also present. The URL <http://www.snetp.eu> is displayed. Below the main content, there is a section for 'Members' with a list of names and a link to <https://extranet.snetp.eu> (members only). The URL <https://extranet.snetp.eu> (members only) is also shown below the screenshot. The text 'Open workshop of the CARD Workshop Brussels, 31 March 2008' is located at the bottom left of the screenshot area.

Open workshop of the CARD Workshop
Brussels, 31 March 2008



Strategic Research Agenda & FP Programme

- Covers:
 - R&D for current & evolutionary LWR
 - Advanced fuel processing
 - Gen IV Fast Neutron Reactors & closed fuel cycle
 - V(HTR) & other applications
 - Cross-cutting (material, simulation, safety, actinide science)
- First draft by June 08
- Final draft by Nov 08
- Publication 1st term 09



Work
Programmes
2009, 2010 →

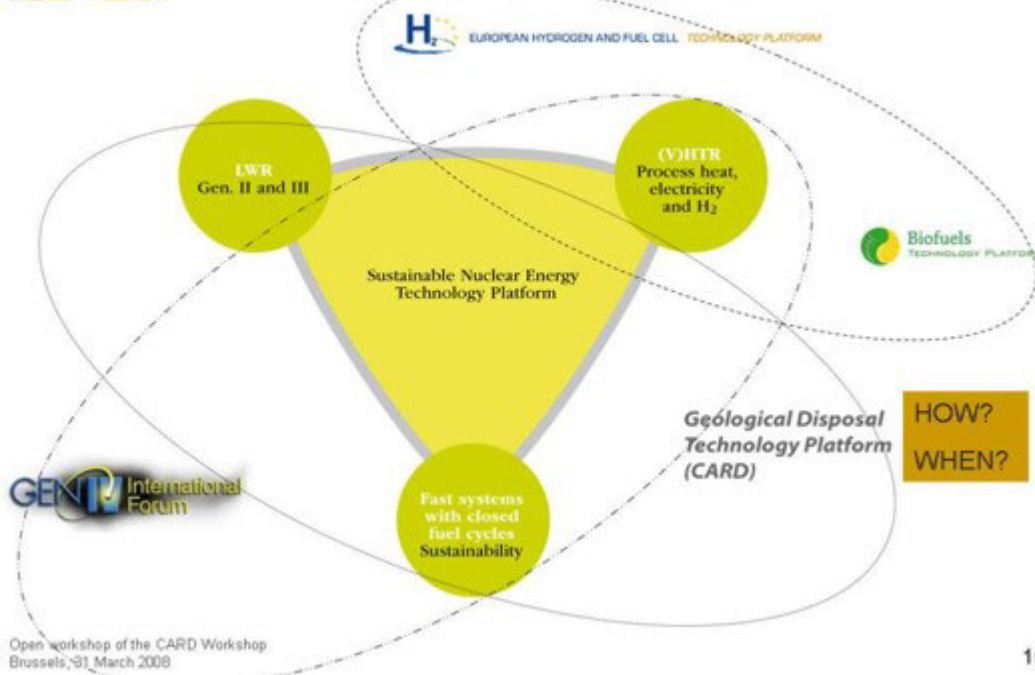
But FP funding only limited part (5%?) of needed resources to deploy SRA. Need better coordination of national programmes (Member State Mirror Group) & public/private partnerships

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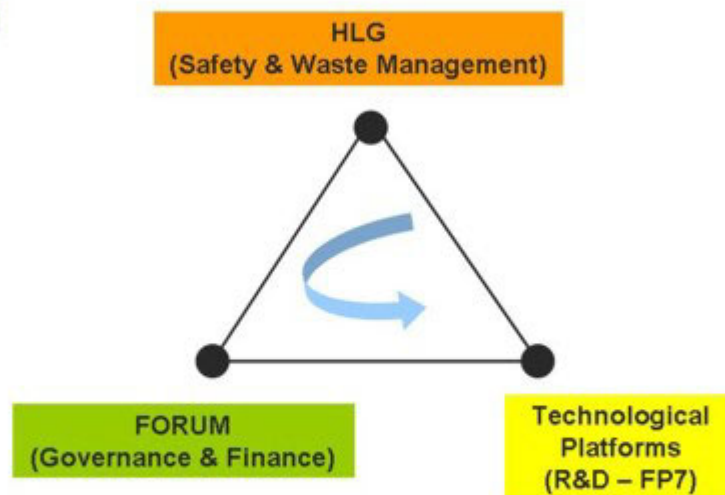
Interactions with other TPs & International initiatives



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Interactions with other EU bodies



Example: Education & Training – for industry & research

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Final remarks

- Draft of SRA to be presented to SNE-TP General Assembly in Nov. 2008.
- SNE-TP covers whole fission R&D except geological disposal – but interface must be properly addressed.
- New stake-holders are joining: utilities, New Member State organisations, but also NGO “Sauvons le Climat” & “Ecologists for Nuclear” → more than 50 member organisations today
- SNE-TP focused on technology. Contribution to SET Plan, *European Industrial Initiative* to develop Generation IV technologies for “sustainable nuclear”
- Strong support from EC Unit Fission in setting up SNE-TP gratefully acknowledged. Support will hopefully continue under FP7 proposal to fund secretariat for 2 years (starting beginning of 2009)

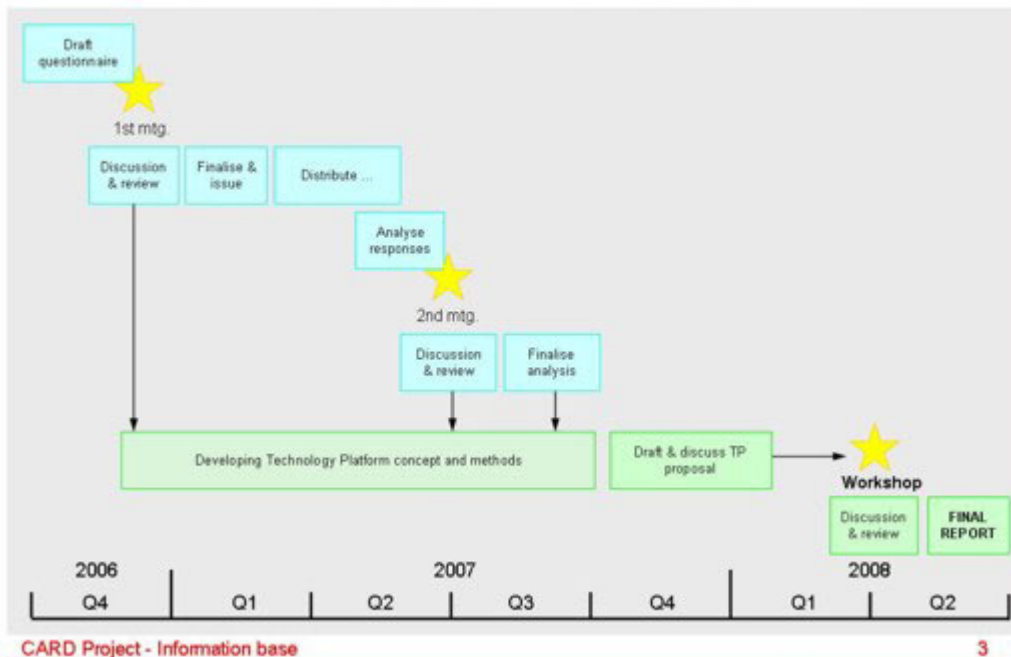
EC CARD Project Information base

Presented by Trevor Sumerling
CARD Workshop, 31 March 2008, Brussels

The CARD mission and work

- ***The aim of CARD is***
 - **to assess the feasibility** of a Technology Platform (TP) that would provide a European Framework for networking and co-operation in the field of RD&D for geological disposal
- ***The study has***
 - **sought inputs** from potential partners in the project and key stakeholders ...
 - **analysed these inputs** so as to develop proposals for a TP to be implemented in FP7
- ***Method ...***
 - a questionnaire was developed based on discussion at the 1st CARD meeting and reviewed by CARD participants
 - this was distributed through the participants, who also collected responses
 - a preliminary analysis of responses was presented and discussed at the 2nd CARD Meeting
 - a final analysis was made and has informed the TP proposal
- ***The analysis is now input to the CARD Workshop ...***

Schematic project timeline and activities



Compilation and analysis process

- 76 filled-in forms from 14 countries (EU & CH)
 - plus 6 statement responses
- Entries were extracted and compiled in a spreadsheet
- Analysis was performed including
 - assignment of organisation to "type" based on responses on role (see next slide)
 - calculation of mean scores allocated by respondees for 'scoring' questions
 - extraction of statements, identifying common or divergent views and points of value to the TP
- The questions ...
 - Q1 to 3 : cover organisation role, participation, motives, objectives and benefits
 - Q4 to 6 : cover suggestions for TP structure and working methods, and specific requirements/conditions
 - Q7 is a final "catch all"

Organisation categories used

- Formal national appointees
 - Implementor / Waste Management Organisation (WMO)
 - Technical Support Organisation (TSO)
- Stakeholders
 - Other WMO (not an implementer, but with funding or other responsibility)
 - Ministry Department (generally with funding and policy responsibilities)
 - Regulatory body or licensing authority
 - Social stakeholder, e.g. municipalities and their association or support groups
- Research providers
 - National Research Institute (NRI) or similar (other than an WMO/TSO)
 - University department
 - Commercial contractor

Q1(a) Respondees by country and type of organisation

	Formal national appointees (FNAs) : 21		Stakeholders : 17+6				Research providers : 30		
	Implementor /WMO	Technical Support Org.	OtherWMO	Ministry Department	Regulator	Social stakeholder	Other NRI	University Department	Commercial contractor
Belgium	Ondraf	SCK,CEN		FPSE/EA	FANC	MOVA STORA	GeoSurBel R. Onc. Belg SURFIDCE	U-Ljg e M-Leuven	
Switzerland	Nagra	PSI			HSK		SwissTop		
Czech Republic	RAWRA						CoReAct Cz.NRI	TU(NP)E TU(CEG)	
Germany	DBE BfS	GRS		BfMfI BfMfT	BfM NML-LSax		BfL, GfE FZJ-IRC FZJ-INE FZJ	TU- Clneth#	TU-Nord
Spain	ENRESA	CIEMAT					ATEMN IES-CISC	CIMRE-UPC	Enviro-Sp
Finland	Posiva	VTT	FFHOy	HTM	STUK	CurS	GeoSurFin	TU- UH-Rohem HU-Teht- AES	
France	ANDRA	IRSN		OPCCST DORI Min Env			CEA ARMNEG CMRS INERIS	UT-Troyes	
Hungary	PURAM								
Italy		ENEA							
Netherlands	COVRA								
Poland			ZuOP						
Slovenia	ARAD				SNZA		JSI GeoSurSl ZAO		IBCConE
Sweden	SVE				SIC SGI	JRamma Okechams	SGP	KTe	Gräber
United Kingdom	NDA					NLSa#	BOS		Neda Solutions

Note: Blue text indicates statement responses only.

Q1(b) With respect to RD&D for geological disposal, please characterise your organisation's role or roles

	Formal National Appointees	Other stakeholders	Research providers
Funding RD&D	3.0 (1-5)	2.2 (0-5)	1.2 (0-5)
Specifying RD&D programmes or assets	4.2 (3-5)	2.7 (1-5)	2.1 (0-5)
Managing RD&D programmes or assets	3.7 (1-5)	1.5 (0-5)	2.6 (1-5)
Carrying out RD&D work to contract	2.7 (0-5)	0.9 (0-5)	3.9 (1-5)
Centre of expertise for specific RD&D	3.4 (2-5)	0.9 (0-5)	4.2 (1-5)
Reviewing sufficiency of RD&D programmes and products	3.1 (0-5)	3.1 (3-5)	2.8 (1-5)
General interest in sufficiency and relevance of RD&D programs & products	2.9 (0-5)	3.3 (2-5)	2.4 (2-5)
Specific interest only in particular programs or RD&D topics or applications	1.1 (0-5)	1.8 (2-5)	2.4 (0-5)
QUALITATIVE KEY:	Very high interest	High interest	Very low interest

Comment: the mean is a more useful indicator and only the mean is used in the following tables

Results show arithmetic mean and range from allowed scores from 5, very important, down to 0, no relevance.

Other roles mentioned : Influencing publicly-funded generic RD&D programmes; Financing responsibility and liabilities; Mandated role or response to legislative requirement; Interest in issues with local implications; Maintenance of RD&D infrastructure; Education and training, especially of young scientists; Reviewing the quality of underlying data and assessing uncertainties.

CARD Project - Information base

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Q1(c) RD&D annual budgets and EC FW contributions

- **For WMO/implementors**
 - from 13 respondees, 8 gave interpretable information
 - accounting for a total of ca. 170 M€/a
 - range = 0.3 to 90 M€/a
 - EC contribution typically a few % (0% to 6%)
- **Technical Support Organisations**
 - from 8 respondees, 4 gave interpretable information
 - accounting for a total of ca. 14 M€/a
 - range = 0.8 to 7 M€/a
 - EC contribution typically a few % but in one case 40-50%
- **For others**
 - question often not relevant
 - where RD&D funded, mainly dependent on WMOs

CARD Project - Information base

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Q2(a) Possible benefits ... which, if any, do you consider beneficial or important from your organisation's perspective ?

	Formal national appointees	Stakeholders	Research providers
Exchange of information and experience on RD&D planning and management	4.2	3.6	3.5
Co-ordinated utilisation of Europe-wide RD&D resources & assets	3.5	2.9	3.3
Effective utilisation of your own or national RD&D resources & assets	3.4	3.2	3.5
Sharing of RD&D planning (e.g. identification of goals & topics)	3.4	2.9	3.3
Sharing of RD&D information and results	4.3	4.0	4.3
Networking among RD&D funders, managers and stakeholders	3.6	3.2	3.3
Identifying centres of competence and excellence in given topics	3.7	3.4	3.8
Influence on own national RD&D programmes	2.8	2.9	3.2
Influence on EC RD&D programmes	3.6	2.9	3.5
Open process of identifying joint research priorities	3.8	3.1	3.7
Up-stream co-ordination (longer-term forward planning)	3.7	3.1	2.8

Results show the arithmetic mean of allowed scores from 5, very important, down to 1, no importance.

Other benefits mentioned: National RD&D optimization and program evaluation; Better understanding of RD&D strategies; Exchange on failures and difficulties; Identification of topics for project proposals; Better education and training (esp. of young scientists); Maintaining expertise; Better knowledge management (system) & access; Collaboration with institutes in same field; Responsiveness to community concerns.

CARD Project - Information base

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Q2(b) How likely is it that your organisation would participate in a well-formulated Technology Platform in this area ? - Data

Organisation type (# responses)	Responses	Comment
Formal National Appointees	Implementor / WMOs (10)	9 likely to very likely 1 conditional The condition relates to the motives and needs of other participants and retaining control of key R&D activities
	Technical Support Organisation (8)	7 likely to very likely 1 conditional The condition relates the attitude of the national implementor
Stakeholders	Other WMOs (2)	1 unlikely 1 very likely The very likely is a WMO that might become an implementer in future
	Ministry Departments (7)*	1 v. likely, 1 possible 3 no or unlikely 2 no answer In most countries the responsible ministries expect the designated WMOs to act in the R&D area.
	Regulators (8)*	4 likely or possible 3 unlikely 1 no answer 2 of the likely / possible are those that gave statement responses indicating interest. For others, lack of direct resource seems the primary deterrent.
	Other stakeholders (6)*	4 unlikely 2 possible Technical aspects are not of deep interest but 2 indicated interest if social and communication aspects covered
Research providers	National Research Institutes (22)	10 very likely 3 likely, 3 possible 1 no, 5 no answer Generally positive responses were given. The no answers it is not a partner or tech. org in this context.
	University Departments (11)	4 very likely, 4 likely; 3 no answer Generally positive responses were given.
	Commercial contractors (5)	1 very likely, 3 likely; 1 possible Generally positive assuming clients or the EC pay.

* Results include interpretation of statement responses.

CARD Project - Information base

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Q2(b) How likely is it that your organisation would participate in a well-formulated Technology Platform in this area ? - *Interpretation*

- **Implementor/WMOs**
 - generally positive responses
 - motives of other participants, control of own resources and TP methods and organisation cited as determining factors
- **Technical Support Organisations**
 - generally positive responses
 - attitude of WMO and ministry (parent funder) cited as determining factors
- **Stakeholders**
 - general encouragement for a TP but organisations consider themselves “not competent” or interested to participate in a primarily technical forum
 - regulators mention resources and independence
 - social stakeholders mention lack of social dimension
- **Research providers**
 - generally positive responses
 - funding and attitude of client WMOs and regulators will be determining factors

Q3 Possible objectives and functions ... which, if any, do you consider most important

	Formal national appointees	Stakeholders	Research providers
Establishing a forum for discussion of RD&D issues and priorities amongst RD&D funders, managers and other stakeholders.	4.0	3.4	3.7
Establishing mechanisms for co-ordinating RD&D on topics of shared interest between programmes.	3.9	2.7	3.3
Establishing mechanisms for co-funding and co-managing RD&D projects of shared interest between programmes.	3.3	2.4	2.8
Establishing a forum and mechanisms for sharing of RD&D information and results.	4.2	3.9	4.4
Establishing mechanisms to identify and support centres of competence and excellence in given RD&D topics.	3.7	3.2	3.5
Providing RD&D funders and managers with a broad range of stakeholder views on RD&D priorities and programmes.	3.7	3.3	3.2
Providing stakeholders with a window to observe and influence RD&D programmes.	3.0	3.6	2.9
Up-stream co-ordination (longer-term forward planning)	3.7	2.6	2.6

Results show the arithmetic mean of allowed scores from 5, very important, down to 1, no importance.

Other objectives & functions mentioned :
 Understanding how other partner organisations plan and manage their RD&D;
 Networking between organisations performing contracted research to the WMOs or the regulators;
 Improve education and training; Improve knowledge management, reach common view on priorities;
 Basis for mobilizing experience and resources in response to emerging issues.

Main conclusions from questions 1 to 3

Participation and Motives

- WMOs must provide the driving input
 - the forum is primarily to serve their ends
- Stakeholders are interested *but*
 - expect limited participation
 - do not see the TP as vital to their functions
- Research providers are interested
 - in the potential for technical exchange
 - but participation dependent on funding of WMOs and regulators

Main conclusions from questions 1 to 3

Objectives, Benefits and Caveats

- Key objectives are
 - forum for discussion of RD&D issues
 - between funders, providers and stakeholders
 - mechanisms for co-ordination of RD&D between programmes
 - efficiency, cost sharing, sharing of expertise and facilities
 - forum for exchange of RD&D information and results
 - important for FNAs, stakeholders and research providers
- Key benefits are
 - exchange on RD&D planning and management (WMOs)
 - what does and does not work
 - sharing of RD&D information and results (all respondees)
- Key reservations are
 - keeping control of key RD&D resources and projects (WMOs)
 - avoiding bureaucracy and duplication of effort (all respondees)

Q4 View on TP structure - summary of comments (1)

- The initial proposal is generally acceptable starting point *but ...*
 - Needs elaboration, especially
 - the relation between work programmes and exchange forum
 - and time scales for implementation
 - Balancing needs of WMOs and other organisations
 - WMOs will expect to remain in control of resources they allocate but other stakeholders must see that their input counts
 - Stepwise implementation should be possible
 - start with a core group of WMOs willing to allocate the resources to planning and implementation
 - hold points to review structure and working methods
 - Flexibility and ability for case-by-case and project-oriented solutions
 - Difficulty of meeting needs of programmes at different stages and for different host rocks
 - Cannot encompass all RD&D issues and should focus on areas of commonality
 - Participants will choose which initiatives and projects to join
 - Structure must
 - promote open dialogue on the RD&D needs for geological disposal between implementers, regulators, technical organisations and policy makers
 - at the same time provide practical benefits - agree and implement a programme
 - Must avoid duplication of existing fora and collaborative arrangements
 - therefore role must be distinctly different from existing fora, e.g. RWMC, EDRAM
 - over time the TP may/could supplant or unify other fora for RD&D co-operation

Q4 View on TP structure - summary of comments (2)

- *Continued ...*
 - Executive body in effective control
 - Must avoid unwieldy organisation
 - Traceable development of the Strategic Research Agenda (SRA)
 - Important first step but also needing ongoing consideration
 - Participants must agree format and working methods
 - traceability needed
 - Legal issues
 - solution needed on intellectual property (IP)
 - contractual obligations of participants
 - Experienced and sufficiently-resourced secretariat needed
 - to support TP as a whole - exchange forum, TP management and programme implementation
 - to provide continuous engine for the project
 - Communication needed outwards as well as intra-TP
 - EC participation to ensure outcomes reflected in EC planning
 - Possible connection to non-EU countries
 - Possible connection to Sustainable Nuclear Fission Technology Platform

Q5 Working methods - summary of comments (1)

- Communication approach should be dynamic & flexible
 - use electronic communications (web, telecon & videocon)
 - plenary and smaller group meetings also needed
- General symposium
 - gather all interested parties and increase networking
 - common synthesis important
- Well defined objectives and clear goals. Capacity to prioritize
- Meeting preparation important (documents posted in advance)
- Working groups with clear mandate and deliverables
- Workshops on specific RD&D topics
- TP should not cause significant additional work load
- Permanent structure and staff for managing the TP
- Procedures for arbitration

Q5 Working methods - summary of comments (2)

- Use methods applied with success on collaborative projects
 - note experience in other EU projects, e.g. NF-PRO, FUNMIG, ACTINET
- The bases of effectiveness will be:
 - clear, precise and consensus programmes
 - realistic and reasonable development horizons
 - precise, logical and conservative assignment
 - assigned and consensus funds
 - milestones, products well defined and consensus
- Information management system
 - structured to meet the needs of all parties
 - especially develop efficient web-based system for exchange
 - standardised reporting procedures on the status of projects
- Sufficiently good agreement common objectives on
 - on the Strategic Research Agenda (SRA) and for each project
 - controversial issues left to be discussed in special working groups
 - achieve consensus SRA by considered exchange (not Symposium)

Q6(a) Specific expectations and constraints (+ve)

- Increase in effectiveness of international co-operation.
- Shared understanding (with technical organisations and stakeholders) of national strategies, approaches, limitations and RD&D priorities
- Development of a shared, peer-reviewed base for future safety cases
- Closer co-operation & contact of our researchers with the international teams.
- Agreed framework for possible cooperation projects
- Means for training of human resources required in future programmes
- Access to competence
- Mechanism for more efficient and trans-national funding of RD&D.
- Opportunity for more transparency internally and towards stakeholders.
- To maintain our RD&D groups in the areas of interest with the present level of excellence

Q6(a) Specific expectations and constraints (-ve)

- Not to duplicate existing fora (clear added value vis-à-vis current fora)
- Not to duplicate existing joint project arrangements
- Not to demand a diplomatically-correct consensus on each issue
- No major influence on EC programmes
- If level of commitment exceeds our resources, limited resources, timing ...
- No restrictions on our own R&D activities
- Must be low additional work load - avoid bureaucracy
- Not focus towards very specific matters
- Reluctance on the shared use of the resources, competition for limited expertise
- The relation of the TP priorities with our own RD&D strategies

6(b) Level of RD&D resource commitment

- **Common responses**
 - Depends on the expected benefits
 - No information for the present moment, too early to say
- **More specific replies include ...**
- Human resources will be needed to initiate the TP
- Can provide support in knowledge management and share our knowledge base
- Need to evaluate TP benefit versus impact on national programme.
- (Only) co-funding to own EC-funded R&D activities
- 5-10 % of annual budget for SNF management
- Would support development of the SRA, thereafter depends on work programme
- Not possible to contribute own financial resources
 - but public information, laboratory infrastructure and human resources are available in principle
- The domestic needs must be preferred in resource allocation
 - therefore, has to be agreed with the national WMO or safety authority

Q7 Additional remarks (1)

- Possibilities to actually influence the EC programmes should be clarified
- Comments on siting; commonality of host rock
- Comments on political process (Government action)
- The policy for RWM must not be handled by Europe
 - It's the responsibility of the member states; experience & competence are in the MSs
- Suggestions for priority topics
- Keep in mind the priority is geological disposal (on schedule)
- Make the organization as simple as possible

Q7 Additional remarks (2)

- Useful to identify/foster centres of excellence that are independent of the nuclear industry and repository implementors
- Geological disposal competes with other waste management options, both politically and in terms of EC funds
- In research institutes like universities
 - much depends on the individual interest of researchers
 - we participate in projects that bring resources to the research groups
- An initiative with considerable potential ...

*All of the above forms an information
input to the Workshop discussion*

Proposals for a Technology Platform for Geological Disposal

Presented by Alan Hooper
CARD Workshop 31 March 2008, Brussels



Structure of Presentation

- **Guiding Principles**
- **Proposed Structure for the Technology Platform**
- **Next steps**
- **Concluding remarks**

Basis for Sustainable Networking

- **Driven by the RD&D needs of each WMO, and the synergies between them**
 - **Efficiency of operation and information exchange**
 - **Avoidance of overlap or duplication of existing networking arrangements (complementarity)**
 - **Longevity of TP to support Member States' national repository programmes to completion (not just FP7)**
 - **Value to WMOs so that operation could be self-supported in the long term**
 - **Co-operation, information exchange and technology transfer between national programmes**
-

NDA

Enhanced Co-operation and Excellence

- **Effective utilisation of resources (e.g. in specialised facilities/URLs, or research institutes)**
 - **Shared knowledge base**
 - **identification of relevant databases**
 - **access arrangements to information**
 - **methods to select peer review experts**
 - **methods for selecting technologies**
 - **Mapping competences and excellence**
 - **Advising EC on the most relevant topics**
-

NDA

Principles for Involving Stakeholders

- **Determine the optimal way in which other stakeholders (regulators, advisory groups, affected communities) can be given access to and influence upon the operation of the TP**

NDA

R D & D Focus

- **To build confidence in safety cases**
 - **more robust against residual uncertainties**
 - **establishing yet greater margins of safety**
- **To support technical demonstrations to show the maturity of concepts developed**
- **To support directly repository implementation**

NDA

R D & D Prioritisation

- **Ensure European R D & D resources are devoted to real cases (not generic ones)**
 - **Boost progress towards implementation of the first geological repositories in Europe**
 - **Pave the way for similar developments in other Member States' programmes**
-

NDA

TP Structure

- **Key Requirements**
 - **A level of access to all participants**
 - **To allow open discussion and exchange**
 - **A formal structure for efficient planning, management and reporting of projects or activities**
 - **Leading to**
 - **A forum for exchange of information and discussion of RD&D needs (in relation to GD implementation)**
 - **A working programme controlled by an executive group (supported by a secretariat)**
-

NDA

TP Working Programme

- **Working groups with specified TP-related mandates (e.g. development of Strategic Research Agenda; education and training; knowledge management)**
 - **Collaborative projects and activities following agreed work plans and objectives**
-

NDA

Waste Management Organisations (WMOs)/Equivalent Organisations

- **Best placed to set strategic objectives for RD&D**
 - **Periodic development of repository safety cases and associated repository designs**
 - **Used to identify RD&D issues that remain to be addressed**
 - **Subject to peer review (academic institutes, regulators)**
 - **A range of repository concepts and geological conditions across EU, nonetheless sufficient synergies for formal co-operation agreements**
 - **High level of informal co-operation in discussions of ideas and initiatives**
 - **Typically rely on commissioning RD&D from suitably qualified organisations**
-

NDA

Technical Support Organisations (TSOs)/Research Organisations

- **Range of responsibilities across Member States for provision of specialised scientific and technical information variously to WMOs, regulators or national governments (sometimes under fixed arrangements)**
 - **Capability to evaluate the status of scientific understanding in key areas**
 - **Knowledge and experience of how RD&D needs can be met**
 - **Complementary requirements for international co-operation**
-

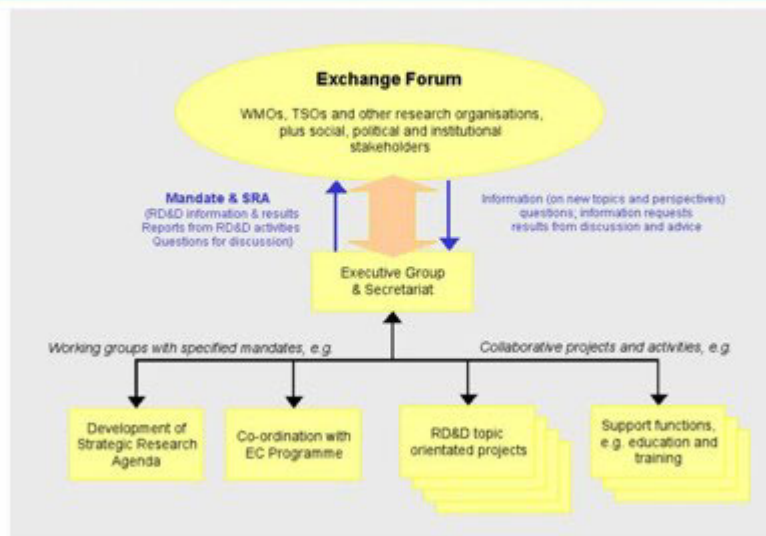
NDA

Regulators

- **For public confidence, must be seen to operate independently of the WMO and not be unduly influenced by WMO strategies**
 - **Need to reserve position on the status of scientific and technical arguments until review of safety case in national programme**
 - **Require greater visibility of the international scientific and technical basis for GD**
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NDA

Proposed Structure for the Technology Platform



NDA

Exchange Forum – Proposed Methods for Information Exchange and Discussion

- **Website with information on TP programme; results; and proposals for review and comment**
- **Meetings to discuss RD&D priorities, the Strategic Research Agenda and the TP programme in general**
- **Workshops on specific RD&D topics or support activities**

NDA

Executive Group – Proposed Responsibilities

- **Control implementation of projects under the TP**
- **Commission working groups with specific remits, e.g. to develop the Strategic Research Agenda**
- **Develop reports on the activities and outcomes of the TP**
- **Seek and respond to views of participants and stakeholders**

NDA

Implementation Proposals (1)

- **Step-by-step process, towards ultimate scope and objectives**
- **Draft of ‘vision’ document for all prospective participants to commit to (strongly informed by outcomes of CARD)**
- **Identification of ‘governance group’ of organisations with national programme responsibilities for deploying research budgets**
- **Appointment of Executive Group with required technical and strategic-level management competence**

NDA

Implementation Proposals (2)

- **Executive Group to propose scope of Strategic Research Agenda (SRA)**
- **Launch of the Technology Platform at workshop, to include presentation of proposed SRA**

NDA

Implications

- **Initially commitment of suitably qualified and experienced staff**
 - **Two WMOs have expressed willingness in principle**
 - **Formal contractual arrangement unhelpful**
- **When collaborative projects are agreed, formal commitment of staff and funding (Consortium agreement model)**
- **Funding required for TP secretariat**
 - **EC open to providing initial support, but funded by WMOs in long term**

NDA

Concluding Remarks

- **High level of support for a TP in principle**
- **Must achieve added value in practice**
- **Reasonable consensus on objectives and constraints**
- **Encouraging practicality expressed in responses**
- **This Workshop with potential participants and stakeholders intended to provide further inputs and measure of support**

NDA