EUROPEAN COMMISSION

European Research Area

CArbon-14 Source Term

CAST

Dissemination plan (D7.3)

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Dissemination Level		
PU	Public	**X**
RE	Restricted to the partners of the CAST project	
CO	Confidential, only for specific distribution list defined on this document	

CAST – Project Overview

The CAST project (CArbon-14 Source Term) aims to develop understanding of the potential release mechanisms of carbon-14 from radioactive waste materials under conditions relevant to waste packaging and disposal to underground geological disposal facilities. The project focuses on the release of carbon-14 as dissolved and gaseous species from irradiated metals (steels, Zircaloys), irradiated graphite and from ion-exchange materials.

The CAST consortium brings together 33 partners with a range of skills and competencies in the management of radioactive wastes containing carbon-14, geological disposal research, safety case development and experimental work on gas generation. The consortium consists of national waste management organisations, research institutes, universities and commercial organisations.

The objectives of the CAST project are to gain new scientific understanding of the rate of release of carbon-14 from the corrosion of irradiated steels and Zircaloys and from the leaching of ion-exchange resins and irradiated graphites under geological disposal conditions, its speciation and how these relate to carbon-14 inventory and aqueous conditions. These results will be evaluated in the context of national safety assessments and disseminated to interested stakeholders. The new understanding should be of relevance to national safety assessment stakeholders and will also provide an opportunity for training for early career researchers.

For more information, please visit the CAST website at:
http://www.projectcast.eu

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Executive Summary

In management of radioactive waste, several groups of individuals can be identified. The knowledge and interest of an individual is essential for implementation of the research results. In CAST, group specific methodologies have been developed to disseminate the new understanding of potential release mechanisms of carbon-14 to waste producers and generators, regulators, waste management organisations, experienced researchers, early career researchers and the public.

For groups whose interest cannot be specified, mass media communication tools are used to disseminate the findings of CAST. These tools are a website, newsletters and scientific articles. The website is divided in sections for an efficient dissemination of results to an audience with different interests. There is a section for the broad scientific community in which the published reports as well as a schedule of intended publication dates of reports can be found. At the homepage, a description of natural carbon-14 is given for an audience with no knowledge in radiation protection and unfamiliar with carbon-14 containing waste. For the public, newsletters are written to disseminate the knowledge developed in CAST. For the broad scientific community, two papers will be submitted to a scientific journal in which the status of the knowledge and knowledge developed is aggregated. For early career researchers, there will be training courses. Researchers outside CAST can attend the General Assembly meetings as observers.

For groups whose interest can be specified, workshops are used to disseminate the results from the research executed. These groups are regulators, waste producers and waste

management organisations. Workshops are held to obtain an integrated view of these three stakeholders in the management of radioactive waste on the progress and achievements in CAST.

List of Contents

1 Introduction

1.1 *Background*

The nature and effects of the processes and events used to assess the safety of a geological disposal facility must be considered for timescales of hundreds of thousands of years. One of the main issues is the ability to assess these events and processes with sufficient confidence over these long time scales. Confidence depends on the quality and presentation of the research executed. In CAST, the source term for carbon-14 from radioactive waste from nuclear reactors is investigated for two processes: corrosion and leaching.

New scientific understanding for the corrosion of irradiated steel and Zircaloys and leaching of spent ion-exchange resins and irradiated graphites under geological conditions is necessary in order to determine a substantiated rate of release of carbon-14. Each type of waste investigated in CAST has a specific Work Package. The results obtained will be evaluated in the context of national safety assessments in WP6. Figure 1-1 shows the work packages used in CAST.

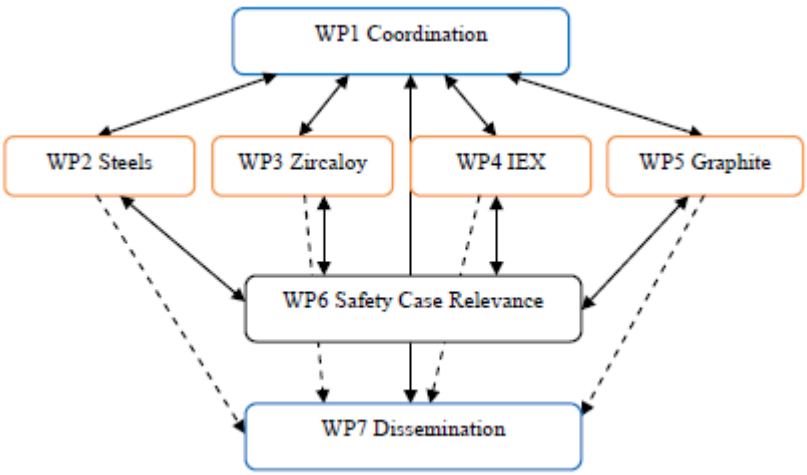


Figure 1-1 Diagram illustrating the interaction between work packages.

1.2 *Objectives*

The objective of this document is to provide the description to disseminate the knowledge developed in CAST to groups identified in CAST. The identified groups range from stakeholders with a general interest in CAST (the public and the broad scientific community) to stakeholders whose interest is specified (waste generators, waste producers, regulators and waste management organisations). End-users are defined in CAST as safety assessors (experienced researchers from technical safety organisations and waste management organisations).

1.3 *Approach*

The knowledge and interest of a group needs to be identified and characterised, so that the new understanding of potential carbon-14 release developed in CAST can be disseminated effectively. A distinction is made between the tools used for mass media and interpersonal communication [EC, 2012].

Knowledge concerning the nationality of organisations participating in CAST can be beneficial for an effective approach in interpersonal tools to disseminate the developed knowledge in CAST at a European level. Figure 1-2 shows an overview in which countries with organisations participating in CAST are made orange.

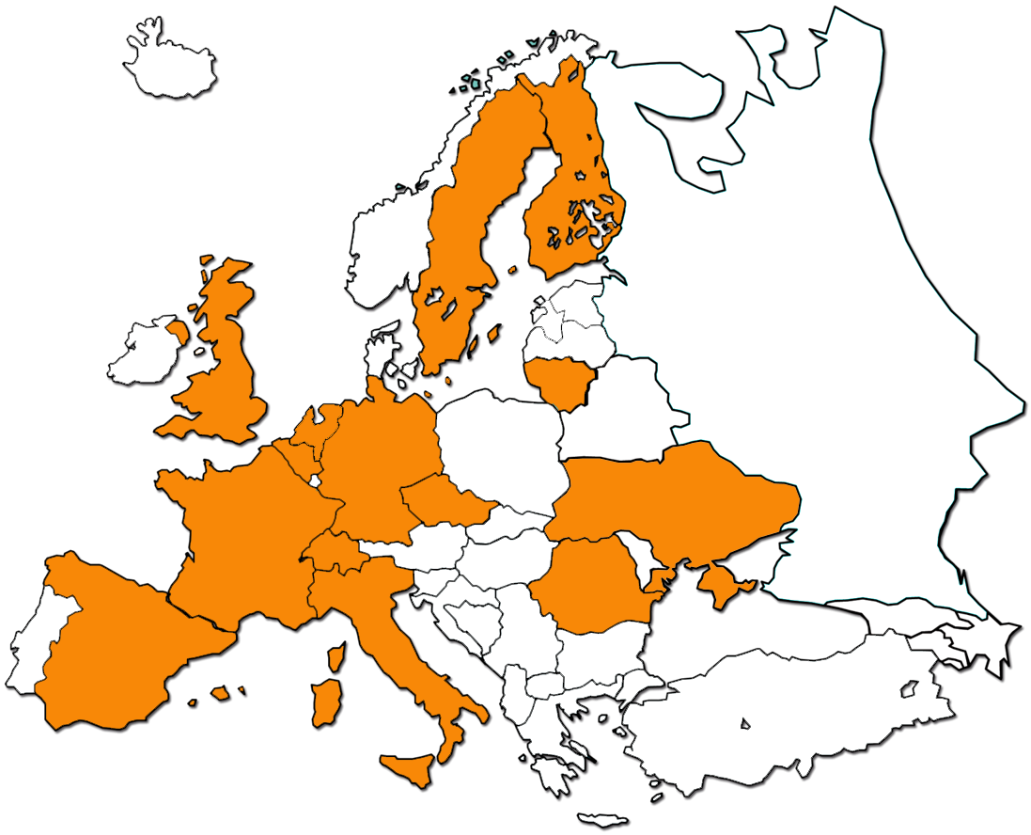


Figure 1-2: Countries for organisations participating in CAST (orange). RWMC from Japan also participates in CAST.

The waste investigated in CAST originates from nuclear plants; commercial power plants as well as research reactors. Most EU countries with operational nuclear power plants have organisations participating in CAST.

For each group, one section is used for the description of disseminating the knowledge developed in CAST. For clarity, each section has the same sub-sections. In the first sub-section, the knowledge and interest of the group is defined. In the second sub-section, the methodology is presented. In the third sub-section, an evaluation of the disseminated knowledge and a methodology to do so is performed in order to assess whether the knowledge developed in CAST has been transmitted. The identified groups that are discussed in this report are: the public (Section 2), researchers (Section 3), end-users (Section 4), regulators (Section 6), waste management organisations (Section 7), and waste

producers (Section 8). In Europe, the institutional arrangements for the management of radioactive waste typically follow the ‘classical triangle’ in which the regulators, waste management organisations and waste producers have clearly defined roles and responsibilities. Workshops are envisaged for these three groups for an implantation of the knowledge developed in CAST on a national scale. These workshops are described in Section 5.

2 Public

2.1 *Definition*

The knowledge of the general public cannot be specified and it is therefore assumed that this audience has no experience in radiation protection and is unfamiliar with carbon-14 containing waste.

2.2 *Methodologies*

Only mass media communication tools are developed for this audience. The homepage of the public website of CAST and the newsletter are the tools to inform these stakeholders with a general interest. A description of natural carbon-14 is given in order to familiarise the public with carbon-14, and to set the context for the CAST project.

2.2.1 Website

The CAST interactive website contains elements encouraging visitors to participate. These elements are intended to encourage the visitor to frequently visit the website and spent more time reading the information provided. Figure 2-1 shows an example available on the CAST website: the production and incorporation of natural carbon-14 is visualised when the cursor is hovered over the main photo.

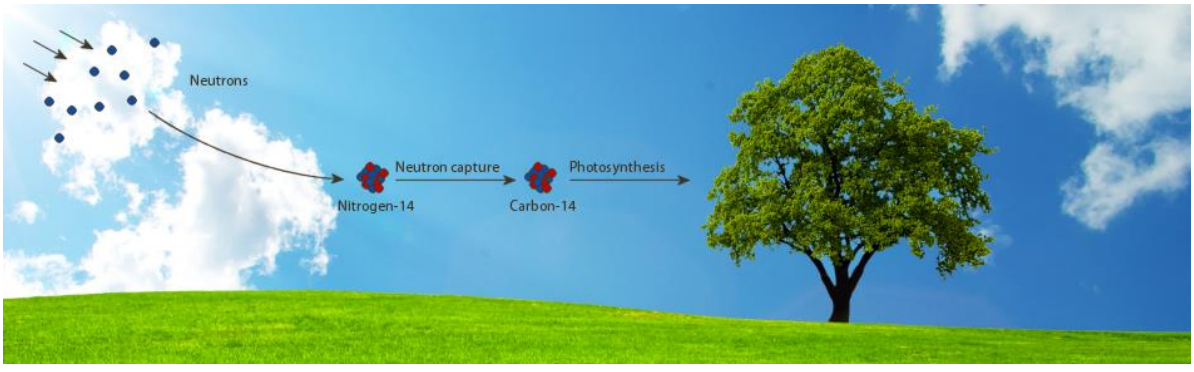


Figure 2-1: Interactive element at the website of CAST

An example, which encourages frequent visits to the website, is the visualisation of the progress of CAST using a growing tree, which shows the percentage of the CAST project which has been completed. At the end of the project, all of the leaves on the tree will have 'grown' from grey into green, as shown in Figure 2-2.

Figure 2-2: Digital growing tree to visualize the progress in the CAST project.

2.2.2 Newsletters

Each newsletter focuses on a specific topic using A3 infographics to illustrate the information. Five newsletters are intended to be produced, one every 9 months. The topics are based on the scheduled publications in the WP2-Steels, WP3-Zircaloy, WP4-Ion exchange resins, WP5-Graphite and WP6-Relevance of results in national contexts and safety assessments:

1) Origin of carbon-14 waste;

2) Radiological characterisation of waste;

3) Experimental approach to determination of release of C-14;

4) Analysis and chemical forms of C-14;

5) Quantification of source term for safety assessment.

The origin of natural carbon-14, its characterisation, available knowledge concerning its release and how natural carbon-14 is incorporated in organisms will be presented in the newsletters to help explain behaviour of carbon-14 in waste. A short description of the upcoming and past events will be presented. These events are General Assembly Meetings, training courses and workshops. For the workshops, these descriptions may include the key outcome, conclusions and recommendations.

The newsletters can be used to provide a snapshot of CAST progress and can be used to generate interest in the project. The newsletters are foreseen to be printed and to be distributed by the CAST participants. The newsletters are also published on the CAST website.

2.3 *Evaluation*

Monitoring of visits to the public website can be performed for an evaluation of its use. Monitoring frequently occurs by placing a digital item (a cookie) from the website on the computer of the visitor. For CAST, no cookies are placed; the ‘address’ of the computer that visited the website is registered. The number of unique visitors is continuously monitored and used as a dissemination indicator on the website. A database of the number of visits to website, as well as its webpages, is made during CAST for an annual evaluation.

3 Researchers

3.1 *Early-career researchers*

3.1.1 Definition

Master and PhD students with a background in (nuclear) engineering, geology, chemistry and mathematics are defined as early career researchers for the CAST project. The specific interest of this group is to learn and gain knowledge and skills to address waste management issues associated with carbon-14 containing wastes; from the point of view of experimental investigations or from a modelling and performance assessment perspective.

3.1.2 Methodology

Interpersonal communication is the main route chosen to transmit the knowledge developed in CAST to early career researchers. Moreover, training courses with a minimum of two days are planned as part of the project.

The first training course is organised by Karlsruhe Institute of Technology (KIT) and is envisaged to take place in February 2016. KIT will provide information on analytical techniques for determination and speciation of carbon-14 under disposal relevant conditions. This includes instructions for working in hot cells, training in remote handling with mock-up manipulators and working with glove boxes, in order to improve the handling and waste management techniques and to boost the safety awareness of scientists. A maximum of 16 participants will be allowed on the training course.

The second training course is organised by COVRA and is envisaged to take place in February 2018. This course includes general sessions on carbon-14 generation from various sources and release, waste in various geological disposal settings and implementing transport models for carbon-14 migration used in WP6 in a software tool. COMSOL is expected to be used since this software tool is one of those preferred by the Safety Case

Integration Group [NEA, 2012]. A maximum of 12 participants will be allowed on the training course.

A description of the plan, content and programme for each training courses will be published on the public website at least 6 months in advance of each training course. A specific section, 'Training', is designed on the public website of CAST so that early career researchers can find the relevant information and documentation about the training courses easily. Every CAST participant will be informed about the date and location of the training courses by e-mail.

There is a small budget available to reimburse travel costs and subsistence for a total of four students from Lithuania, Poland, Slovakia, Bulgaria, Romania, Slovenia, Croatia and the Czech Republic for each course.

3.1.3 Evaluation

The training courses are quantitatively considered successful if more than 8 students attend the course. One week after each training course, the students will be asked to provide feedback on the course. Their feedback on the first training course can be used to optimise the second training course.

3.2 *Experienced researchers*

3.2.1 Definition

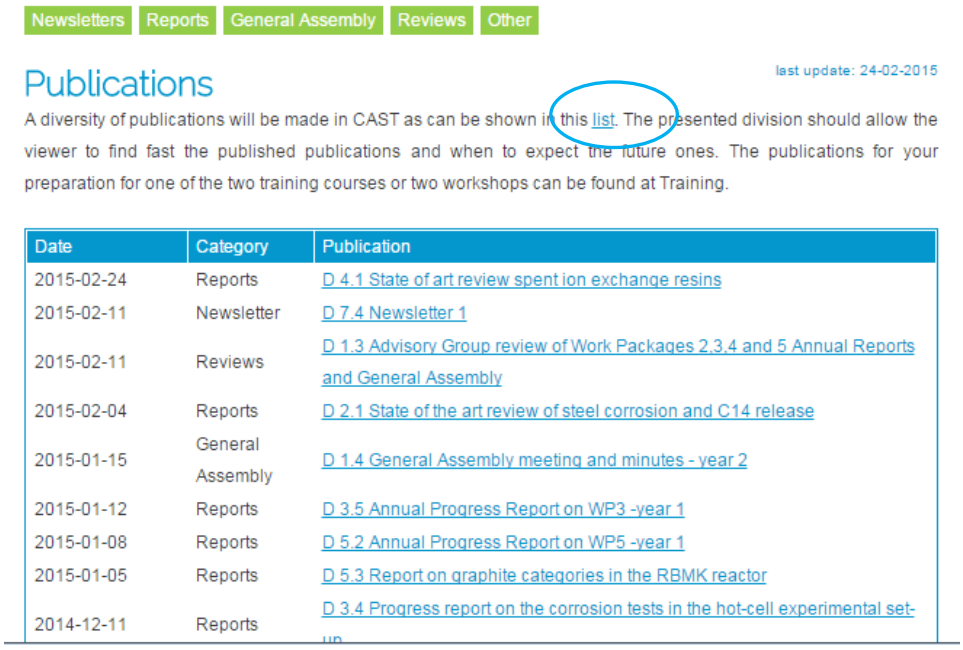
Researchers with several years of experience in radioactive waste R&D are considered to have sufficient background knowledge, so the general information on carbon-14 and radioactive waste provided to the public and early career researchers, will not be required. Their interest is expected to depend on the nature of organisations at which they work e.g. WMO, technical support organisations (TSOs), universities, research centres, nuclear

processing facilities and electricity generating companies. It is therefore not possible to specify their interest.

3.2.2 Methodologies

Only mass media communication tools to disseminate the progress and obtained results are made in CAST for this audience. These tools are website and papers intended to be published in scientific journals. Two scientific publications with an overview of the findings of CAST are foreseen. The first one is scheduled to be submitted after the state-of the arts reports of Work Package 2, 3, 4, 5 and 6 are finished. The second one after the final reports of Work Package 2, 3, 4, 5 and 6 are finished. These scientific publications will be produced by JRC-ITU.

It is expected that researchers have an interest in reports in which specific details are expected to be found. The list of publications including the expected date for publishing has been published at the public website of CAST. Figure 3-1 shows a screenshot in which the list of publications can be downloaded by clicking on list with the cursor.


Newsletters | Reports | General Assembly | Reviews | Other

Publications

last update: 24-02-2015

A diversity of publications will be made in CAST as can be shown in this list. The presented division should allow the viewer to find fast the published publications and when to expect the future ones. The publications for your preparation for one of the two training courses or two workshops can be found at Training.

Date	Category	Publication
2015-02-24	Reports	D 4.1 State of art review spent ion exchange resins
2015-02-11	Newsletter	D 7.4 Newsletter 1
2015-02-11	Reviews	D 1.3 Advisory Group review of Work Packages 2,3,4 and 5 Annual Reports and General Assembly
2015-02-04	Reports	D 2.1 State of the art review of steel corrosion and C14 release
2015-01-15	General Assembly	D 1.4 General Assembly meeting and minutes - year 2
2015-01-12	Reports	D 3.5 Annual Progress Report on WP3 -year 1
2015-01-08	Reports	D 5.2 Annual Progress Report on WP5 -year 1
2015-01-05	Reports	D 5.3 Report on graphite categories in the RBMK reactor
2014-12-11	Reports	D 3.4 Progress report on the corrosion tests in the hot-cell experimental set-up

Figure 3-1: Screenshot of the CAST webpage with location of intended list of publications.

This link makes it very easy to find a complete list of deliverable and expected deliverable publication dates. Deliberately, the full title of the uploaded publications is used in order to facilitate the researcher in its search for specific details. Published reports are uploaded during the execution of research in CAST. The public website also acts as an archive from which publications can be downloaded after CAST has completed, from 31 March 2018 until 1 April 2023.

Apart from results obtained in CAST being available in reports, it is possible to observe the CAST General Assembly Meetings, where the results are presented by the researchers themselves. The date, location and contact details to attend these meetings will be published in the Newsletters and on the public website once the details are known.

3.2.3 Evaluation

The number of visits at the webpage with publications (and reports) is monitored and used as a quantitative performance indicator.

Two independent experts monitor the scientific progress of CAST. These experts are a corrosion specialist, Dr. Fraser King and a carbon-14 specialist, Dr. Irka Hadjas. Their reviews are published on the website of CAST.

4 End-users

4.1 *Definition*

End-users are in CAST defined as experienced researchers that implement the investigated release of carbon-14 from neutron irradiated zircaloy, steel, graphite and/or ion-exchange resins in post-closure safety assessments for geological disposal of the waste. These researchers work at waste management organisations (WMO) and technical safety organisations (TSO). Figure 4-1 shows the countries of the end-user group members participating in CAST from October 2014.

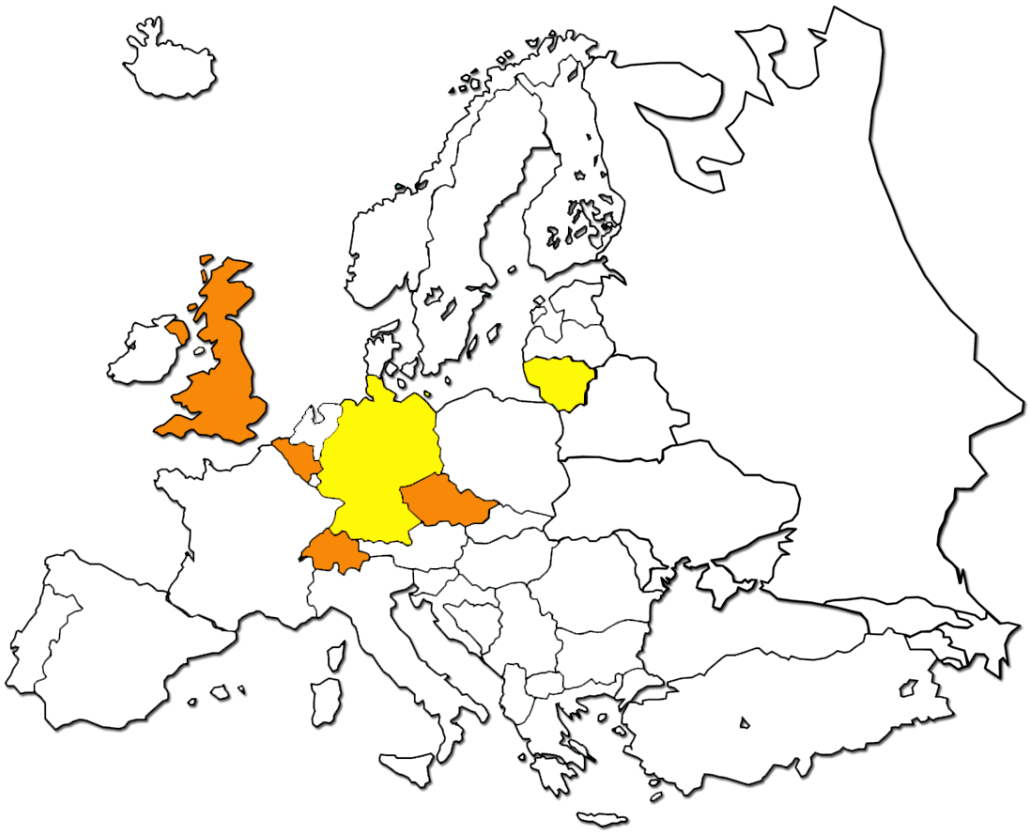


Figure 4-1: Countries with organisations participating that perform safety assessments in WP6 of CAST (WMO in orange, TSO in yellow) – status October 2014;

4.2 *Methodology*

The dissemination of knowledge developed in CAST takes place continuously due to their participation in the project. No specific communication tool will be made, but regular updates are provided to the CAST participants via the General Assembly Meetings, the CAST website and the CAST newsletters.

4.3 *Evaluation*

At the end of the CAST project, the end-users participating in CAST will be asked whether working within an EU-funded research project was effective for their implementation of the knowledge developed in CAST.

5 Workshops

A specific section on ‘Training’ is designed on the public website of CAST so that relevant information and documentation about the workshops can be found easily.

5.1 *Definition of audience*

For the workshops it is envisaged that participants will have an interest in research executed in CAST, but can also contribute to the confidence in national safety assessments. The research is evaluated from different perspectives in order to specify the contribution. The scientific progress is already evaluated in CAST by the CAST Advisory Group. For an implementation of the new understanding of potential release mechanisms of carbon-14 radioactive materials under conditions relevant to waste packaging and disposal to underground facilities on a national scale, the stakeholders in the ‘classical triangle’ of the management of radioactive waste are envisaged.

In Europe, the institutional arrangements for the management of radioactive waste typically follow the ‘classical triangle’ in which the regulators, waste management organisations and waste producers have clearly defined roles and responsibilities [Codée, 1999]. It is based on IAEA guidance in which the waste disposer is responsible for developing and implementing an integrated national strategy under a firm government policy. The waste producer is to finance the disposal of radioactive waste. Such separation is important to avoid conflict of interest: the regulator is independent of those that are regulated. Figure 5-1 shows a schematic view of the structure.

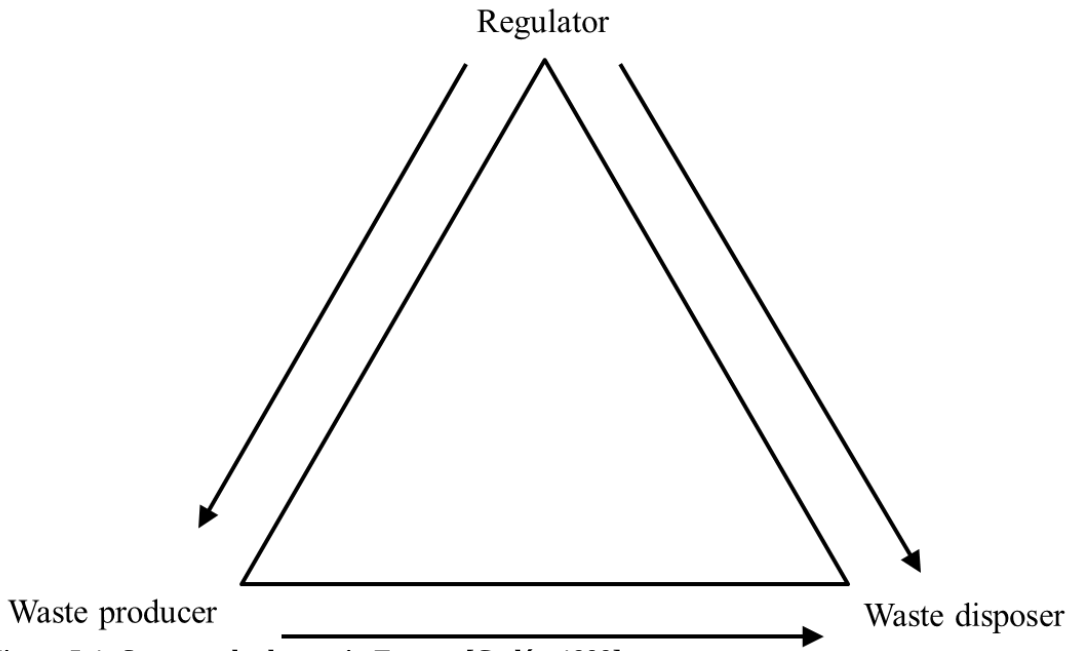


Figure 5-1: Structural schemes in Europe [Codée, 1999]

The waste disposer that is responsible for management and eventual disposal of carbon-14 containing waste is defined in CAST as the waste management organisation. In CAST, it is assumed that this management includes ensuring implementation of research and development. For Member States with no dedicated radioactive waste management organisations, the individual waste producers have implementation responsibilities.

In the latest IAEA glossary [IAEA, 2003] waste generator is used for the organisation that generates waste (instead of waste producer). The waste producer is defined in CAST as the organisation that processes the waste for disposal and the waste generator the one that generates the waste and therefore finances the disposal and processing of the waste. The producer and generator may be the same organisation as this separation may not be present for every type of waste investigated in CAST and national differences may largely depend on the amount of nuclear power plants present in the country. The waste producer is assumed in CAST to contribute to waste characterisation in order to quantify the source term for the post-closure safety assessment of disposal of the (processed) waste.

For the regulators, documentation will be prepared by LEI in order to allow them to make an effective contribution to the CAST workshop during their attendance. For Member States where the implementation of disposal of carbon-14 containing waste is at an early stage, participation by (an) organization(s) with a mandate that can implement the present state of the art and the knowledge developed in CAST in their national programmes for safe management of spent fuel and radioactive waste is preferred.

For countries with less advanced disposal programmes, their technical safety organisations, rather than regulator or waste management organisations, may have the best skills base to implement the knowledge developed in CAST in the context of national safety assessments. Thus technical safety organisations may be invited to participate in the workshops.

5.2 *Objectives*

Two workshops are envisaged to ensure that the developed knowledge in CAST is provided in a timely manner to the target groups. The first one is scheduled in January 2016 and the second one in January 2018. The objectives of the two workshops are to:

- Contribute to an integrated view of the management of carbon-14 containing waste between regulators, waste producers and waste management organisations.
- Further identify synergies between countries for (future) cooperation.

There is budget reserved for 60 participants for each workshop. There is a strong preference that the same 60 individuals participate in both workshops in order to increase the likelihood to meet these objectives. For each workshop, an overview for the scientific community is scheduled to be available as a draft submitted to a scientific journal.

5.2.1 First Workshop

In order to identify synergies between countries for (future) cooperation each participating country presents – preferably by the waste management organisation - in two slides their answers to the following questions:

For each type of carbon-14 containing waste investigated in CAST:

- What are the amounts you expect to have / will be generated?
- What is the designated end-point of each type of waste?

Questions for the regulators to be answered in the second workshop will be defined in the first workshop. The management of (carbon-14 containing) waste, roles and responsibilities of a country less advanced in disposal of waste will be presented in order to have an example for an integrated view.

The dissemination from CAST has a threefold aim:

1) To become acquainted with the proposed research;

2) To disseminate the initial findings;

3) To allow sufficient opportunity for questions.

To become acquainted with the proposed research in CAST, it would be beneficial to visit a waste storage facility. COVRA has a waste storage facility where the waste can be viewed easily, therefore the first workshop will take place in the Netherlands at COVRA's premises.

The state-of the art of the potential release mechanisms of the waste investigated in CAST will be presented, preferably by the Work Package Leaders 2, 3, 4, and 5.

The present implementation of carbon-14 release in safety assessments will be presented by a waste management organisation (preferably Work Package Leader 6) and a technical safety organisation. Each presentation can be followed by a panel discussion.

5.2.2 Second Workshop

In order to identify synergies between countries for (future) cooperation, each participating country in the workshop presents in two slides their answers to the following questions:

For each type of carbon-14 containing waste investigated in CAST:

- What (traceable) information can you share for the waste characterisation to calculate disposal of this waste? Preferably to be answered by a waste producer.
- What assumptions do you think need to be made for your national safety assessment? Preferably to be answered by a waste management organisation / technical safety organisation.

In the second workshop, the questions defined in the first workshop for the regulators are envisaged to be answered.

The management of (carbon-14 containing) waste, roles and responsibilities of a country advanced in disposal of waste will be presented in order to have an example for an integrated view. This country is expected to be the country in which the second workshop is hosted (to be decided around June 2017).

The dissemination from CAST has a twofold aim:

1) To present the results obtained;

2) To discuss the outcomes with the regulators, waste management organisations and waste producers.

The evolved knowledge of potential release mechanisms of the waste investigated in CAST will be presented. These presentations will be presented preferably by the Work Package Leaders 2, 3, 4, and 5. Potential questions and answers can be used for the proceedings.

The potential changes in implementation of carbon-14 release in safety assessments will be presented by a waste management organisation and a technical safety organisation. Each presentation can be followed by a panel discussion.

5.3 *Evaluation*

The attendance of the workshop by the regulators is considered successful when, for 50% of the countries participating in CAST, one expert from each national regulatory body participates in the workshops. The regulator's attendance is also considered successful if 3 additional EU Member States with carbon-14 containing waste but not yet participating in CAST also participate in the workshops. The same procedure will be used for waste management organisations and waste producers.

One week after each workshop, the regulators / technical safety organisations acting on behalf of the regulator will be asked to provide feedback on the workshops. Their feedback can then be used to optimise the second workshop. It is foreseen that these workshops provide an assessment whether the knowledge (to be) developed in CAST has been transmitted to the regulator. After each workshop, proceedings will be published on the CAST website. Both workshops are documented in the form of proceedings. These proceedings are edited by JRC-ITU and published in the form of a CAST project report as well as JRC Technical Report.

Presentations made at both workshops will be published on the website of CAST together with the proceedings.

6 Regulators

6.1 *Definition*

The main interest of the regulator is expected to be the state of the developed knowledge to evaluate the behaviour of the carbon-14 containing waste after disposal. The confidence in such evaluations or assessments depends on the presentation of the executed research. The performed research may be presented in several ways with emphasis on issues important to regulators from countries with advanced and less advanced research programmes into geological disposal of the waste:

1) For the regulators from countries with advanced disposal programmes the presentation of research results will focus on the results and details on the methodology used, experimental conditions, et cetera. Details on the conditions of the performed investigations will provide regulators with the opportunity to assess the quality of the results and interpretations.

2) For the regulators from countries with less advanced disposal programmes the presentation of research results will focus on provision of general knowledge, generic data related to carbon-14 containing waste and the order of uncertainty range related to that data. These knowledge and data will be further used while reviewing generic safety case (developed for the conceptualization phase).

6.2 *Methodology*

Workshops will be used to transmit the knowledge developed in CAST. These workshops are described in the previous section. A hierarchy is chosen to inform a regulator about the workshops:

1) The waste management organisations participating in CAST would inform their country's regulator about the workshops. Technical safety organisations may act on behalf of the regulator.

2) Regulators from EU countries whose waste management organisations do not participate in CAST are informed by COVRA in cooperation with the Lithuanian Energy Institute (LEI). LEI is one of the participants EU Horizon 2020 framework project SITEX[1]-II and therefore is expected to use this connection to invite regulators or technical safety organisations acting on behalf of the regulator not participating in CAST.

There is a budget to reimburse the travel costs and subsistence for up to five regulators or technical safety organisations from some EU countries to attend the workshops if sufficient funding is not available. These countries are Bulgaria, Lithuania, Romania, Poland, Slovakia, Slovenia, Croatia and Czech Republic, excluding technical safety organisations participating in CAST.

The documentation necessary for an effective contribution from the regulators will be published at the public website at least 2 months in advance of each workshop.

[1] Sustainable network of Independent Technical EXpertise for radiaoctive waste disposal

7 Waste management organisations

7.1 *Definition*

Waste management organisations (WMOs) are considered responsible for the implementation of disposal of the waste. Their specific interest may depend on additional responsibilities. A WMO that receives the waste after the initiation of the construction of a geological disposal facility may be interested in the outcomes of CAST in order to draft or underpin the substantiation for waste acceptance criteria. A WMO that is also the owner of waste is likely to be interested in the disposability of the stored waste in order to assess whether additional processing methodologies are necessary for safe disposal of the waste. Figure 7-1 shows the WMOs participating in CAST.

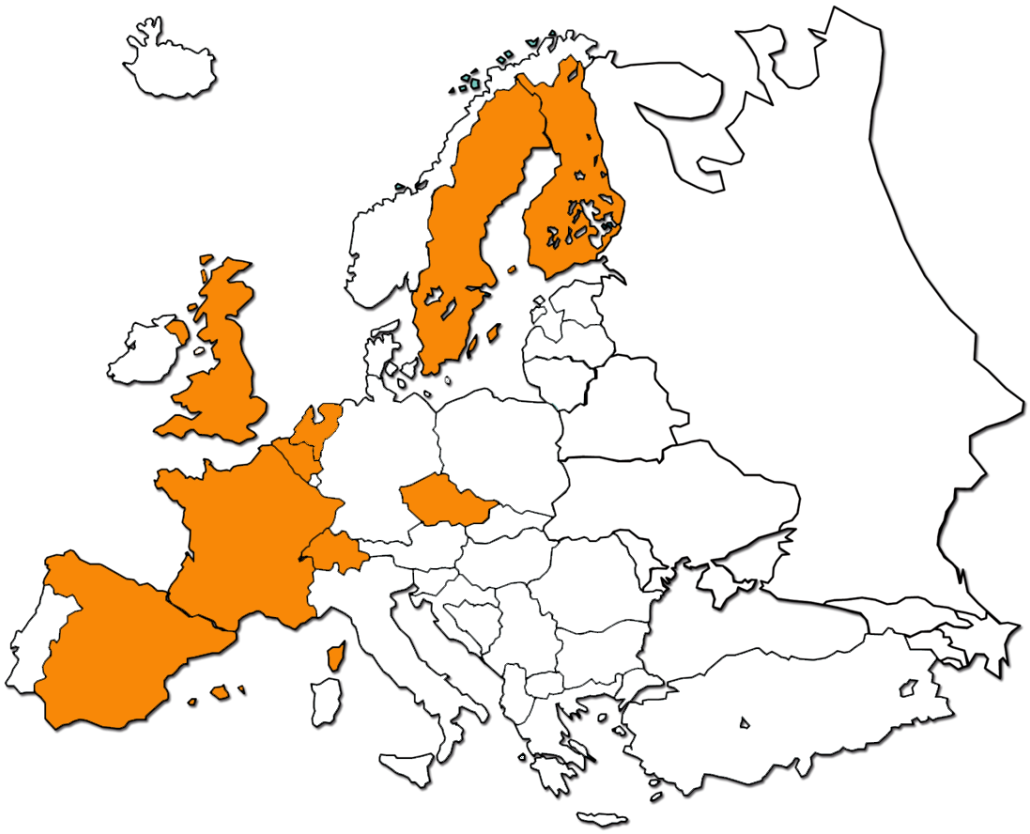


Figure 7-1: Countries (in orange) with waste management organisations participating in CAST.

7.2 Methodology

Workshops will be used to transmit the knowledge developed in CAST. These workshops are described in section 5. WMOs from Slovakia (DECOM), Hungary (PURAM), Bulgaria (SERAW), Slovenia (AROA), Lithiuana (RATA) and Romania (AN&DR) are expected to be interested in the knowledge developed in CAST because these countries have nuclear power plants.

Established personal contacts are used to invite persons working at WMOs not participating in CAST. Participation of these WMOs at workshops is expected to be more successful when the persons working at these WMOs are invited by persons working in the same countries and who participate in CAST. RATA (Lithuania) and AN&DR (Romania) are therefore intended to be invited by Lithuanian Energy Institute (LEI) and Institute for Nuclear Research Romania (INR). There is a budget to reimburse the travel costs and subsistence for three WMOs from some EU countries to attend the workshops if sufficient funding is not available. There is a preference to devote the reimbursement to RATA and AN&DR because research institutes in their countries participate in CAST and therefore a national implementation of the knowledge developed in CAST is expected to take place sooner than countries with no organisations participating in CAST.

PURAM (Hungary) is an executive group member of IGD-TP and will therefore be invited to participate in the workshops through IGD-TP.

There is budget available to pay for the attendance of another single person from a WMO from a country with insufficient national funding to attend the workshops if RATA (Lithiuana) and AN&DR (Romania) have confirmed their attendance for the workshop scheduled in January 2016 and January 2018. COVRA will invite other WMOs after the response of RATA and AN&DR from LEI and INR in order to include the potential reimbursement for the travel costs and subsistence.

8 Waste producers

8.1 *Definition*

The waste investigated in CAST is generated by nuclear power and research plants. The waste generators may process their waste for geological disposal. Waste producers process the waste if requested by owners of nuclear plants. The specific interest of waste generators and producers is the assessment of the disposability of the (processed) waste in order to anticipate for future costs. As indicated in section 5, the waste producer in CAST is expected to contribute to the workshop for waste characterisation for the post-closure safety assessment.

8.2 *Methodology*

Workshops will be used to transmit the knowledge developed in CAST. These workshops have been described in section 5. A hierarchy is chosen to inform a national waste producer about the workshops:

1) The WMOs participating in CAST are foreseen to inform one professional working at the waste producer they think is appropriate to participate in the workshop. With 9 WMO's participating in CAST, there should be 9 representatives of waste producers from 9 countries.

2) For the other 5 countries, the research organisations participating in CAST will be asked to invite one professional working at the waste producers, who they think are appropriate to participate in the workshop.

COVRA will invite other countries after consultation of their WMOs.

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