

“Monitoring the FP7 EURATOM contribution to the EU’s SD objectives”

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Summary

Policy context: EURATOM and FP7

The European Atomic Energy Community (EURATOM) aims to contribute to the formation and development of Europe’s nuclear energy industries. The Seventh Framework Programme of EURATOM for nuclear research and training activities (FP7 EURATOM) is the main instrument to coordinate and advance research for the peaceful use of nuclear energy in the EU. This includes issues on reactor technology development for nuclear fission as well as fusion energy, safety, waste management and radiation protection.

How does research in SP EURATOM contribute to EU SD objectives ?

In general some 50 % of the research carried out under the Specific Programme for “Nuclear Research and Training Activities” (SP EURATOM) within the FP7 EURATOM contribute to at least one of the 78 operational objectives in the renewed EU Sustainable Development Strategy (EU SDS). Depending on the unit of the analysis, the share varies between 46 % for topics, 44 % for projects and 51 % for the funding provided by SP EURATOM (“EC contribution”). Another 16 % of the topics (13 % of the projects and 22 % of the EC contribution) have been identified as potentially contributing to EU SDS objectives, although the quality of some of the impacts is yet undetermined.

Which EU SDS objectives are addressed most prominently by SP EURATOM?

How is the budgetary contribution of SP EURATOM distributed across the seven EU SDS key challenges?

Objectives related to “conservation and management of natural resources” (€ 67.8 million), “public health” (€ 51.8 million) and – to a lesser extent – “sustainable consumption and production” (€ 9.2 million) are addressed most prominently by SP EURATOM in terms of funding. Many of the impacts address issues like resource efficiency and avoidance of waste. However, a number of these impacts, in particular regarding management of nuclear waste, are publicly contested and not yet scientifically determined, indicating a need for further research on these issues.

How did the contribution of SP EURATOM to the EU SDS change over time?

By analysing the development of SP EURATOM and its impact on the objectives of the EU SDS from 2007 to 2011, two different trends can be identified: on the one hand the share of topics with positive impacts rose continuously, whereas on the other hand the share of topics with undetermined impacts declined.

Where are the centres of excellence of SP EURATOM research contributing to EU SD objectives?

Although research efforts in SP EURATOM are undertaken in numerous European countries, organisations from two countries – Germany and France – coordinate the majority of the SD-relevant research projects in SP EURATOM.

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Policy context: EURATOM and the FP7

Aims and tasks of the European Atomic Energy Community (EURATOM)

The European Atomic Energy Community (EURATOM) generally aims to contribute to the development of Europe's nuclear energy industry. More specifically, the tasks of EURATOM include the promotion of research and the dissemination of technical information, the establishment of uniform safety standards, investments for basic nuclear energy installations and security of supply of ores and nuclear fuels.

FP7 EURATOM is the main instrument to coordinate and advance research for the peaceful use of nuclear energy in the EU

The Seventh Framework Programme of EURATOM for nuclear research and training activities (FP7 EURATOM) is the main instrument to coordinate and advance research for the peaceful use of nuclear energy in the EU. FP7 EURATOM consists of two specific programmes running from 2007 to 2011. The first Specific Programme "EURATOM for Nuclear research and training activities" (hereinafter referred to as "SP EURATOM") concerns investment and cooperation in research in the areas of nuclear fusion, nuclear fission energy and radiation protection between the EU and its Member States. The second Specific Programme covers activities by the Joint Research Centre in the context of nuclear energy, including nuclear waste management, and environmental impact, nuclear safety, and nuclear security¹.

FP7 EURATOM runs from 2007 to 2011 with a budget of € 2.7 billion

The FP7 EURATOM is separate from the FP7 under the EC Treaty (now TFEU) but runs in parallel. While the FP7 runs for the whole EU financial period from 2007 to 2013, FP7 EURATOM is limited to 5 years ending in 2011 and another Framework Programme will be decided for the remaining two years. In comparison to the FP7 budget of about € 50.5 billion for the period 2007 to 2013, FP7 EURATOM budget accounts for 2.7 billion over 5 years (2007 to 2011). The Specific Programme EURATOM has a share of € 2.2 billion, the major part of which goes to fusion energy research (€ 1.9 billion).

Analysing the contribution of SP EURATOM to EU SD objectives

Research related to "Nuclear Fission and Radiation Protection" is in the focus of this policy brief

This policy brief deals with the thematic area "Nuclear Fission and Radiation Protection" within SP EURATOM². The analyses presented here focus on how research funded under SP EURATOM contributes to the key challenges and operational objectives of the EU Sustainable Development Strategy (EU SDS)³. By doing so, the policy brief investigates the structure of SP EURATOM, the EU SDS objectives affected by SP EURATOM research, the

¹ [Council Decision 2006/977/Euratom of 19 December 2006 concerning the specific programme to be carried out by means of direct actions by the Joint Research Centre.](#)

² In the thematic area "Fusion Energy", the realisation of ITER is the main objective, and only three calls for proposals have been issued (in the Work Programme 2007). The three respective topics (coordination and support actions aimed at strengthening the interfaces of the fusion community with related scientific communities) are included in the analysis presented here.

³ A referential framework of 78 operational objectives outlined in the EU SDS is used for the FP7-4-SD.eu monitoring system; see <https://www.fp7-4-sd.eu/index.php?request=public:page:default&page=about#sds>.

funding provided to the respective research projects, and the geographical spread of centres of excellence within the EU.

How does research in SP EURATOM contribute to EU SD objectives?

About 46 % of research funded by SP EURATOM contributes to EU SDS objectives

About 46 % of the topics (44 % of the projects) of the Specific Programme for “Nuclear Research and Training Activities” in the FP7 EURATOM contribute to at least one of the operational objectives of the EU SDS. Another 16 % of the topics (13 % of the projects) have been identified as potentially contributing to EU SDS objectives, although the quality of some of the impacts is yet undetermined⁴. This refers to issues that are publicly contested and not yet scientifically determined, indicating a need for further research. Overall, about 60 % of the topics (57 % of the projects) in SP EURATOM have expected impacts (positive and/or undetermined) on one or more of the 78 EU SDS objectives.

The share of EC contribution to projects addressing EU SDS objectives is slightly higher, at 73 % (€ 105.3 million out of € 145.2 million). € 73.1 million (51 %) are spent on projects with positive impacts on EU SDS objectives, and another € 32.3 million (22 %) on projects whose impacts are partly undetermined. The variation between the shares of topics, projects and EC contribution can be explained by the different number and size of the projects across the topics.

Which EU SDS objectives are addressed most prominently by SP EURATOM?

Research topics in SP EURATOM mainly contribute to EU SDS objectives related to public health and natural resources

When investigating the contribution of the Specific Programme EURATOM to the 78 operational objectives of the EU SDS, objectives related to the areas “public health” (36 topics) and “conservation and management of natural resources” (27 topics) cover by far the largest amount of topics (Figure 1). At the level of the operational objectives “improving resource efficiency” (10 topics) and “other expected impacts on conservation and management of natural resources” (14 topics) are addressed the most within the key challenge “conservation and management of natural resources”. Within “public health” these are “developing capacities to respond to health threats in a co-ordinated manner” (19 topics), “other expected impacts on public health” (10 topics) and “improving information on environmental pollution and adverse health impacts” (9 topics).

The protection of both human health and the integrity of ecosystems is of high concern in SP

There is a clear link between the objective categories related to “other expected impacts” of the challenges “conservation and management of natural resources” and “public health”: Positive impacts (7 topics) on these objectives mainly relate to the issue of protection against nuclear

⁴ Typology of impacts: “positive”: supporting the EU SDS objectives; “undetermined”: impacts that due to a lack of scientific evidence cannot yet be categorised as positive, negative or neutral.

EURATOM research

disasters, which in turn impacts on human health and the integrity of ecosystems.

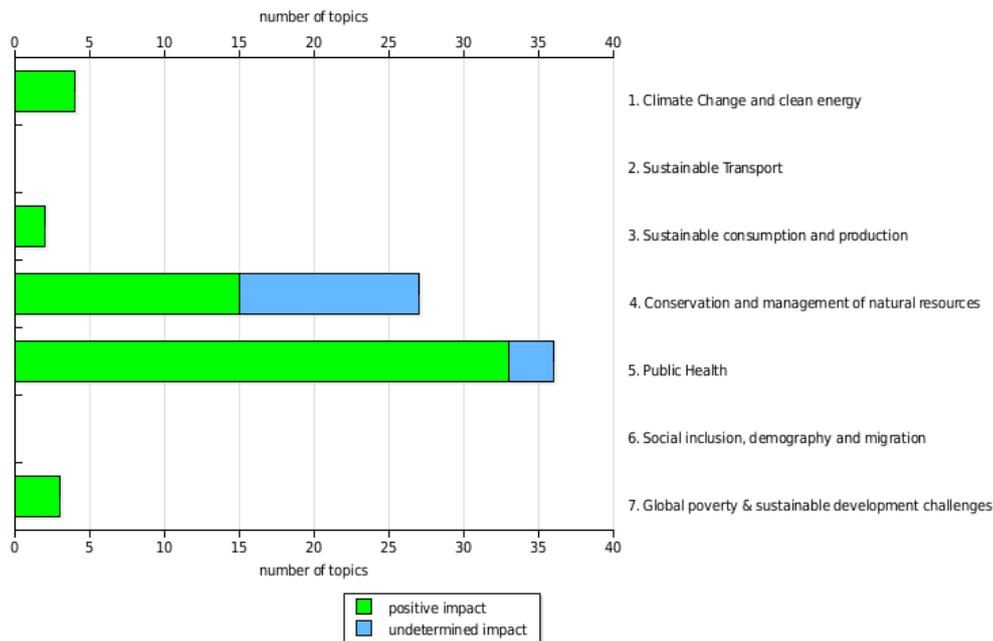


Figure 1: Number of SP EURATOM topics contributing to the EU SDS key challenges⁵

“Avoid generation of waste” is an issue of concern in research under SP EURATOM

As shown in Figure 1 above, the area of “conservation and management of natural resources” is very prominent in terms of undetermined impacts, i.e. impacts that are publicly contested and not yet scientifically determined, indicating a need for further research. The issues addressed in a more or less controversial way are avoidance of waste and geological deposits of nuclear waste. More specifically, the majority of these undetermined impacts can be found in the operational objectives “other expected impacts on conservation and management of natural resources” (7 topics), “avoid generation of waste by promoting reuse and recycling” (5 topics) and “avoid generation of waste by applying the concept of life-cycle thinking” (4 topics).

How is the financial contribution distributed across EU SDS objectives?

The highest amount of SP EURATOM funding is dedicated to the EU SDS objectives related to natural resources and public health

The distribution of EC contribution across the EU SDS objectives (see Figure 2) shows that more projects have been conducted that are impacting (positive and undetermined) on “conservation and management of natural resources” (19 projects, 27 topics) than on “public health” (16 projects, 36 topics). Similar to Figure 1 above, these two areas – receiving a funding of € 67.8 and € 51.8 million respectively – are most addressed in terms of EC contribution. However, “sustainable consumption and production”

⁵ Since each project may have impacts on more than one operational objective and/or key challenge, the sub-totals (number of projects and amount of funding per key challenge) should not be added up as this would result in potentially overestimated figures!

(€ 9.2 million) also accounts for a considerable amount of funding⁶.

Issues like resource efficiency and avoidance of waste are very prominent in terms of funding

Within the area “management and conservation of natural resources”, the operational objectives “improving resource efficiency” (€ 35.9 million), “avoid generation of waste by applying the concept of life-cycle thinking” (€ 30.8 million), “avoid generation of waste by promoting reuse and recycling” (€ 26.0 million) and “other expected impacts on conservation and management of natural resources” (€ 21.8 million) receive the highest attention in terms of EC contribution. Concerning “public health”, the operational objectives “developing capacities to respond to health threats in a co-ordinated manner” (€ 24.9 million), “other expected impacts on public health” (€ 18.3 million) and “improving information on environmental pollution and adverse health impacts” (€ 11.1 million) are addressed most.

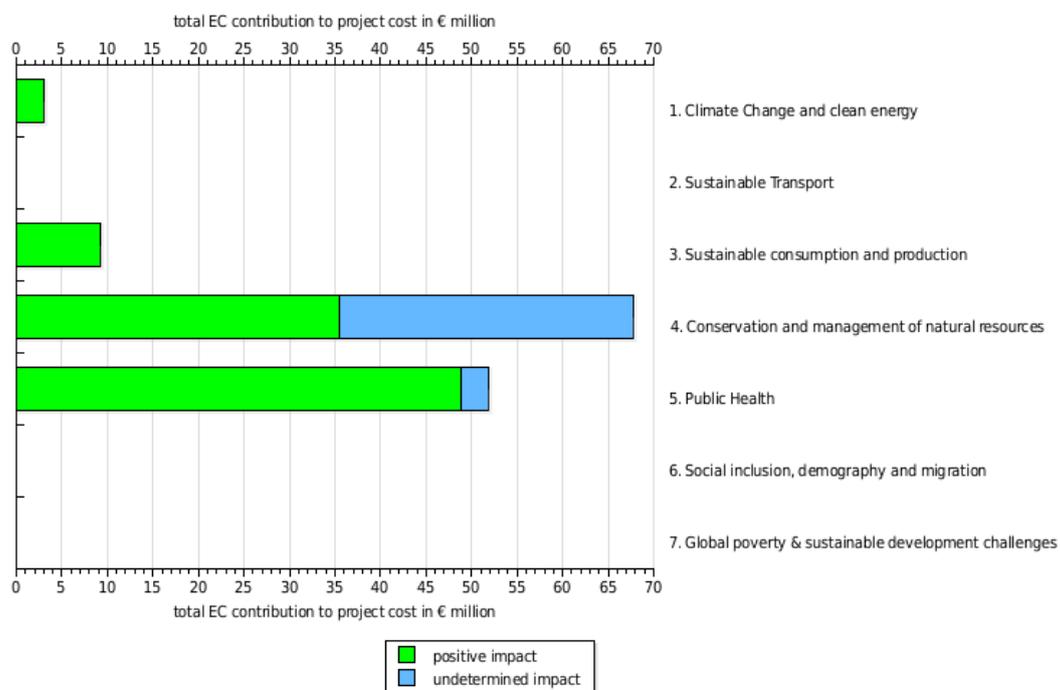


Figure 2: Total EC contribution to projects contributing to the EU SDS key challenges (€ million)⁷

How did the contribution of SP EURATOM to EU SD objectives change over time?

The share of topics with positive impacts rose

As shown in Figure 3 the share of topics in SP EURATOM contributing to EU SDS objectives has increased since 2007, although the trend was not

⁶ The differences between the figures on topics and on EC contribution can be explained by the fact that the number and size of the projects vary across topics and that not all of the topics are being translated into action by funding of projects.

⁷ It is important to note that not all topics called for are being translated into action by funding of projects: in the Specific Programme EURATOM from 2007-2009, projects are being funded under some 46 topics only (69 % of all topics called for). However, more than one project may be funded under one topic. Since each project may have impacts on more than one operational objective and/or key challenge, the sub-totals (number of projects and amount of funding per key challenge) should not be added up as this would result in potentially overestimated figures!

between 2007 and 2011, and the share of topics with undetermined impacts declined

continuous. The Work Programme 2011 contained the highest share of topics with a positive expected impact (80 %). However, it has to be noted that the number of topics called for between 2007 and 2011 was not stable, and decreased from 25 topics in 2007 to 10 topics in 2011. At the same time the number of topics with undetermined impacts decreased from 20 % in 2007 to zero in 2011.

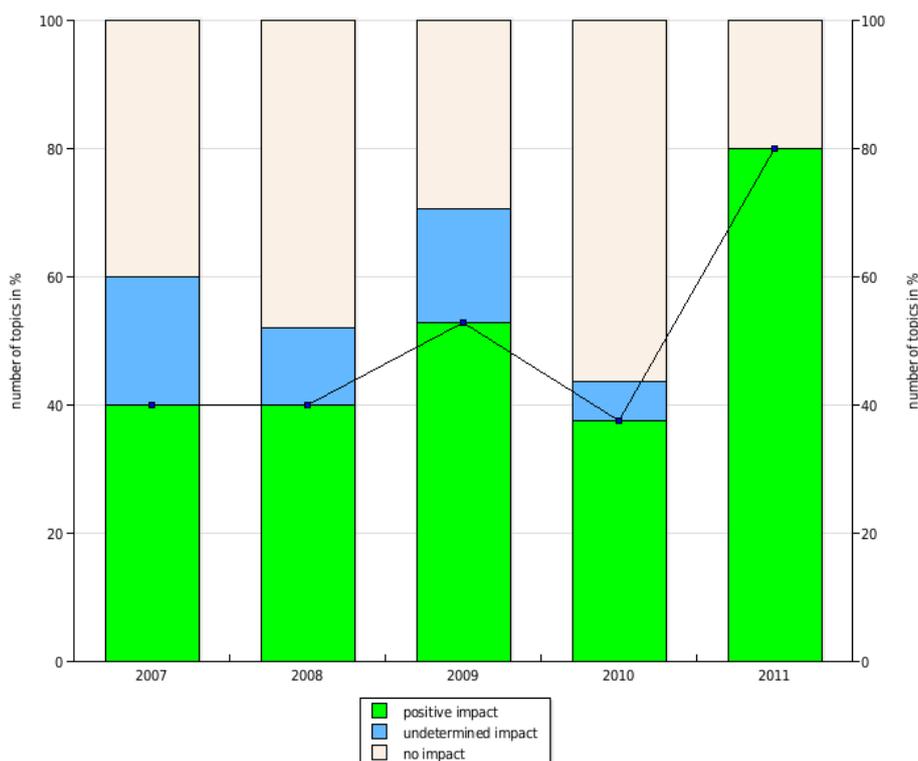


Figure 3: Share of topics with expected impacts in the Specific Programme EURATOM from 2007 to 2011

While EC contribution to projects with undetermined impacts was decreasing, the EC contribution to projects with positive impacts increased between 2007 and 2009

From the perspective of funding provided by SP EURATOM to research projects, Figure 4 shows that between 2007 and 2009 (more recent data on projects funded by SP EURATOM is not yet available⁸) the share of EC contribution attributed to undetermined impacts steadily declined from about 30 % to less than 10 %. In parallel, the share of EC contribution allocated to projects with positive impacts increased strongly from about 50 % in 2007 to more than 80 % in 2009. The share of EC contribution to projects without expected impacts on SD objectives peaked in 2008 with more than 50 %.

The change in the patterns of impacts from 2007 to 2009 was due to a decline in the total number of projects from 20 to 14 and a change in the focal points of the annual Work Programmes (there are almost no

⁸ Data on research projects and their respective EC contribution are only available from 2007 to 2009 because projects from the Work Programmes 2010 and 2011 are still under negotiation.

identical topics across the Work Programmes 2007, 2008 and 2009).

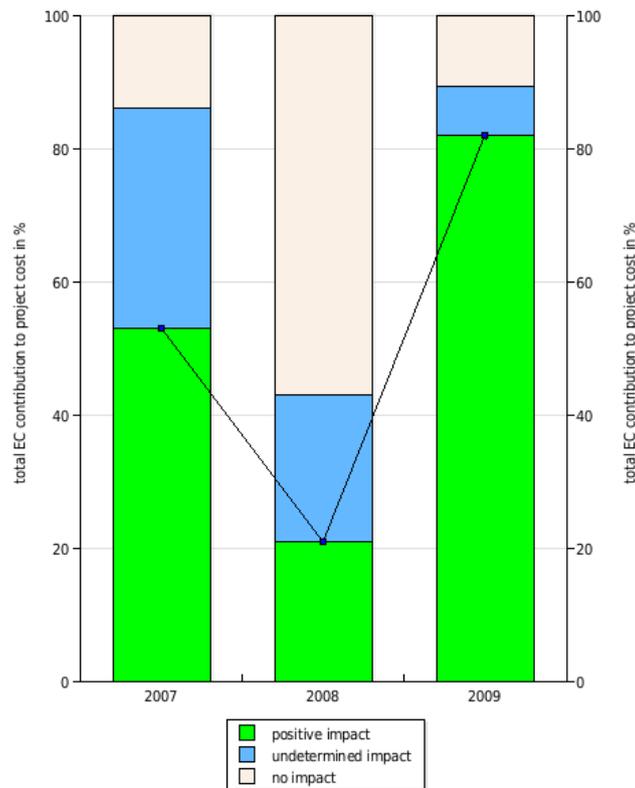


Figure 4: Share of EC contribution to projects with expected impacts in the Specific Programme EURATOM from 2007 to 2009⁹

Where are the centres of excellence in SP EURATOM research contributing to EU SD objectives?

France and Germany are centres of excellence in terms of SD-relevant research efforts within SP EURATOM

As shown in Figure 5, the EU Member States which can be considered as centres of excellence for SD-relevant research¹⁰ in SP EURATOM are Germany and France with 11 and 9 coordinated projects respectively, followed by Belgium and the United Kingdom with 3 coordinated projects each. Project participants from Germany and France together coordinate about two-thirds of all SD-relevant projects under SP EURATOM. As regards the differences in research foci across Europe, France coordinates mainly projects addressing objectives related to “public health” (5 out of 9 coordinated projects). Germany, on the other hand, centres its research efforts more on projects affecting “sustainable consumption and production” and “conservation and management of natural resources” (in

⁹ Data on research projects and their respective EC contribution are only available from 2007 to 2009 because projects from the Work Programmes 2010 and 2011 are still under negotiation.

¹⁰ For the purpose of this analysis it is assumed that institutions from countries which are responsible for coordinating a project are characterised by an exceptional scientific knowledge base and the essential coordination skills to implement the respective project. Therefore countries with a high number of coordinated projects can be seen as leaders in the respective field of research.

total 10 out of 11 projects).

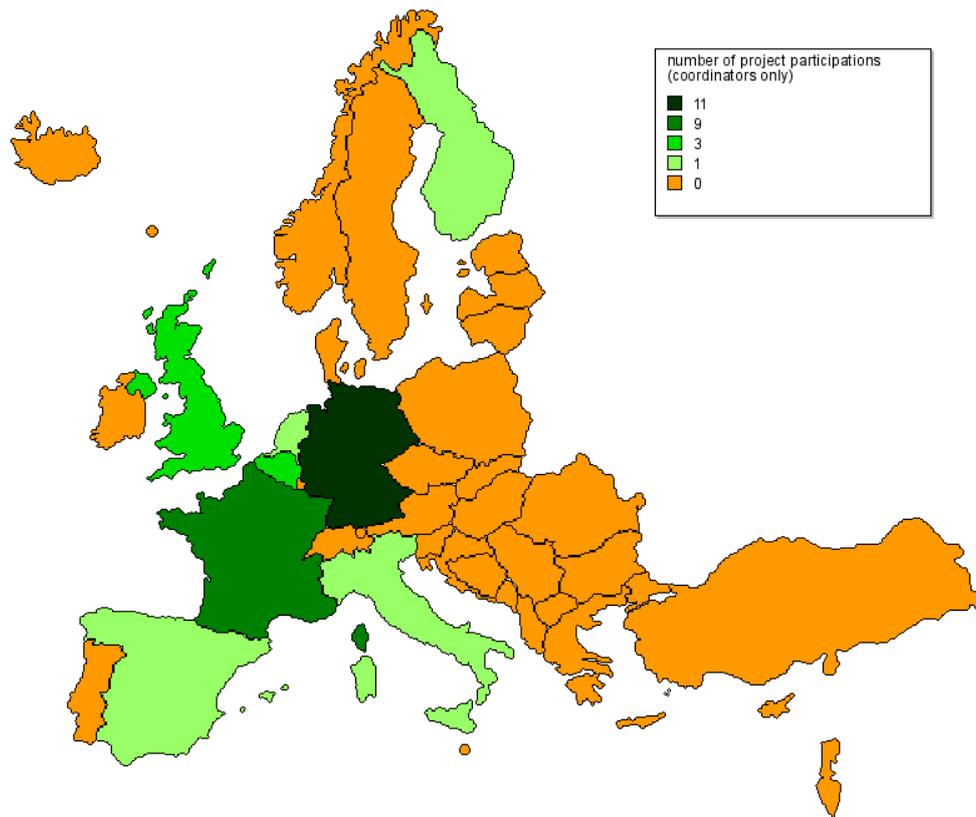


Figure 5: Geographical representation of coordinated projects impacting on the EU SDS objectives in EU Member States and associated countries

Conclusions

A clear link exists between Sustainable Development and SP EURATOM

This policy brief analyses the impact of the Specific Programme for “Nuclear Research and Training Activities” in the Seventh Framework Programme EURATOM (FP7 EURATOM) on the objectives of the EU Sustainable Development Strategy (EU SDS). Although the issue of nuclear energy and research thereof is controversially discussed within both science and the public, there is a prominent link between sustainable development and research in SP EURATOM.

About half of the research carried out in SP EURATOM is contributing to EU SDS objectives

Overall, almost half of the projects carried out under the SP EURATOM are contributing to EU SDS objectives, accounting for about 51 % of EC contribution (€ 73.1 million out of € 145.2 million), whereby “conservation and management of natural resources” and “public health” cover the largest share. More specifically, issues like resource efficiency, avoidance of waste and capacities to respond to health threats are most prominently addressed in terms of funding. From the perspective of “public health” the issues of “developing capacities for health threats” and disaster protection are addressed most. Concerning “conservation and management of natural resources”, research focuses on avoidance and recycling of nuclear waste, improving resource efficiency of energy production and protection against

Public health and conservation and management of natural resources are addressed most prominently

nuclear disasters to maintain the integrity of ecosystems.

**Germany and France
are key players in
research addressing
EU SDS objectives**

At Member State level, Germany and France are the centres of excellence in research within SP EURATOM, coordinating about two thirds of SD-relevant research projects in the EU. In this regard, the sustainability issues in “public health” are most addressed by France, whereas Germany focuses on “conservation and management of natural resources” as well as “sustainable consumption and production”.

Authors' proviso

The fact that EURATOM research contributes to various sustainability targets of the Renewed EU Sustainable Development Strategy of 2006¹¹ implies that the research will probably contribute to the development of new technologies and practices that can be regarded as an improvement in relation to current practices in the nuclear energy sector. However, it does not imply that current or expected future practices in the nuclear sector are acceptable or unacceptable. It also does not imply that the authors regard the EURATOM programme as an effective and/or efficient means for achieving the SD targets of the Renewed EU Sustainable Development Strategy: If one regards the expected future practices in the nuclear energy sector as not acceptable with regard to sustainability standards (as many today do), then RTD to improve the current practices can be regarded as a waste of efforts. However, if one expects that these practices are acceptable, or could become acceptable by RTD efforts, many EURATOM projects contribute to sustainable development.



¹¹ European Council (2006) Review of the EU Sustainable Development Strategy (EU SDS – Renewed Strategy, 26 June 2006, 10917/06