

“Monitoring the FP7 contribution towards the transition to a green economy in the context of Sustainable Development”

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Summary

EU policy context: moving forward to a green economy

The Europe 2020 Strategy and one of its main deliverables, the Flagship Initiative “A resource efficient Europe”, aim to engage into a transition towards a green economy, *inter alia* by fostering resource efficiency and research and development. In parallel, the notion of a green economy is at the core of the UN Rio+20 Conference on Sustainable Development and perceives the concept as a vehicle for achieving sustainable development.

The international perspective on green economy: The Rio+20 Conference

Overall, more than one third of the research carried out under the FP7 Specific Programme ‘Cooperation’ between 2007 and 2011 contributes to the transition to a green economy in the context of Sustainable Development¹. The contribution accounts for about 44 % of the topics, 38 % of the projects and 40 % of the funding (i.e. € 4.2 billion out of € 10.5 billion).

FP7 and international R&D cooperation

Among the ten SP ‘Cooperation’ themes, TRANSPORT, ENERGY and ENVIRONMENT, over the five years, cover the largest number of topics having positive expected impacts on a green economy. In budgetary terms (EC contribution to projects), the themes ICT and Materials (NMP) constitute the main sources for funding on green economy research.

Rio+20 and international cooperation in research

In terms of R&D collaboration network perspective, Germany, the United Kingdom, France and Italy form the core of the FP7 research network contributing to a green economy. Comparisons of cross-border research collaboration reveal that these four countries form very strong collaboration patterns between each other, and they are at the same time the most prominent project partners for other European countries.

A framework for analysing 'green economy' research

FP7 research involving least-developed countries (LDCs) particularly addresses societal challenges such as ‘climate change and clean energy’ and ‘conservation and management of natural resources’. Other important challenges addressed by international FP7 research projects are *inter alia* related to ‘sustainable consumption and production’ or ‘sustainable urban planning’. And while it is mainly ‘private for profit organisations’ carrying out the research in EU Member States, in landlocked developing countries the majority of participating institutions is formed by ‘higher or secondary education institutions’ and ‘public organisations’.

How does research in FP7 contribute to the transition towards a green economy?

What is the structure of cross-border collaboration of FP7-funded research contributing to a green economy?

What is the role of developing and transition countries in FP7 research for a green economy?

¹ In this policy brief, terms such as “addressing green economy objectives” or “contributing to the transition towards a green economy” are used synonymously for “contributing to at least one of the 31 objectives within the green economy referential framework”.

Introduction

International R&D collaboration among European Member States and developing countries in the context of green economy

The aim of this policy brief is to review how the EU prepares for the transition to a green economy with regard to R&D in the 7th Framework Programme for Research and Technological Development (FP7). In the view of international R&D collaboration and capacity building for a green economy, special attention is given to the role of least-developed and transition countries within FP7 research. In our analysis we focus on structure and funding for research, collaboration patterns, specific aspects on green economy and country comparisons.

The concept of a green economy gathered widespread attention during the aftermath of the economic crisis and in the context of the UN Conference on Sustainable Development (UNCSD, “Rio+20”)². Generally, it can be regarded as one of the manifold manifestations of the different dimension of sustainable development that emerged during the last decade (some others are *inter alia* integrated policy and planning in key sectors, sustainable urban management or sustainable consumption and production). However, special prominence is given to this concept representing a mutually inclusive relationship between the environment and economy in the prelude to the Rio+20 conference.

In the context of achieving the transition to a green economy, in particular least-developed countries (LDCs) are struggling with such fundamental transitions. Therefore, international R&D collaboration is one of many ways to enable capacity building, knowledge and technology transfer to developing countries helping to build up a green economy.

EU policy context: moving forward to a green economy

Resource efficiency and innovation are at the core of the Europe 2020 Strategy

The European Union through the Europe 2020 Strategy³ and under its ‘sustainable growth’ priority is fostering the transition towards a green economy. The Europe 2020 Strategy put forward a series of deliverables, so-called flagship initiatives, in particular the ones on ‘A resource efficient Europe’⁴ and ‘An industrial policy for the globalisation era’⁵, to enable this transition. Under the former, a roadmap for resource efficiency has been drafted which aims to decouple the use of natural resources from economic growth and envisages a range of new policy measures. More specifically, it provides a “... policy framework that creates a playing field, where innovation and resource efficiency are rewarded, creating economic opportunities and improved security of supply through product redesign, sustainable management of environmental resources, greater reuse, recycling and

² See <http://www.uncsd2012.org/rio20/>

³ See http://ec.europa.eu/europe2020/index_en.htm

⁴ See http://ec.europa.eu/resource-efficient-europe/index_en.htm

⁵ See http://ec.europa.eu/enterprise/policies/industrial-competitiveness/industrial-policy/index_en.htm

substitution of materials and resource savings.”⁶

With regard to R&D the European Commission develops a series of so-called ‘Innovation Partnerships’ for meeting resource efficiency goals e.g. on water, raw materials and productive and sustainable agriculture. Furthermore, Joint Technology Initiatives and other forms of private-public partnerships will pool national research efforts in the area of resource efficiency. Transnational research through the new European Framework Programme for Research and Technological Development – ‘Horizon 2020’⁷ – specifically focuses research funding on issues such as sustainable energy, transport and construction; management of natural resources; preservation of ecosystem services and biodiversity; resource efficient agriculture and the wider bio-economy, etc.

The international perspective on green economy: The Rio+20 Conference

Green economy is a concept integrating the environment and economic perspective of sustainable development

The UN Conference on Sustainable Development (UNCSD, ‘Rio+20’) held in Rio de Janeiro in June 2012 is a major milestone with regard to the conceptual development of a green economy in the context of sustainable development. Although in the context of pre-Rio+20 negotiations a general consensus on what constitutes a green economy is lacking, agreement was achieved that developments towards a green economy must be in the context of sustainable development⁸.

As argued in the Rio+20 Zero-draft document “The Future We Want”⁹, green economy is not a substitute for sustainable development but rather an economic interpretation of it. Moreover, a green economy can be conceived as a vehicle for achieving sustainable development by integrating the environment and economic perspective and, furthermore, a pathway for creating sustainable livelihoods and promoting poverty alleviation.

The notion of a green economy is one of the manifold manifestations of the different dimension of sustainable development that emerged during the last decade (some others are *inter alia* integrated policy and planning in key sectors, sustainable urban management or sustainable consumption and production). However, special prominence is given to this concept representing a mutually inclusive relationship between the environment and economy dimension of sustainable development in the prelude to the Rio+20 conference.

UNEP follows a natural and built capital approach in order to define the

In this regard, in its report ‘Towards a Green Economy’¹⁰, the United Nations Environment Programme (UNEP) elaborated a substantial framework for a green economy. Overall, UNEP defines a green economy as one that results in

⁶ [Roadmap to a Resource Efficient Europe](#)

⁷ http://ec.europa.eu/research/horizon2020/index_en.cfm

⁸ [CO-CHAIRS' SUMMARY: First Preparatory Committee Meeting for the UN Conference on Sustainable Development, 2012 20 May 2010](#)

⁹ [Rio+20 Zero-draft document “The Future We Want”](#)

¹⁰ [UNEP “Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication”](#)

concept of a green economy

“improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities”. More specifically, in a green economy, growth in income and employment are driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services.

The Report also embraces a sectoral approach for analysing principal challenges and opportunities towards a green economy. The sectors are derived from natural capital (agriculture, fishing, forests and water) and “built” capital (renewable energy, manufacturing, waste, buildings, transport, tourism and cities) on the other hand¹¹.

FP7 and international R&D cooperation

The international dimensions of R&D in Europe aims inter alia to address specific problems that third countries and in particular developing countries face

The international dimension of R&D in the European Union is no longer confined to a specific scientific and technological (S&T) cooperation programme but is now inherent in all European Community research activities – and in particular in the 7th Framework Programme for research and technological development. This international policy has three objectives, in which the last two are of particular importance for capacity building inter alia in developing countries:

- To support European competitiveness through strategic partnerships with third countries in selected fields of science and by engaging the best third country scientists to work in and with Europe.
- To enhance the production of knowledge and scientific excellence by enabling European universities, research institutions and firms to establish contact with their partners in third countries, thereby facilitating access to research environments outside Europe and promoting synergies on a global scale.
- To address specific problems that third countries face or that have a global character, on the basis of mutual interest and mutual benefit.

FP7 cooperation with third countries will be targeted in particular at the following groups of countries:

- Candidate countries;
- Mediterranean partner countries (MPC), Western Balkan countries (WBC), Eastern European and Central Asian countries (EECA), Africa, the Caribbean and the Pacific (ACP), Latin America and Asia;
- **Developing countries, focussing on their particular needs of each country or region concerned;**
- Emerging economies.

¹¹ One of the first studies to embrace this capital approach to sustainable development was the 1989 book “Blueprint for a Green Economy” by Pearce et al..

Rio+20 and international cooperation in research

R&D collaboration, technology development and transfer are important pathways for developing countries to achieve a green economy

Many states and in particular least-developed countries, landlocked developing countries, small island developing states, middle-income countries and African countries are facing challenges for achieving a green economy. As additional costs to their economies will arise from structural adjustment, support by the international community will be substantial.

International cooperation in R&D which is in the centre for analysis in this policy brief is just one of many facets for supporting the transition to a green economy. In general, research for a green economy encompasses innovation, from small incremental changes to key technological breakthroughs as well as basic and applied research that targets challenges and guide actions (inter alia social sciences research to develop our understanding of behavioural drivers and changes).

In this regard the UN¹² specifically acknowledges the need of developing countries and agrees to

- facilitate international collaborative research on green technologies involving developing countries;
- encourage creation of Centres of Excellence as nodal points for green technology R&D;
- support developing countries' scientists and engineers and scientific and engineering institutions to foster their efforts to develop green local technologies and use traditional knowledge

A framework for analysing 'green economy' research

A framework to identify research that contributes to the transition to a green economy

This policy brief analyses research contributing to the transition to a green economy by analysing international FP7 R&D collaboration among European Member States and developing countries. The focus lies on collaboration patterns, thematic focus areas and country comparisons. To this end, experts from DG Research and Innovation together with experts from WU Vienna extracted a set of operational objectives as outlined in the renewed EU Sustainable Development Strategy (EU SDS).

The rationale behind the selection of operational objectives was based on a text analysis of the European Commission Communications for Rio+20 and the 'Roadmap to a Resource Efficient Europe', and other sources such as the UNEP Report 'Towards a Green Economy'.

The outcome of the screening of objectives was a framework comprising inter alia important aspects of a green economy and has been used as a basis for analysing research for a green economy. Essentially, operational objectives linked to 'climate change and clean energy', 'sustainable transport',

¹² [Rio+20 Zero-draft document "The Future We Want"](#)

‘sustainable consumption and production’ and ‘conservation and management of natural resources’ cover the basic pillars of a green economy. The list of objectives selected for the green economy framework within the context of sustainable development covers cross-cutting and integrated issues such as sustainable ‘consumption and production’ or ‘management of natural resources’ as well as more sectoral ones such as ‘transport’. A list of objectives selected for the green economy framework can be found in the Annex to this policy brief. It has to be made clear that this list of objectives is not exhaustive, but rather represents the SD relevant aspects covered by both the green economy perspective and the EU SDS. A table of objectives selected for the green economy framework can be found in the Annex to this policy brief (see page 17).

As documents dealing with the concept green economy concept engage in a sectoral (e.g. buildings, transport, energy etc) as well as thematic approach on natural resources (water, food, forests etc) we follow this trend by explicitly focusing our analysis on these perspectives. In this regard, we engage in comparisons of international research collaboration among EU MS and developing countries within the following 4 areas of our green economy framework:

- climate change and clean energy
- sustainable transport
- sustainable consumption and production
- conservation and management of natural resources

By using this framework for analysis, this policy brief addresses the following questions:

- How the EU prepares for the transition to a green economy with regard to R&D in the 7th Framework Programme.
- What is the role of developing and transition countries within FP7 research for a green economy.

How does research in FP7 contribute to the transition towards a green economy?

Almost half of FP7-funded research topics contribute to the green economy

About 44 % of the topics (38 % or in total 1126 projects) of the SP ‘Cooperation’ Work Programmes 2007 to 2011¹³ contribute to at least one of the 35 operational objectives within the green economy framework. Furthermore, the amount of funding provided by FP7 (total EC contribution) accounts for 40 % (i.e. € 4.2 billion out of € 10.5 billion). The variation is due to differences in the number and size of projects funded by the individual ‘Cooperation’ themes¹⁴ (see box 1 below for a brief description of the FP7’s ‘Cooperation’ programme and its ten thematic areas).

Institutions participating in FP7 projects for a green economy comprise ‘private for profit organisations’, ‘research organisations’, ‘higher or secondary education institutions’, ‘public organisations’ and ‘other institutions’. Not surprisingly, the majority of institutions participating are originating from the EU (about 5 000), followed by third party countries such as transition countries and developing countries accounting for a share of 2 % and 1 %, respectively.

Box 1: The FP7 ‘Cooperation’ Specific Programme

The Specific Programme (SP) ‘Cooperation’ is at the core of FP7, representing about two thirds of the overall FP7 budget (i.e. € 32 billion out of € 50 billion) over the period 2007-2013. It fosters collaborative research across Europe and other partner countries, through projects by transnational consortia of industry and academia, in ten thematic areas. Since the start of FP7 in 2007, a total of 2409 topics have been called for so far in the annual Work Programmes (WPs). Under these topics, 2987 projects have been or are being carried out with a total EC contribution (i.e. the co-financing provided by FP7) of € 10.5 billion. The EC contribution accounts for more than two thirds of the total project costs (i.e. the co-financing provided by FP7 plus other funding sources) of € 15.1 billion. For further information, please visit http://cordis.europa.eu/fp7/cooperation/home_en.html.

How do the ten ‘Cooperation’ themes contribute to a green economy?

Research topics within the theme of ENERGY is most prominently addressing green economy objectives

As indicated by Figure 1 below, the theme TRANSPORT accounts for the largest number of topics with positive expected impacts on objectives contributing to the green economy (283 topics), followed by ENERGY and ENVIRONMENT both covering 235 and 227 topics respectively. However, when looking at the share of topics, ENERGY (88 %) followed by ENVIRONMENT (71 %) and Materials (NMP; 69 %) cover the largest share of

¹³ It is important to note that not all topics called for are being translated into action by funding of projects. Data on the number of projects stemming the Work Programme 2010 are still not complete, and projects from the Work Programme 2011 are not included as they are still under negotiation.

¹⁴ The ten themes are: (1) Health, (2) Food, Agriculture and Fisheries, Biotechnology, (3) Information & communication technologies, (4) Nanosciences, nanotechnologies, materials & new production technologies, (5) Energy, (6) Environment (including Climate Change), (7) Transport (including aeronautics), (8) Socio-economic Sciences and the Humanities, (9) Space and (10) Security.

green economy relevant research.

With regard to the themes ENERGY and TRANSPORT, a share of 4 % and 2 %, respectively, have been identified as potentially contributing to EU SDS objectives, although the quality of some of the impacts is yet undetermined¹⁵.

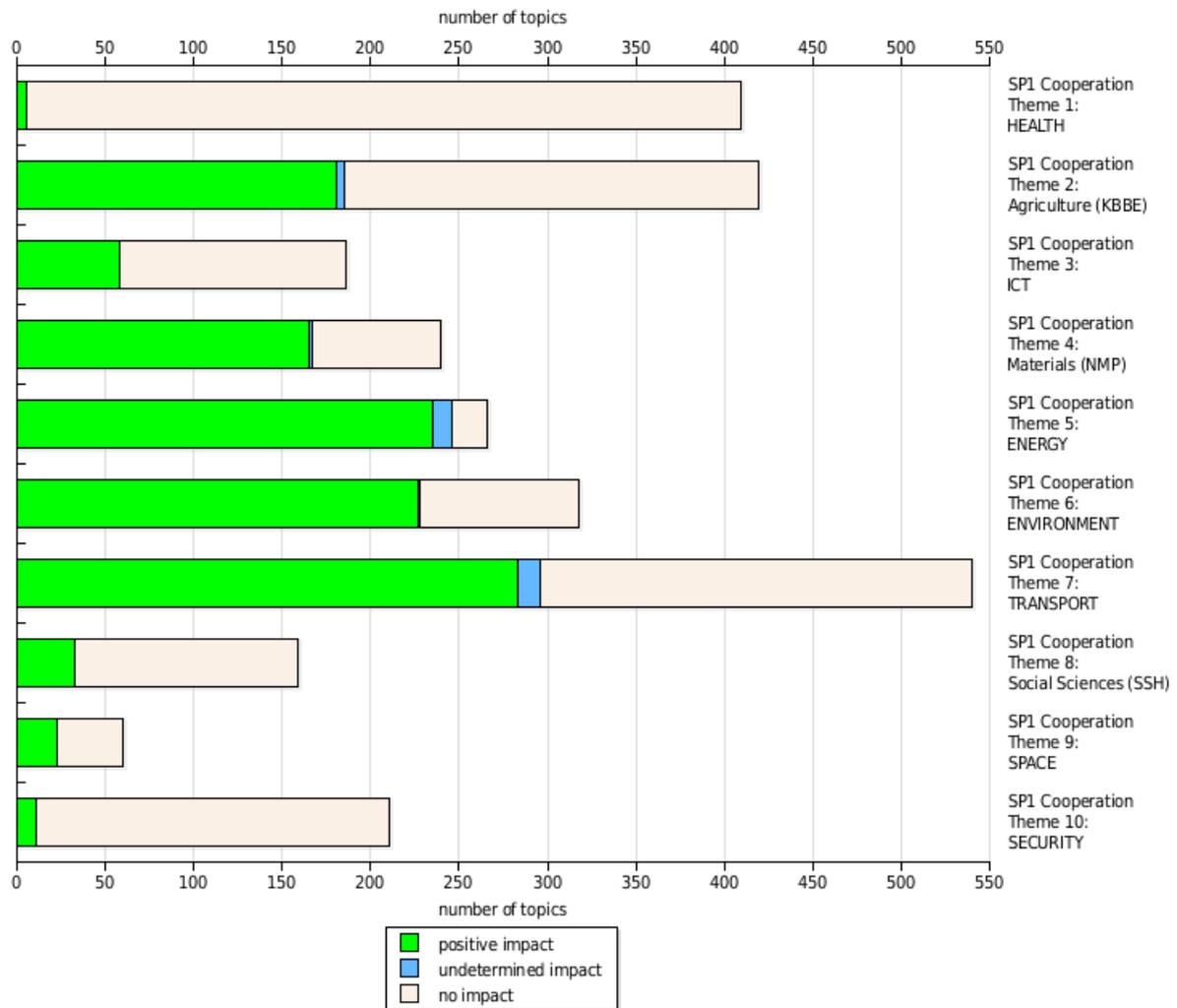


Figure 1: Number of topics with expected impacts on green economy objectives in the ten ‘Cooperation’ themes

How big is the EU financial contribution to green economy research across the FP7 themes?

The themes ICT, NMP and ENERGY provide the highest amount of EC contribution (€) to research projects contributing to a green economy

When looking at the amount of EU co-financing (“total EC contribution”) compared to number of topics positively addressing green economy research, the picture changes quite substantially (see Figure 2). With regard to absolute figures of EU co-financing, ICT outperforms all other themes by accounting for a total of € 1 billion. It is followed by NMP (€ 920 million), ENERGY (€ 700 million) and TRANSPORT (€ 660 million).

¹⁵ Typology of impacts: "positive": supporting the green economy objectives in the context of sustainable development; "undetermined": impacts that due to a lack of scientific evidence cannot yet be categorised as positive, negative or neutral.

As ICT exceeds all the other themes in terms of total EC co-financing, not surprisingly the amount of EU co-financing contributing to green economy objectives is relatively high. When looking at the relative figures, however, the themes ENERGY and ENVIRONMENT, account for the largest share of EU co-financing addressing green economy objectives, covering 93 % and 82 %, respectively. The patterns of EU co-financing is similar to the one presented above for the number of topics.

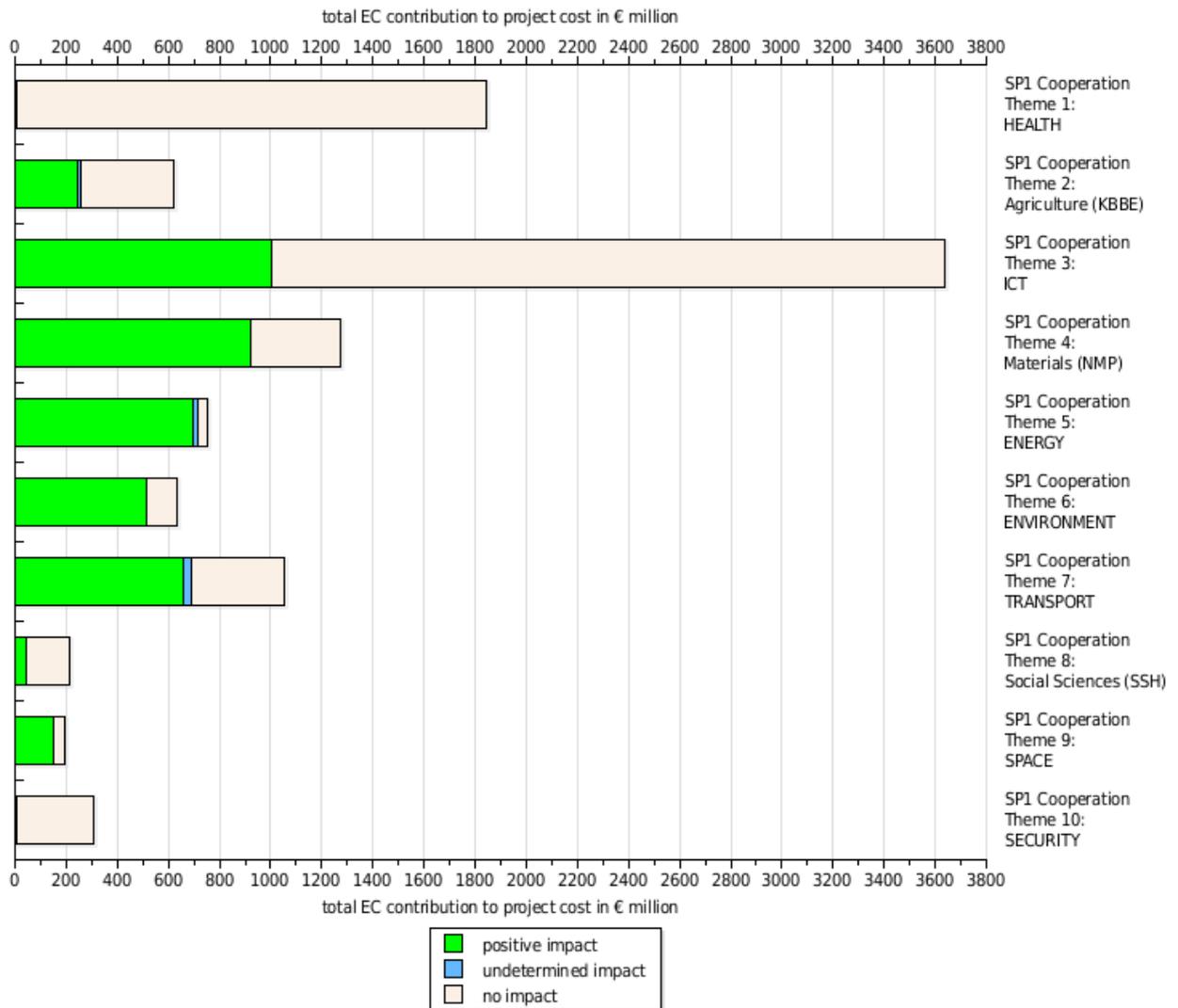


Figure 2: Total EC contribution to projects with expected impacts in the ten 'Cooperation' themes

What is the structure of cross-border collaboration of FP7-funded research contributing to a green economy?

Social network analysis is applied to analyse the cross-border collaboration of research funded under SP

‘Cooperation’ that address green economy aspects

The following paragraphs provide an analysis on the structure of the FP7 research network contributing to a green economy according to the patterns of research collaboration between countries by means of social network analysis¹⁶. Figure 3 combines information on EC contribution and the number of research collaborations among countries¹⁷.

The most relevant actors concerning research contributing to a green economy – the “core”¹⁸ of the FP7 collaboration network – is characterised by countries that all share a very dense patterns of lines (lines represent research collaborations; i.e. organisations of two separate countries participating in the same project) among each other. These countries collaborate with most other countries and, moreover, have strong collaborations with the other core countries. Additionally, core countries are characterised by receiving a rather high EC contribution.

The most relevant collaboration partners - the “core” of the FP7 research network - contributing to a green economy are Germany, the United Kingdom, France and Italy

Overall, by taking a first glance on the cross-border collaboration in Europe on research addressing aspects of a green economy, Germany corresponds to the centre of the collaboration network. Due to its high number of FP7 projects and consequently large amount of accumulated EC contribution it shares collaborations lines with almost every other country in the network analysed here. The United Kingdom, France and Italy together with Germany form the core of the FP7 collaboration network contributing to a green economy, mainly because of the fact that these countries share very dense ties of research collaborations among each other.

The “semi-periphery” of the network consists of countries with well established collaborations with the core countries

The second most important group in terms of research collaboration in Europe represents the so-called “semi-periphery”. However, as indicated by the hierarchical clustering method, this group can be further differentiated into a inner and outer semi-periphery. The former includes Spain, Sweden, the Netherlands and Belgium, all of which in contrast to the outer semi-periphery have well established research collaborations in particular with

¹⁶ By analysing and visualising research collaborations of organisations involved in FP7 research contributing to a green economy between countries through means of Social Network Analysis, countries can be identified which play a central role in the research network. Central players are connecting a large number of actors which are located more in the periphery of a network and therefore represent the backbone of network by ensuring participation and connectedness. Furthermore, higher connectivity in a network facilitates organisations access to different knowledge pools and the flow of knowledge between various actors.

¹⁷ It is important to note that for the sake of clarity and visibility, research collaborations between countries (lines between vertices in Figure 3) of less than 200 have been excluded from the analysis and the graphical representation. As a consequence, countries with less than 200 collaborations with each of their partner countries have been excluded from the analysis. In addition, as the co-funding provided by FP7 to the individual organisations (and thus the respective countries) is confidential, the figures on the EC contribution allocated to the countries for the purpose of this analysis have been estimated by assuming that all project partners receive the same share of funding.

¹⁸ Countries with similar patterns of collaboration (e.g. core countries) have been identified by means of hierarchical clustering.

Germany and, furthermore, with the other core countries. The outer part, formed by Greece, Switzerland, Austria, Finland, Poland, Portugal, Norway and Denmark, shares fairly weaker research collaborations with the core countries than the inner semi-periphery.

Countries on the periphery are characterised by rather loose collaboration among each other and stronger ones to the “core” of the network

The last class of countries form the so-called “periphery” of the network. These countries are characterized by rather loose collaboration patterns (less than 200 collaborations) among each other as compared with the core of the network. Countries forming the periphery are Slovenia, Romania, Hungary, Czech Republic and Ireland. The “core” of the FP7 research network – Germany – is the most common project partner in FP7 projects for all of these countries.

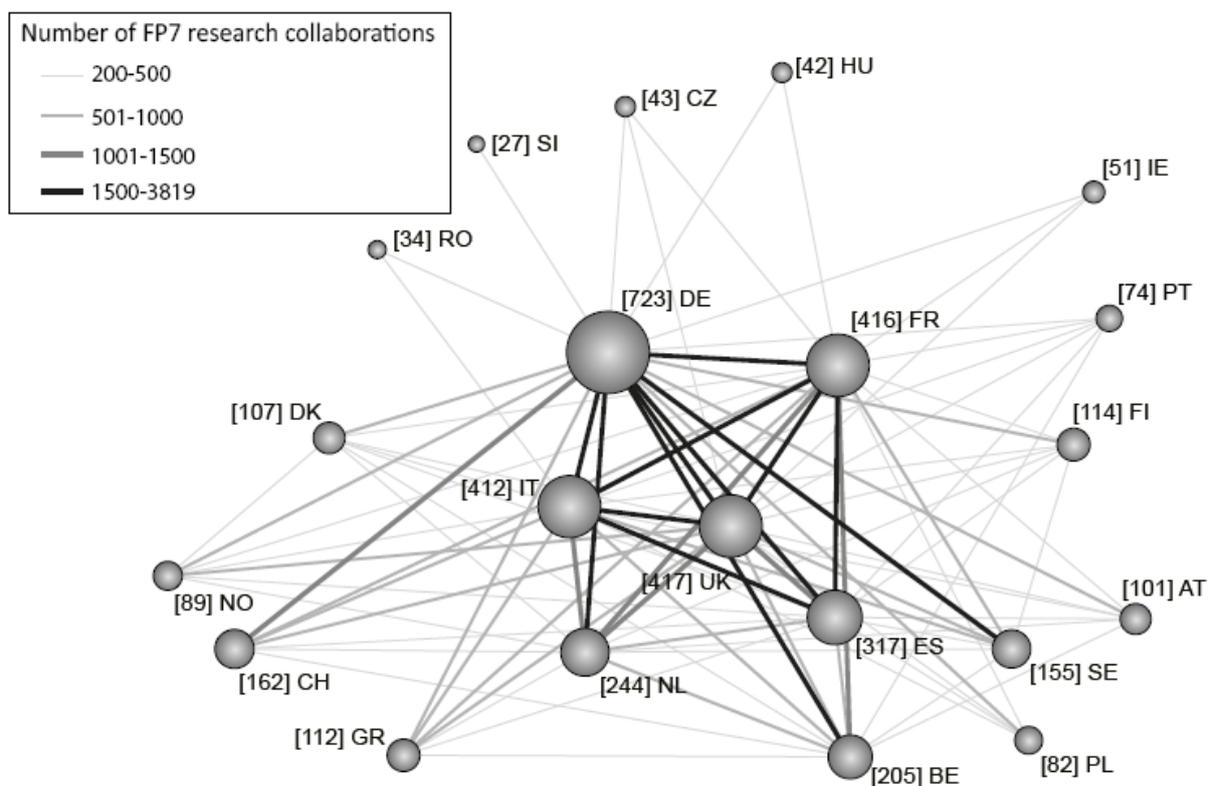


Figure 3: Network of FP7 research collaboration contributing to a green economy between EU Member States (estimated EC contribution in million € in brackets)¹⁹

Substantial differences exist between the amount of EC contribution and the patterns of collaboration

Comparing the amount of EC contribution and the patterns of collaboration between countries as indicated by Figure 3, considerable differences can be identified. Countries like Hungary, the Czech Republic and Romania receive a similar amount of estimated EC contribution, but show rather different patterns of collaborations: Hungary and Romania emphasise FP7 collaboration with two countries of the “core” (Germany/France, or Germany/Italy, respectively), whereas the Czech Republic collaborates with three countries (Germany, the United Kingdom and France). A similar pattern

¹⁹ The position of the vertices has been automatically computed by computer software and does not contain any specific information. See footnote 10 above concerning the estimation of the EC contribution figures.

can be identified by comparing Greece and Finland of the outer semi-periphery. While Finland shares rather loose ties with its collaboration partners, Greece fosters well established collaboration lines to all of the core countries.

Different collaboration patterns among countries sharing a relatively similar amount of EC contribution can be explained to some extent by the different size of the projects the organisations of the respective countries are participating in.

What is the role of developing and transition countries in FP7 research for a green economy?

Only a relatively small number of developing and transition countries is participating in FP7 projects relevant for a green economy.

In order to shift the view to an international context in green economy research, the following paragraphs provide an overview about the collaboration with and involvement of transition and least-developed countries (LDCs comprising land locked developing countries, small island states developing countries and other least-developed countries)²⁰ in green economy research within the FP7. This section, furthermore, provides an overview on research projects contributing to specific aspects of green economy research by giving a detailed description of some research projects.

Overall, when compared to the number of almost 5 000 institutions from EU Member States (MS), the number of 39 institutions originating from least-developed countries is rather low (see Table 1). A similar picture is reflected in the number of institutes situated in transition countries amounting to 133. The sub-group of small island developing states is not present in international FP7 collaborations.

EU MS institutions are dominated by private for profit organisations, whereas developing countries are represented by Research organisation, Higher or secondary education institution or Public organisation

One of the major differences among EU MS and LDCs with regard to institution type is the predominance of ‘private for profit organisations’ in EU Member States, while in landlocked developing countries the majority of participating institutions is formed by ‘higher or secondary education institutions’ and ‘public organisations’. A similar picture is evident for other least-developed countries, where research organisations and public organisations represent the highest share of institutions. The type of institutions originating from transition countries – with the majority being ‘private for profit organisations’ – is somewhat more balanced as compared to EU MS.

²⁰ Countries have been identified as least developed countries (comprising both “Small Island Developing State” and “Landlocked Developing Country”) and transition countries according to the [United Nations Statistics division](#)

Table 1: Type of institutions collaborating in FP7 projects relevant for a green economy apportioned to country origin

Institutions Origin	Private for profit organisation	Research organisation	Higher or secondary education institution	Public organisation	Other institution	Total
EU Member States	3155	705	603	311	199	4973
Landlocked developing countries	2	2	8	4	1	17
Other least developed countries	1	7	5	8	1	22
Transition countries	50	30	38	10	5	133
Other countries	326	168	231	98	28	851
Total	3534	912	885	431	234	5996

There are 13 FP7 projects relevant for a green economy with at least one collaboration partner from landlocked developing or other least-developed countries, and 99 projects including at least one partner from transition countries.

What aspects of green economy research are addressed by FP7 research involving developing countries?

SP ‘Cooperation’-funded research involving LDCs contributes considerably to the challenges “climate change and clean energy” and “conservation and management of natural resources”

In this section, the angle of view is changed by concentrating more on what aspects of a green economy are covered by international SP ‘Cooperation’ research (see Figure 4).

Overall, objectives related to the EU SDS challenge ‘conservation and management of natural resources’ are addressed most prominently (19 topics), followed by objectives related to ‘climate change and clean energy’ (10 topics). Objectives stemming from the key challenges ‘sustainable consumption and production’ and ‘sustainable transport’ as well as under the heading ‘integrative and other objectives’ are ranking on the lower end of the scale.

Box 2 below provides some examples of international projects with involved developing countries contributing to particular aspects of a green economy.

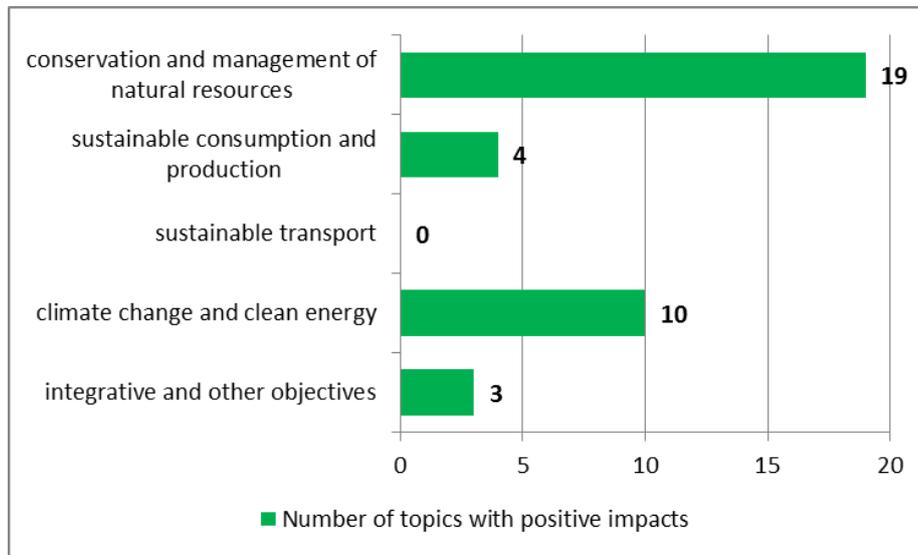


Figure 4: Number of topics to EU SDS objectives representing the green economy²¹

Box 2: FP7 projects involving LDCs in green economy research

[FUNCITREE - Functional diversity: An ecological framework for sustainable and adaptable agro-forestry systems in landscapes of semi-arid and arid eco-regions](#)

The project [FUNCITREE](#) will make substantial contributions to agroforestry systems and ecological science through its integration of theories and concepts from both fields, and will thereby provide a scientifically based model for the design of modernized agroforestry systems. The project will identify, and characterize the main factors influencing the adoption/non adoption of agroforestry in selected target areas.

[UNDESERT - Understanding and combating desertification to mitigate its impact on ecosystem services](#)

[UNDESERT](#) aims at combating desertification and land degradation in order to mitigate their impacts on ecosystem services, and following on human livelihoods. The West African region is central for understanding desertification and degradation processes, which are already severe and widespread as a consequence of climate change and human impact. An improved understanding of the effects of desertification and degradation processes is obtained on a local to regional scale by integrating remote sensing information with sound field data on biodiversity and soil as well as socioeconomic and climate data.

²¹ The category “integrative and other objectives” summarizes the objectives „Promoting sustainable urban planning”, “Promoting sustainable tourism” and “Promoting sustainable construction and housing”

[ISSOWAMA - Integrated Sustainable Solid Waste Management in Asia](#)

The project [ISSOWAMA](#) aims to bring together experts and stakeholders in the field of solid waste management in Asian developing countries and Europe. The project will promote international cooperation between research organisations, universities, and social and governmental stakeholders in a European and Asian context (local waste processors, local municipalities and policy makers, local NGOs representatives, etc).

[EuroBioRef - EUROpean multilevel integrated BIOREFinery design for sustainable biomass processing](#)

The [EUROBIOREF](#) project deals with the entire process of production and transformation of biomass, from fields to final commercial products including chemicals, polymers, materials and specific bio-jet fuels. It adopts a flexible and a modular process design adapted to large but also small scale production units easier to install in various European areas. The overall efficiency of this approach aims to exceed existing pathways with specific targets of improving cost-efficiency by 30%, reducing energy consumption by 30% and producing zero waste.

Background & methodological notes

In order to assess how research funded within FP7 – in particular from the Specific Programme ‘Cooperation’, given its overall aim of “contributing to sustainable development” – contributes to the key challenges and objectives of the EU SDS, a monitoring system was set up by the [Vienna University of Economics and Business \(WU Vienna\)](#) in cooperation with [Delft University of Technology \(TU Delft\)](#) and [maystorm software GmbH](#) on behalf of [DG Research and Innovation](#). Since April 2010, the results of the monitoring of all Work Programmes published so far under FP7 (i.e. the Work Programmes 2007-2011) are available to the public via the public platform www.fp7-4-sd.eu.

The monitoring system consists of two main elements: (i) scientific evidence-based screening, and (ii) a public platform allowing users to interactively analyse the results from various points of view. These two main parts and the methodology behind them will be described in detail below.

Scientific evidence-based screening

The monitoring system combines two main features of European policy: The FP7 on the one hand, with its themes and activities (mainly from the ‘Cooperation’ programme), and the key challenges and objectives of the EU SDS on the other. In order to make this combination operational, a **qualitative text analysis of the topic descriptions** (a ‘topic’ is the most precise point of the hierarchy applied within FP7, outlining the needs, aims and expected impacts of the research to be undertaken concerning a specific issue) that are published in the annual FP7 Work Programmes has been undertaken. The key challenges and operational objectives specified in the renewed EU SDS of 2006 have in this regard been used as a [referential framework](#)²².

The initial screening was conducted by experts from WU Vienna and TU Delft, with the aim of identifying positive (i.e. supporting the EU SDS objectives), negative (i.e. conflicting with EU SDS objectives) or undetermined (i.e. impacts which due to a lack of scientific evidence cannot yet be categorized as positive or

²² In addition to the seven EU SDS Key Challenges, an additional (eighth) category was introduced (“additional SD objectives”) containing a number of objectives that are not included in the EU SDS, but are stated in national SD strategies (NSDS), such as ‘sustainable regional development’, ‘sustainable tourism’, ‘SD governance’ or ‘public security & protection’. By including these additional objectives, the monitoring system allows to not only monitor the contribution of FP7 to the EU SDS, but also to the most common objectives stated in national SD strategies.

negative) expected impacts. In order to ensure the quality and accuracy of the identified impacts, some 10 % of the topics (including those having negative or undetermined impacts) were additionally validated by thematic experts from [Ecologic Institute](#), [INFRAS Research & Consulting](#), and [ISI Fraunhofer](#).

When interpreting the results of the monitoring system, it is important to keep in mind that the results are based on **ex-ante evaluations of expected impacts** specified in the topic descriptions, and must not be understood as *ex-post* impact assessments of projects that are or have actually been carried out under a particular topic. However, as FP7 comprises a peer review process which ensures that the projects selected for funding actually meet the expected impacts outlined in the topic descriptions, the results provided by the monitoring system can nevertheless be seen as a “proxy” of actual impacts.

For a [more detailed description of the methodology behind the scientific evidence-based screening](#), please consult the monitoring system’s website www.fp7-4-sd.eu.

Interactive database at www.fp7-4-sd.eu

In order to make the results of the monitoring system available to the public, to allow customized analyses according to the interests of individual users, and to stimulate a public debate on particular issues, a public platform has been set up at www.fp7-4-sd.eu that – as one of its main features – includes an interactive database which allows analysing the data of the monitoring system from various points of view. To this end, it offers three so-called “Views” producing graphs, maps and tables which can be manipulated by applying several filter options in order to focus the analysis on particular FP7 themes, Work Programmes and EU SDS objectives. The analyses presented in the subsequent section of this quarterly report have been produced by combining the available “Views” and filter options.

In addition to the topics included in the FP7 Work Programmes, information of projects which are or have actually been carried out within FP7 has been integrated into the interactive database in order to allow even more sophisticated analyses, such as analysing the amount of funding (“EC contribution”) dedicated to research on “climate change”, “low carbon economy”, “SD governance”, etc., only to name a few. Moreover, the analyses can be broken down to the national and regional levels, allowing for a comparison across EU Member States or between regions within a particular country.

The monitoring system currently (as of April 2011) comprises information on about 2,400 topics (from the ‘Cooperation’ Work Programmes 2007 to 2011) and 3,000 projects (from the years 2007 to 2010) with more than 33,000 project partners and a total EC contribution of more than € 10,500 million.

In order to stimulate a public debate, the database allows ‘zooming’ into the detailed screening results, i.e. the impacts a topic is expected to have on the key challenges and operational objectives of the EU SDS (see above), and additionally enables users to provide feedback.

For a [more detailed description of the monitoring system’s interactive database](#), please consult the guideline at www.fp7-4-sd.eu.

Annex: List of objectives selected for the low-carbon economy framework

The following EU SDS objectives have been selected for the green economy framework used for the analyses presented in this policy brief. The list of objectives is based on the referential framework of 78 EU SDS operational objectives that is used for the FP7-4-SD monitoring system.

EU SDS key challenge “Climate Change and clean energy”:

- Reducing GHG emissions
- Promoting environmental sustainability of energy
- Enhancing adaptation and mitigation of Climate Change
- Raising the share of renewables
- Raising the share of biofuels
- Reducing energy consumption (increasing energy efficiency and/or decreasing energy demand)
- Other expected impacts on Climate Change and clean energy

EU SDS key challenge “Sustainable Transport”:

- Decoupling economic growth and demand for transport
- Achieving sustainable levels of transport energy use
- Reducing transport greenhouse gas emissions
- Reducing pollutant emissions
- Achieving environment friendly transport modes
- Modernising the EU framework for public passenger transport
- Encouraging better efficiency of public passenger transport
- Encouraging better performance of public passenger transport
- Reducing CO2 emissions from new car fleets

EU SDS key challenge “Sustainable consumption and production”:

- Addressing social and economic development within the carrying capacity of ecosystems
- Decoupling economic growth from environmental degradation
- Improving the environmental performance for products and processes
- Encouraging the uptake of environmentally/socially better performing products and processes by businesses and consumers
- Raising the level of Green Public Procurement (GPP)
- Increasing the global market share of the EU in environmental technologies
- Increasing the global market share of the EU in eco-innovations
- Other expected impacts on Sustainable consumption and production

EU SDS key challenge “Conservation and management of natural resources”:

- Reduce the overall use of non renewable natural resources
- Reduce environmental impacts of raw materials use
- Improving resource efficiency
- Promotion of eco-efficient innovations
- Improving management and avoiding overexploitation of renewable natural resources
- Contributing effectively to achieving the four United Nations global objectives on forests
- Avoid generation of waste by applying the concept of life-cycle thinking
- Avoid generation of waste by promoting reuse and recycling

Additional SD objectives:

- Promoting sustainable urban planning
- Promoting sustainable tourism
- Promoting sustainable construction and housing

