



ECO-INNOVERA

**Development of a Research and Innovation Strategy
Position Paper (draft)**

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1 Summary

1.1 Background

Task 1.2 of the ECO-INNOVERA Description of Work (DoW) has the objective to develop and maintain a research and innovation (R&I) strategy for the ERA-Net. The strategy is described as a “living document”, representing the evolving priorities of the consortium at different stages of the network’s life.

Task 1.2 has as its main deliverable the publication of three iterations of the strategy document:

- Position paper (June 2011)
- Interim strategy (August 2012)
- Full strategy document (June 2014)

This document is largely based on a draft Position Paper, submitted to the Commission in June 2011, but also includes some additional analysis, including work on ways to describe and depict the “eco-innovation landscape”.

A key feature of the R&I strategy is that the activities it will propose go beyond the DoW and are not financed directly through the project. If these activities are to be implemented, they will need to be either:

- Self funded by partners
- Achieved by influencing others to act on our behalf, or
- Supported by external funding

A consultative approach has been followed to try to ensure the strategy has identified activities which are value-adding and enjoy a degree of ownership by members of the consortium.

Six priority topics were identified through a workshop held at the first full consortium meeting (at which 22 out of 25 members were present). The topics are:

1. Developing a common understanding of eco-innovation
2. A better understanding of national/regional programs, leading to a research landscape for eco-innovation in Europe
3. Metrics
4. Value chains and business models
5. Systems thinking applied to different sectors
6. Structuring eco-innovation: sectoral roadmaps

1.2 Next steps

1.2.1 Framework development (incorporating topics 1 & 2)

The work to date has been valuable in demonstrating that no single framework is likely to be sufficient for all the needs of ECO-INNOVERA and that we need to investigate alternative descriptions in parallel.

CML have been tasked with responding to the challenges to their framework made during the Birmingham workshop, and will report back by autumn 2011. Based on their findings, an assessment will be made on the optimum application of this framework to meet the needs of ECO-INNOVERA and from this the final definition of their contribution to the project will be agreed.

The eco-innovation landscape will be further populated with data from national/regional programs, and potentially also international activities, and used to identify areas where there are gaps in terms of eco-innovation support. We will investigate how the information can be filtered to better present complex information, and to what extent this version of this approach can be used as a communication (website) and management tool.

We will continue to liaise with the EcoInnovation Observatory / Technopolis to monitor the development of alternative typology proposed by Michal Miedzinski.

1.2.2 Metrics (topic 3)

An assessment of next steps for this topic will be made on delivery of the interim report by task 2.4: elaboration of common metrics for ex-ante environmental assessment, scheduled for March 2012.

1.2.3 Value chains/Business Models and System Innovation (topic 4 & 5)

The survey conducted over May/June has proved very informative, both in terms of the range of experiences reported and identifying potential learning opportunities. Several potential activities have been identified (see page 13); these need to be elaborated and prioritized. These will be reviewed at the Strategic Board meeting, and potentially could be the subject of a workshop at the next full consortium meeting.

Our recommendations include:

- Value chains/new business models to be put forward for consideration as a topic for the next joint call. This could take a range of forms, for example:
 - Focusing on a particular sector (effectively a thematic call)
 - Without a specific sectoral focus, but requiring applicants (perhaps from different countries) to form consortia which span a significant part of the value chain
 - Development of business models which are completely new, or new to a particular field of application
- Assess available case studies, in conjunction with work on eco-innovation frameworks, to identify key sectors/value chains of interest to ECO-INNOVERA. The criteria for identifying these sectors could be based on a gap analysis of the eco-innovation landscape and/or potential for future growth.

- The topic of system innovation should be developed either as a substantive part of the eco-innovation conference (Spring 2012) or through a separate workshop with expert contributions.
- The list of value-adding activities is prioritized, through the input of the Strategy Board and wider consortium.

Over a longer timeframe, after agreement of 2 key sectors that are of major interest for ECO-INNOVERA as far as (i) value chains & business models and (ii) system thinking are concerned, a detailed investigation could be performed, including e.g.:

- Examples/potential for technological and non-technological eco-innovation,
- Status and impact of eco-innovation within the sector/value chain,
- Identification of barriers to the implementation of eco-innovation,
- Learning and recommendations applicable to a wider spectrum of European industry.

1.2.4 Structuring eco-innovation/sectoral roadmaps (topic 6)

At this stage it is not possible to identify which areas (sectoral or cross-cutting) should be examined under this topic. However, it is noted that the work developing 2 key sectors described above could be an important contributor to this process.

2 Development of the strategy

2.1 Introduction

In the ERA-Net Description of Work (DoW) submitted to the Commission, task 1.2 details a number of activities to be completed in order to develop a Research and Innovation strategy for ECO-INNOVERA. This task expends a significant amount of effort during the project, so it is worthwhile pausing to reflect on the purpose and value in developing an R&I strategy for the network.

The DoW describes a discrete set of activities and deliverables associated with the contract with Commission. At this level the ERA-Net functions as a project, forming a solid foundation for the better co-ordination of eco-innovation in Europe.

The ambition of the consortium partners, however, goes beyond the project described in the DoW. We believe there is a unique opportunity to build a larger program of activities, based on the intersection of interests of 25 partners. The R&I strategy seeks to identify and prioritize value-adding activities for the partners, and is the start of the process by which the ERA-Net moves beyond a project into pro-active network. Our ultimate objective is that the network becomes self-sustaining.

Activities identified in the R&I strategy augment and complement those described in the DoW, and if they are to be implemented effectively will be either:

- Self funded by partners
- Achieved by influencing others to act on our behalf, or
- Supported by external funding (this could include additional funding from the Commission for an ERA-Net+ or other network).

With a consortium of 25 members (ranging from policy makers/regulators, research funders and innovation agencies) the range of interests and motivations for participating in the ERA-Net is diverse. To build a strong network, it is necessary to define a portfolio of activities to which each partner will subscribe, at least in part. This is not the same as saying consensus is required on every topic - in some cases ownership of a particular topic may be more limited and bi- or multi-lateral may be a more effective means to achieve the desired result.

To build this portfolio of activities, a consultative approach will be employed throughout the project, making use of workshops and internal surveys to build agreement on and ownership of topics to be progressed. At this stage, it is not possible to say to what extent partners will choose to enact those activities – this position paper should be regarded as a provisional statement describing some of the options available.

2.2 Overview of activities on strategy development

The first step in the consultative process took place at the kick-off meeting in January 2011. This was the first opportunity to canvass the opinions of the full consortium, and so a workshop (total 4 hours duration) was incorporated into the agenda over the two days. In parallel sessions, and then in a plenary session, consortium members were asked to suggest and develop possible topics for the strategy. The short list of topics was prioritized by a voting process which resulted in the areas described overleaf.

Topic	Description
1) Developing a common understanding of eco-innovation	ECO-INNOVERA should create/develop a common understanding of the concept of eco-innovation in relation to the elements of the framework. This could include what is eco-innovation in R&D terms, and assistance in defining topics for the second joint call.
2) National programs / developing a research landscape	ECO-INNOVERA should develop a detailed knowledge of national programs and from this develop a research landscape for eco-innovation in Europe. A key feature of this landscape is that it will focus on real-life results and understanding how research can be brought to the market.
3) Metrics	Monitoring of programs should be developed to include criteria to identify/measure innovations leading to system change.
4) Value chains and business models	<p>In the short term, ECO-INNOVERA should identify value chains that it wishes to work with, and create or make use of existing meeting places such as industrial fairs or forums such as the Green Business Forum in the US, or Enterprise Europe Networks.</p> <p>This would bring better knowledge to ECO-INNOVERA, feeding into foresight and roadmapping activities. We should be able to develop a shared vision of non technological barriers to eco-innovation, and an understanding of the effectiveness of different policy instruments and other tools.</p> <p>This would feed into better policy actions to support eco-innovation, for example in terms of standardization, public procurement and urban planning.</p>
5) Systems thinking applied to different sectors	<p>ECO-INNOVERA should develop practical ways to help implement systems thinking in different sectors.</p> <p>What are the most appropriate ways to combine regulation, research and other tools to accelerate system innovation/thinking?</p>
6) Structuring eco-innovation: contribution to sectoral roadmaps	ECO-INNOVERA should work with policy makers and funders to structure eco-innovation in Europe. For a few relevant sectors, ECO-INNOVERA should provide a clear R&D strategy of framework; this could include identifying or developing roadmaps for specific sectors.

These areas should be regarded as a starting point for the development of the R&I strategy and may be subject to change. For example, subsequent discussions of topic 6 have highlighted a risk of duplication of other ERANETS' activities through an overly sectoral approach, whereas trans-sectoral approaches could offer a unique, value-adding role for ECO-INNOVERA in some cases.

In practice, there is significant interdependence of the priority areas, as is illustrated below:

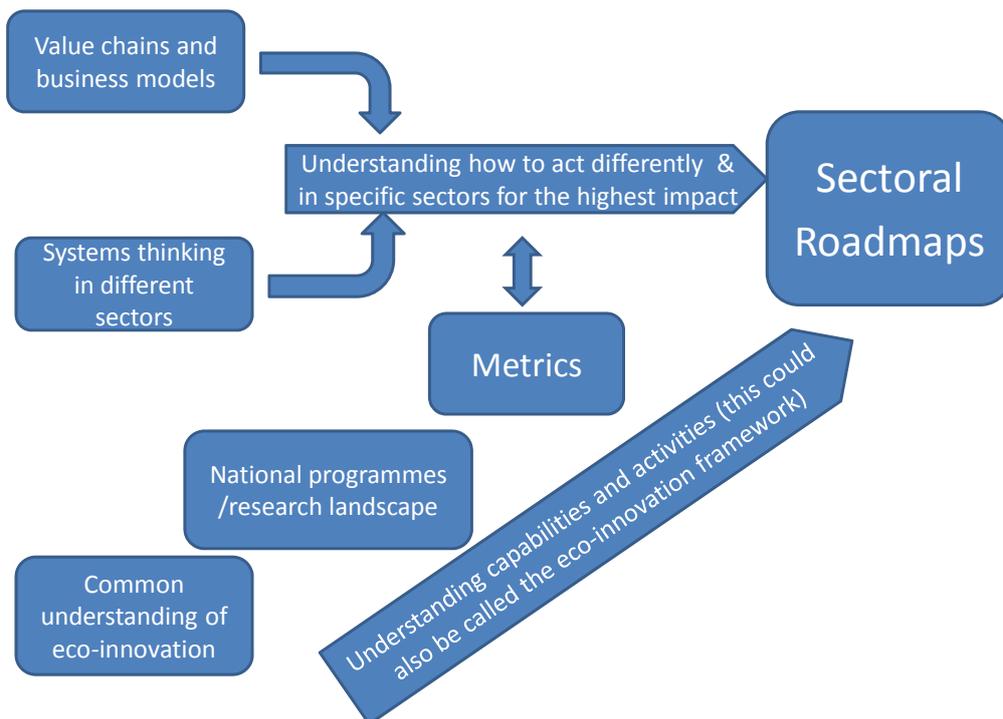


Figure 1: Interrelation of the topics

The first two topics (and to a lesser extent metrics, the third topic) form the foundation of our understanding of eco-innovation; how we view and segment the world of eco-innovation, and assemble information on our capabilities and activities. This could also be called the eco-innovation framework.

Topics 4 and 5 articulate activities that could be high-impact and value-adding. ECO-INNOVERA should not duplicate activities found in other European programs – other ERA-Nets, Technology Platforms and project – but seek to act differently, with appropriate focus to achieve the highest impact. The outcome of this could be the generation of a limited number of sectoral roadmaps, probably building on existing roadmaps or strategy documents to avoid duplication of effort.

Two substantive activities have been carried out since the kick-off meeting in order to make progress on the R&I strategy:

- Workshop exploring different frameworks for eco-innovation (effectively developing the topics 1 and 2)
- A survey within the consortium of current activities linked to topics 4 and 5

Topic 3 (metrics) is the subject matter of task 2.4: elaboration of common metrics for ex-ante environmental assessment, which is scheduled to provide an interim report in March 2012. No work was conducted on topic 6 during this period, being reserved for later iterations of the strategy.

2.3 Framework development

2.3.1 Current status

On 23/24 March 2011 a workshop was held in Birmingham, UK which had the objective to help develop a framework for describing eco-innovation which would be both robust and in a form which is readily applicable to the proposed activities of ECO-INNOVERA. Present at this workshop were several members of the management team and other consortium members, invited experts and the consultants CML (University of Leiden).

A significant part of the workshop attempted to apply a framework developed by CML to real-life eco-innovation policies and programs, using case studies from the UK, The Netherlands and Poland. It was evident from this exercise that the highly policy-oriented framework from CML was not readily applicable to these national case studies, even for the expert audience present.

The lesson learned from this exercise was that no single framework would be sufficient to present the range of eco-innovation policies and activities to a broad audience base. Not only is the range of activities that can be described as eco-innovation vast, but also there are potentially multiple audiences and users of any given framework. In these circumstances, trying to develop a single, universal framework would be confusing and could even be counterproductive.

Currently, three frameworks (fig. 2) are under development, to be applied and evaluated as appropriate to the needs of the project.

- CML framework: while this approach builds on significant previous expertise and has been developed by a well-regarded academic institution, its focus on policy analysis does not suit the current needs of the project. Work on this approach will be taken forward under an existing sub-contract managed by IenM¹.
- Miedzinski approach: a prototype typology presented at the Birmingham workshop in a personal capacity by Dr. Michal Miedzinski from Technopolis. This framework was presented at a very early stage of development but is potentially significant because it might be taken forward by a major partner to ECO-INNOVERA (i.e. the Eco-Innovation Observatory). The lead for developing this framework clearly belongs to Technopolis but ECO-INNOVERA will keep in regular contact to assess this framework as it is developed.
- Eco-Innovation landscape: a pragmatic “bottom-up” approach which maps known activities against quasi “sectors” including resources, agri-food, manufacturing, construction and services. This spreadsheet-based tool has been tested by populating with over 100 networks/projects/funding programs (mostly pan-European in scope) and found to be a robust approach, although it will need to be further tested, for example against the international and national/regional programs described in other ECO-INNOVERA tasks.

Work will continue on the eco-innovation framework, to assess its value and utility to the project. At a minimum it provides for the first time a means to compare a large range of networks and projects at a glance (reducible in size to A3-width poster). Its greater value lies in identifying where the gaps lie in terms of eco-innovation support – the areas where ECO-INNOVERA should focus to minimize duplication of other networks and maximize its unique added-value.

¹ Ministry of Infrastructure and Environment, The Netherlands (partner 25)

CML framework	Miedzinski approach	Eco-Innovation landscape
Intended primarily as a tool for policy makers working from a general policy direction or high level policy challenges. Could be viewed as a high-level options selection tool for eco-innovation policy.	Prototype version of an approach under development by lead partner of the Eco-Innovation Observatory	Bottom-up approach describing range of “sectors” in which eco-innovation is applied. Developed by mapping interactions with potential partner networks/projects such as ERA-Nets, Technology Platforms etc.
<p>1) Three broad domains (with sub-structure at society, economy, technology levels)</p> <ul style="list-style-type: none"> • Instruments • Mechanisms • Goals <p>2) Cross cutting cells for different types of policy instruments e.g. prohibitive, prescriptive, options-creating, economic and informational.</p>	<p>Structure mainly corresponds to “Mechanisms” and “Goals” regions of CML framework and includes:</p> <ul style="list-style-type: none"> • Functional <ul style="list-style-type: none"> ○ function/performance delivered, problem solved • Impact levels/categories <ul style="list-style-type: none"> ○ economy, environment, society ○ scale, acceleration • Analytical <ul style="list-style-type: none"> ○ type of innovation ○ profile of innovator(s) ○ sector (NACE) ○ region (location) 	<p>Sectoral categories:</p> <ul style="list-style-type: none"> • Resources (energy, minerals, materials, biomass, water, land/air) • Agrifood (including forestry) • Infrastructure • Construction • Manufacturing • Health (human, animal, plant) • ICT (electronics, software, photonics, robotics) • Services (tourism, creative industries, other) • Energy (generation, heat & cooling, efficiency) • Transport • Cross-cutting (basic science, env. science, humanities, policy support, regional & international)
Advantages: policy-based model consistent with other approaches to eco-innovation (e.g. OECD), backed up by significant academic literature. In principle could allow comparison of different types of intervention across dissimilar sectors.	Advantages: provides an intermediate level of granularity, allowing comparison of different interventions across/within sector.	Advantages: provides visual means to map and assess remit of a large number of partner networks, identify gaps where ECO-INNOVERA may have a value-adding role
Disadvantages: complex, abstract structure and approach does not lend well to application to real-life examples of eco-innovation programs and policies	Disadvantages: at an early stage of development; lead for future work lies with third party	Disadvantages: does not provide a means to assess and compare different types of intervention within and across sectors; risk of oversimplification of categories / ambiguities in sectoral classification.

Figure 2: Comparison of some alternative frameworks to describe Eco-innovation

2.3.2 Analysis

The Birmingham workshop helped us identify a need to develop the framework (in the form of an Excel spreadsheet) so that it is well populated with different examples of eco-innovation, and also simplified to be more accessible / understandable to a wider audience.

In addition, the national case studies provided useful insights which may be of use in ECO-INNOVERA's forward program of activities.

- A challenge-based approach to a societal image can be an effective focus for a program, bringing together a broad range of instruments (more than conventional CR&D) to achieve its goal.
- Eco-innovation is concerned not only with the introduction of new technologies and products, but also with increasing the rate of implementation to a rate consistent with policy objectives. This may entail measures to remove barriers to good practice, overcoming established patterns of behaviour or to take human factors into account.
- ECO-INNOVERA should consider ways to leverage its available funding to make national programs better at incorporating/doing eco-innovation.
- The stakeholder mapping approach is a valuable tool to help focus activities, whether in terms of stakeholder engagement (e.g. which ERA-Nets and ETPs to work with), evaluating programs and proposals or measuring performance and outcomes.
- Different countries/regions will have a range of research challenges/priorities to meet and innovation landscapes in which they operate. A "one size fits all" is unlikely to be successful; ECO-INNOVERA should also consider measures which take into account national / regional variations. In some cases, additional resources such as structural funding may be available, although it is not clear how ECO-INNOVERA might influence these to promote eco-innovation.
- For recent entrant countries, similar to Poland, measures to increase the critical of innovation programs may have a significant European component. Improving the focus of research (i.e. industrial relevance), better knowledge transfer and mobility of personnel are also likely to have a significant European dimension in these cases.

2.4 Survey results: Value chains and System Thinking

To identify the current status and understanding of the topics (i) value chains and business models and (ii) system thinking within ECO-INNOVERA partners, and to develop further steps on these topics an email questionnaire was prepared and sent to all partners of the consortium. The questionnaire was designed to ensure both a common structure and consistency in approach, and encourage an open discussion. The interviews were conducted by telephone, to expedite a response and allow investigation of specific points in greater detail. Case studies, or other means to illustrate the discussion, were added to the questionnaire to stimulate a good response.

A total of 17 out of 25 consortium partners, representing 12 countries, contributed responses to the survey, albeit with varying levels of detail. In general, there is a rich experience of programs addressing value chains & business models (topic 4). This should provide fertile ground for the exchange of best practice and other activities. In contrast, the responses to questions on topic 5 (system innovation) were more varied, with fewer partners describing significant programs at the national or regional level. In addition, there were (at least) 3 views of what the terms systems thinking or systems innovation describe:

System innovation: high impact innovation which goes beyond technological innovation and could involve a substantially different model for delivering a consumer benefit (such as delivery of a product as a service).

Systemic innovation: interventions at multiple points in a system or supply chain to encourage widespread take-up through some multiplier effect, or design of an innovation program so that it helps build critical mass in specific areas.

Systems thinking could be taken at the highest level, meaning a holistic approach to innovation support that takes into account the inter-relation of different systems – for example water, energy, resources to achieve the optimal benefit.

Future work should clarify these definitions, and ensure there is common understanding and agreement of the meanings of these terms, to help us develop this topic further.

The survey identified a number of areas which were considered to be value-adding by the consortium members. These responses could provide the core to future work on these two topics, although further work will be necessary to prioritize and elaborate the precise meaning of the recommendations, and to establish clear owners among the consortium to take these forward.

The areas identified as representing added value are:

Value chains and business models

- Best practice, such as:
 - Guidelines and tools for research programs
 - Instruments, tools, practices for environmentally friendly innovation
 - Knowledge sharing – e.g. produce leaflets/web pages with good examples and model cases, workshop + brokerage event
 - Information platform
- Identify sectors/value chains with the highest ability to innovate
- Prove that an energy efficient economy will effectively contribute to resource efficiency, less environmental impacts, enhanced competitiveness
- Provide focus – identify limited number (1-2) of topics, for example Industrial Symbiosis, new business models, sustainable communities
- Provide role models for the integration of sustainability into a whole value chain
- Raise awareness and improve awareness of the importance of non-technological innovation (target audience both policy makers and innovation actors)
- Develop a strategic agenda; ECO-INNOVERA to act as a “think tank”

System innovation

- Benchmark social innovations in different countries
- Case studies, best practice
 - National/regional programmes supporting system innovation
 - knowledge sharing, with focus on replicating good ideas on a local basis
- Focus on specific environmental issues
- Funding of research on system innovation implementation (potential joint call)
- Identify key areas in most need of a systemic change (packaging, use of chemicals, waste management including cradle to cradle)
- Import and dissemination of ideas
- Importance of unintended consequences (e.g. bio fuels debate)
- Understand the regional context - additional complexity may apply (multilevel governance, complex networks of actors, evolution of eco-innovation by non-linear paths)