INNOVATION NEEDS ORIENTATION

EMInInn
Environmental Macro Indicators of Innovation

Innovation needs Orientation

COOPERATION

THEME [ENV.2011.3.1.9-3]

[Macro-level Indicators to monitor the environmental impact of innovation]

It is difficult to assess the positive or negative macro-environmental impacts of innovations, because they are not inherent to a technology, but a product of physical, behavioural, social and economic conditions. A "green" car may be an additional car instead of a substitute. Money saved through energy-saving will result in shifted expenditures with low or high negative environmental impacts. Positive micro or meso impacts of eco-innovation may be outweighed at the macro level by larger-scale processes which they may have catalysed.

The European research project EMInInn will track the past development and diffusion through the economy of pervasive innovations that can be expected to have had an appreciable positive or negative environmental impact. The aim of the project is to generate deeper insights into the role of innovation in decoupling environmental impacts from economic growth, helping policy makers to both assess the benefits from past innovations as well as maximize benefits from present and emerging innovations.

Focussing on environmental pressures, the project will analyse macro-environmental impacts of innovations in five sectors: energy, transport, construction, ICT and waste.

EMInInn
Environmental Macro Indicators of Innovation

EMInInn FACTS

Duration: 3.5 years,

November 2011 – May 2015

Man-Months: 250

Total Budget: 3.2 Mio €

EC Contribution: 2.5 Mio. €

GENERAL OBJECTIVES

- The delivery of accurate and comprehensive information on the environmental impacts of innovation to strengthen the science-policy link in order to enable policy makers to stimulate eco-innovation and to both assess and maximize its benefits.
- Development of methodologies and quantification of macro-level indicators to monitor the ex-post impacts of innovation processes, including diffusion of innovations into society, their economic impacts, and their impacts on key environmental categories (namely resource flows, waste and recycling, energy, emissions, and land use and biodiversity).
- Contribution to the identification of drivers and barriers relating to eco-innovation, thereby facilitating the full recognition of eco-innovation potential.
- Support for the decision-making process on policy targets and methods for evaluating the environmental impacts of innovation and other relevant policies on the basis of physical indicators.

R&D OBJECTIVES

- Combine the insights and outcomes of recent advanced initiatives and research projects on the measurement of innovation.
- Compile and systematise from different sources the available data to measure the environmental impacts of innovation.
- Provide a common understanding on eco-innovation by creating common definitions and analytical boundaries that will enable the development of ex-post assessments and modelling of the environmental effects of innovation.
- Apply, combine and, where appropriate, integrate methods, tools and approaches to show the macro-environmental results of past innovations in a range of different fields, thereby to create or enhance the ability to make ex-post assessments and modelling of innovation and its related (environmental) impacts in the areas of resource flows, waste and recycling, energy, emissions, and land use and biodiversity.
- Improve the ability to monitor and assess secondary environmental and economic impacts of innovation (e.g. rebound effects).
- On the basis of the assessment of the results, make recommendations that will support policy makers in the design of innovation policies and framework conditions.
- Identify innovations and novel system configurations that may be able to contribute to absolute decoupling of economic growth and environmental pressure as well as to the conditions for this to occur.

CONCEPT AND METHODOLOGY

Phase 1: Definitions, measurement and analytical framework

In a first step EMInInn will assemble and set out coherently, on the one hand, macro-indicators and data of environmental impacts and, on the other hand, indicators and data to measure innovations. The definitions and delineations will be the basis for selecting appropriate analytical frameworks to operationalize assessments of environmental impacts associated with innovation on a macro scale.

Phase 2: Innovation impact analysis

Ex-post assessment of the economy-wide environmental impacts of selected pervasive innovations through the application of advanced analytical frameworks in the context of:

- Technologies of energy supply and demand
- Information and Communication Technologies (ICT)
- Transport
- Built environment and buildings
- Waste management and recycling

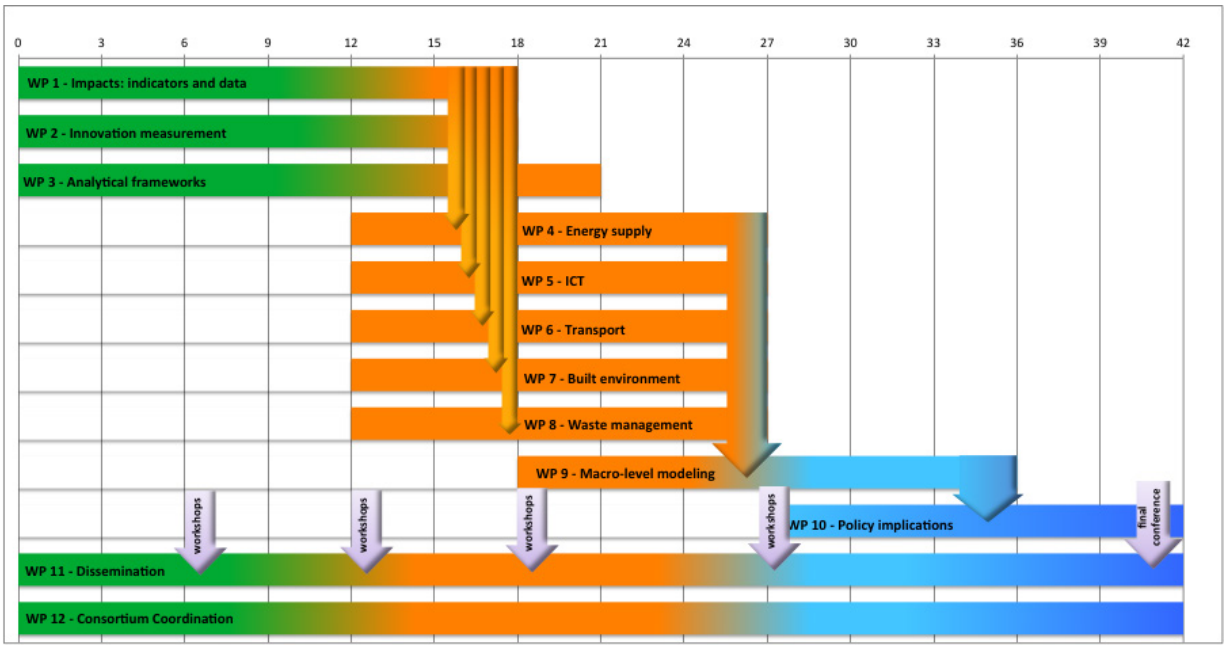
This assessment will be supplemented by a limited amount of scenario work and economic modelling.

Phase 3: Policy implications and dissemination

EMInInn will strengthen the science-policy link through the interaction with experts, stakeholders and policy-makers. In that context EMInInn will address EU policies, which affect three major fields of environmental impact:

- resources and waste,
- energy and climate, as well as
- land-use and biodiversity.

PROJECT STRUCTURE



WP 1: Macro-environmental impacts: indicators/data

Inventory of existing and proposed macro-environmental indicators; Analysis of information and data generation needs for selected indicators; Further development of indicators

WP 2: Innovation measurement: indicators and data

Determination of improvements in energy, material and eco-efficiency; Examination of innovations in use and under development; Drivers and barriers to eco-innovation; The link between indirect and direct innovation indicator; Parameterisation of innovation and enabling factors for environmental-economic analysis

WP 3: Analytical frameworks: methods and data

Survey of Methods, Tools and Data; Top-down ex-post analysis of innovations; Bottom-up ex-post analysis of innovations; Incorporating the bottom-up ex-post analysis into an Input-Output model of the economy; Integration of results

WP 4: Technologies of energy supply and demand

Selection of mainstream environmental technologies and mapping their diffusion; Identification of environmental impacts of these energy technologies; Selection of important new low-carbon technologies; Generation of a small number of low-carbon energy system scenarios and assessment of the macro-environmental impacts of the scenarios

WP 5: Infomation and Communication Technologies (ICT)

Selection of mainstream information and communication technologies and mapping their diffusion; Identification of environmental impacts of these information and communication technology innovations; Selection of new information and communication technologies potentially important for the environment

WP 6: Transport

Selection of mainstream environmental technologies and mapping their diffusion; Identification of environmental impacts of these transport innovations; Ex post and ex ante assessment of important new low-carbon transport technologies

WP 7: Built environment and buildings

Selection of past environmental technologies and mapping their diffusion; Identification of the environmental impacts of these energy technol-

ogies' diffusion; Selection of important technical options for reducing impacts from households/ housing and generation of a small number of impact scenarios diffusion; Assessment of the macro-environmental impacts of the scenarios diffusion

WP 8: Waste management

Identification of relevant innovations and mapping their diffusion; Ex post analysis of impacts of waste-related innovations; Identification of policy drivers of waste-related innovation

WP 9: Macro-level modeling / ex ante assessment

Selecting innovations for ex ante assessment; Development of scenarios for diffusion of the technologies; Assessing direct environmental impact; Assessing indirect and economy wide environmental impacts

WP 10: Policy implications: Policy implications: integration, coordination, conclusions and recommendations

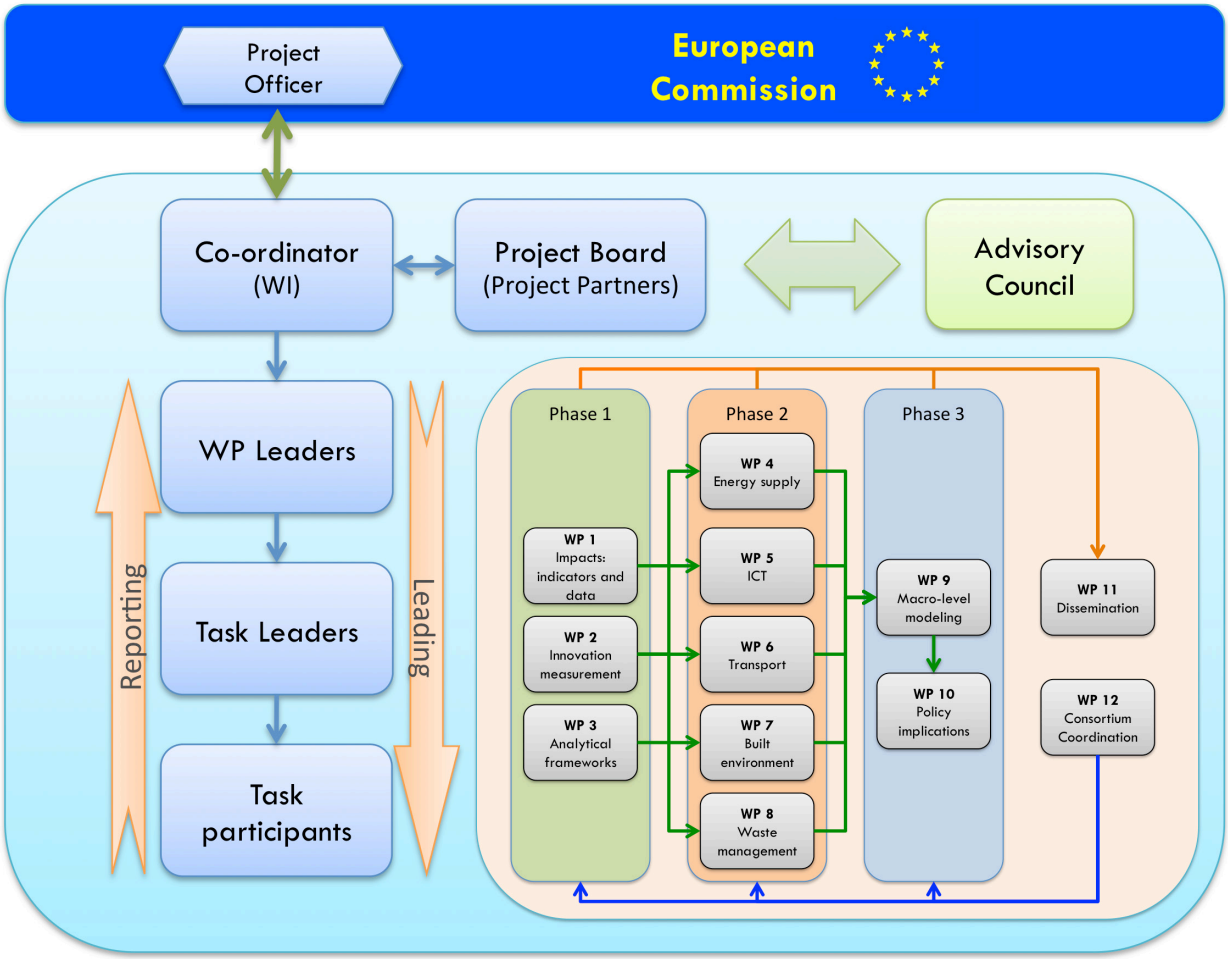
Review of the Thematic Strategies for Sustainable Use of Natural Resources and for Prevention and Recycling of Waste; Review of climate and energy policies; Review of EU biodiversity and land use policies; Innovation policy and integration

WP 11: Dissemination

Dissemination and capacity building; Communication and promotion; Support of WP10 (Policy implications)

WP 12: Consortium Coordination

MANAGEMENT STRUCTURE AND PROCEDURES



PROJECT PARTNERS

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Netherlands Organization for Applied Scientific Research	Netherlands
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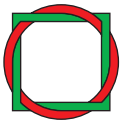

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Universiteit Leiden

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TNO innovation for life

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