

Conference Discussion Paper

“Framing and Focussing: European Resource Policies in the Context of Sustainable Development”

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written by

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1. Introduction

This discussion paper provides background information for the ESDN Conference 2011, including the working group session. This year's conference is entitled, "Framing and Focussing: European Resource Policies in the Context of Sustainable Development", and has two main objectives:

- **To broaden the discussion on resource policies in Europe, advocating a more comprehensive approach from a sustainable development perspective** (e.g. addressing the link between resource efficiency and the rebound effect, tackling cross-sectoral pressures and challenges resulting from resource availability and accessibility and exploitation/utilization patterns, inter-relationship between resources, and governance challenges).
- **To develop recommendations for the EU and Member States on integrated resource policies in the context of sustainable development**, particularly with regard to the [Europe 2020 Strategy](#) flagship initiative, "[A resource-efficient Europe](#)" (COM(2011) 21), and the Road Map that will be developed to implement this flagship initiative.

This year's ESDN Conference is the 10th annual conference of the network. For a comprehensive documentation of all previous ESDN Conferences, please go to the [ESDN homepage](#). The ESDN Conference 2011 is organised by the ESDN in cooperation with the [Hungarian EU Presidency](#).

The ESDN Conference 2011 will comprise **three sessions**:

- Session 1: Resource policies in Europe – framing of key issues in the context of sustainable development
- Session 2: Working Groups – different dimensions of resource policies in Europe
- Session 3: Developing recommendations for the EU and Member States level

This discussion paper has the following structure: chapter 2 outlines several procedural issues of the conference; chapter 3 provides an overview of political and scientific debates on resource policies; chapter 4 describes international and European resource policy approaches and initiatives; chapter 5 elaborates on the resource policies and initiatives at the national level; and finally, chapter 6 introduces the format for the parallel working groups.

A full documentation of the conference will be published as ESDN Conference Proceedings shortly after the event.

2. Procedural issues and conference flow

Similarly to previous ESDN conferences, the 2011 event will deal with the conference topic in **different formats** (for details, please see the conference programme):

- Keynote presentations will highlight general issues and key aspects of the conference topics;

- Panel discussions will provide an overview of experiences and standpoints of different actors and institutions;
- Plenary discussion will give ample time for the conference participants to discuss and reflect on the different topics amongst themselves as well as to bring in their own experiences;
- Working groups will discuss specific aspects of the conference topics in-depth;
- Summaries of the results of panels and working group discussions during the conference can be used for immediate reactions and further discussions.

A **professional moderator** (Mr. Peter Woodward, Quest Associates, UK) will guarantee a good conference flow, moderate panel and plenary discussion, moderate questions and inputs from the participants, and weave the intellectual content together. Peter will also use several innovative and create methods to foster discussions and interactions among the conference participants.

The **keynotes in Session 1** will provide a comprehensive framing of resource policies and management in the context of sustainable development. The **political discussion** that follows the keynotes in Session 1 aims to look at a “smart framing” of resource policies in the context of sustainable development and what would be required to bring the topic to the attention of politicians and to foster action.

The **parallel working groups in Session 2** will allow an in-depth discussion in smaller groups about different dimensions of resource policies in Europe (WG1: innovation dimension of resource policy and management; WG 2: security of supply/resource security; WG 3: ecological and social rucksack and the rebound effect; WG 4: resource policies and governance challenges). Each working group will be kicked-off by a flashlight presentation to highlight important issues and present some primary recommendations. The working groups will then debate the recommendations and develop additional ones. This will be followed by a **panel discussion** with different stakeholder representatives to discuss how they drive the agenda on resource policy and management in Europe. As an interlude in Session 2, there will be two short presentations on “knowledge brokerage in sustainable consumption” and **two European research projects** (RESPONDER and CORPUS, both funded by DG Research in FP 7) that are closely linked to the ESDN.

The second conference day will be kicked off **in Session 3 by moderated presentations** on examples of national resource policy strategies and initiatives. This will be followed by an **interactive discussion** to reflect on various other national activities and experiences. In order to collect recommendations for resource policy in the context of sustainable development, the **working group results** will be presented and discussed in sub-groups at the tables and during the plenary. The ESDN Steering Group will then come forward with concluding remarks and further steps. In the final slot on **ESDN network activities & perspectives**, the participants are invited to bring in their ideas for further strengthening the network and the role of ESDN in fostering sustainable development in Europe.

3. Political and scientific debates on resource policies

With the *unsustainable use of natural resources* to regain or boost economic growth in the industrialised world, and the ever growing desire to increase the economy and living standards in the so-called developing world, the pressure on resource policy and management is dramatically increasing. A few figures to underline this argument (Bleischwitz et al., 2009): Global extraction of natural resources is steadily increasing. In 2020, a total resource extraction of around 80 billion's tones (200% of the 1980 value) will be necessary to sustain worldwide economic growth. For various commodities, the peak of extraction has already been reached or is about to be reached (e.g. oil, natural gas, various metals). The rapidly increasing demand for resources has led to an unprecedented boost in resource prices. The European economy is increasingly dependent on natural resource and resource imports from other world regions (EEA, 2010). The EU is the world region that outsources the biggest part of resource extraction required to produce goods for final demands, thus exceeding self-sufficiency of resource use. The pressure on resource policy and management becomes even more vivid when considering the fact that, based on latest predictions by the United Nations ([UN Press Release, 3 May 2011](#)), the world population will reach 9.3 billion in the year 2050.

In order to meet this pressure and develop policy options for less or more efficient resource use, the European Commission published the **Europe 2020 flagship initiative, “A resource-efficient Europe”**, in January 2011. It points out that “continuing our current patterns of resource use is not an option” and argues that “using resources more efficiently will help us achieve many of the EU’s objectives” (European Commission, 2011:2). A Roadmap for a resource-efficient Europe, expected to be released in mid-2011, will “set out a vision for the structural and technological change needed up to 2050, with objectives to be reached by 2020 and suggestions about how they could be met” ([website of DG Environment](#)). The flagship initiative will be described in more detail below.

Resource efficiency was also the topic of the **11th Green Week in Brussels** from 24-27 May 2011. More than 3,000 participants from all over Europe met to debate about ways how to best address resource policy and management. Two commissioners made it very clear that change and policy actions are necessary: Janez Potočnik, Commissioner for the Environment, said that “we are clearly overusing this planet’s resources many times over, we are still being so inefficient” (Potočnik, 2011) and, therefore, it is necessary to change and steer society to a new path. He continued to argue that the transition will not be easy, but “policies and measures [are] needed to bring about the transformation in our economies and the transformation in our behaviour” (ibid.). Connie Hedegaard, Commissioner for Climate Action, made clear that action is crucial because “business-as-usual will mean less well-being, more insecurity, and a lot of costs to cope with the consequences [of unsustainable resource use.]” (Green Week, [Daily News 27 May 2011](#)). Another interesting contribution at the Green Week 2011 was made by Björn Stigson, President of the World Business Council for Sustainable Development. He remarked that we live in world with limits and, therefore, there will be competition about efficient resource use. The “Green Race” is already on between leading economies, especially with China. Mr Stigson argued that, in order to compete in the “Green Race”, Europe “needs to transform the economy faster than it is doing today” (Stigson, [Hot Topics interview at Green Week 2011, 27 May 2011](#)). He pointed out that two efforts are required in this context: on the one hand, Europe needs to create higher demand on the home market for a resource efficient

economy to build capacities and develop innovation potential for resource policy and management; on the other hand, businesses need to be supported by a regulatory framework that helps them to speed up the transformation towards a low resource economy.

These current debates make *this year's ESDN Conference* very topical. The conference *aims to broaden the debate on resource policies and to advocate for an integrated approach in line with the concept of sustainable development*. Janez Potočnik, in his opening speech at the Green Week 2011, addressed several important aspects in this context. He argued that "I speak about resource efficiency as a further and practical implementation of sustainable development. [...] Resource efficiency goes far beyond the boundaries of traditional environmental policy. [...] Therefore, we have to improve the synergies between our policies" (Potočnik, 2011).

In the following section, we will shortly reflect upon the scientific and conceptual debates on natural resources and their management.

3.1 Natural resource management paradigms

Modern debate on natural resources and the sustainability of their management began in the late 18th and early 19th century, and the ideal of societal steering as management based upon scientific understanding of the population and the environment was formed: "Modern thinking about the environment is characterized by the belief that nature can be managed or governed through the application of the scientific principles of ecology" (Rutherford, 1999:37).

The primary paradigm of natural resource management was rooted in this context. Natural resources are supposed to be used for human benefit (i.e. this paradigm is utilitarian) and nature outside of the sphere of human influence does not possess any intrinsic value (i.e. this paradigm is anthropocentric). This paradigm came to be known particularly in North American environmentalism as environmental conservation. The countermovement to the conservation movement was represented by thinkers such as Aldo Leopold, Henry Thoreau or John Muir (and the Sierra Club he established). They pushed for wilderness preservation, a more radical alternative to environmental conservation, defending the position that nature has a value of its own. Despite the political success of the conservation movement and the optimistic rhetoric up until late 1960s, the conservation movement did not have a lot of success in halting the decline of natural resources (Thadaku, 2005).

Even though the modernist management "resulted in enormous advance in resource productivity and human welfare" (Walker & Salt, 2006:6), it does not seem to be able to deal with the emerging secondary and so-called 'wicked' problems. It is now being recognised that the world does not behave in an incremental and linear cause-and-effect fashion, but is in a constant process of change. Environment–society interactions are characterized by complexity, indeterminacy, irreversibility and non-linearity, with systems "usually configured and reconfigured by extreme events, not average conditions" (ibid.). Pursuing the goal of efficiency might undermine a system's resilience, i.e. its ability to absorb and adapt to internal and external disturbances, and therefore threaten long-term sustainability.

The third main paradigm, the *integrated approach to natural resource management (INRM)*, originating in the 1980s, addresses exactly these systemic issues (Folke et al., 2005; Allison & Hobbs, 2006). It stands for “a process which promotes the coordinated development and management of resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems”. By considering the linkages between natural systems and socioeconomic systems, resource management should have environmental, economic and social benefits in mind (Rahaman & Varis 2005): multiple aspects of natural resource use (sustainable yield, biophysical carrying capacity, resilience), economic aspects such as meeting production goals of producers and other direct users (security of supply, reduction of dependency on a particular resource, low costs or prices, efficient utilisation, innovation, job creation), as well as social aspects (e.g. empowerment for the community, poverty alleviation, social inclusion, equity and fairness, welfare of future generations; Lowell et al. 2002, Holling & Meffe 2002, Williams et al. 1998, Mbaiwa 2004). INRM is increasingly adopting systems-thinking concepts and tools (such as systems modelling, adaptive management and resilience thinking) in order to capture the complex dynamics across social, ecological and economic systems. For example INRM seeks to understand the extent to which a system can absorb natural and human perturbations and continue regenerating without slowly degrading or even unexpectedly flipping into undesirable states (Folke et al. 2005, Holling 1973, Holling 2001, Berkes et al. 2003). This systems approach replaces the view that resources can be treated as discrete entities in isolation from the ecosystem and social systems (Olssen et al. 2004).

The INRM is clearly in line with the sustainable development concept and became the “favoured approach” of environmental policy in the 1990s (Allison & Hobbs 2006), originally applied in land use and water management. “Sustainable development and management of global and regional resources is not an ecological problem, nor an economic one, nor a social one (...) [i]t is a combination of all three” (Holling 2000). Addressing only the social dimension of resource management without an understanding of the resource and eco-system dynamics will not be sufficient to guide society towards sustainable outcomes (Folke et al. 2005). Similarly, focusing only on the ecological side as a basis for decision making may lead to too narrow conclusions (Folke et al. 2005) and may also miss a number of environmental problems. Sustainable resource management goes beyond ecological (i.e. “regulation and control”), economic (i.e. “get the prices right”) and social (i.e. “empowerment and stakeholder ownership”) thinking. ***Through an integrated approach, the trade offs and synergies between the three dimensions of sustainable development can better be addressed in decision making*** (Bleischwitz 2009; Holling 2000).

3.2 The concept of resource efficiency

In the 1980s, a reform-oriented school of economics and environmental studies named ecological modernisation gained increasing attention among scholars and policymakers (Huber 1982, Simmonis 1989, Mol et al. 2009). Work on ecological modernisation grew out of the belief that the decoupling of economic growth from environmental destruction may become “an emerging feature of certain advanced industrial economies” (Baker 2006; see also the discussion on the ‘environmental Kuznets curve’). Technological innovation was supposed to achieve ‘**dematerialisation of economic growth**’ – e.g. an increase in resource efficiency by a factor of 4 could result in the doubling of GDP with only half of the original resource input (von

Weizsäcker et al. 1995; see also Schmidt-Bleek 1998). Concepts of resource efficiency, dematerialisation or decoupling currently used in the political debate originate in this school.

The concept of **resource efficiency** is itself rooted in the paradigm of neoclassical economics (efficient utilization of resources, economic scarcity of resources measured in prices or costs, resources which are scarce might be substituted with technological alternatives; see Folke et al., 2005), however, it has no commonly agreed upon definition (OECD, 2008a). The focus is typically either on maximising economic output with a given resource input (increasing resource productivity), or on minimising resource input with a given economic output (decreasing resource intensity); or sometimes both (Factor 4 example). At the company level, managers seek higher resource efficiency through the 3Rs (reduce, reuse, recycle).

Several related concepts and indicators are in use. **Eco-efficiency**, a concept first coined by the World Business Council for Sustainable Development in its 1992 publication “Changing Course” (Schmidheiny, 1992), is defined as delivery of “competitively priced goods and services that satisfy human needs and bring quality of life while progressively reducing environmental impacts of goods and resource intensity throughout the entire life cycle to a level at least in line with the Earth's estimated carrying capacity”. It is a slightly broader concept than resource efficiency as it covers all environmental implications of production (i.e. not only of resource use). The OECD also frequently utilises the indicator of **resource productivity** (analogically to labour or capital productivity), an indicator reflecting the output generated or value added per unit of resources used (OECD, 2010a). **Ecological rucksack** is an indicator measuring the hidden material costs of a product expressed as tons of any material which is extracted, processed, transported or deposited during the production of a given product and its transport to the point of sale.

The concept of **‘circular economy’**, currently being successfully implemented in China, is based on the acknowledgement that the economy is embedded in a planetary bio-geophysical system and depends on both in terms of securing the necessary raw materials and absorbing or processing waste (i.e. sources and sinks; Ayres & Simonis, 1994). It embeds cleaner production and industrial ecology in a broader system, encompassing industrial firms, networks or chains of firms, eco-industrial parks, and regional infrastructure to support resource optimization (IISD, 2006). A sustainable economy, in contrast to others, is characterized by a much reduced use of renewable and non-renewable inputs and closed-loop reuse and recycling of material outputs, thus drastically reducing or eliminating waste.

There are, however, several contested issues: Firstly, ecological economists suggest that in order **to sustainably manage resource use, information on its limits is needed**, in particular on the risks arising from critical thresholds and ecological feedback systems. Market prices do not reflect the absolute scarcity of resources, and even if in theory all market failures were addressed, a competitive equilibrium still would not deliver a sustainable allocation of resources across generations (Folke et al., 2005). Secondly, resource management driven by conservation interests often **ignores the need for systemic, adaptive designs**. Those driven by economic interests often act as if the uncertainty of nature could be compensated for by human engineering and management controls. Therefore, a common cause behind failures of investment in sustainable resource management is the lack of a systemic and integrated approach in policy solutions (Holling, 2000). Thirdly, when analyzing impacts of resource efficiency, **rebound ef-**

facts should be taken into account. Through behavioural changes or other systemic responses, rebound effects have the potential to compensate (or even overcompensate) for the potential resource savings made possible by resource efficiency (Schettkat, 2009). A *direct rebound effect* occurs when higher efficiency lowers consumption costs, leading to higher consumption of a good. An *indirect rebound effect* occurs when lower consumption costs increase real income, triggering an increase in consumption. Although the existence of the effect is uncontroversial, analysis of rebound effects is challenging due to its high complexity (from simple demand reactions to price and income variations). Determining the size and importance of rebound effect in real word situations is therefore highly difficult.

4. International and European resource policy approaches and initiatives

In this chapter, we provide an overview of the resource policy approaches and initiatives of the OECD and the European Union.

4.1 OECD's work on nature resource policies and management

The Organisation for Economic Co-operation and Development (OECD) has, since the early 1980s, promoted international and national policies aimed at preventing and reducing waste generation and managing waste residues in an environmentally sound manner. The OECD has worked on resource productivity and waste management issues for the last 20 years. Since 2001 there has been a shift from waste minimization ('end-of-life perspective') to a more integrated approach, and management of materials in a sustainable manner through the whole life-cycle (from extraction and processing through use and to the disposal of the product), as it has become evident that waste minimisation policies which address only end-of-life products and materials are not effective in reducing increasing amounts of waste and material consumption associated with economic activity.

The [OECD Environmental Strategy for the 1st Decade of the 21st Century](#), adopted by Environment Ministers in May 2001, clearly outlined the need for governments to look for integrated management solutions which link resource use and prevention of waste into a coherent policy approach. Against this background, in 2004 the OECD Environment Directorate initiated a new initiative on [sustainable materials management](#) (SMM), followed up by the OECD Council recommendations on material flows and resource productivity (OECD, 2004; OECD, 2008b). The OECD has called on the countries to introduce actions for an integrated approach, using life-cycle thinking on materials and improving resource productivity of resources in a cost effective manner. After a long debate on taking stock on SMM and sharing experiences with governments, at the 2010 Global Forum on Environment (GFENV) focusing on sustainable materials management the OECD proposed concrete steps and measures to put SMM into practice or to extend it to new areas. The aim of the 2010 and 2011 OECD work on SMM is to put into practical measures what has been set as target in the OECD council recommendation in 2008, focusing on (OECD, 2011):

- 1) sustainable materials management
- 2) environmentally sound management of waste
- 3) trans-boundary movements of waste, waste prevention and minimisation
- 4) radioactive waste management

The OECD working definition of SMM was developed in the first OECD workshop on SMM (held 2005 in Seoul, Korea): “Sustainable Materials Management is an approach to promote sustainable materials use, integrating actions targeted at reducing negative environmental impacts and preserving natural capital throughout the life-cycle of materials, taking into account economic efficiency and social equity” (OECD, 2007). SMM recognises that different materials have different attributes and life cycles with implications on their resource-efficient transformation, production, use and recycling (see also Figure 1 below). SMM, having resource productivity, economic efficiency and social equity at its core, elevates the focus of governments, industry and consumers from individual material, product or process attributes to an entire system of material flows and associated life-cycle impacts.

Resources: the stock of natural capital (in the lithosphere and biosphere) that underpins sustainable development (energy resources and minerals, water, soil, forests, fish stocks....)	Materials – the transformation of resources to meet economic and social needs (timber, food, steel, combined in consumer products...)			
	Example of initial transformation	Example product or good	Illustrative use profile	example end-of life scenario (illustrative percentages only)
	Ore to metal	Steel beam	Building and Construction component with 80 year life span	95% recycled 5% to landfill
	Oil to plastic resin	carpet	Building and Construction component with 15 year life span	50% recycled 25% converted to energy 25% to landfill
	Raw log to lumber	Roof truss	Building and Construction component with 80 year life span	75% recycled 25% to landfill
Sustainable Materials Management: is an approach to promote sustainable materials use – reducing impact and preserving natural capital across the life cycle while taking into account economic efficiency and social equity				

Figure 1: The relationships between resources, materials and SMM (OECD, 2010b:7).

4.1.1 Policy implications of sustainable materials management

To highlight the shift from individual material, product or process attributes to the entire system of material flows and associated life-cycle impacts and help governmental authorities policy development for SMM, a **conceptual framework for a systemic view on material flows** has been developed by the OECD Environment Directorate on the basis of a broad literature review (see Figure 2). The framework shows resource flows between three sets of systems – ecological, industrial and societal. Applying an SMM approach would, for example, focus actions on not only developing infrastructure to ensure efficient recycling and recovery of materials (typical waste-reduction-focused policies), but also actions that would improve the sustainability of the transformation of the resource into a material (e.g. reducing carbon intensity of energy inputs) and optimise the design of the product to ensure best use of materials and optimal use and end-of-life profile (OECD, 2010b).

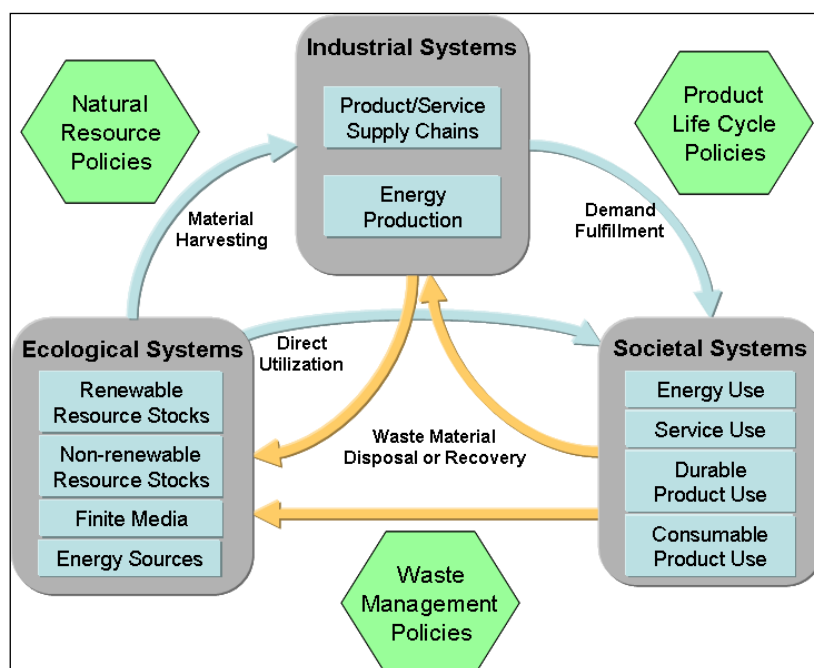


Figure 2: OECD's systemic view on material flows (OECD, 2010a:21).

Based on the results of the 2010 Global Forum, and in order to provide guidance for the development and implementation of SMM policies at the national level, the OECD Environment Directorate also elaborated a set of [policy principles](#) ('framework conditions'), [policy instruments](#) and [targets](#). The OECD work on SMM, however, does not provide guidance for national authorities on resource policies, but focuses more on waste management and life-cycle policy targets and instruments with indirect impact on the resource base; direct actions to ensure sustainability of the resource base do not fall within the scope of SMM (OECD, 2010b:25).

The **four SSM policy principles** defined by the OECD policy report are: (1) preserve natural capital; (2) design and manage materials, products and processes for safety and sustainability from a life-cycle perspective; (3) use the full suite of policy instruments to stimulate and reinforce sustainable economic, environmental and social outcomes; and (4) engage all parts of society to take active, ethically-based responsibility for achieving sustainable outcomes (OECD, 2010a).

4.1.2 Horizontal linkages to related OECD programs

The OECD attempts to strengthen coordination between its SMM approach and other programs within the OECD, such as the [Green Growth Strategy](#)¹ (which should incorporate SMM outcomes over 2010-2011²), the [program on material flows and resource productivity](#)³, the

¹ The Green Growth Strategy aims to identify policies that would promote both economic efficiency and environmental integrity, while ensuring social equity. The Strategy guides government intervention across broader green growth policy areas, covering fiscal, innovation, trade, labour and social policies, as well as key sectors such as energy, transport, agriculture and fisheries. The initiative also focuses on four environmental areas: 1) climate change, 2) biodiversity and quality of eco-systems, 3) use of natural resources, and 4) materials management (OECD, 2010c).

² For details see the following URL: <http://www.unep.fr/scp/lifecycle/documents/Presentations/Sustainable%20Materials%20Management%20%28Henrik%20Harjula%29.pdf>.

project on [eco-innovation and sustainable manufacturing](#) and, outside the OECD, the UNEP Resource Panel and EU initiatives on resource efficiency. The OECD also aims to submit SSM outcomes to the Environment Ministerial Meeting in 2011. Moreover, these outcomes will, together with the work of the UNEP Resource Panel, provide a basis for a 2011 report to G8 Ministers on the implementation of the [Kobe 3R Action Plan on initiatives to reduce, reuse and recycle materials](#), and in 2013, to the OECD Council on the Implementation of Recommendations on Resource Productivity (OECD, 2008b).

The OECD aims to “optimis[e] collaboration and minimis[e] overlap” as already analysed in an OECD study (OECD 2010a). Almost all of the initiatives have a focus on: (1) reducing the impacts of manufacturing; (2) reducing the impacts of consumption; and (3) enhancing recycling and the recovery of valuable materials. Other areas of overlap include enhancing resource efficiency and productivity in materials production, reducing greenhouse gas emissions during distribution of materials/products and optimising materials recovery and reuse (OECD, 2010a:11). The study suggests that while the Green Growth Strategy and the UNEP framework for action on sustainable consumption and production provide comprehensive approaches that are intended to guide OECD government actions, the SMM and resource productivity activities/initiatives should be more focused to support specific aspects of these framework programs in order to minimise overlap (ibid.).

4.2 EU initiatives on resource efficiency

Over the past 30 years, resource use has been a theme in European environmental policy discussions – and the third Environmental Action Plan (1982-1986) has pointed out the potential of environmental policy to enhance competitiveness of the EU’s economy (Baker, 2006). Resource scarcity, however, has been lacking political attention at the European level for decades (European Commission, 2005). For example, in the fifth EAP (1993-2000) the emphasis was put on changing growth through higher material efficiency, without taking scarcity issues into consideration. As environmental policies have focused mostly on the visible problems of waste and pollutions, they were not successful in changing and reversing production patterns which led to increasing trends in consumption of resources (European Commission, 2005). Therefore, the **6th EAP (2002-2012)** aimed to set the priority on resource and waste management from a life-cycle perspective, in order to strengthen environmental policies for de-coupling economic growth from resource use. Against this background, in 2005 the European Commission proposed a [Thematic Strategy on the Sustainable Use of Natural Resources](#) to guide Member States towards more sustainable patterns of resource use.

Due to recent developments in commodity markets, especially a major surge in global raw material demand between 2002 and 2008, the **issues of resource scarcity and security of raw materials supply** as well as **resource efficiency** have moved to the forefront of the European political agenda again (interview with a representative of DG Env, 28 Feb 2011). In the framework of the Europe 2020 Strategy, the European Commission has launched two important initiatives: (1) the [new strategy on raw materials](#) (based on the earlier 2008 [initiative on raw materials](#)) which addresses security issues and improvement in supply of raw materials; and (2) the flag-

³ The OECD program on material flows and resource productivity includes the establishment of a common knowledge base to enable sound fact-based Material Flow Analysis (MFA) and to inform related policy discussions, such as SMM.

ship initiative [A Resource-efficient Europe](#) in support of a shift towards a resource-efficiency and low-carbon.

4.2.1 Thematic strategy on the sustainable use of natural resources

The **2005 EU resource strategy** has the objective to reduce negative environmental impacts generated by the use of natural resources⁴ while ensuring economic growth (European Commission, 2005:5). In more detail, it aims to decouple [decouple what?] by an increase in resource efficiency, ensuring that: (1) consumption of natural resources, both renewable and non-renewable, stays below the threshold of overexploitation; (2) environmental impacts stabilise or decrease; and (3) economic growth increases (see Figure 3 below).

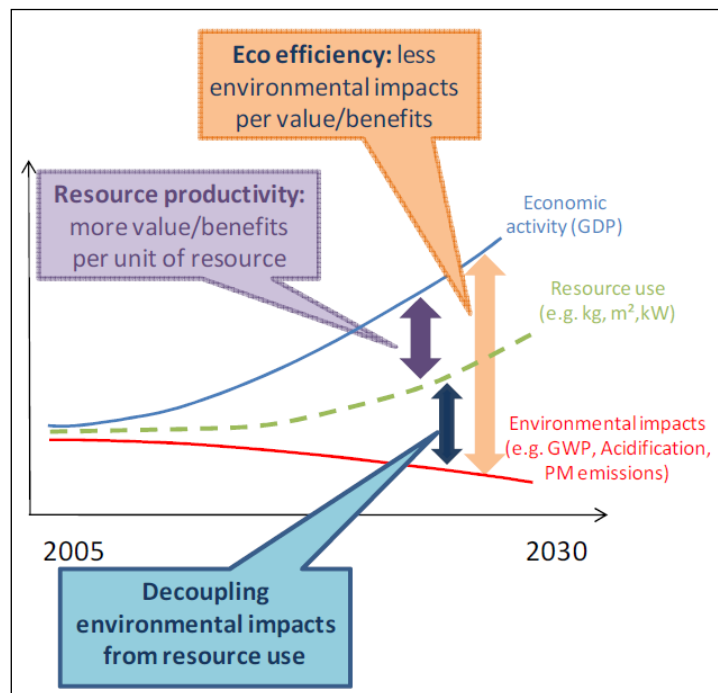


Figure 3: The EU resource strategy (BIS, 2010:20).

Four areas of action to guide implementation at the EU level and Member State levels are specified:

- improvement of understanding and knowledge of European resource use, its negative environmental impacts and significance in the EU and globally;
- development of tools to monitor and report progress in the EU, Member States and economic sectors;
- fostering of the application of strategic approaches and processes both in economic sectors and in the Member States and encouraging them to develop related plans and programmes;
- raising awareness among stakeholders and citizens of the significant negative environmental impacts of resource use.

⁴ Natural resources are defined as natural assets deliberately extracted or modified by humans activity for their utility to create economic value, divided between three categories: raw materials (metals, minerals, fossils and biomass), environmental media (air, water and soil; flow resources such as wind, geothermal, tidal and solar energy) and space or land (EC, 2005:3).

The resource strategy also offers an analytical framework to foster accountability for environmental impacts of resource use in public policies, identifying impacts throughout the whole life cycle and including global and cumulative impacts. The European Commission considers this necessary to design policy measures which can be most effective for reducing environmental impacts.

The implementation of the 2005 resource strategy was conducted through ***action plans and strategies at the national level***. A 2010 evaluation of implementation (BIS, 2010), conducted in preparation of the not yet announced review of the strategy, shows that despite improvements in resource productivity in the EU and the achieved relative decoupling of material use in some areas, absolute decoupling has not been achieved. The integration promoted by the strategy had a positive but only partial and uneven influence at the national level, which was most likely caused by insufficient understanding of its key concepts (such as ‘resources’), lack of operational tools (e.g. for measuring environmental impacts linked to resource use), and lack of specific targets with quantitative goals (BIS, 2010). Nevertheless, some promising national-level examples have been noted (see next chapter). Among the significant successes of the strategy are also the establishment of a Data Centre for Natural Resources, the development of indicators of resource use, progress in cross-sectoral policy integration, gradual implementation of the life-cycle approach and a boost in awareness of environmental impacts of resource use and life-cycle thinking at the national and European level. The evaluation recommends improvements in more precise formulations, awareness raising, the establishment of a basket of indicators, fostering the development of resource initiatives at the level of Member States, and fostering policy integration (BIS, 2010).

4.2.2 Europe 2020 flagship initiative “A resource-efficient Europe”

The European Commission has also brought the theme of resource efficiency into the [Europe 2020 Strategy](#), where it found its place as one of the flagship initiatives under the goal of ‘sustainable growth’, entitled [A resource-efficient Europe](#). The flagship initiative aims to build a strategic, integrated approach for ensuring concrete policy actions on resource efficiency. It also aims to achieve a shift towards a resource-efficient, low-carbon economy in the perspective of medium-term objectives for 2020 and pave the way towards longer-term goals for 2050. In particular, it should: (1) boost economic performance while reducing resource use; (2) identify and create new opportunities for economic growth and greater innovation and boost the EU's competitiveness; (3) ensure security of supply of essential resources; (4) fight against climate change and limit the environmental impacts of resource use (European Commission, 2011b:4). Between February and April 2011, the EC has launched a [consultation process](#), collecting the views of businesses, other stakeholders and the public on policy options for the ***roadmap to a resource-efficient Europe***, scheduled for publication in mid-2011. The roadmap will set out a vision for the structural and technological change needed up to 2050, with objectives to be reached by 2020 and suggestions about how they could be met. It will propose ways to increase resource productivity and to decouple economic growth from resource use and its environmental impact. Areas where policy action can make a real difference will be a particular focus, and specific bottlenecks, like inconsistencies in policy and market failures, will be tackled to ensure that policies are all going in the same direction. Cross-cutting themes such as con-

sumption and innovation will also be in the spotlight, and key resources will be analysed from a life-cycle or value-chain perspective ([DG Environment website](#)).

The key aim of the flagship initiative is “to increase certainty for investment and innovation by forging an agreement on the long-term vision and ensuring that all relevant policies factor in resource efficiency in a balanced manner” (European Commission, 2011a). The flagship initiative cuts across sectors and includes broad policy areas such as climate change, energy, transport, industry, raw materials, agriculture, fisheries, biodiversity and regional development. For delivering coordinated action, complex modelling will be required. Existing models have a sectoral focus, and they insufficiently capture and estimate the full impact of resource use on ecosystems, enterprises, the economy, and society. The flagship initiative, therefore, also aims to build up a knowledge base and develop a more comprehensive analytical framework.

In comparison to the 2005 resource strategy, the flagship initiative enlarges the focus to include resource management and security of supply of essential resources, and strives to better interlink demand-side (getting prices right, providing information to consumers) and supply-side (identifying critical raw materials, ensuring sustainable supply) policies addressing resource use. The flagship initiative also seems to tackle some of the mentioned shortcomings of the resource strategy, such as better policy integration across numerous sectors and policy areas, aiming for a more comprehensive analytical framework capturing impacts of resource use on ecosystems, enterprises, economy and society as a whole, enlarging the focus from resource demand to also resource supply issues (e.g. critical resources), and including global concerns and issues of resource security, as well as setting more quantifiable targets.

Moreover, the flagship initiative identifies the need for the EU to intensify international cooperation for several reasons. International cooperation on resource use would contribute to achieving the EU’s objectives of sustainable development and poverty reduction in resource-reliant developing countries. Also, encouraging the shift to clean technologies would help reduce the fast growing demand for global resources. Trade policies should therefore be better integrated with development policies (policy coherence) to address supply of resources through e.g. exchanges in skills, technology and best practice. The EU is interested in working with other international organizations such as the OECD and UNEP (European Commission, 2011b). In particular, the Rio+20 international conference on sustainable development in 2012 with its focus on green economy and environmental governance will provide a good opportunity for the EU to coordinate its resource efficiency measures with global partners.

On a more immediate time scale, the topic of resource efficiency will, among other plans, be linked to:

- the EC’s [Energy 2020: A Strategy for Competitive, Sustainable and Secure Energy](#) and the [Energy Infrastructure Priorities for 2020 and Beyond: A Blueprint for an Integrated European Energy Network](#);
- the [communication on raw materials](#) which will identify critical raw materials and define measures to help supply raw materials from domestic and global markets to the EU;
- the [Energy Efficiency Plan 2011](#) which aims to achieve energy savings of 20 % across all sectors and will be followed by a directive on energy efficiency in the 3rd quarter of 2011; and

- the [2020 EU biodiversity strategy in preparation](#).

In the long-term, following initiatives will help to deliver the flagship initiative:

- the [Roadmap for Moving to a Competitive Low-Carbon Economy in 2050](#) sets the goal of reducing gas emissions by 80-95 % by 2050 while improving the EU's energy security and promoting sustainable growth and jobs;
- the [White Paper on the future of transport](#) will present a vision for a low-carbon, resource-efficient, secure and competitive transport system by 2050, removing internal market obstacles for transport and promoting clean technologies;
- the *Energy Roadmap 2050* (to be published autumn 2011; public consultation has finished recently) will explore the possible paths towards a low-carbon resource-efficient energy system.

The flagship initiative has also linkages to earlier strategic efforts such as the [EU action plan on sustainable consumption and production](#) (2008), the [Eco-innovation Platform](#), the [Environmental Technologies Action Plan \(ETAP\)](#), and the [Integrated Product Policy](#) (2003). The aim of the flagship initiative also serves the main objective of the 2006 [EU Sustainable Development Strategy](#) (EU SDS) which explicitly mentions the need to move towards a resource efficient economy in order to enable the EU to achieve continuous improvement of quality of life both of current and future generations (Council of the EU 2006). Moreover, this initiative is also linked to other flagship initiatives of the Europe 2020 Strategy, such as the [innovation union](#), [youth on the move](#), the [European platform against poverty](#) and others.

The governance and monitoring of the flagship initiative will take place in the framework of the Europe 2020 strategy and will integrate the relevant elements of the EU SDS in order to ensure overall coherence. They will be based on an analysis of both EU policies and those of individual Member States in their National Reform Programmes as part of the [Annual Growth Survey exercise](#). This will be done as part of the European Semester for 2012 (European Commission, 2011a).

5. Resource policies and initiatives at the national level

In this chapter, the Conference Discussion Paper gives an overview of national resource policies and initiatives. Before we provide some insights into the concrete work of countries that will be present at the conference (most of which are considered as having adopted a proactive approach) (BIS, 2010), we illustrate some findings of a recent survey by the European Environment Agency (EEA).

5.1. EEA survey on national resource efficiency policies and instruments

In late May 2011, EEA published the initial findings of [their survey](#) of resource efficiency policies and instruments in its member and collaborating countries. The final report of the survey will be published in September 2011⁵.

⁵ We would like to thank Pawel Kazmierczyk, Project Manager, Sustainable Consumption and Production at the European Environment Agency, for background information on this EEA report.

The EEA initiated a survey of resource efficiency policies and instruments in its member and collaborating countries in November 2010. The survey was spurred by the Europe 2020 flagship initiative “A resource-efficient Europe” and the European Commission’s interest in expanding the knowledge base on this topic. The survey had the aim to collect, analyse and disseminate information about national experience in developing and implementing resource efficiency policies, and to facilitate sharing of experience and good practice (EEA, 2011a). A standardised set of questions was used to elicit information on the policies, targets and indicators in place; priority resources; the main policy drivers and institutional setup; and knowledge gaps and information needs. In total, 31 countries had provided information, including 25 countries of the EU-27.

The individual country submissions on their resource efficiency policies indicate that there is neither a clear definition “resources” or “resource efficiency”, nor a common understanding of the terms. Terms such as “resource efficiency”, “sustainable use of resources” or “minimising use of natural resources” are often used as synonyms. Generally, most countries seem to interpret resource efficiency rather broadly, including not only raw materials, but also water, land use, biodiversity, etc. This is largely in line with the European Commission’s interpretation of the topic in documents published to date (EEA, 2011a).

The EEA’s initial findings further argue that very few countries have a dedicated strategic policy document for resource efficiency (EEA, 2011a). Instead, six broader types of strategies or action plans commonly include references to resource efficiency: (1) national sustainable development strategies (NSDSs); (2) national environmental strategies/action plans; (3) sustainable consumption and production (SCP) action plans; (4) raw materials plans and strategies; (5) strategies and plans related to climate change; and (6) economic reform programmes. Some countries (e.g. Finland) are shifting from classical environmental policies (targeting energy efficiency, water, waste, etc.) to integrated resource efficiency policies. A few countries apply a holistic approach, focusing on greening the whole economy instead of giving attention to particular resources (e.g. UK). In terms of references to resource efficiency in sectoral policies, two sectors were far more frequently mentioned than others: (a) energy supply, renewable energy and energy efficiency; and (b) waste management and recycling.

According to the EEA’s initial findings, information on strategic objectives, targets and indicators for resource efficiency shows a large variety of approaches, directions and levels of detail (EEA, 2011a). Strategic objectives for resource efficiency tend to be fairly general in nature, most often referring to ensuring sustainable use of natural resources; improving energy efficiency; increasing recycling of waste; and waste prevention or decoupling waste and growth. Other fairly common objectives include sustainable management of minerals; improving resource efficiency; reducing energy use; increasing the share of renewable energy; improving water quality; reducing the use of water; and protecting biodiversity. Several countries (e.g. Austria, Denmark, Germany and Italy) have strategic objectives addressing absolute quantities of resources used, such as reducing resource use by a certain factor (e.g. Factor 4).

The initial findings of the survey also show that there is a great variety of institutional settings and organisational arrangements for developing and implementing resource-efficiency policies at the national level. Generally, four types of ministries are involved, specifically those addressing environment, energy, economy and agriculture. This sometimes leads to overlapping com-

petencies or unclear responsibilities. A few countries have established mechanisms to coordinate work on resource efficiency (e.g. Finland, the Netherlands). Some countries have set up 'specialised agencies' to support policy development (e.g. Finland, Germany). Regarding knowledge gaps and information needs, the responses show that countries are most interested in how best to integrate resource efficiency into other policies; sharing good practice on policy implementation; strategic objectives, targets and measuring progress; policy effectiveness evaluation; and use of market-based instruments for resource efficiency (EEA, 2011a).

5.2. Examples of national resource strategies and initiatives

We provide an overview of five countries (Austria, Finland, Germany, Hungary, and the Netherlands). Representatives of these countries will also present at the conference the most recent and/or most interesting developments in their respective country; the biggest challenges they are facing in their strategies/initiatives; as well as what they learned and what advice they would give to other countries.

5.2.1 Austria

The ***Austrian Resource Efficiency Action Plan (REAP)***, currently under development, aims to achieve an absolute decoupling of economic growth from resource consumption. The action plan considers the potential for efficiency gains, reduction of environmental impacts and reduction of primary resource consumption over the whole life cycle in a systemic way, while focusing on key use-related issues and complementing existing initiatives with targeted measures. REAP is considered an important tool for achieving the targets of the Austrian National Sustainable Development Strategy (NSDS), but also achieves synergies with other eco-innovation initiatives such as the Austrian Energy Strategy, the Public Procurement Action Plan, the Masterplan Green Gobs. The Resource Efficiency Action Plan will be finished in mid-2011.

Next to the absolute decoupling goal, the task of the action plan is to coordinate stakeholders already involved and to give existing initiatives a common direction and guidance so that they may become mutually supportive. This will be done by identifying gaps and contradictions between initiatives and identifying measures to address these gaps. The Austrian Ministry of Environment, which is mainly responsible for the coordination of this process, organised between 2009 and 2010 a number of workshops and a "round table resource efficiency" in order to involve as many stakeholders as possible from the various ministries, as well as academia and business, and to collect opinions on the priorities of the action plan. Lessons learned from the preparatory process include:

- There are already existing national-level initiatives addressing some aspects and life cycle stages of resource use. The preparation of an action plan should, therefore, start with acquiring knowledge on the existing initiatives and their synergies, and develop a network of stakeholders. The involvement of business/industry is a particularly necessary pre-condition.
- It is necessary to identify the most important areas of resource use and to provide a good data foundation for the action plan. Thus, Austria has worked out a resource report, parallel to REAP, which has collected the necessary data to serve as a foundation for the action plan.

- The following main fields of action have been identified: “resource efficient production”; “recycling and use of secondary materials”; “resource efficiency in public procurement” and “resource efficiency and awareness rising”.

5.2.2 Finland

The 2009 publication [A Natural Resource Strategy for Finland: Using Natural Resources Intelligently](#) was the first of its kind in Europe, as it addresses all natural resources within a single strategic framework (BIS, 2010). Resource use is understood by the strategy as a source of well-being and a basis for economic activities which also safeguard the environment, i.e. in a wider perspective, extending across all sectors of society. The strategy promotes four key long-term (2030) strategic goals: (1) Finland should become a bio-economy generating high added value; (2) Finland utilises and recycles materials effectively; (3) regional resources generate both national added value and local well-being; and (4) Finland takes initiatives and leads the way on natural resource issues. Key topics are: bio-economy (including the enhancement of controls over the material cycle), product-centered resource efficiency and interaction between rural areas and growth centres. The strategy is expected to have wide impact on various areas linked to natural resources, such as climate energy policies, biodiversity or reshaping of Finland’s forest sector (SITRA, 2009).

The preparatory process has been a non-governmental effort coordinated by SITRA (the Finnish Innovation Public Fund) under the supervision of the Finnish Parliament. In a dynamic process it included a wide range of individuals and organizations, representing society, politicians, administrators, business representatives, researchers, organizations and the media, who gave their opinions on targets and measures of the strategy. The preparation utilized innovative approaches where goal setting, implementation, evaluation and development work are all seen as parts of a single continuous process (SITRA, 2009:4). The implementation follows a work plan with an iterative process of strategic goal setting, implementation of specific measures and periodic reviews of the overall progress. To translate the principles conveyed by the strategy into concrete steps, a number of development projects are being implemented (e.g. projects to develop expertise in reserves and characteristics of various types of bio-materials, establishment of bio-refineries processing organic materials to produce energy and new raw materials, development of calculation methods and measures to express the use of natural resources and material flows).

The work on the strategy has led to the development of the bio-economy strategy and the [minerals strategy](#) (both adopted in 2010) as well as the publication of a government report on natural resources (submitted to the parliament for adoption in 2010). The latter report works with the vision of making Finland by 2050 “a responsible forerunner in the intelligent natural resource economy” (MEEF, 2011:51) and follows the strategic guidelines of the resource strategy when formulating areas of change and outlining the challenges ahead. The report will be integrated in the 2011-2014 government program, and is expected to play an important role in shaping resource policies.

5.2.3 Germany

As a response to the 2005 EU Resource Strategy, the German Federal Ministry of Environment initiated research projects in various fields related to resource efficiency. One of the most important, involving 31 research institutes and lasting from 2007 - 2010, was on [material and resource efficiency](#), with an analysis of policy instruments that is also useful for policy makers. In 2007, the ministry also invited various stakeholders from industry, economy, society and academia to participate in a [network on resource-efficiency](#), an experiment in finding new forms of governance with the aim not only to foster closer collaboration and innovation, but also to share information on ongoing initiatives in efficiency improvement. The Ministry of Environment was also asked by the Ministry of Economy to develop an **updated governmental strategy on resource efficiency** which will be adopted late 2011/early 2012. First drafts of the strategy are already published and open for comments from various stakeholders. The implementation of the strategy shall be horizontally coordinated between the Ministry of Environment and other relevant ministries, but involvement is expected also from the Parliamentary Committee for Inquiry into Growth, Prosperity and the Quality of Life.

The strategy aims to strengthen the target of doubling raw material by promoting a quadrupling of resource efficiency in the medium term by 2020 (i.e. the factor 4 approach, closely linked to the national SD strategy, which sets similar goals for productivity improvements). This initiative is one of the rare attempts to set quantitative targets regarding overall resource use in the EU (BIS, 2010:68). The draft of the strategy contains a description of the challenges, indicators for resource efficiency, and an outline of 20 actions addressing resource efficiency from the perspective of (i) resource policies, (ii) production and consumption, and (iii) circular flow economy and analyses of mass flows.

5.2.4 Hungary

In Hungary, environmental issues have grown in importance since the change of regime and EU accession has also accelerated the pursuit of environmental policies. Besides environmental concerns, the improvements in resource efficiency seen in the past decades were partly due to economic restructuring, e.g. closing inefficient industries and mines, investments into improving efficiency of the remaining industries, substantial shift towards the service sector, etc. (EEA, 2011b).

In the last few years, as a result of new environmental challenges, growing public consciousness, and because of the need for new ways of economic development, sustainable consumption and production, resource efficiency and green economy have become keywords and thus gain focus in policy making. The fact that Hungary is not abundant in many important resources means that security of supply remains a main concern. Besides, the growing costs of resource use and the restricted access to many resources have led to the recognition of water, soil and land, biodiversity, energy as resources of strategic importance. As a consequence, improving resource efficiency is an overall objective of several policies in Hungary (EEA, 2011b).

Improving resource efficiency is addressed in the National Environmental Program in a comprehensive way. Sectoral plans, in particular the Waste Management Plan, is elaborated in accordance with the thematic program of the National Environmental Program. The [National En-](#)

[Environment Program \(NEP\)](#) 2009-2014 addresses environmental issues in a comprehensive and integrative manner. The elaboration of the program was based on Driving forces-Pressures-State-Impacts-Responses (DPSIR) logic, offering an opportunity to address resource efficiency in a complex way. The NEP contains 9 thematic action programs and focuses, inter alia, on the improvement of resource efficiency and energy, biodiversity, sustainable management of our genetic resources, sustainable land use, sustainable water management, sustainable production and consumption, food safety, waste management.

As regards energy and resource efficiency, the NEP intends to continue with the steps aiming at improving the efficiency of production and technology development in different sectors (e.g. promotion of material efficient technologies, waste reduction to be applied during design, enforcement of the chemicals policy, improvement of energy intensity, application of environment management systems, and utilisation of secondary raw materials). The NEP sets as an objective the widespread application of principles and methods helping the prevention and/or reduction of environmental pressure related to production as well as to facilitate the adoption of a life cycle approach, and identifies measures to be implemented by different stakeholders (EEA, 2011b).

The development and implementation of policies on resource efficiency are coordinated at ministerial or inter-ministerial level, mainly by the Ministry of Rural Development (water, nature protection and biodiversity, waste, etc.), the Ministry of National Development (climate change, energy) as well as the Ministry for National Economy (raw materials, industry). In addition to the ministerial level coordination, agencies are set up for specific themes and sectoral initiatives, e.g. Energy Centre, Hungarian Office for Mining and Geology, Research Institute of Agricultural Economics, etc (EEA, 2011b).

5.2.5 The Netherlands

The Netherlands were one of the first countries to set the decoupling of environmental degradation from economic growth as an overarching objective (the third National Environmental Action Plan 1998). Means of breaking the link between economic growth and environmental pressure included environmentally-friendly goods and services, efficient land use and internalizing environmental costs in prices. In the early 2000s, it became clear that an integrated approach to resource use was needed: Dutch consumption is often part of a chain involving the production of raw materials and their transport from other countries, with processing taking place in the Netherlands and the use and disposal of products taking place in the Netherlands or exported. The **fourth National Environmental Policy Plan** (2001), therefore, argued that in order to make the whole chain sustainable, and to avoid shifting of the problem to other regions or future generations, a transition of the entire international system of production and consumption would be needed. It formulated a goal for 2030 of “a safe and healthy life within an attractive living environment surrounded by dynamic nature areas, without damaging biodiversity or exhausting natural resources” and launched programmes for the energy system (including mobility), biodiversity and food/agriculture.

Recently, the Netherlands has strongly advocated the development and implementation of sustainability criteria for bio-fuels, which should prevent that CO₂ is reduced at the expense of social costs (e.g. raising food prices) and degradation of ecosystems. The Netherlands Standar-

disation Institute, with the support of market parties, the government and NGOs, has developed certain standards to ensure the sustainable production of biomass for energy along the whole chain, and to help companies and consumers to adopt more sustainable consumption patterns. This voluntary instrument sets out specific criteria based on the minimum requirements for sustainable bio-mass production and use. A certification expected to be enforced in 2011 will ensure that applicants comply with those criteria.

Also related is the Dutch Sustainable Trade Initiative (IDH), which has a mission to accelerate and up-scale sustainability within mainstream commodity markets, particularly focusing on mainstreaming social and ecological sustainability of commodity supplies from emerging markets to the Netherlands and Western Europe. The IDH includes the Millennium Development Goals for poverty reduction, sustainable environment, and an open trading and financial system (MDGs 1, 7 and 8). It is forging coalitions between government agencies, companies, trade unions and social organizations, and sector by sector transforming the market to make sustainable production and trade the norm ([currently implementing programs](#) on [cocoa](#), [tropical timber](#), [tea](#), [natural stone](#), [soy](#), [tourism](#), [cotton](#), [aquaculture](#), [electronics](#) and [spices](#)).

6. Working group topics and formats

Like in previous ESDN conferences, parallel working groups will discuss the conference topic in-depth. This year, the main objectives of the four working groups (WGs) are

- a) to discuss four specific dimensions of resource policies in Europe respectively:
 - i. innovation dimension (WG 1);
 - ii. security of supply and resource security (WG 2);
 - iii. ecological and social rucksack, rebound effect (WG 3);
 - iv. resource policies and governance challenges (WG 4); and
- b) to develop, in each of these dimensions, recommendations for resource policy in the context of sustainable development in Europe and the national level.

Each of the four WGs will be kicked off by a flashlight presentation that will provide a short overview of the respective dimension/topic of resource policy and will present first recommendations. After the flashlight, the participants of each WG will have a general discussion on the topic and bring in their own experiences and thoughts. The participants will then split into smaller groups to discuss the recommendations presented in the flashlight, and will work on additional recommendations. After this discussion in sub-groups, the participants will share their recommendations and will vote on the 3 most important ones.

On the next day, the recommendations developed in the WGs will be presented in the plenary by the WG moderators (ESDN Office staff). Afterwards, a final reflection on all recommendations by the conference participants will take place in the form of table discussions.

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