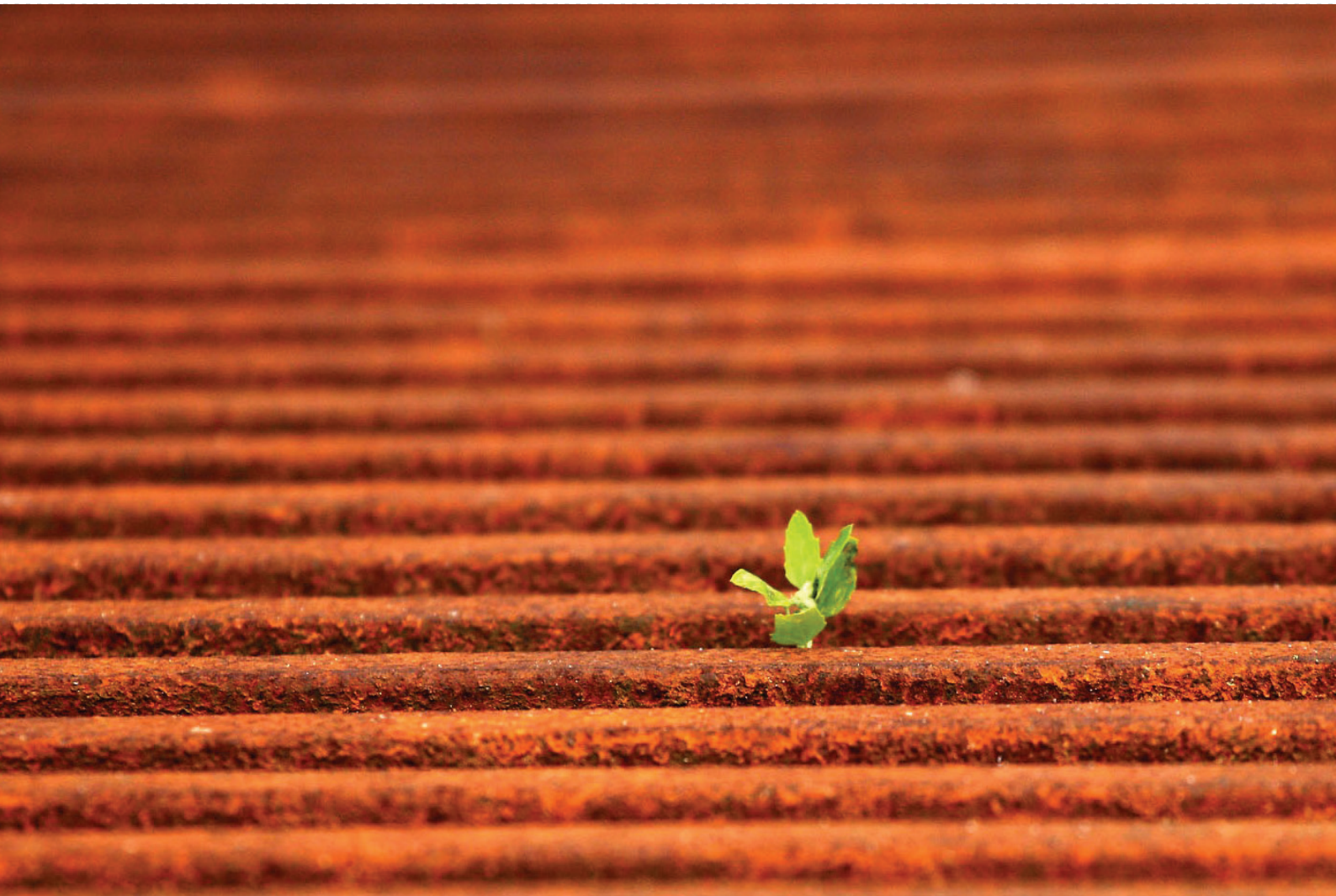


Resource efficiency in Europe

Policies and approaches in 31 EEA member and cooperating countries

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European Environment Agency
Kongens Nytorv 6
1050 Copenhagen K
Denmark
Tel.: +45 33 36 71 00
Fax: +45 33 36 71 99
Web: eea.europa.eu
Enquiries: eea.europa.eu/enquiries

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Prepared by:

Paweł Kaźmierczyk, Mikkel Stenbæk Hansen, Jens Günther, David McKinnon, Christian Loewe, Fredrik Lingvall, Tamas Kristof Kallay, Jozsef Szlezak, Bettina Bahn-Walkowiak, Marton Herczeg, Dominic Wittmer.

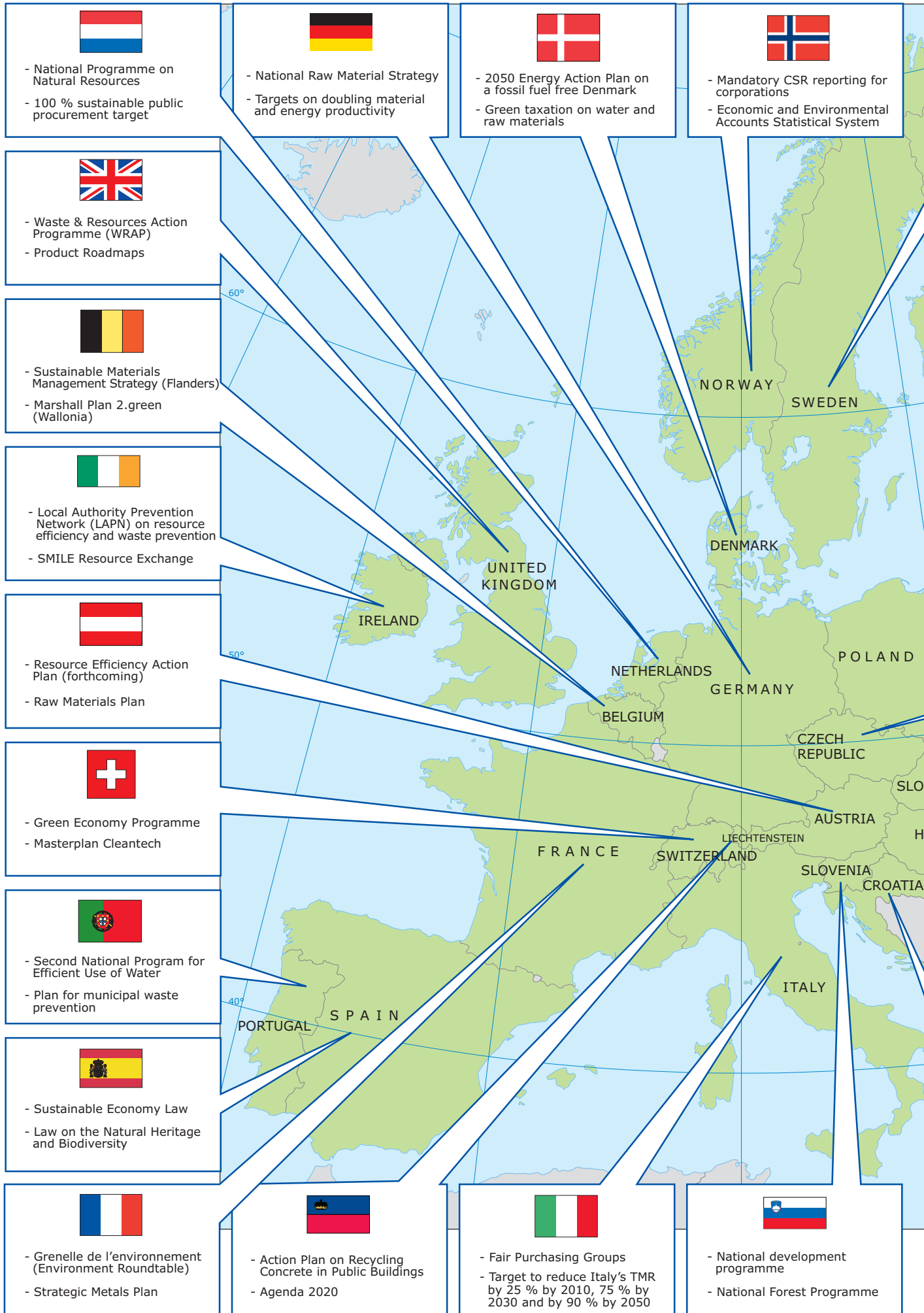
ETC/SCP Task Managers:

Mikkel Stenbæk Hansen and Jens Günther.

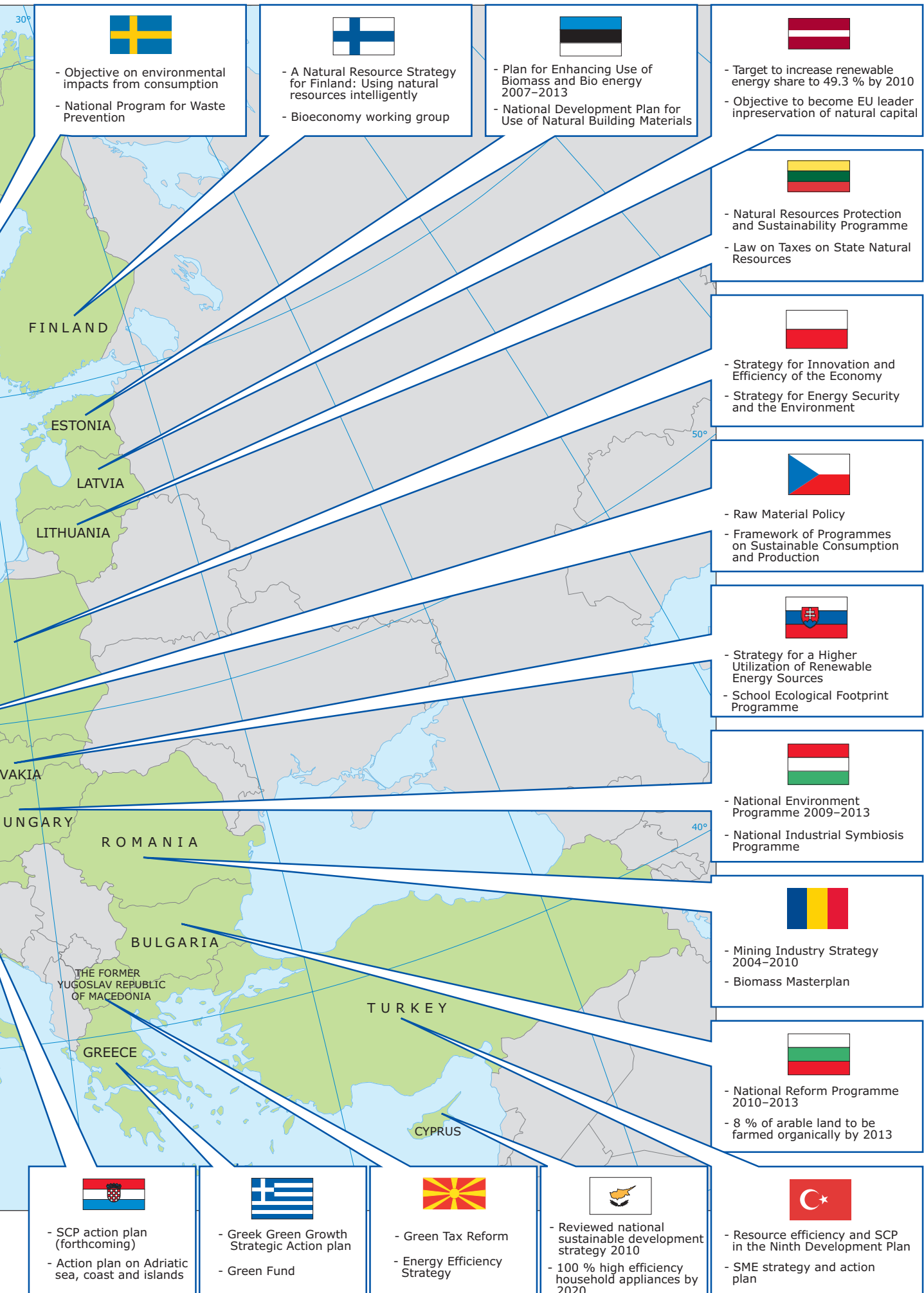
EEA Project Manager:

Paweł Kaźmierczyk.

Selected examples of resource efficiency policies, instruments or targets presented in the country profiles



Further information about resource efficiency policies, including the 31 detailed country profiles, are available on the EEA website: <http://www.eea.europa.eu/resource-efficiency>



Executive summary

Rationale and objectives of the survey

Resource efficiency is now a key priority for policymakers across Europe — as the EU underlined when it designated resource efficiency as one of seven flagship initiatives in its Europe 2020 strategy for smart, sustainable and inclusive growth.

In November 2010, anticipating the need for countries to respond to the Europe 2020 Resource Efficiency Flagship Initiative and in view of the European Commission's interest in expanding the knowledge base on the topic, the European Environment Agency (EEA) and its European Topic Centre on Sustainable Consumption and Production (ETC/SCP) initiated a survey of resource efficiency policies and instruments with its member and cooperating countries network (Eionet).

The survey aimed to collect, analyse and disseminate information about national experiences in developing and implementing resource efficiency policies, and to facilitate sharing of experiences and good practice.

A total of 31 countries provided information, including 25 Member States of the EU-27. Information on national resource efficiency policies was provided by Eionet's national reference centres for sustainable consumption and production and resource use or by national focal points, following the same EEA approach used in the country assessments in the EEA's report *The European environment — state and outlook 2010* (SOER 2010).

To maximise the consistency of country reports, a standardised set of questions was used to elicit information on policies, targets and indicators in place; priority resources; the institutional set-up and main policy drivers; and knowledge gaps and information needs. The project team reviewed initial country responses to identify the possible need for additional information, to suggest areas to strengthen and to ensure maximum consistency across countries. Revised country responses were published as 'country profiles on resource efficiency

policies' and are available on the EEA website: www.eea.europa.eu/resource-efficiency.

Key points from the analysis of the information provided by countries

This summary report presents an overview of findings from the analysis of information provided by countries. It reviews national approaches to resource efficiency and explores similarities and differences in policies. The analysis is illustrated with short examples of policy initiatives in the countries, which are described in more detail in the country profile documents. The key findings are set out below.

Defining 'resources' and 'resource efficiency'

- One of the key goals of the survey was to determine how the countries define or interpret the terms 'resources' and 'resource efficiency', so the survey included no definitions for them. The country submissions indicate that there is neither a clear definition nor a common understanding of key terminology. Terms such as 'resource efficiency', 'decoupling', 'sustainable use of resources' or 'minimising use of natural resources' often seemed to be used as synonyms. However, this could partly result from problems translating terminology into various languages.
- Only five countries (Austria, Cyprus, Hungary, Poland and Spain) formally define the term 'resources' in their policies, and some of those use a more narrow term, 'raw materials', when addressing resource efficiency. Generally, most countries seem to interpret resource efficiency quite broadly, including raw materials, energy sources, biomass, waste, land and soil, water and biodiversity. This is largely in line with the European Commission's interpretation in documents published to date.
- Several countries noted difficulty in interpreting what is covered under the heading 'resource efficiency' and how this new policy priority is related to 'sustainable consumption and

production (SCP)', 'sustainable use of natural resources', 'green economy', etc.

Resource efficiency in strategies and action plans

- Very few countries (Austria and Germany as well as the Flanders Region in Belgium) report having a dedicated strategic policy document (e.g. a strategy or a national action plan) for resource efficiency. Instead, six broad 'economy-wide' types of strategies or action plans commonly include references to resource efficiency. The most common were national sustainable development strategies and national environmental strategies and action plans, followed by SCP action plans; raw materials plans and strategies; strategies and plans related to climate change; and economic reform programmes.
- About a half a dozen countries seem to be shifting from classical 'environmental' policies (targeting energy efficiency, water, waste, etc. in a standalone fashion) to more integrated resource efficiency policies. A couple of countries reported applying an holistic approach focusing on greening the whole economy, instead of giving attention to particular resources.
- Concerning resource efficiency featuring in sectoral policies, the two sectors most frequently mentioned were energy (including supply of energy, energy efficiency, use of renewable energy sources and climate change) reported by 28 countries and waste (management of waste, and recycling and recovery) noted by 22 countries. Additionally, the public sector (mainly in the context of green public procurement), building and construction, water management, forestry and transport were frequently mentioned. Some countries also listed technological innovation, mining and quarrying, agriculture, industry and fisheries.
- Except for transport, the services sector does not appear to be a target of resource efficiency policies at present.

Priority resources

- The priority resources most commonly reported by countries were energy carriers (22 mentions) and waste (18), followed by minerals and raw materials (16) and water (14). These four were followed by forests and timber, biodiversity, biomass and renewable energy sources. Beyond those, a large diversity of resources were mentioned reflecting local conditions: land and soil, construction materials, agricultural crops, air, fish, metals, the sea and coast, and others.

- When individual priority resources reported by countries are grouped into broader categories (e.g. timber, agricultural crops and fish can be combined into the category 'biomass') the picture changes somewhat and the top three priority resources become: energy sources (including fossil fuels and renewables), biomass (including agricultural crops, timber and fisheries) and raw materials (including minerals, construction materials and metals). These were priorities in about three quarters of the countries. About half of the countries listed waste, land and soil, and water as priority resources.

Strategic objectives, targets and indicators

- Information provided by countries on strategic objectives, targets and indicators for resource efficiency reveals a large variety of approaches, directions and levels of detail. Strategic objectives for resource efficiency tend to be fairly general in nature, most often referring to ensuring more efficient use of natural resources, materials and energy; increasing recycling of waste; improving the share of renewables in the overall energy mix; and preventing waste or decoupling waste generation from economic growth (all reported by more than half of the countries). Other fairly common strategic objectives focus on reducing use of water and protecting water resources, sustainable forest management, and halting the loss of biodiversity.
- Half a dozen countries have strategic objectives addressing absolute quantities of resources used, such as reducing resource use by a certain factor or percentage. Some countries aim to reduce the use of fossil fuels.
- Only Sweden reported having strategic objectives related to global environmental impacts of national consumption, while the Netherlands reported addressing the environmental impacts embodied in international trade.
- In the context of promoting resource efficiency, a large number of countries reported having strategic objectives related to SCP, indicating that they consider resource efficiency as a challenge related to the entire production-consumption system in the economy.
- Concerning consumption areas with significant environmental impacts, several countries reported having objectives and/or targets in the fields of housing (typically for energy efficiency in buildings and sometimes for appliances and electricity use); mobility (typically for increased use of biofuels in transport and fuel-efficiency standards for cars); and food (typically on the amount of land under organic farming).

However, in most cases objectives and targets aimed at improving technological efficiency rather than addressing consumption by managing demand.

- The country responses indicate that concrete and measureable targets related to resource efficiency are most commonly set for waste, energy use and energy efficiency, reducing GHG emissions, and increasing the share of land used for organic farming. Most targets tend to be driven by EU requirements.
- Only six countries reported targets addressing material efficiency and use of materials.
- The level of detail and focus of indicators on resource efficiency varied widely, possibly reflecting the rather broad understanding of the term. The most widely used indicators (identified in between half and two thirds of the countries) seem to be in the areas of waste, energy and material use. Indicators related to water, land use and forestry are also relatively widespread. Only a few countries reported indicators that take account of pressures embedded in imported goods. A handful of countries reported indicators on patterns of consumption and on environmental awareness. Four countries reported using indicators on the environmental impacts of resource use.

Experience with resource efficiency policy instruments

- Countries were invited to present those policy instruments and initiatives that they consider good practice for improving resource efficiency. No attempt was made through this question to make a methodical and comprehensive analysis of policy instruments used. However, the examples presented indicate that countries see most value in sharing experience regarding economic instruments and information-based instruments. Only a few countries mentioned research programmes or initiatives addressing household consumption.

Institutional and organisational arrangements

- There is a great variety of institutional settings and organisational arrangements for developing and implementing resource efficiency policies. Typically four types of ministries are involved — those addressing environment, energy, economy and agriculture, often with responsibility for a single sector or type of resources. Quite often

national environmental agencies or various specialised 'efficiency agencies' also play a role. This abundance of actors sometimes leads to overlapping competencies or unclear responsibilities.

- Only a few countries have established mechanisms to coordinate work on resource efficiency nationally. Some countries have set up 'specialised agencies' or research consortia to support policy development. The involvement of regional and local level administrations in policymaking seems to be limited (although the survey did not ask specifically for information on activities at the regional and local levels).

Policy drivers

- Factors frequently reported to drive resource efficiency policy can be roughly grouped into those related to the environment (e.g. concerns about environmental degradation or sustainable development) and those related to the economy (e.g. the energy crisis, rising costs of resources, the need for a deep economic reform, future resource scarcity or reducing dependence on imports). There was no clear conclusion as to their relative importance, except when policy priorities were driven by an acute shortage of a critically important resource (e.g. water).
- EU policy initiatives appear to be a strong driver of policy development at the country level. A dozen countries reported already including various aspects of resource efficiency in new policies and strategies prepared in response to the Europe 2020 Strategy and its flagship initiatives, as well as the EU Raw Materials Initiative. EU accession requirements were a major factor for candidate countries.

Knowledge gaps and information needs

- From the responses on knowledge gaps and information needs, it appears that countries are most interested in information on how best to integrate resource efficiency into other policies and in sharing information and experience on good practice in policy implementation. Other topics of interest to several countries included strategic objectives, targets and indicators to monitor progress, and assessing the effectiveness of various policy instruments. However, with almost fifty separate issues, there was a large variety of needs and interests.

Some EEA considerations for future policies on resource efficiency

Building on the survey's findings, some EEA reflections on the analysis of country information are presented below. These could be considered in developing future resource efficiency policies at the EU and country levels.

Benefits of resource efficiency policies: synergies and trade-offs

Reflecting on the drivers for resource efficiency policymaking, the countries indicated a combination of environmental, economic and political factors. In doing so, they highlighted the potential synergies between efforts to achieve environmental and economic goals. For example, one of the most commonly reported priority resources is waste, now widely recognised as economically important because it is a secondary raw material and a substitute for primary resources. At the same time, better waste management has the additional benefit of reducing greenhouse gas emissions and other pressures on the environment, with potentially significant economic and social benefits.

Efforts will be needed to ensure that resource efficiency policies are coherent with other key policies. In some instances, decision-makers face the need for trade-offs. For example, the introduction of 'biomass for energy' strategies in many countries, driven by the need to increase the share of renewable energy sources in the overall energy mix, means that biomass resource efficiency could become a key policy area in the near future. This could draw in agricultural or forestry policy and necessitate compromises between energy policy, agricultural and food policy, spatial planning, biodiversity preservation and ecosystem maintenance.

EU policies can play a key role as a driver of resource efficiency policymaking

While countries often adopt sectoral and resource-specific policies due to the importance of particular resources or sectors, other policies result from EU and international requirements. Indeed, EU policy initiatives appear to be a strong driver of national policies, indicating both an opportunity and a need for EU resource efficiency policies to provide guidance and strategic direction.

In addition to elaborating specific policies, EU contributions could include helping to develop

a common understanding of key concepts around resource efficiency, enabling sharing of knowledge and experience, and guiding work on development of indicators. They could also include stimulating a discussion on targets for reduced consumption of certain materials or reducing overall use of resources.

Towards a common understanding of resource efficiency

The survey responses revealed fairly widespread uncertainty about the definition of 'resource efficiency' and its relationship to other concepts such as 'sustainable consumption and production' and 'the green economy'. This uncertainty appears to complicate efforts at the country level to develop policies and to set targets and policy objectives.

To support policy coherence, it could be helpful to develop and communicate an understanding of the interlinkages, overlaps and synergies between these and related concepts. One possible approach could be for EU resource-related policies to use broad interpretations of 'resource efficiency' but leave it to the countries to decide which policies and resources are most relevant in their national context.

Targeting resource efficiency policy

Most countries identify resource efficiency as a priority in economy-wide strategies but policy measures to increase resource efficiency are primarily located in environmental or sectoral policies. This mismatch raises a question about where to focus policy intervention — the economy as a whole, selected sectors or priority resources.

Consumption appears to be a priority area for strengthening policy if resource efficiency is to improve significantly. Very few countries presented examples of policies and instruments addressing consumption. Those that did mainly referred to information instruments (e.g. various labels), or focused on technical efficiency improvements rather than on managing demand.

Using economic instruments to change consumption behaviour could be particularly important, given the apparently limited national experience with policies addressing consumption, except for information-based instruments. Another topic of interest — important although raised by only a few countries — could be how to address the rebound effect and steer consumption towards low-impact products or services.

Product-oriented resource efficiency initiatives did not feature prominently in country responses, with the exception of a general emphasis on green public procurement and some mention of integrated product policy, both driven by EU initiatives. This indicates that resource efficiency could be strengthened through an increased focus on products (and thus also on consumption). Furthermore, increasingly globalised product chains and ever growing international trade imply that EU product-oriented initiatives could also have a global knock-on effect for improving resource efficiency.

Financial sector and business community participation in developing policies on resource efficiency appears to be limited, judging by country responses. This highlights the importance of making a business case for resource efficiency. Three particularly relevant aspects in this context include decreasing dependence on imports of strategic resources, creating green jobs and maintaining the competitive edge of European industries.

Global environmental impacts of a country's consumption are increasingly the focus of policy debate and some emerging national initiatives. This indicates a desire for policies that take into account resources 'embedded' in global trade, in addition to the traditional focus on 'domestic' resource efficiency (within national borders).

Setting policy objectives and targets

Strategic objectives and targets vary substantially across countries. Future EU policies could play an important role in defining common EU-wide strategic objectives and targets on resource efficiency, perhaps with differentiated time perspectives. While agreeing and setting targets is a politically complex process, the survey demonstrated that common EU targets can be an important driver for policy development at the country level. New policies could include specific targets where feasible, or provisions for setting targets at a later date, or provide a framework for discussing aspirational targets.

Indicators and measuring resource efficiency

Building on current Commission work on resource efficiency indicators, future efforts could emphasise the need for EU-wide integrated resource efficiency indicators. Among other things, these would address trade-offs and resources embedded in traded goods, and would include impact indicators that combine economic and ecosystem objectives. Several accounting methods (e.g. material flow accounting, NAMEA and environmentally extended input/output analysis, lifecycle assessment, ecosystem capital) offer the potential to produce a coherent indicator package of this sort.

Targets and indicators are one of the areas identified by countries as a priority for exchanging experience and sharing good practice. One important element in this context would be to intensify cooperation between policymakers and the statistical offices or research institutes responsible for producing resource efficiency indicators.

Strengthening the knowledge base for resource efficiency

Reflecting on their information needs and knowledge gaps, countries identified over fifty different issues. Among the more common needs were information on how best to integrate resource efficiency into other policies; good practice in policy implementation (including assessing policy effectiveness); and setting strategic objectives, targets, and indicators. Further work on strengthening the knowledge base for resource efficiency could target some or all of these areas.

Initiatives on institutional development and capacity-building could focus on better integration of resource efficiency within existing institutions; stimulating closer inter-institutional collaboration and strengthening coordination mechanisms to improve policy coherence and consistency; and fostering stakeholder dialogue and public participation to mobilise broad support for policy implementation.

It could also be worth exploring if and how a platform for sharing good practice in resource efficiency policy could assist policymaking at the national, regional and local levels.

1 Background and scope of work

Resource efficiency is now a key priority for policymakers across Europe — as the EU underlined when it designated resource efficiency as one of seven flagship initiatives in its Europe 2020 strategy for smart, sustainable and inclusive growth (European Commission, 2010).

In November 2010, anticipating the need for countries to respond to the Europe 2020 Resource

Efficiency Flagship Initiative (European Commission, 2011) and in view of the European Commission's interest in expanding the knowledge base on the topic, the European Environment Agency and its European Topic Centre on Sustainable Consumption and Production initiated a survey of resource efficiency policies and instruments with its member and cooperating countries network (Eionet).



Note: Further details about the survey, including the 31 country profiles, are available on the EEA website: <http://www.eea.europa.eu/resource-efficiency>.

The survey aimed to collect, analyse and disseminate information about national experiences in developing and implementing resource efficiency policies, and to facilitate sharing of experiences and good practice.

A total of 31 countries provided information, including 25 countries of the EU-27. A full list of participating countries is provided in Annex 1. Information on national resource efficiency policies was provided by Eionet's national reference centres for sustainable consumption and production and resource use, following the same approach used in the country assessments in *The European environment – state and outlook 2010* (SOER 2010) (EEA, 2010).

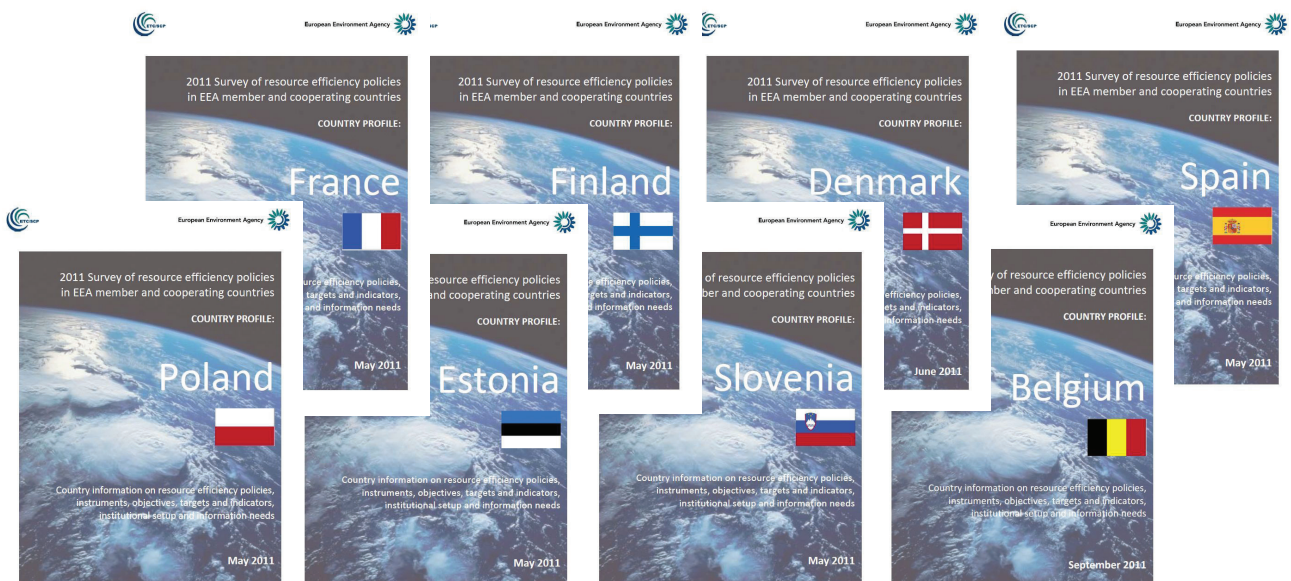
The results comprise the following components:

- A set of **31 country profiles on resource efficiency policies** – self-assessments prepared by countries with assistance from the EEA and the ETC/SCP. These documents broaden the knowledge base for policymaking by describing the current status of resource efficiency policies in each country (including an inventory of policy initiatives, priority resources, strategic objectives, targets and indicators, institutional set-up, information needs and examples of policy initiatives or instruments proposed by each country).
- This **summary report** prepared by the EEA and the ETC/SCP. It presents an overview of findings from the analysis of final information

provided by 31 EEA member and cooperating countries on resource efficiency policies and instruments. It reviews national approaches to resource efficiency and explores similarities and differences in policy responses. The analysis in the report is illustrated with examples of policy initiatives in the countries.

As an interim deliverable, an informal paper drawing on initial information from the countries was prepared in March 2011 to inform the development of the Commission's forthcoming Communication on a Roadmap to a Resource Efficient Europe (European Commission, 2011b). The paper presented initial findings from an analysis of country information and was accompanied by draft country profiles. Neither the initial findings nor the draft profiles were broadly disseminated, however, as they were based on preliminary information.

The survey used a standardised set of questions to elicit information on policies, targets and indicators in place; priority resources; the main policy drivers and institutional set-up; and knowledge gaps and information needs. The eight questions, set out in Annex 2 to the present report, were accompanied by detailed guidance and supplemented with examples of country profiles as they became available. The project team reviewed initial country responses to identify the possible need for additional information, to suggest areas to strengthen, and to ensure maximum consistency across countries. Revised responses underwent a light language



Eionet: a partnership network

Eionet is a partnership network of the European Environment Agency (EEA) and its member and cooperating countries. It consists of the EEA itself, six European Topic Centres (ETCs) and a network of around 1 000 experts from 39 countries in over 350 national environment agencies and other bodies dealing with environmental information.

In-country networks consist of the **national focal points** (NFPs) and the **national reference centres** (NRCs). NFPs are the main contact points for the EEA and organise national coordination of activities related to the EEA. NRCs are nationally funded groups of experts in organisations nominated by member countries, which possess relevant knowledge on various environmental issues. NRCs are established in twenty-six specific areas of environmental activity, for example air quality, climate change, river quality, waste generation, biodiversity, energy, or sustainable consumption and production including resource use.

Through Eionet, the EEA gathers timely, nationally validated, high-quality environmental data from countries, which contribute to the integrated environmental assessments and other analysis available on the EEA website. The Eionet partnership is crucial to the EEA in helping collect and organise data and develop and disseminate information.

More information is available at <http://www.eea.europa.eu/about-us/countries-and-eionet>.

edit, and after a final check for consistency with the structure, were used to publish 'country profiles on resource efficiency policies'. After confirmation by the countries that they represent the best available information, these were made available on the EEA website.

The participation rate in this voluntary initiative was very high. This was most likely due to a combination of policy relevance (notably regarding the Europe

2020 Resource Efficiency Flagship Initiative and the forthcoming Communication on a roadmap to a resource-efficient Europe), internal country needs, the initiative's focus on exchange of information and good practice, and the motivation and dedication of Eionet contributors.

Further information about the survey, including the 31 country profiles, is available on the EEA website: <http://www.eea.europa.eu/resource-efficiency>.

Important note:

The analysis in this survey is based solely on the information in the country profiles provided by EEA member countries through the national reference centres on SCP and resources and the national focal points. Substantial efforts were made to ensure that the responses from the countries are as complete and comprehensive as possible. This included providing guidance at the outset of the survey about the types of national institutions that are relevant to resource efficiency and whose input could be sought, and carrying out a thorough review of initial country responses to suggest possible additional topics to consider. However, it was ultimately left to the countries to decide the scope of the responses. Thus, no claim is made that this report covers all possible facets of resource efficiency — it is possible that countries have policies, instruments or targets related to resource efficiency that remain unreported.

2 Definitions of 'resources' and 'resource efficiency'

Before presenting the analysis of country information, it is necessary to reflect on how the countries interpret and use the terms 'resources' and 'resource efficiency'.

By design, the survey did not define the two terms, nor did it point to the terminology used in the Thematic strategy on the sustainable use of natural resources, or in the material flow accounting framework developed by Eurostat. Indeed, the guidance provided to countries explained that one of the goals of this work was to examine how the countries themselves interpret the terms and approach the topics.

Eurostat's economy-wide material flow accounting framework

To monitor economy-wide material flows, Eurostat has developed an accounting methodology and a number of indicators that describe the material throughput and material stock additions in a (national) economy expressed in tonnes. It accounts for all extraction of biomass, fossil fuels, metals and metal ores and industrial minerals, and for imports and exports of all goods, but it excludes water and air.

More detail on the MFA terminology is provided in Annex 7.

The country reports present two possible routes to arrive at national interpretations of the terms. First, national policies and legislation sometimes — albeit rarely — include explicit definitions. Second, a definition or scope can be 'deduced' by reviewing countries' policies, action plans, priorities, objectives and targets.

In the forthcoming **Austrian Resource Efficiency Action Plan**, the term 'resources' mostly applies to 'materials' such as metals, minerals, biomass and fossil-based substances. However, there are also links to energy efficiency and efficient use of 'other natural resources' such as water or soil.

For more details, see the country profile documents.

Analysis of the information in the country profiles shows that only a few (5) countries formally define the term 'resources' in their policies. Austria provides such a definition in its Resource Efficiency Action Plan, while Cyprus defines 'natural resources' in its sustainable development strategy. In a few other countries the term is defined in environmental legislation or policies (Hungary, Poland, Spain).

Spain defines natural resources as 'every component in nature susceptible to use by a human to satisfy his or her needs and with a real or potential value, such as natural landscapes, surface and underground water, soil, subsoil and agricultural land, forest, hunting and protected land, biodiversity, geo-diversity, genetic resources and ecosystems that support life, hydrocarbons, hydroelectric, aeolian, solar, geothermal and similar resources, air, radio-electric spectrum, minerals, rocks, other geological renewable and non-renewable resources.'

(Spanish Law 42/2007 of the Natural Heritage and the Biodiversity).

For more details see the country profile documents.

The analysis of country information also shows that the understanding of 'resources' is mostly based on classical environmental policies focusing on single resources or environmental media. Most of the countries place primary focus on energy sources (28) and 'raw materials' like metals, minerals and biomass (24 countries reported at least two of the three as a priority) in their national resource-related policies. However, energy carriers (mainly fossil fuels) generally fall under a separate, energy-related policy area.

One interesting trend is that the majority of the countries (24) now consider waste — as a secondary raw material — to be a priority resource and see waste recycling and recovery as an important tool for reducing material consumption and improving resource efficiency.

All in all, by addressing energy, waste, water, food, atmosphere, biodiversity, soil or land in the context of resource efficiency, nearly all the countries seem to go beyond raw materials in their understanding of natural resources. Several countries also include more locally specific aspects like cultural and recreational values of ecosystem services, game animals, fish resources, sea coasts and islands, landscape, brines and thermal waters or genetic resources (in relation to biodiversity).

Poland's National Environmental Policy for 2009–2012 distinguishes between 'protection of natural resources' and 'improving the state of the environment and environmental security'. Topics covered under the heading of 'protection of natural resources' include nature protection, sustainable forestry, rational use of water resources, soil protection, and sound management of geological resources. Areas under the heading of 'improving the state of the environment and environmental security' include health and environment, air quality, protection of water quality, waste management, noise and electromagnetic fields, and chemicals in the environment.

For more details, see the country profile documents.

None of the countries provided an explicit definition of resource efficiency. Most (26) focused on raw materials or material resources when referring to resource efficiency. Terms like 'resource efficiency', 'resource productivity' and 'decoupling' are used interchangeably, to express how 'efficiently' the economy is using resources. Several countries (Estonia, Italy, Norway, Portugal) referred to the concept of double decoupling (i.e. decoupling economic growth from resource use and from environmental pressure, as defined in the

Natural resources in the **EU's Thematic strategy on the sustainable use of natural resources** are defined to cover 'raw materials such as minerals, biomass and biological resources; environmental media such as air, water and soil; flow resources such as wind, geothermal, tidal and solar energy; and space (land area)'. The 2011 **EC communication 'Roadmap to a resource efficient Europe'**, is also based on a broad understanding of resources, including raw materials, energy, water, air, land and soil, biodiversity, stable climate and ecosystem services.

EU thematic strategy on the sustainable use of natural resources (European Commission, 2005) to clarify their understanding of resource efficiency. This implies that their understanding of resource efficiency relates the level of resource to total economic output.

In general, most country responses indicate quite a broad interpretation of the term 'resources', corresponding loosely to the all-encompassing definition of natural resources given in the EU thematic strategy on the sustainable use of natural resources. This is also in line with the European Commission's communication of 26 January 2011, 'A resource-efficient Europe — Flagship initiative under the Europe 2020 Strategy' (European Commission, 2011) and the subsequent 'Communication on a Roadmap to a Resource Efficient Europe' (European Commission, 2011b).

Finally, it is necessary to point out that, in addition to the vague definition or broad interpretations of the terms by countries, there are potential difficulties and inconsistencies in translating key terminology into various languages.

Considerations for policy — towards a common understanding of resource efficiency

In general, countries indicated uncertainties regarding terminological definitions. Many seem to use the terms 'resource efficiency', 'sustainable use of resources' and 'minimising use of natural resources' as synonyms. There is also a wide range of understandings of the term 'resources'.

These uncertainties indicate that there is scope for reflecting on the advantages and disadvantages of providing clear definitions of the terms 'resource efficiency' and 'resources', rather than leaving them undefined. One possible approach could be for EU resource-related policies to provide strategic guidance based on the current broad interpretations but, when it comes to implementation, leave it to the countries to decide which policies and resources are most relevant in their national context.

Several countries reported difficulty in interpreting what is covered under the heading 'resource efficiency' and how this new policy priority relates to concepts such as sustainable consumption and production, sustainable use of resources and the green economy. It may be of value for policy coherence to develop and communicate an understanding of interlinkages between these and other key related concepts.

3 Resource efficiency in economy-wide strategies or action plans

Only a few countries (Austria and Germany as well as the Flanders Region in Belgium) reported having dedicated strategic policy documents — a strategy or a national action plan — that address resource efficiency as the main goal ⁽¹⁾. In most countries, the topic of resource efficiency is instead addressed in various economy-wide strategies and action plans.

Analysis in this report distinguishes between various types of policy documents, including:

Economy-wide strategies and action plans, which affect all economic actors and have overarching themes. Examples include environmental strategies, sustainable development strategies, and sustainable consumption and production (SCP) strategies.

Sectoral strategies and action plans, which affect only actors within the target sector. Examples include waste strategies, energy strategies and transport policies.

Resource-specific strategies and action plans, which affect a single resource or group of resources. In practice, there is significant cross-over between resource-specific strategies and sectoral strategies. Examples include biomass strategies, fisheries strategies and forest strategies.

Product-oriented strategies and action plans, which focus on improving products and building a market for more sustainable products. The principal approach in this area is green public procurement but other examples include product roadmaps and information instruments such as environmental labelling.

Austria's Resource Efficiency Action Plan and Germany's National Resource Efficiency Programme, due to be adopted in 2011, both aim to reduce the use of raw materials. Other resources such as land, biodiversity and water will be addressed in separate strategies or action plans.

The Sustainable Materials Management Strategy of the Flemish Region in Belgium can also be

considered as a dedicated resource efficiency strategy. The emphasis of the strategy is on raw materials (both renewable and non-renewable) and on using them sustainably and efficiently by closing material cycles and maximising the use of secondary raw materials in the production process.

In 2010 Germany started preparing its **National Resource Efficiency Programme**. The Programme's main focus will be on minimising the environmental impacts of raw material production and consumption, with policy measures taken at all administrative scales, from national to business level. The programme is due to be launched at the end of 2011.

For more details, see the country profile documents.

In focusing on raw materials, these strategic documents reflect a fairly traditional understanding of the term 'resources'. Nonetheless, with measures planned at all administrative levels and in various economic sectors, they treat resource efficiency as a cross-cutting policy field requiring a dedicated strategy.

Austria's Resource Efficiency Action Plan (REAP) is due to be adopted in 2011. It will provide a framework and impetus for resource efficiency and will focus on promoting ecodesign, cleaner production and the 'green economy'. Public and private consumption will also be addressed.

For more details, see the country profile documents.

Except for the few exceptions mentioned above, the majority of countries appear to address resource efficiency through various economy-wide policies, strategies and action plans. Six broad types of strategies and action plans that commonly include references to resource efficiency are:

⁽¹⁾ The same is true for 'sustainable use of natural resources', which is significant because many countries use the term as a synonym for 'resource efficiency'.

- national sustainable development strategies;
- national environmental strategies or action plans;
- raw materials plans and strategies ;
- SCP action plans;
- strategies and plans related to climate change;
- national reform programmes.

Among the above six, most commonly reported were the first two types of strategies and action plans. An overview of economy-wide strategies and action plans addressing resource efficiency is provided in Annex 3.

Several countries (6) apply an holistic approach, focusing on greening the whole economy, rather than concentrating on particular resources. A shift from classical environmental policies (addressing energy efficiency, water, waste, etc.) to integrated resource efficiency policies is beginning to take place. The United Kingdom appears to take the most comprehensive approach in this respect, although the Switzerland's Green Economy Programme, Greece's Green Growth Strategic Action Programme, Finland's Natural Resource Strategy and Germany's Bio-Economy Strategy seem to be moving in a similar direction.

The **UK's policy focus is on greening the whole economy** with the aim of delivering environmental and financial benefits for individual businesses and the UK economy as a whole. The approach to resource efficiency has been to use various measures to reduce product impacts, encourage action by businesses and improve government procurement.

For more details, see the country profile documents.

Policies on (industrial) development and competitiveness were noticeably absent from country responses regarding resource efficiency in economy-wide policies. The same was generally true of the responses relating to sectoral policies (see Chapter 4). On the other hand, the impulse from the Europe 2020 strategy — linking resource efficiency to boosting EU competitiveness — is increasingly being reflected in national policies. About a third of the countries (11) reported that they are currently preparing national reform programmes taking into account the Europe 2020 strategy and the flagship initiatives. It is expected that resource efficiency will feature prominently in these national strategies.

Countries with strategies to green the whole economy point out that achieving a green economy can boost the competitiveness of the whole country. Croatia,

Hungary and Slovenia adopt similar thinking in their development strategies for national regions.

Nearly half of the countries (14) reported the need to address possible future scarcity of raw materials, securing access to energy and resources, and maintaining industrial and economic competitiveness as key drivers for developing resource efficiency policies (see Chapter 10). However, it would appear that countries have only just begun to include these priorities in national policies, strategies or action plans.

Countries that report having a national raw material strategy (i.e. Austria, the Czech Republic, Finland and Germany) highlight that securing supplies of raw materials is important for the international competitiveness of national industries. In doing so, they directly take up current discussions on raw materials scarcity and the EU Raw Material Initiative (European Commission, 2008 and 2011c).

The **Flemish Sustainable Materials Management Strategy**. In 2011 the Flemish Government (Belgium) started to translate the Sustainable Materials Management Programme into an economy-wide strategy. The main focus will be organising and managing sustainable material cycles, increasing the use of secondary raw materials in the production process and minimising impacts on the environment resulting from raw material mining and processing.

For more details, see the country profile documents.

In its National Programme on Natural Resources, the Netherlands provides a comprehensive overview of existing policies in various fields that can contribute to sustainable and resource-efficient management and use of natural resources. The Programme aims to provide the basis for discussions on an integrated strategic policy on resources, and marks an interim step towards a resource efficiency strategy. Interestingly, policy development in the Netherlands appears to be strongly based on life-cycle thinking. Impacts are examined within national boundaries but also globally by focusing on sustainable trade.

Similarly, Sweden's policies take the global environmental impact of its consumption into account by estimating, for example, the greenhouse gas emissions, water use and land use abroad needed to support domestic consumption. Although clearly an exception rather than a rule at present, this consideration of consumption and end-users indicates that policymakers are gradually recognising the need to address domestic production and consumption equally.

Considerations for policy – integrating resource efficiency into economy-wide policies

Only a handful of countries report having a dedicated strategic policy document (e.g. a strategy or a national action plan) for resource efficiency. Instead, most identify resource efficiency as a priority in various economy-wide strategies, even though actual policy measures to increase resource efficiency are mostly included in environmental or sectoral policies. This raises a question about where to focus policy intervention – whether resource efficiency policies should aim at the economy as a whole, focus on selected sectors or target specific priority resources. Perhaps future EU resource efficiency policies could provide general guidance on all of the above but with explicit leeway left to the countries to choose the mix appropriate for the local conditions.

Under the Europe 2020 strategy, Member States are required to prepare national reform programmes. Several countries, mainly from new Member States, reported using the process of developing national reform programmes to introduce aspects of resource efficiency into economic policy. In addition, some countries have integrated considerations from the EU Raw Material Initiative into national plans to ensure security of supply of raw materials and to foster economic competitiveness. The fact that EU policy initiatives appear to be a strong driver of economy-wide resource policies indicates both a need and an opportunity for EU resource efficiency policies to provide guidance and strategic direction.

Many countries reported having different strategies or policies dealing with the concepts of sustainable consumption and production, sustainable use of resources and the green economy. Combined with the already mentioned difficulty in interpreting what is covered under the heading 'resource efficiency,' this indicates a need for a discussion to clarify the overlaps and synergies between these concepts.

Resource imports are growing continuously and policy initiatives are beginning to emerge that address the global environmental impacts of a country's consumption. This indicates a desire for policies that take into account resources 'embedded' in imports and global trade, in addition to the traditional focus on 'domestic' resource efficiency (within national borders).

4 Resource efficiency in sectoral policies

In addition to examining the inclusion of resource efficiency in dedicated strategies or action plans and in economy-wide strategies (see Chapter 3), the survey also reviewed how and where resource efficiency appears in sectoral, and product- and resource-specific strategies or action plans. Table 4.1 provides an overview of sectoral strategies and action plans related to resource efficiency as reported by countries.

The responses reveal that resource efficiency measures appear in a wide variety of sector- and resource-specific policy documents. Their inclusion seems to be driven by the need to secure a sustainable supply of resources, the aim of using resources more efficiently, the economic and social gains to be made from efficiency, and the need to protect the environment. An overview of sectoral or resource-specific strategies and action plans addressing resource efficiency, as reported by countries, is provided below.

In all, 28 countries reported having strategies or action plans related to the **supply and use of energy** containing references to resource efficiency. These can be broadly divided into overarching energy strategies, renewable energy strategies and energy-efficiency strategies.

- **Overarching energy strategies** tend to focus on providing the economy with a secure supply of energy. As such, they also include provisions for renewable energy sources.
- **Renewable energy strategies**, including strategies addressing specific technological solutions (for example, use of biomass), focus on the need to diversify energy supply in the light of economic, security and emissions considerations. These strategies and action plans have been driven primarily by EU legislation and international commitments to reduce emissions. All EU-27 Member States delivered renewable energy action plans to the European commission before the 30 June 2010 deadline. Energy strategies and action plans demand that the energy sector consume an increasingly broad range of resources, often including

bio-resources. In reference to the latter, seven countries have specific strategies for the exploitation of forests and other biomass (including waste) for energy generation.

- **Dedicated energy efficiency action plans** (EEAPs), mandated for Member States by the Energy End-Use Efficiency and Energy Services Directive (EU, 2006), were mentioned by 22 countries. The deadline for Member States to communicate the second round of EEAPs to the European Commission was 30 June 2011. As such, it is somewhat surprising that more countries did not report the presence of EEAPs, as all EU-27 Member States submitted first round EEAP drafts.

With a view to addressing future population growth, resource scarcity and price volatility, **Germany's Ecological Industrial Policy** is a policy framework that seeks to increase the efficiency of energy and resource use, and increase the use of natural renewable resources to stem growing dependence on finite resources. It aims to do this by strengthening current and future strategic industries, promoting innovation, adapting the structure of industry and transforming the industrial material base. Expected benefits include economic growth, new products and new jobs.

For more details, see the country profile documents.

A fourth strand of these energy-related strategies and action plans are the dedicated climate strategies reported by seven countries (the Czech Republic, Ireland, Latvia, Lithuania, Norway, Portugal and Switzerland, and the Wallonia Region in Belgium). These address energy as a core component but also tend to cover a broader range of potential leverage points to reduce greenhouse gas emissions.

Table 4.1 Policy areas that include elements of resource efficiency as reported by participating countries

	Energy and climate					Economy			Materials			Waste				
	Energy strategy	Renewables strategy	Energy efficiency	Energy — biomass	Climate change strategy	Economic strategy	Industrial development	Eco-tech/clean-tech	Materials strategy/raw materials plan	Metals	Construction materials	Waste management plan	Waste prevention programme	Waste recycling	C&D waste	Hazardous waste
Austria			x					x	x			x	x			
Belgium		x (ii)	x (i,ii)	x (iii)	x (iii)			x (ii, iii)		x (iii) ⁽⁹⁾		x (i,ii)	x (i)			
Bulgaria	x	x	x	x								x				
Croatia	x											x				
Cyprus		x	x									x				
Czech Republic	x	x		x	x	x			x			x				x
Denmark	x	x														
Estonia	x	x	x	x						x		x				
Finland	x	x	x			x			x			x	x	x		
Former Yugoslav Republic of Macedonia		x	x			x	x					x				
France		x								x		x				
Germany		x	x	x				x	x							
Greece		x														x
Hungary	x	x	x					x				x	x			
Ireland	x		x		x								x			x
Italy		x	x				x									
Latvia	x	x	x		x				x ⁽³⁾			x				
Liechtenstein										x						
Lithuania	x				x				x ⁽¹⁰⁾			x				
Netherlands			x			x			x						x	
Norway					x											
Poland	x	x	x	x		x	x	x	x			x		x		
Portugal	x	x	x		x							x	x			x
Romania		x	x	x					x ⁽⁵⁾							
Slovakia	x	x	x	x				x	x			x				
Slovenia	x	x	x						x ⁽⁶⁾			x				
Spain		x	x			x ⁽⁷⁾			x			x				
Sweden												x	x			
Switzerland	x	x	x		x	x						x				
Turkey			x				x ⁽⁸⁾									
United Kingdom			x									x	x			

Note: (1) environmental management in public sector
(2) as part of Exemplary State Plan
(3) Underground resources strategy
(4) Energy Performance Certificates
(5) Mining Industry Strategy
(6) National Mineral Resource Management Programme
(7) draft Sustainable Economy Law
(8) including Turkish Industrial Strategy Toward EU Membership and SME Strategy and Action Plan
(9) Better use of resources in the quarries sector
(10) State Strategy for Use of Underground resource

(i) Brussels capital region
(ii) Flanders
(iii) Wallonia

Table 4.1 Policy areas that include elements of resource efficiency as reported by participating countries (cont.)

	Government/infrastructure							Environment			Agriculture					
	GPP	Education	Transport	Buildings	Land/space management	Tourism	Healthcare	Biodiversity	Water management	Air Quality	Agriculture	Fisheries/sea	Organic agriculture	Rural development	Forestry	Hunting
Austria	x	x														
Belgium	x (i)			x (i,ii)				x (i,ii)	x (i)				x (iii)			
Bulgaria					x			x	x		x	x			x	
Croatia								x	x	x	x	x			x	
Cyprus	x		x						x							
Czech Republic									x		x					
Denmark																
Estonia	x (1)							x			x				x	x
Finland	x		x	x												
Former Yugoslav Republic of Macedonia						x			x			x			x	
France	x (2)		x	x				x				x				
Germany											x				x	
Greece	x		x	x												
Hungary			x	x	x			x	x		x		x		x	
Ireland	x	x							x							
Italy	x			x												
Latvia			x	x				x	x		x				x	
Liechtenstein																
Lithuania				x	x			x	x		x				x	
Netherlands				x					x							
Norway								x								
Poland	x		x	x (4)				x	x		x	x	x		x	
Portugal	x				x				x							
Romania	x								x		x				x	
Slovakia	x		x	x					x						x	
Slovenia			x					x	x		x		x		x	
Spain	x		x	x		x			x		x	x	x		x	
Sweden																
Switzerland	x		x	x	x			x	x	x	x				x	
Turkey																
United Kingdom	x															

Note: In addition, some countries reported additional policy initiatives:

Belgium: Federal Products Plan; Eco-efficiency Scan programme (ii); DuWoBo (ii); Enhanced Landfill Mining (ii); Chain Management (ii); Eco-clusters (ii).

Estonia: National development plan for Oil Shale

Finland: Energy smart built environment; Carbon Neutral Municipalities; Bioeconomy.

Germany: Ecological Industrial Policy; circular flow economy at state level.

Ireland: Green business initiative; Green Hospitality award; packaging waste prevention programme; Cleaner Greener Production Programme; SMILE resource exchange; FreeTrade Ireland; Sector specific guides on waste prevention; Local authority waste prevention network; StopFoodWaste campaign; Green schools.

Netherlands: National Programme on Natural resource; Holistic approach to resource efficiency.

Poland: Horizontal industrial policy; Integrated Product Policy; cleaner production strategy.

Portugal: Thematic Operation programme for territory Valuing; integrated pollution prevention and control; EcoDesign for energy related products; EMAS; waste plans for edible oils, used tyres, municipal waste, industrial waste.

Romania: support for the organisation and implementation of a functional cross-compliance; The rehabilitation and reform of the irrigation system; National Strategy for Drought mitigation, prevention and combating land degradation and desertification on short, medium and long term.

Slovakia: Plan for Municipal development in heat energy; energy security strategy;

Switzerland: resource efficient ITC

United Kingdom: Product roadmaps; WRAP and associated sectoral commitments in construction, utility, retail, drinks manufacturers and DIY sectors.

The introduction of 'biomass for energy' strategies, driven by the need to increase the share of renewable energy sources in the overall energy mix, means that biomass resource efficiency could become a key policy area in the near future. This could draw in agricultural or forestry policy and necessitate trade-offs between energy policy, agricultural and food policy, spatial planning and biodiversity.

The survey responses indicated that most countries (24) count **the waste management sector and waste legislation** as essential components in the move toward resource efficiency. These countries tend to see waste as a secondary raw material, and consider waste recycling and recovery an important tool for reducing virgin material consumption and improving resource efficiency. This has implications not only for the waste management sector itself (e.g. in the form of a mandated shift to waste treatment options that exert less pressures on the environment, improved waste collection and separation, and material recovery), but also for upstream waste producers and downstream users of recycled materials. Specifically, the construction and demolition sector, the retail sector (through packaging waste policies), and many industries (through hazardous waste policies) are all directly influenced by waste policies that include resource efficiency elements.

Several (8) countries also reported waste prevention programmes, sometimes as stand-alone initiatives but more often within the umbrella of overall waste strategies. Waste prevention programmes tend to act within specific economic sectors or on particular types of waste rather than adopting a generic, economy-wide approach. For example, the Austrian waste prevention programme, published in summer 2011, targets the construction sector, households and industry, the food sector and the reuse sector.

Households are affected by waste measures that demand separate collection and returnable packaging, and are also subject to local waste collection practices. Few initiatives directly tackle waste generation in households, although packaging waste legislation targeted at industry does affect

Portugal's construction and demolition waste legislation establishes a chain of responsibility that binds both owners and contractors of works and local municipalities to proper management of the waste produced during construction and demolition. The aim is to prevent the production of waste where possible and recover as much waste as possible when it does occur.

For more details, see the country profile documents.

household waste generation. Industries and sectors that use recovered and recycled materials (either directly or indirectly) are influenced by the many waste policies that contain provisions on recycling.

Regulation of construction and demolition waste encourages better use of materials in the **building and construction sector**. In all, 13 countries also have policies and strategies designed to modernise new and existing housing stock to minimise resource use (focusing exclusively on energy in the survey responses). This is typically achieved through updating building standards, retrofitting drives (for roof and cavity insulation and windows), energy-efficiency schemes and information tools such as energy certificates. These schemes tend to focus on reducing energy use. In terms of EU legislation, the resource efficiency of the construction industry is also affected by national implementation of the Energy-Related Products Directive (EU, 2009).

The Belgium – Flanders Energy Renovation Programme 2020 is a comprehensive programme containing a variety of short- medium- and long-term provisions to ensure that by 2020 no buildings in Flanders waste energy. Among the specific targets, the Programme provides that all buildings should have floor and roof insulation, all windows should be fitted with double glazing, and central heating efficiency should be above 90 %. It also includes support for outside insulation of exterior walls, hollow wall insulation and the replacement of electrical heating.

For more details, see the country profile documents.

Transport also features prominently in the survey responses. Resource efficiency measures were reported in both overall transport strategies and dedicated action plans within particular transport systems. Over a third of the countries (11) reported policies in this area, including general transport strategies and specific initiatives for promoting public transport or more sustainable forms of private transport.

Eighteen countries reported that policies in the **water management** sector contained resource efficiency components. The issue of efficiency was more pronounced in countries with limited water resources or periodic acute shortages, while those not short of water focused more on protection of water quality

The **public sector** as an economic entity can be an important advocate of resource efficiency, and in this context 15 countries and the Brussels capital region of Belgium mentioned green public procurement as an important resource efficiency policy.

Fourteen countries cited **forestry** as a key sector in national resource efficiency. The majority of these policies focused on forestry as a means of efficient timber production but some had other or supplementary goals: one example is Romania's National Plan to Combat Illegal Logging.

Agriculture was mentioned by seven countries as a priority sector for resource efficiency, with organic agriculture highlighted by a further four countries. Again, given the importance of food security and the role agriculture plays in environmental protection, it is perhaps surprising that more countries did not report the agriculture sector as important for resource efficiency. **Fisheries and the sea** was also mentioned by nine countries, both as a means of securing and protecting fish supplies, but also as general protection for sea water quality and in one instance (Estonia) for preserving community income from fishing.

Finally, a few countries mentioned other areas such as hospitality, health, retail, genetic resources, and biological and landscape diversity. It is important to note, however, that the summary in this chapter is based exclusively on country reports prepared under the survey and as such may not be an exhaustive list of resource efficiency policies, strategies and action plans in EEA countries (see the 'important note' in Chapter 1).

Six countries reported policies and action plans aimed at strengthening **innovation, development and deployment of environmental technology**. Environmental technologies can be used in all economic sectors and influence the efficiency of all resource use. However, initiatives are often targeted at priority sectors — renewable energy, for example — and as such eco-technology can also appear as a strand of broader environmental policy. Environmental technology strategies are driven by both environmental goals and economic and competitiveness concerns.

The latter point could be a partial explanation for the surprisingly low number of countries reporting industrial and competitiveness policies containing resource efficiency measures. Another possible reason could be that efficient use of material inputs in business is primarily, and perhaps most effectively, driven by financial concerns (the need to lower costs) rather than requiring policy-driven solutions. In addition, material inputs to industry are often regulated by resource-specific policies, which themselves encourage efficiency, potentially reducing the need for dedicated resource efficiency measures in industrial policy. Similarly, eco-innovation and eco-technology strategies, together with research, often implicitly promote resource efficiency of industry as a whole.

Considerations for policy — resource efficiency in sectoral policies

Many national sectoral and resource-specific policies and action plans are driven by the presence and importance of a certain resource or sector. Others are driven by EU and international requirements. This means that European processes for resource efficiency could aim to incorporate general principles where commonalities exist, while also acknowledging the differing needs and priorities of individual countries in terms of available resources and economic requirements.

According to the survey responses, energy and waste are the sectoral policy areas where resource efficiency measures are most often applied. However, in dealing with primary material flows, these sectors also have a significant impact on the resource efficiency of other sectors. Waste policies can encourage more efficient use of materials during production (potentially regardless of the economic sector) and energy efficiency strategies can drive increased resource efficiency in a broad range of industrial and commercial sectors. As such these are strong leverage points for increasing resource efficiency.

The introduction of 'biomass for energy' strategies in many countries, driven by the need to increase the share of renewable energy sources in the overall energy mix, means that biomass resource efficiency could become a key policy area in the near future. This could draw in agricultural or forestry policy and necessitate trade-offs between energy policy, agricultural and food policy, spatial planning, biodiversity preservation and ecosystem maintenance.

The cross-sectoral nature of resource efficiency means that it is important to ensure that sectoral policies do not have adverse effects in other sectors. Some level of institutionalisation of resource efficiency could potentially act as a bridge between sectors and actors (see Chapter 9 on institutional set-up).

The fact that EU policy initiatives appear to be a strong driver of sectoral policies underlines that there is an opportunity and a need for EU resource efficiency policies to provide guidance and strategic direction. These policies should be coherent with the Europe 2020 strategy's other flagships initiatives, in particular those on industrial competitiveness and on innovation.

5 Product-oriented resource efficiency initiatives

To capture a broad spectrum of possible policy approaches, countries were asked whether they had established resource efficiency strategies or action plans for specific products or groups of products.

Only Belgium and the United Kingdom reported having adopted policy documents directed at specific product categories. The Federal Product Policy Plan of Belgium (2009–2012) targets products and equipment for building (including heating appliances); energy-consuming equipment; products and substances for domestic use; vehicles and rolling stock; biomaterials and biofuels; and food products. The UK Product Roadmaps have been operating since 2007 and target ten product categories (see box below). In addition, Bulgaria, Germany, Poland and Portugal highlighted in their responses the importance of integrated product policies (IPP) for improving resource efficiency in general.

In the framework of a voluntary agreement between the Department for Environment, Food and Rural Affairs (Defra) and relevant supply chain actors, **the United Kingdom has developed ten product roadmaps** in four priority product groups (food and drink, passenger transport, buildings, and clothing and textiles). The roadmaps, which are currently being implemented, use a 'whole life cycle' approach to help improve the environmental performance of products.

For more details, see the country profile documents.

Just over half of the countries (16) reported that they had implemented or were planning to implement green or sustainable public procurement (GPP/SPP) initiatives, including preferential provisions for resource-efficient goods and products. The relative enormity of the public purse can greatly expand the market for green and sustainable goods and services.

GPP initiatives tend to take the form of national action plans or strategies ⁽²⁾ and are implemented at the national agency or ministry level. In some countries they are also implemented at municipal and institutional (hospitals, schools) level. The fact that countries referred to promoting GPP/SPP is also a good example of how voluntary EU initiatives can steer relevant policy action at the national level ⁽³⁾.

Seven countries (Austria, Denmark, Finland, France, Germany, Ireland, and Slovakia) also referred to national eco-labelling schemes as important tools to increase the supply of and demand for sustainable and green products and thereby improve resource efficiency. At the same time, there were only sporadic references to initiatives promoting relevant EU labelling schemes (e.g. the EU Ecolabel or the EU Energy Label).

About half of the countries referred in their responses to a broad spectrum of product-oriented instruments relevant for resource efficiency. These included promoting eco-design (although only Norway, Poland, Portugal and Turkey explicitly mention the Ecodesign Directive); product life cycle assessment (LCA); deposit-refund schemes; reuse and repair schemes; product labelling; and economic instruments targeted at products. Extended producer responsibility (EPR) was also mentioned, although countries have seldom applied it in concrete policy measures.

A selection of resource efficiency initiatives targeting products is presented in the following box.

Although **extending the lifespan of products** as a general objective of resource efficiency policy was mentioned sporadically, countries reported few concrete initiatives. Also, very few countries made reference to **environmental or sustainability considerations from the product life-cycle**

⁽²⁾ The countries include Austria, Belgium, Bulgaria, Cyprus, Denmark, Estonia, Finland, France, Germany, Italy, Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Switzerland and the United Kingdom.

⁽³⁾ Although the EU has defined a relevant indicative target, there were no mandatory requirements on the part of Member States concerning GPP at the time of writing (summer 2011). Relevant EU policies include the Commission's communication on IPP and GPP, the 'greening' of Public Procurement directives, and a policy process aimed at defining common GPP criteria in the EU.

Examples of product-oriented resource efficiency initiatives at the national level:

Austria's Sustainable Weeks for promoting sustainable products. As a public-private partnership, the annual Sustainable Weeks are jointly organised by the Federal Ministry of Agriculture, Forestry, Environment and Water Management, the Federal Ministry of Economy and participating trade associations and shops. The promotion campaign lasts for one month each year and focuses on products that comply with predefined sustainability criteria and guidelines. The participating products bear the official label of the campaign 'It brings something sustainable'.

Belgium (Flanders)'s network of repair and reuse centres. A network of reuse centres has been established in the Flemish Region, with the active collaboration of OVAM, the Flemish Public Waste Agency. The mission of the reuse centres is to collect and repair discarded but usable goods and then resell them at an affordable price. The centres are subsidised based on the levels of reuse they manage to achieve. The long-term objective of this initiative is that the reuse sector will achieve an average of 5 kg of reused goods per resident and employ some 3 000 people by 2015.

Italy's tax deduction for 'Fair Product Groups'. Italy's 2008 Financial Act grants a tax deduction to certain 'Fair Product Groups', including local products (in order to minimise the environmental impact of the transport), fair-trade goods (in order to respect disadvantaged producers by promoting their human rights, in particular those of women, children and indigenous people) and reusable or eco-compatible goods (to promote a sustainable lifestyle).

France's environmental labelling of consumer products. France has put in place a system to introduce environmental labelling of consumer products. To this end, since 2008, a multi-stakeholder platform supervises cross-cutting and sector-based working parties charged with developing a general method to calculate the environmental impact of products and rules for categories of products. France will launch a national trial in July 2011.

For more details, see the country profile documents.

perspective (and cumulative impacts along the entire production-consumption-disposal chain).

All in all, product-oriented resource efficiency initiatives did not feature prominently in country responses, with the exception of a general emphasis

on green public procurement and some mention of integrated product policy, both driven by EU initiatives. However, some initiatives were highlighted that could be of interest for resource efficiency policy development at the EU level or could relatively easily be replicated at the national level.

Considerations for policy – product-oriented initiatives

Product-related initiatives are a potentially effective instrument to change prevailing patterns of consumption. Green public procurement can be a strong driver for growth in the market for sustainable and resource-efficient products. At the same time, both European and national product labelling schemes can bolster consumer awareness and increase demand for more sustainable products. Combining or encouraging more synergies between these two approaches could lead to more sustainable consumption patterns.

Ecolabelling is a useful tool that can help create more knowledgeable consumers and support the emergence of markets based on environmental and social criteria. This is directly related to resource efficiency in some products (sustainably grown timber or energy-efficient appliances, for example) but perhaps not for others. Product labelling illustrates the need for life-cycle thinking and coordinated action in the field of resource efficiency.

Belgium's Federal Product Policy Plan and the UK's Product Roadmaps point to a possible way to influence the resource efficiency of high impact product groups directly by engaging relevant actors in the product supply chains.

Increasingly globalised product chains and ever growing international trade mean that EU product-oriented resource efficiency initiatives could have a double benefit — reducing global impacts of Europe's consumption and, through standard setting and leading by example, stimulating a global market for resource-efficient goods and products.

6 Priority resources

Responding to the request to identify priority resources or resource categories in economy-wide or sector-specific resource efficiency policies, a total of 22 countries highlighted energy carriers and 18 highlighted waste. These were followed by minerals and raw materials, water, and forests and wood, which were mentioned by more than 40 % of countries (see Table 6.1). It is interesting to note that countries identified a wide variety of priority resources, indicating that the majority adopt a broad understanding of 'natural resources', extending beyond raw materials.

Table 6.1 summarises resources that countries identified as a priority in economy-wide or sector-specific resource efficiency policies.

Energy carriers

Countries primarily regard energy resources as a priority because of their central role in economic activity. This makes it essential to ensure an affordable and secure supply of energy resources. Except for greenhouse gas emissions, environmental considerations in most cases appeared secondary. However, the significant number of renewable energy strategies adopted by European countries — one third (11) of the countries prioritise renewable energy sources — appears to be driven primarily by EU climate and energy policies.

Waste

As already mentioned in Chapter 4 on sectoral policies, the majority (18) of the European countries now consider waste to be a priority resource or secondary raw material. The policy focus is shifting from traditional waste management to waste prevention and efforts to adopt a life-cycle approach. Recycling and recovery are seen as important tools for reducing material consumption and improving resource efficiency. Furthermore, a growing number of waste prevention strategies are in place or being elaborated across Europe. This situation seems to be largely driven by EU legislation encouraging the recovery of resources from waste and limiting the share of waste going to landfill. Interestingly, while

In 2006, the **Flemish government (Belgium)** and the Flemish Public Waste Agency (OVAM) decided to start a transition process in **sustainable materials management**, called 'Plan C'. Within the Plan C framework a consortium was established in 2008 to explore potential pathways to develop an **Enhanced Landfill Mining (ELFM)** approach. In the ELFM Consortium's view, landfills should be considered as 'temporary storage places awaiting further treatment'.

For more details, see the country profile documents.

60 % of EU-15 Member States indicated that waste is a priority resource, only one third of new EU Member States did so.

Minerals and raw materials

Countries generally emphasised effective use of minerals and construction materials on account of the resulting economic benefits, although positive environmental impacts were also considered. It is not entirely clear from the responses whether countries included metals in this group — surprisingly, only three countries mentioned metals as a separate category.

Forests and wood

Prioritisation of forests as a source of timber seems to be driven by the need to optimise the quality and quantity of wood supplies and to increase demand for local wood production. Forests are also valued for their many other functions (watershed regulation,

Germany's recently published **National Raw Material Strategy (2010)** primarily focuses on securing the availability of mineral raw materials. Increasing material efficiency, mainly via guidance and information instruments, is viewed as one pathway to secure access to raw materials. Sustainable extraction and processing of raw materials, and returning secondary raw materials in waste to the resource cycle are important elements in the strategy.

For more details, see the country profile documents.

erosion control, carbon capture, maintaining soil nutrients and recreation) and are regarded as the basis of ecological security and balance.

Water

The need to ensure sufficient quality and quantity of water supply in the long term drives the prioritisation of water as a resource. The management of water sources has become a major concern across many parts of Europe, with the main challenge being balancing the need for water against its availability (or scarcity).

Other priority resources

Other priority resources identified fairly frequently (i.e. by more than a quarter of countries) include biodiversity, renewable energy sources, biomass, and land and soil.

Countries mentioned a broad diversity of other less common priority resources. Reported only by one or two countries, these priorities reflected local

conditions and included game, landscape and oil shale (Estonia); gravel (Liechtenstein and Sweden); phosphorus (Sweden) and genetic resources (Spain and Hungary). Metals were mentioned as a priority resource by only three countries. While somewhat surprising, this may have been because some countries included metals under another category, e.g. minerals or raw materials.

Croatia's Strategy for Sustainable Development (2009) considers the Adriatic sea, coast and islands as resources of strategic importance for sustainable development and defines key objectives for their protection. An action plan on the Adriatic Sea, coast and islands is currently being prepared in consultation with all relevant government bodies and the business and civil society sectors.

For more details, see the country profile documents.

Ireland's SMILE Resource Exchange programme supports the development of mutually beneficial partnerships between businesses. The SMILE network aims to save businesses money by developing a network of businesses that reuse each other's surplus products, by-products and reusable items, and share services, space and logistics. Examples of items and products that may be available are plastics, timber, cardboard, paper, pallets, and warehouse or office space. The ambition is that such collaboration reduces costs for businesses, diverts waste from landfill and reduces CO₂ emissions.

For more details, see the country profile documents.

It is worth noting that there were some overlaps among the priority resources reported by countries. As shown in Figure 6.1, when these individual priority resources are grouped into broader categories (e.g. timber, agricultural crops and fish can be combined into the category 'biomass') the ranking of priorities presented above changes somewhat.

The top three categories of priority resources become: biomass including agricultural crops, timber and fisheries (36 mentions); energy sources including fossil fuels and renewables (33 mentions), and raw materials including minerals, construction materials and metals (24 mentions). These were priorities in about three quarters of the countries. About half of the countries identified waste, land and soil, and water as priority resources.

Figure 6.1 Priority resources by a broad category

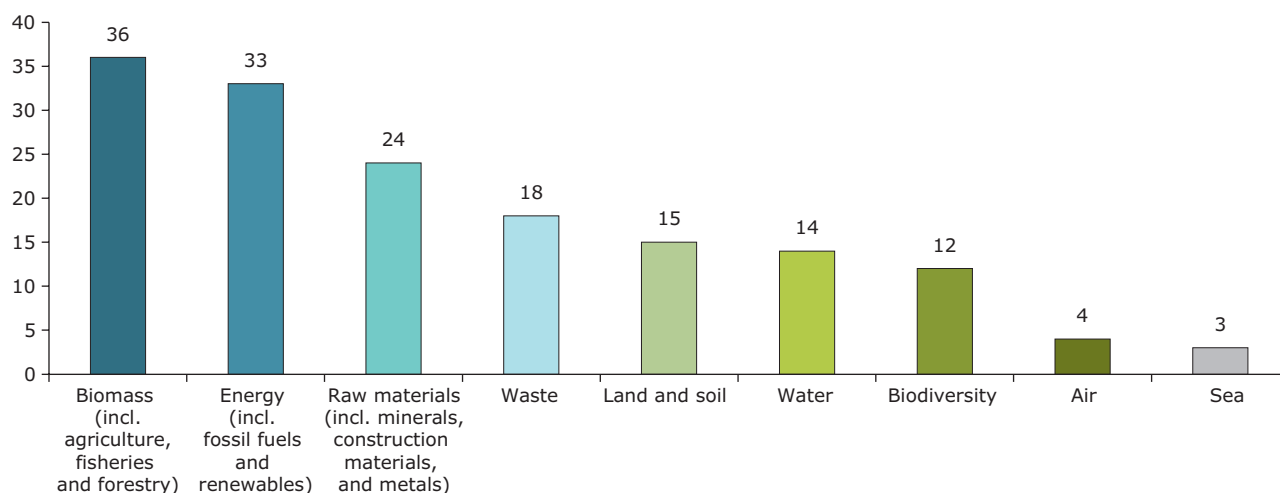


Table 6.1 Resources identified as a priority in national or sector-specific resource efficiency policies

Prioritised Resources	Energy carriers/ fossil fuels	Waste	Minerals/raw materials	Forest/wood	Water	Biodiversity	Renewables	Biomass	Land	Soil	Construction material	Agricultural crops/food	Fish	Air	Metals	Sea
Austria	•		•					•			•	•			•	
Belgium (Federal level)	•		•			•										
Belgium (Flanders)		•	•				•	•								
Belgium (Wallonia)	•	•		•	•					•						
Bulgaria					•											
Croatia	•	•		•	•		•		•					•		•
Cyprus			•	•	•	•						•	•	•		•
Czech Republic	•	•	•	•				•								
Denmark		•	•	•	•											
Estonia			•	•	•	•		•	•	•	•		•			
Finland	•	•	•	•	•		•		•		•					
Former Yugoslav Republic of Macedonia				•		•	•					•				
France	•	•	•			•		•							•	
Germany	•		•	•				•	•							
Greece	•	•														
Hungary	•			•	•	•	•	•	•	•	•					
Ireland		•														
Italy	•						•									
Latvia	•						•									
Lichtenstein	•	•			•											
Lithuania	•	•	•				•		•				•			
Netherlands	•			•								•			•	
Norway																
Poland	•	•	•	•	•	•	•	•		•			•	•		
Portugal	•	•	•	•	•	•	•				•	•				
Romania		•	•		•	•		•								
Slovakia	•	•					•	•								
Slovenia			•													
Spain			•		•	•				•			•	•		•
Sweden	•	•		•		•		•	•	•						
Switzerland	•			•		•			•	•						
Turkey	•	•			•											
United Kingdom	•	•														
Total	22	18	16	15	14	12	11	11	8	7	5	5	5	4	3	3

Considerations for policy – priority resources

The priority resources identified by countries fall within the broad scope of the EU's Thematic strategy for sustainable use of resources and the Resource Efficiency Flagship Initiative under the Europe 2020 strategy. However, a few countries have chosen to focus on greening the whole economy and developing integrated resource-efficiency policies, rather than focusing on specific priority resources.

A majority of countries identified energy carriers and fossil fuels as a priority resource. This was partially driven by environmental considerations (reducing GHG emissions) but economic factors were the key force (e.g. concerns about a high dependence on imports and the need to improve the efficiency of existing energy systems). This could be an indication that there is less need for policy intervention in those areas where economic considerations are already driving more efficient use of energy resources.

One of the most commonly reported priority resources is waste, now widely recognised as a secondary raw material and a substitute for primary natural resources. Combined with a growing emphasis on waste prevention, this shift of perception is an essential step towards developing a circular economy.

In those countries where waste prevention was seen as an important field for policy intervention, organic and food waste were the most commonly identified waste streams to target. It is worth noting that better waste management would have the additional benefit of reducing pressures on the environment, including greenhouse gas emissions.

7 Strategic objectives and targets

The great majority of countries (27) responding to the survey reported having several **strategic objectives** covering a wide variety of areas related to resource efficiency. This demonstrates the awareness of interlinkages between resource efficiency and related areas of environment policy in general. At the same time, the strategic objectives vary significantly between the countries, indicating differing focus areas and possibly also different interpretations of the survey questions.

This report makes a distinction between **strategic objectives** and **targets**. 'Strategic objectives' refer to broad strategic policy goals that are neither quantifiable nor have a specific timeline. 'Targets' are those policy goals that are specific, measurable and set a deadline or have a specified time limit to achieve.

Most of the reported strategic objectives are fairly general in nature and tend to express guiding principles rather than concrete commitments. Typical examples include ensuring sustainable use of natural resources; economical or rational use of natural resources; resource conservation; promoting sustainable consumption and production; minimising use of primary resources; securing supplies of materials; ensuring energy security; and reducing energy use.

Table 7.1 provides an overview of the strategic objectives reported by at least four countries. The most commonly reported strategic objectives – reported by more than 10 of the 31 reporting countries – were as follows (the figure in brackets indicates the number of countries):

- increasing **recycling** rates (23)
- efficient use of **natural resources/raw materials** (22) ⁽⁴⁾
- improving **energy efficiency** (19)

- increasing the share of **renewable energy** (18)
- **waste prevention/decoupling waste** generation from economic growth (18)
- reducing **energy use** (17)
- sustainable **forest** management (14)
- halting **biodiversity loss** (14)
- reducing **water use** (13)
- improving the **water quality** of natural waters (12)
- reducing **energy use in buildings** (12)
- reducing emissions of **air pollutants** (11)
- promoting **sustainable consumption and production** (11).

The fact that three quarters of the countries report having objectives for using resources efficiently indicates that resource efficiency is already high on the political agenda at country level. Still, country approaches vary, for example in terms of focusing on 'sustainable use of natural resources' or 'economic use of resources'. This may indicate a difference in drivers for resource efficiency between countries, although the lack of agreed definitions and consistent terminology around resource efficiency probably also play a role.

Although the most common approach seems to be to aim for more efficient resource use rather than absolute decoupling, some countries also reported strategic objectives addressing actual quantities of resource use, such as reducing resource use by a certain factor (e.g. Factor 4). Examples include Austria, Belgium (Flanders and Wallonia regions), France, Italy, and Portugal, which are all EU-15 Member States.

The picture is somewhat different in the area of energy, where a majority of countries report objectives not only for energy efficiency but also for absolute reductions in energy use. It is worth noting that these objectives are driven by EU energy policy and its targets. In addition, some countries, such

⁽⁴⁾ Countries use different wording to describe strategic objectives in this category. The term 'efficient use of natural resources/raw materials' also covers objectives such as 'sustainable use of natural resources', 'economic use of natural resources' and 'rational use of raw materials'.

as Cyprus, Denmark, Germany and Slovakia have reported specific objectives on reducing the use of fossil fuels. Similar momentum could perhaps be created with respect to material use if the EU could agree on common strategic objectives and targets for material use and resource efficiency.

Other strategic objectives reported by several countries include the following (the figure in brackets indicates the number of countries):

- reducing the use of **mineral resources** (10)
- making **transport** more sustainable (9)
- sustainable **agriculture** (9)
- increasing **security of supply** of energy and materials (9)
- promoting **green public procurement** (8)
- reducing use of **fossil fuels** (7)
- sustainable **land use** (7)
- reducing **resource use** (6)
- sustainable **fisheries** (6)
- protecting **groundwater** (6).

Finland has reported a particularly comprehensive set of **strategic objectives** on resource efficiency. One objective states that Finland should take the initiative and lead the way on natural resource issues. Others cover areas such as strengthening minerals policy; securing the supply of raw materials; reducing the environmental impact of the minerals sector and increasing its productivity; strengthening research and development initiatives and expertise; energy efficiency; waste and recycling; climate change; and sustainable public procurement.

For more details see the country profile document.

The number of objectives that countries reported in areas such as sustainable management of forests, halting the loss of biodiversity, greening transportation and sustainable agriculture are broadly in line with the identified priority resources, discussed in Chapter 6.

Interestingly, more than a third of the countries (11) reported having objectives related to promoting sustainable consumption and production. This indicates that many countries consider resource efficiency to be an holistic challenge related not only to production but to the entire production-consumption system of the economy.

Only the Netherlands and Sweden consider global impacts caused by national consumption. Sweden reported strategic objectives related to the global environmental impacts caused by national consumption. The Netherlands aims to address

the global perspective by taking into consideration environmental impacts embedded in international trade.

Sweden's objective on the global environmental impacts of national consumption

Sweden has supplemented its environmental goals with a new, broad consumption-based objective. The overall objective of Swedish environmental policy is to solve the major environmental problems within one generation, without causing increased impact on health and the environment outside Sweden. This requires, among other things, that eco-cycles are resource effective and do not contain hazardous chemicals, ecosystems recover, biodiversity is preserved, the share of renewable energy increases and consumption levels are kept within the global carrying capacity.

For more details, see the country profile documents.

Pricing of resources and internalising costs of pollution often stand out as critical issues in achieving a transition to a more resource-efficient society. In this regard it is interesting that only a few countries (e.g. Italy) reported strategic objectives or targets aimed at making less resource-intensive products more affordable than more resource-intensive alternatives through green tax reform.

Italy's objectives on the use of natural resources

- improving the efficiency of the production and consumption model (eco-efficiency);
- reforming fiscal policy towards reduced resources exploitation;
- reflecting externalised costs (both environmental and others) within the total price of raw materials, outputs of the main production and consumption systems, and construction projects;
- progressively shifting from consumption of goods to equivalent services;
- applying material flow and material input indicators to evaluate economic policies;
- steering citizen consumption and public authority purchasing models towards goods and services with minimum use of materials.

For more details, see the country profile documents.

Several countries (Denmark, Finland, Greece, and Portugal) have reported strategic objectives aimed at creating more green jobs. Only four countries (Denmark, Finland, the former Yugoslav Republic of Macedonia and Switzerland) mentioned promotion of eco-efficient technologies as a strategic objective. Furthermore, only a couple of countries reported strategic objectives to dematerialise consumption gradually.

Overall, strategic objectives vary substantially between countries. Given that EU-wide goals are a strong driver for national policy action, future EU resource efficiency policies could play an important role in defining common EU-wide strategic objectives on resource efficiency, for instance on dematerialising the economy or reducing the dependence on critical materials.

Examples of strategic objectives on resource efficiency reported by countries

- Maintaining resource throughput at the same level in the short term. In the long term the total resource consumption should decrease absolutely and resource productivity should increase by a factor of four (Austria).
- Increasing the use of rain water in the period 2010–2015 to preserve water resources (Belgium — Flanders).
- Ensuring that spatial planning contributes to reducing energy consumption (Denmark).
- Increasing resource efficiency significantly by 2050 (Denmark).
- Ensuring that all state forests are certified by the Forest Stewardship Council (FSC) or the Programme for the Endorsement of Forest Certification (PEFC) (Denmark).
- Becoming independent of fossil fuels by 2050 (Denmark).
- Developing solutions to address global mineral chain challenges (Finland).
- Having a thriving bioeconomy generating high added value (Finland).
- Taking initiatives and leading the way on natural resource issues (Finland).
- Adopting a new model of sustainable development that respects the environment combined with lower consumption of energy, water and other natural resources (France).
- Launching a green tax reform and restructuring taxes from labour towards investments in a green economy in which inefficient use of energy and resources decreases. The reforms should tax away from 'goods' (e.g. employment) towards taxing 'bads' (e.g. inefficient energy use) (the former Yugoslav Republic of Macedonia).
- Reducing land consumption in absolute terms (Germany).
- Increasing considerably the energy-related use of biomass (Germany).
- Becoming the EU leader in preserving, increasing and sustainably using natural capital (including managing natural capital, creating market instruments, capitalising natural assets and promoting sustainable lifestyles) (Latvia).
- Meeting the need for food and shelter for 9 billion people globally in 2050. The general objective is to reduce the environmental impact of this production throughout the whole value chain (the Netherlands).
- Making public procurement 100 % sustainable (the Netherlands).
- Achieving continued economic growth without an increase in energy use and reducing the energy intensity of the Polish economy to the EU-15 level (Poland).
- Effective use of resources, including recycling of secondary raw materials, and energy recovery, including measures to reduce material and energy consumption in production processes (Poland)
- Increasing the lifespan of products (Portugal).
- Reducing dependence on imported energy (Portugal).
- Consolidating the industrial cluster associated with wind power and creating new clusters associated with new technologies in the renewable energy sector, thereby generating new jobs (Portugal).
- Promoting industrial symbiosis (Portugal).
- Supporting biomass energy utilisation financially (Slovakia).
- Increasing the share of wood use in the primary energy balance (Slovenia).
- Recovering food wastes and comparable wastes from food processing plants etc. using biological treatment by 2010. This target relates to waste that is not mixed with other wastes and that is of sufficient quality to be suitable, following treatment, for recycling into crop production (Sweden).
- Reducing the consumption of resources to environmentally sustainable levels (footprint 'one'). This is the vision of the Cleantech Masterplan (Switzerland).
- Improving environmental product information for consumers (Switzerland).
- Creating an agricultural structure that is highly organised and competitive, while taking into account the goals of achieving food security and safety and using natural resources sustainably (Turkey)

For more details, see the country profile documents.

Table 7.1 Strategic objectives for resource efficiency reported by four or more countries

Strategic objectives	Energy and fossil fuels					Natural resources/ raw materials				Waste		Water		Other areas																				
	Increase energy/material security	Reduce use of fossil fuels	Reduce energy use in buildings	Increase renewable energy share	Reduce energy use	Improve energy efficiency	Decoupling (material and energy from economic growth)	Reduce use of minerals	Reduce resource use	Efficient use of resources/raw materials/Increase resource efficiency	Increase recycling	Prevent/decouple waste	Groundwater protection	Improve water quality	Reduce water use	Wastewater	Eco-efficient technologies	Promotion of ecolabel	Green tax reform	Green jobs	Biomass	Fish	Land use	Promotion of GPP	Agriculture	Transport	Sustainable consumption and production	Air emissions	Biodiversity	Sustainable forestry				
Austria																																		
Belgium (Flanders)																																		
Belgium (Wallonia)																																		
Bulgaria																																		
Croatia																																		
Cyprus																																		
Czech Republic																																		
Denmark																																		
Estonia																																		
Finland																																		
Former Yugoslav Republic of Macedonia																																		
France																																		
Germany																																		
Greece																																		
Hungary																																		
Ireland																																		
Italy																																		
Latvia																																		
Liechtenstein																																		
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Netherlands																																		
Norway																																		
Poland																																		
Portugal																																		
Romania																																		
Slovakia																																		
Slovenia																																		
Spain																																		
Sweden																																		
Switzerland																																		
Turkey																																		
United Kingdom																																		
Total	9	8	12	18	17	19	5	10	6	22	23	18	6	12	13	4	4	4	4	4	4	5	6	7	8	9	9	11	11	14	14			

A majority of countries (25) reported having established **targets for resource efficiency**. These generally provide more concrete details compared to the strategic objectives discussed above. Country responses show that targets are most often established in the following areas:

- waste (as set by EU requirements), e.g. reduced amounts of waste disposed, increased amounts of waste separately collected and increased recycling rates;
- energy, e.g. reducing energy use (according to EU requirements), increasing the share of renewable energy in total energy use (according to EU requirements), increasing energy efficiency of buildings (according to EU requirements) and increasing overall energy efficiency;
- air emissions, e.g. reducing greenhouse gas emissions (according to EU requirements);
- land use, e.g. increasing the share of arable land farmed organically.

As the list above shows, countries tend to adopt specific, measurable and time-bound targets mainly in those areas where EU directives mandate target setting. Here, EU environmental policy is clearly a key driver for setting resource-efficiency-related targets at the country level.

Furthermore, the list above confirms a rather broad interpretation of the term 'resource efficiency' by countries. For a full list of specific targets reported by countries, see Annex 4.

Targets for land use

Denmark, France, Germany and Switzerland have reported the following targets for land use:

- In **Denmark** the area for nature should increase by at least 100 000 hectares by 2020.
- In **France** at least 2 % of the national landmass should be placed under robust protection within 10 years, in particular by creating three new national parks. In addition, 20 000 hectares of wetlands should be acquired and preserved and by 2020–2030 one third of riverbanks should be preserved.
- In **Germany** growth in land use for housing, transport and related soil sealing should be reduced to 30 ha per day by 2020.
- In **Switzerland**, the total built-up area should stabilise at 400 m² per head of population.

For more details, see the country profile documents.

Although much less frequently, some countries reported targets for issues such as material efficiency/productivity, material use, sustainable agriculture (other than land under organic farming), sustainable forestry (including increased use of wood products from sustainable forestry), water scarcity and quality, sustainable fisheries, land use (other than agriculture and forestry), green public procurement, transportation, research and development expenditure, and green jobs. For example, only four countries (Denmark, France, Germany and Switzerland) reported specific targets on land use other than those aimed at agriculture and forestry.

Germany's targets on material and energy efficiency

Germany is one of very few countries to have adopted targets on material and energy efficiency, specifically:

- doubling abiotic material productivity by 2020 compared to 1994;
- doubling energy productivity by 2020 compared to 1990.

For more details, see the country profile documents.

Only six countries reported targets for material efficiency and material use. Germany and Romania reported having targets in place to improve material productivity, while four countries (Austria, Estonia, Italy and Sweden) reported targets for reducing absolute amounts of material use.

Although water scarcity is a priority issue for many countries, surprisingly only Portugal reported targets on improving the efficiency of water use and no country reported targets for absolute reductions in the consumption of drinking water. Similarly, according to the country responses, the issue of 'critical' raw materials is not yet addressed by countries in detail, despite recent EU initiatives on critical raw materials (European Commission, 2011c). Except for Sweden's target on increasing the recovery of phosphorus from wastewater, there seem to be few if any targets for improved management of specific materials or substances.

Regarding consumption areas associated with high environmental impacts, several countries reported having objectives or targets specifically in the fields of housing (typically for energy efficiency in buildings and sometimes for appliances and electricity use), mobility (typically for increased

Targets on reducing and managing waste – Brussels capital region

The fourth Regional Waste Prevention and Management Plan published in 2010 aims to achieve measurable prevention targets for numerous waste streams by 2020. The following targets are included:

- reducing per capita household waste by 37 kg annually (with specific targets set for streams such as food, paper and superfluous packaging);
- reducing office waste per worker by 37 kg annually (with specific targets set for streams such as food, paper and superfluous packaging);
- reducing school waste per pupil by 6.5 kg annually (with specific targets set for stream such as food, paper and superfluous packaging);
- recycling 50 % of municipal waste;
- reducing non-households waste production by 10 %;
- recycling 50 % of industrial waste;
- recycling 90 % of construction and demolition waste.

For more details, see the country profile documents.

use of biofuels in transport and fuel efficiency standards for cars) and food (typically increasing land area under organic farming). However, in most cases objectives or targets are set for efficiency improvements in technology and production rather than addressing consumption by managing demand.

One exception is Finland, which has established targets for the public sector to reduce the demand for transport and mobility, and to increase consumption of organic, vegetable-based or seasonal food.

Overall, targets related to resource efficiency vary substantially between individual countries. Targets (i.e. quantifiable policy goals with a designated timeframe) are seldom present in areas other than waste, energy use and energy efficiency, renewable energy use and land under organic farming. Therefore, EU policy could potentially play an important role in stimulating a discussion on defining EU-wide targets. These could, for example, aim at reduced consumption of certain materials or an absolute reduction in overall resource use.

Selected targets for sustainable public procurement in Finland

- New government buildings or new leased properties must meet the requirements of 'energy efficiency class A' and existing buildings under renovation must meet the requirements of at least 'energy efficiency class C' by 2010. All buildings that are new, under renovation or leased must be 'passive' by 2015.
- The need for transport and mobility will be reduced by 10 % by 2015.
- The amount of organic, vegetable-based or seasonal food will be increased through procurement of food services. These foods will be available in government kitchens and provided by food services at least once a week in 2010 and at least twice a week by 2015.

For more details, see the country profile documents.

Selected examples of targets on resource efficiency:

Material efficiency

- Doubling abiotic material productivity by 2020 as compared to 1994 (Germany).

Material use

- Reducing total material requirement (TMR) by 25 % by 2010, 75 % by 2030 and 90 % by 2050 (Italy).
- Reducing annual extraction of natural gravel to not more than 12 million tonnes by 2010 (Sweden).
- Reducing the consumption of fossil fuels by 20 % by 2020 (Switzerland).

Forestry

- Expanding the forest area to 2.3 million ha by 2013 (Estonia).
- Increasing per capita consumption of wood and wood products from sustainable forestry from 1.1 m³ to 1.3 m³ (Germany).

Agriculture – organic farming

- Increasing the share of organically farmed areas in the total agricultural area to 20 % by 2010 (Austria).
- Farming 8 % of arable land organically by 2013 (Bulgaria).
- Reducing by half the use of phytopharmaceutical products and biocides within 10 years (France).

Land use

- Placing at least 2 % of the country area under robust protection within 10 years, in particular by creating three new national parks (France)
- Reducing growth in land use for housing and transport and related soil sealing to an average of 30 ha per day by 2020 (Germany).

Energy consumption

- Reducing final energy consumption by 2 % by 2010 and 16 % by 2016 (Austria).
- Decreasing final energy consumption by at least one third in the period 2020–2050 (Finland).

Energy efficiency

- Achieving a 100 % share of high efficiency household electric appliances by 2020 (Cyprus).
- Doubling energy productivity by 2020 as compared to 1990 (Germany).

Energy efficiency of buildings

- Reducing energy consumption in existing buildings by at least 38 % by 2020 (France).
- Achieving energy refurbishment of all state and public buildings before the end of 2012 (France).
- Making all government buildings that are new, under renovation or leased 'passive' by 2015 (Finland).
- Achieving thermal rehabilitation of all buildings built in the period 1950–1980 by 2020 (Austria).

Renewable energy

- Increasing the share of renewables in total energy generation to 25 % in 2010 and 45 % in 2020; and increasing the share of renewables in electricity generation to 80 % in 2010 and 85 % in 2020 (Austria).
- Increasing the share of renewables in total energy consumption to 49.3 % in 2010 (Latvia).
- Installing 165 MW of wind turbine capacity, 25 MW CPS, 10 MW of photovoltaic capacity, 4 MW of biomass plant capacity and 3 MW of biogas plant capacity by 2015 (Cyprus).

Waste

- Reducing the quantity of waste produced annually by 20 % (Hungary).
- Recycling at least 70 % of construction-demolition waste in 2020 (Hungary).

Green public procurement

- Producing at least 30 % of publicly purchased electricity from renewable energy sources by 2010 and at least 60 % by 2015 (Finland).
- Achieving sustainable cocoa (100 % in 2025), timber (50 % in 2011), soy and palm oil (100 % in 2015) in public procurement (the Netherlands).

Other

- Recovering at least 60 % of phosphorus compounds in wastewater by 2015 for use on productive land, with at least half returned to arable land (Sweden).

For more details, see the country profile documents and Annex 4 in this report.

Considerations for policy – strategic objectives and targets for resource efficiency

The vast majority of countries responding to the survey reported having several strategic objectives relevant to resource efficiency. However, both strategic objectives and targets related to resource efficiency vary substantially across countries.

Very few countries have adopted strategic objectives related to the absolute quantities of resources used. Similarly, only a handful of countries reported having specific targets for increasing material efficiency and reducing material use.

Most targets were reported in the areas of waste, reducing energy use, increasing the share of renewable energy, increasing the energy efficiency of buildings, overall energy efficiency and increasing land under organic farming. Most of these appear to be driven by EU requirements. While agreeing and setting targets is a politically complex process, country reports demonstrate that common EU targets can be an important driver for policy development at the country level.

More specifically, in the energy sector a majority of countries report not only objectives on increasing energy efficiency but also targets on absolute reductions in energy use, both of which are driven by EU energy policy. Similar momentum could potentially be created with respect to material use if agreement could be reached on common EU targets e.g. for reducing the use of selected priority materials.

Only a few countries reported objectives or targets to make less resource-intensive products more affordable than more resource-intensive alternatives.

A large number of countries have reported objectives related to promoting sustainable consumption and production. This indicates that many countries consider resource efficiency to be an holistic challenge related to the entire production-consumption system in the economy. However, with the exception of GPP, consumption and demand are rarely addressed through target setting.

To provide the necessary stimulus for resource efficiency, future EU policies could play a key role in setting overall policy objectives and establishing EU-wide strategic objectives and targets, e.g. for reduced consumption of specific materials or for reductions in absolute resource use. Alternatively, they could set aspirational targets or include provisions for setting targets at a later date.

8 Indicators

All countries reported having indicators in place to measure progress in improving resource efficiency, although the level of detail and coverage varied markedly across countries. Indicators reported to measure resource efficiency are generally developed to monitor whether and to what degree targets are being met (see Chapter 7 and Annex 4). However, indicators are sometimes also used to monitor trends in important policy areas even when targets have not been set.

An overview of reported resource efficiency indicators is presented in Table 8.1 below. The most widely reported indicators are within the following areas (in descending order, figures in brackets indicate number of countries):

- waste generation (total waste and/or waste fractions for specific waste streams) (20);
- share of renewable energy in total energy supply (18);
- waste management (rates of recycling, landfilling and other waste management practices) (18);
- domestic material consumption ⁽⁵⁾ (DMC) or material efficiency (DMC relative to gross domestic product) (17);
- energy consumption (17);
- energy efficiency (15).

The most commonly reported resource efficiency indicators are thus related to waste, energy and material use. This is in line with the priority resources mentioned in Chapter 6 and the strategic objectives and targets described in Chapter 7.

Some other relatively widely reported indicators relate to water use; land use; forest area; transport and infrastructure (e.g. the vehicle fleet's eco-score, energy use in transport, and the transport infrastructure area); area under organic farming; direct material input (DMI); domestic extraction (DE); water quality; exploitation index of water sources; eco-efficiency in economic sectors; and fisheries. The text box below

Slovenia's environmental indicator system

The Slovenian environmental indicator system developed by the Slovenian Environment Agency is particularly comprehensive (http://kazalci.arso.gov.si/?data=home&lang_id=94). The system, designed to be very user-friendly, contains more than 180 indicators, key messages, graphs, assessments and innovative links between different indicators.

For more details, see the country profile documents.

provides a sample of resource efficiency indicators reported by only a few countries.

Overall, it seems that most of the indicators commonly reported by countries are those which are included in Eurostat's Sustainable Development Indicators, or other indicators produced by Eurostat.

Most indicators are calculated with a domestic perspective (i.e. only considering what is happening within national borders). Only a handful of countries reported indicators that take account of material use embodied in imported goods or raw materials. Belgium (Wallonia Region) and Italy reported using total material requirement (TMR) as a national indicator, Italy reported using the ecological footprint, whereas France and Norway mentioned the environmental footprint of final demand.

As already mentioned in Chapter 7, pricing of resources is a critical factor in stimulating a transition to a more resource-efficient society. Nonetheless, only two countries (Denmark and Slovenia) reported using indicators of price changes for particular resources or products. Similarly, only three countries (Denmark, Romania and Switzerland) reported indicators monitoring consumption patterns or the environmental awareness of citizens, even though both issues are critical for increasing resource-efficiency.

⁽⁵⁾ For more details on MFA-based indicators, including DMC, DMI, and TMR etc. please see Annex 7.

Switzerland's environmental indicator system

In Switzerland, two exhaustive systems of indicators address the environment and sustainable development, providing a basis for indicators to guide policy and resource efficiency:

- FOEN manages 22 sets with a total of 170 indicators on the state of the environment: <http://www.bafu.admin.ch/umwelt/indikatore/index.html?lang=en>.
- MONET is a system based on 17 key sustainable development indicators (six directly related to resource use) allowing constant monitoring: <http://www.bfs.admin.ch/bfs/portal/en/index/themen/21/02/01.html>.

For more details, see the country profile documents.

Only four countries (France, Italy, Norway and Switzerland) reported having indicators addressing environmental impacts of resource use. While methodological work on compiling broadly accepted impact indicators is still under way, relevant indicators include the ecological footprint, Human Appropriation of Net Primary Productivity (HANPP), Land and Ecosystems Accounting (LEAC), Environmentally Weighted Material Consumption (EMC) and indicators based on environmentally extended input-output analysis (EE-IOA). It is not clear why countries make limited use of such indicators but possible explanations could include the lack of certain data required for the calculations, as well as methodological uncertainties that limit their uptake at the political level.

Overall, the majority of indicators reported are 'pressure indicators' such as Domestic Material Consumption (DMC). 'Response indicators' (e.g. ecolabel awards) or 'driver indicators' (e.g. consumption patterns) are used less frequently. Response indicators specifically designed for resource efficiency are needed to prepare policy-effectiveness studies, and the limited

availability of this type of indicators may complicate efforts to undertake such studies. Similarly, a wider use of 'driver indicators' could assist European resource efficiency related policy making by improving the understanding of the relationships between environmental pressures and the factors driving these.

Examples of resource efficiency indicators less frequently reported by countries

- share of population with access to organised systems for collecting and transporting waste (Bulgaria);
- number of eco-label awards (Bulgaria, Cyprus and Denmark);
- public expenditure on environmental protection (Czech Republic and France);
- water consumption and water price (Denmark);
- citizen awareness of the eco-labels 'Nordic Swan' and 'European Flower' (Denmark);
- proportion of buildings with district heating or central heating (Denmark);
- area of spoilt land (mined areas and land under landfills; number of abandoned buildings in local government units) (Estonia);
- household consumption expenditure by type, socio-economic status, region, age, household size and structure, and income (Finland);
- per capita consumption of wood and wood products from sustainable forestry (Germany);
- ecological footprint (Italy);
- number of households composting (Portugal);
- number and size of households (Romania);
- average annual meat consumption per capita (Romania);
- livestock density index (Romania);
- area of protected forests (Slovenia);
- quantity of biofuel made from wood (Slovenia);
- area of forests accessible to the public (Slovenia);
- energy prices, energy taxes and subsidies in the energy sector (Slovenia);
- green public procurement indicators (Spain).

For more details, see the country profile documents.

Table 8.1 Overview of resource efficiency indicators most commonly reported by countries

Categories	Materials					Energy				Water			Land			Waste		Others				
	Indicators	Components of DMC/DMI	Total Material Requirement (TMR)	Domestic Material Consumption (DMC)/GDP/DMC/capita	Direct Material Input (DMI)/DMI/GDP or GDP/DMI	Domestic extraction (DE)	Energy efficiency of buildings	Biofuels share in transport	Share of renewable energy	Energy consumption	Energy efficiency	Exploitation index of renewable water resources	Water quality	Water use (total or by sector)	Forest area	Share of agricultural area under organic/agro-environmental farming	Land use/conversion of land/soil	Amount of waste recycled and/or the amount of waste deposited	Waste generation (total or per waste stream or sector)	Fisheries	Eco-efficiency of different sectors	Transport and infrastructure
Austria			•	•	•													•				
Belgium (FL)			•	•		•		•	•	•			•					•	•		•	•
Belgium (WA)		•								•		•	•								•	
Bulgaria	•		•															•	•	•		
Croatia			•				•	•	•		•	•	•	•	•	•	•	•	•			
Cyprus								•	•			•		•	•							
Czech Republic			•					•	•	•	•	•	•	•	•	•	•	•	•			•
Denmark				•		•		•	•				•					•	•		•	
Estonia					•			•				•		•		•		•		•		
Finland	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•		•	
Former Yugoslav Republic of Macedonia								•	•	•					•	•		•			•	•
France			•					•	•	•		•			•			•	•			
Germany				•		•		•		•						•						•
Greece																						
Hungary										•			•		•	•		•	•			
Ireland			•						•			•						•				
Italy		•	•	•	•						•	•						•	•			
Latvia						•								•								•
Liechtenstein																		•	•			
Lithuania																						
Netherlands																						
Norway								•		•												
Poland			•		•		•	•	•	•	•	•	•	•	•	•	•	•	•	•		
Portugal			•					•	•	•								•	•			
Romania	•		•				•	•	•		•	•	•	•	•	•	•	•	•	•		
Slovakia			•	•	•			•	•	•		•	•	•	•	•	•	•	•		•	
Slovenia	•		•	•			•	•	•	•				•		•		•	•			•
Spain																						
Sweden			•	•	•			•	•					•	•	•	•	•	•			•
Switzerland			•			•		•	•	•		•	•	•	•	•	•	•	•			•
Turkey																						•
United Kingdom			•		•				•	•			•								•	
Total	4	3	17	9	8	5	5	18	17	15	7	7	13	12	11	13	18	20	6	7	9	

Considerations for policy – resource efficiency indicators

The level of detail and focus of indicators on resource efficiency varied widely, possibly reflecting the rather broad understanding of the term. The most commonly reported indicators are in the areas of waste, energy and material use. Indicators related to water, land use and forestry are also relatively widespread.

Overall, most indicators reported are 'pressure indicators' such as Domestic Material Consumption (DMC). 'Response indicators' (e.g. eco-label awards) or 'driver indicators' (e.g. consumption patterns) are used less frequently. No indicators focused on resource efficiency of products or product groups.

Although there is growing recognition that a significant and increasing share of overall environmental pressures and resource use are embodied in imported and exported goods and raw materials, only a few countries reported indicators that take account of resources embedded in international trade. A handful of countries reported using indicators on patterns of consumption and on environmental awareness. Only three countries reported having indicators addressing environmental impacts of resource use.

Building on the current work of the European Commission on resource efficiency indicators, future EU policy could play an important role in emphasising the need to develop EU-wide integrated resource efficiency indicators. Among other things, this could include developing response indicators and driver indicators on resource efficiency to generate an improved and more holistic understanding of the underlying factors driving resource use and to identify leverage points for policy intervention.

Such an integrated approach would also need to address trade-offs, resources embedded in traded goods and impact indicators that combine economic and ecosystem objectives. Several accounting methods (e.g. material flow accounting, NAMEA and environmentally extended input/output analysis, life cycle assessment, ecosystem capital) offer the potential to produce a coherent indicator package of this sort.

It is worth noting that objectives, targets and indicators for resource efficiency are one of the areas identified by countries as a priority for exchanging experience and sharing good practice (see Chapter 12).

9 Institutional set-up

As could be expected, country responses revealed a significant variety of institutional settings and organisational arrangements for developing and implementing resource efficiency policies. While a few countries indicated a limited number of organisations involved in developing policies for resource efficiency, the majority reported quite a large number of institutions at different levels within government. These typically included four types of ministries: those addressing the environment, energy, economy and agriculture. Among the four, ministries of environment often have the broadest range of responsibilities and cover a variety of issues related to resource efficiency.

Other commonly mentioned ministries included those responsible for development or regional development, physical planning and transport, domestic affairs, finance, education, foreign affairs and international cooperation, and foreign trade. Frequently, environmental agencies or various 'efficiency agencies' were also involved. In addition,

Initiated in 2006 by the Federal Ministry of Economy and Technology (BMWi), the **German Material Efficiency Agency** ('Deutsche Materialeffizienzagentur' or 'demea') was founded to promote resource efficiency. Its main goals are to provide information and increase public awareness of the importance of material efficiency, to encourage companies to realise material efficiency potentials and to support them actively with a framework of support programmes and a pool of material efficiency consultants.

Demea is currently running several initiatives. For example, VerMAT (Verbesserung der Materialeffizienz) is an advisory programme for improving material efficiency in small- and medium-sized enterprises. The NeMAT (Netzwerken zur Materialeffizienz) programme aims to create knowledge networks for material efficiency (regional networks and networks within the same industry or the same supply chain). In 2004 the BMWi established the **German Material Efficiency Prize**, which is awarded annually to innovative solutions on resource efficiency (<http://www.materialeffizienz.de>).

For more details, see the country profile documents.

The Polish **Material Reserves Agency** is a specialised institution charged with maintaining reserves of strategic materials and optimising resource use. With six regional branches and a number of depots throughout the country, the Agency's responsibilities include managing reserves of materials and fuels, medical products, and agricultural products and foods (<http://eng.arm.gov.pl>).

For more details, see the country profile documents.

in some cases publicly supported institutions outside ministries were mentioned, in particular research institutions and national statistical offices (the latter playing a key role in providing indicators related to resource efficiency).

Responsibility for developing resource efficiency policies is commonly shared across various ministries, corresponding to their specific field of responsibility and jurisdiction. For the most part, responsibility tends to be organised around single sectors or types of resources. In some instances, this can result in overlapping responsibilities and unclear competencies. Only a handful of countries reported having an overarching central body to steer and coordinate work and inter-institutional cooperation (e.g. Finland) or another mechanism to foster collaboration in the field of resource efficiency policies (e.g. the Netherlands, Switzerland).

In a few countries (Finland, Germany and Poland), ministerial activities are complemented by 'specialised agencies' established to support development and implementation of policies and action programmes at the national level.

Some countries (e.g. Finland and Germany) seem to engage with networks of experts at the interface of research, policymaking and practical implementation, to build up a national knowledge base for resource efficiency, stimulate knowledge transfer and enable better implementation of resource efficiency measures within business sectors and individual companies. Cleaner production centres, technology transfer centres and

innovation agencies were mentioned in this context (e.g. Croatia, Poland, Slovakia).

Only a few countries (e.g. the Czech Republic and Denmark) explicitly reported national environmental information agencies or regional information and education centres as being important for overall capacity-building on sustainable development and resource efficiency. Some countries (e.g. Denmark, Poland) reported having specialised institutional arrangements such as product panels, multi-stakeholder forums and platforms to address various issues (e.g. public procurement or LCA).

As part of **Finland's** national programme to promote sustainable consumption and production, in spring 2008 the Ministry of the Environment and the Ministry of Employment and the Economy established a **Material Efficiency Centre** as a unit within a company Motiva. The Centre aims to be an independent national coordinator, information source and data and knowledge centre in the field of material efficiency. Activities of the Centre include:

- developing material efficiency audit tools for companies;
- assisting in environmental technology procurement;
- international cooperation activities;
- developing the material flow cost accounting standard (ISO 14051).

Motiva itself is an expert company promoting efficient and sustainable use of energy and materials. Its services are utilised by the public administration, businesses, communities, and consumers. Motiva operates as an affiliated government agency, and the company's entire share stock is in Finnish state ownership. Motiva is also the national competent body for ecolabelling (Nordic Swan and EU Flower) since 1 January 2011 (<http://www.motiva.fi/en>).

For more details, see the country profile documents.

Implementation of measures for material and resource efficiency is often associated with additional financial investments. It therefore seems surprising that financial institutions were not explicitly mentioned as an important actor in the field of resource efficiency. This is all the more surprising because more than a third of countries presented various environmental funds as examples of good practice (see Chapter 11). Only few countries (e.g. Denmark and the United Kingdom) named public trusts as important institutions for capacity-building and implementation. Such trusts focus primarily on renewable energy and energy efficiency.

In October 2010, the Federal Ministry of Economy and Technology officially launched the **German Mineral Resources Agency**, located at the Federal Institute of Geosciences and Natural Resources (BGR). The foundation of the German Mineral Resources Agency was a response to current political discussions on the availability of critical mineral resources at the national and European levels.

The major objective of the Agency is to increase the transparency of markets for critical mineral resources via scientific support and monitoring. It also aims to build up the knowledge base on critical mineral resources that could support German industry, especially SMEs. At present, a strategy for the German Mineral Resources Agency is still being developed and work will be implemented in steps (<http://www.bgr.bund.de>).

In 2009, the Federal Environment Ministry and the Association of German Engineers founded the **Centre for Resource Efficiency (VDI ZRE)**. The aim of the centre is to reduce resource consumption in German industries and to promote integrated use of technologies protecting the environment, natural resources and the climate. This will mainly be done through awareness raising, case studies and best-practice databases (<http://www.vdi-zre.de>).

For more details, see the country profile documents.

Only a handful of countries (e.g. Belgium, Germany and Spain) reported participation in policymaking at the local level (e.g. municipalities) or in regions or federal states, although it is important to note that information on regional initiatives was not explicitly requested in the survey. Since implementation of many initiatives related to resource efficiency takes place at the local or regional level (e.g. waste, water, land), this would seem to indicate that

Regional resource efficiency initiatives in Germany include the **Effizienz-Agentur NRW**, which since 1998 has provided assistance to small- and medium-sized manufacturing enterprises in the German state of North Rhine-Westphalia. Its objective is to promote the transition to a sustainable economy through new strategies, innovative technology and ecologically oriented measures. The Effizienz-Agentur NRW also acts as an intermediary between industry, science, politics, the media and the public (<http://www.efanrw.de>).

In 2005, Rhineland-Palatinate created the **Effizienznetz Rheinland-Pfalz** (EffNet), as a central consulting and information platform for SMEs in the areas of resource efficiency and environmental technologies (<http://www.effnet.rlp.de>).

For more details, see the country profile documents.

In Finland, a broad range of organisations are involved in developing and implementing policies for resource efficiency. One example of a **new way to organise work collaboratively** is LYNET (<http://www.lynet.fi>), the Consortium for Research on Natural Resources and the Environment, consisting of:

- Evira — the Finnish Food Safety Authority
- GL — the Finnish Geodetic Institute
- MTT — Agrifood Research Finland
- Metla — the Finnish Forest Research Institute
- RKTL — the Finnish Game and Fisheries Research Institute
- SYKE — the Finnish Environment Institute

LYNET coordinates research work and the provision of expert services, research infrastructure and support services. It also manages information databases related to renewable resources and the environment. The Geological Survey of Finland (<http://en.gtk.fi>) and the Finnish Meteorological Institute (<http://en.ilmatieteenlaitos.fi>), are also involved in the work.

For more details, see the country profile documents.

in most countries the development of resource efficiency framework policies is considered the role of central government. Except for countries with a federal structure, institutions with a more regional focus seem to act primarily as intermediaries for capacity-building on resource efficiency, sometimes addressing specific target groups, such as SMEs.

Many countries emphasised the importance of resource efficiency targets and indicators to measure progress, as well as the deficiencies in this area. It is therefore somewhat surprising that only a few countries reported on the participation of national statistical offices, research institutes and think tanks in this important work.

The **National Competitiveness Council of Croatia** (NCC) is an independent advisory body consisting of 23 members and four key interest groups (the business sector, government, trade unions, and the academic community). Its main goal is to foster dialogue, partnership and consensus on programmes and policies critical to the country's sustainable growth and development. One of the NCC roles is recommending and creating guidelines for development policies. It also authored the 55 Policy Recommendations for Raising Croatia's Competitiveness.

For more details, see the country profile documents.

Another interesting, if a little surprising, observation regarding policy development is the apparently limited stakeholder participation. The information reported by the countries shows very little involvement of the private sector or civil society organisations, except in the areas of research or some forms of public-private partnership in the field of resource management (e.g. water, energy). This may, however, be because the survey question focused on the development and implementation of resource efficiency policies, not the political decision-making process itself.

Similarly, only a few countries (e.g. Croatia and the Czech Republic) cited chambers of commerce, trade associations or business councils as part of the institutional arrangement. These were often associated with establishing national sustainable development councils.

Finally, only a few countries (e.g. Finland and Sweden) reported the involvement of parliaments or parliamentary committees in developing policies on resource efficiency.

All in all, the prevailing picture is that the institutional set-up for resource efficiency policies involves a few 'typical' ministries, which tend to focus narrowly on their area of jurisdiction, usually a single sector or resource type. Central coordination of activities and policy initiatives appears limited. Combined with an occasional overlap of competencies, this underlines that the broad strategic topic of resource efficiency is an emerging issue, and that capacity development at the various levels will be needed to address the complex problems ahead.

The Swedish Environmental Protection Agency is responsible for coordinating the national system of environmental quality objectives, including providing data. A **Parliamentary Committee** has recently been introduced into the system. Its mission is to advise the government regarding the introduction of new goals and strategies based on a broad agreement between parliamentarians from all parties, as well as experts representing government, industry and NGOs. The government evaluates the achievement of objectives (overall goals, environmental quality targets and interim goals) regularly. The next evaluation will take place in 2012.

For more details, see the country profile documents.

Considerations for policy – institutional arrangements for resource efficiency

Institutional and organisational arrangements to support resource efficiency policies will need to address both the complexity and cross-cutting nature of the issues, as well as the trade-offs and unclear or conflicting competencies that exist. Some organisational aspects to strengthen policy development and implementation could include:

- better integration of resource efficiency within existing institutions and within their areas of responsibility;
- stimulating closer inter-institutional collaboration to improve coherence and consistency of policies (including introducing mechanisms for coordinating work);
- fostering multi-stakeholder dialogue and public participation to mobilise support for implementing resource efficiency initiatives;
- strengthening the knowledge base on resource efficiency at the national and local levels;
- highlighting the role of financial institutions in implementing resource efficiency initiatives;
- supporting closer cooperation between policymakers and statistical offices or research institutes responsible for producing resource efficiency indicators.

10 Main drivers for resource efficiency policies

This part of the survey aimed to determine how resource efficiency first became a policy concern, how it evolved over time and which main forces are driving resource efficiency policy development at the national level. Most countries focused their response on the main driving forces, with only a few also covering the evolution of resource efficiency policy.

Reflecting on the evolution of the policy field, only a handful of countries indicated when resource efficiency became a political priority. Austria, Belgium (Flanders), and Germany explicitly traced this back to the 1970s, with the remaining countries mentioning much later dates. Overall, EU-15 Member States tended to indicate that resource efficiency become a political priority at an earlier point in time than those that joined the EU later.

The countries that provided information on the evolution of resource efficiency policy tended to identify the energy crisis of the 1970s or the beginning of environmental policies at around that time as a starting point. They stressed a strong focus on waste and recycling policies, and to some extent also product policy. Some (e.g. Croatia and Hungary) explicitly mentioned change in the political and economic system as a starting point for resource efficiency concerns, while others referred to the global financial crisis and economic recession of recent years. Some countries (e.g. Belgium – Wallonia, Spain and Turkey) referred in their response to an acute shortage of critical resources (water, geological resources and marine resources).

Only a few countries (e.g. Greece and Hungary) explicitly mentioned the need for deep economic reform as a driving force to improve resource efficiency. On the other hand, nearly all countries commented that global economic conditions were a strong driver for resource efficiency (e.g. the increase or volatility of raw material prices, high import dependency, global competition, innovation and technology developments, potential for job creation, scarcity and security of supply, and international trade issues). In this respect, for a majority of countries resource efficiency has now become a strategic economic issue. Most countries

have already formulated national policy objectives in response to these global challenges and a few already indicated that resource efficiency will be part of a long-term national strategy (with a timeframe extending to 2020–2030).

It was somewhat surprising to note that only a few countries (e.g. Denmark) mentioned public or NGO pressure as a driver for the evolution of the policy field. No countries mentioned the mass media or businesses and industry as pressure factors. This may, however, be the result of the survey questions focusing on the development and implementation of resource efficiency policies, and not addressing the political decision-making process itself.

Furthermore, very few countries (e.g. the United Kingdom) explicitly mentioned the aim to make a clear business case for resource efficiency, based on the idea that it reduces costs and risk for businesses, in addition to reducing pressures on the environment. A few countries (e.g. Bulgaria and the United Kingdom) mentioned the need to create conditions and incentives for more pro-environment behaviour, mainly referring to support to consumers to make more sustainable lifestyle choices, and demanding more sustainable goods from producers.

The terminology problems and lack of definition of resource efficiency mentioned in Chapter 2 may well have influenced country responses regarding drivers for resource efficiency policy. Nevertheless, three main categories of drivers can be distinguished among the country responses: environment-related, economic and political drivers.

Environment-related drivers

Resource efficiency is seen as an environmental priority in nearly all countries, with resource use causing concern because of associated environmental degradation. A number of countries noted the fundamental role of the environment for their economy or society. On the other hand, only a few countries considered health as explicitly linked to resource efficiency. Several countries reported considering the issue of resource efficiency in the

context of sustainable development, where resource use, climate change and energy are strongly related. At the same time, most countries tended to focus within national borders. The global dimension was mainly seen (if at all) as an economic risk — e.g. in terms of dealing with resource shortages — rather than as a global environmental problem.

Several countries signalled that the **Europe 2020 strategy** is already a strong driver for resource efficiency policies.

- **Spain's Act on Sustainable Economy 2011** aims to create a more sustainable production and consumption model and takes into account the objectives of the Europe 2020 Strategy.
- Latvia is reflecting the strategy's main elements when developing its **Sustainable Development Strategy of Latvia** until 2030.
- The **Flemish Reform Programme** will be used as an implementation tool for the priorities listed in the Europe 2020 Strategy.
- The **Lithuanian national reform programme** has been designed in line with Europe 2020 strategy.
- The **Estonia 2020** national competitiveness plan currently under preparation is also following the priorities of the EU's growth strategy.
- In the **Polish national reform programme**, efficient use of resources is emphasised in sections on infrastructure development and innovation.

Other countries that listed Europe 2020 as a driving force for national work on resource efficiency policies include Austria, Bulgaria, Denmark, Hungary and Slovenia.

For more details, see the country profile documents.

Economic drivers

Most countries identified possible scarcity of resources and securing future access as an important risk to the economy, and a lot identified concerns about price increases and volatility as a policy driver. Increasing costs were seen as a concern mainly in the fields of energy, water, waste and non-renewable raw materials. Surprisingly, given the many recent policy initiatives on critical raw materials, only a few countries mentioned the issue of 'rare metals'.

Some countries (e.g. Croatia, Hungary, Switzerland, Turkey) noted the need to reduce their import dependence for specific resources — mostly energy related such as oil but also raw materials — as a major driver. A few countries, (e.g. the Netherlands) pointed to the need to reduce environmental pressures embedded in international trade as an (upcoming) driver for resource efficiency policies. Others (e.g. Portugal) noted the need to adapt to changes in the global economy in general.

Political drivers

Many countries noted that EU policy initiatives are a strong driving force for national resource efficiency policies. A wide spectrum of EU policies was mentioned in this context, including waste policies, integrated product policy, the Action Plan on Sustainable Consumption and Production and Sustainable Industrial Policy, the Thematic Strategy on the sustainable use of natural resources, or the EU Raw Material Initiative. The Europe 2020 strategy — with its requirement for adopting national reform programmes and the Flagship Initiative for a Resource Efficient Europe — appears to be a strong policy signal. Political drivers were mentioned more often by countries that have joined the EU in recent years or which are preparing to join the EU (e.g. Croatia, Turkey).

Considerations for policy – key drivers for resource efficiency policies

Reflecting on policy drivers for resource efficiency, countries mentioned a combination of environmental, economic and political factors. Those related to the environment include concerns about environmental degradation or sustainable development, while factors related to the economy included the energy crisis, price volatility, rising costs of resources, economic reform, future scarcity or reducing dependence on imports. There was no clear conclusion as to their relative importance, except for the high priority accorded to acute shortages of critical resources (e.g. water).

EU policy initiatives appear to be a strong driver for policy development at the country level. Several countries reported already including various aspects of resource efficiency in new policies and strategies in response to the Europe 2020 Strategy and its flagship initiatives, as well as the EU Raw Materials Initiative. EU accession requirements were a major factor for candidate countries.

Bearing in mind the Europe 2020 strategy's long-term objective of 'smart, sustainable and inclusive growth', countries may wish to put a greater emphasis on innovation, education and social considerations in future resource efficiency policies.

It does not appear from country responses that the business community, civil society and mass media are strong driving forces in resource efficiency policymaking. This indicates the need to increase public recognition of the importance of the topic, which could be addressed by stronger communication and capacity-building efforts.

The wide spectrum of reported policy drivers show that resource efficiency is a cross-cutting field integrating economic and environmental concerns. Future resource efficiency policies could explicitly address growing concerns about long-term access to strategic resources.

11 Examples of policy instruments and initiatives to promote resource efficiency

Stimulating the exchange of experiences in developing and implementing resource efficiency policies was one of the main goals of the survey. Participating countries have put in place numerous initiatives to support resource efficiency covering a wide spectrum of policy areas including raw material extraction, production and waste management. There is also considerable diversity in the types of instruments used.

Countries were therefore invited to present those policy approaches and instruments that they consider good practice in policymaking on resource efficiency. Except for guidance related to the format of presentation, countries were given complete freedom to choose and present cases. Thus, no attempt was made through this question to make a methodical and comprehensive mapping of all policy instruments used by countries for improving resource efficiency.

Overall, thirty-one countries provided about 190 examples⁽⁶⁾ covering the entire spectrum of policy instruments, from regulatory instruments and economic instruments, to information-based instruments and voluntary agreements. It should be noted, however, that only a certain number of these policy instruments and initiatives were developed with the primary aim of improving resource efficiency. Table 11.1 presents an overview of the types of instruments and initiatives presented by countries, while the full list is set out in Annex 5.

Information-based instruments related to resource efficiency (47 references by 22 countries) were among the most commonly reported policy tools. The examples provided cover a large spectrum of approaches such as information campaigns (including web-based ones) on issues such as waste prevention, green public procurement or energy efficiency (e.g. Belgium, Czech Republic, Denmark, Poland, Switzerland, Turkey); environmental

Selected examples of information-based instruments and tools for resource efficiency

The Czech Republic's Green Company initiative aims to collect and treat WEEE directly in companies (<http://www.remasystem.cz>).

Germany's self-check tool developed by the Demea agency helps businesses identify potentials to increase material efficiency (<http://www.materialeffizienz.de>).

Hungary's Green Days programme offers ecological tips (for example on energy saving, use of raw materials and water, food consumption, health, education, work, transport, housing, free time) (<http://www.zoldkoznapok.hu> and <http://www.egymozdulat.hu>).

Ireland's SMILE programme encourages businesses to share and exchange resources (<http://www.smileexchange.ie>).

The United Kingdom's WRAP website provides guidance on enhancing resource efficiency for local authorities, individuals and businesses (<http://www.wrap.org.uk>).

For more details, see the country profile documents.

education (e.g. a national environmental education centre in Spain); labelling schemes; and national events (e.g. sustainable weeks in Austria).

Six countries mentioned labelling schemes but the focus was mainly on energy efficiency. Exceptions were the German Blue Angel label, which has integrated resource conservation as an indicator, and the Nordic Swan ecolabel which also considers resource efficiency. A newly developed comprehensive life-cycle-based environmental label for consumer goods providing an 'ecological price' — an indication of a product's environmental footprint in addition to the ordinary price — is being tested in France.

⁽⁶⁾ Out of about 190 good practice examples presented (i.e. almost six examples per country on average), about thirty focused on waste and twenty-five on energy policies. Fourteen are still in the planning or early implementation stage.

Another approach using information tools consists of providing expert support for material or resource efficiency measures. This can include consultancy services, advice programmes and information on material efficiency. Examples include the Czech Republic's Initial Review for Sustainable Consumption and Production programme; the Material Efficiency Agency and the Resource Efficiency Network in Germany; and WRAP and the Resource Efficiency Helpline in the United Kingdom.

Only seven countries referred to research programmes. Based on the responses provided by countries, Germany seems to have the most comprehensive research programme on material efficiency and resource conservation.

Germany's Material Efficiency and Resource Conservation Research Programme

In 2007, the German Environment Ministry and the Federal Environment Agency commissioned a large-scale research project 'Material Efficiency and Resource Conservation' (MaReSS). The project's main goals were to identify resource efficiency potentials, develop target-group-specific approaches and policies on resource efficiency, and develop an agenda for increasing resource efficiency in consumption and production (<http://ressourcen.wupperinst.org/en>).

In order to pool existing knowledge about efficient use of resources and strengthen communication between economy, science, and politics, the German Environment Ministry created the Network Resource Efficiency (<http://www.netzwerk-ressourceneffizienz.de>).

For more details, see the country profile documents.

The most frequently mentioned type of policy instruments were **economic instruments** (60 examples in 18 countries). Such instruments were mainly taxes or charges addressing a wide range of issues like air pollution, buildings, waste, motor vehicles and plastic bags. A few countries presented resource taxes and charges targeting specific groups of resources, such as minerals, water, timber and game for hunting.

Institutional and organisational arrangements to support resource efficiency also featured quite prominently in country reports (25 examples in 16 countries). By far the most common example was environmental funds and 'ecofunds', which provide financing for resource efficiency measures (among other things). However, several countries (Denmark, Finland, Germany, the Netherlands, Spain and

Resource taxes in Estonia, Italy, Lithuania and other countries

While taxes on energy products (mainly fossil fuels) are harmonised in the EU and water charges are commonly used, taxes on other resources such as minerals, metals or biomass appear less widespread. Extraction charges or taxes on mineral resources such as sand, gravel, rock, dolomite, limestone and clay were reported as examples of good practice by Estonia, Italy and Lithuania. However, more countries noted economic instruments elsewhere in their country profiles.

For more details, see the country profile documents.

Sweden) also presented initiatives aimed at setting up networks or partnerships for various aspects of resource efficiency.

Developing strategies or action plans for resource efficiency appears to be another important area for countries, with 23 examples reported in 16 countries. However, most initiatives addressed national waste management plans or energy efficiency plans, which are required by EU regulations. Furthermore, most countries reported strategies and action plans related to resource efficiency in the earlier sections of the survey earmarked for this (see Chapters 3 and 4).

Some countries highlighted various **sector-oriented policies** (18 examples in 14 countries). These covered, for example, **public-private partnerships and voluntary agreements with industry** for reducing energy use and GHG emissions (e.g. Belgium-Wallonia), construction materials (e.g. Liechtenstein, United Kingdom), food and packaging (e.g. the Netherlands, United Kingdom) or wood and detergents (e.g. Belgium at the federal level). Further examples include Norway's 'Oil for development' programme, which assists in managing petroleum resources in a more sustainable way in developing countries, the publicly funded 'National Industrial Symbiosis Programme' in Hungary, and the 'Saving money

Portugal's Organised Waste Market initiative

The Organised Waste Market initiative, is a voluntary economic instrument for facilitating and promoting commercial exchanges of waste, fostering recovery by bringing waste back into the economic production-consumption cycle.

For more details, see the country profile documents.

through industry links and exchanges' business service in Ireland.

Regulatory instruments were mentioned 17 times in 11 countries. Examples include Poland's Geological and Mining Law, Sweden's producer responsibility system, Denmark's Planning Act for Land Use and Romania's Forest Code.

Funding schemes to support resource efficiency specifically are not well established in Europe so far. The **National Trust Ecofund in Bulgaria** (focusing on preventing pollution of water and air) and the **Environmental Protection and Energy Efficiency Fund (EPEEF) in Croatia** provide examples of redirecting resource taxes to environmental projects.

The **Aggregates Levy Sustainability Fund in the United Kingdom** uses approximately 10 % of the tax revenue generated through the Aggregates Levy to provide funding for research and projects aimed at minimising the effects of aggregates production. Since its implementation in 2002 the Fund supported over 2 000 projects. After running for nine years the programme was due to end on 31 March 2011.

The **Fund for the Reduction of the Global Energy Cost (FRGE) in Belgium** and the **Eco-Fund in Slovenia** are examples of public-private partnerships offering low-interest loans to implement structural energy saving measures in private homes.

For more details, see the country profile documents.

Only a few countries presented examples of policy instruments addressing the area of household consumption (i.e. the Czech Republic, Denmark, France and Hungary). This corresponds well with the rather low-key approach to consumption described earlier in this report. Five countries, however, highlighted public consumption as a priority area dealt with through sustainable public procurement policy (Belgium, Denmark, Norway, Poland and Switzerland).

The overall picture emerging from the 190 examples of good practice provided by countries is that resource efficiency is a diverse and dynamic policy field. At present it is largely dominated by waste and energy policies but increasingly includes creative and successful tools and approaches addressing other resources.

The scope of this policy field is also subject to a broad range of interpretations, in part due to the lack of a clear definition of 'resource efficiency'. This has led to countries reporting a rather wide range of instruments. It appears, however, that information-based and economic instruments are widespread and countries see good potential for sharing good practice within these areas. Numerous examples of targeted and successful policies appear worth considering for dissemination as good practice in order to stimulate further policy development.

Table 11.1 Examples of policy instruments and initiatives presented by countries as good practice to promote resource efficiency

	Strategies/ action plans	Regulations	Economic Instruments	Sector policies/PPPs	Research programmes/ institutions	Information- based instruments	Environment funds	Others
Austria	1			1	1	1		
Belgium (federal level)	1	1		1		4	1	1
Belgium (Flanders)		1p	1p			2		
Belgium (Wallonia)				2		2		
Bulgaria		2		1			2	
Croatia			7			1	1	
Cyprus	4p			1				
Czech Republic			1	1		6		
Denmark	1	1	2	2		4		1
Estonia			5					
Finland	1p							1
Former Yugoslav Republic of Macedonia			4			1		
France	1					1p		
Germany	1 + 1p	2	2		4	4		
Greece						1		
Hungary	1 + 1p			1	2	4	1	1
Ireland						1		
Italy			3			1		
Latvia			9					
Liechtenstein	1							
Lithuania	1		4					
Netherlands	1p			2p				
Norway	1	1	1	1		2	1	
Poland	3	2				3		
Portugal	1p	1	5			1	1	1
Romania	2	1	3			1	1	
Slovakia			2	1		3	2	
Slovenia		1	2				1	
Spain				1	1	2		1
Sweden		3	3		1	1		
Switzerland	2		2	1				
Turkey		1	4		1	1		
United Kingdom				2		1		
Totals	15 + 8p	16 + 1p	59 + 1p	16 + 2p	9	46 + 1p	11	6

Note: p = indicates planning or early implementation phase.

Considerations for policy – exchanging good practice in resource efficiency policymaking

The examples of resource-efficiency-related policy instruments and initiatives reported by countries indicate that information-based instruments and economic instruments are widespread and countries see the most potential for sharing good practice within these areas.

Institutional and organisational arrangements to support resource efficiency were also commonly reported, although the majority were environmental funds of various forms. Given the limited use of mechanisms to coordinate inter-institutional cooperation on resource-efficiency policies mentioned in Chapter 9, it could be worth exploring how to strengthen the policy development and coordination element of the knowledge base.

Very few countries presented examples of policy instruments and initiatives addressing household consumption. Those cited were mainly information-based instruments (e.g. labels or information campaigns). Future EU resource efficiency policies could promote and strengthen measures to reduce environmental impacts by influencing household consumption.

Countries are applying a very broad spectrum of policy approaches to support resource efficiency. However, very few countries reflected on the effectiveness of the resource efficiency policy instruments and initiatives that they reported as good practice. This indicates a potential area for capacity-building, particularly since many countries identified policy evaluation as a knowledge gap (see Chapter 12).

It could be worth exploring if and how a platform for sharing good practice regarding resource efficiency policy could assist policymaking at the national, regional and local levels.

12 Information needs and knowledge gaps

With a view to further developing the knowledge base for resource efficiency, one important objective of the survey was to identify country information needs and existing knowledge gaps.

All in all, countries raised almost fifty different issues in their responses, with about half a dozen topics shared by more than a quarter of the countries. Annex 6 provides a detailed overview of responses.

The responses on information needs and knowledge gaps indicate that countries are most interested in experience in integrating resource efficiency into other policies; in sharing knowledge and good practice on issues such as strategic objectives, targets and indicators; and in evaluating policy effectiveness. This is probably for practical reasons — such information would directly support and help focus policy development at the national level.

However, the issues raised were not limited to policy tools and approaches, but included a number of thought-provoking and fairly fundamental questions (see box). This appears in part to reflect the fact that the term 'resource efficiency' is still largely undefined. Indeed, this latter issue was listed by several countries as a challenge that needs to be addressed. Some countries also reflected on the need for a general transition of Europe's economy and society, with resource efficiency playing a key role. In this context, countries highlighted the need to focus the research agenda and identify possible conflicts or trade-offs.

Another aspect apparent in the survey responses and also in informal interaction with the countries was the challenge they seem to face in developing 'something new' in the context of the Europe 2020 Resource Efficiency Flagship Initiative. Essentially, countries were uncertain whether this new EU priority required the adoption of new policies or whether EU policies should aim to (re)package existing priorities and policies under the umbrella of resource efficiency, perhaps focusing on filling the most pressing gaps.

Back to basics?

In identifying their information needs to support policymaking, countries highlighted certain issues that were fairly predictable but also raised some more fundamental questions and issues, including the following:

- how can the rebound effect be addressed?
- how can countries account for resources or impacts embedded in global trade?
- is 'zero growth' a viable policy choice?
- is absolute decoupling possible?
- what is the cost of inaction?
- what is the link between resource efficiency and biodiversity?

For more details, see the country profile documents.

Among topics that appeared to be of less interest than might have been expected were the institutional and organisational set-up for resource efficiency, experience with using economic arguments and making the business case for resource efficiency, and methods for awareness raising and involving stakeholders.

With a quarter of countries mentioning the need to strengthen the knowledge base for resource efficiency, it appears that practical information on real-life experience with resource efficiency policies in European countries would significantly help national administrations in policy development. The responses about needs and information gaps provide a broad menu of topics for possible future support to the member countries.

For its part, the European Commission has also highlighted the need to expand the knowledge base — and in this context the information on country needs could serve as a starting point to identify some priority areas for further capacity-building. Several countries expressed interest in practical approaches to integrating resource efficiency into other policies, setting targets and developing indicators to monitor progress, and tools for assessing policy effectiveness.

Considerations for policy – addressing knowledge gaps and information needs

Reflecting on their information needs and knowledge gaps, countries seem to be most interested in information on how best to integrate resource efficiency into other policies and in sharing good practice on issues such as strategic objectives, targets and indicators. Monitoring and assessing policy effectiveness also appear to be topics of interest for several countries. However, with almost fifty separate issues mentioned, there was a large variety of needs and interests.

Addressing consumption would appear to be a priority area for strengthening policy if a significant improvement in resource efficiency is to be achieved. Information on using economic instruments to change consumption behaviour could be particularly important in this context, given the apparently limited national experience with policies addressing consumption, except for information-based instruments.

Another important topic of interest – albeit one raised by only a few countries – is the question of how to address the rebound effect and steer consumption towards low-impact products or services.

Several countries reported that uncertainty about the definition of 'resource efficiency' is a significant challenge, leading to uncertainties about how to develop 'something new' in response to future European policies on resource efficiency.

13 Some EEA considerations for future European policies on resource efficiency

Drawing on the 'considerations for policy' at the end of each chapter, this final chapter summarises some of the survey's potential implications for future resource efficiency policies.

Benefits of resource efficiency policy: synergies and trade-offs

Reflecting on the drivers for resource efficiency policymaking, the countries indicated a combination of environmental, economic and political factors. In doing so, they highlighted the potential synergies between efforts to achieve environmental and economic goals.

For example, one of the most commonly reported priority resources is waste, now widely recognised as economically important because it is a secondary raw material and a substitute for primary resources. Combined with an emphasis on waste prevention, this shift of perception is an essential step towards developing a circular economy. Moreover, as shown in a recent EEA report (EEA, 2011) better waste management has the additional benefit of reducing greenhouse gas emissions and other pressures on the environment, with potentially significant economic and social benefits.

Bearing in mind the Europe 2020 strategy's long-term objective of 'smart, sustainable and inclusive growth', countries may wish to put a greater emphasis on innovation, education and social considerations in future resource efficiency policies. Efforts will also be needed to ensure that resource efficiency policies are coherent with industrial and product policies.

In some instances, decision-makers face the need for trade-offs. For example, the introduction of 'biomass for energy' strategies in many countries, driven by the need to increase the share of renewable energy sources in the overall energy mix, means that biomass resource efficiency could become a key policy area in the near future. This could draw in agricultural or forestry policy and necessitate compromises between energy policy, agricultural and food policy, spatial

planning, biodiversity preservation and ecosystem maintenance.

EU policies can serve as a key driver of national resource efficiency policymaking

While countries often adopt sectoral and resource-specific policies due to the importance of particular resources or sectors, other policies result from EU and international requirements. Indeed, EU policy initiatives appear to be a strong driver of national policies, indicating both an opportunity and a need for EU resource efficiency policies to provide guidance and strategic direction.

In addition to elaborating specific policies, EU contributions could include helping to develop a common understanding of key concepts, enabling sharing of knowledge and experiences, and developing indicators and measures. They could also include stimulating a discussion on targets for reduced consumption of certain materials or reducing overall use of resources, perhaps with explicit leeway left to the countries to choose the mix appropriate for local conditions.

Towards a common understanding of resource efficiency

The survey responses revealed fairly widespread uncertainty about the definition of 'resource efficiency' and its relationship to other concepts such as 'sustainable consumption and production' and 'the green economy'. This uncertainty appears to complicate efforts to discuss and analyse the topic and to set targets and policy objectives.

It would be useful to reflect on the advantages and disadvantages of providing clear definitions of key concepts, in particular 'resource efficiency' and 'resources'. To support policy coherence, it would also be helpful to develop and communicate an understanding of the interlinkages, overlaps and synergies between these and related concepts.

One possible approach could be for EU resource-related policies to use broad interpretations of

'resource efficiency' but leave it to the countries to decide which policies and resources are most relevant in their national context.

Targeting resource efficiency policy

Most countries identify resource efficiency as a priority in economy-wide strategies but policy measures to increase resource efficiency are primarily located in environmental or sectoral policies. This mismatch raises a question about where to focus policy intervention — the economy as a whole, selected sectors or priority resources.

Consumption appears to be a priority area for strengthening policy if resource efficiency is to improve significantly. Very few countries presented examples of policies and instruments addressing consumption. Those that did mainly referred to information instruments (e.g. various labels), or focused on technical efficiency improvements rather than on managing demand.

Using economic instruments to change consumption behaviour could be particularly important, given the apparently limited national experience with policies addressing consumption, except for information-based instruments. Another topic of interest — important although raised by only a few countries — could be how to address the rebound effect and steer consumption towards low-impact products or services.

Product-oriented resource efficiency initiatives did not feature prominently in country responses, with the exception of a general emphasis on green public procurement and some mention of integrated product policy, both driven by EU initiatives. This indicates that resource efficiency could be strengthened through an increased focus on products (and thus also on consumption). Furthermore, increasingly globalised product chains and ever growing international trade imply that EU product-oriented initiatives could also have a global knock-on effect for improving resource efficiency.

Financial sector and business community participation in developing policies on resource efficiency appears to be limited, judging by country responses. This highlights the importance of making a business case for resource efficiency. Three particularly relevant aspects in this context include decreasing dependence on imports of strategic resources, creating green jobs and maintaining the competitive edge of European industries.

Global environmental impacts of a country's consumption are increasingly the focus of policy debate and initiatives. This indicates a desire for policies that take into account resources 'embedded' in global trade, in addition to the traditional focus on 'domestic' resource efficiency (within national borders).

Setting policy objectives and targets

Strategic objectives and targets vary substantially across countries. Future EU policies could play an important role in defining common EU-wide strategic objectives and targets on resource efficiency, perhaps with differentiated time perspectives. While agreeing and setting targets is a politically complex process, the survey demonstrated that common EU targets can be an important driver for policy development at the country level. New policies could include specific targets or provisions for setting targets at a later date, or room for discussion on aspirational targets.

Indicators and measuring resource efficiency

Building on current Commission work on resource efficiency indicators, future efforts could emphasise the need for EU-wide integrated resource efficiency indicators. Among other things, these would address trade-offs, resources embedded in traded goods, and impact indicators that combine economic and ecosystem objectives. Several accounting methods (e.g. material flow accounting, NAMEA and environmentally extended input/output analysis, lifecycle assessment, ecosystem capital) offer the potential to produce a coherent indicator package of this sort.

Targets and indicators are one of the areas identified by countries as a priority for exchanging experience and sharing good practice. One important element here would be to intensify cooperation between policymakers and the statistical offices or research institutes responsible for producing resource efficiency indicators.

Strengthening the knowledge base for resource efficiency

Reflecting on their information needs and knowledge gaps, countries identified several common issues. These include a need for information on how best to integrate resource efficiency into other policies; good practice in policy implementation (including assessing policy effectiveness); and setting strategic objectives, targets, and indicators. Further work

on strengthening the knowledge base for resource efficiency could target some or all of these areas.

Initiatives on institutional development and capacity-building could focus on better integration of resource efficiency within existing institutions (and strengthening mechanisms for coordinating work); stimulating closer inter-institutional collaboration to improve coherence and consistency

of policies; and fostering stakeholder dialogue and public participation to mobilise support for policy implementation.

It could also be worth exploring if and how a platform for sharing good practice regarding resource efficiency policy could assist policymaking at the national, regional and local levels.

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Annex 1 Countries that responded to the survey

The following countries responded to the survey:

Austria	Italy
Belgium (separate submissions received from the federal level and the regions of Brussels capital city, Flanders and Wallonia)	Latvia
Bulgaria	Liechtenstein
Croatia	Lithuania
Cyprus	Netherlands
Czech Republic	Norway
Denmark	Poland
Estonia	Portugal
Finland	Romania
The former Yugoslav Republic of Macedonia	Slovakia
France	Slovenia
Germany	Spain
Greece	Sweden
Hungary	Switzerland
Ireland	Turkey
	United Kingdom

Annex 2 Survey questionnaire

The survey questionnaire comprised the following questions:

- Q1: Does your country have a national resource efficiency strategy or a dedicated action plan for resource efficiency — or is one such currently under preparation? If not, is the topic of resource efficiency addressed instead as part of other environmental strategies/other policies ?
- Q2: Are there any sector-specific strategies or action plans to improve resource efficiency in individual economic sectors? Have resource efficiency strategies or action plans been set up for specific products or groups of products?
- Q3: Have individual types of resources (or resource groups) been identified as a priority for national or sector-specific resource efficiency policies?
- Q4: What strategic objectives and targets have been set for resource efficiency? Which indicators are used to measure improvements in resource efficiency?
- Q5: What is the institutional set-up for the development and implementation of resource efficiency policies?
- Q6: Evolution and main drivers for resource efficiency policies
- Q7: Which specific policy instruments or initiatives on resource efficiency from your country would you like to present in more detail?
- Q8: If a follow-up workshop on resource efficiency policies were to be organised, what topics would you find of most use?

The questions were accompanied by detailed notes and examples to provide guidance to the countries responding to the survey. Information was collected between January and May 2011.

Annex 3 Economy-wide policies with resource efficiency components

	National SD Strategy	National Environmental Strategy	SCP Action Plan	Raw Materials Plan	Climate Change Strategy/Plans	National Reform Programme	Other
Austria	X			X			Resource Efficiency Action Plan (y ¹); Austrian Masterplan Green Jobs; Strategy on Research, Technology and Innovation
Belgium (Federal)	X						Federal Products Plan (2009–2012); National Biodiversity Strategy
Belgium (Brussels)	(X)						Regional Waste Management and Prevention Plan
Belgium (Flanders)	(X)	(X)				(X)	Sustainable Materials Management Strategy (y); New Industrial policy (y)
Belgium (Wallonia)	(X)				(X)		Marshall Plan 2.green
Bulgaria	y	X			y	X	National Programme for Action on Environmental and Health
Croatia	X		y				Action Plan for Environmental Protection (y), Action Plan for Adriatic Sea, Coasts and Islands; Economic Recovery Programme, Regional Development Strategy
Cyprus	X					X	
Czech Republic	X	X	X	X	X	X	National Development Plan of the Czech Republic 2007–2013; Economic Growth Strategy; Spatial Development Policy;
Denmark	X						Green growth (2009)
Estonia	X	X					
Finland	X		X	X			Towards a Smart Resource Economy
Former Yugoslav Republic of Macedonia	X						
France	X	X					
Germany	X			X			Framework Research Programme for Sustainable Development; Research Strategy for BioEconomy 2030; National programme on resource efficiency (y)
Greece							Green Growth Strategic Action Plan; National Strategic Framework Programme
Hungary	X	X			X	y	New Hungarian Rural Development Programme; National Spatial Development Concept; New Széchenyi Plan; New Hungarian Development Plan
Ireland	X				X		National Development Plan
Italy		X	X ²				
Latvia	X	X					Strategic development plan for Latvia 2010–2013
Liechtenstein							Agenda 2020
Lithuania	X	X		X ³		y	Law on Taxes on State Natural Resource; Long-term Development Strategy of the State
The Netherlands							National Programme on Natural Resources
Norway	X						

	National SD Strategy	National Environmental Strategy	SCP Action Plan	Raw Materials Plan	Climate Change Strategy/Plans	National Reform Programme	Other
Poland		X				y	Strategy for Innovation and Efficiency of the Economy (y); Assumptions for National Programme for the Development of Low-Emission Economy (y); Sustainable Development of Rural Areas, Agriculture and Fishery Strategy (y); Poland 2030: Development Challenges, Energy Security and Environment Strategy (y)
Portugal	X	X			X		Integrated Product Policy, National Programme for Spatial Planning Policy, Waste Management National Plan
Romania	X	X					
Slovakia	X					X	Innovation Strategy of the Slovak Republic; Development Strategy of the Slovak Society
Slovenia	X	X				y	National Development Programme; Strategy for Regional Development; Strategy on Spatial Development; National Strategic Reference Framework
Spain	X						Sustainable Economy Law; Natural Heritage and Biodiversity Law
Sweden		X					
Switzerland	X				X ⁴		Green Economy Programme, Swiss Cleantech Masterplan
Turkey		X					Ninth Development Plan; National Programme of Turkey for the Adaptation of the EU Acquis
United Kingdom	X						Building a Low Carbon Economy: Unlocking Innovation and Skills Strategy; Low Carbon Transition Plan; Roadmap to a green Economy (y); Natural Environment White Paper (y); Waste & Resource Action Programme

Note: ¹ (y) = under preparation.

² Preliminary programme.

³ Natural resources protection and sustainability programme

Annex 4 National targets related to resource efficiency

Country	Target
Material efficiency	
Germany	Doubling of the abiotic material productivity by 2020 as compared to 1994
Romania	1.2–1.5 % minimum reduction per year of the specific materials and energy consumption rates and production losses in the processing industries, power generation, residential sector, transport and construction
Material use	
Austria	In the long term the total resource consumption shall decrease absolutely and the resource productivity shall increase by factor 4
Estonia	Direct extraction of oil shale should not exceed 20 million tons per year by 2015
Italy	Reduction of Italian TMR by – 25 % by 2010, – 75 % by 2030 and by – 90 % by 2050
Sweden	By 2010 extraction of natural gravel in the country will not exceed 12 million tonnes per year.
Switzerland	Reduce the consumption of fossil fuels by 20 % by 2020
Agriculture	
Austria	The share of ecological farmed areas on all agricultures used areas shall increase to 20 % by 2010
Bulgaria	Areas of the total arable land farmed organically should be 8 % by 2013
Croatia	Increase the share of arable land from the present 1 092 000 ha to 1,800,000 ha, by using uncultivated land that presently amounts to 947 000 ha
Croatia	By 2013 increase the share of areas used for ecological production (including pastures and forests) to at least 5 % and support the development of the market for ecological products
Cyprus	Organic Farming increase to 1.5 % until 2013
Denmark	Reduce the release of nitrogen from agriculture by 19,000 tonnes by 2015 and reduce it further by 2020. Reduce the release of phosphorous from agriculture by 210 tonnes by 2015 Reduce the impact from pesticide from 2.1 to 1.4 by end of 2013 corresponding to a frequency in use of pesticides of 1.7 Reduce the release of ammonia
Denmark	Use of 40 % of animal manure for green energy by 2020
Denmark	A doubling of the organic farming area by 2020
Denmark	A reduction in the agricultural emissions of greenhouse gases by 700,000 tonnes and a further reduction in 2020
France	Achieve 6 % of the agricultural surface being farmed organically by 2012 and 20 % by 2020. Reduce by half the use of phytopharmaceutical products and biocides within 10 years. Achieve a figure of 30 % of low energy farms by 2012. Have 50 % of farms applying for environmental certification.
Forestry	
Belgium — Wallonia	11 % of private forests are certified, 100 % of public forests owned by the Walloon Region are certified and 95 % of public forests owned by the local authorities are certified
Bulgaria	Land from Country Territory covered by forests to reach 35.9 % in 2015
Cyprus	Introduction of more than 70 % of national forest land in 'Natura 2000' network
Denmark	Forest landscapes should cover 20–25 % of Denmark after one tree generation (80–100 years) — and the scope and potential for natural habitats and processes should be strengthened in this effort.
Denmark	3–5 trees per hectare is left for natural death and decay, both deciduous and coniferous
Denmark	All Danish state forests are FSC or PEFC certified
Estonia	The total forest area should be minimum 2.3 million ha by 2013
Estonia	Forest growing stock should be 460 million m ³ by 2013
Estonia	Forest felling volume should be 10.5 million m ³ by 2013
Estonia	The relative share of felling in annual increment of timber should be 87 % by 2013
Germany	Increase the per capita consumption of wood and wood products from sustainable forestry from 1.1 m ³ to 1.3 m ³
Latvia	Amounts of forest land not less than in 01.01.2006. Illegal forest cutting not more than 1 %
Land use (excluding agriculture and forestry)	
Denmark	By 2020 Denmark's area for nature should increase by minimum 100 000 hectares
France	Place 2 % at least of the national landmass under robust protection within 10 years achieved, in particular, by the creation of 3 new national parks. Acquire and preserve 20,000 hectares of wetlands. By 2020–2030 preserve one third of our riverbanks.

Country	Target
Germany	Reduction of land use for housing, transport and soil sealing to the daily growth of 30 ha in 2020
Switzerland	Total built-up area in Switzerland should stabilise at 400 m ² per head of population
Energy efficiency	
Austria	Improvement of energy intensity by at least 5 % until 2010 and at least 20 % until 2020 (as compared to the average of 2001–2005)
Cyprus	Increase energy efficiency by 1 % annually
Denmark	By 2020 Denmark should be among the three most energy-efficient countries in the OECD
Finland	Increase energy efficiency with 20 % by 2020
Germany	Doubling the energy productivity by 2020 as compared to 1990
Poland	Reducing the energy intensity of the Polish economy to the EU-15 level
Romania	1.2–1.5 % minimum reduction per year of the specific materials and energy consumption rates and production losses in the processing industries, power generation, residential sector, transport and construction
Slovenia	2.5 % reduction in the annual rate of growth of overall energy needs compares to the growth of GDP
Energy consumption	
Austria	2 % reduction of final energy consumption by 2010, and 16 % by 2016
Belgium — Flanders	Energy savings: 9 % of final energy consumption in 2016 compared to 2001–2005
Bulgaria	9 % energy savings/627 ktoe/from the final energy consumption for the period 2008–2016 (indicative goal)
Croatia	Reduce direct energy consumption by 9 % in the period of 2008–2016 (compared to the average consumption in the period 2001–2005)
Cyprus	Total energy savings of up to 3 % during 2008–2010 and up to 10 % during 2008–2016
Cyprus	Total energy savings of up to 3 % during 2008–2010, up to 10 % during 2008–2016 and 20 % savings in total primary energy consumption until 2020
Cyprus	100 % use of high-efficiency electric household appliances by 2020
Denmark	The rate of annual energy savings is increased to 1.5 pct. of final energy consumption (in 2006) equalling annual savings of 10.3 PJ. Denmark's overall energy consumption must be reduced by 6 % by 2020 compared to 2006
Denmark	From 2010 energy saving obligations of energy supply companies are increased from 2.95 PJ to 5.4 PJ
Finland	The goal is to enhance final energy consumption by approximately 37 TWh, i.e. around 11 %, by 2020
Finland	The efficiency of electricity consumption must be enhanced by some 5 TWh, representing approximately 5 %
Finland	The longer-term vision entails a further decrease in final energy consumption by 2050 of at least one third of the 2020 level.
Finland	The target is to be a pioneer in energy-smartness by 2017, the national jubilee year, and, by 2050, to make the Finnish built environment the best in the world
Former Yugoslav Republic of Macedonia	Energy savings amount to 9 % of the average consumption registered in the period of five years (2002–2006) until year 2018, with continuous promotion of energy efficiency and monitoring until 2020
Greece	Reduction of energy consumption by 20 % till the year 2020
Hungary	Yearly energy saving of 1 % (almost 7 PJ) between 2008 and 2016
Poland	Achieve 9 % of energy savings by 2016 in the sectors not covered by the EU-ETS Achieve energy savings of 9 % of the annual average amount of end-use energy consumption from the period 2001–2005 by 2016 (i.e. by 53.452 GWh)
Romania	The energy saving target for 2016 is 2.800 thousand tep that is representing 13.5 % from the average obtained in the 2001–2005. The average annual decrease of the final energy consumption in the period 2008–2016 will be 1.5 %, a value that is 50 % higher than the minimum required by Directive 2006/32/EC.
Slovakia	3 % (12.4 PJ) reduction of final energy consumption by 2010 and 9 % (37.2 PJ) by 2016
Slovenia	To achieve the 9 per cent saving of overall energy consumption in the period 2008–2016
Switzerland	Limit the increase in electricity consumption to a maximum of 5 % between 2010 and 2020. From 2020 onwards, the objective is to stabilise electricity consumption.
Energy in buildings	
Austria	Thermal rehabilitation of all 1950–1980 buildings by 2020
Belgium — Flanders	21 % of new built residences with excellent energy performance (MINA 4) by 2015
Denmark	By 2020, new buildings shall use 75 % less energy than in 2009
Finland	All public buildings that are new, under renovation or leased must be passive by 2015.
France	Reduction of energy consumption in existing buildings of at least 38 % by 2020
France	All new buildings to be low energy (BBC) by 2012 and energy positive (BEPOS) by 2020
France	Refurbishment of 400,000 homes per year from 2013
France	Refurbishment of 800,000 of the most energy intensive social housing units by 2020
France	Commitment to the energy refurbishment of all State and public buildings before the end of 2012
Latvia	Till 2016, reduce average specific thermal energy consumption in buildings from 220–250 kWh/m ² /year to 195 kWh/m ² /year. And till 2020 reach 150 kWh/m ² /year.
Lithuania	To renovate about 70 % of multi-apartment buildings till 2020 to improve energy efficiency in buildings by renovating or modernising heating systems, roof structures, windows and doors, etc.
Lithuania	To reduced district heat and fuel input by 30 % in the existing housing sector in comparison to 2004.

Country	Target
Lithuania	To change up to 75 % of district heat supply networks by 2015 by the renovation of residential houses, including the insulation and upgrading of heat supply systems.
Renewable energy	
Austria	Renewables' share of total energy generation 25 % in 2010 and 45 % in 2020;
Austria	Renewables' share of electricity generation 80 % in 2010 and 85 % in 2020
Belgium — Wallonia	To reach a level of 10 % of renewable energy in the global energy consumption
Bulgaria	16 % share of renewable in gross final energy consumption, including a 10 % share of renewable energy in transport by 2020.
Croatia	20 % of renewable energy sources in final energy consumption up to 2020
Croatia	10 % of bio fuels in the total consumption of petrol and diesel fuel up to 2020
Cyprus	Doubling renewable energy contribution to the total energy consumption from 1.9 % in 1997 to 3.8 % in 2010 (and 6 % of electricity) — increase to 13 % of total energy consumption by 2020
Cyprus	Substitution of 2.5 % of fossil fuels with biofuels during 2008–2010 in transportation — and increase of renewable energy share in transportation sector up to 10 % until 2020
Cyprus	Installation of 165 MW wind turbines, 25 MW concentrated solar power capacity, 10 MW photovoltaic systems, 4 MW biomass, and 3 MW biogas systems until 2015
Denmark	Renewable energy at least 20 % of gross energy consumption by 2011
Denmark	Renewable energy shall account for 10 per cent of the total energy use in the transport sector by 2020
Denmark	Establishment of 400 MW new windmills at sea by 2012
Denmark	Denmark should among the three countries in the world that increases its renewable energy share the most by 2020
Estonia	Increase of renewable energy share in final energy consumption to 25 % by 2020
Estonia	The use of wood fuel in energy production (PJ/y) should be minimum 30 PJ/y by 2020
Finland	At least 30 % of purchased electricity will be produced from renewable energy sources by 2010 and at least 60 % by 2015.
Former Yugoslav Republic of Macedonia	Increasing the share of renewable energy sources from 13,8 % in 2005, up to 21 % in 2020, in the total energy consumption. Consumption of bio-fuels until 2020 is planned to reach 10 % of the total fuel consumption in the transport sector
France	Renewable energy should make up least 23 % of total energy consumption by 2020. Overseas regions: by 2020 achieve 50 % renewable energy and reach complete energy autonomy by 2030
Greece	Widest possible increase of the use of renewable energy sources (up to 40 % in 2020 in electricity production)
Hungary	Renewable energy consumption to be increased to 120,56 PJ by 2020 (compared to 51,3 PJ in 2005), the share of renewables in total energy consumption to reach 14,65 %
Latvia	Renewable energy share had to be 49,3 % of total consumed energy in 2010
Lithuania	To increase the part of the renewable energy resources in the total energy consumption up to 23 per cent by 2020.
Lithuania	To increase electricity produced from renewable energy resources by 21 percent in 2020, the relevant figures being up 36 percent in the heating and cooling sector, and at least 50 percent in centralised heating.
Poland	Achieve 15 % of use of renewable energy in the energy sector and 10 % in transport
Romania	Achieve a 24 % share of renewable energy in the final gross energy consumption. The share of electricity produced from renewable sources in total gross energy consumption is provided from 35 % in 2015 and 38 % in 2020.
Slovakia	Renewable energy's share of total energy consumption 4 % in 2010 and 7 % by 2015. 19 % production of electricity from renewable energy in 2010.
Slovakia	5,75 % share of biofuels on total energy consumption of fuels in 2010 and 10 % share in 2020.
Slovenia	Ensure a 25 % share of renewable energy sources in the overall energy use and 10 % share of renewable energy sources in transport by 2020
Switzerland	Increase the proportion of renewable energy in the overall energy consumption by 50 %
Water	
Hungary	Building a drainage system serving 89 % of the population by 2015
Portugal	In ten years time, PT aims to attain: - 80 % of efficiency in water consumption in the urban sector; - 65 % of efficiency in water consumption in agriculture; - 85 % of efficiency in water consumption in industry sector.
Fisheries	
Estonia	The maximum quantity of fish caught must be 98 000 tons of fresh fish in a year by 2013
France	Creation of protected marine areas to cover 10 % of those waters over which the State is sovereign and within territorial waters, by 2012 in mainland France and 20 % by 2020 half of which will be fishing reserves
Transportation	
Cyprus	Increase usage of public transport from 2–10 % until 2015
Finland	The need for transport and mobility in the public sector will be reduced by 10 % by 2015

Country	Target
France	Reduction of greenhouse gas emissions over 20 % of the transport sector by 2020, increase by 25 % the share of non-road and non-air freight by 2012, double the share of non-road freight going to and coming from ports by 2020, make biofuels 10 % of petrol and diesel consumption by 2020, reduce average emissions of new vehicles to 95 g of CO ₂ /km by 2020, achieve 10 % renewable energy in the transport sector
Waste	
Belgium — Brussels capital region	Reduction of 37 kg/inhabitant/year of household waste (targets per streams: food, paper, superfluous packaging, etc) Reduction of 37 kg/worker/year office waste (targets per stream: food, paper, superfluous packaging, etc) Reduction of 6.5 kg/pupil/year of school waste (targets per stream: food, paper, superfluous packaging, etc) Recycling of 50 % municipal waste Reduction of 10 % of non-households waste production Recycling of 50 % industrial waste Recycling of 90 % of construction and demolition waste
Belgium — Wallonia	To have 65 % of household waste collected separately
Bulgaria	Not less than 60 % by weight of packaging waste is recovered or incinerated with energy recovery
Bulgaria	Not less than 55 % and not more than 80 % by weight of packaging waste to be recycled
Bulgaria	Waste oils – 40 % regeneration for 2012 and each subsequent year
Bulgaria	End of Life vehicle – 93 % minimum for reuse and recovery and 84 % minimum for reuse and recycling for 2013
Bulgaria	Packaging waste — achieve the following targets for recycling and recovery until 2013: Not less than 60 % by weight of packaging waste is recovered or incinerated with energy recovery; Not less than 55 % and not more than 80 % by weight of packaging waste to be recycled; Waste oils – 40 % regeneration for 2012 and each subsequent year. End-of-life vehicle – 93 % minimum for reuse and recovery and 84 % minimum for reuse and recycling for 2013; Waste of electrical and electronic equipment — achieve the following targets: For Category 1 and 10 — Not less than 80 % recovery and not less than 75 % recycling or reuse. For Category 3 and 4 — Not less than 75 % recovery and not less than 65 % recycling or reuse. For Category 2,5,6,7 and 9 — Not less than 70 % recovery and not less than 50 % recycling or reuse. For gas discharge lamps- not less than 80 % recycling or reuse. Waste batteries and accumulators — achieve the following targets after 2010: recycling of 65 % of lead-acid batteries and accumulators, including recycling of the lead content to the highest degree recycling of 75 % of nickel-cadmium batteries and accumulators, including recycling of the cadmium content to the highest degree recycling of 50 % of other waste batteries and accumulators By 2010 the amount of biodegradable municipal waste for land filling must be reduced to 75 % based on of the total weight amount of biodegradable municipal waste produced in 1995; By 2013 the amount of biodegradable municipal waste for land filling must be reduced to 50 % based on of the total weight amount of biodegradable municipal waste produced in 1995; By 2020 the amount of biodegradable municipal waste for land filling must be reduced to 35 % based on of the total weight amount of biodegradable municipal waste produced in 1995
Croatia	By 2010 reduce quantities of finally landfilled waste as well as generated hazardous waste by approx. 20 % in comparison to 2000
Czech Republic	Decrease in the weight fraction of wastes deposited in landfills by 20 % by 2010 compared to 2000; An increase in recovery of wastes with preference for recycling to 55 % of all waste produced by 2012; Recovery of 75 % wt. of produced construction and demolition wastes by 2012; Share of biologically degradable municipal wastes (BDMW) deposited in landfills will be up to 75 % in 2010, up to 50 % in 2013 and in 2020 up to 35 % of the total amount (weight) of BDMW produced in 1995; Collection of used portable batteries in the amount of 100 g p.a. per inhabitant and ensure material recovery of 50 % wt. thereof by 2006; Collection and material recovery of 95 % wt. of the total amount of lead storage batteries placed on the market by 2012; Reuse and recover at least 95 % of the average weight of all end-of-life vehicles accepted during a calendar year and reuse and provide for material recovery of at least 85 % of the average value of all end-of-life vehicles accepted during a calendar year from January 1, 2015 at latest;
Denmark	Recycle minimum 65 % of total waste amounts by 2012 Reduce landfilled waste amounts to maximum 6 % by 2008 Collect 45 % of batteries by 2012
Estonia	Target levels for waste recovery share in total waste generation (%) by 2013: glass 60 %; plastics 40 %; paper 50 %. Target level for weight of building demolition waste recovery (%) by 2020: at least 60 % from total weight
Finland	The volume of municipal waste will be stabilised and then reduced to the level at the beginning of 2000 until the year 2016. <i>Recovery target for municipal waste is 80 %</i> The target is that 50 % of municipal solid waste will be recycled, energy will be recovered from 30 % and a maximum of 20 % will be landfilled until the year 2016.

Country	Target		
Former Yugoslav Republic of Macedonia	Activity/waste stream	Target	To be achieved by
	Improvement of collection and source segregation efficiency:		
	• (mixed municipal waste	collection efficiency 90 %	2014
	• segregation of hazardous and	segregation efficiency 100 %	2010
	• non-hazardous waste fraction (manufacturing/service sector)		
	Landfill of waste:		
	• landfill of MSW on temporary facilities (after conditioning)	100 % of collected MSW	2014
	• landfill of MSW on facility compliant with EU standards *	50 % of the total MSW	2014
	• reduction of biodegradable waste disposed on landfills (transition period needed)	reduction to 75 %	2014
	• reduction of the greenhouse gas emissions (landfills only)	reduction for app 25 % of CO ₂ -equivalent.	2014
	• diversion of industrial hazardous waste streams from non-hazardous landfills	100 % effect	2010
	Special waste streams:		
	• packaging waste of all 3 categories (transition period needed)	recovery 50 % recycling 25 %	(2018) (2018)*
	• used tyres	collection efficiency 90 % energy recovery 100 %	2014 2014
	• batteries/accumulators	ban on import and sale of the Hg & Cd batteries and batteries containing too high Pb content	2010
• end-of-life vehicles	collection 90 % recovery or reuse 70 % recovery or reuse 85 %	2014 (2018) (2018)	
• waste electric & electronic equipment	collection 90 %	2014	
• PCB/PCT waste	Inventory complete destruction	2009 (2018)	
• C&D waste collection/recovery/recycling facilities & landfill	collected 30 % recovered/recycled 10 % disposal 90 %	2014	
Note: * Most of our landfills are not compliant with EU standards and we need a transition period for the process of compliance. At the moment we have about 77 % collection of MSW which is stored both at temporary facilities and land-filled on permanent landfills.			
France	Reduce the production of household waste and similar by 7 % by 2014, Aim to re-cycle 35 % of household waste and similar materials in 2012 and 45 % in 2015, Attain a 75 % recycling rate for household packaging by 2012, Attain a 75 % re-cycling rate for 75 % of industrial waste by 2012, Reduce by 15 % the quantity of waste incinerated and stored by 2012 as compared with 2008.		
Hungary	Reducing the quantity of yearly waste produced by 20 % (from 2009 to 2013), producing no more than 20 million tons of by 2014 By 2014, a minimum of 40 % of the generated waste should be recycled and the energetic reuse level should reach 10 % The selective collection system of municipal waste should be accessible for 80 % of the population by 2014 (HWMP) 60 % of the packaging waste should be recycled by 2012, at least 70 % of the construction-demolition waste should be recycled until 2020, etc. (HWMP)		
Italy	reduction of dangerous waste with regards to 2000 data of 20 % by 2010 and 50 % by 2020 SCF Targets (Legislative Decree 152/2006): recovery from 45 % in 2008, up to 65 % by 2012. In 2008, the actual data is 30.6 % (Northern Italy 45.5 %, Central 22.9 %, Southern 14.7 %).		
Latvia	Separate collection systems for glass, paper, plastic and metal; 50 % of household waste will be recycled; 75 % of demolition and construction waste will be recycled.		
Lithuania	To ensure waste biodegradable municipal waste disposal to landfills accounts for by 2013 not more than 50 % of the total amount of biodegradable municipal waste generated in 2000. To create organisational and/or technical conditions for annual collection and utilisation of at least 60 % of packaging waste measured by the amount packaging released on the internal market by the end of 2012.		
Norway	The proportion of waste recovered will be raised to about 75 % of the total quantity in 2010 and subsequently to 80 %		
Slovakia	Achieve for the material recovery 70 % of total generated waste in 2010 (WMP 2006–2010) Increase energy recovery of waste to 15 % of total generated waste in 2010 (WMP 2006–2010) To minimise the amount of the landfilled waste to 13 % of total waste generated in 2010 (WMP 2006–2010)		

Country	Target				
Slovenia	Minimum recovery				
	Minimum recycling				
	Collection rate				
	Packaging	2012	60 %	55 % (60 % glass, 60 % paper and cardboard, 50 % metal, 22.5 % plastic, 15 % wood)	
	ELV	2015	95 %	85 %	100 %
	WEE	2006	70 %	50 %	min 4 kg per inhabitant per year
	Batteries	2011			25 %
		2012			45 %
		2016		50 to 75 % (efficiency)	
	Tyres	2006	0 landfill of tyres		
	Biowaste diverted from landfills	2006	reduction to 75 % of the 1995 level		
		2009	reduction to 50 % of the 1995 level		
		2016	reduction to 35 % of the 1995 level		
	New targets (WFD)	2015	Separate collection: at least paper/metal/plastic/glass		
2020		50 % household waste			
2020		70 % construction and demolition waste			
Sweden	<p>The quantity of waste disposed of to landfill, excluding mining waste, will be reduced by at least 50 % by 2005 compared with 1994.</p> <p>By 2010 at least 50 % of all household waste will be recycled through materials recovery, including biological treatment.</p> <p>By 2010 at least 35 % of food waste from households, restaurants, caterers and retail premises will be recovered by means of biological treatment. This target relates to food waste separated at source for both home composting and centralised treatment. By 2010 food waste and comparable wastes from food processing plants etc. will be recovered by means of biological treatment. This target relates to waste that is not mixed with other wastes and that is of such a quality as to be suitable, following treatment, for recycling into crop production.</p>				
GHG emissions					
Croatia	20 % decrease in greenhouse gas emissions (in comparison to 1990) up to 2020				
Cyprus	20 % reduction (based on 1990) of GHG emissions until 2020				
Denmark	Denmark must reduce total greenhouse gas emissions by 21 % in 2008–2012 compared to 1990 levels				
Finland	The municipalities participating in the Carbon Neutral Municipalities (CANEMU) project, i.e. Kuhmoinen, Mynämäki, Padasjoki, Parikkala and Uusikaupunki, aim to achieve carbon neutrality, i.e. to decrease their greenhouse gas emissions by a minimum of 80 per cent from the 2007 level, by 2030. Uusikaupunki has adopted an even more ambitious objective: a 30 per cent reduction on the 2007 emissions level by 2012				
France	Reduce greenhouse gas emissions by 20 % by 2020				
Latvia	Main objective in the climate change sector is to ensure that between 2008–2010 total greenhouse gas emissions do not exceed 92 % of level in 1990				
Lithuania	To ensure an 8 % reduction of greenhouse gases emissions from the level of 1990 in the period from 2008 to 2012.				
Slovakia	Reduce GHG emissions by 8 % during the period 2008–2012 related to the base year (1990) level				
Switzerland	Switzerland intends to reduce CO ₂ emissions between 2008 and 2012 by an average of 10 % compared to 1990. The Federal Council aims at a long-term reduction target of 1–1.5 t CO ₂ -equivalent per capita by 2100. As an intermediate target, by 2050 greenhouse gas emissions are to be reduced by at least 50–85 %.				
Green public procurement					
Denmark	Public procurement: Commitment to the 50 % target for green public procurement in 2010 covering 10 product groups				
Finland	The central government will switch to green electricity. At least 30 % of purchased electricity will be produced from renewable energy sources by 2010 and at least 60 % by 2015				
Finland	New government buildings or new, leased properties must meet the requirements of energy efficiency class A and existing buildings under renovation must meet the requirements of at least energy efficiency class C by 2010. All buildings that are new, under renovation or leased must be passive by 2015				
Finland	The need for transport and mobility will be reduced by 10 % by 2015. In 2020, at least half of all new purchased or leased passenger cars will have carbon dioxide emissions of less than 120 g/km and at least 25 % will be under 110 g/km				
Finland	Organic, vegetable-based or seasonal food will be available in Government kitchens and provided by food services at least once a week in 2010 and at least twice a week by 2015				
France	By 2012 achieve the target of 20 % of organic products being used in hospitals, schools, canteens etc. By 2010 increase purchases of wood by the State to be 100 % from sustainable forests (eco-certified).				
Italy	<ul style="list-style-type: none"> • By the end of 2009, at least 30 % of the public purchases shall match ecological requirements. • 30–40 % of durable goods within public authorities should be with reduced energy consumption by the end of 2009. 				

Country	Target
Others	
Denmark	Expenditure on research and development should be increased to a level of about 3 per cent of GDP by 2010
Denmark	Double financial support for research, development and demonstration of energy technology to DKK 1 billion per year to 2010
Greece	Creation of 180000 new jobs in the energy conservation sector
Sweden	By 2015 at least 60 % of phosphorus compounds present in wastewater will be recovered for use on productive land. At least half of this amount should be returned to arable land.

Annex 5 Policy instruments presented by countries as good practice for promoting resource efficiency

Below is the complete list of some 190 policy instruments and initiatives that countries presented as examples of good practice.

Austria	<ul style="list-style-type: none"> • Austrian Programme on Technologies for Sustainable Development (2005) • Sustainable Weeks (annually) • Waste Prevention and Recycling Strategy (2006) • Waste Prevention Vienna Programme 'Naturally less waste' (1998)
Belgium (federal level)	<ul style="list-style-type: none"> • Fund for the Reduction of the Global Energy Cost (FRGE) (2006) • Eco Management and Audit Scheme (EMAS) for all public services (2005) • FEDESCO (public Energy Services company) for public EE investments (2005) • Sustainable Public Procurement Guide (2005) • Corporate Social Responsibility (CSR) Framework and Action Plan (2007) • Sector agreements on wood and detergents (2011) • Development of methodology for calculation of environmental impacts of products (2011) • Bioenergy for households (under development) • Legislative emission framework for heating systems and boilers
Brussels capital region	<ul style="list-style-type: none"> • No information provided
Belgium (Flanders)	<ul style="list-style-type: none"> • Plan C (transition network on sustainable material management) (2006) • Recycling certificates (planning stage) • Enhanced Landfill Mining (ELFM) consortium (2008) • Chemical Leasing Project (experimental stage)
Belgium (Wallonia)	<ul style="list-style-type: none"> • Sector agreements on energy and GHG emissions reductions — 162 companies/15 sectors (2003) • Water seepage management (2003) • CO₂ calculator for household appliances (2006) • Waste prevention website (2008)
Bulgaria	<ul style="list-style-type: none"> • Energy contracting (ESCO) • Energy Efficiency Fund • Energy Law (2006) • Law on Renewable and Alternative Energy Sources and Biofuels • National Trust Eco Fund (1995)
Croatia	<ul style="list-style-type: none"> • Pollution charges (CO₂, SO₂, NO₂) • Charges on buildings subjected to EIA • Waste charges • Environmental charge on motor vehicles • Fees on water use • Fees on production/import of products with problematic contents • Forestry Act — fees for the use of beneficial functions of forests • Environmental Protection and Energy Efficiency Fund (EPEEF) (2003) • Cleaner Production Centre (CRO-CPC) (2000)
Cyprus	<ul style="list-style-type: none"> • Energy Efficiency Action Plan (2011) (planning stage) • Renewable Energy National Action Plan 2010–2020 (planning stage) • Water initiative (planning stage) • Water management plan
Czech Republic	<ul style="list-style-type: none"> • <i>The Czechs in a Consumer Paradise!?</i>- awareness raising report • Czech Environmental Information Agency (CENIA) educational toolkit on sustainable consumption and production for elementary and secondary school children • Recyklorahni (awareness campaign for schools) • Srotonator (awareness campaign for regional cities) • Green company (awareness campaign for companies) • Green municipality (awareness campaign for municipalities) • Green savings (support for family house insulations) • Initial Review for Sustainable Consumption and Production (IR SCP) for enterprises (2011–2012)

Denmark	<ul style="list-style-type: none"> • Tax rebate scheme for energy-intensive companies complying with requirements in a voluntary agreement • Energy Strategy 2050 (2011) • Nordic expert workshop on sustainable consumption and green lifestyle (2010) • Website on the role of Nordic retailers in sustainable consumption and production (2011) • Partnerships between the Ministry of the Environment and the cities of Copenhagen, Aarhus and Odense • Forum for sustainable professional procurement (partnership of 12 public and private sector organisations) • Green taxes (24 different taxes; approx. 4 % of GDP) • Waste Prevention Campaigns (food, housing, mobility) • Purchasing guidelines (50 since 1996) • Cities for a better climate • The Planning Act (land use)
Estonia	<ul style="list-style-type: none"> • Mineral resources extraction charge (dolomite, granite, gravel, sand, limestone, clay, peat, phosphatic rock, oil shale, crystalline building stone) (1991) • Water abstraction charge • Fishing charge • Forest stand cutting charge • Hunting charge
Finland	<ul style="list-style-type: none"> • Government decision on energy efficiency measures (to be launched in 2011) • Network of actors promoting energy efficiency innovation
Former Yugoslav Republic of Macedonia	<ul style="list-style-type: none"> • Subsidy scheme for solar energy • Preferred tariffs for renewable energies • Reduced VAT (5 %) for thermal solar panel systems • Law on the Environment (2005) incl. various differentiating tax systems • Multimedia educative package by Regional Environmental Centre
France	<ul style="list-style-type: none"> • Environmental labelling for consumption goods indicating information on resource use, pollution, CO₂ emissions, impact on biodiversity, etc. (from 2011 on in a testing phase) • The green and blue infrastructure (2009)
Germany	<ul style="list-style-type: none"> • National ICT Strategy 'German Digital 2015' (to be launched in 2011) • Action Plan 'Germany: Green IT Pioneer' (2008) • Integration of the closed cycle and waste management into a sustainable resource-conserving substance management (2004) • Identification of Relevant Substances and Materials for a Substance Flow-Oriented, Resource-Conserving Waste Management (2006) • Research programme on Material Efficiency and Resource Conservation (MaResS) (2007–2010) • Institute on resource technology (to be launched in 2011) • Act for Promoting Closed Substance Cycle Waste Management and Ensuring Environmentally Compatible Waste Disposal (1994, latest update 2006; now under revision) • Commercial Wastes Ordinance (CWO): Ordinance on the Management of Municipal Wastes of Commercial Origin and Certain Construction and Demolition Wastes (2003) • Ecological tax reform (1999/2003) • Eco-Innovation Programme (1978) • DEMA Material Efficiency Award Scheme (first awarded in 2004) • DEMA consultative programmes on material efficiency (2004) • Resource efficiency network (2006) • 'Blue Angel' (Established 1978)
Greece	<ul style="list-style-type: none"> • Public awareness campaign on portable batteries (2005–2010)
Hungary	<ul style="list-style-type: none"> • Pannon Seed Bank project (2010) • Money back through the window (MBW) project (2002) • Greening the daily life programme • Zero waste programme • Green Investment Scheme (GIS) (2009) • Environmental Technology Innovation Strategy (planning stage) • National Biodiversity Strategy • Waste Management Plan • Soil vulnerability mapping by RISSAC • Labelling scheme for local, hand-made and organic products • National Industrial Symbiosis Programme (NISP)
Ireland	<ul style="list-style-type: none"> • SMILE (Saving Money through Industry Link & Exchanges) Resource Exchange (2010)
Italy	<ul style="list-style-type: none"> • Label of the National Association of Biological Architecture for recycled construction materials • Tax on plastic bags • Aggregates tax • White certificates scheme (2005)
Latvia	<ul style="list-style-type: none"> • Natural resources tax covering a wide variety of issues, including emissions of polluting substances, waste disposal, packaging, radioactive substance, vehicles, coal, etc. • Plastic bag charge
Liechtenstein	<ul style="list-style-type: none"> • Action Plan (2010) Using of recycled building materials from construction and demolition waste in public buildings and plants and increase of the use of recycling materials in road surfaces

Lithuania	<ul style="list-style-type: none"> • Tax on (harmful) goods (tyres, accumulators, voltaic cells, oil or petrol filters, intake air filters, hydraulic shock-absorbers) • Tax on packaging (glass, plastic, PET, Composite, metal, paper/carton and other packaging) • Tax on state natural resources (sand, clay, dolomite, etc.) • Tax on water use • National Strategic Waste Management Plan for 2007–2013
Netherlands	<ul style="list-style-type: none"> • Non-paper (position paper) for resource efficiency roadmap (2010) • Co-operation with industry on Sustainable Food systems • Co-operation with industry on Sustainable trade
Norway	<ul style="list-style-type: none"> • Environmental and Social Responsibility in Public Procurement in the Norwegian Action Plan (2007–2010) • Nordic Swan ecolabel • Energy requirements in the building code • Energy fund • Oil for Development (OfD) programme • Environmental taxes • Mandatory CSR reporting for corporations
Poland	<ul style="list-style-type: none"> • National Programme for Augmentation of Forest Cover • The Polish Eel Management Plan (2007) • Rational Mineral Deposits Management (1994) • Time to save energy (2007) • Intelligent Energy — a user guide (2008/2009) • Multimedia Campaign promoting demand-side EE • National Action Plan on Sustainable Public Procurement (2010–2012) • Action Plan on Energy policy until 2030
Portugal	<ul style="list-style-type: none"> • Organised Waste Market (OWM), a voluntary economic instrument for facilitating and promoting commercial exchanges of waste, fostering recovery by bringing waste back into the economic circuit • Waste Management National Plan (upcoming) • Economic and financial regime for water resources • Water resource tax • Water Resources Protection Fund • Fiscal incentive for purchases of electric vehicles by businesses • Tax credits for the purchase of energy efficient equipment • Revising the vehicle registration tax by annually reducing the CO₂ emission categories by 5g/km • Business and Biodiversity Initiative • Legal Framework for Construction and Demolition Waste (2008)
Romania	<ul style="list-style-type: none"> • Forest Code (2008) • Biomass Master Plan (2010) • System for Timber Flow Control and for Tracking the Wood Source (SUMAL) (2008) • National waste management plan • Environmental tax system: pollution (new cars), emissions (2006), ferrous and non-ferrous metallic waste sales, packaging of imported goods and plastic shopping bags • Environmental Fund (administration of environmental taxes for replacement of heating systems, renewable energy, environmental awareness campaigns, investments in parks, forests) • Jalopy Programme — financial incentive for cars scrapping and purchasing hybrid/electrical cars (2010/2011) • Green certificate transitions scheme (renewable energies)
Slovakia	<ul style="list-style-type: none"> • Community Eco Management and Audit Scheme (EMAS) • Environmentally friendly products (2002) (146 products) • Support for research and development of environmental technologies (within ETAP I & II) • Environmental fund • Recycling fund • Long-term strategy of use agricultural and non-agricultural crops for industry purpose (2009) • Ecological footprint school programme (8 categories of consumption) • Material flows analyse in management of natural sources focusing on energy utilisation of agricultural biomass (2008–2010)
Slovenia	<ul style="list-style-type: none"> • Environmental taxes, e.g. Landfill tax and waste water tax (both earmarked for municipal environmental infrastructure) • Eco Fund • Forest management plan (2001)
Spain	<ul style="list-style-type: none"> • Energy Diversification and Saving Institute (IDAE) • Initiatives in Public Transport Metropolitan Areas (17 areas) • Cities for Climate Network • Volunteer Services in Rivers Programme (Rivers Restoring National Strategy) (2007–2010) • Environmental Education National Centre (CENEAM)
Sweden	<ul style="list-style-type: none"> • Landfill tax (2000) • Tax on household waste to incineration/fees for municipal waste collection • Ban on landfill of organic and combustible waste (2002/2005) • Requirements for all municipalities to develop municipal/regional waste management plans • Producer responsibilities: batteries, packaging, paper/newsprint, tyres, cars, light bulbs • Deposit-refund systems for beverage containers (2005) • Municipalities waste management plans • Towards sustainable waste management research programme • National liaison group on food waste (2010)

Annex 5

Switzerland	<ul style="list-style-type: none">• Green Economy Program• Cleantech Masterplan• CO₂ tax• Tax on Volatile Organic Compounds
Turkey	<ul style="list-style-type: none">• Small and Medium Industry Development and Support Administration (KOSGEB) (training, study, consultancy services)• Turkish Scientific and Technical Research Institute (TÜBİTAK)• Technology Development Foundation of Turkey (TTGV) (R&D)• Support for ISO9000/ISO 14000 quality system and environmental management certificates• Energy Efficiency Law• Law on Utilisation of Renewable Energy Sources for the Purpose of Generating Electrical Energy• Regulation on Energy Performance in Buildings
United Kingdom	<ul style="list-style-type: none">• WRAP (Waste & Resources Action Programme)• Construction Commitment in the construction, demolition and excavation sector (over 500 signatories)• Courtauld Commitment in the grocery retail sector of food and packaging

Annex 6 Overview of information needs and knowledge gaps reported by countries

Area identified as an information need or knowledge gap	Countries that identified the need or gap	Number of countries
Integrating resource efficiency into sectoral policies/other policies	BE (Flanders), BG, CY, CZ, DE, DK, EE, GR, HU, LV, PL, PT, SK.	13
Sharing knowledge and good practice on implementation of resource efficiency	BE (Wallonia), BG, HR, CY, DK, EE, FI, FR, GR, IT, PT, RO, SK.	13
Indicators and measuring resource efficiency	BE (Flanders), BE (Wallonia), DE, DK, IE, HR, PT, RO, SE, SK, SLO, UK.	12
Setting strategic objectives and targets	BE (federal), BE (Flanders), BG, DE, DK, LT, PT, SE.	8
Policy-effectiveness evaluation	BE (Wallonia), BG, DK, EE, FI, IT, LT, RO.	8
The knowledge base and the need for structured information on resource efficiency policies	BE (Wallonia), BG, DE, EE, HU, PT, SE.	7
Framing national resource efficiency programmes	DE, DK, GR, PT, SK.	5
The definition of resource efficiency	BE (federal), BE (Brussels capital region), BE (Flanders), CY, FR.	5
Implementing and evaluating resource efficiency programmes	BE (Brussels capital region), BE (Flanders), FI, LV, RO.	5
The rebound effect	AT, BE (federal), HU, IE.	4
Improving energy efficiency policies	ES, PL, RO, TR.	4
How to account for resources embedded in trade/imports	AT, BE (federal), CH, NL.	4
The institutional and organisational set-up for resource efficiency	DE, FIN, NL, SK.	4
Economic arguments for implementing resource efficiency	BE (Brussels capital region), ES, UK.	3
Environmental impacts of resource use outside national borders	AT, CH, NL.	3
Achieving a closed loop/circular economy	PL, SE, SI.	3
Recycling's potential to improve resource efficiency	CH, PL, SE.	3
Awareness raising	BE (Flanders), ES, PL.	3
Involving stakeholders	BE (Flanders), LV, PL.	3
Indicators of overall environmental impacts of consumption and productions/beyond GDP	AT, BE (federal), CH.	3
Ecological tax reform	ES, PL, PT.	3
Strengthening the science-policy interface/eco-innovation	HR, ES.	2
Resource availability and supply risks/scarcity, economy and environment	CH, CZ.	2
Transition management	BE (federal), BE (Flanders).	2
Convergence of resource efficiency and SCP	CY, FR.	2
Food waste	DK, ES.	2

Area identified as an information need or knowledge gap	Countries that identified the need or gap	Number of countries
Waste management systems	ES, MK.	2
Resource efficiency and conservation of ecosystem services	DK, HU.	2
Synergies between economic growth and environmental protection	PL, ES.	2
Green public procurement	ES, PL.	2

Note: Topics mentioned by single countries:

- Capacity-building: DE
- Cost of inaction: BE (federal)
- Dealing with tradeoffs in resource efficiency policies: HU
- Ecodesign and LCA: IE
- Environmental footprint of products/produce information: CH
- Extended producer responsibility: PT
- Funding sources/financing schemes: RO
- Influence of lifestyles on resource use/guiding consumers towards more sustainable lifestyles: AT
- Integrated pollution prevention and control: MK
- Is absolute decoupling possible?: AT
- Link of resource efficiency and green economy with biodiversity: DK
- Nutrition and food sector — LCA data and assessments of food products, cooperation with the retail sector: CH
- Overview of EU policies on resource efficiency: HR
- Overview of existing programmes and projects to avoid duplication: BE (Flanders)
- Potential for 7EAP including resource efficiency and green economy: DK
- Prioritisation/identifying sectors with highest potentials for resource efficiency: LT
- Recycling of rare technical metals from electronic waste: CH
- Renewable energy and smart grids: CH
- Use of market-based instruments: NL
- Zero growth/no growth: AT

Annex 7 Economy-wide material flow accounts and derived indicators

To monitor economy-wide material flows, Eurostat has developed an accounting methodology and a number of indicators that describe the material throughput and material stock additions in a (national) economy expressed in tonnes. EW-MFA accounts for all extraction of biomass, fossil fuels, metal ores and metals, and industrial minerals, and the imports and exports of all goods, but excludes water and air. The most frequently used MFA indicators, often given in tonnes per capita, are:

- Domestic Extraction Used (DEU), which sums all natural resources extracted in a given country and used in the economy;
- Direct Material Input (DMI), which measures the input of materials into the economy, i.e. DEU plus physical imports of goods (IMP);
- Domestic Material Consumption (DMC), which equals DMI minus exports (EXP) and thus represents the domestic material consumption of an economy;

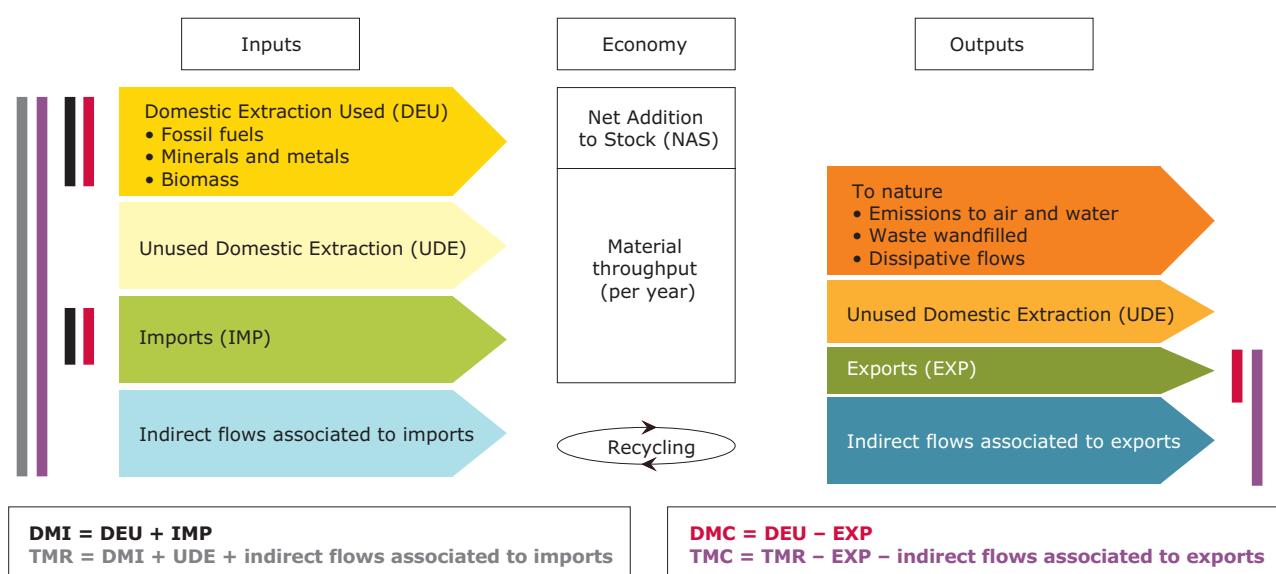
- Total Material Requirement (TMR), which includes hidden or indirect material flows (i.e. the material rucksack) associated with both domestic material extraction (Unused Domestic Extraction, UDE) and the materials imported (Raw Material Equivalents, RME, and the unused extraction abroad). TMR is also referred to as a 'global resource footprint'.

Conceptually, the definition of materials in material flow analysis is as follows:

Minerals = non-metallic minerals + metals

Material = fossils + biomass + (non-metallic minerals + metals)

Resource productivity, a measure of how efficiently an economy uses resources, is generally expressed as gross domestic product (GDP) per unit of resource use expressed in one of the indicators above.



It is important to note that the DMI elements (i.e. DEU and IMP) can be sourced from Eurostat, while the additional elements to build TMR (i.e. unused domestic extraction UDE and hidden flows of IMP) have been developed by the ETC/SCP based on data from the Wuppertal Institute

Main sub-components of the four broad material categories in the MFA accounts

The four broad material categories in MFA accounts are biomass (approximately 22 % of EU-27 total DMI in 2007), metals (approximately 5 %), non-metallic minerals (approximately 51 %) and

fossil energy materials/carriers (approximately 23 %). In MFA these can be further disaggregated into a total of 55 sub-categories of materials. However, confidentiality issues prevent Eurostat from publishing the detailed 55-category EW-MFA accounts for the EU-27.

Nevertheless, for illustrative purposes it is possible to give a rough characterisation of each of the four broad material categories and what their main components are. The table below details the five or six most important components (by weight) of Direct Material Input in each broad category for the EU-27 over the period 2000–2007.

	% share within group		% share within group
Biomass: ~ 22 % of total DMI	100	Non-metallic minerals: ~ 51% of total DMI	100
Cereals	16–18	Sand and gravel	62–66
Fodder crops	15–16	Limestone and gypsum	17–19
Timber	14–16	Marble, granite, sandstone, basalt, etc.	5–8
Grazed biomass	12–15	Other non-metallic minerals	3–4
Sugar crops	7–8	Clays and kaolin	3
Straw	6–8		
	% share within group		% share within group
Metals: ~ 5 % of total DMI	100	Fossil fuels: ~ 23% of total DMI	100
Iron	59–62	Crude oil and natural gas liquids	39–41
Copper	14–17	Hard coal	18–19
Bauxite and other aluminium	7	Lignite (brown coal)	17–20
Imported metal products	6–12	Natural gas	17–19
Other metals	3–4	Oil shale and tar sands	2
Zinc	2–3	Imported oil-based (plastic) products	1–2

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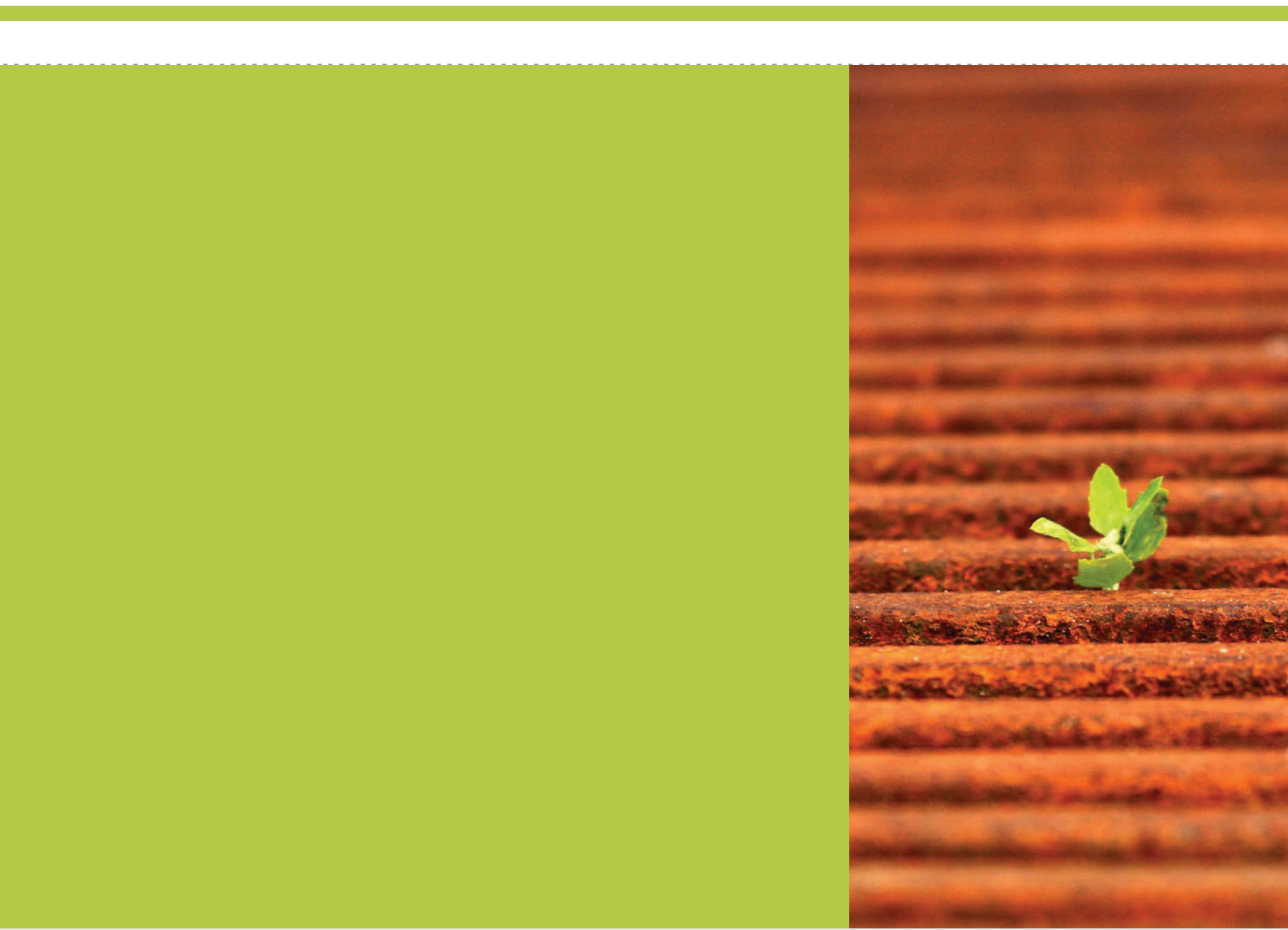
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European Environment Agency
Kongens Nytorv 6
1050 Copenhagen K
Denmark

Tel.: +45 33 36 71 00
Fax: +45 33 36 71 99

Web: eea.europa.eu
Enquiries: eea.europa.eu/enquiries

