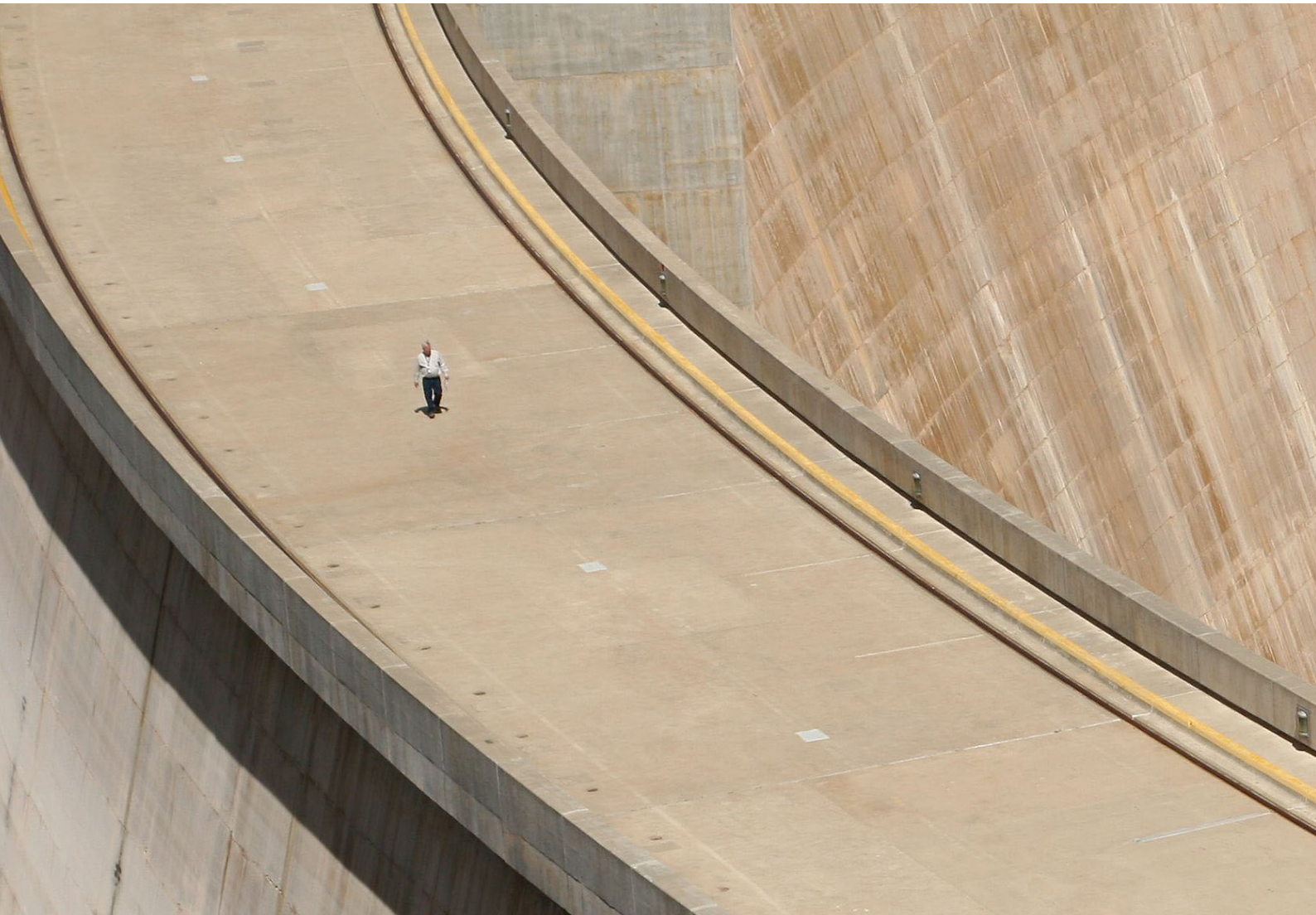


# More from less — material resource efficiency in Europe

2015 overview of policies, instruments and targets in 32 countries



**Sweden** 

May 2016

This country profile is based on information collected by the Swedish Environmental Protection Agency. This document should not be seen as an official list of government priorities and is not necessarily an exhaustive list of all national material resource efficiency policies, objectives, targets or activities in place. The information is current as of June 2015.

This country profile was prepared as part of the 2015 EEA review of material resource efficiency policies, that aimed to collect, analyse and disseminate information about the development and implementation of material resource efficiency policies in EEA member and cooperating countries. The work resulted in the following outcomes:



**32 short country profiles** (this document) – self assessments prepared by countries, describing the current status of material resource efficiency policies including key strategies and action plans, policy objectives, instruments, targets and indicators, and the institutional setup. Countries were also invited to share reflections on the future direction of resource efficiency policies.

**EEA report *More From Less – material resource efficiency in Europe*** – prepared by the EEA and ETC/WMGE, the report analyses trends, similarities and differences in policy responses, showcases selected policy initiatives from the countries, and offers some considerations for the development of future policies.

The EEA report *More from less – material resource efficiency in Europe* and the 32 country profiles are available at: <http://www.eea.europa.eu/resource-efficiency>



For information about trends and policies on municipal waste management in the participating countries, please visit: <http://www.eea.europa.eu/publications/managing-municipal-solid-waste>

Information about EU Member States' waste prevention programmes can be found at: <http://www.eea.europa.eu/publications/waste-prevention-in-europe-2015>

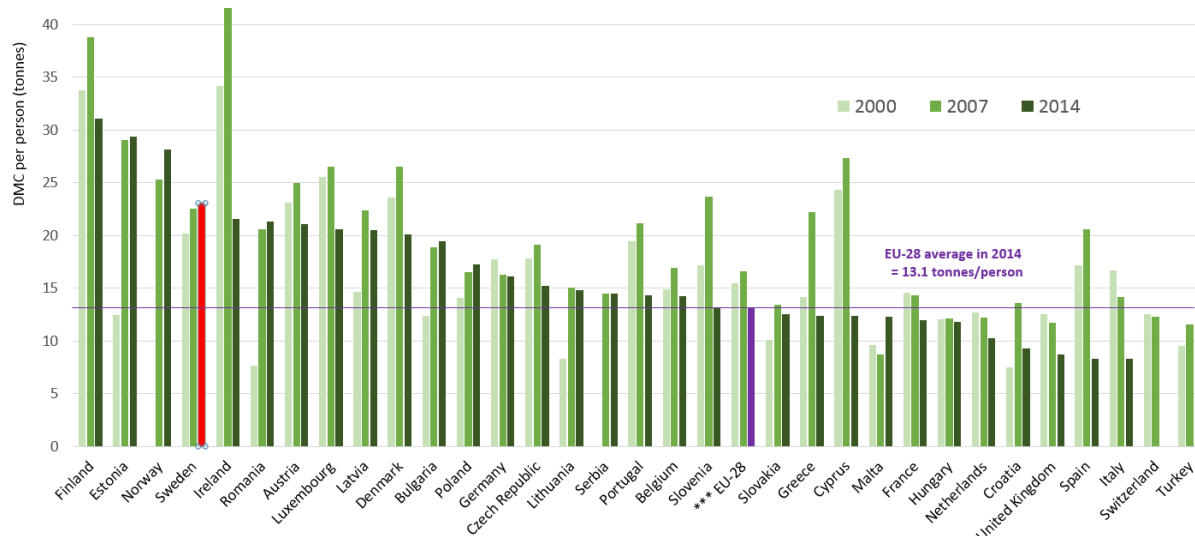
For information on climate- and energy-related policies, including those on energy efficiency, in the participating countries, please visit: <http://www.eea.europa.eu/themes/climate/ghg-country-profiles>

## Sweden, facts and figures

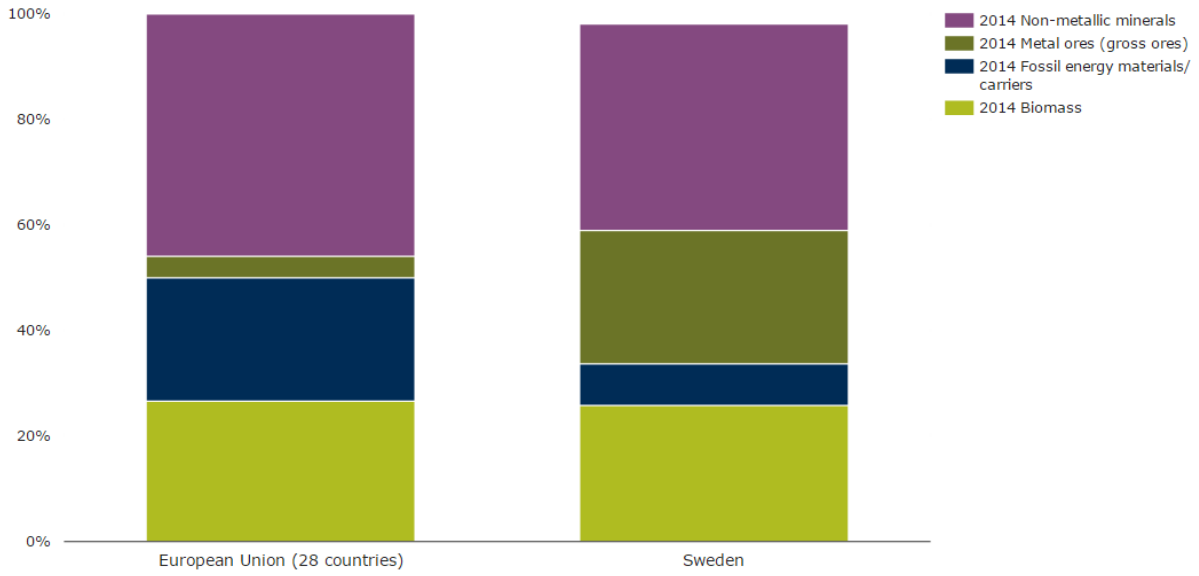
Source: Eurostat

	<p><b>GDP:</b> EUR 431 billion (3.1 % of EU-28 total in 2014)</p>
	<p><b>Per person GDP:</b> EUR 33,700 (in purchasing power standard) (123 % of EU-28 average per person in 2014)</p>
	<p><b>Use of materials:</b> 224 million tonnes DMC (3.4 % of EU-28 total in 2014) 23.1 tonnes DMC/person (176 % of EU-28 average in 2014) Resource productivity 1.75 EUR/kg (88 % of EU-28 average in 2014)</p>
	<p><b>Structure of the economy:</b> agriculture: 2 % industry: 12 % services: 86 % (2014 est.)</p>
	<p><b>Surface area:</b> 438,600 square kilometres (9.8 % of EU-28 total)</p>
	<p><b>Population:</b> 9.7 million (1.9 % of EU-28 total)</p>

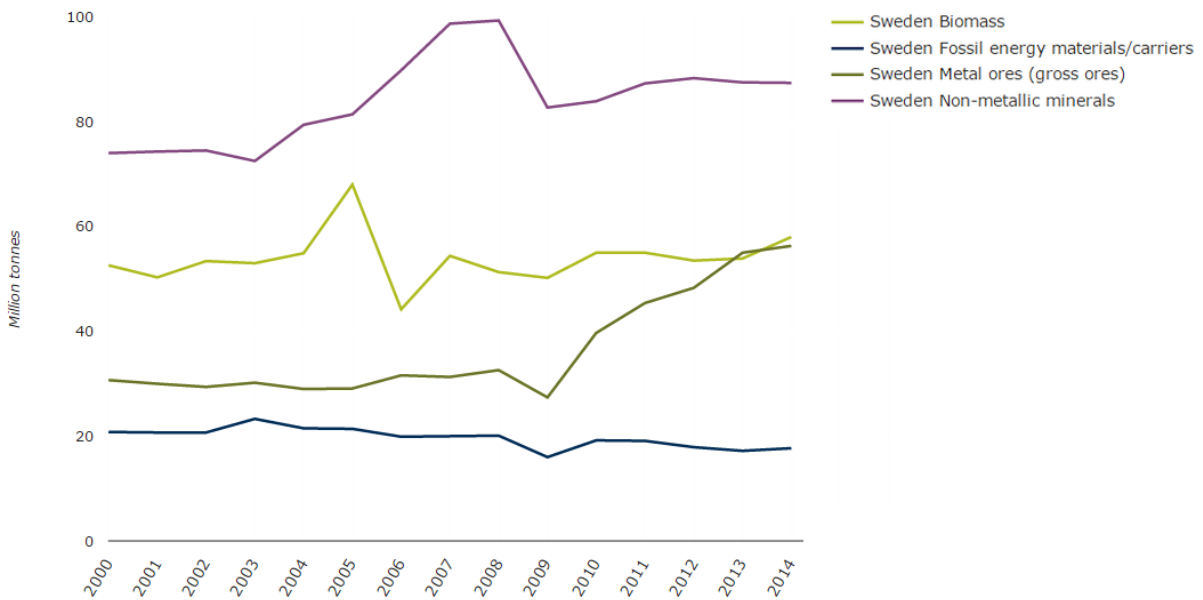
Use of materials (DMC) per person, participating countries and EU-28  
(2000, 2007 and 2014)



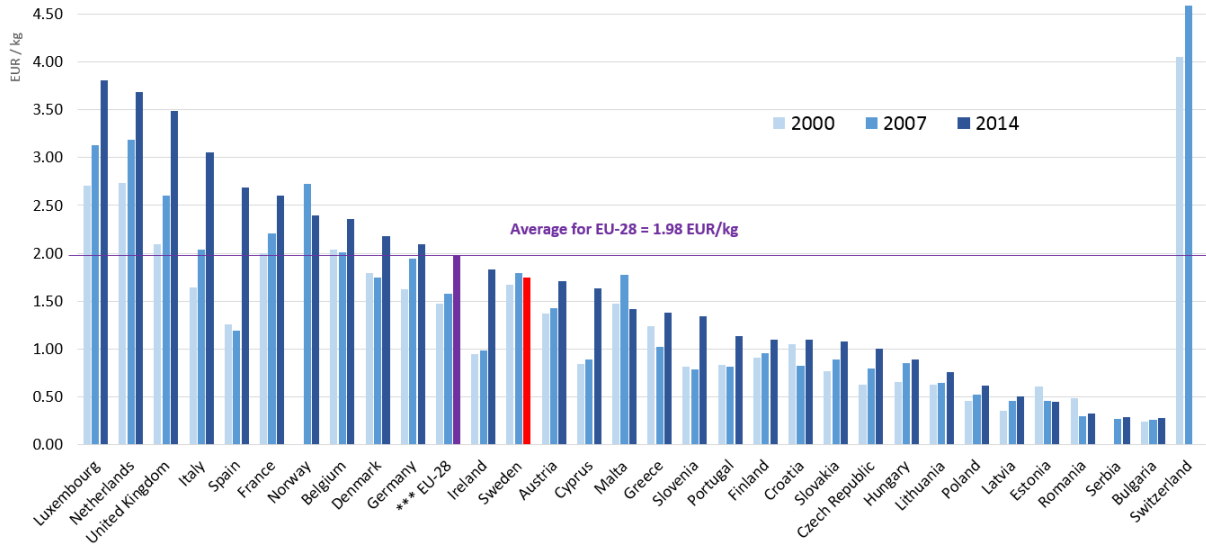
**Domestic material consumption by category, EU-28 average and Sweden (2014)**



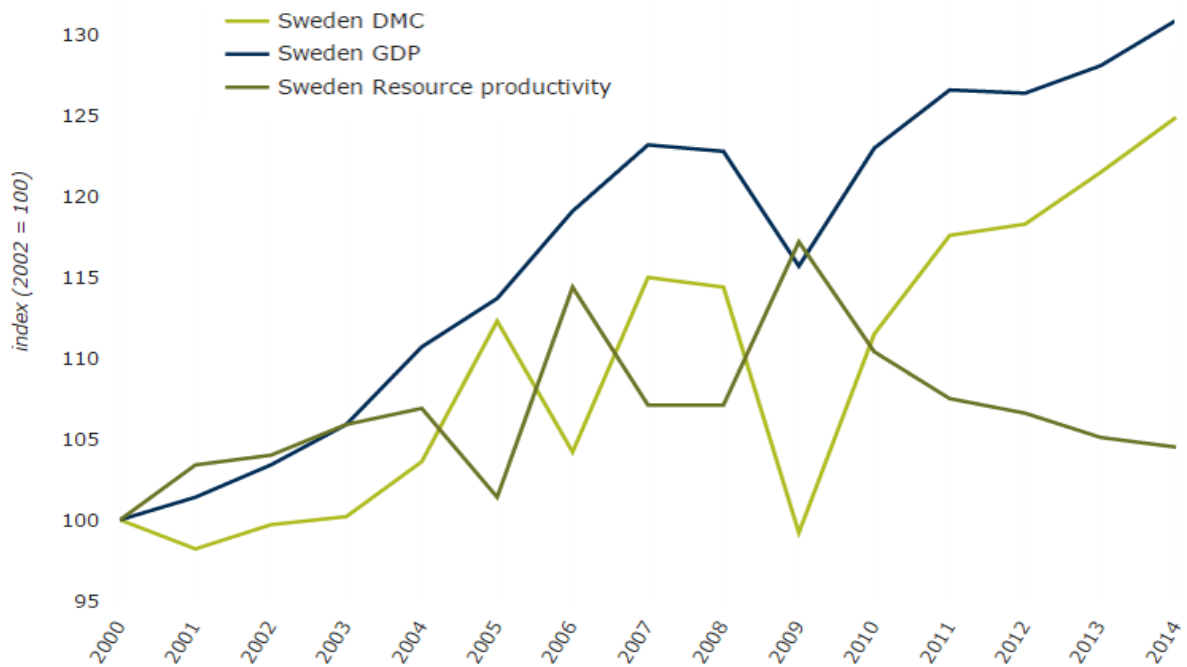
**Trends in material consumption, Sweden by category (2000–2014)**



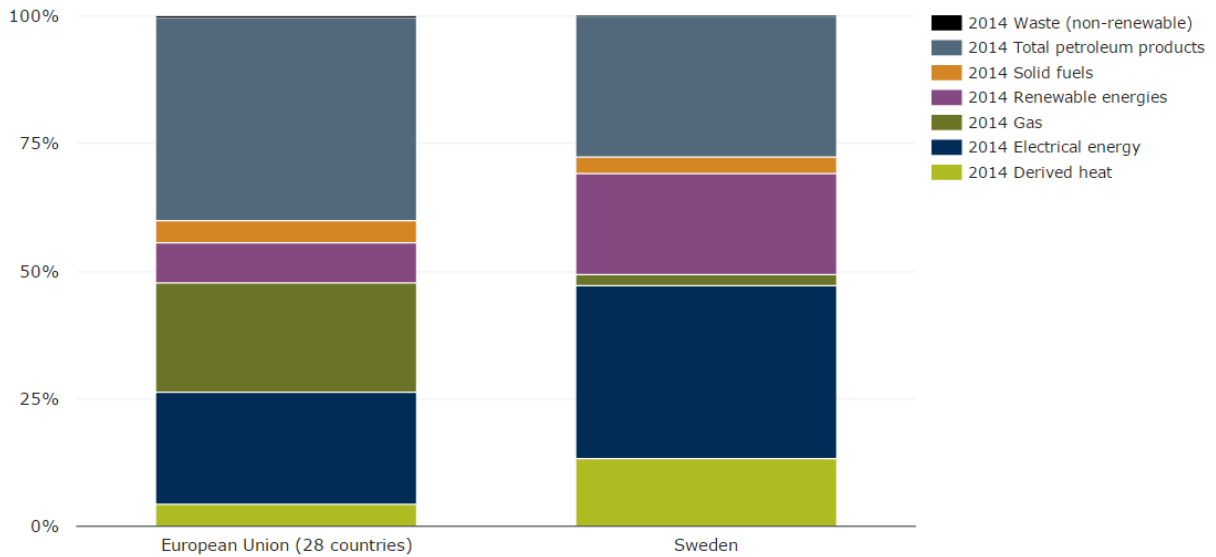
**Resource productivity (GDP/DMC), participating countries and EU-28  
 (2000, 2007 and 2014)**



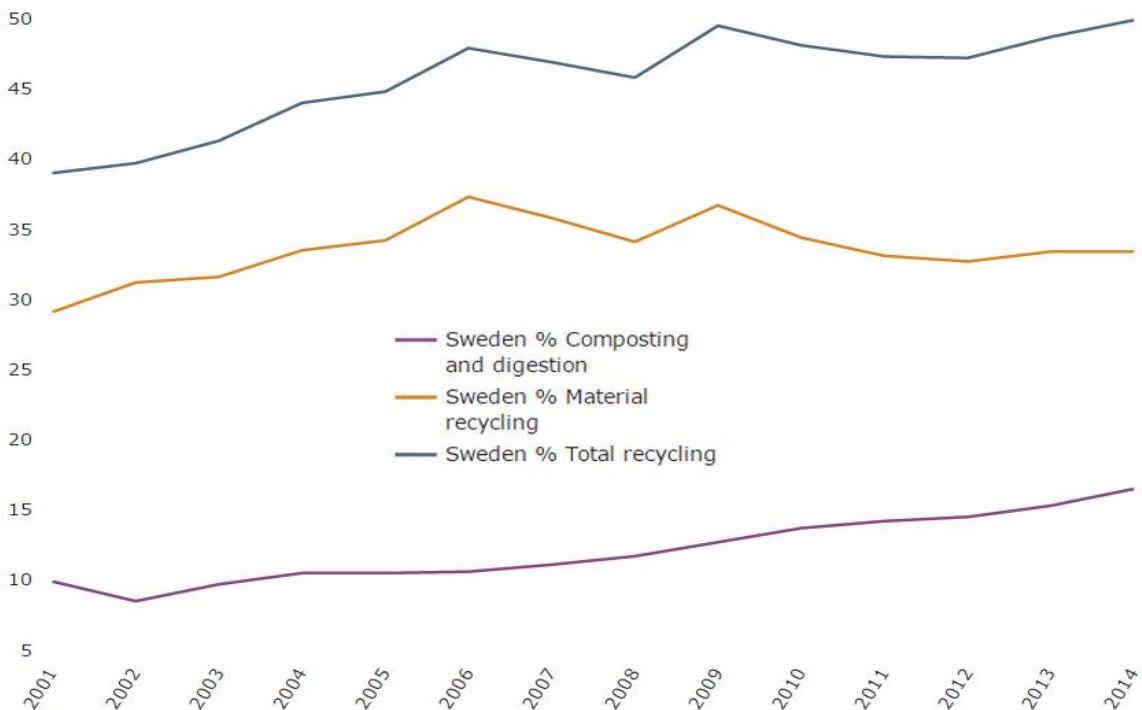
**GDP, DMC and resource productivity trends, Sweden (2000–2014)**



**Share of final energy consumption by fuel type, EU-28 and Sweden (2014)**



**Recycling of municipal waste, Sweden (2001–2014)**



## Introduction

There is no specific national strategy or action plan for resource efficiency developed in Sweden. However, the main areas in need of change, as identified in the flagship initiative and the Roadmap to a Resource Efficient Europe are to a large extent the environmental considerations as covered by the Swedish Generational Goal and the Environmental Quality Objectives discussed below. The Environmental Quality Objectives lay the basis and set up priorities for environmental work in Sweden, and should also be integrated in other issues. So even though there is no specific national resource strategy, or national definition of material resource efficiency, the concept is still a high priority nationally.

## Scope of material resource efficiency

Given that there is no nationally defined strategy for resource efficiency, there is no national definition of the concept.

## Driving forces of material resource efficiency

Based on key policy documents, the major parameters for material resource efficiency could be summarised as environmental concerns and competitiveness. In addition to this, waste management and waste prevention have to a large extent been drivers of policy.

Environmental concern has been one of the main drivers for resource efficiency in Sweden, starting with measures aimed at point sources (emissions from production plants) and moving to the lifecycle approach comprised by the Generation goal. Sweden has historically had good access to natural resources, including iron and other metals, wood, water and hydropower at low cost. These resources have founded our national wealth over centuries. Security of supply in terms of access to international resources has not yet been a main driver of resource efficiency in Sweden.

## Priority material resources, sectors and consumption categories

### Priority materials

Sweden's Mineral Strategy – For Sustainable use of Sweden's Mineral Resources that Creates Growth throughout the Country – focuses on five strategic areas for long-term sustainable mineral use. The first area covers a mining and mineral industry in harmony with the environment, culture and other industries; greater resource efficiency; improved dialogue and synergy with other industries; and mining communities with attractive natural and cultural environments (<http://www.government.se/content/1/c6/21/89/86/30eccfae.pdf>).

Natural gravel, phosphorous and waste are highlighted in the system of Environmental Quality Objectives.

**Natural gravel:** the Swedish gravel tax was introduced in July 1996. The rationale for introducing the gravel tax was primarily environmental, with concerns about resource scarcity, water quality and preserving the landscape. Thus, the conservation of natural gravel and material substitution to preserve the landscape were the main reasons for introducing the tax.

Sweden's Environmental Quality Objectives are of relevance to both biomass and soil protection. The Objective on **sustainable forests**, for example, reads: 'The value of forests and forest land for biological production must be protected, at the same time as biological diversity and cultural heritage and recreational assets are safeguarded'.

There is also an obligation to reforest productive forest land in Sweden (SFS 2008:662).

**Waste streams of particular concern** in the Waste Prevention Programme are food waste, electrical and electronic waste, textiles, and construction and demolition waste. Measures focusing on the waste phase include producer responsibility for packaging, newspapers, tyres, cars and electrical and electronic products, where producers are responsible for dealing with end-of-life products.

A tax on waste going to landfill entered into force in January 2000. The tax has dramatically reduced landfill and helped in the implementation of landfill bans, though it is not yet clear whether it has had an impact on waste quantities. In Sweden it has been illegal to dispose of sorted burnable waste in landfill since 2002, and for organic waste since 2005 (SFS 2001:512). The aim of these bans is to improve resource conservation and reduce environmental impact. To make recycling easier, a requirement for sorting burnable waste at source was also introduced in 2002.

Existing goals on energy efficiency and the work to make it happen also influence the use of resources. **Reduction in the use of fossil fuels** is covered by the government's 2020 climate and energy targets: a 40 % reduction in greenhouse gas emissions; at least 50 % renewable energy in the energy mix; 200 % more efficient energy use; and at least 10 % renewable energy in the transport sector.

The environmental taxes on natural gravel and fossil fuel mentioned above are annually accounted for in the Swedish Environmental Accounts (<http://www.scb.se/en/Finding-statistics/Statistics-by-subject-area/Environment/Environmental-accounts-and-sustainable-development/System-of-Environmental-and-Economic-Accounts/Aktuell-Pong/38171/Environmental-taxes/271568/>).



### Priority industries and economic sectors

- Initiatives on sustainable production and consumption of food including limiting food waste throughout the food supply chain.
- Textile and building products are prioritised.
- Extended producer responsibility for packaging, newspapers, tyres, cars and electrical and electronic products.
- The mining sector as a focus of the Swedish mineral strategy.

### Priority consumption categories

- Food.
- Electrical and electronic products.
- Textiles.
- Construction materials.

On food, for example, there is an ongoing campaign to reduce food waste run by the Swedish National Food Agency, Environmental Protection Agency (EPA) and the Board of Agriculture (<http://stoppamatsvinnet.nu> in Swedish).

## Policy framework

### National strategies or action plans for material resource efficiency

**The Swedish Environmental Code** – the country's package of environmental laws – includes a general consideration of resources. For example: 'The Environmental Code shall be applied in such a way as to ensure that the use of land, water and the physical environment in general is such as to secure long term good management in ecological, social, cultural and economic terms; and reuse and recycling, as well as other management of materials, raw materials and energy are encouraged with a view to establishing and maintaining natural cycles.' The government bill for the Environmental Code contains text corresponding to that of the EU waste hierarchy: 'In the choice between reuse, recycling, energy recovery and disposal, the method that gives the best results from a resource efficiency perspective without overlooking other important environmental considerations should be prioritised. In most cases, this will mean that reuse is chosen before recycling and that energy recovery should only be used thereafter, which in turn should normally be preferable to disposal (<http://www.regeringen.se/sb/d/108/a/1348>).

Material resource efficiency is included in the **Generational Goal**. The overall goal of environmental policy is to hand over to the next generation a society in which the major environmental problems have been solved without increasing environmental and health problems outside Sweden's borders (<http://www.miljomal.se/sv/Environmental-Objectives-Portal/Undre-meny/About-the-Environmental-Objectives/Generation-goal/>).

Sweden has **16 Swedish Environmental Quality Objectives**. Along with the Generational Goal and the Milestone Targets, they guide all the environmental work by providing directions on what should be achieved, how and at what pace. There are some similarities between the Roadmap to a Resource Efficient Europe and the Objectives. Problem areas and the need for change correspond to a large extent with the environmental problems identified in the Objectives (<http://www.miljomal.se/Environmental-Objectives-Portal/>).

The systematic approach of the Environmental Quality Objectives covers several issues of resource efficiency, though not always with quantitative targets.

In addition to the Environmental Quality Objectives there are Milestone Targets. The Milestone Targets are intended to identify a desired social change and specify steps towards achieving the Generational Goal and one or more of the Environmental Quality Objectives. However, they do not specify a state of the environment, since this is established in the Environmental Quality Objectives and associated specifications. The Targets are divided into five areas: reduced climate impact, air pollution, dangerous substances, waste, and biodiversity.

**Sweden's Waste Plan 2012–2017 – From waste management to resource efficiency** – was adopted by the Swedish Environmental Protection Agency on 16 May 2012. The primary purpose of the Plan is to steer waste management towards greater resource efficiency. It contains objectives and a description of measures for a number of priority areas. The measures are intended to help reduce the quantity and hazardous nature of waste, better utilise the resources in waste, stop the dispersal of hazardous substances and improve waste management generally.

The Plan sets out a number of priority areas where measures are needed, such as waste management in the construction and engineering sector, household waste and resource efficiency in the food chain. The measures are aimed at both public authorities and operators. The Plan is intended to supplement the Environmental Code and other waste legislation and to contribute to the attainment of relevant Objectives within the Environmental Quality system (<http://www.naturvardsverket.se/Documents/publikationer6400/978-91-620-6502-7.pdf>, in Swedish).

#### **Sweden's Waste Prevention Programme**

The Waste Prevention Programme (<http://scp.eionet.europa.eu/facts/WPP/sweden>) complements the Waste Plan and further develops waste prevention. The aim of the Programme is to guide and inspire Swedish stakeholders so that environmental goals are achieved, less waste is generated and products are designed to contain no dangerous substances, irrespective of how much the economy grows. The Programme contains eight objectives and 167 measures. The EPA will monitor the

Programme and draw up a new one by 2018. Programme objectives will contribute to the fulfilment of Sweden's environmental objectives and supplement the interim objectives (<http://www.naturvardsverket.se/Documents/publikationer6400/978-91-620-6654-3.pdf?pid=14439>).

**Sweden's Minerals Strategy** aims for a sustainable use of mineral resources that creates growth throughout the country (<http://www.government.se/contentassets/78bb6c6324bf43158d7c153ebf2a4611/swedens-minerals-strategy.-for-sustainable-use-of-swedens-mineral-resources-that-creates-growth-throughout-the-country-complete-version>).

The Swedish government has given the Swedish Geological Survey (SGU) the task to follow up on all activities under the Minerals Strategy. Every year a special event is organised for a follow-up of the actual outcome of all the suggested measures.

### The circular economy and closing material loops

A transition to a more circular economy calls for the involvement of all economic sectors. Sweden welcomes a broad approach of cost-effective measures in the forthcoming proposal, which should be based on a life-cycle perspective, promoting sustainable consumption and non-toxic material cycles, and stimulating innovation and business opportunities. Examples of key elements for stimulating the transition to a green and circular economy are:

- Prevent and phase out from material cycles substances of very high concern, through improved information about recyclability; information on the content of substances of very high concern and further restrictions in existing product legislation on substances of very high concern.
- Waste prevention is clearly linked to policy measures such as resource efficiency and sustainable consumption and production, as well as to legislation on chemicals and products. Waste streams of particular concern are food, electrical and electronic equipment, textiles, construction and demolition waste and plastic items. These streams are a priority because they involve large flows of material, which result in substantial emissions of greenhouse gases during extraction, production and waste management, and some of the streams often contain hazardous substances.
- Improve and promote economic instruments and coordinated funding.
- Promote collaborative consumption. Sweden welcomes initiatives on collaborative economy/industrial symbioses and new business models as well as dissemination of best practices including digital solutions. However, further analysis is needed of the particular areas where collaborative consumption could be/has been proven to be most beneficial and resource efficient, and which areas of the shared economy require action to meet new business and domestic needs and to facilitate uptake.
- Sweden supports the development of the EU Resource Efficiency Scoreboard and welcomes further development on new main indicators.

## General policy objectives for material resource efficiency

Examples of general policy objectives in the above mentioned policies:

- The **Environmental Code** shall be applied in such a way as to ensure that the use of land, water and the physical environment in general is such as to secure good long-term management in ecological, social, cultural and economic terms. Reuse and recycling, as well as other management of materials, raw materials and energy are encouraged with a view to establishing and maintaining natural cycles.
- The Generational Goal means that the basic conditions for solving environmental problems are to be achieved within one generation, and that environmental policy should be directed towards that aim. Two of the Generational Goal's seven objectives relate directly to material resource efficiency: 'material cycles are resource-efficient and as far as possible free from dangerous substances' and 'natural resources are managed sustainably'.
- The **Swedish Waste Plan** points to a series of initiatives to be taken on the road to a more resource-efficient society. There is more focus on the need to reduce the quantity of waste and its hazardous content than in previous waste management plans. Although recycling retrieves resources, it can only compensate for a small part of the resource use and environmental impact arising from the creation of new products.
- The aim of the Sweden's **Waste Prevention Programme** is to guide and inspire Swedish stakeholders so that environmental goals are achieved, less waste is generated and products are designed to contain no hazardous substances, irrespective of how much the economy grows. Increased resource efficiency in the construction sector and food chain are two examples of the programme's policy objectives.
- Sweden's **Minerals Strategy** aims to ensure that the country's mineral assets are exploited in a long-term sustainable way, with consideration shown for ecological, social and cultural dimensions, so that natural and cultural environments are preserved and developed. The Strategy deals with non-energy minerals for industrial purposes. The term 'mining and minerals industry' refers to enterprises that produce ore for metal extraction, aggregates, industrial minerals and natural stone. One out of five strategic areas for long-term sustainable use of minerals refers to resource efficiency. The objective is to extract ore and minerals from Swedish bedrock with greater resource efficiency. The recycling rate of end-of-life metallic and mineral products and of process waste is to increase and waste volumes are to be reduced.

## Institutional set-up and stakeholder involvement

### Institutional set-up for material resource efficiency policies

The Swedish EPA is responsible for co-ordinating the whole follow-up system of the Environmental Quality Objectives, including data provision. The Environmental Objectives system consists of goals on three levels:

- A Generational Goal, defining the direction of the changes that need to occur in society within one generation if the Environmental Quality Objectives are to be met. Decisions concerning this goal will be taken by the Riksdag.
- Environmental Quality Objectives, defining the state of the Swedish environment that is expected to result from environmental action. Decisions on the Objectives will be taken by the Riksdag.
- Milestone Targets, which are steps on the way to achieving the Generational Goal and the Environmental Quality Objectives. In the first instance, such Targets will be decided by the government. If it is evident that the Riksdag should decide, or if the government considers it appropriate, they will be decided by the Riksdag.
- For each of the 16 Environmental Quality Objectives there is a responsible authority.

### Process to ensure stakeholder participation

Dialogue, involvement of actors, development of indicators, measures and support for international processes are all necessary parts of the environmental system. Examples of stakeholder participation are:

- The idea of the Swedish Environmental Quality Objectives is to follow them up on a regular basis, with annual reports to the government and an in-depth evaluation once every parliamentary term. A number of government agencies are responsible for following up and evaluating specific Objectives in close connection with their own areas of responsibility. The Swedish EPA, working with all the agencies with responsibilities within the Environmental Objectives system, prepares an overall report to the government (<http://www.miljomal.se/sv/Environmental-Objectives-Portal/Undre-meny/Who-does-what/>).
- The Swedish EPA and the Confederation of Swedish Enterprise in 2011 established a Working Group for Resource Efficiency and Environmental Footprints. The aim of the group is to:
  - i) analyse effects on environment and competitiveness in Sweden,
  - ii) collect information and exchange experience,
  - iii) give input and influence initiatives to/from European Commission,
  - iv) facilitate negotiations in Environmental Council, Council and Parliament.

- The Centre for Resource Efficiency in Sweden (CERISE) involves companies, authorities and research institutes. The Centre's objective is to contribute to industries' efforts to increase resource efficiency (reduction in the use of resources and increased material efficiency); improved energy efficiency; greater efficiency in the use of ecosystem services; increased competitiveness; and reduced environmental impact. Participants represent various industries such as energy, pulp and paper, manufacturing, chemicals, waste and recycling, and more. The network organises seminars and several partners of the Centre participate in research projects aiming at highlighting different issues in resource efficiency. The steering group of CERISE consists of representatives from industry, the IVL Swedish Environmental Research Institute, Swedish Environmental Protection Agency and Ministry of the Environment and Energy.
- One example of an ongoing project that brings together stakeholders from both the private and public sectors is the project run by the Royal Swedish Academy of Engineering Sciences on Resource efficient business models – strengthened competitiveness (Resurseffektiva affärsmodeller – stärkt konkurrenskraft). The aims of the project are to stimulate the emergence of new business models with built-in resource efficiency that maximises resource value. The project will also highlight examples of business models aiming at resource efficiency in various sectors as well as identifying instruments encouraging the development of these business models. This applies to both the type and design of instruments.

### Suggestions for international support mechanisms to exchange experience

The existing webinars are well-functioning forums for the exchange of experience and learning.

Two topics of interest are:

- i) resource efficiency regarding the management of stocks of resources in the built environment – such as metals accumulated in the built environment that are no longer in use but not yet recycled);
- ii) further analysis of the particular areas where collaborative consumption could be/has been proven to be most beneficial and resource efficient, and which areas of the shared economy require action in order to meet new business and domestic needs and facilitate uptake.

### Policy instruments

#### Policy instruments commonly used for material resource efficiency

There is a mixture of regulatory instruments in place such as the Environmental Code, economic instruments such as the Landfill tax, and information-based instruments such as the ongoing campaign to reduce food waste.

There is also a focus on funding research for sustainable innovation and the circular economy. Two examples are:

- i) a newly started programme to increase economic and environmental sustainability in resource and waste management, thereby contributing to resource efficiency in business and society, creating new business opportunities, strengthening competitiveness and meeting global challenges (<http://www.vinnova.se/en/>);
- ii) a four-year research programme on the circular economy funded by the Swedish Foundation for Strategic Environmental Research (<http://www.mistra.org/aktuellt/nyhetsarkiv/2015-03-25-42-miljoner-till-forskning-om-produktdesign-och-resurseffektivitet.html>).

For examples of policy instruments related to material resource efficiency see also the section on Policy framework.

### Examples of good practice

In 2010 the Swedish parliament decided on a changed system for Environmental Quality Objectives, Milestone Targets and extended contents in the Generational Goal. The Generational Goal, which defines the direction of environmental policy, is to provide guidance regarding the values that are to be protected and the changes in society that are needed if the desired quality of the environment is to be achieved.

The goal is intended to guide environmental action at every level in society. The bullet points that spell out its practical implications will be among the criteria used to assess whether the basic conditions for achieving each of the Environmental Quality Objectives are met.

The Generational Goal means that the basic conditions for solving the environmental problems we face are to be achieved within one generation, and that environmental policy should be directed towards ensuring that:

- ecosystems have recovered, or are on the way to recovery, and their long-term capacity to generate ecosystem services is assured;
- biodiversity and the natural and cultural environment are conserved, promoted and used sustainably;
- human health is subjected to minimum adverse impacts from environmental factors, while at the same time the positive impact of the environment on human health is promoted;
- material cycles are resource-efficient and as far as possible free from dangerous substances;
- natural resources are managed sustainably;
- the share of renewable energy increases and the use of energy is efficient, with minimal impact on the environment;
- patterns of consumption of goods and services cause the least possible problems for the environment and human health.

## Targets and indicators

### Targets for material resource efficiency

The Swedish Environmental Quality Objectives are evaluated continually. The Environmental Objectives Portal currently presents some 100 national indicators tracking progress towards the Environmental Quality Objectives and the Milestone Targets. A summary of the Council's overall assessment of progress towards the Environmental Quality Objectives is set out in the report de Facto 2010: Sweden's environmental objectives – Swedish consumption and global environmental pressures (Swedish only).

Within the system of Environmental Quality Objectives there are also 24 Milestone Targets that indicate steps along the way to the Environmental Quality Objectives and the Generational Goal (<http://swedishepa.se/milestone-targets>). Examples related to material resource efficiency include:

- **Better resource management in the food chain (milestone within waste).** Measures are to be taken so that, by 2018, resource management in the food chain is improved through separation and biological treatment of at least 50 % of food waste from households, catering services, shops and restaurants, with the aim of recovering plant nutrients, with at least 40 % treated in such a way that energy is also recovered.
- **Construction and demolition waste (milestone within waste)** Measures are to be taken so that, by 2020, at least 70 % by weight of non-hazardous construction and demolition waste is prepared for reuse, recycling and other material recovery.
- **Non-toxic and resource-efficient ecocycles.** The safe use of recycled material from a health and environmental perspective through, as far as possible, avoiding the recirculation of dangerous substances while resource-efficient ecocycles are sought. This is to be achieved through an overall action strategy within the EU, which, by 2018 at the latest, is to result in a number of measures, including the finalisation and co-ordination of EU regulations on waste, chemicals and goods so that they steer towards non-toxic and resource-efficient ecocycles, and the establishment of the principle of high and uniform requirements on the content of dangerous substances in newly produced and recycled materials, through a decision where appropriate.

No national objectives or targets are set based on material flow accounting indicators.

For additional information please see the section on the Swedish Environmental Quality Objectives.

### Indicators to monitor use of materials and resource efficiency

According to EU regulation on environmental accounts Sweden compiles data on economy-wide material flow accounts (EW-MFA). However, no national objectives or targets are followed up by these indicators.



Data is presented at the website of Statistics Sweden and the website of Eurostat ([http://www.scb.se/en /Finding-statistics/Statistics-by-subject-area/Environment/Environmental-accounts-and-sustainable-development/System-of-Environmental-and-Economic-Accounts/Aktuell-Pong/38171/Behallare-for-Press/386192/](http://www.scb.se/en/Finding-statistics/Statistics-by-subject-area/Environment/Environmental-accounts-and-sustainable-development/System-of-Environmental-and-Economic-Accounts/Aktuell-Pong/38171/Behallare-for-Press/386192/)).

Within the system for Environmental Quality Objectives there is a wide range of indicators (<http://www.miljomal.se/sv/Miljomalen/Alla-indikatorer/>, in Swedish).

## Optional questions

### Reflections on the country's trends in the use of materials and resource efficiency

The indicator domestic material consumption (DMC) shows that in 2014 Sweden's material consumption was about 23 tonnes per person. This is higher than the EU average, about 10 tonnes DMC/ per capita higher. A possible explanation is differences in material composition used by various countries' economies. The DMC indicator includes biomass materials such as forest and agricultural products, metals, non-metallic minerals such as sand and gravel for road construction and buildings, fossil fuels, other goods and net import of waste. If a country has a large proportion of imports for its material consumption this is reflected by the magnitude of the indicator. For example, imported final goods weigh less than the source material they are made of. Sweden has a high consumption of metal ores (gross ores), which is a result of a large mining industry and the generation of large amounts of material. Increased mining of metal ores and non-metallic minerals (sand and gravel) in Sweden has contributed to the increase in DMC between 2000 and 2013.