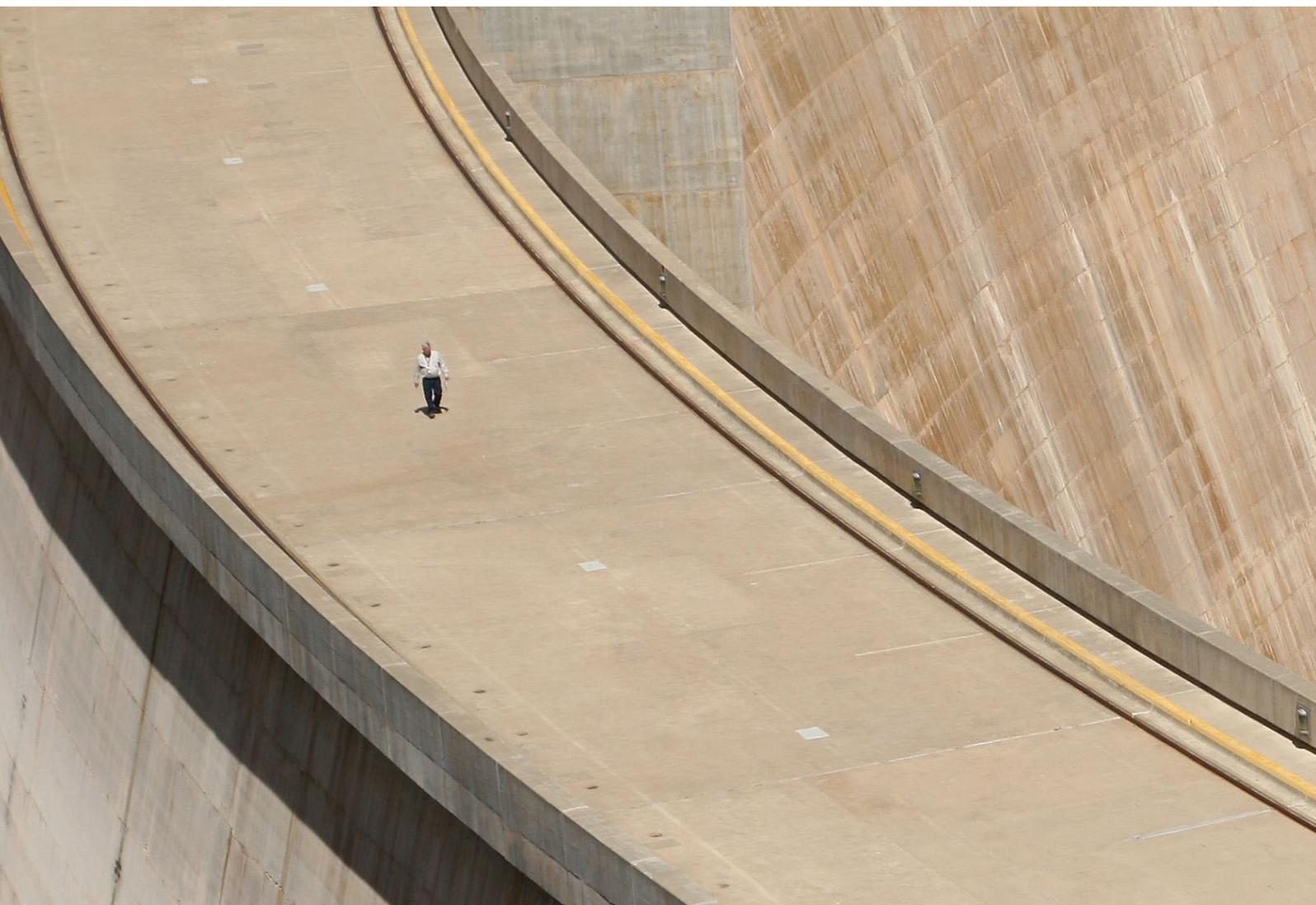


More from less — material resource efficiency in Europe
2015 overview of policies, instruments and targets in 32 countries



Netherlands 

May 2016

This country profile is based on information collected by the agency Rijkswaterstaat Leefomgeving and by colleagues at the policy department of sustainability at the Ministry of Infrastructure and Environment. 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 December 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>

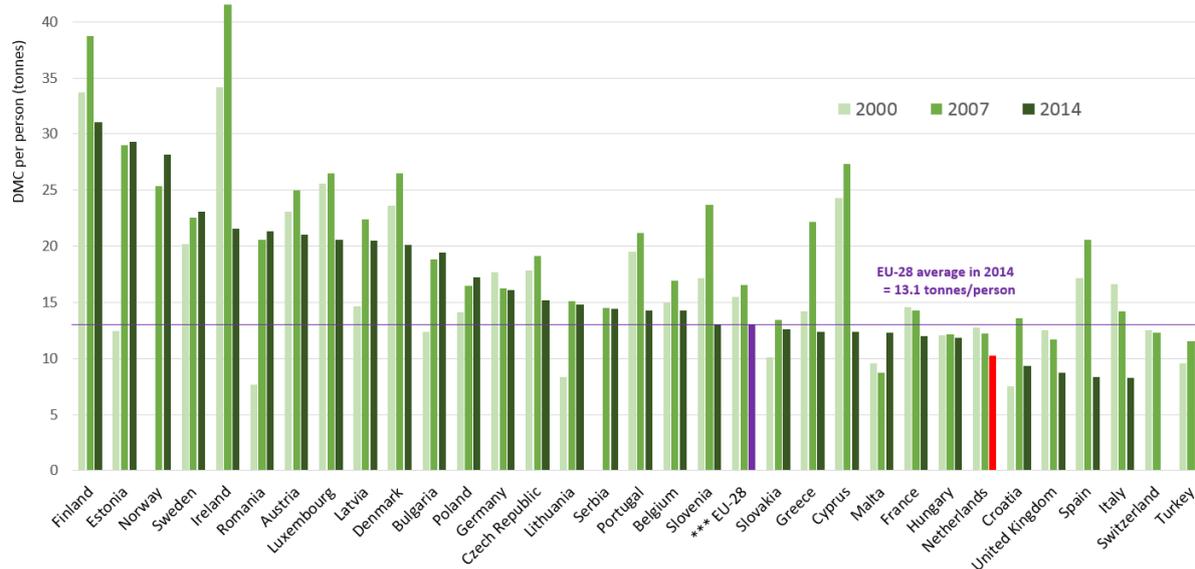
For information on climate- and energy-related policies, including those on energy efficiency, in the participating countries, please visit: <http://www.eea.europa.eu/themes/climate/ghg-country-profiles>

The Netherlands, facts and figures

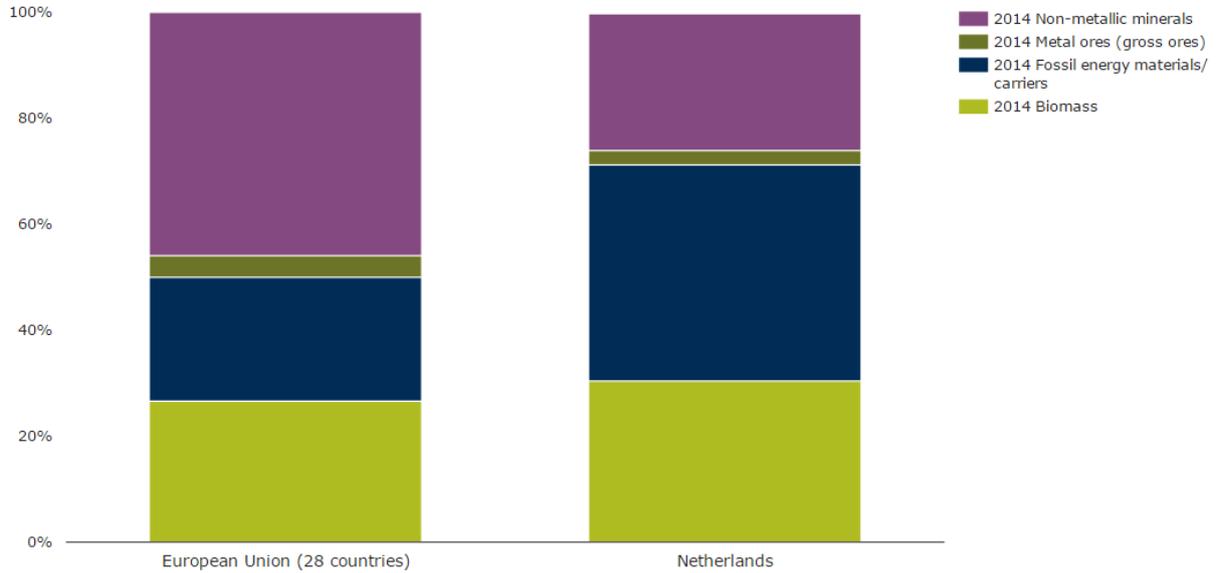
Source: Eurostat

	<p>GDP: EUR 663 billion (4.7 % of EU-28 total in 2014)</p>
	<p>Per person GDP: EUR 35,900 (in purchasing power standard) (131 % of EU-28 average per person in 2014)</p>
	<p>Use of materials: 173 million tonnes DMC (2.6 % of EU-28 total in 2014) 10.3 tonnes DMC/person (79 % of EU-28 average per person in 2014) Resource productivity 3.68 EUR/kg (186 % of EU-28 average in 2014)</p>
	<p>Structure of the economy: agriculture: 2.8 % industry: 22.3 % services: 74.8 % (2014 est.)</p>
	<p>Surface area: 41,500 square kilometres (0.9 % of EU-28 total)</p>
	<p>Population: 16.9 million (3.3 % of EU-28 total)</p>

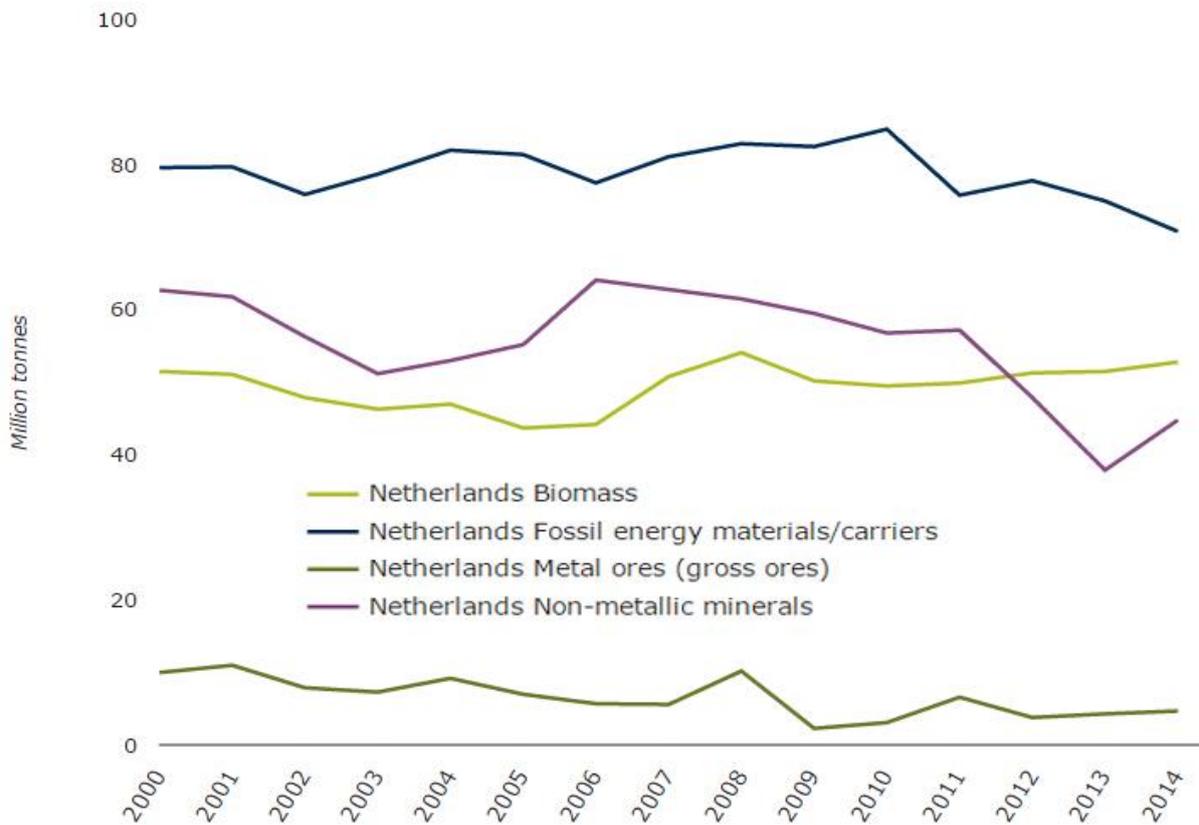
Use of materials (DMC) per person, participating countries and EU-28
(2000, 2007 and 2014)



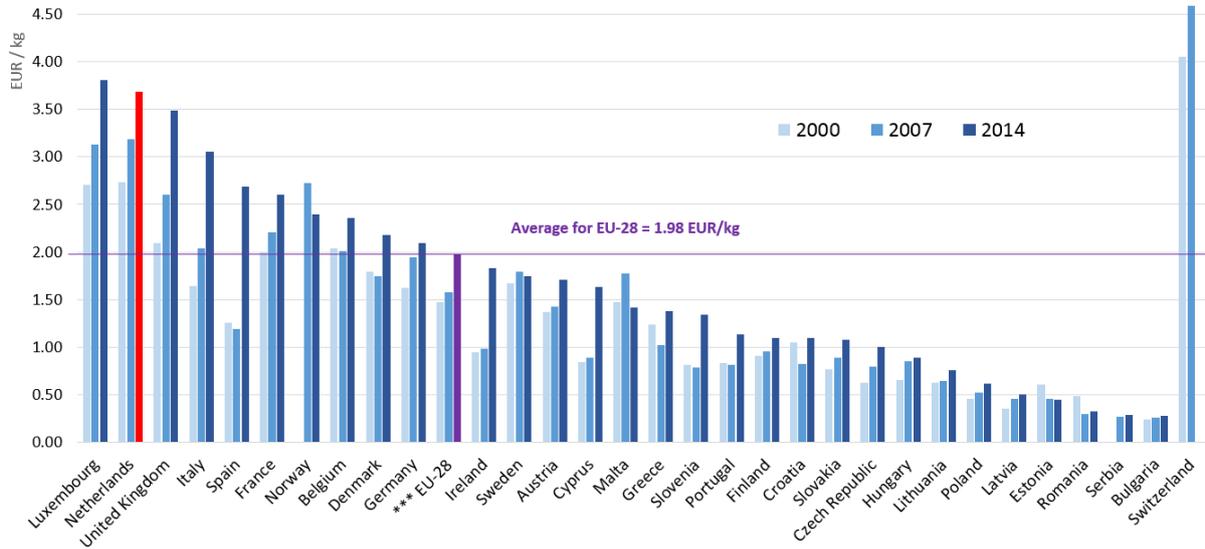
Domestic material consumption by category, EU-28 average and the Netherlands (2014)



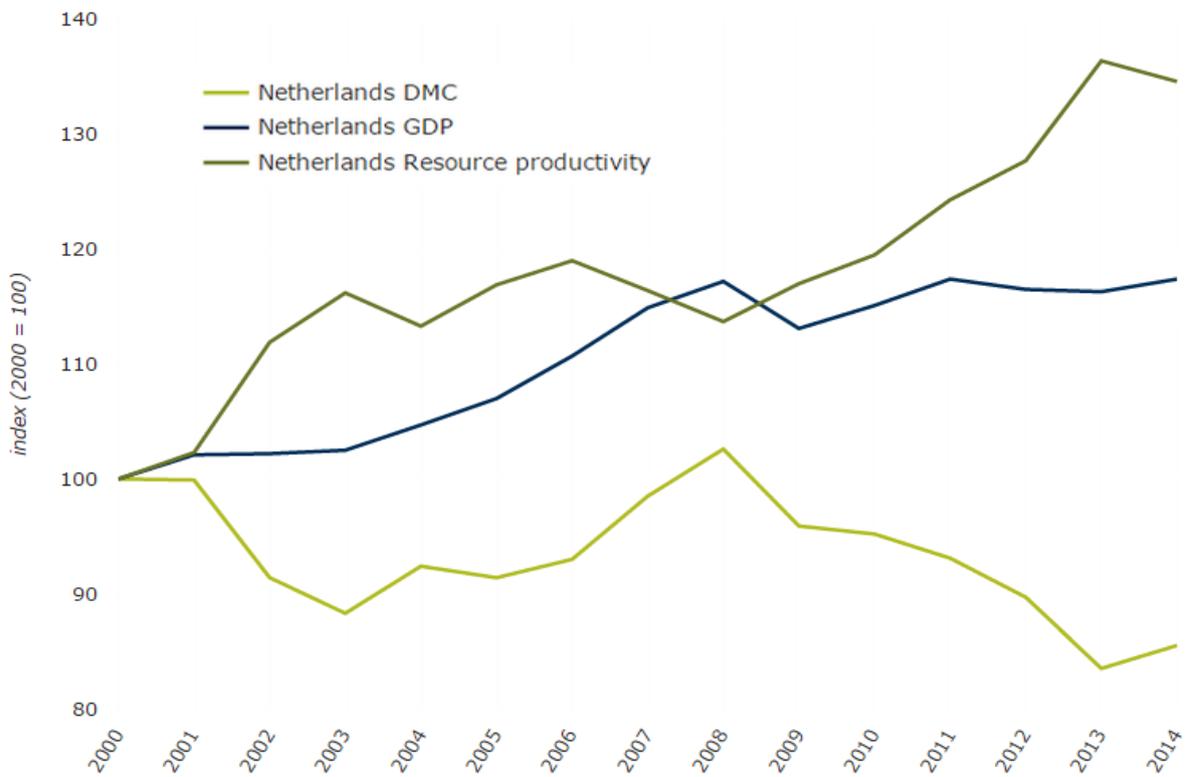
Trends in material consumption, the Netherlands by category (2000–2014)



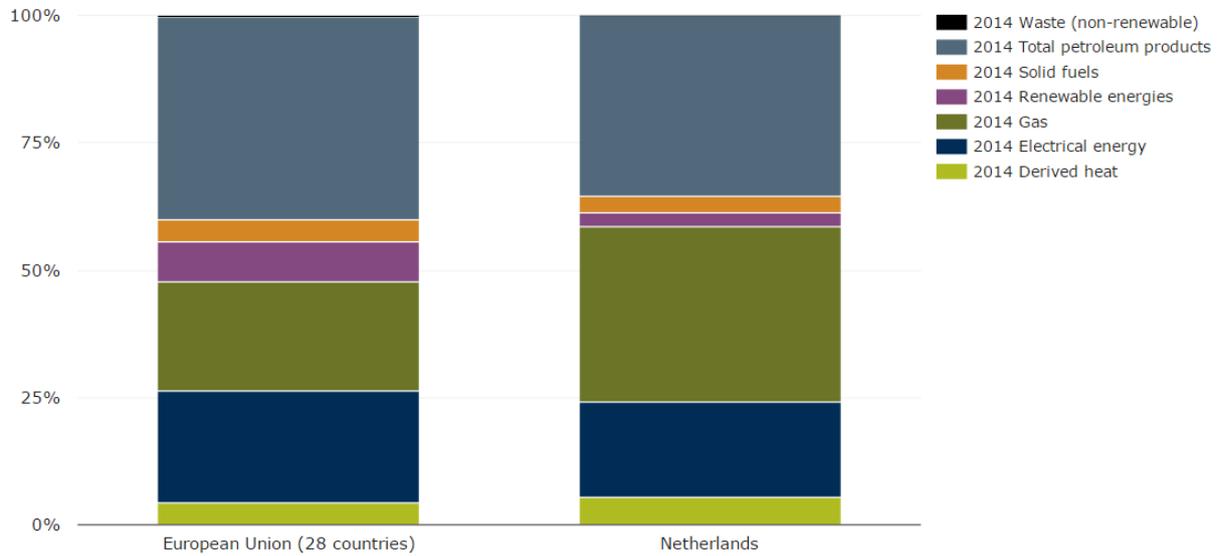
**Resource productivity (GDP/DMC), participating countries and EU-28
 (2000, 2007 and 2014)**



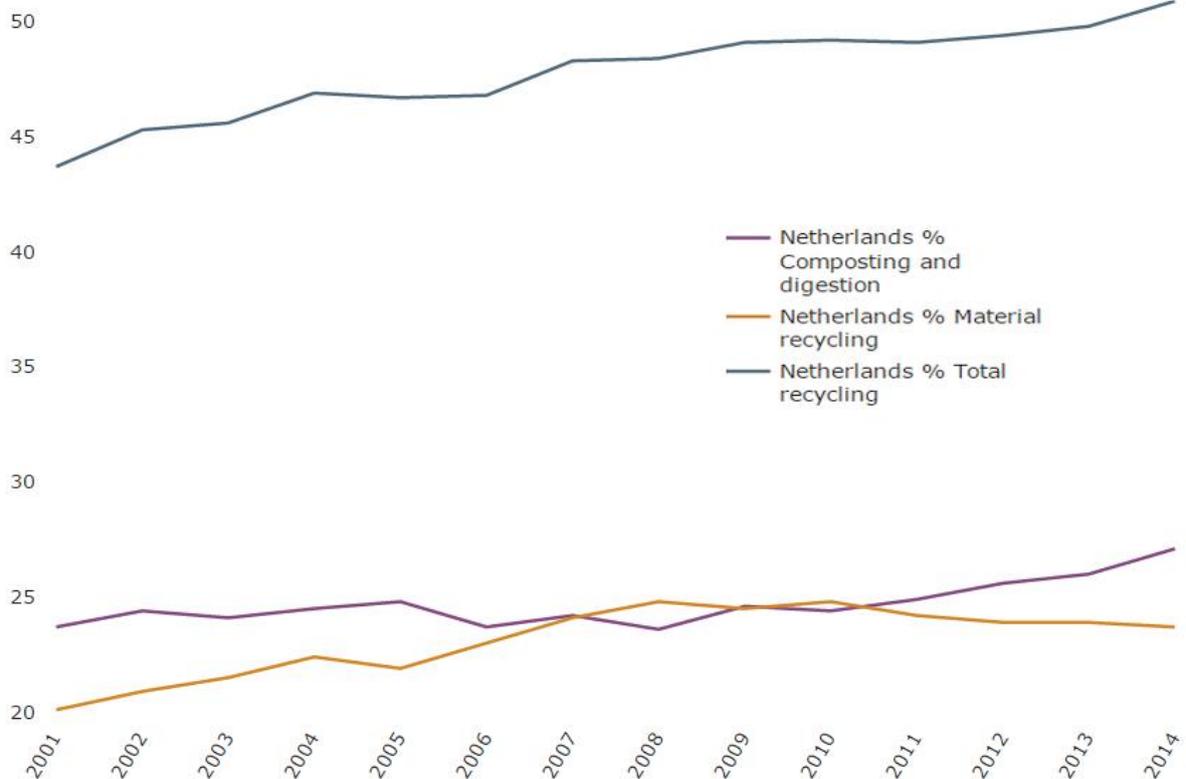
GDP, DMC and resource productivity trends, the Netherlands (2000–2014)



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



Recycling of municipal waste, the Netherlands (2001–2014)



Introduction

At the time of writing (December 2015) the Netherlands does not have a dedicated national resource efficiency strategy or action plan. However, several related policy documents are in place – such as on waste management, waste prevention, the circular economy and green growth. A stand-alone resource efficiency strategy is not anticipated as the theme is already included in the circular economy strategy and other related policies.

Scope of material resource efficiency

The programme *From Waste to Resource* covers the broad natural resource categories: fossil resources, minerals, metals and renewables (biomass). These are made explicit as follows:

Natural capital provides us with resources. It also improves the quality of our living environment and contributes to our health. A familiar example of this is green space in cities. This results in lower use of materials, less heat stress, less particulate matter, and a healthier population. To safeguard the supply of these services, this capital has to remain vibrant and be able to replenish itself in a natural way.

A circular economy is an economic system based on the reuse of products and materials and the conservation of natural resources, coupled with the aim of creating value in every link of the system. In a circular economy, cycles are closed and chains designed to be as efficient as possible. Waste and emissions no longer exist, transference to humans and the environment is prevented, and the depletion of resources or the Earth system is no longer an issue.

Driving forces of material resource efficiency

A number of major factors drive resource efficiency in the Netherlands, including:

- **The securing of raw materials**, dealing with geopolitical threats and the efficient use of raw materials.
- **Economic growth**, through cost savings and the creation and exploitation of economic opportunities.
- **A reduction in environmental impact** through more efficient and effective use of raw materials, less waste, less landfill and incineration, and lower emissions.

• **Employment growth.** Research by the Ellen MacArthur Foundation and the Netherlands Organisation for Applied Scientific Research (TNO) expect very positive effects on employment. TNO, in a study commissioned by the Ministry of Infrastructure and the Environment, estimates (annual) gains of EUR 7.3 billion in 2020, representing 54 000 jobs. This sum includes slightly more than EUR 1 billion through an expanding services sector, EUR 0.93 billion in agriculture and EUR 5.3 billion in industry. An expansion of the circular economy for technical products in the Netherlands initially means advocating more maintenance and repair work, intensive reuse and increased recycling. Expanding the circular economy in the biotic sector is calculated by better cascading the use of biowaste streams.

<https://www.government.nl/binaries/government/documents/reports/2013/10/04/opportunities-for-a-circular-economy-in-the-netherlands/tno-circular-economy-for-ienm.pdf>

• **Sustainable use and restoring natural capital.**

The policy documents where the driving forces of resource efficiency are made most explicit are *From Waste to Resource* and the introductory part of the letter to the House of Representatives in the 2015 *Progress Report*.

<https://www.government.nl/topics/environment/documents/reports/2015/04/15/annex1-progress-of-report-from-waste-to-resource-15-april-2015>

Priority material resources, sectors and consumption categories

Priority materials

In 2014 the Ministry of Economic Affairs carried out research on the 22 non-organic (abiotic) materials considered critical for Dutch companies (*Materialen in de Nederlandse economie 2014*).

<https://www.rijksoverheid.nl/documenten/rapporten/2014/05/19/materialen-in-de-nederlandse-economie-een-beoordeling-van-de-kwetsbaarheid>

The report considers the vulnerability of the Netherlands' economy to supply risks weighed against the economic importance of the selected materials. These do not correspond precisely to the critical materials identified by the European Union (EU).

This study, now extended to 64 abiotic materials, explores the sectors of the economy in which these metals and minerals are used, in what kind of products, the extent of the country's dependence on importing them, related supply risks (economic, social and ecological), how the risks can be tackled, and any potential for improvement in more than 100 sectors. The research was completed in December 2015 : *Vervolgonderzoek materialen in de Nederlandse economie*

<https://www.rijksoverheid.nl/documenten/rapporten/2015/12/11/materialen-in-de-nederlandse-economie> (English translation will be published soon). The consequences of supply security form the core of the study, but company sensitivity when buying raw materials or semi-manufactured products is also

addressed. The research uses the following indicators: long-term supply; short-term supply; the operating results of companies; and risks to company reputation.

The materials with the greatest long-term supply insecurity for the Netherlands' economy are antimony (Sb), germanium (Ge), indium (In), gallium (Ga) and the rare earth metals. The materials with the largest impact on the economy are iron (Fe), copper (Cu) and aluminium (Al).

Short-term supply insecurities also apply to the rare earth metals, gallium (Ga), germanium (Ge) and antimony (Sb).

The industrial sectors with the greatest risk of supply insecurity of these raw materials include electronics, electrical appliances, appliances for transport vehicles (cars, ships) and a number of other industries including games, sports equipment, furniture and jewellery, followed by the production of metal items and machinery.

Risks related to company reputation are by far the greatest for the transport appliance sector, because of its dependence on materials with a large environmental impact or that come from countries with a bad human development record, or those known as conflict metals, such as tin (Sn), tantalum (Ta), wolfram (W) and gold (Au).

Based on this study a self-assessment tool for criticality of resources is being developed for companies.

The Netherlands has a long policy tradition of prevention and recycling in a number of waste streams chosen for their volume, weight and environmental impact. Some years ago this policy evolved into a value-chain or sector-based approach. Several projects on materials/products or sectors are currently underway. Selection criteria for a specific material, product or sector are based on a mix of factors including waste volume and weight, environmental impact, economic impact, political impact and the willingness to cooperate of relevant stakeholders. In these so-called value-chain projects, stakeholders along the chain are involved in identifying a common target and agreeing on a set of measures to tackle economic opportunities, better design, longer use of products, better recycling and less final waste. Sometimes this is formally laid down in a covenant, green deal or value-chain agreement, and the government has a facilitating role in many of the projects. The following materials/products are currently subject to the value-chain approach:

- plastics;
- biomass;
- textiles;
- food (waste);
- phosphorus;
- construction and demolition waste (concrete);
- packaging;
- electronics;
- wood;
- diapers;
- waste in social services;
- underground infrastructure materials like cables, wires and pipes;
- mechanical installations in the built environment.

Priority industries and economic sectors

The circular economy *From Waste to Resource* programme has not identified specific industries or economic sectors, but several products, materials and sectors are addressed through a range of programmes (see above).

In the programme *Nederland Circulair!*, a value-chain selection method has been developed on the basis of economic impact, environmental impact, value preservation potential and transition potential. Ten key value chains have thus been prioritised:

- plastics and rubber used in the construction of infrastructure;
- machinery and installations – for example for air conditioning and refrigeration – used in hospitality and offices;
- disposable and single-use products used in health care;
- chemical products and chemical leasing;
- electrical and electronic waste from households in waste management;
- organic waste from hospitality and health care;
- automotive remanufacturing and component harvesting from recycling and waste treatment;
- the Dutch maritime industry, covering the design and manufacture of ships and off-shore facilities;
- office furniture assembly;
- plastic and paper packaging used in food production.

The first three have been selected to start a value-chain project.

Finally, the follow-up study to [Materialen in de Nederlandse economie \(2014\)](#) concluded that the influence of the price volatility of raw materials on the cost price of bought goods is very small for most sectors because of a relatively small share of these materials in many end products. The influence of price volatility may be substantially larger in the industrial sectors of appliances for transport, metal products, machinery, and electrical and electronic equipment, amongst others.

<https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/rapporten/2014/05/19/materiale-n-in-de-nederlandse-economie-een-beoordeling-van-de-kwetsbaarheid/materialen-in-de-nederlandse-economie-een-beoordeling-van-de-kwetsbaarheid.pdf>

Priority consumption categories

No priority consumption categories have been explicitly identified, but priority product groups include:

- plastics (plastic bags);
- biomass;
- textiles;
- food (waste);
- packaging;
- electronics;
- diapers.

Policy framework

National strategies or action plans for material resource efficiency

The Netherlands' policy on resource efficiency is covered by a range of policy documents addressing different aspects of resource efficiency. In general, the aim is to combine raw materials policy with waste management policy, together leading to a policy on circular economy.

In 2011 the Netherlands government published a **Raw Materials Memorandum** ([grondstoffennotitie](#)) drawn up by the Ministries of Foreign Affairs, Economic Affairs, and Infrastructure and the Environment. The starting point of the Dutch Cabinet is that the business world must play the leading role while the authorities facilitate, stimulate, coordinate and set a framework. This memorandum contains three agendas with recommendations for solving problems with raw materials:

- Agenda 1: secure, enlarge and make the supply sustainable.
- Agenda 2: restrict the demand side and if possible make it sustainable.
- Agenda 3: make the use of raw materials more efficient and sustainable.

This three-part agenda is partly laid down in the Ministry of Economic Affairs' 2012 **Programme on Bio-based Economy**. The programme aims to replace virgin non-renewable resources with renewable ones.

<http://www.rijksoverheid.nl/documenten-en-publicaties/kamerstukken/2012/04/02/hoofdlijnennotitie-biobased-economy.html>

In the **Coalition Agreement** (2012), the new Dutch Cabinet '*strives to a circular economy, wants to stimulate the (European) market for sustainable resources and stimulate the reuse of scarce raw materials*'.

The *Programme on Bio-based Economy* was further developed by the Ministry of Economic Affairs in its 2013 **National Policy for Green Growth**, with a progress report in 2015.

<https://www.rijksoverheid.nl/binaries/rijksoverheid/documenten/kamerstukken/2013/03/28/kamerbrief-groene-groei-voor-een-sterke-duurzame-economie/kamerbrief-groene-groei-voor-een-sterke-duurzame-economie.pdf> and <https://zoek.officielebekendmakingen.nl/blg-532623.pdf>

The *National Policy for Green Growth* launched the Cabinet's ambition for green growth, with important challenges and opportunities in eight domains. In respect of resource efficiency, two domains are most important: the bio-based economy and waste as a resource. The goal of the bio-based economy is to optimise the use of biomass under the cascading principle. The shift from waste to resource will lead to a more circular economy.

Several measures were formulated for waste as a resource:

- launch a pilot project for the introduction of a circular economy in a promising sector in order to gain experience with the transition process (certain high-potential production chains that place a heavy burden on the environment will also be made more sustainable over the next four years);
- publish a survey of the opportunities for and obstacles to a circular economy in the Netherlands (by mid-2013);
- set out a strategy for motivating consumers to help use resources efficiently;
- launch a programme based on the 'triple-helix' approach (public sector, industry and research institutions) to foster innovation, with the theme of waste as resource, by 2014 at the latest. This was expected to result in agreements about what research programmes should be set up and implemented for technological, process and system innovation and training agendas;
- the focus in implementing waste policy should be on targets for green growth and, specifically, on reducing the consumption of raw materials.

Green growth policy is built on four pillars: smart use of market incentives; an incentivising framework with legislation that promotes dynamism; innovation; and the government as a network partner.

The waste to resource domain was extended in the circular economy programme **From Waste to Resource**, published in 2014, which formulated specific measures to enable the transition from a linear to a circular economy. A progress report was published in April 2015

<https://www.government.nl/topics/environment/documents/reports/2015/04/15/annex1-progress-of-report-from-waste-to-resource-15-april-2015>

All steps in the chain are covered to keep the waste leaving the chain to an absolute minimum in the very near future: sustainable sourcing, circular design and production, sustainable consumer behaviour, waste prevention and better recycling of what waste there is.

From Waste to Resource **describes the circular economy as:** 'an economic system, based on the reuse of products and materials, and the conservation of natural resources, coupled with the aim of creating value in every link of the system'. In a circular economy, cycles are closed and chains designed to be as efficient as possible. Waste and emissions no longer exist, transference to humans and the environment is prevented, and the depletion of resources or the Earth system is no longer an issue.

The programme has three objectives:

- keeping our natural capital vibrant;
- improving the security of supply;
- reinforcing the earning power of the Dutch economy.

These objectives can be neither considered nor achieved independently of each other. Economic growth, employment and competitiveness are tied to keeping the

natural capital vibrant. This scope encompasses the sustainable extraction of raw materials, making circular services and design, production and consumption, and finally – because there will still be waste for some time to come – the programme also focuses on the waste stage.

Nine operational goals are defined in the programme:

1. identify, sustainably manage and utilise natural capital;
2. focus the design and development of products on circularity;
3. increase and disseminate knowledge about the circular economy and make it practicable;
4. encourage resource-free business operations;
5. turn chains into cycles;
6. develop financial and other market incentives;
7. make consumption and procurement circular;
8. gear waste policy to the circular economy, and improve waste collection and recycling;
9. develop indicators and metrics that quantify the transition to a circular economy.

In 2016 a **Government wide Programme on Circular Economy** will be developed in close cooperation between at least four ministries – Infrastructure and the Environment; Economic Affairs; Foreign Affairs; and Interior and Kingdom Relations – under the leadership of the Ministry of Infrastructure and the Environment. It will combine and integrate the circular economy policies of the different departments and will include the programme *From Waste to Resource*.

The 2009 **Waste Management Plan 2** (LAP2) includes a chapter on prevention of waste and is accompanied by the *National Prevention Plan on Waste* as a separate programme.

http://www.lap2.nl/publish/pages/100734/beleidskaderttw2_13_preventie.pdf

and

http://www.lap2.nl/publish/library/206/afvalpreventieprogramma_nl_final_2013.pdf

The Waste Management Plan is currently under revision, with public consultation on a draft **Waste Management Plan 3** (LAP3) scheduled for early 2016, and final publication expected at the end of the year. Besides covering all aspects of waste under the EU Waste Framework Directive (WFD), it will also be a materials plan with a specific resource efficiency strategy linked to the circular economy programme.

As indicated, both the Dutch *Waste Management Plan 2* (LAP2) and the *Waste Prevention Plan* have a primary focus on conserving materials for other uses and to prevent them from becoming waste.

In addition, there is a focus on a value-chain approach to valorise as much of the material in the different waste streams as possible, making it useful in other value chains (or the same one), all of which helps to minimise waste generation and maximise recycling and reuse rates.

Resource efficiency is one of the priority procurement criteria of the Netherlands' policy on **Green Public Procurement** (<https://www.pianoo.nl/public-procurement-in-the-netherlands>). In the category of office furniture, for example, requirements are included for minimum product lifespan, availability of spare parts, specifications on used textiles, separability of component materials and the use of sustainably sourced wood. Suggestions are made for the use of biological or recycled fibres. For the product category of street furniture, for example, the use of recycled plastics is stipulated and all the materials used have to be marked.

Government experiments are currently underway to test the use of circular concepts and business models in eight areas: information and communication technology (ICT); cars; office furniture; buildings; paper; clothing; catering; and packaging. The *Green Deal Circulair Inkopen* on circular procurement, in which the government is participating, is running. Participants from companies, civil society organisations, and local and national governments exchange experience in circular procurement and agree to implement the approach in their own organisations.

Resource efficiency is also one of the aims of the **innovation policy**, which is included in our enterprise policy, especially for the priority sectors of agri-food, horticulture and propagation materials, high-tech materials, the creative industry and chemicals. <http://topsectoren.nl/english>

The action agenda for the priority chemicals sector and the business plan for a bio-based economy aims to achieve a 'green chemistry' in 2050 and to use biomass in existing and new materials. Smart plastic materials are light-weight, self-repairing, self-cleaning and completely recyclable, and no scarce materials are used. The business plan for a bio-based economy also lays down appropriate measures and innovation pathways.

<https://www.rijksoverheid.nl/documenten/rapporten/2011/06/17/new-earth-new-chemistry>

The circular economy and closing material loops

In the circular economy programme *From Waste to Resource*, the circular economy is described as an economic system based on the reuse of products and materials and the conservation of natural resources, coupled with the aim of creating value in every link of the system. In a circular economy, cycles are closed and value chains designed to be as efficient as possible. Waste and emissions no longer exist, transference to humans and the environment is prevented, and the depletion of resources or the Earth system is no longer an issue.

<https://www.government.nl/topics/environment/documents/reports/2015/04/15/annex1-progress-of-report-from-waste-to-resource-15-april-2015>

In 2016 a **Government wide Programme on Circular Economy** will be developed in close cooperation between at least four ministries – Infrastructure and the Environment; Economic Affairs; Foreign Affairs; and Interior and Kingdom Relations – under the leadership of the Ministry of Infrastructure and the Environment. It will combine and integrate the circular economy policies of the different departments and will include the programme *From Waste to Resource*.

The three objectives of the *From Waste to Resource* programme are:

- keeping our natural capital vibrant;
- improving the security of supply;
- reinforcing the earning power of the Dutch economy.

These objectives can be neither considered nor achieved independently of each other. The approach of the programme ties economic growth, employment and competitiveness to keeping our natural capital vibrant. As such, the programme addresses all links in the chain. Its scope encompasses the sustainable extraction of raw materials, circular services and design, production and consumption, and finally – because there will still be waste for some time to come – it also addresses the waste stage.

Towards the end of the value chain, the eighth of the programme's nine operational goals (for more details please see the next section, on general policy objectives for material resource efficiency) is to gear waste policy towards the circular economy and improved waste collection and recycling. This goal has a two-fold aim:

- within a year, to have initiated a project for removing obstructions to the circular economy; and
- to promote the practical application of end-of-waste and by-product criteria.

In addition, the Dutch Cabinet wants to see 75 % of domestic waste being separated by 2020, with no more than 100 kilograms of such waste per head of the population being produced annually. The 75 % target is also a Cabinet ambition for comparable non-domestic waste. In combination with measures earlier in the value chain, there should be a 50 % reduction in material losses, from 10 million to 5 million tonnes, over the next decade.

Several measures on closing the value chains have been formulated, outlined below.

- Removal of legal obstacles: taking stock of obstacles that entrepreneurs encounter when investing in innovation and ensuring that the solution to a particular problem is made available to the entrepreneur concerned. Dealing with complex obstacles can require international pilot projects.
- Promote the use of end-of-waste and by-product criteria.
- National criteria for assigning end-of-waste classification.
- Regulatory criteria for by-products under the WFD: on 1 April 2015, the Ministerial Decree specifying the criteria for by-products under the WFD came into force. This Decree utilises the freedom offered by the WFD to classify production residues as a by-product instead of as waste. As a result, companies can more easily use production residues as a resource. For the time being, the Decree applies only to crude glycerin.
- Optimum use of the EU Waste Shipment Regulation.
- Promote innovation in the field of recycling: further promotion of innovation takes place within the context of the Netherlands' *Agreement (covenant) for More and Better Recycling (Meer en Betere Recycling)*. This includes three steps: produce a list of innovative recycling technologies that are suited to a circular economy; identify the barriers to the introduction of such

innovations; and identify methods or instruments that can provide more encouragement for adopting such innovations.

- Tailor norms or certification to the circular economy.
- Promote high-value recycling: in collaboration with processing companies and the recycling industry, 20 collaborative projects are now ongoing thanks to the *Agreement for More and Better Recycling*, aimed at higher-volume recycling on the one hand and high-value recycling on the other. A project for defining and producing high-value recycling has been started within the context of the Agreement. Tenders will be requested for the development of methodologies on which to base policy for high-value recycling of waste.
- Encourage better waste separation at sorting facilities.
- Sustainable use of bottom ash produced by waste-to-energy plants while making the reprocessing of bottom ash acceptable to society.
- Collect more separated domestic waste: in collaboration with municipalities, a public framework for sustainable waste management has been defined, and an action programme for reducing the amount of residual waste has been set up.
- Motivate private citizens to separate waste: campaigning and fitting actions to themes.
- Separation of non-domestic waste: the aim of the *VANG Buitenshuis* programme is to achieve non-domestic waste separation, and hence bring about a widespread change in behaviour.

General policy objectives for material resource efficiency

The programme *From Waste to Resource* opens with the following general objective: to live prosperous and healthy lives now and in the future. This requires a responsible approach to using raw materials and the natural capital that produces our raw materials, food, clean air, water and energy. The Netherlands is using the programme to speed up the transition to a circular economy.

<https://www.government.nl/topics/environment/documents/reports/2015/04/15/annex1-progress-of-report-from-waste-to-resource-15-april-2015>

This programme has three more specific objectives:

- keeping our natural capital vibrant;
- improving the security of supply;
- reinforcing the earning power of the Dutch economy.

Nine operational goals are defined in the programme:

1. Identifying, sustainably managing and utilising natural capital: by 2020, the use of and impact on natural capital is fully factored into decisions by companies and government bodies.
2. Focusing the design and development of products on circularity: concepts for circular design are applied in a manner that will substantially help with the objective of a 50 % reduction in material loss, from 10 million to 5 million tonnes, over the next 10 years.

3. Increasing and disseminating knowledge about the circular economy and making it practicable: by 2020, the circular economy is an integral part of curriculums for specific professional disciplines and for education in general, as well as a fixed item of industrial policy.
4. Encouraging resource-free business operations: by 2020, companies are fully aware of the risks they face regarding resources, and have integrated operations that are more circular in their business strategies.
5. Turning chains into cycles: adapt at least 10 major chains, in collaboration with partners, so that the result is an obvious contribution to the three main goals of the programme – to keep our natural capital vibrant, improve the security of supply, and reinforce the earning power of the Dutch economy.
6. Developing financial and other market incentives: develop financial and market incentives that encourage business operations to become circular.
7. Making consumption and procurement circular: reduce the footprint of the government's own procurement and that of total consumption in the Netherlands by 2020. Moreover, be a leader for the development and dissemination of knowledge and experience concerning sustainable and circular purchasing.
8. Gearing waste policy to the circular economy and improving waste collection and recycling (a two-fold aim): within a year, initiate a project for improving the situation regarding all obstructions to the circular economy, and promote the practical application of end-of-waste and by-product criteria. In addition, 75 % of domestic waste is to be separated by 2020, with no more than 100 kilograms of such waste being produced annually per head of the population. The 75 % target is also an ambition for comparable non-domestic waste. In combination with measures earlier in the chain, there should be a 50 % reduction in material loss, from 10 million to 5 million tonnes, over the next 10 years.
9. Developing indicators and metrics that quantify the transition to a circular economy: promote the development of reliable metrics, methods and certification standards that can measure the transition to a circular economy and boost its acceleration.

Institutional set-up and stakeholder involvement

Institutional set-up for material resource efficiency policies

The Ministry of Infrastructure and Environment is in charge of coordinating action towards **resource efficiency**.

In 2016 a **Government wide Programme on Circular Economy** will be developed in close cooperation between at least four ministries – Infrastructure and the Environment; Economic Affairs; Foreign Affairs; and Interior and Kingdom Relations – under the leadership of the Ministry of Infrastructure and the Environment. It will combine and integrate the circular economy policies of the different departments and will include the programme *From Waste to Resource*.

Energy and resource efficiency are largely disconnected in the Netherlands and potential synergies have not been developed. **Energy** is covered for the most part by the Ministry of Economic Affairs. Attempts are now being made to relate the two

subjects more. For instance, in the agreements for energy savings between the Ministry of Economic Affairs and relevant industry sectors, options are explored for energy savings by using new or fewer materials in these sectors.

Many Dutch cities – including Amsterdam, Rotterdam, Almere, Utrecht, Dordrecht and Haarlemmermeer – are making plans for sustainability through resource efficiency or a circular economy. In the context of a circular economy, the starting point is generally a study on the **metabolism of the city or region** in question, exploring the strengths of the area, possibilities for resource efficiency, barriers and drivers, and business opportunities. This process is also done in cooperation with local industries and other stakeholders. The shift from sustainability plans to circular economy plans is still at the start-up phase.

<https://www.amsterdam.nl/gemeente/organisatie/ruimte-economie/ruimte-duurzaamheid/ruimte-duurzaamheid/making-amsterdam/sustainability/> and <https://www.amsterdam.nl/ondernemen/duurzaam-ondernemen/nieuws-duurzaam/circulaire-economie/>

Under the *From Waste to Resource* programme there is also a specific strategy to promote **material chains at the local level**, which will start by developing an analytical model for assessing the urban metabolism.

Process to ensure stakeholder participation

While the government can set out certain rules, a prerequisite for the transition to a circular economy is the participation of and cooperation between stakeholders.

A prominent example of stakeholder participation – in which government was asked to participate in a stakeholder initiative – is the *Green Deals* programme launched in 2011. This is an innovative way of getting the best out of the ‘polder approach’ – a consensus-based approach to decision making. The Green Deal approach in the Netherlands is an accessible way for companies, other stakeholder organizations, local and regional government and interest groups to work with Central Government on green growth and social issues. The aim is to remove barriers in order to help sustainable initiatives get off the ground and to accelerate this process where possible. Central Government plays a key role in this area.

Initiatives often start from the bottom up, in response to societal dynamics. See more at: <http://www.greendeals.nl/english/#sthash.Ucxnoz3K.dpuf>

Nearly 200 *Green Deals* have been concluded so far, many of which also relate to resource efficiency.

Other examples of successful cooperation with stakeholders in the Netherlands are:

- *Realisation of Acceleration towards a Circular Economy (RACE)*. This coalition between non-governmental organisations (NGOs) and the government implements projects to accelerate circular design, enlarge high-value reuse, address obstacles to achieving a circular economy, improve communication, and accelerate the introduction of circular principles in product chains. The programme *Nederland Circulair!* runs through 2014–2016 as a minimum.

- *Covenant on the improvement of recycling: more and better.* The partners in this endeavour include a large proportion of the companies active in the field of waste management, recycling and production of secondary materials, as well as local authorities responsible for separate waste collection. The most important benefit of the covenant is that companies and authorities work together on projects for improving recycling. The projects are part of a joint working programme that is renewed every year.
- Close cooperation with municipalities on the waste flows that are collected by these authorities (municipal waste). An agreed *cooperation framework* and a 10-year working programme have been launched. The target is to minimise the residual waste fraction per person from 242 kilograms in 2013 to 100 kilograms in 2020, with a reductions over the following five years. A joint programme committee has been formed, financed by central government, to improve waste separation, prevent waste and optimise material chains, working with other value-chain partners.
- Specific *value-chain agreements*:
 - plastics, where over 70 partners are focusing on improving innovation and reducing the negative impact of plastics;
 - phosphate, where more than 35 Dutch businesses, knowledge institutes, governments and NGOs are members of the Nutrient Platform. The joint ambition is to create a market for recycled nutrients in which as many nutrients as possible are recovered from waste streams (wastewater, sludge, manure, swill) and recycled into valuable new products (fertilisers, animal feed, chemicals). In case of a surplus on the Dutch market, the recovered nutrients are exported to contribute to soil improvement and food security elsewhere.
- *Packaging agreement* between companies, local government and central government to finance and improve prevention and recycling of packaging waste, and to reduce litter. This is a 10-year agreement that focuses on good cooperation between partners, improving innovation while gradually closing the circle for packaging material. Starting in 2013, there has been an increase in plastic recycling, and a sustainable packaging institute is working on prevention with a yearly roadmap. A beverage cartons collection is running for a three-year period (2015–2017), and in 2016 a two-year pilot for a refund system for small drinking bottles and cans is beginning nationwide.

Suggestions for international support mechanisms to exchange experience

Existing initiatives such as from the Ellen MacArthur Foundation are very important and useful; conferences can also be helpful.

Important topics include the development of new business models; natural capital and primary resources; new ambition in European product policy; the concept of waste; food loss and food waste; finance for circular innovation (boosting access to financing for initiatives that contribute to the transition towards a circular economy); and removing EU-wide barriers and regulatory obstacles.

Policy instruments

Policy instruments commonly used for material resource efficiency

Regulatory instruments

Regulatory instruments vary depending on context. In general, the Netherlands traditionally prefers to work with stakeholders on a voluntary cooperative basis before entering into regulation. However, a range of regulatory instruments is also available, including for example:

- Ban on landfill of all recyclables and products/materials that can be incinerated. This is also steered by minimum standards in the national waste management plan (LAP). The ban has probably been the most effective instrument for resource efficiency in the past, but in many cases it leads to a low level of recycling.
- Producer responsibility legislation, for instance on packaging, waste electrical and electronic equipment (WEEE), end-of-life vehicles, batteries, tyres, and a generally binding declaration-of-waste management fee on flat glass. This legislation has led to systems based on charging schemes set up by producer responsibility organisations (PROs). Overall, the extended producer responsibility (EPR) approach enjoys both greater economies of scale (compared with having a large number of PROs) and reduced administrative costs (compared with a taxation-based system).
- A new development in legislation is the move to *better* regulation. In cooperation with the Ministry of Economic Affairs, a taskforce has been established to look at the barriers and problems companies experience with legislation or rules that may influence opportunities for moving to a circular economy. It helps companies to overcome obstacles, explains the rules or, if possible, changes the rules. Many questions are about the concept of waste, what is to discard, when is a product a by-product and when is the end-of-waste stage reached. The taskforce has found that changes already made to legislation may not be widely known, so that those responsible for licensing tend to operate on the side of caution.

Economic and financial instruments

The government recently re-introduced the landfill tax and extended coverage to include the incineration of Dutch residual waste for the first time; imported waste is exempt. The tax rate for incineration has been set primarily with the objective of generating a stable revenue stream. A landfill tax, together with regulations on landfill, has been the most influential instruments over a long period.

The Netherlands has various financial mechanisms for influencing environmentally friendly investments – including Vamil (arbitrary depreciation of environmental investments) for accelerated depreciation of investments in sustainable technologies and MIA (Environmental Investment Rebate) for tax deduction of investments in sustainable technologies – and resource efficiency is one of the criteria. Lower taxation is also possible for people investing in green investment

funds. Several subsidies are available for innovation and innovative projects in general.

A financial instrument used by many local governments – and which is very effective for separate collection of household waste – is the concept of pay-as-you-throw: consumers have to pay only for what they put in their non-recyclable waste bin (by weight).

Information-based instruments

Using behavioural insights to influence consumer behaviour: this combines advice with sociological and psychological insights, moving beyond the *homo economicus* view. These instruments are at an early stage of development and implementation.

Instruments related to labelling include life-cycle analysis (including biodiversity), product environmental footprint and organisational environmental footprint. Labelling is also to be streamlined and made more transparent.

Voluntary agreements

Not so much a measure but an attitude – cooperation – has been particularly important. The Netherlands has a long and distinctive tradition of consensus-based decision making known as the ‘polder approach’. This approach, carried out through dialogue and negotiation, is used to reach decisions in which more than one level of government is involved. Given this strong tradition, the use of voluntary agreements (such as negotiated ‘covenants’ or ‘gentlemen’s agreements’) is commonplace. At the core of this cooperation is making good use of the competences of the parties involved, bringing expected and unexpected parties together, and creating commitment.

Other instruments

A good working enforcement agency is very important. In the Netherlands this agency pays special attention to discouraging illegal waste shipments, which is both very effective and also supports the country’s recycling companies.

Examples of good practice

A prominent example of a showcase is the **Green Deals programme** launched in 2011. This is an innovative way of getting the best out of the ‘polder approach’ – a consensus-based approach to decision making.

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Other examples of successful cooperation include the following:

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Circular design

In the programme *Netherlands Circulair!*, implemented by the RACE coalition, a specific part of the programme is aimed at circular design. Student and professional designers are trained in new business models and in the principles of circular design of products – including what materials to use and how to design for reuse, repair, refurbishment and recycling. A train-the-trainers programme and an online toolbox for agents of change have been developed. For the principles and theory developed and used in the Netherlands, see the publication *Products that Last* (<http://productsthatlast.nl/site/app/index2.html?#/home>).

Obstacles to resource efficiency related to shared or overlapping competencies

A new development in legislation is the move to *better* regulation. In cooperation with the Ministry of Economic Affairs a taskforce has been established to look at the barriers and problems companies experience with legislation or rules that may influence opportunities for moving to a circular economy. The taskforce helps companies to overcome obstacles, explains the rules or, if possible, changes the rules. Many questions are about the concept of waste, what is to discard, when is a product a by-product and when is the end-of-waste stage reached. The taskforce has found that changes already made to legislation may not be widely known, so that those responsible for licensing tend to operate on the side of caution.

Raising awareness

An interactive platform on circular economy has been created offering examples of good practice and other information. www.circulairondernemen.nl

Prioritising resources

In the programme *Nederland Circulair!*, a method for selection of value chains has been developed using criteria of economic impact, environmental impact, value preservation potential and transition potential.

Ten key value chains have been prioritised:

- plastics and rubber used in the construction of infrastructure;
- machinery and installations – for example for air conditioning and refrigeration – used in hospitality and offices;
- disposable and single-use products used in health care;
- chemical products and chemical leasing;
- electrical and electronic waste from households in waste management;
- organic waste from hospitality and health care;
- automotive remanufacturing and component harvesting from recycling and waste treatment;
- the Dutch maritime industry, covering the design and manufacture of ships and off-shore facilities;
- office furniture assembly;
- plastic and paper packaging used in food production.

The Organisation for Economic Co-operation and Development (OECD), in its 2015 environmental performance review of the Netherlands, concluded on waste management that:

'Netherlands has a strong track record in waste management, with new challenges to transition to a circular economy. The Netherlands is one of the OECD's best performers in the area of waste management, having successfully achieved progressively ambitious targets while keeping charges at relatively low levels. The Dutch economy is one of the most resource-efficient in the OECD. Since 2000, absolute decoupling of waste generation from GDP has been achieved, landfilling has been virtually eliminated and there has been a marked shift towards incineration with energy recovery. Yet ongoing efforts to increase material recycling and composting have only resulted in marginal improvements. The transition from traditional waste management towards a circular economy is underway. This will require developing new business models, finding new ways of working across the whole product chain and dealing with commodity price volatility. A detailed roadmap to promote the circular economy, tailored indicators and stronger product policies can help spur this transition towards a circular economy.'

OECD Environmental Performance Reviews: The Netherlands 2015 (http://www.oecd-ilibrary.org/environment/oecd-environmental-performance-reviews-the-netherlands-2015_9789264240056-en)

Targets and indicators

Targets for material resource efficiency

In the Netherlands all the waste-related targets of different EU directives, including the Waste Framework Directive, the Packaging Directive and the WEEE Directive, are under implementation. The more ambitious targets are:

- residual household waste should amount to less than 100 kilograms per person per year by 2020 and less than 30 kilograms by 2025;
- at least 75 % of household waste (including bulky waste) should be collected separately by 2020;
- at least 75 % of the waste produced by small companies, offices, stores and services should be collected separately by 2020;
- at least 95 % of construction and demolition waste should be recycled by 2015;
- At least 85 % of industrial waste should be recycled by 2015;
- by 2022, no more than 5 million tonnes of residual waste is allowed to be incinerated or sent to landfill (in 2012 the figure was 10 million tonnes);
- by 2021, at least 51 % of plastic packaging waste should be recycled;
- by 2021, at least 43 % of wood packaging waste should be recycled;
- by 2015, recycling of glass packaging should reach 90 %;
- by 2030, recycling of metal packaging should reach 85 %.

In several projects on material or product value chains it is the intention that the stakeholders themselves set targets, laid down in voluntary agreements, covenants or Green Deals.

Furthermore the programme *From Waste to Resource* focuses mainly on the shift towards a circular economy.

Indicators to monitor the use of materials and resource efficiency

Material resource use in the Netherlands is monitored by the National Statistical Agency (CBS, Statistics Netherlands) in the annual environmental accounts published online. <http://www.cbs.nl/NR/rdonlyres/6293456F-8E61-4821-964D-17C7D67416B8/0/environmentalaccountsofthenetherlands2013.pdf>

Accounting is based on international standards (concepts, definitions, classifications) and existing statistics, to enhance comparability with other countries' performance and future monitoring. The Dutch performance is included in the EU Resource Efficiency Scoreboard.

More data can be found in specific publications (on material flows in *Monitor Materiaalstromen*, 2013, <http://www.cbs.nl/NR/rdonlyres/F0325ADE-2F98-4B63-9931-D85A43574007/0/2013Monitormateriaalstromenpub.pdf>) and the bi-annual *Dutch Sustainability Monitor* (*Monitor Duurzaam Nederland*, 2014, <http://www.cbs.nl/en-GB/menu/themas/dossiers/duurzaamheid/publicaties/publicaties/archief/2015/monitor-duurzaam-nederland-2014.htm>).

In addition there are protocols for monitoring specific industries such as the bio-based industries or construction and demolition.

Important indicators included in the existing *Sustainability Monitor* (Chapter 4) are the efficiency of raw material usage relative to domestic consumption (RMC/DMC) 2008/2012; economic dependency on rare or critical materials and resources; transition to a bio-based economy; and the worldwide impact (footprint) of consumption and production in the Netherlands.

Under the Environmental Assessment Agency (PBL) and universities, statistical data on the use of land and natural resources (energy; food/fisheries/forestry; mining; footprints of domestic production and consumption) is published frequently in an online *Compendium*. <http://www.compendiumvoordeleefomgeving.nl/onderwerpen/nl0042-Environmental-data-compendium.html?i=41>

The Ministry of Infrastructure and the Environment is working together with the National Statistical Agency on extending the existing monitoring system from 2016 to include data on (waste) water; repair and reuse of products; 'dematerialisation' of goods and services; and recycling, substitution and sustainability of raw material usage.

Optional questions

Recent policy developments concerning natural resources in the broader sense of the term

Natural capital provides us with raw (abiotic) materials and agricultural (biotic) commodities, improves the quality of our habitat and contributes to our health. It forms the foundation of our economic activity. Protecting our natural capital and the ecosystem services we derive from it is therefore vital to our economy. To address the entire cycle, the circular economy should focus attention on optimising the sustainable use of ecosystem services and minimising the impact of resource use on our natural capital.

Further development and integration of natural capital accounting can provide essential information for the internalisation of environmental costs in the production phase of both abiotic and biotic resources. Such internalisation of environmental costs is a win-win policy option: it stimulates more rational consumption and the use of secondary materials, and it provides intrinsic incentives to limit the claim on our natural capital and reduce the ecological footprint of raw material consumption.

Furthermore, natural capital accounting facilitates the sustainable use of ecosystem services which can contribute to reduced use of limited conventional materials, reduced environmental degradation, reduced heat stress, better flood protection and improved air and water quality.

To achieve this, Member States are already actively working on gaining insight on where natural capital is located, the state it is in and its potential. The MAES (Mapping and Assessment of Ecosystems and their Services) working group is supporting the work of Member States in this regard.

In the programme *From Waste to Resource*, operational goal 1 is to identify, sustainably manage and utilise natural capital. The goal is that by 2020, the use of and impact on natural capital is fully factored into decisions made by companies and government bodies.

Disseminating information on natural capital to local governments and the private sector is key to enable its incorporation into operations and planning. The Netherlands recently published the [Atlas Natuurlijk Kapitaal](#).

<http://www.atlasnatuurlijkkapitaal.nl/en/home>

Which way should resource efficiency go in the future?

Include resource efficiency in circular economy policy.