Country profile

More from less — material resource efficiency in Europe

2015 overview of policies, instruments and targets in 32 countries

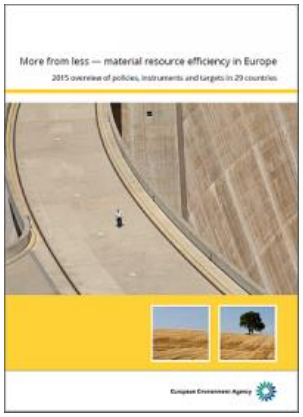
Portugal

May 2016

European Environment Agency

This country profile is based on information collected by Ana Cristina Carrola, Ana Cristina Fernandes, Ana Sofia Vaz, Miguel Déjean Guerra, Rita Ribeiro and Sofia Rodrigues from the Portuguese Environment Agency and Graça Espada, from the General Secretariat of the Ministry of Environment, Spatial Planning and Energy. 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 November 2015.

This country profile was prepared as part of the 2015 EEA review of material resource efficiency policies, which aimed to collect, analyse, and disseminate information about experience with 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 used 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 thirty two country profiles are available at: http://www.eea.europa.eu/resource-efficiency

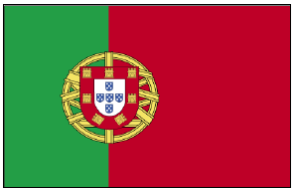
For information about trends and policies on municipal waste management in the countries, please visit: http://www.eea.europa.eu/publications/managing-municipal-solid-waste

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 in the countries, including those on energy efficiency, please visit: http://www.eea.europa.eu/themes/climate/ghg-country-profiles

Portugal, facts and figures

Source: Eurostat



GDP: EUR 173 billion (1.2% of EU-28 total in 2014)

Per person GDP: 21,400 Euro (in purchasing power standard)
(78% of EU-28 average per person in 2014)

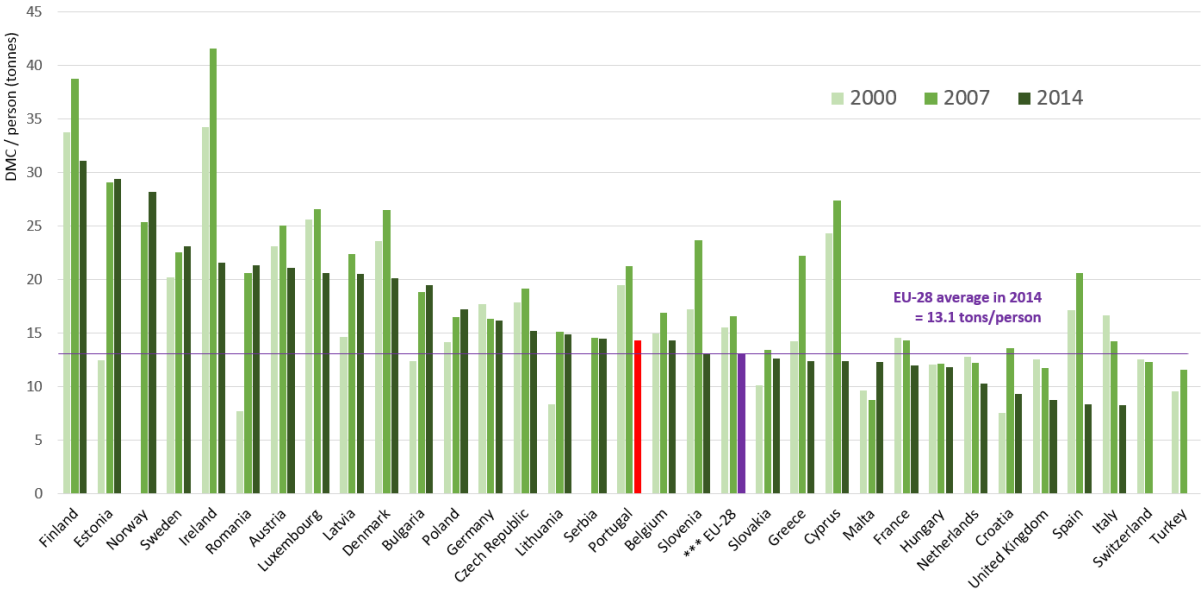
Use of materials:
149 mllion tonnes DMC (2.2 % of EU-28 total in 2014)
14.3 tonnes DMC/person (109% of EU-28 average per person in 2014)
Resource productivity 1.14 EUR/kg (57% of EU-28 average in 2014)

Structure of the economy:
agriculture: 2.6%
industry: 22.4 %
services: 75.0 % (2014 est.)

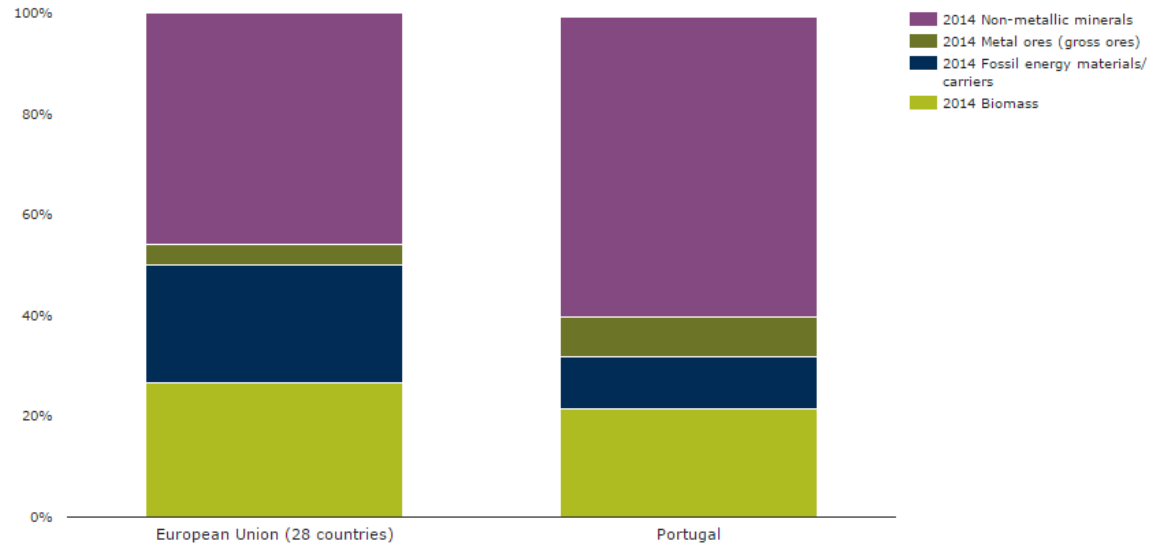
Surface area: 92,200 square kilometres (2.1 % of total EU-28)

Population: 10.4 mln (2.0 % of EU-28 total)

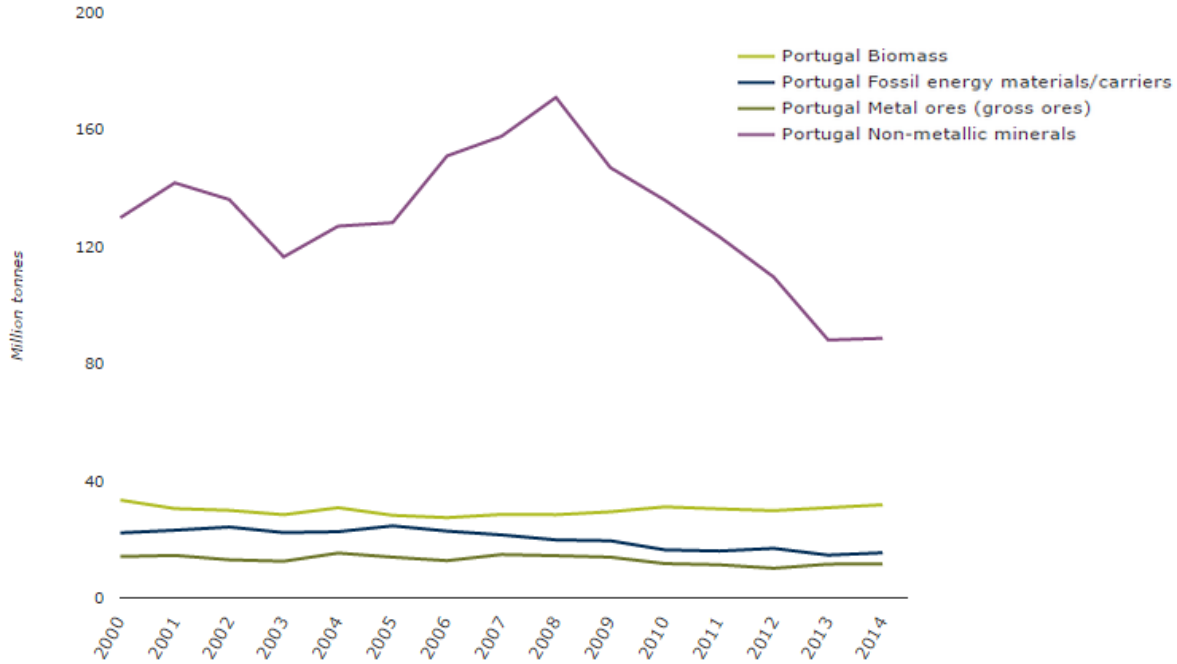
Use of materials (DMC) per capita in Europe, 2000, 2007 and 2014



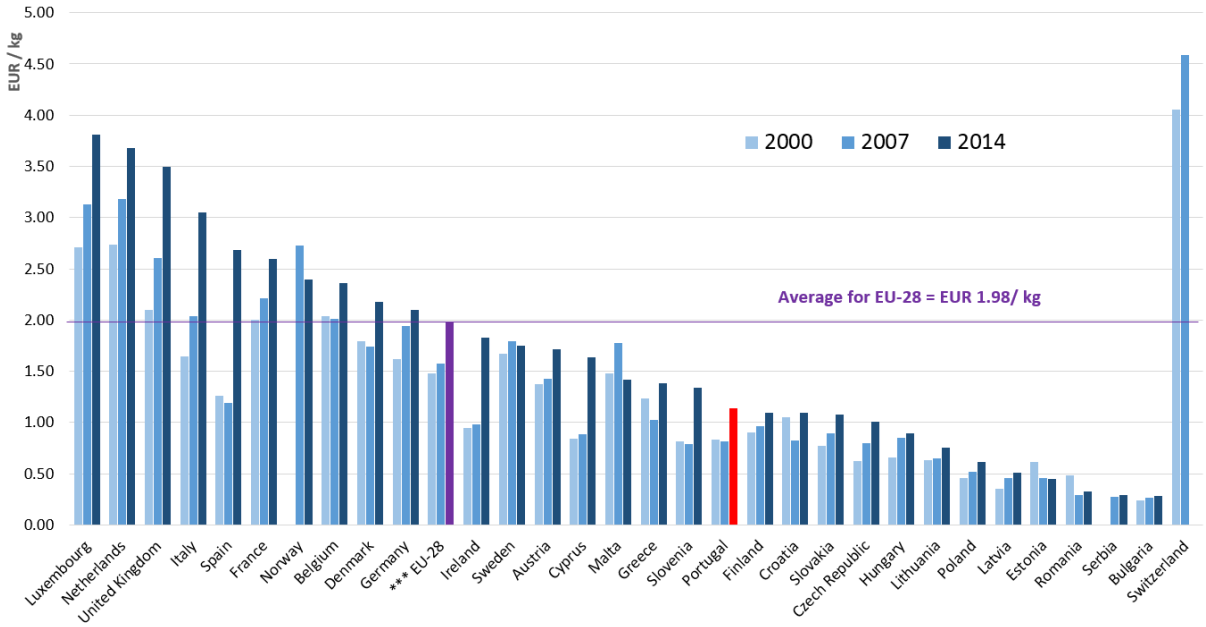
Domestic material consumption by category, compared with the EU-28 average (2014)



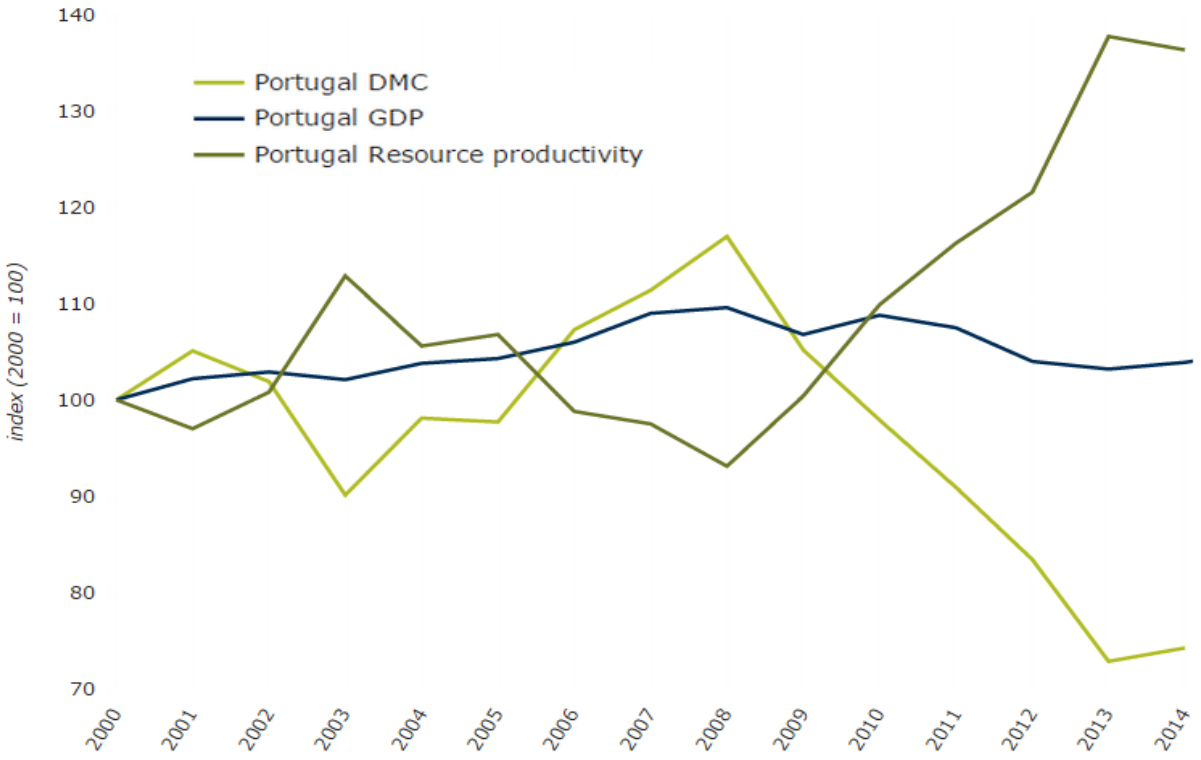
Trends in material consumption 2000-2014, by category



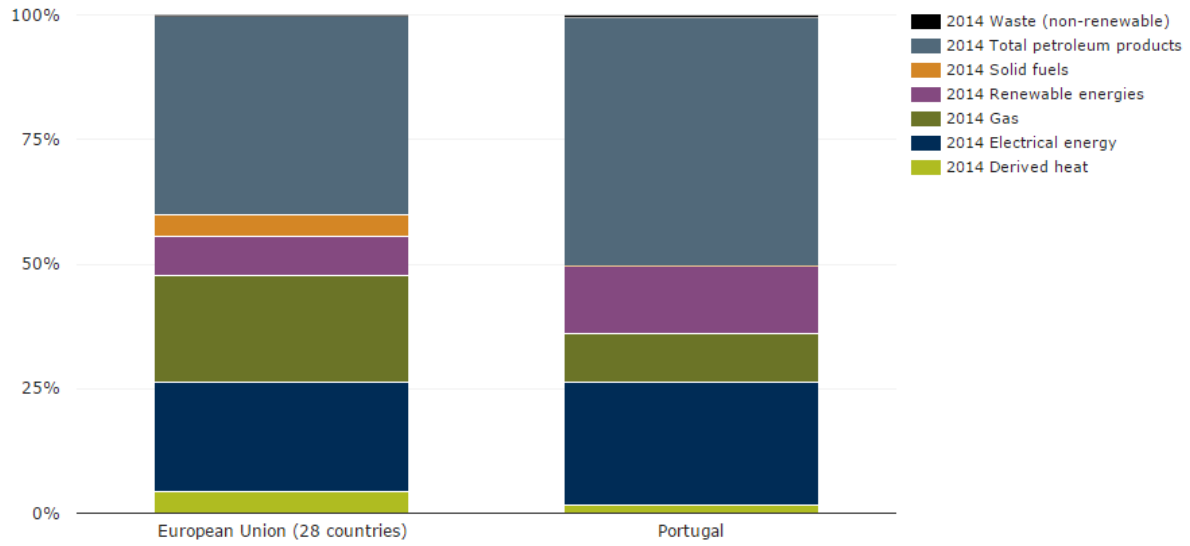
Resource productivity in Europe, 2000, 2007 and 2014 (GDP/DMC)



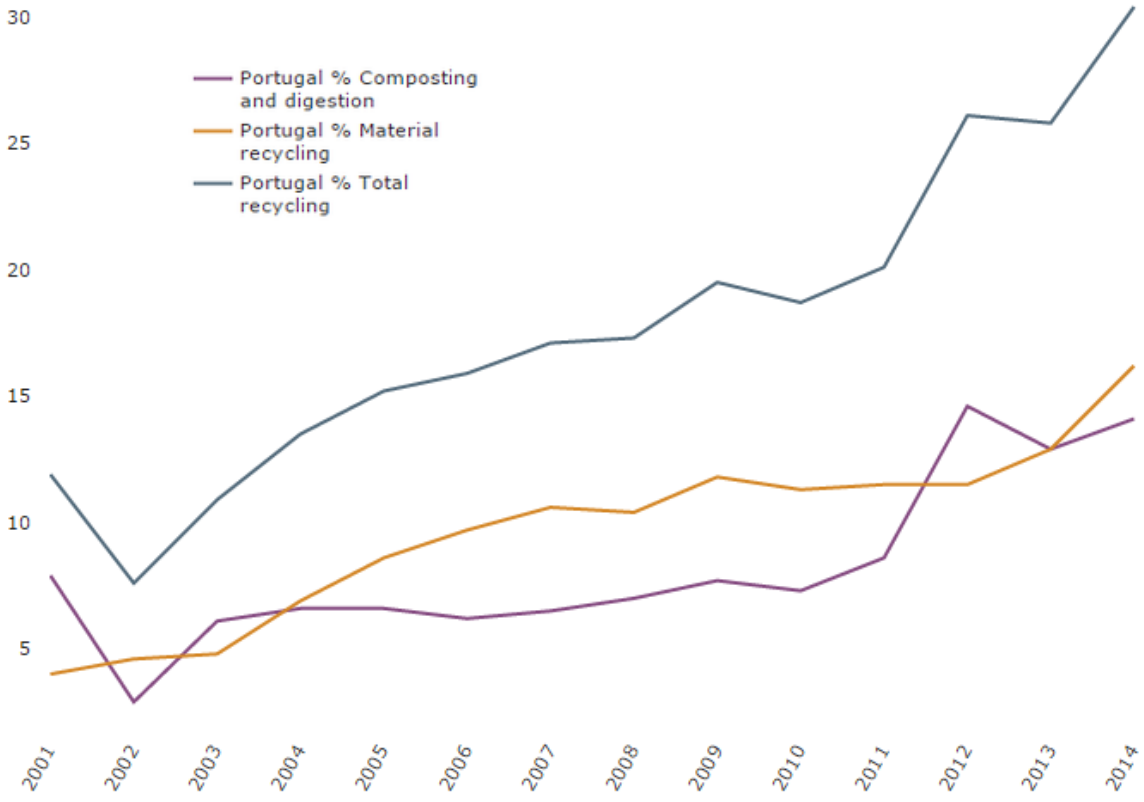
GDP, DMC and resource productivity trends, 2000-2014



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



Recycling of municipal waste, Portugal



Introduction

Portugal currently has neither a specific national resource efficiency strategy, nor an action plan. However, three different documents (presented in more detail in a later section) provide national guidance regarding resource efficiency:

- the Framework Act on the Environment (http://dre.pt/pdf1sdip/2014/04/07300/0240002404.pdf);
- the Green Growth Commitment (GGC), which resulted from the work of the Coalition for Green Growth and was signed in April 2015 (http://www.crescimentoverde.gov.pt/wp-content/uploads/2014/10/CrescimentoVerde_EN_dig_290815.pdf);
- the Operational Programme Sustainability and Efficiency in Resource Use – PO SEUR 2020 (https://poseur.portugal2020.pt/).

Scope of material resource efficiency

The term 'resource efficiency' is not explicitly defined in any of the three documents referred to above.

However, this concept is addressed throughout the GGC as one of the key ideas behind its vision: *'Optimised resource management aimed at increasing productivity and maximising its use (e.g. reuse, recycling, energy efficiency) while reducing carbon intensity'.*

This management strategy *'would help decouple economic growth from the use of resources, foster energy and material efficiency'.*

These definitions are still under study at EU level. In fact, recent initiatives such as Greening the European Semester and revision of the Europe 2020 Strategy focused on resource efficiency and stressed the need to move towards a circular economy in a holistic context of a large number of other measures and initiatives, monitored by an appropriate indicator for measuring overall progress towards resource efficiency, and complemented by a dashboard of macro indicators on materials, water, land and carbon as well as a set of thematic indicators.

The driving forces of material resource efficiency

One of the major concerns that drive material resource efficiency policies is economic development.

The GGC aims to harness economic opportunities and to create jobs associated with green growth. These goals are consistent with the major challenges facing Portuguese society: growth, employment, lower dependency on imports, smarter taxation – higher taxes on what harms and pollutes and lower taxes on what produces and earns – and quality of life. The GGC encompasses three key ideas:

- focus on highly green economic activities with national and/or international impact that can contribute to increasing gross domestic product (GDP) and creating employment;
- optimised resource management aimed at increasing productivity and maximising its use, for example through reuse, recycling, energy efficiency, material efficiency, water efficiency, ecodesign and urban renewal, while reducing carbon intensity;
- focus on stimulating activities that protect the environment, for example by increasing renewable energy production, improving air and water quality and enhancing biodiversity.

General factors and concerns that drive material resource efficiency policies common to several national policies include:

- increase resource conservation and efficiency of resource use;
- increase the life time of products;
- reduce water, energy and raw material use;
- ensure compliance with national commitments in the context of European policies on energy and climate change;
- reduce dependence on foreign energy;
- consolidate the industrial cluster associated with wind power and create new clusters associated with new technologies in the renewable energy sector, creating new jobs;
- promote sustainable development and enabling conditions for fulfilling commitments undertaken by Portugal to reduce emissions of greenhouse gases, use renewable energy sources and increase energy efficiency.

Priority material resources and sectors

Priority materials

Individual types/categories of material resources were identified in the following policies:

- Decree-Law No. 267/2009 on waste edible oils – contribution for biodiesel production;
- Strategy for Construction and Demolition Waste (Decree-Law No. 46/2008);
- Used Tyres legislation (Decree-Law No. 111/2001);
- Strategic Plan for Industrial Waste Management – PESGRI (mineral resources);
- Strategic Plan for Solid Municipal Waste - PERSU 2020 (packaging waste – glass, plastic, paper and board, metal, wood; electrical and electronic equipment; batteries and accumulators; used edible oils);
- National Plan for Industrial Waste Prevention – PNAPRI (products with high pollutant potential);

Considering the necessity to limit the use of natural resources and therefore promote the introduction of recycled constituents in the manufacturing of new materials, Portugal establishes the use by public bodies responsible for hiring construction works, rehabilitation or maintenance of road infrastructures of bituminous mixtures incorporating modified bitumen with rubber from the recycling of tyres, in its end-of life, on pavements (Order No. 4015/2007).

During discussion on the 'waste package directive' Portugal supported the use of the EU list of critical raw materials as reference.

Priority industries and economic sectors

Related to waste management, Portugal is working on a plan for construction and demolition waste that integrates the whole cycle from the fabrication of the construction material to its end of life. Although the construction sector has reduced its activity significantly in Portugal, it is still an important sector as a waste producer, particularly as the sub-sector of building renovation is growing. Apart from construction, which is probably the main sector, there are other sectors of interest for Portugal, including the treatment of ship slops and the dismantling of vessels.

Priority consumption categories

All products involving extended producer responsibility are a specific target. The National Authority for Waste is implementing an ecotax that will make taxes reflect recyclability and producers' efforts to avoid superfluous or dangerous materials in the fabrication of their products

Policy framework

National strategies or action plans for (material) resource efficiency

Although Portugal has neither a specific national resource efficiency strategy nor an action plan, several command-and-control instruments contribute to the same purpose, although not necessarily aligned in their priorities, actions and targets.

There are three different documents that provide national guidance regarding resource efficiency.

- The Framework Act on the Environment (Lei de bases do Ambiente), which came into force in April 2014, which updates the previous Act from 1987, referring to 'natural resources' in a broad sense (http://dre.pt/pdf1sdip/2014/04/07300/0240002404.pdf).
- The GGC, which seeks to position Portugal among the leaders of the global sustainable development paradigm. With this Commitment the country seeks to achieve a new national development model, aiming to comply with three major objectives by 2020: 1) to position Portugal as a global benchmark for green growth; 2) to promote a low-carbon economy, highly efficient in resource use; and 3) to produce more wealth and jobs by investing in the sustainability of industries and territories. The GGC's vision is to 'foster green economic growth in Portugal with national impact and international visibility, stimulating green economic activities, promoting the efficient use of resources and contributing to sustainability'.

  The Commitment entails 14 quantified goals with two timeframes (2020 and 2030). In relation to the efficient use of resources, the GGC aims to: 1) increase productivity of materials; 2) increase the incorporation of waste in the economy; 3) focus on urban renewal; 4) improve energy efficiency; 5) improve water efficiency; and 6) increase the use of public transport. This document covers both the broad concept of 'natural resources' and the more narrow understanding of resource efficiency (material resources and/or raw materials).

  The GGC resulted from the work of the Coalition for Green Growth and was signed in April 2015 (http://www.crescimentoverde.gov.pt/wp-content/uploads/2014/10/CrescimentoVerde_EN_dig_290815.pdf).
- PO SEUR 2020, which came into force in 2014 and aims to contribute to sustainable growth, responding to the challenges of the transition to a low-carbon economy based on more efficient use of resources and promoting greater resilience to climate risks and disasters (https://poseur.portugal2020.pt/). This programme embraces the broader understanding of 'natural resources' efficiency.

Other national policies and strategies address material resource efficiency among their other topics.

Waste management and prevention

- National Plan for Waste Management (PNGR) – http://apambiente.pt/_zdata/Politicas/Residuos/Planeamento/RCM_11-C_2015_Aprova_PNGR.pdf
- Framework on Waste Management (Decree-Law no 73/2011) – http://www.apambiente.pt/_zdata/Politicas/Residuos/DL_73_2011_DQR.pdf
- Ecodesign for energy related products (Decree-Law No. 26/2009) – http://dre.pt/pdf1sdip/2009/01/01800/0055500565.pdf
- Construction and Demolition Waste (CDW) legislation (Decree-Law No. 46/2008 amended by Decree-Law No 73/2011) – http://www.apambiente.pt/_zdata/Politicas/Residuos/DL_73_2011_DQR.pdf http://siddamb.apambiente.pt/publico/documentoPublico.asp?documento=28564&versao=1
- Used Edible Oils Management (Decree-Law No. 267/2009) – http://www.apambiente.pt/_zdata/Politicas/Residuos/FluxosEspecificosResiduos/OAU/DL267.pdf
- Used Tyres legislation (Decree-Law No. 111/2001) – http://www.valorpneu.pt/Cache/binImagens/XPQ032QXX463SQcms5QzHYZKU.pdf
- PERSU 2020 – http://apambiente.pt/_zdata/DESTAQUES/2014/Portaria_PlanoEstrategico_PERSU2020_final.pdf
- PESGRI – http://www.apambiente.pt/index.php?ref=16&subref=84&sub2ref=108&sub3ref=208
- PNAPRI – http://www.apambiente.pt/index.php?ref=16&subref=84&sub2ref=108&sub3ref=208
- Strategic Plan for Hospital Waste (PERH) – http://www.apambiente.pt/_zdata/Politicas/Residuos/Planeamento/PERH/Portaria_43_2011_PERH.pdf

Sectoral strategies

- National Renewable Energy Action Plan (PNAER) – https://dre.pt/application/dir/pdf1sdip/2013/04/07000/0202202091.pdf
- National Energy Efficiency Action Plan (PNAEE) – https://dre.pt/application/dir/pdf1sdip/2013/04/07000/0202202091.pdf
- National Strategy for Forests (ENF) – https://dre.pt/application/file/66432612
- Strategic Framework for Climate Policy (QEPiC) – Resolução do Conselho de Ministros n.º 56/2015 – https://dre.pt/home/-/dre/69905655/details/maximized?p_auth=H3vFObbg&serie=I

- National Programme for Climate Change 2020/2030 (PNAC)
- National Strategy for Climate Change Adaptation (ENAAC 2020)
- National Strategy for Ecological Public Procurement 2008-2010, approved by Council of Ministers Resolution No 65/2007, of 7 May – under revision

General policy objectives for material resource efficiency

Examples of policy objectives in Portugal include:

- introducing biofuels and other renewable fuels for road transport practices, replacing fossil fuels with the aim of reducing emissions of greenhouse gases, increasing the diversification of primary energy consumption and reducing the dependence on foreign energy;
- decoupling economic growth from material consumption;
- decoupling economic growth from waste production;
- increasing integration of waste in the economy;
- reducing waste production;
- reducing the amount of waste disposed;
- reducing emissions of greenhouse gases from the waste sector;
- preventing waste production;
- promoting the closure of material cycles.

GGC. One of the three key ideas of the GGC is that 'promoting the efficient use of resources implies optimised resource management aimed at increasing productivity and maximising the use of resources (e.g. material efficiency, energy efficiency, water efficiency, ecodesign, urban renewal)'.

PO SEUR. The EU-funded PO SEUR intends to contribute to implementation of the Europe 2020 strategy, particularly in relation to the green growth priority, responding to the challenges of the transition to a low-carbon economy, based in a more efficient resource use and promoting greater resilience to climate risks and disasters.

PNGR 2020. The PNGR aims to promote the integration of waste policy into the product's life cycle, focused towards a circular economy and guaranteeing a higher efficiency of natural resource use. It is based on two fundamental strategic objectives: to promote the efficient use of natural resources in the economy and to prevent or reduce the adverse impacts of the production and management of waste.

Decree-law no. 73/2011. A priority for the government is to improve the prevention of waste generation and to promote reuse and recycling of resources in order to extend their use in the economy before returning them in an appropriate condition to the natural environment. It is also considered important to promote the full exploitation of the recently organised waste market as a way to consolidate the valorisation of waste, with advantages for economic operators and to encourage the use of specific waste with high-value potential.

Decree-law no. 267/2009. Recycling of used edible oils, specifically for biofuel production, is an important asset in the current context of national and EU energy policies.

PERSU 2020. The PERSU embodies waste management as a way to continue the material life cycle. Waste is managed as an endogenous resource, minimising its environmental impact and taking advantage of its socio-economic value. This Plan promotes the efficient use and management of primary and secondary resources, decoupling economic growth from material consumption and waste production.

PESGRI. The PESGRI is working on an integrated treatment system for industrial waste, considering the reduction, reuse and recycling of industrial waste an absolute priority. Along with the construction of integrated recovery and disposal centres, an organized waste market was established, supported by online trading platforms.

PNAPRI. The PNAPRI is a planning tool whose main purpose is to reduce the danger and quantity of industrial waste, not only through the application of prevention measures and technologies to industrial processes (including internal energy recovery of the produced waste), but also through behavioural change among economic agents and consumers.

PERH. The PERH aims to strengthen measures for the prevention of medical waste, going beyond mere waste management and introducing the material life-cycle approach, with a focus on reducing the environmental impact resulting from production and waste management, and strengthening the concept of the economic value of waste. Moreover, it encourages the recovery of waste and the use of materials resulting from recovery, considering elimination the very last option.

PNAEE. The PNAEE is an energy planning tool aiming to ensure a substantial improvement in energy efficiency throughout the country.

ENF. The ENF aims to identify the measures needed for a balanced management of forest resources, in three dimensions: economic, social and environmental. This strategy provides for action to promote the judicious, responsible and efficient use of forest resources.

Resource efficiency and the circular economy

When waste is at stake, the main concern is compliance with the quantitative targets established by EU directives, such as the ones set for:

- the construction and demolition waste stream and municipal waste, by the Waste Framework Directive for the year 2020;
- the diversion of biodegradables from landfills, by the Landfill Directive;
- several extended producer responsibility waste streams (namely WEEE, packaging, end-of-life vehicles, batteries and accumulators; tyres; mineral oils), according to their own specific legislation.

In this sense, when preparing for reuse/recycling targets, it is useful to match the supply of recycled materials/secondary raw materials with its demand by the manufacturing industry. The Portuguese extended producer responsibility schemes include, in a general way, waste management operator associations (usually recycling plants). This structure for extended producer responsibility schemes has been helpful in determining the capacity of recycling that is available within each specific stream of waste.

Targets and indicators

Targets for material resource efficiency policies

- Increasing productivity of materials – from EUR 1.14 GDP/kg of materials consumed in 2013 to 1.17 in 2020 and 1.72 in 2030 (GGC).
- Increasing the incorporation of waste in the economy – from 56 % in 2012 to 68 % in 2020 and 86 % in 2030 (GGC).
- Improving energy efficiency (energy intensity) – from 129 tonnes oil equivalent (toe) per million 2011 EUR of GDP in 2013, to 122 in 2020 and 101 in 2030 (GGC).
- Promoting the sustainable use of metal resources – which may reach 1 % of GDP and create 25 000 jobs (GGC).
- Achieving 47 kg per person per year of recyclable waste recovered after sorting, by 2020 (PERSU 2020, GGC).
- Increasing by 50 % the volume of timber and other certified forest products traded on the market, between 2010 and 2020 (ENF, GGC).

- Reducing energy consumption in the public administration by 30 % by 2020 and 35 % by 2030 (PNAEE 2016, GGC).
- Boosting the share of renewable energy - From 25.7% of final energy consumption in 2013, to 31% in 2020 and 40% in 2030 (GGC, PNAEE).
- Introducing 1200 electric vehicles in public administration (GGC).
- Reducing energy consumption in buildings, by 25 % in 2020 and 30 % in 2030 (PNAEE 2016, GGC).
- Reducing 25 % of primary energy consumption by 2020 (PNAEE 2016).
- Increasing energy auto-consumption to 300 MW by 2020 (GGC).
- Increasing passenger kilometres by 15 % in public transport from 2014 to 2020 (GGC).
- Improving water efficiency - From 35% of unbilled water in 2012 to a maximum of 25% in 2020 and 20% in 2030 (GGC).
- Dissociating economic growth and waste production – reducing from 0.10 tonnes of produced waste per thousand EUR of wealth generated in 2008–2012 to 0.082 tonnes in 2020 (PNGR 2020).
- Increasing the preparation of construction and demolition waste for reuse, recycling and other forms of material recuperation to 70 % by 2020 (PNGR 2020).
- Increasing the preparation of municipal waste for reuse, recycling and other forms of material recuperation to 50 % of the recyclable content, until 2020 (PERSU 2020).
- Increasing waste integration in the economy from 50 % in 2008–2012 to 68 % in 2020 (PNGR 2020).
- Reducing waste production by 18 % by 2020 (PNGR 2020).
- Reducing biodegradable municipal waste sent to landfill by 35 % in relation to reference year 1995, by 2020 (PERSU 2020).
- Progressive elimination of waste disposal in landfills, towards the eradication of direct deposition of waste in landfills (0 %) in 2030 (PERSU 2020).
- Achieving a minimum reduction of 7.6 % by weight of the figure recorded in 2012, per capita, in waste generation, by 31 December 2016 (PERSU 2020).
- Achieving a minimum reduction of 10 % by weight of per person waste generation recorded in 2012, that is not exceed 410 kg per person per year by 31 December 2020 (PERSU 2020).
- Ensuring, at national level, the recycling of at least 70 % by weight of packaging waste, by 31 December 2020 (PERSU 2020).
- Limiting the production of medical waste from Group IV to 8 % by 2016 (PERH).
- Limiting to at least 10 % the production of medical waste from Group IV subject to transboundary shipment (PERH).

Indicators to monitor the use of materials and resource efficiency

- Resource Productivity (EUR GDP/tonne DMC).
- Domestic material consumption (tonnes).
- Incorporation of waste in the economy (%).
- Energy intensity in the economy (tonnes oil equivalent/million EUR GDP).
- Primary energy consumption (total, by economic sector, by energy source) (toe).
- Final energy consumption (total, by economic sector) (toe).
- Energy dependency (%).
- Share of renewable energy in gross final energy consumption (%).
- Electricity generated from renewable sources (%).
- Waste use as raw materials (%).
- Waste introduced in production processes (%).
- By-products traded between industries (%).
- Municipal waste recycling (%).
- Valued sludge in relation to volumes produced (%).
- Biodegradable urban waste landfilled (%).
- Waste production (tonnes, tonnes/person, tonnes/thousand EUR GDP).
- Municipal waste generated (tonnes; kg/person/year).
- Municipal waste treated (total; landfill; energy recovery; mechanical and biological treatment; material recovery; mechanical treatment; and organic recovery) [tonnes; % of total waste generated].
- Preparation for reuse and recycling fee (%) (includes paper, card, plastic, glass, metal, wood and biodegradable municipal waste).
- Proportion of municipal waste selectively collected (%); (municipal waste selectively collected/municipal waste collected) (includes packaging and non-packaging of: paper and board, plastics, metals, glass and wood).
- Waste recovery (tonnes) by specific flow (products/waste).
- Packaging waste recovery (tonnes).
- Packaging waste recycling (tonnes).
- Recycling rates for glass waste (%).
- Recycling rates for paper and board waste (%).
- Recycling rates for plastics packaging waste (%).

- Recycling rates for metallic packaging waste (%).
- Recycling rates for wood packaging waste (%).
- Medical waste treated (sent for reuse, recycling and other forms of recovery) (tonne; % of total waste generated).
- Transboundary shipment of medical waste (%).

Policy instruments

Most important policy instruments for material resource efficiency

Derived from the fact that extended producer responsibility management schemes (supported by command/control policy instruments) have been implemented in Portugal for a longer time than economic/financial instruments, a broader experience was obtained.

The adoption of a life-cycle approach based on extended producer responsibility caused a turnaround in waste legislation in Portugal, reflected, in practice, in the establishment of collective or individual waste stream management systems, committed to complying with qualitative preventive requirements along with the attainment of management targets according to the waste hierarchy. The impact of this management approach is particularly visible for the following waste streams.

Packaging waste
Between 2004 and 2008 there was an increase in the amount of waste packaging, followed by a decrease until 2012, after wich it increased again. In 2013 an evaluation of packaging waste generation resulted in1.559 million tonnes. The recycling rate was 65 %, above the EU target for 2011 (55 %). In terms of total recovery, the target was 60 % and Portugal achieved 64.8 %. In 2013, Portugal reached the following recycling targets per packaging material:

- recycled paper and cardboard waste increased to 73 % 2013 after a 25 % decrease from 2008 to 2012, above the EU target (60 %);
- recycled glass reached 56 %, below the EU target of 60 %;
- recycled ferrous and non-ferrous packaging is above the 50 % target, at a recycling rate of 76 %;
- plastic packaging recycling achieved 35 %, above the EU targets.
- wood waste packaging recycling achieved 98 %, above the 15 % target.

The activity of the collective systems of packaging waste (Sociedade Ponto Verde, Valormed and Sigeru) contributed to the rates attained for recycling and recovery.

Batteries and accumulators

In 2014 Portugal recovered 30.574 tonnes of old batteries and accumulators out of 31.913 collected. Essentially, the schemes charge fees to producers based on the amount of batteries placed on the market, either per kg, per battery or according to market share. In Portugal, the cost is determined by the type of battery, its classification (i.e. consumer/vehicle/industrial battery) and its chemical content (e.g. lead-acid/nickel-cadmium/alkaline/zinc carbon/lithium/button/lithium ion).

The goal for portable batteries and accumulators collected is 25 %. The collected rate was 28% in 2014, above the 25 % target.

End-of-life vehicles

An 83 % target for reuse + recycling and 91 % for reuse + recovery were achieved in 2013 (thus, beyond the mandatory ones foreseen) and involved the release of 94.179 Certificates of Destruction.

WEEE

The collection and recovery results achieved in 2014 by WEEE management collective systems, allowed to exceed the targets set by the Directive:

- Collection: 4,8kg per inhabitant (50.255 tonnes);
- Total recovery: 94% (46.421 tonnes)

End-of-life tyres

Although there is no specific Directive concerning end-of-life tyres, in Portugal there are targets established by law.

In 2014 the management of this waste stream allowed the following targets to be reached:

- Collection: 110% (the same as in 2013)
- Preparation for reuse and rethreading: 18% (corresponding to a decrease of 2% compared to 2013)
- Recycling: 72% (1% more than in 2013)

Green fiscal reform

A Green Fiscal Reform entered into force in January 2015, pursuing the following goals: to reduce energy dependence; to induce sustainable production and consumption patterns; to contribute to eco-innovation and promote the efficient use of resources, including water, energy and materials (paradigm shift from a linear towards a circular economy); to encourage entrepreneurship and job creation; to diversify public revenue sources in a context of fiscal neutrality and economic competitiveness; and to efficiently achieve international targets and goals.

This Reform was designed under two principles: triple dividend (to protect the environment and to reduce energy dependency; to foster growth and jobs; to contribute to budgetary responsibility and to reduce external imbalances) and fiscal

neutrality (net increase in revenue must be used towards the decrease of other taxes, namely on income).

Under this Green Fiscal Reform one of the most important policy instruments for improving material resource efficiency was reviewed: the Waste Management Tax (TGR – *Taxa de Gestão de Resíduos*). The green taxation reform also introduced a charge on lightweight plastic bags and a landfill tax.

More information is available in English at: http://www.crescimentoverde.gov.pt/wp-content/uploads/2014/10/ReformaFiscalidadeVerde_GreenTaxReform_emagazine.pdf)

Examples of good practice

The project *Menu Dose Certa* was implemented by LIPOR (the intermunicipal waste management system of Oporto), to decrease food waste generation by means of awareness campaigns focused both on changing consumption behaviour and on economic, environmental and associated health issues.

The first stage of this project started in 2008 with a pilot targeted on the catering and restaurant services, having as its main objective the reduction of organic waste (food) derived from this sector's daily activity. The vision was to propose to restaurants the preparation of a balanced menu (correct amount of food and nutritional value) that would discourage food waste, with associated economic advantages not only for restaurants, but also for customers and for the municipalities (waste management), promoting the fight against food waste by preventing its generation.

The results obtained were so striking (pointing a decrease of around 77 %), that the experience was further replicated both in restaurants and school canteens. Furthermore, good everyday practices were disseminated for people making their own meals at home.

Institutional setup and stakeholder involvement

Institutional set-up for material resource efficiency policies

There are specific institutions which co-ordinate the different material resource policies related to the different materials, as listed below:

- waste: Portuguese Environment Agency;
- energy: Directorate-General for Energy and Geology and ADENE – Portuguese Energy Agency;
- biomass: Institute for Nature Conservation and Forestry.

The Ministry of Environment, Spatial Planning and Energy usually co-ordinates material resource efficiency policies with other ministries, such as the Ministry of Agriculture and Sea, the Ministry of Economy and the Ministry of Health. An example of the results of such co-ordination is the GGC.

Process to ensure stakeholder participation

As part of legislative processes and definition of strategies or plans, a public consultation is required.

A recent and perhaps slightly different public consultation process took place with the drafting of the Portuguese GGC. The GGC assumed that at least as important as the content of the Commitment was the underlying process of participation and co-responsibility in its formulation and implementation. In this context, there was a particularly active process of public consultation, which lasted four months and during which different agents explored and debated the different topics that constitute the Commitment, allowing the identification of opportunities, weaknesses and constraints. This process contributed to the conciliation of interests, providing greater consistency and robustness to the GGC. In fact, the final document resulted from the spirit of the discussion and the work of a wide range of actors who are aware of the huge potential for economic growth and competitiveness that sustainability and the environment represent – the Coalition for Green Growth. This Coalition, founded in February 2014, brings together the efforts of about 100 associations and representatives of business, scientific and financial organisations, as well as government agencies, foundations and non-governmental organisations (NGOs).

Regarding waste policies, it all depends on the kind (specific waste stream) and source (urban/non-urban) of waste you are dealing with. For instance, when dealing with the packaging waste stream (which is indeed the most cross-cutting one), one must involve – besides packers/fillers responsible for placing packed goods in the Portuguese market, – municipalities (when dealing with packaging waste from household sources), raw material packaging producers as well as packaging material recyclers, retailers, consumers, industry and catering

establishments, as well as other regulatory bodies from public administration (oversight, regulatory bodies, and so on).

Suggestions for international support mechanisms to exchange experience and share lessons from the implementation of material resource efficiency policies

Portugal believes that the Organisation for Economic Co-operation and Development's (OECD's) Environmental Policy Committee (namely the Working Party on Resource Productivity and Waste – WPRPW) is a relevant forum for discussion of these issues.

Portugal also believes that particular attention should be given to the Community Strategy on Sustainable Use of Natural Resources, due to the fact that this thematic strategy relies on specific long-term initiatives to be implemented between 2005 and 2030, and retains a trans-European character allowing an assessment of materials and resource flows at EU level (that includes imports and exports from third countries). In that sense, Portugal believes it is important to follow up the implementation mechanisms put in place at community, national and international levels and monitor the state of implementation by gathering and making available information, thus acquiring some maturity from the experience gained in the process.

Optional questions

Reflections on recent policy developments regarding natural resources in the broader sense of the term

One recent policy development regarding natural resources in the broader sense of the term was the signature of the Green Growth Commitment (GGC). With this Commitment the country seeks, amongst other goals, to promote a low-carbon economy, highly efficient in resource use. The Commitment covers both the broad concept of 'natural resources' and the more narrow understanding of resource efficiency (material resources and/or raw materials).

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The GGC was signed in April 2015 [http://www.crescimentoverde.gov.pt/wp-content/uploads/2014/10/CrescimentoVerde_EN_dig_290815.pdf].

Which way should resource efficiency go in the future?

It is clear that a global transition in resource use patterns will play a central role in addressing the long-term, often complex and cumulative impacts that unsustainable systems of production and consumption have had and continue to have on the environment and people's health.

On the side of production, one possible and promising approach is life-cycle assessment (LCA), which looks at resource use and environmental impacts along the full life cycle of a product, from extraction to recycling or disposal. By showing where the critical instances of resource use are located, LCA is a powerful tool for increasing resource efficiency. On the side of consumption, satisfying results are much harder to obtain. Mindsets and behaviour are not easily changed – and yet there is reason to be hopeful. Adding to a growing environmental conscience, the economic and financial crisis has had profound and hopefully long-lasting effects on consumer behaviour. Largely due to its effects, as consumers, we are reducing our carbon footprint by buying locally, recycling, repairing, reusing, sharing and so on.

Such consumer behaviour, along with that of a growing number of industries for which increasing resource efficiency in production is not a mere response to environmental objectives but a core determinant of economic competitiveness and sustainable growth, decisively contributes to greening the economy, and slowly but surely puts us on course towards a circular economy, where decoupling of economic growth from resource use slowly becomes a reality and the material loop starts closing. Green growth plans or strategies such as the recently launched Portuguese GGC are clear contributors to this transition.

Another impactful trend pushing towards the establishment of a green economy is the increasing role of eco-innovation, an approach to technological development that embodies the need to reduce negative impacts on the environment. Moreover, the replacement of subtractive manufacturing methods with additive manufacturing or 3D printing, as it is commonly known (and generally characterised as having high disruptive potential), could lead to a drastic reduction in waste generation throughout the whole production process which, together with the small-scale production it allows and the increased use of sustainable raw materials, should result in a significant reduction in the consumption of scarce

natural material resources – undoubtedly an important step towards decoupling. In addition, the trend for local production, which can increasingly take place near the point of consumption, avoiding large distribution networks, may bring major benefits in terms of greenhouse gas emissions. These are some of the fundamental conditions on the path to a green economy.

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Reflections on the trends in efficiency of material resource use in Portugal

In Portugal, domestic material consumption (DMC) generally increased until 2008 (with exceptions in 2002 and 2003) and has declined since then until 2013. This evolution was determined by the contraction of economic activity in Portugal and, particularly, loss of the relative importance of industries characterised by more intensive use of materials, particularly in the construction sector. However, in 2014, DMC slightly increased by 2.5 % compared to 2013, probably due to a modest economic recovery, still to be confirmed.

In 2014 Portugal registered a DMC of 14.3 tonnes per person (19.5 in 2000), having approached the European average. Indeed, in 2014 DMC per person in the EU-28 was 13.1 tonnes (15.5 in 2000). This indicator therefore fell more sharply in Portugal than in the EU.

Also, there was an improvement in the relative position of Portugal in terms of DMC per person: from the 24th country with the lowest DMC per person in 2000 to the 15th in 2014.

Updated data available at:
http://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=en&pcode=t2020_rl110