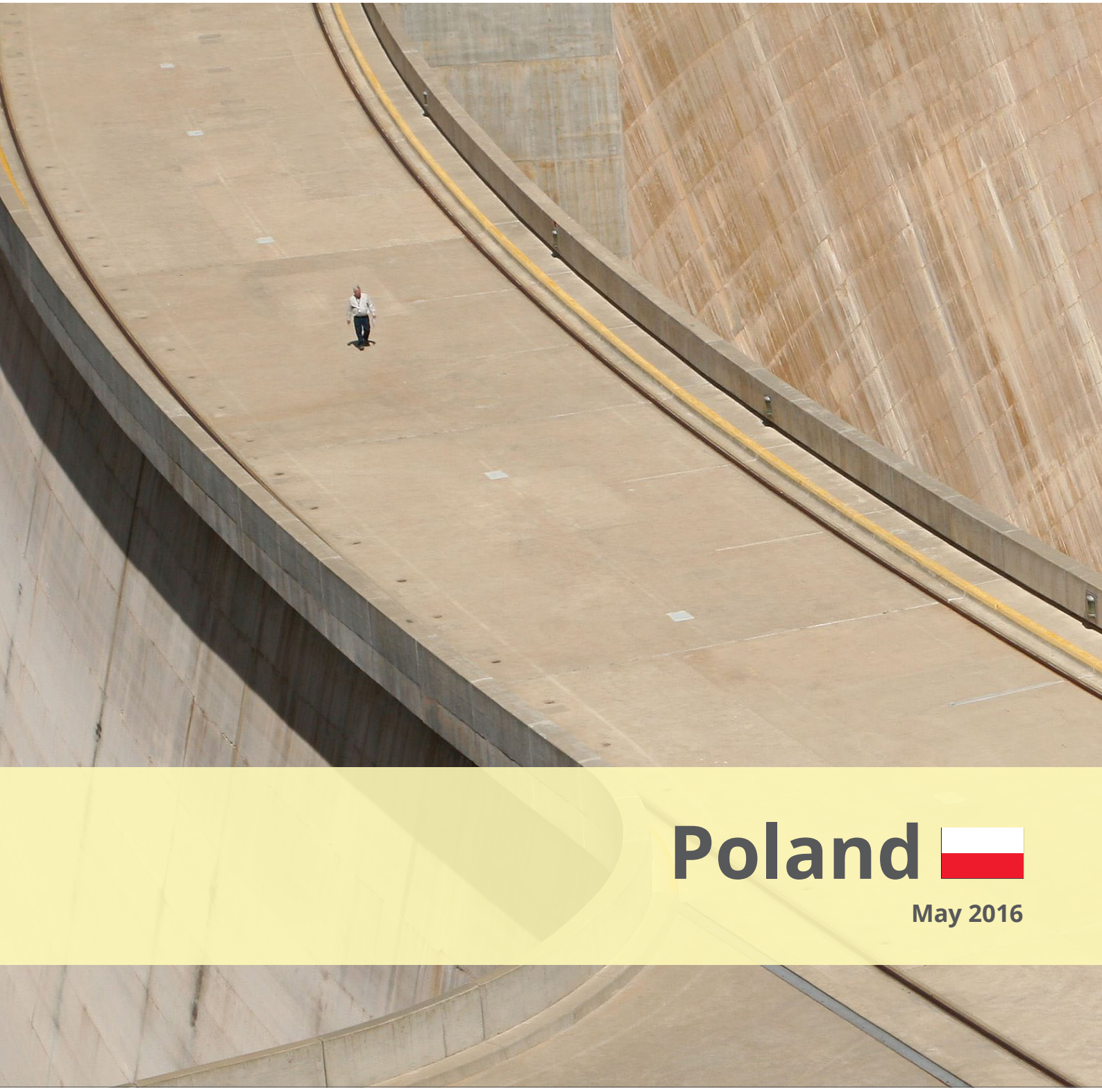
Country profile

More from less — material resource efficiency in Europe

2015 overview of policies, instruments and targets in 32 countries



Poland

May 2016

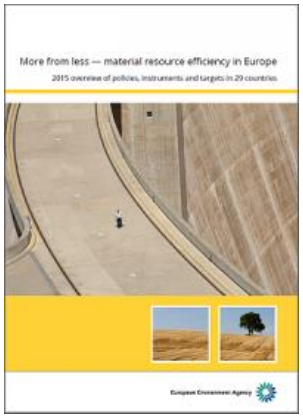
European Environment Agency

This country profile is based on information provided by: Ministry of Economy, Ministry of Environment, Chief Inspectorate for Environmental Protection, Ministry of Agriculture and Rural Development, Ministry of Infrastructure and Development, and Central Statistical Office.

Coordination: Małgorzata Bednarek, EEA/EIONET National Focal Point, CIEP.

This country profile 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, 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

Poland, facts and figures

Source: Eurostat

GDP: EUR 411 billion (2.9 % of EU-28 total in 2014)

Per person GDP: EUR 18,600 (in purchasing power standard)
(68 % of EU-28 average per person in 2014)

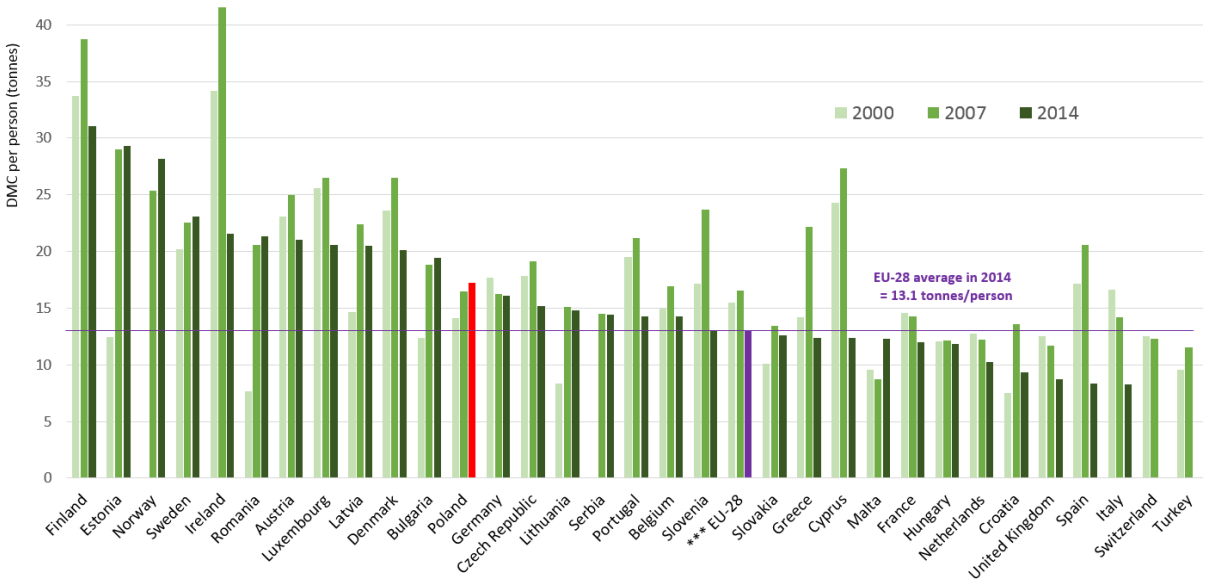
Use of materials:
654 million tonnes DMC (9.9 % of EU-28 total in 2014)
17.2 tonnes DMC/person (132 % of EU-28 average per person in 2014)
Resource productivity 0.62 EUR/kg (31 % of EU-28 average in 2014)

Structure of the economy:
agriculture: 3.7 %
industry: 32 %
services: 64.3 % (2014 est.)

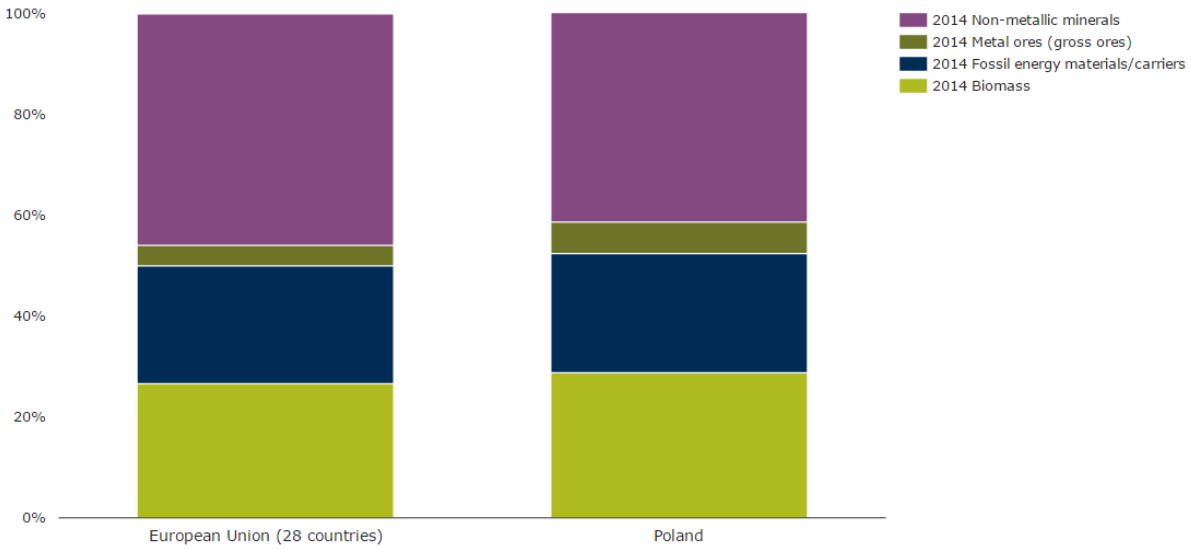
Surface area: 312,700 square kilometres (7.0 % of EU-28 total)

Population: 38.0 million (7.5 % of EU-28 total)

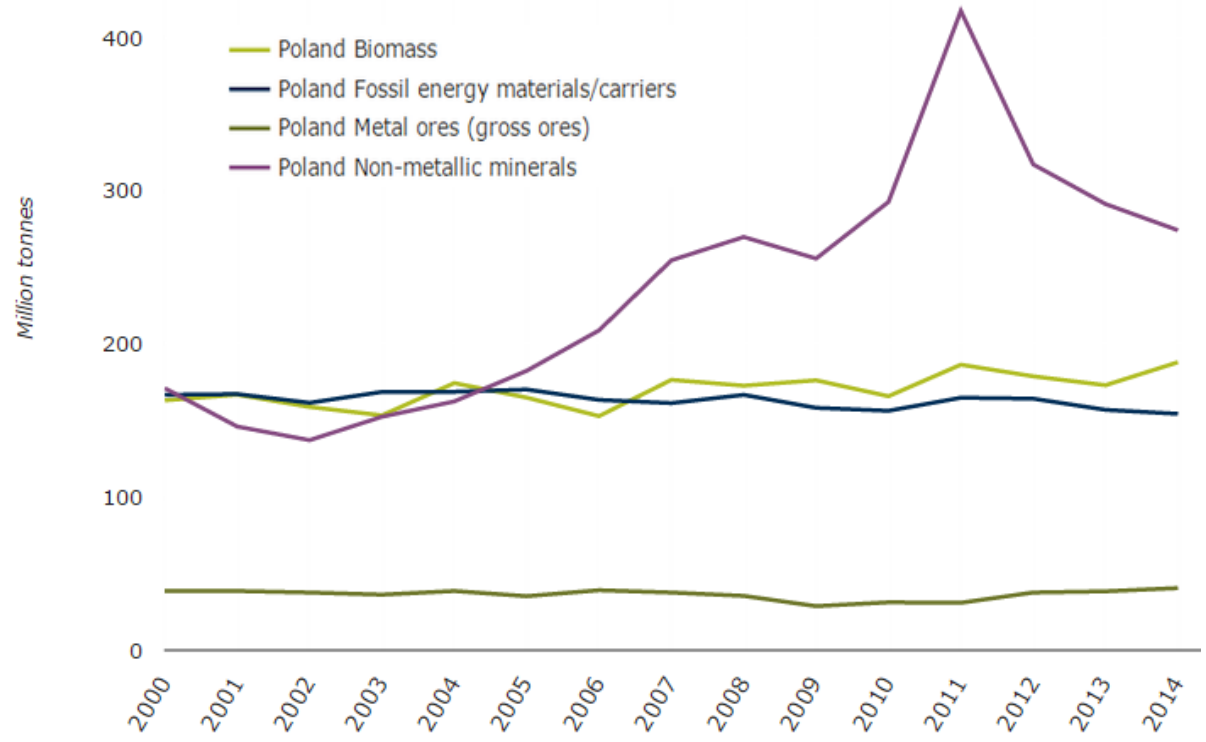
Use of materials (DMC) per person, participating countries and EU-28
(2000, 2007 and 2014)



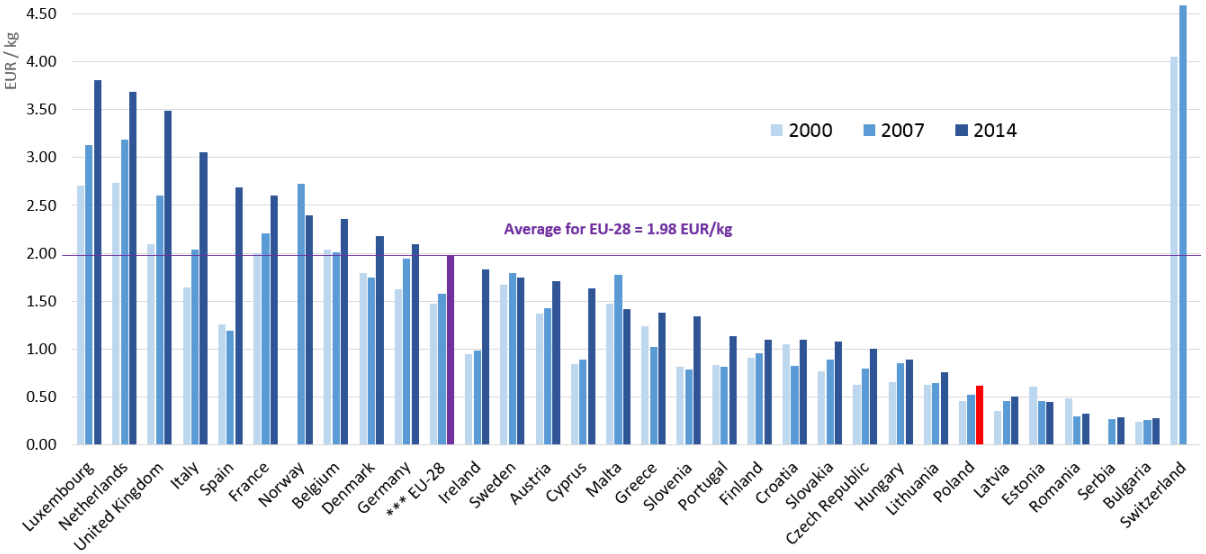
Domestic material consumption by category, EU-28 average and Poland (2014)



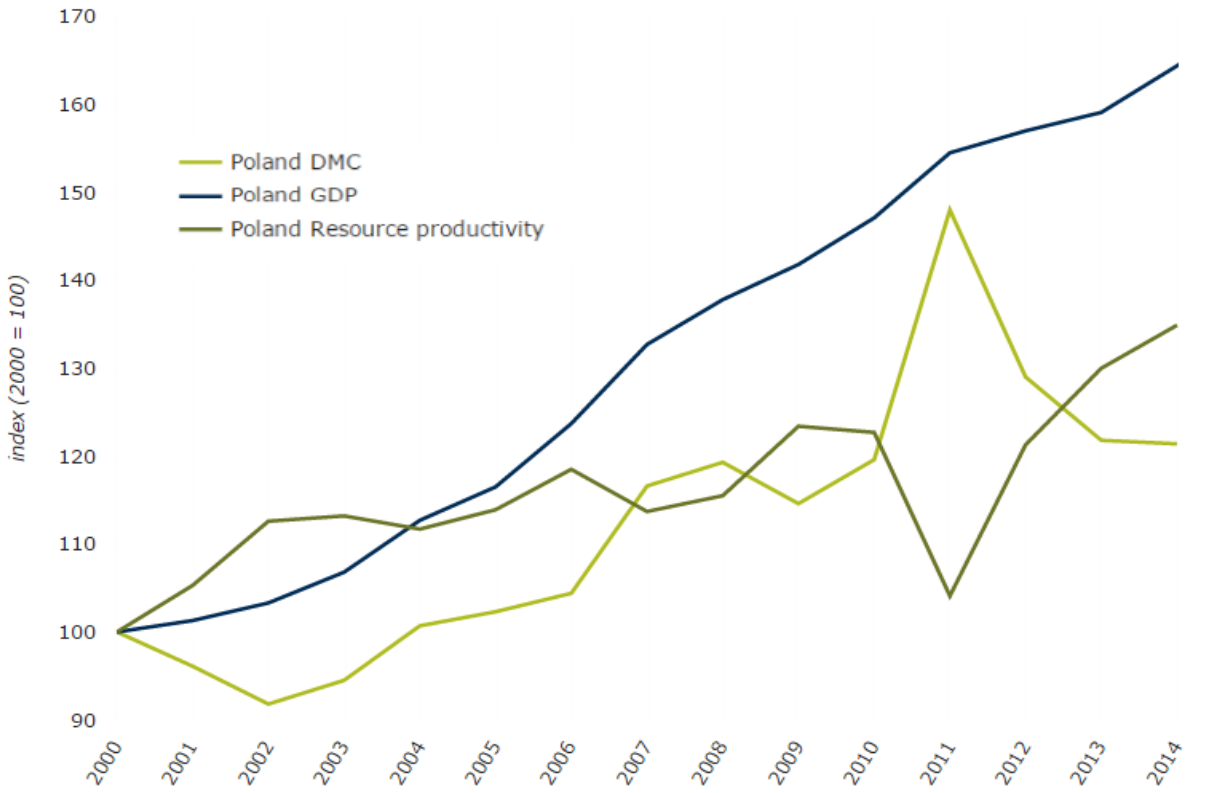
Trends in material consumption, Poland by category (2000–2014)



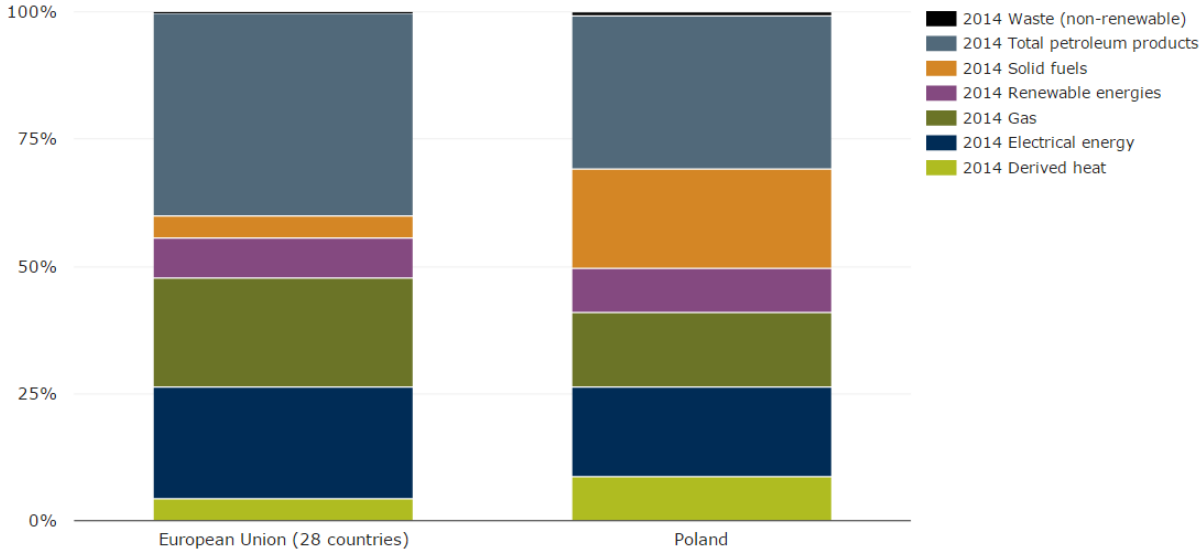
Resource productivity (GDP/DMC), participating countries and EU-28
(2000, 2007 and 2014)



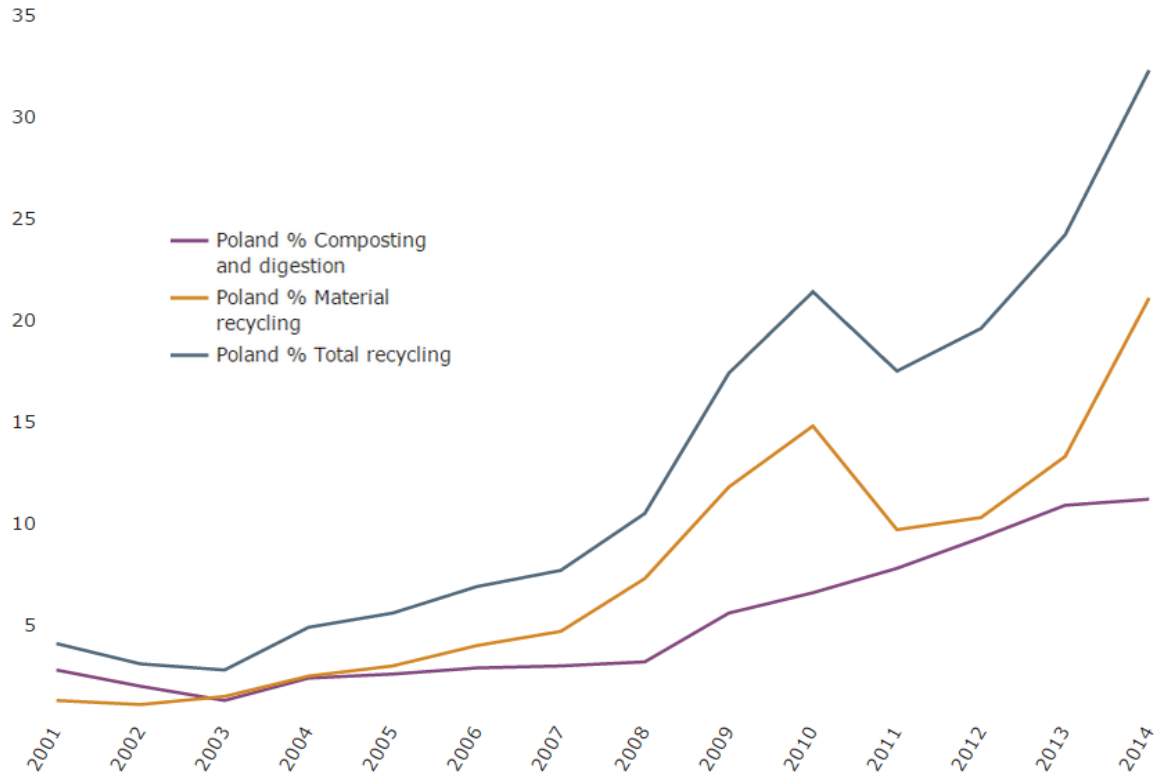
GDP, DMC and resource productivity trends, Poland (2000–2014)



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



Recycling of municipal waste, Poland (2001–2014)



Introduction

Poland does not have a dedicated national resource efficiency strategy or action plan.

However, there are several documents (either ready or in preparation) that touch upon the question of resource efficiency (see the section on policies for more detail).

Scope of material resource efficiency

In the Strategy for Innovation and Efficiency of the Economy (SIEE), the Energy Security and Environment Strategy (ESES) as well as in the National Development Strategy 2020 (NDS) the resources have been divided into natural, those extracted for example by mining and used for the first time, and secondary resources, those acquired by recycling.

The SIEE is not focused on specific resources but it emphasises interdependencies between resources and economic progress and it also describes action in the areas of sustainable agriculture and sustainable building as the most important in the context of resource efficiency. The focus of the ESES and NDS is on energy resources and water and in case of ESES also on timber.

Driving forces of material resource efficiency

Among the most important factors are:

- raw materials supply security concerns;
- striving for increased competitiveness of the economy;
- health issues; and
- the question of standards of living – thus, among others, striving for a better state of the environment.

To keep the economy developing and taking into account the limited natural resources with increasing costs of their use, cutting down the use of natural resources per product or services unit, at all levels of consumption and production cycle, is essential.

Transformation to green growth is also required by the climate and energy policy. According to the ESES, the priorities for environmental protection are inter alia: reducing air pollution and the reform of the water management system. As regards energy issues, Poland has large deposits of coal. Crude oil and gas are imported, opening the country to the risks of uncertain supplies and prices. This drives the need for diversification of energy sources as well as an increase of efficiency and decrease of energy consumption. During recent years Poland has made considerable progress as regards

energy efficiency – energy consumption in gross domestic product (GDP) fell by around 30 %. It was achieved, *inter alia*, by improving thermal efficiency of buildings, modernisation of street lights and the enhancement of operations in industrial processes.

The resource efficiency priorities are strongly related with the amount of deposits within the area of the country. The resource efficiency policy takes current and future needs into account although it is worth noting that scientific and economic development, as well as the environmental protection law, have strong impact on the resource management policy. What is more, mineral resources of less importance, or even treated as useless, may be valuable in the future. It also drives the need for strong links between management of geological resources and land use and spatial planning policy which should take into account possible future needs for deposits.

Priority material resources, sectors, and consumption categories

Priority materials

Poland defined four general resource categories in the ESES and three of them concern material resources. These are **energy sources** (used in the energy and industrial sectors: hard coal, lignite, natural gas, crude oil, biomass), **water** (the anti-drought and deficiency approach) and **wood** (as an element of multifunctional forests).

As regards the **geological resources** there is a system of mining concessions. The "White Paper on the protection of the strategic deposits", calling for making actions to guarantee exploitation possibilities in the future not confined by the land use, presents a list of strategic deposits locations with the highest score assigned by the valorization. These are the documented but not exploited yet: 43 deposits of hard coal, 15 deposits of lignite coal, 11 deposits of natural gas, 4 deposits of crude oil, 19 deposits of metal ores (Cu, Zn-Pb, Mo-W-Cu, Ni), 3 deposits of potassium-magnesium salts. The list, as the whole document, is under consultation and can be extended in the near future.

Poland recognises the importance of preparing a list of industrial raw materials identified as key to Poland's industries, and as a result the "Action Plan for Poland's security regarding non-energy raw materials" is in preparation – an important part of the Action Plan will be a listing of critical raw materials. For the purpose of the Action Plan, they are understood to be important for the growth of Polish industry and simultaneously as problematic due to possible supply risks. Therefore, the **identification of critical raw materials** is going to be correlated primarily with the development prospects of Polish industry (for example, based on an analysis of growth dynamics in the recent years, as well as on a study of various strategy documents which define the most promising branches of industry in Poland, and which have stimulated development of concrete measures to support them (for example, National Intelligent Specializations).

Bearing in mind the specific character of every national economy in the European Union (EU), it can be expected that the **Polish list of critical raw materials** may not be consistent with the EU's list. According to the current work schedule, the Action Plan, including the list of critical raw materials, will be finalised in early 2016.

With regard to **energy raw materials**, Poland has large deposits of coal which, considering the dependency on the import of gas (almost 70 %) and of crude oil (over 95 %), will play the role of a major factor stabilising Poland's energy security.

The EPP2030 recognizes that coal (**hard coal and lignite**) will continue to be the basic fuel in the Poland's primary energy mix as well as for the generation of electricity and heat, but its share in the energy mix will decline due to energy and climate obligations and increasing role of renewable energy sources (RES). The main objective in this field is the efficient and effective management of coal deposits located within the territory of the Republic of Poland.

Due to the geological and climatic conditions in Poland, the dominant renewable energy source is **solid biofuel** (around 80 % of energy from RES). Liquid biofuels, hydro, wind and biogas energy have a share of a few per cent each, other sources are marginal. The ESES takes into account renewable resources such as biomass in line with fossil fuel use in combined heat and power (CHPs) plants for cogeneration. Agricultural production residues (biomass) is expected to be used in small scale biogas plants. However, when speaking of timber as a source of energy (biomass), regulation 1229 (2012) of the Minister of Economy regarding renewable sources of energy states that only lower grade wood and its waste can be used for combustion when biomass use is being defined. Also no subsidies apply when high quality timber (long and semi-long logs) and shredded timber is intentionally used for energy purposes. This leads to a rational use of all kinds of timber. Having in mind the increasing use of renewable energy sources (up to 15 % of final energy consumption in Poland) it is necessary to take into account the biomass of agricultural origin. At the same time we note that for energy purposes, by-products, waste or residues from rural and agri-food industry sources should primarily be used.

The environmental policy, focused on the improvement of the state of environment which is connected to human wellbeing and health, makes energy resources key resources to be more efficiently managed.

Priority industries and economic sectors

Neither specific industries nor economic sectors were directly identified as priorities. However NPDLEE is more focused on some sectors than on others (see section on circular economy). According to the environmental policy and strategies mentioned above as well as the natural resources of Poland, the energy sector can be regarded as one of the priorities.

Priority consumption categories

No specific consumption categories have been identifies as priorities. The focus is more on a systematic approach rather than on different kinds of consumption. However the National Programme for Development of a Low-Emission Economy, under preparation, focuses on certain sectors more than on the others (see section on circular economy).

In case of waste management waste streams were identified (National Waste Management Poland, National Waste Prevention Programme), which should be addressed first in order to reduce their generation. Among them are:

a) municipal waste;
b) packaging waste;
c) food waste;
d) waste electrical and electronic equipment (WEEE).

With reference to timber, as it was mentioned above, there are some instruments to use higher quality elements in industry and **not** in the energy sector.

Policy framework

National strategies or action plans for material resource efficiency

The key strategic documents under the national development policy include:

Long-term National Development Strategy 2030. Third Wave of Modernity, adopted by the Council of Ministers on the 5th of February 2013, showing main trends, challenges and development concepts using a long-term perspective

The **National Development Strategy 2020** adopted by the Council of Ministers on 25 September 2012, based on the sustainable development scenario, defining three strategic areas: an effective and efficient state, a competitive economy, and social and territorial cohesion

https://www.mir.gov.pl/media/3336/Strategia_Rozwoju_Kraju_2020.pdf

There are nine **horizontal strategies** to achieve the objectives of the NDS.

There are several documents, either ready or in preparation, that touch on the question of resource efficiency:

- The Energy Security and the Environment Strategy (ESES) – one of nine horizontal strategies, concerns energy raw materials;

http://www.mg.gov.pl/files/upload/20531/2014-04-15_BEiS_%20przyjety_przez_RM.pdf

- The Strategy for Innovation and Efficiency of the Economy (SIEE) – another of the nine strategies; one of its four specific objectives is “Increased resource and raw materials efficiency”;

http://www.mg.gov.pl/files/upload/20046/SIEG_ENG_wersja%20ksiazkowa.pdf

- The Strategy for Sustainable Development of Rural Areas, Agriculture and Fishing; http://www.minrol.gov.pl/content/download/39850/221066/version/1/file/SZRWRiR%20przyj%C4%99ta%20Uchwa%C5%82%C4%85%20Nr%20163%20RM%20z%20dn%2025%20kwietnia%202012r.pdf

- The Energy Policy of Poland until 2030 (EPP2030 currently being updated in the form of Energy Policy of Poland until 2050 – EPP2050);
http://www.mg.gov.pl/files/upload/8134/Polityka%20energetyczna%20ost_en.pdf

  and annexes:
  http://www.mg.gov.pl/Bezpieczenstwo+gospodarcze/Energetyka/Polityka+energetyczna

- The National Energy Efficiency Action Plan (NEEAP 2014) outlines existing and planned measures to stimulate efficiency improvements in the residential, service, industry and transport sectors;

- The National Programme for Development of a Low-Emission Economy (NPDLEE) – an executive programme for SIEE, currently in the final stages of preparation in the Ministry of Economy; one of its specific objectives is "better resource efficiency (including waste management)"; draft for consultation published in August at http://www.mg.gov.pl/Bezpieczenstwo+gospodarcze/Gospodarka+niskoemisyjna/Narodowy+Program+Rozwoju+Gospodarki+Niskoemisyjnej; principles of the Programme adopted by the Council of Ministers in 2011 http://www.mg.gov.pl/files/upload/10460/NPRGN.pdf

- The Action Plan for Poland's Security Regarding Non-Energy Raw Materials – the primary goal of the Action Plan is to accommodate the short- and long-term needs of the industry in terms of security of supply of high-quality raw materials at affordable prices. Therefore, the core part of the Action Plan is the identification of critical raw materials which are understood as necessary for the growth of Polish industry and, at the same time, whose reliable supply may be endangered. Simultaneously, as it has been recognized that there is no appropriate coordination between different government entities responsible for raw materials management in Poland, the Action Plan should constitute an important step towards definition of a consistent and cohesive mineral resource policy.

  The structure of the Action Plan is based on the mineral resource life cycle, i.e. it consists of chapters on exploration, extraction, processing, production, recycling and substitution. In addition, the international dimension (i.e. imports) has been taken into consideration. The Action Plan should identify shortcomings in all the above-mentioned areas, in particular with regard to the critical raw materials, and include recommendations for policy improvements. Guidelines: http://www.mg.gov.pl/files/upload/23408/Założenia.docx

- White Paper on the protection of the strategic deposits - prepared by the Ministry of Environment and published in November for consultation http://www.mos.gov.pl/g2/big/2015_11/39cc45004f940d9be17174220a8373b3.pdf - it calls for protecting the strategic deposits to make them available for exploitation in the future – inter alia by having land use not preventing valuable deposits exploitation.

- National Policy on Forests – adopted by the Council of Ministers on 22 April 1997;

- National Programme for the Augmentation of the Forest Cover (NPAFC) – adopted by the Council of Ministers in 1995 and updated twice, in 2003 and 2014 – to guarantee the efficient timber use in the future

- 2014–2030 Forest Management Strategy, prepared by Polish State Forests – it has been noted that above all, multifunctional forests are a guarantee for their conservation – as an element of natural good/capital as well as source of timber; this document applies to all state forest areas but is not classified as a national strategy. New afforestation projects are part of the implementation of the multi-functional and sustainable development of the country.

- National Forest Programme (in preparation); the prospective strategy of development for forest sector for 2030–2080;

- National Waste Management Plan 2014
http://www.mos.gov.pl/g2/big/2013_11/2328f96819e9bda79bf26d0e00728080.doc

- National Waste Prevention Programme (NWPP)
http://www.mos.gov.pl/g2/big/2014_10/a400f6bb998e8fbc1bc8451fe5c41b11.pdf
(with data updated as on pages 27-28)

Resource efficiency is also implemented by adopting EU regulations within domestic legislation, for example, in the Environment Protection Act, Energy Efficiency Act etc. Moreover, as an effect of these documents, resource efficiency is widely promoted through eco-education. Based on the Environment Protection Act regulations, the National Environment Protection and Water Management Fund is allowed to co-finance various projects, educational or investments (industrial, urban development), bearing in mind resource efficiency with reference to sustainable development and other conditions.

The circular economy and closing material loops

The NPDLEE is being constructed to reflect the circular economy concept. It is recognised that transition towards the circular economy requires introducing changes at each stage of the value chain, from the product design, through more sustainable production, to new ways of transforming waste into resources. It also calls for new business models and consumption behaviour.

This approach will be supported in the Programme along five main lines:

- energy production in a low-emission manner;
- better resource efficiency (including waste management taking into consideration closing material loops from whole supply chain);
- developing sustainable production (in the industrial, construction and agricultural sectors);
- low-emission transformation in mobility;
- promotion of sustainable consumption patterns.

There are four priorities and more than 10 actions that are focused on promoting sustainable consumption patterns in four areas: promoting sustainable consumption in everyday life, in public administration, through green public procurement (GPP) and in spatial planning.

An interesting issue is the possibility of using the geological resources not only as a deposit to be extracted but also for other purposes – for example salt deposits are used to store gas and liquid fuels.

The Polish government agrees with the opinion presented in *Towards a circular economy: A zero waste programme for Europe* Communication that "*existing infrastructure, business models and technology, together with established behaviour keep economies 'locked-in' to the linear model*." However, the changes in the economic model should be preceded by the necessary analysis taking into account differences between countries' economic and social conditions. Moving to a circular economy cannot increase inequalities between the countries but it should be an incentive to sustainable development.

The main strategic objective for Poland up to 2020 is to develop a sustainable economy based on efficient use of resources, respect for the environment and achieving higher competitiveness through the use of technologies with a lower demand for raw materials and energy and enabling the use of recyclable raw materials and renewable energy, with waste prevention as an important element.

Among the most important objectives that can be identified in the national strategic documents that support waste prevention are: securing economically valuable deposits of virgin raw materials and increasing the use of recyclable raw materials [NWPP]. These objectives are also mentioned in the National Spatial Development Concept 2030. It is necessary to develop policy guidelines that aim to create conditions to significantly increase the use of recyclable materials in the economy.

General policy objectives for material resource efficiency

The third objective of the SIEE – "*Increased resource and raw materials efficiency*" – is to decrease material consumption and energy intensity of products and services, increase the rationality of water use and the export of environmental goods and services, which should also result in creating green jobs. To achieve this general target the following actions are envisaged:

- putting of the socio-economic system on a greener path, particularly by reducing energy and material consumption;
- supporting the development of a sustainable construction sector – from planning and design, through erection to management throughout buildings' life cycle.

The main objective of the ESES is to ensure a high quality of life for present and future generations, taking environmental protection into account and creating conditions for the sustainable development of the energy sector which will guarantee energy security for Poland as well as the effectiveness and competitiveness of the Polish economy. The ESES covers major issues important for energy security and the environment, such as energy efficiency, enhanced security of fuels and energy supplies, development of renewable energy sources, development of competitive fuel and

energy markets, efficient natural resources management, sustainable management of geological resources, water management, multifunctional forest management, biodiversity management and waste management, as well as the development of services and products complying with the high requirements for environmental protection. Implementation and support for low-waste technology, cost-effective and environmentally sound recovery and disposal technologies – waste incineration is mentioned as a key issue.

The key objectives of the ESES are:

1. rational management of resources (described in the section on priority resources);
2. security and competitiveness of energy supply;
3. improvement of the state of the environment;

Under the rational management of resources target, the following specific objectives have been set:

1.1 rational and effective use of minerals;

1.2 water management for protection against flood, drought and water shortage;

1.3 preserving biodiversity including multifunctional forest management;

1.4 streamlining space management;

Under the security and competitiveness of energy provision, the following specific objectives have been set:

2.1. better use of national energy sources;

2.2. improvement of energy efficiency;

2.3. guaranteeing security of supply for imported energy materials;

2.4. modernization of the electric power industry, including preparation for nuclear energy;

2.5. development of competition in the fuel and energy markets, supporting the consumers' position;

2.6. increasing the importance of distributed renewable energy;

2.7. energy development in suburban and rural areas;

2.8. development of services for a new generation of vehicles using alternative fuel.

The Energy Policy of Poland until 2030 (EPP2030) identified its strategic directions as:

- improving energy efficiency;
- enhancing security of fuel and energy supplies;
- diversification of the electricity generation structure by introducing nuclear energy;

- development of the use of renewable energy, including biofuels;
- development of competitive fuel and energy markets;
- reducing the environmental impact of the power industry.

Poland is on the path of preparing the Energy Policy of Poland up to 2050. Energy efficiency is one of the priorities of EPP2050 and progress will be of key importance to implementing all of its objectives.

The objective "*better resource efficiency (including waste management)*" in draft NPDLEE is to increase resource efficiency, support reuse of waste and work out standards for the use of by-products.

The main objectives of National Waste Management Plan 2014 associated with material resource efficiency policies are:

- to maintain the trend of decoupling growth in the amount of generated waste from economic growth, expressed as GDP;
- to increase the recovery share, in particular the recycling of glass, metals, plastics, paper and cardboard, and energy recovery from waste in accordance with requirements of environmental protection.

The key objectives, priorities and directions specified in long-term strategic documents, mentioned in section on national strategies, that support waste prevention include:

1) creating incentives accelerating the development of a green economy;

2) decreasing environmental pressure caused by pollution to water, air and soil;

3) securing economically valuable mineral deposits and increasing the use of recyclable materials;

4) rational resources management;

5) supporting the transition to a low-carbon economy in all sectors and environmental protection;

6) rational waste management, including its use for power generation

The National Policy on Forests aims to safeguard the permanence of forests, along with their multi-functionality. The policy recognises three main functions of forests – productive, social and ecological. The overriding aim of the forest policy is to designate a set of actions shaping relations between people and forests, with the aim of preserving – in changing natural and socio-economic circumstances – the conditions for the sustainable multi-functionality of forests, their wide-ranging use and protection and their role in shaping natural environment, in line with present and future expectations of society. The National Programme for the Augmentation of the Forest Cover (NPAFC) refers to the need for efficient use of timber, defines the area of agricultural land designated for afforestation and presents a comprehensive action plan intended to rationalise the structure of the use of the national natural space.

Institutional setup and stakeholder involvement

Institutional set up for material resource efficiency policies

Ministry of Environment – responsible for the ecological context taking into account environmental issues and the protection of the environment, for eco-labelling and EMAS;

Ministry of Economy – responsible for the economic context, looking at these issues more from the point of view of effectiveness of the economy and as a part of supply system;

Ministry of Agriculture and Rural Development – responsible for agricultural resources and food efficiency policies;

Ministry of Finance – responsible for taxes, including environmental taxes;

National Fund for Environmental Protection and Water Management – supporting, *inter alia*, projects for resource efficiency;

Central Statistical Office – responsible for the annual transmission of the EW-MFA questionnaire to Eurostat.

Note: A new Ministry of Energy will be established in 2016.

Process to ensure stakeholder participation

There are conferences, working meetings and dedicated working groups that enhance the cooperation of the institutions.

Legislative and strategic acts and programmes are normally widely consulted with a range of stakeholders. For example the Ministry of Economy is committed to that principle including for documents of lesser importance. The Assumptions for the Action Plan on Poland's security regarding non-energy raw materials were consulted with, for example, numerous industry and academia representatives, whose remarks were to a large extent taken into account into the draft document.

There are educational campaigns promoting the efficient use of resources, held for example by the Ministry of Environment

https://www.mos.gov.pl/kategoria/4702_kampanie_spoleczne/

Suggestions for international support mechanisms to exchange experience

One of the most important international (in this case EU) fora regarding resource efficiency from the economic perspective is the Raw materials Supply Group (RMSG), organised and led by the European Commission (EC), that, *inter alia*, features updates and discussions on important initiatives and presents national and international best practices. It is valuable that the group comprises not only the EC and EU Member States' representatives, but also representatives of industry and civil society.

An exchange of the experience and sharing the lessons with the countries outside the EU, particularly with countries with high material consumption rates such as Japan, the Republic of Korea or United States of America would be very valuable.

Policy instruments

Policy instruments commonly used for material resource efficiency

In the NPDLEE the most common policy instruments proposed are: popularisation of certain action (including counselling services), supporting research and development (R&D) related to supported technologies or, to a lesser extent, legislative changes and financial support for certain actions.

The measures to improve energy efficiency in EPP2030 include among others:

- setting the national objective of enhancing energy efficiency;
- stimulating development of cogeneration ;
- using mandatory energy performance certificates for buildings and apartments when they are marketed or rented;
- determining energy intensity of devices and power-consuming products, introducing minimum standards for power-consuming products;
- committing the public sector to serve as a role model of economical energy usage;
- supporting R&D on new solutions and technologies reducing energy consumption, in all kinds of its processing and use;
- applying demand side management techniques, stimulated by diversification of distribution prices during the day, and of electricity prices on the basis of reference prices as a result of introduction of an intra-day market, and sending price signals to customers by the use of remote bilateral communication through electronic meters;
- information and education campaigns promoting efficient energy use.

The main instrument to support and stimulate energy efficiency improvements is an obligation (from the Energy Efficiency Act of 15 April 2011) imposed on energy entities and energy market operators – coupled with a white certificates scheme. The certificates are granted for energy-efficient

investments, such as modernisation of local heating grids and heat sources, buildings, lighting and household appliances, as well as energy recovery and modernisation of industrial devices and installations to reduce energy usage. Entities selling electricity, natural gas and heat to final consumers are obliged to obtain a certain number of white certificates depending on the amount of energy sold to final consumers. If an entity cannot fulfil their obligation (either by obtaining WhC or by substitution fee), a penalty is applied.

In the period 1990–2012 the energy intensity of the Polish economy decreased by 30 %. Poland has made significant progress in energy efficiency improvement. However, there is great potential to do more in this field, particularly in transforming our energy, building and transport sectors.

Achieving the *Towards a circular economy: A zero waste programme for Europe* Communication vision without the support from the government would not be possible. It requires an analysis of the possibilities for public aid. The European funds are very important to support the projects As regards the waste management, taking into account Polish experience from projects under Infrastructure and Environment Operational Programme and Regional Operational Programmes for 2007-2013 and from the development of the current one for 2014–2020, it is clear that the best form of public aid to waste management, in accordance with the regulations on public aid, is compensation for providing services of overall economic interest. Poland used this approach effectively in the 2007–2013 period and developed special guidelines for entities involved in the financing system of waste management to facilitate the use of public aid. A preference of the Commission for such compensation as the way of supporting the achievement of the targets and appropriate documents and guidelines prepared by the Commission are highly desirable.

The following waste prevention methods are currently applied at national and regional levels:

(1) as regards the use of planning action, or other economic instruments promoting the efficient use of resources, the polluter-pays principle is implemented, as well as extended producer responsibility for certain products; waste prevention was included in NWMP 2014 and VWMPs

The polluter-pays principle:

One of the instruments which implements the polluter-pays principle is a landfill fee. First elements of a landfill fee system were introduced in the 70-ties (of the previous century) – for waste from mining industry. The system was expanded over years and in 2002 the last group of waste, i.e. municipal waste, was included into the system. Landfill fee is submitted to national (14 %) and voivodship (26 %) funds of environmental protection and water management and poviat (10 %) and municipal (50%) budgets. Revenues are used exclusively for investments in the field of environmental protection and water management.

Extended producer responsibility for certain products:

Extended producer responsibility (EPR) was introduced for the first time in Poland in 2002. Nowadays the following products are covered by EPR: packaging, batteries, waste electrical and electronic equipment (WEEE), end-of life vehicles (ELV), oils and tyres.

Batteries:

Entrepreneurs marketing batteries or accumulators are now vested with more extensive liability for marketed products, which extends from putting such products on the market to their final disposal when the product becomes waste. Therefore, distributors of batteries or

accumulators are required to organise and finance the collection, treatment, recycling and disposal of waste batteries and accumulators, and the proper management of waste batteries and accumulators. Since 2010 they have been required to ensure adequate levels of collection and recycling.

Packaging waste:

An obligation to assure packaging waste recovery and recycling levels was imposed on each entrepreneur who places packaged products on the market, and hence the principle of extended producer responsibility was put into effect. Should an entrepreneur fail to achieve the required levels, they are obliged to pay a product fee, which is calculated for the difference between the required and the achieved recovery and recycling levels. The fee is a form of sanction that is imposed on an entrepreneur who places a product in packaging on the market but fails to discharge the statutory obligations.

WEEE is handled in a similar way

(2) as regards the promotion of R&D in the area of achieving cleaner and less wasteful products and technologies, and the dissemination and use of the R&D results, measures within the framework of general industry restructuring have been carried out since the 1990s; international projects are carried out, for example, ZeroWIN (on industrial symbioses), CERREC (Central Europe Repair & Re-use Centres and Networks), TRANSWASTE (under which a ReUse Corner was established next to the Separate Municipal Waste Collection Facility in Poznań), FoRWaRD, "Don't waste food, think green" (reducing and preventing the generation of food waste)

ZeroWIN:

Wroclaw University of Technology participated in the project. It was a research project with concepts developed to reduce waste, mainly at the production stage. There were 10 industrial case studies. University participation was to coordinate the substantive work of these case studies (developing a strategy for these case studies and the concept of waste reduction). The project was completed in April 2014. The results of the work have been included in several publications. The results can serve as an example for Polish entrepreneurs.

CERREC

http://cerrec.eu/ (see more at: http://cerrec.eu/files/CERREC-cor6-lores.pdf and http://cerrec.eu/downloads/best-practises):

- The Dobrcz Community in Kujawsko-pomorskie supports the making use of the not needed toys, clothes, furniture,
- Emmaus is a non-governmental organisation, which supports the homeless and people in difficult life circumstances. They help people by offering shelter and work. Emmaus community members are engaged in the collection and repair of second-hand goods, which are then sold in their charity shop. In return, they have an opportunity to become financially independent and gain

skills, allowing them to return to the job market. More importantly though, they no longer feel excluded from society as they become active participants in the local community,
- Waste Management Company in Poznan has a "Point of Second Life For Re-Use", allowing residents to leave items that can be used by others.
- http://www.transwaste.eu/file/001695.pdf

TRANSWASTE:

"New Life" Point in Poznań (Waste Managment Company)
http://www.transwaste.eu/file/001670.pdf

Main actions conducted by the waste managment company:

- management of waste dump sites;
- current operation and final recultivation of a landfill
- production and sale of electricity and heat made from biogas;
- conducting selective collection and segregation of waste;
- recycling, selection and sale of waste;
- reception of selectively collected waste;
- collection of hazardous, nonhazardous and inert waste;
- collection and receipt of waste electric and electronic equipment;
- processing of biodegradable waste;
- running collection points for hazardous, inert and bulky waste;
- projects contributing to maintenance of order and tidiness in the city;
- interventions in remediation of consequences of road accidents notified by the city
- guards or police;
- interventions in removal of contamination and dead animals from public places;
- conducting ecological education.

FoRWaRD

http://foodrecoveryproject.eu/

The project involves the Polish Federation of Food Banks (http://www.bankizywnosci.pl) saving food and helping needy people – the federation operates 32 food banks throughout the country. In 2011–2012 they carried out a mass-media awareness campaign *"Don't Waste Food. Think Green"* financed by the National Fund for Environmental Protection and Water Management.

(3) promotion of eco-design (systematic integration of environmental aspects into product design with the aim of improving the environmental performance of the product throughout its life cycle through the implementation of research projects in the field of eco-design) is carried out; specific waste prevention measures are implemented in relation to individual waste streams;

(4) information on waste prevention techniques with a view to facilitating the implementation of best available techniques by industry is provided by means of training on best available

technologies for environmental protection, their implementation and on the options to acquire funds for green investment;

(5) training is organised for competent authorities on the introduction of waste prevention requirements in permits granted pursuant to the Act on Waste and the Environmental Protection Law, as well as general training on the Act on Waste (transposing the provisions of the Waste Framework Directive), including the waste management hierarchy resulting from the Act;

(6) measures to prevent waste generation at installations not falling under integrated permits have been introduced; appropriate provisions exist in the Act on Waste and the Environmental Protection Law (pursuant to Article 184 and 188 of the Environmental Protection Law – the request and permit for waste generation specify "*means of preventing waste generation or reducing the quantity of waste and its negative environmental impact*");

(7) information campaigns are used and financial support is provided for businesses; information, financial and decision-making support for businesses, including small- and medium-sized enterprises, provided under the Innovative Economy Programme, financed by the European Regional Development Fund and the state budget;

(8) environmental management systems are promoted, including EMAS, ISO 14001 and Responsible Care – training familiarises entrepreneurs with the principles of developing environmental management systems (ISO 14001, EMAS, Responsible Care); consulting for businesses is provided in relation to the implementation of environmental management systems;

(9) financial instruments, such as incentives on clean purchases or the institution of an obligatory payment by consumers for a given article or element of packaging that would otherwise be provided free of charge, are used, for example, a deposit for returnable bottles or a fee for disposable bags;

(10) awareness-raising campaigns and information provision addressed to the general public or a specific set of consumers are used; a national information portal on sustainable lifestyles is run by the Ministry of the Environment (www.ekoszyk.mos.gov.pl); introduced new legal regulations that emphasise the need to carry out awareness-raising campaigns on waste management, including waste prevention;

(11) preventing the generation of food waste through the operation of food banks by providing charity organisations with good quality food by shops, restaurants, producers, etc. in order to deliver it to people in need; this way production surpluses, batches with short best-before dates or items recalled from trade due, for example, to incomplete labelling can be managed;

(12) since 1996, the Clean Production Programme has been implemented aimed at preventing pollution generation and minimising the consumption of natural resources, while reducing costs for companies.

Examples of good practice

An 2013 EEA project presented examples of good practice in Poland:

- Thermo-modernisation and Renovation Fund as a source of financial support for thermo-modernisation investment in housing;
- GreenEvo for green technologies;
- White certificate scheme for energy efficiency improvements;

and are available at: http://forum.eionet.europa.eu/nrc-scp-waste/library/eionet-webinars/webinars-resource-efficiency/1st-webinar-national-good-practice-showcases-27-feb-2013

Other interesting projects are the following:

A series of workshops will be launched aimed at presenting various waste prevention strategies and concepts in individual sectors (for example, as part of the "Good waste management practices" forum initiated by the Minister of the Environment and the National Fund for Environmental Protection and Water Management, aimed at creating a platform for the exchange of ideas, views and experience of key actors in the waste management market).

A national information platform dedicated to waste prevention, containing data, studies and guidelines on waste prevention implementation for local governments, institutions and entrepreneurs, will be developed. It is assumed that the platform will include methodological guidelines for lower-level authorities, local governments, institutions, the business sector and residents, defining a coherent strategy for the implementation of the waste prevention.

Examples of measures aiming at the production phase:

- waste-light design (for example, the promotion of guidelines for minimalist design for packaging with a special focus on ensuring reusable or recyclable characteristics);
- support for environmental management systems (for example, initiating a label system as official recognition of good environmental management practices of public and private companies)
- sector agreements (for example, voluntary agreements with business associations oriented towards the substitution of harmful substances and to accelerate the substitution of heavy metals and other hazardous substances in products)
- diffusion of best available techniques (for example, programmes that bring together expertise on managing energy, water and materials costs and make it easier for businesses and organisations to access practical, on-the-ground support to cut waste and use resources more efficiently, making savings and improving competitiveness);
- market-based instruments for resource efficiency (for example, evaluating the differentiation of natural resources tax rates for different groups of materials in order to promote efficient use of resources) [NWPP].

Reuse in Poland:

Reuse is a priority action that prolongs a product life and hence reduces its environmental impact. Reuse concerns items that never become waste – for example, as a result of a sale on a web portal or donating second-hand items to people in need. Reuse can also be an effect of preparing waste items for reuse. Preparing for reuse is the second level of waste management hierarchy.

Already today, there are many forms of reuse available in Poland. Under the CERREC project (http://cerrec.eu/files/CERREC-cor6-lores.pdf) that is concerned with national terms of introducing reuse, it was estimated that the amount of second-hand items sold is street markets is ca. 6 kilograms per person per year. Undamaged, clean items that do not create any risk for the users, such as furniture, flower pots, toys, bicycles, ceramics, glassware and electronic devices are accepted.

Other examples of reuse existing in Poland, in decreasing order of importance:

1) web portals acting as intermediaries in the sale of second-hand items (Allegro, olx.pl and Gumtree);
2) donating items to friends;
3) web portals acting as intermediaries in exchanges/donations (for example gratyzchaty);
4) second-hand stores selling more valuable items and antiques;
5) announcements in local press (sale and donations);
6) second-hand boutiques;
7) donations through churches and other intermediary charity organisations.

Most of the enumerated forms of reuse are not registered in any way; therefore, they are not considered in the statistics on the levels of reuse (apart from the reuse of WEEE and car parts).

Reuse corner:

Municipalities are required to establish and run separate municipal waste collection facilities (PSZOKs), where people can deliver problematic waste, including, for example, bulk waste. The operation of a reuse corner as a separate part of PSZOK is a simple solution, known in other countries, which allows for the practical implementation of bulk waste prevention. The creation of a reuse corner during the organisation of PSZOK hardly increased the cost at all.

The corner is a place that collects items and passes them on to subsequent users on certain occasions, as a part of a campaign, or all year round. The users may include inhabitants or "collectors", who reintroduce the items to the market, for example, through their sale at street markets. Items may be taken for a fee, but also free of charge, according to the principle "leave or take a thing". For organisational reasons, collection may be limited to the inhabitants of, for example, a town or a municipality who take items only for their own uses.

A reuse corner next to the PSZOK (http://www.transwaste.eu/file/001695.pdf) in the waste management facility in Poznań was created in 2012 as part of the Transwaste project (http://www.transwaste.eu/), which can be considered the first example of good practices in this field in Poland.

Targets and indicators

Targets for material resource efficiency

For monitoring of the SIEE there are indicators relating to the main objective, as well as to the specific ones.

Indicators to monitor the main objective – a highly competitive (innovative and efficient) economy, based on knowledge and cooperation – include

> **Resource productivity** (based on an existing Eurostat indicator) with **a measurable target for 2015** of 0.45 and for 2020 of 0.5 (ratio of **gross domestic product (GDP) to domestic material consumption (DMC)**, expressed in EUR per kilogram)

The SIEE adopted one target related to the objective on increased resource and raw materials efficiency:

> **Final energy intensity** (kilograms of oil equivalent per EUR, in fixed prices in 2000)- target value of the indicator in 2015 and 2020 was established at 0.2 (baseline 2010 was 0.24).

The examples of the Indicators used in the ESES for Targets 1 and 2 are the following:

- water – consumption for needs of the national economy and population in hundred cubic metres (hm^3) baseline 2010: 10 365.5 hm^3, the expected value in 2020, 10 100 hm^3;
- share of industry in total water use (%) – baseline 2010,74 %; the expected value in 2020, 65 %
- forest cover as % of total geographical area – baseline 2010, 29.2 %; expected value in 2020, 30 %;
- Farmland Bird Index (FBI) – baseline 2010, 88 %; expected value in 2020, 90 %;
- the share of land covered by zoning plans – baseline 2010, 26.4 %; expected value in 2020, 35 %;
- ODEX aggregated energy efficiency indicator – base value in 2010, 74.5 (updated to 74.3); the expected value in 2020, 63;
- the share of energy from renewable sources in gross final energy consumption - baseline 2010, 9.5 % (updated to 9.3); the expected value in 2020, 15 % minimum.

The indicators for the NPDLEE are currently under construction. There is a national initiative to develop indicators for the resource productivity target.

In the EPP2030, the improvement of energy efficiency is the first priority, with two specific objectives namely, to make efforts to achieve the development of the Polish economy without an increase in primary energy demand, and to decrease the energy intensity of the Polish economy to the EU-15 2005 level.

Specific objectives in the area of "improving energy efficiency" in the EPP2030 are as follows:

- to enhance efficiency of power generation by building highly efficient generation units;
- to achieve a two-fold increase (as compared to 2006) in power generation with the use of highly efficient cogeneration technology by 2020;
- to limit grid loss during transmission and distribution by modernising the existing grid and building a new one, replacing low efficiency transformers, and developing distributed generation;
- to increase end-use energy efficiency;
- to increase the ratio of annual demand for power to the maximum demand for power at peak usage hours, which limits the total cost of meeting the demand for power.

The target in the NEEAP 2014 derived from the EED (Energy Efficiency Directive 2012/27/EU) is estimated at the level of 96 million tonnes of oil equivalent of primary energy consumption in 2020.

The indicative target for Poland comprised in the Energy Efficiency Act is to **achieve final energy savings of 9 %** of the annual average amount of final energy consumption in 2001–2005 by 2016. The target for 2016 is settled at a level of 53,452 gigawatt hours (4.5 million tonnes of oil equivalent) in sectors not covered by the EU-ETS.

National Programme for the Augmentation of the Forest Cover (NPAFC) - adopted by the Council of Ministers in 1995 and updated twice since then, in 2003 and 2014, sets out the tasks designed to **expand the national forest cover to 30 % by 2020 and 33 % by 2050.**

Main goal of municipal waste management is to **prepare for reuse and recycle waste materials** such as paper, metals, plastics and glass from households and, if possible, other waste that resembles household waste **at the minimum level of 50 % of their mass by 2020** [NWMP].

Regarding to construction and demolition waste from buildings and road infrastructure: "*by 2020, preparation for re-use, recycling and other forms of* ***recovery of construction and demolition*** *materials should achieve the level of* ***at least 70 % by weight*****"** [NWMP].

The general target in the field of waste management from selected branches of the economy (but without a timeline): **increase in the waste disposed not in landfills.**

The waste policy framework in Poland (NWPP) provides concrete qualitative or quantitative waste prevention targets. Quantitative objectives in relation to the total quantity of generated waste are:

(1) to preserve economic growth with the total quantity of generated waste at a constant level,

Indicator: quantity of waste generated in Poland according to data from the Central Statistical Office of Poland (CSO);

(2) to maintain the trend for decoupling growth in the amount of generated waste from economic growth expressed in GDP;

indicator: quantity of waste generated in Poland in relation to GDP [kg per EUR of GDP].

Indicators to monitor use of materials and resource efficiency:

Some indicators are listed in the previous section discussing targets. Furthermore:

The Central Statistical Office is working on **environmental economic accounts** (including material flow accounts**)** in order to abide with the legal requirements of the Regulation (EU) No 691/2011 of the European Parliament and of the Council of 6 July 2011 on European environmental economic accounts.

Eurostat's **material flow accounts** constitute a comprehensive data framework systematically recording the inputs of materials in European economies in a detailed breakdown by material category, for example, fossil energy carriers, biomass and metal ores. The current questionnaire on economy-wide material flow accounts (EW-MFA) is transmitted annually to Eurostat. These accounts have been introduced in the Polish legal framework (into the Programme of Statistical Surveys of Official Statistics).

Various indicators are derived from material flow accounts – most prominently **domestic material consumption** (DMC) or **resource productivity**.

Eurostat has also developed a model to estimate raw material consumption (RMC) for the aggregated EU economy. Raw material consumption is defined as the annual quantity of raw materials extracted from domestic territory, plus all physical imports and minus all physical exports (both expressed in raw material equivalents). However, at present no work is carried out in Poland on national raw material equivalents and RMC the indicator.

The resource productivity indicator (GDP/DMC) is calculated by Eurostat based on the data transmitted by the Central Statistical Office in the material flow accounts questionnaire.

Sustainable Development Scoreboard, developed by the Polish Central Statistical Office (http://stat.gov.pl/cps/rde/xbcr/gus/oz_wskazniki_zrownowazonego_rozwoju_Polski_us_kat.pdf) lists resource efficiency indicators (in euro/kg), sourced from the Eurostat data.

At http://strateg.stat.gov.pl you can find STRATEG system created by the Central Statistical Office, presenting data derived from different sources and used to monitor the implementation of strategies in Poland and the EU.

The Waste policy framework in Poland (NWPP) provides concrete waste prevention indicators to monitor material resource use and improvements in material resource efficiency. In relation to the total quantity of generated waste, two can be mentioned:

- the quantity of waste generated in Poland according to data of Central Statistical Office of Poland (CSO);
- the quantity of waste generated in Poland in relation to GDP [kilograms per EUR of GDP].

Indicators on the quantitative objectives for key waste streams (NWPP):

Mining waste

objective: reduced quantity of waste in relation to the production volume;

indicator: ratio of waste generated in the mining industry to the production volume (black coal, brown coal, copper and rock raw materials in total) [tonne per tonne], data source: Central Statistical Office and Polish Geological Institute – National Research Institute.

Waste from thermal processes

objective: reduced quantity of waste in relation to the amount of generated energy;

indicator: ratio of waste generated in the power industry to the amount of produced energy [tonnes/gigawatt hour], data source: Central Statistical Office and Energy Regulatory Office.

Hazardous waste

objective: reduced environmental pressure through an increase in the amount of goods produced in Poland covered by eco-labelling;

indicator: number of issued eco-labelling certificates in Poland., data source: data of the Polish Centre for Research and Certification.

Municipal waste

objective: reduced amount of mixed municipal waste;

indicator: amount of mixed municipal waste per person [kilograms per person per year], data source: Central Statistical Office

Packaging waste

objective: reduced quantity of packaging waste in relation to the volume of products;

indicator: quantity of packaging waste in relation to GDP in constant prices from 2000 [thousand tonnes per billion EUR of GDP per year]; data source: report of the Minister of the Environment, Report of the Republic of Poland on the amount of packaging waste generated and recovered or incinerated with heat recovery in combustion plants, Central Statistical Office data for GDP.

indicators for comparisons in individual industries:

1) share of reusable packaging in packaging placed on the market [%],

2) mass of the packaging in relation to the mass of the product placed on the market [kilogram per kilogram].

Food waste

objective: less food wasted;

indicator: quantity of food delivered to food banks – the indicator should be regarded as auxiliary since it does not reflect the complexity of the problem of food waste generation; data source: food banks.

Waste electrical and electronic equipment (WEEE)

objective: increased reuse, for example, by means of networks for the exchange and repair of electrical and electronic equipment, as well as collecting and preparing WEEE for reuse;

indicator: share of the mass of totally reused waste equipment in the total mass of waste equipment collected in a given year [%]; data source: Reports of the Chief Inspector for Environmental Protection on the operation of the waste electrical and electronic equipment management system

Summary:

Monitoring of general quantitative NWPP objectives

Item	Indicator	Unit	Desired tendency	Benchmark value (year)	Subsequent years
1	*Amount of generated waste*	*tonnes/year*	↘	*135 million (2012)*	*141 million (2013)*
2	*Quantity of waste generated in Poland in relation to GDP in constant prices (year 2000 = 100 %)*	*million tonnes/ PLN billion (kg/PLN)*	↘	*0.116 (2012)*	*0.119 (2013)*

Monitoring of specific NWPP objectives [NWPP]

Item	Indicator	Unit	Desired tendency	Benchmark value(year)	Subsequent years
1	*Quantity of mining waste:* *1) Waste from the flotation of non-ferrous metal ores and* *2) Waste generated at the stage of rinsing and cleaning minerals* *in relation to the quantity of the product (black coal, brown coal and copper in total)*	*tonnes/tonnes*	↘	*0.34* *(2012)*	*0.37 (2013)*
2	*Quantity of waste from the power industry (encompassing:* *1) ash and slag mixture from wet discharge of combustion waste;* *2) fly ash from coal;* *3) mixture of fly ash and solid waste from lime desulphurisation methods;* *4) slag, combustion*	*tonnes/GWh*	↘	*132 (2012)*	*134 (2013)*

Item	Indicator	Unit	Desired tendency	Benchmark value(year)	Subsequent years
	ash and bottom ash in relation to the amount of produced energy)				
3	*Number of issued ecolabelling certificates (Eko-znak and/or Ecolabel) in Poland per year*	*-*	↗	*36 including: 12 for chemicals, 23 for electrical and electronic equipment, 1 for furniture (2012)*	
4	*Amount of collected mixed municipal waste per person*	*kg/person/year*	↘	*222.5 (2012)*	*213 (2013)*
5	*Quantity of packaging waste in relation to GDP in constant prices from 2000*	*thousand tonnes/PLN billion/year*	↘	*4.02 (2011)*	*4.00 (2012)* *4.07 (2013)*
6	*Quantity of food delivered to food banks by entrepreneurs in Poland (excl. food from EU support programmes) (auxiliary indicator)*	*tonnes/year*	↗	*7,428 (2012)*	*8,697 (2013)*
7	*Share of the volume of WEEE reused as whole appliances in the total volume of WEEE collected in a given year*	*%*	↗	*0.42 (2011)*	*0,51 (2012)* *0,64 (2013)*

(The data for 2014 are not yet available.)

Optional questions

Which way should resource efficiency go in the future?

It seems that resource efficiency started as a chiefly environmental question, but it is increasingly recognised as a pillar of economic effectiveness. That will probably be more and more emphasised, as uneconomic projects cannot succeed in the long term.

A general trend in the use of resources in the economy is the widening number of raw materials used in increasingly compact form – that is particularly visible in the facilities for generating renewable energy or used in the construction of electric vehicles or IT equipment that use a whole range of different raw materials.

The other question is combining resource efficiency with more rational consumption – it will be extremely hard to escape the point where the consumption of resources in some Western countries will need to take account of the limited amounts of resources.

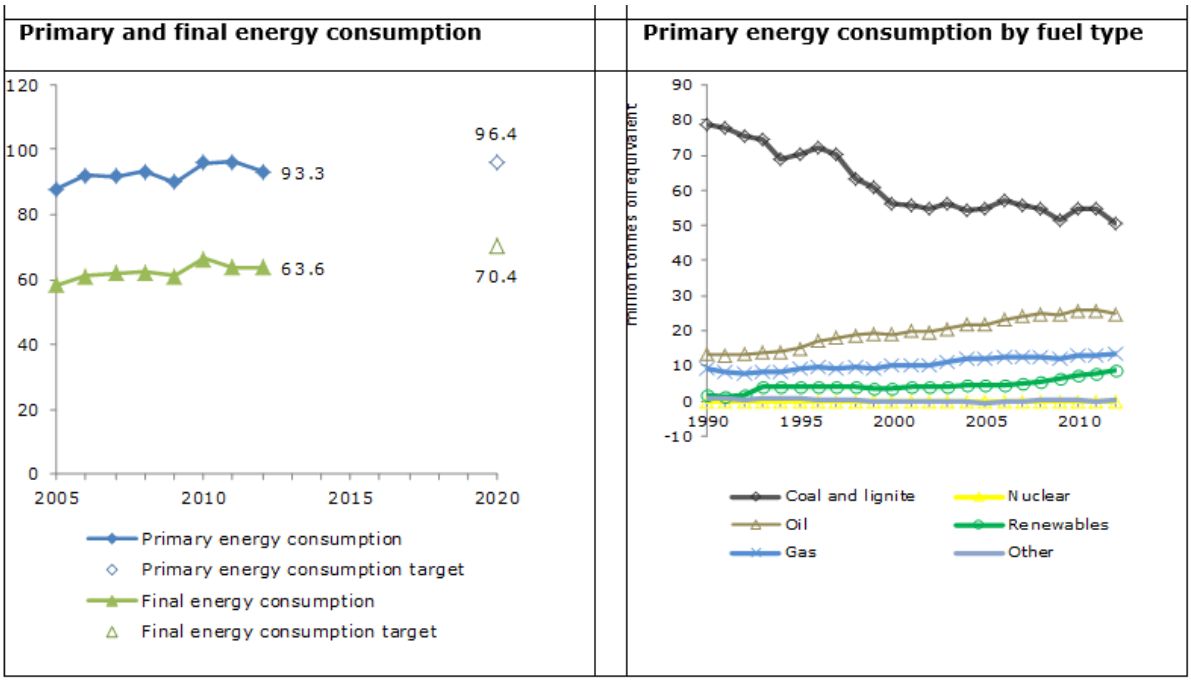
The life cycle of products and particularly the life time or durability of products is very important. Commercial revenues may be earned when consumers have to buy new products often, but this raises issues of resource efficiency and waste.

The resource efficiency policy should take into account the need for improving the quality and durability of the products – that concerns many sectors as well as products of different economic value. It is worth indicating that in the past many products were more durable than they are today, shoes or cars are examples. Poor materials and workmanship are used to increase sales and cut costs. The development of electronics aimed at making life easier by automating simple actions has transformed simple products into complex IT machines equipped with a lot of additional elements each of which can fail and increased consumption and waste production. There is also a broader issue of product design and expert knowledge when in many cases it is not possible to repair a single element of a product meaning that the whole object has to be exchanged and becomes waste. The other aspect is the proper definition of quality – an example could be the food sector where the appearance of products, fruit for example, is too often treated as the reason to waste it although the products are healthy and nutritious.

According to the static approach to resources, mineral deposits are being depleted and they are non-renewable and limited. However, a dynamic approach emphasises that the scantiness of a resource refers to a specific area and time period. Scientific and technical development, geological studies, substitution, recycling and reuse give opportunities to increase the resource base to compensate consumption. Humankind invented many applications of specific material resources and then dropped some to use others.

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

The Polish economy is continuously growing. In the last 20 years significant progress has been made in reducing pressures on the environment. Despite successes achieved, challenges regarding high material- and energy-consumption persist. Dynamics of the growing trend in final energy use remains much lower than GDP dynamics. Whereas domestic material consumption has been growing intensively and its dynamics are similar to economic growth. It has been determined by growth in non-metallic material consumption and largely related to the implementation of infrastructural projects.



Source: SOER2015

The Action Plan for Poland's security regarding non-energy raw materials – currently being written – looks at raw materials more from the economic perspective (i.e. assuring raw materials access for the economy, in particular for industry, bearing in mind the importance of particular raw materials for the technologies of the future). The Assumptions for the Action Plan present five pillars with actions including exploration and knowledge base; Extraction; and Processing and raw materials recovery from waste.