Country profile

More from less — material resource efficiency in Europe

2015 overview of policies, instruments and targets in 32 countries

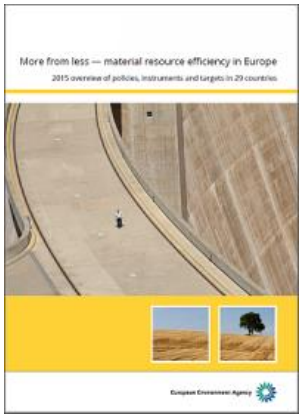
Croatia

May 2016

European Environment Agency

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

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



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

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

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

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

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

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

Croatia, facts and figures

Source: Eurostat

GDP: EUR 43 billion (0.3 % of EU-28 total in 2014)

Per person GDP: EUR 16,100 (in purchasing power standard)
(59 % of EU-28 average per person in 2014)

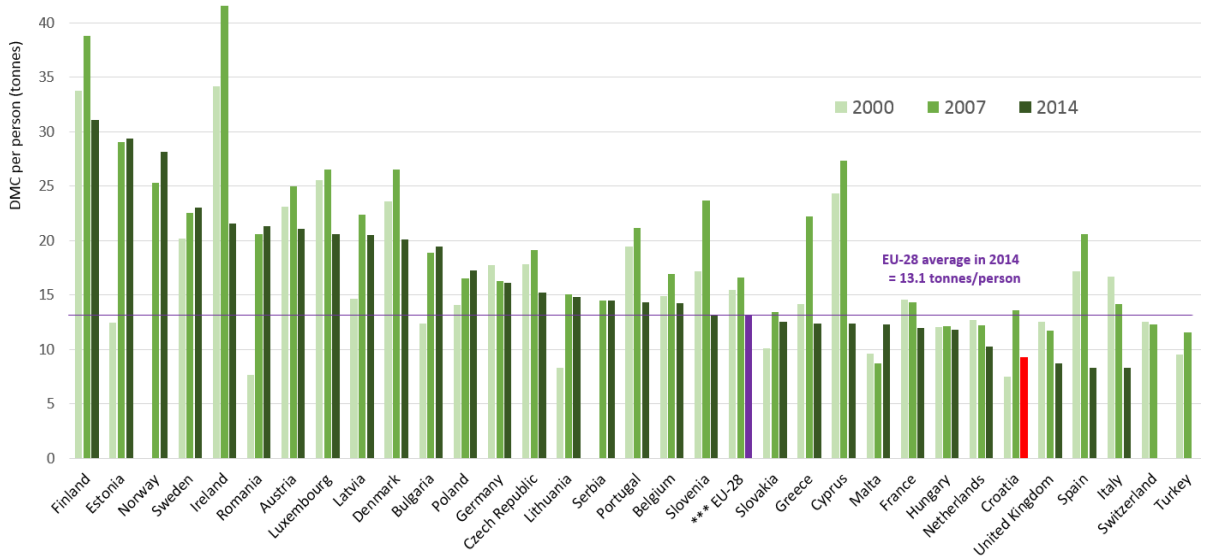
Use of materials:
39 million tonnes DMC (0.6 % of EU-28 total in 2014)
9.3 tonnes DMC/person (71 % of EU-28 average per person in 2014)
Resource productivity 1.10 EUR/kg (55 % of EU-28 average in 2014)

Structure of the economy:
agriculture: 4.5 %
industry: 26.6 %
services: 68.9 % (2014 est.)

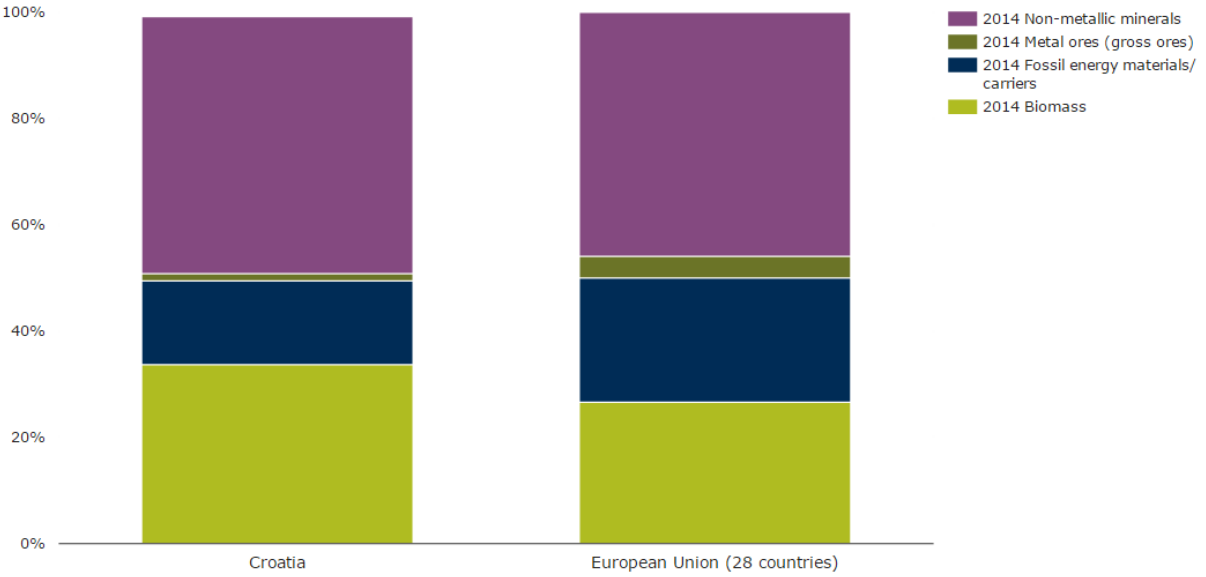
Surface area: 56,500 square kilometres (1.3 % of EU-28 total)

Population: 4.2 million (0.8 % of EU-28 total)

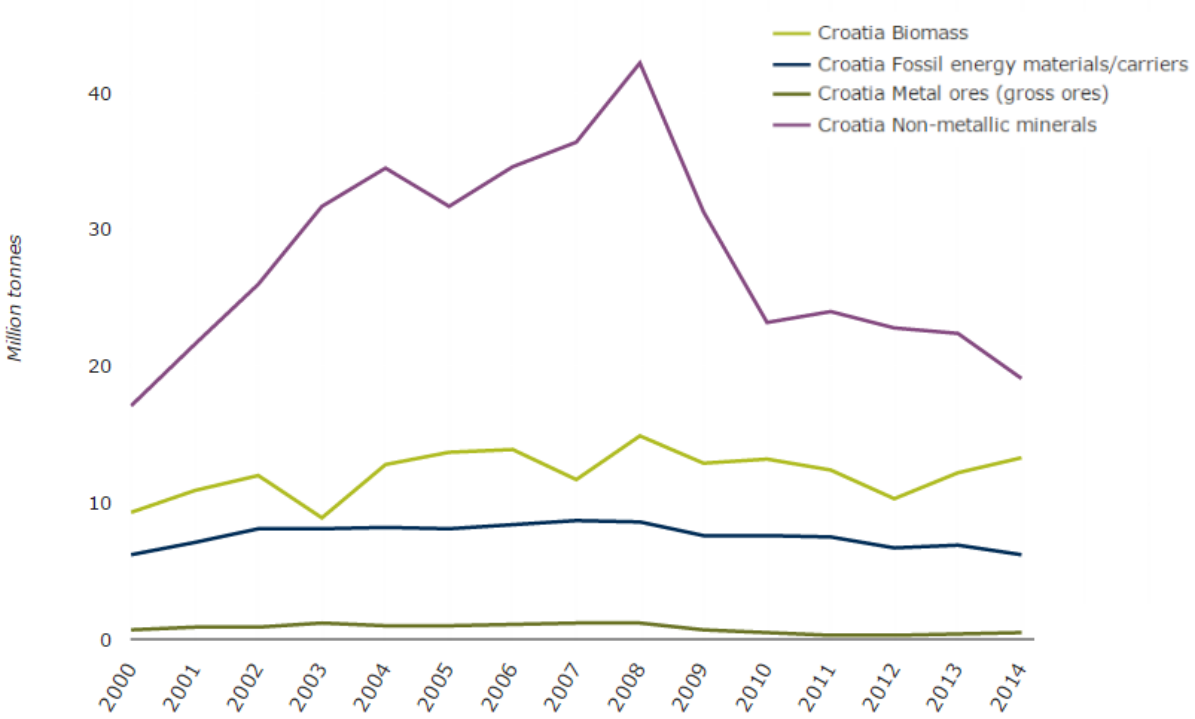
Use of materials (DMC) per person, participating countries and EU-28 (2000, 2007 and 2014)



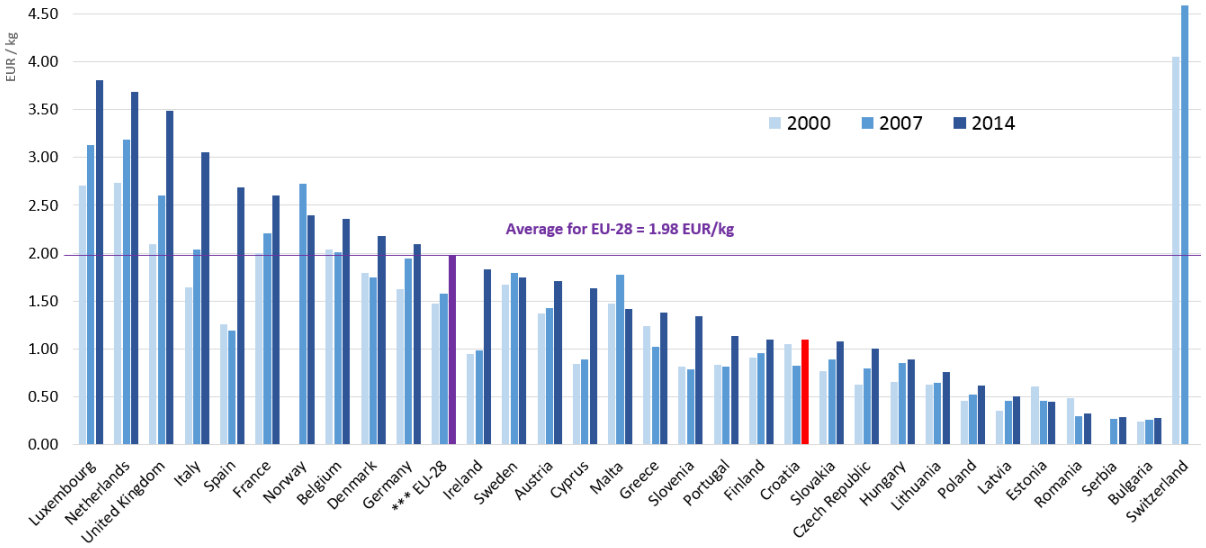
Domestic material consumption by category, EU-28 average and Croatia (2014)



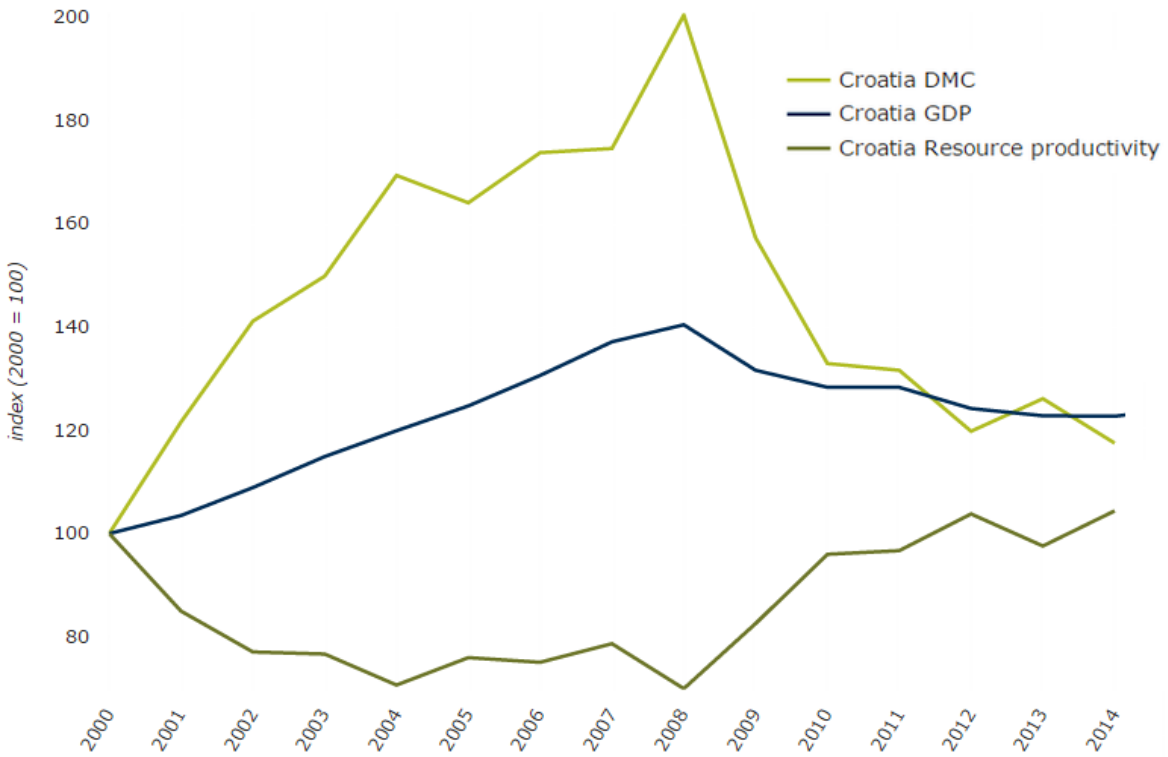
Trends in material consumption, Croatia by category (2000–2014)



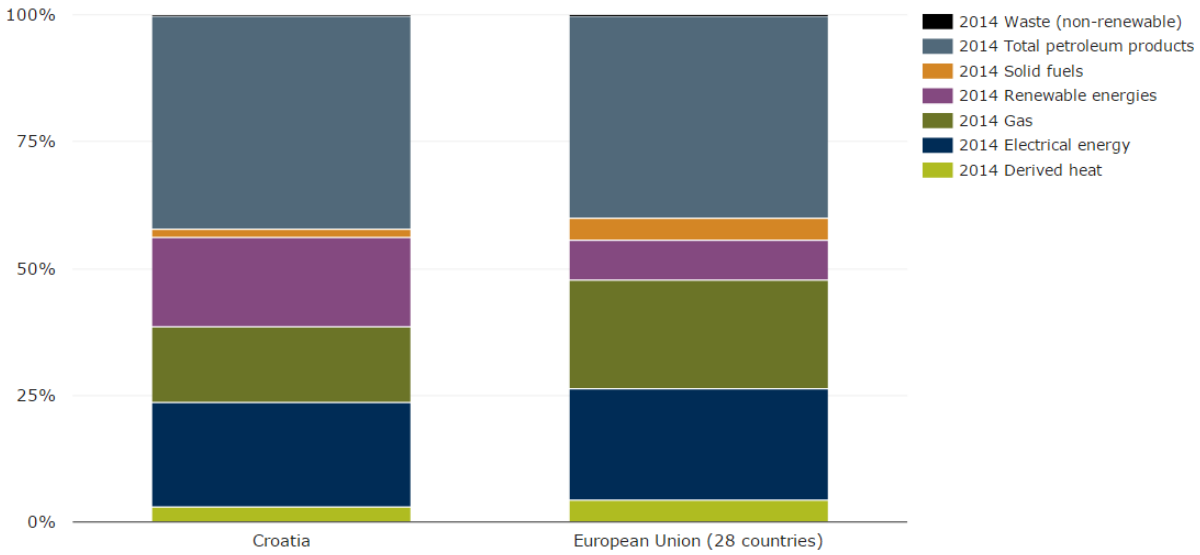
Resource productivity (GDP/DMC), participating countries and EU-28 (2000, 2007 and 2014)



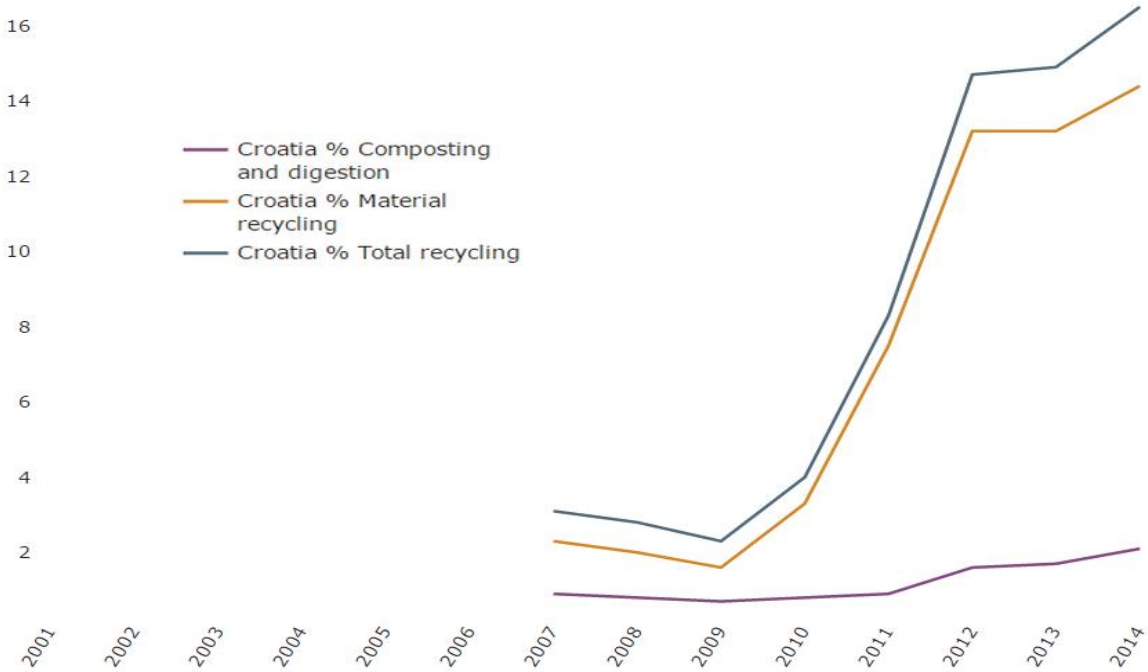
GDP, DMC and resource productivity trends, Croatia (2000–2014)



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



Recycling of municipal waste, Croatia (2001–2014)



Introduction

The concept of the efficient and sustainable management of natural resources is presented throughout the national environmental legislation and elaborated in a number of specific sectoral strategies. However, material resource efficiency is not specifically addressed through a single strategy or an action plan dedicated to resource efficiency.

The new National Environmental Action Plan is currently in drafting process. In this document one of the priorities is to foster sustainable consumption and production and boost resource efficiency through low-carbon development and circular economy. This Action Plan was made on the basis of national guidelines and 7th Environment Action Programme.

Scope of material resource efficiency

The term *resource efficiency* and its scope are not explicitly defined, but in the new National Environmental Action Plan it will be one of the important guidelines for realization of the priorities such as a) Protection, conservation and improvement of natural resources and environment, and b) Fostering sustainable production and consumption.

Driving forces of material resource efficiency

The major factors that drive material resource efficiency in Croatia are environmental concerns, political documents (see section on policies) and economic interests (see section on policy instruments).

The Strategy of Sustainable Development of the Republic of Croatia (OG 30/09) holds a key position as the document that directs long-term economic and social development, and environmental protection towards sustainable development of Croatia.

Croatia has been a Party to the United Nations Framework Convention on Climate Change (UNFCCC) since 1996 and ratified the Kyoto Protocol in 2007. To achieve its objectives in terms of curbing greenhouse gas emissions, Croatia joined the EU emission trading system (EU ETS).

The Energy Development Strategy (OG 130/09) is a baseline document for the development of a sustainable energy sector that defines policy and measures, and sets goals.

The National Action Plan for Incentivising of Production and Use of Biofuels in Transport for 2011–2020 developed by the Ministry of Economy in 2010, takes into account the objectives and rules defined by strategic documents of the EU on the promotion of the production and use of biofuels.

(http://www.mingo.hr/userdocsimages/energetika/Nacionalni%20akcijski%20plan%20poticanja%20proizvodnje%20i%20korištenja%20biogoriva%20u%20prijevozu%20za%20razdoblje%202011.-2020.pdf)

During the 2014 International Waste Management Symposium, Zagreb, it was pointed out that the circular economy is a driver for jobs and for the creation of green technologies.

Priority material resources, sectors, and consumption categories

Priority materials

Act on Mining (OG 56/13, 14/14,) adopted by Croatian Parliament in April 2013, includes **mineral resources - energy mineral resources, mineral raw materials for industrial processing, mineral raw materials for the production of construction materials, dimension stone, and metal mineral resources**. The law establishes an obligation to develop a strategy for mineral resources management and a unified information system on mineral resources to ensure the sustainable management and protection of raw minerals. This information system will be led by the Ministry of Economy, which is in charge of mining.

Act on Waste, namely Act on Sustainable Waste Management (OG 94/13) prescribes that **waste whose valuable properties** can be used must be collected and stored separately, so as to allow the management of such wastes in accordance with the waste hierarchy.

Producer responsibility schemes have been introduced for **six waste streams**, among others for waste electric and electronic equipment (WEEE) and end-of-life vehicles, that are important sources of secondary materials.

Further, the draft Waste Prevention Programme, to be part of a new Waste Management Plan, foresees **several waste categories** that should be considered as priority streams. One of them is **construction and demolition waste,** which has great potential from a resource efficiency perspective.

The Sustainable Waste Management Act prescribes restrictions on disposal of biodegradable municipal waste, including **food waste**. The act sets the obligation of separate collection of bio-waste for composting, digestion or energy recovery. It defines the order of priority of waste management, with a primary emphasis on the prevention of waste generation.

Among biodegradable waste types, **food waste** has been defined as a priority waste stream in the draft Waste Prevention Programme to be adopted as part of National Waste Management Plan.

Priority industries and economic sectors

The Act for Energy Efficiency in Final Consumption regulates the adoption of programmes and plans for improving energy efficiency and their implementation. Energy efficiency measures, especially the activities of **energy services** and energy audits, places obligations on the **public sector**, **energy subject** and **large consumers.**

1st National Action Plan for Energy Efficiency 2008–2010 contains a description of measures to improve energy efficiency in Croatia in order to achieve its 2010 goals and meet the requirement that the **public sector** becomes beacon in energy efficiency.

The Croatian Government adopted the Programme of Energy Renovation of Public Buildings for 2014–2015 in October 2013. This sets targets for the renewal of the total floor area of heated and/or cooled buildings owned and/or used by **central government**.

The Programme for Energy Renovation of Commercial Non-Residential Buildings for 2014–2020 addresses commercial non-residential buildings designed for business and/or service activity, and includes the following purposes: offices; hotels, restaurants and catering facilities; retail and wholesale buildings and industrial facilities.

Priority consumption categories

In 2014, the Croatian Government adopted several programmes focused on the energy consumption and energy efficiency of existing housing in Croatia, including the Programme for Energy Renovation of Family Houses for the period 2014–2020 which prioritizes family houses built between 1945 and 1987.

Policy framework

National strategies or action plans for material resource efficiency

The concept of the efficient and sustainable management of natural resources is presented in national environmental legislation and elaborated in a number of specific sector strategies, including:

The Strategy for Sustainable Development of the Republic of Croatia (OG 30/09;), adopted by Croatia's parliament in February 2009, contains the basic principles and criteria for determining goals and priorities that will ensure the sustainable development of the country. Promoting sustainable consumption and production is one of the main principles in directing Croatia towards sustainable development. The patterns of sustainable consumption and production can be applied in many sectors in order to reduce the consumption of natural resources, emission to air, water and soil and waste generation. Another principle, in directing Croatia towards sustainable development, is recovery of natural resources, for example, by reuse or recycling.

The Waste Management Strategy of the Republic of Croatia (OG 130/05;), adopted by Croatia's parliament in October 2005, assesses the current situation, identifies problems and obstacles, sets objectives and measures for waste management and guidelines for the recovery and disposal. Overall this document establishes the framework for waste reduction and sustainable waste management. The strategy, and the National Waste Management Plan as its implementation document, introduce continuous waste management planning which is reflected at all levels, from

national to local, while also being present in other sectors – water management, mining, physical planning, construction, etc.

The Waste Management Strategy was a framework for the preparation the **Waste Management Plan** for the Republic of Croatia for 2007–2015 (OG 85/07, 126/10, 31/11, 46/15)

The concept of the plan is based on the waste management hierarchy, which gives priority to waste prevention, recycling, reuse and other types of recovery.

According to the **Sustainable Waste Management Act** (OG 94/13), adopted in July 2013, the Ministry of Environmental and Nature Protection has made a new Waste Management Plan along with a Strategic Environmental Assessment. The Plan will be adopted in 2016.

The overall objective of **National Forest Policy and Strategy** (OG 120/03) will increase the contribution of forests to the national economy through the sustainable management, use and comprehensive protection of forest resources and biodiversity. This includes sustainable management of forest resources in cooperation with interested parties and their sustainable use is considered as use in a manner that does not lead to deterioration, but maintains their potential. The forestry sector has one of the priority roles in reducing greenhouse gas emissions, through the more widespread use of biomass as an energy source, which is achieved by management or the primary processing of timber .

The **Strategy for the Development of Industrial Processing of Wood and Paper** (OG 114/04) recognizes that ecosystem management should become one of the priority activities for each branch of this sector and by that it primarily relates to the implementation of measures such as introduction of the statutory basis for organising the collection of waste paper (incentives) or introduction of an eco-label.

The **Industrial Strategy of the Republic of Croatia** for the period 2014 – 2020 (OG 126/14, http://narodne-novine.nn.hr/clanci/sluzbeni/dodatni/433381.pdf) provides an overview of the resources of the Croatian economy, such as non-metallic minerals, metal ores, agricultural land, forests, water and marine resource.

The **Energy Development Strategy** of the Republic of Croatia, (OG 130/09) adopted in October 2009, defines the development of the Croatian energy sector by 2020 along with adoption of the EU *acquis*, thus ultimately building a sustainable energy system that satisfies three basic objectives: security of supply, competitiveness of the energy sector and the development of a sustainable energy sector.

National Energy Efficiency Programme for the period 2008 - 2016 (http://www.mingo.hr/userdocsimages/energetika/Nacionalni%20program%20energetske%20u%C4%8Dinkovitosti%202008.%20-%202010..pdf) is a master plan for energy efficiency in Croatia and a comprehensive basis for the development of the:

National Action Plan for Energy Efficiency.

The 2nd National Action Plan for Energy Efficiency by the end of 2013 (http://www.mingo.hr/userdocsimages/2.%20Nacionalni%20akcijski%20plan%20energetske%20ucinkovitosti%20za%20razdoblje%20do%20kraja%202013.pdf) was made as a prerequisite for meeting the EU target of a 20 % reduction in primary energy consumption by 2020 compared with basic (business-as-usual) scenario.

By the adoption of 3rd National Action Plan for Energy Efficiency for the period 2014–2016 (http://www.mingo.hr/public/3%20Nacionalni_akcijski_plan.pdf) continues the constant progress of activities and measures stipulated in National Energy Efficiency Programme. The 3rd National Action Plan for Energy Efficiency introduced an obligation of energy efficiency and established systems for monitoring, measuring and verifying savings that will contribute to a comprehensive and exact assessment of achieved savings, and encourage all stakeholders to the implement the measures.

National Action Plan for Renewable Energy Sources by 2020 (http://www.mingo.hr/userdocsimages/energetika/NAP_OIE.pdf) determines a national target for renewable energy of 20 % in gross final energy consumption.

The Transport Development Strategy of the Republic of Croatia for the period 2014 – 2030 (OG 131/14) aims to develop an effective and sustainable transport system, for example through the use of biofuels, in Croatia, and to ensure financial, social and environmental sustainability and energy efficiency.

The **Entrepreneurship Development Strategy** of the Republic of Croatia for the period 2013–2020 (OG 136/13) recognised the limitations for development of small business and set up five goals among which is improving economic performance. Another of the measures supports business in plant and equipment modernisation, the introduction of new technology, and procedures, standards and measures to improve efficiency in the manufacturing sector.

Act for Energy Efficiency in Final Consumption (OG 152/08, 55/12, 14/14), regulates the efficient use of energy in final consumption; the adoption of programmes and plans for improving energy efficiency and their implementation; energy efficiency measures, especially the activities of energy services and energy audits; obligations of public sector; energy and large consumers; as well as consumer rights in the implementation of energy efficiency. The purpose of this act to achieve the goals of sustainable energy development: reducing the negative environmental impact of the energy sector; improving the security of energy supply; satisfying customers' needs; and the international obligations of the Republic of Croatia in reducing greenhouse gas emissions and encouraging the implementation of energy efficiency measures. This act is the basis for the development of the National Energy Efficiency Programme and National Action Plan for Energy Efficiency.

1st National Action Plan for Energy Efficiency 2008–2010 () (http://www.mingo.hr/userdocsimages/energetika/Prvi%20nacionalni%20akcijski%20plan%20za%20energetsku%20u%C4%8Dinkovitost%202008.%20-%202010..pdf) contains a description of measures to improve energy efficiency in Croatia in order to achieve the 2010 goals and meet the requirements that the public sector becomes a in energy efficiency.

2nd National Action Plan for Energy Efficiency by the end of 2013

3rd National Action Plan for Energy Efficiency for 2014–2016

In October 2013, the Croatian Government adopted the **Programme of Energy Renovation of Public Buildings** for 2014–2015 (http://www.mgipu.hr/doc/EnergetskaUcinkovitost/Program_energetske_obnove_javnih_zgrada_2014-2015.pdf), which stipulated the refurbishment of about 200 public buildings. One of the goals is the fulfilment of the requirements of Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, according to which the Member States have, since January 2014, been required to renew 3 % of the total floor area of heated and/or cooled buildings owned and/or used by central government each year.

Energy renovation of buildings and increasing energy efficiency provide considerable financial savings. Given that buildings account for more than 40 % of total energy consumption, energy-efficient houses can provide not only a higher standard of living, but also can achieve savings on housing costs of 30–60 % if the renovation is carried out in accordance with the principles of energy efficiency. Reduced energy consumption, especially of fossil fuels, leads to a reduction of carbon dioxide emissions, which means less environmental pollution, and therefore better protection of public health. As a result, in 2014 the Croatian Government adopted several programmes aimed at identifying and analysing energy consumption and energy efficiency in existing housing in Croatia, the potential and possibilities of reducing energy consumption in existing buildings, the elaboration of implementation measures to encourage improvements in energy efficiency and assessing their impact.

Programme for Energy Renovation of Family Houses for 2014–2020 with a detailed plan for the period 2014–2016 (OG 43/14, 36/15; http://narodne-novine.nn.hr/clanci/sluzbeni/dodatni/431066.pdf). With regard to the energy performance and the construction methods, priorities are family houses built between 1945–1987.

Programme for Energy Renovation of Apartment Buildings for the period 2014 – 2020 with a detailed plan for the period 2014 – 2016 (OG 78/14, http://narodne-novine.nn.hr/clanci/sluzbeni/dodatni/432095.pdf). Apartment buildings accounted for about 35% of the total housing in Croatia.

Programme for Energy Renovation of Commercial Non-Residential Buildings for2014–2020 with a detailed plan for 2014–2016 (OG 98/14, http://narodne-novine.nn.hr/clanci/sluzbeni/dodatni/432768.pdf). Commercial, non-residential buildings are constructed for business and/or service activity, and include one of the following purposes: offices; hotels, restaurants and catering facilities; buildings for retail and wholesale businesses or Industrial facilities. Complete renovation can achieve the Nearly Zero Energy Building standard, meaning that the building is very energy efficient and that a significant share of its energy usage is from renewable sources, including renewable energy produced in or near the building itself. Nearly Zero Energy Building will be the standard for construction from the January 2019 for public buildings, and from January 2021 for all new buildings. The Ministry of Construction and Physical Planning has prepared the plan for increasing the number of Nearly Zero Energy buildings by 2020 (http://www.mgipu.hr/doc/Propisi/PLAN_PBZ_0_energije_do_2020.pdf).

Croatian Government through the **Environmental Protection and Energy Efficiency Fund** subsidizes programmes for energy renovation of buildings (family houses, apartment buildings, commercial non-residential buildings).

http://www.fzoeu.hr/en/energy_efficiency/building_sector/

The Ministry of the Environmental and Nature Protection began with activities on development of the Strategy on adaptation to climate change for the period until 2040 with a view to 2070 and the Action Plan. In this documents will be given guidelines for climate change adaptation for vulnerable sectors such as Water resources, Agriculture and Biodiversity.

The circular economy and closing material loops

According to the Act on Sustainable Waste Management (OG 94/13), Croatia is committed to providing separate collections of waste paper, metal, plastic and glass, WEEE, waste batteries and accumulators, end-of-life vehicles, waste tyres, waste oil, waste textiles and medical waste from January 2015.

A local government should to carry out the separate collection of hazardous waste, waste paper, metal, glass, plastics and textiles and coarse (bulky) waste as a way of providing:

- one or more functioning recycling yards or mobile units in its territory;
- setting an appropriate number and types of containers for separate collection of hazardous waste, waste paper, metal, glass, plastics and textiles, not covered by the waste management system for special category of waste;
- informing households about the location and change of location of the recycling yard, mobile units and containers for separate collection of hazardous waste, waste paper, metal, glass, plastics and textiles and transport services for bulky waste at the customer's request.

It is expected that the Waste Prevention Programme (currently in daft) is going to be one of a documents dedicated to linking elements of the resource efficiency and waste policies.

General policy objectives for material resource efficiency

According to the **Strategy for Sustainable Development**, some of the major objectives relating to material resources are:

- achieving balanced and stable economic growth that would have less impact on further environmental degradation and waste generation. Growth must be accompanied by a change in unsustainable behaviour patterns in households and in the public and private sectors;
- use of forests and forests land in accordance with the principles of sustainable forest management;
- stable energy supply, with the necessary reduction of adverse effects on the environment by increasing the share of renewable energy and the implementation of energy efficiency measures in all sectors.

Specific objectives in terms of activities or measures to achieve main objectives:

- in accordance with changing consumption patterns in the developed world, invest in scientific research and the application of cleaner and environmentally efficient technologies with reduced use of natural resources, reduced emissions and waste quantities, and reduced risks to health and safety;
- encourage the use of cleaner fuels and technologies, and promote those forms of transport that use energy efficiently;
- encourage efficient use of private vehicles – fuel efficiency, efficient driving styles, etc.

The Waste Management Strategy, objective:

- avoidance of waste generation and a reduction of waste amounts at source and the to be disposed of, with a simultaneous increase in material and energy recovery;

Institutional setup and stakeholder involvement

Institutional set up for material resource efficiency policies

The Ministry of Environmental and Nature Protection (MENP, http://www.mzoip.hr/) is responsible for implementing policies in the field of environmental and nature protection and raising awareness about the importance of sustainable development. Its scope may be divided into four main segments: waste management, nature protection, circular and green economy, and air protection and measures to mitigate the effects of climate change.

The Ministry of Environmental and Nature Protection is responsible for the development and implementation of waste management policy at the national level. Institutional responsibilities are divided across vertical sectors – the state is responsible for managing hazardous waste and waste incineration. Counties are responsible for managing all other types of waste, excluding municipal waste that falls under the jurisdiction of local government – municipalities and towns. Regional and local authorities implement public policies in their own domains according to the waste management plans for their respective level.

The ministry coordinates and implements the policy of sustainable development relating to sustainable consumption and production, eco-labels, green public procurement, use of renewable energy, implementation of energy efficiency, cleaner production, cleaner transport and green industries.

However, some aspects of environment are embedded in the responsibility of other ministries, namely:

- **Ministry of Economy,**
- **Ministry of Agriculture,**
- **Ministry of Maritime Affairs, Transport and Infrastructure.**

For example, the Ministry of Economy (ME, http://www.mingo.hr/en) develops and conducts policies concerning industry, energy and mining (include energy efficiency policies).

Also, there are numerous **agencies** and **councils** that, through their work, encourage the strengthening of environmental protection and the efficient use of resources.

The **Croatian Agency for the Environment and Nature** (CAEN; http://www.azo.hr/Default.aspx) collects and analyses data on the state of environmental components – air, water, sea, soil, and data on environmental pressures – polluting emissions, quantities and types of waste, waste management practices, etc.

The agency is responsible for managing **Environmental Information Systems** (EIS), for environmental assessments and reports at the national, regional and EU levels and monitoring the effects of prescribed measures, plans and strategies used as a baseline for steering of environmental protection and sustainable development policies. It also ensures the right of access to relevant environmental data and information at national and international levels, and improves communication and dissemination of information to decision makers and the public.

Croatian Chamber of Economy (CCE; http://web.hgk.hr/) is an independent professional and business organisation that promotes, represents and coordinates the common interests of its members at home and abroad. Members of the CCE are all legal entities engaged in economic activity and have headquarters in Croatia. The CCE has the right to start initiatives for adoption of laws and other regulations that affect the economic system and measures of current economic policy. It also provides opinions, comments and suggestions on drafts and proposals of laws and other regulations in this area, as well as participating in the preparation of laws and regulations of interest to its members. The CEE also prepares materials on topical economic issues and refers them to relevant government departments as joint proposals of the business community.

Croatian Business Council for Sustainable Development – the HR BCSD (http://www.hrpsor.hr/hrpsor-1-84.html) is a non-profit organization, established as part of a global network of the World Business Council for Sustainable Development (WBCSD). The mission of HR BCSD is the exchange of best practises and highlighting positive examples across the entire business sector, as well as the advocacy of dialogue between all stakeholders and the encouragement new partnerships in order to achieve greater competitiveness and the creation of innovation.

The Croatian Cleaner Production Centre (CRO-CPC, http://www.cro-cpc.hr/) is a non-governmental organization that promotes the concept of cleaner production in Croatia. The centre's services are intended for the industrial and service sectors, public administration, industry associations, educational institutions, financial organisations and the public. It is a member of UNIDO/UNEP's worldwide network of national cleaner production centres – the Resource Efficient and Cleaner Production Network.

Process to ensure stakeholder participation

The key stakeholders in Croatia are the relevant ministries who create policies relating to the management natural resources and raw materials. Responsibility is divided between the Ministry for Environment and Nature Protection, Ministry of Economy, Ministry of Agriculture, Ministry of

Construction and Physical Planning, Ministry of Maritime Affairs, Transport and Infrastructure, depending on resource. The relevant ministry prepares a draft strategy or policy and proposes it to the government which directs them to the Croatian parliament for adoption. At the same time informing and involving the general public (public, non-governmental organizations and councils) plays a big role in this process, by giving their opinions and suggestions on the proposed policies.

Suggestions for international support mechanisms to exchange experience

Cooperation with European Environment Agency (EEA) through EIONET – EEA publications (thematic reports) and webinars, are especially helpful for the exchange of good practice in policy design and the sharing of experience and lessons from the implementation of material resource efficiency policies in other countries. Also, it is very important to exchange of information on indicators, methods for measuring and monitoring of the material efficiency.

On the national level there is a lack of a national strategy or action plan dedicated to resource efficiency that should define the term *resource efficiency* and make a distinction between natural resources/resource efficiency and raw materials/material efficiency. The most useful mechanism for filling this gap will be adoption of the Strategy for Sustainable Development and further establishment of systems in fields/sectors that covers material resource elements.

Additionally, these elements should be introduced into sectorial strategies, for example, Croatia has the obligation of developing a strategy for mineral resources management and establishing a unified information system of mineral resources in order to sustainably manage raw minerals. This is prescribed by the Act on Mining (OG 56/13). The strategy should determine main goals and targets, and measures to achieve the sustainable management of raw minerals.

Policy instruments

Policy instruments commonly used for material resource efficiency

There are a number of policy instruments that propose many economic instruments aiming at environment protection and that, at the same time, are of importance from the resource efficiency.

Economic/financial instruments, including taxes, charges, financial support schemes, etc.

Regulation on unit charges, corrective coefficients, detailed criteria and measures for setting charges on environmental load with waste (OG 71/04);

- charges for burdening the environment with waste: non-hazardous industrial waste deposited in landfills and on hazardous waste. Taxpayers for non-hazardous waste are legal entities and persons disposing municipal and/or non-hazardous industrial waste to landfills. The charge is calculated and paid according to the amount of waste deposited in landfill. The

charge for hazardous waste is calculated and paid according to the amount of produced and unprocessed hazardous waste or according to the amount of produced and not exported hazardous waste and the waste characteristics.
- charges on production/import of products which at the end of their lifetime become one of the special problematic categories of waste – packaging, oils, batteries, accumulators, WEEE, end-of-life vehicles and tyres.

These charges are collected by the Environmental Protection and Energy Efficiency Fund (EPEEF, http://www.fzoeu.hr/). From its founding in 2003, this performs financing, preparation, implementation and development of programmes, projects and related activities in the field of conservation, sustainable use, protection and improvement of the environment and in the field of energy efficiency and renewable energy.

This implies that one part of the funds raised through charges is used to finance environmental protection and energy efficiency, and particularly for:

- remediation of landfills, encourage prevention and reduction of waste, waste processing and recovery of valuable properties of waste;
- encouraging cleaner production, avoiding and reducing waste and emissions in the production process;
- implementation of national energy programmes;
- encouraging the use of renewable energy sources – solar, wind, biomass, etc.;
- encouraging sustainable construction;
- encouraging cleaner transport.

Besides that, the fund participates in co-financing of programmes, projects and other activities (see above) when organised and financed by international organisations, financial institutions and bodies, and other legal entities. Examples are “Put your house in order”, “Energy management in cities and counties” and “Promoting energy efficiency in Croatia” in collaboration with UNDP Croatia.

The objective of the programme “Bring your house in order” (http://www.enu.fzoeu.hr/hio) is to establish energy management in the buildings owned or used by Croatian Government while reducing energy consumption by 10 – 30%.

The “Energy management in cities and counties” project (http://www.enu.fzoeu.hr/sge) introduces energy management in cities and counties by encouraging application of the principles of energy efficiency in buildings owned by the city or county, or in those for which the city or county pays the bills for energy and water consumption.

The primary objective of the “Promoting energy efficiency in Croatia” project (http://www.enu.fzoeu.hr/o-projektu) is to encourage the use of economically viable, energy efficient technologies, materials and services, both in the public sector and in households, and all in order to reduce unnecessary energy consumption and emissions of harmful greenhouse gases.

- Incentive charge

The incentive charge is paid to encourage the production of electricity from plants using renewable energy sources and cogeneration plants, in accordance with the national strategic goals related to

the share of renewable energy sources and cogeneration in total electricity consumption. The money is used to encourage the electricity production from power generation plants using renewable energy sources and cogeneration plants.

Regulation about incentives for electricity from renewable energy sources and cogeneration (OG 128/13)

- Charge for the use of beneficial functions of forests

The legal entities and private persons engaged in economic activities have to pay a quarterly charge of 0.0265% of total revenues for use the beneficial functions of forest . This charge collected by *Hrvatske šume*, the national forest management company, is used for financing biological regeneration and forest protection, forest management on karst, rehabilitation and reconstruction of stands affected by drought and other disasters, construction of forest roads, demining forest areas and other work necessary for preservation and promotion of beneficial functions of forests.

The Forest Act (OG 140/05, 82/06, 129/08, 80/10, 124/10, 25/12, 18/13, 94/14)

Regulatory obligation

- There is an obligation for the owner of a building that is for sale or lease, or under construction, to provide the prospective buyer, tenant or future owner with an energy certificate valid for up to 10 years. This obligation is a part of the implementation of strategies to increase energy efficiency and reduce carbon dioxide emissions, i.e., implementation of European Directive 2010/31/EU (Ordinance on energy certification of buildings, OG 48/14, 150/14, 133/15 ;)

Voluntary agreements

Products that have a smaller environmental footprint than equivalent products throughout its life cycle are awarded with a national environmental protection label "*Environmentally Friendly*". . The goal of this environmental label is to promote products with reduced adverse impacts on the environment compared to other equivalent products, thus contributing to the efficient use of natural resources and a high level of environmental protection and consumer information. The environmental protection label *"Environmentally Friendly"* is granted by the Ministry of Environmental and Nature Protection and is valid for a maximum of three years.

(Ordinance on Environmental Label, OG 70/08, 81/11 ;)

Regulation of Environment Protection Act of the Republic of Croatia (OG 80/13, 78/15) establishes a framework for the implementation of the Regulation (EC) No. 66/10 of the European Parliament and of the Council of 25 November 2009 on EU Eco-labels and Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation of organisations in the EU eco-management and audit scheme (EMAS), repealing Regulation (EC) No 761/2001 and Commission Decision 2001/681/EC and 2006/93/EC. According to the act, the Ministry of Environmental and Nature Protection is responsible for awarding the EU Eco-label in Croatia.

The Eco-management and Audit Scheme (EMAS) is a voluntary instrument of environmental protection which encourages organisations of various economic activities on improve environmental management and inform the public about environmental impacts. The Croatian Agency for the Environment and Nature is responsible for the establishment and maintenance of the EMAS Register, and the Ministry of Environmental and Nature Protection is responsible for implementing the inspection supervision.

Examples of good practice

To raise awareness of the advantages of waste management and resource efficiency, and to promote the benefits of a circular economy to business and civil society, Zagreb hosted an International Waste Management Symposium in 2014. (http://www.mzoip.hr/hr/ministarstvo/vijesti/cirkularna-ekonomija-pokretac-za-nova-radna-mjesta-i-kreiranje-zelenih-tehnologija.html) and international Conference 'Croatia waste expo - Gospodarenje otpadom 2015.' (http://www.mzoip.hr/hr/ministarstvo/vijesti/ucinci-cirkularne-ekonomije-mjerljivi-na-najjasniji-nacin---kroz-radna-mjesta.html)

It was pointed out that the circular economy is a driver of jobs and the creation of green technologies. Examples of a good practice from other countries were presented.

Targets and indicators

Targets for material resource efficiency

The Strategy for Sustainable Development:

- reduce the amount of finally disposed of waste as well as the amount of hazardous waste generated by approx. 20 % by 2010, compared to 2000;
- increase the share of renewable energy, excluding hydro power plants exceeding 10 megawatts, in gross final energy consumption to 20 % by 2020;
- by 2016 decrease final energy consumption by 9 %, compared to the 2001–2005 average;
- by 2012 decrease primary energy consumption by 20 %, compared to the primary energy consumption in 2008.

The Energy Development Strategy, common goals (with EU Energy Strategy):

- 20 % of renewable energy in gross final energy consumption by 2020;

- 10 % share of renewable energy used in all transport modes, in comparison the final energy consumption in land transport;
- through applying energy efficiency measures, decrease final energy consumption by 9 % in the period up to 2016. Compared to the average value in the period 2001. – 2005.

National goal:

The share of electricity produced from renewable energy sources, including large hydropower plants, in total electricity consumption in the period up to 2020, held at the level of 35 %.

Indicators to monitor use of materials and resource efficiency:

Examples of indicators included in the Strategy for Sustainable Development include:

- domestic material consumption;
- total quantity of generated waste;
- amount of recycled waste and the amount of disposed waste;
- annual energy consumption per person;
- share of renewable energy in final energy consumption.

The Croatian Agency for the Environment and Nature regularly publishes these indicators in the *State of the Environment Report of the Republic of Croatia* (2014; http://www.azo.hr/Izvjesca29) and in the *Environment in Your Pocket* (http://www.azo.hr/Publication08).

Besides the indicators prescribed by Strategy, the Croatian Agency for the Environment and Nature has developed and publishes a broader list of indicators:

a) **material flow accounts** (**MFA) indicators:** material productivity; domestic extraction; import, export and domestic material consumption by material category; and decoupling domestic extraction and direct material input from gross domestic product (GDP);

b) energy consumption in building construction, final energy consumption by sector, gross final energy consumption by energy forms, energy efficiency (ODEX), renewable energy production, total quantities of collected and recovered special waste categories.

The National List of Indicators (NLI), 2015 revision (http://www.azo.hr/ObjavljenaNacionalnaLista) consists of a datasheet which includes information on the data source, data set and data flow, defines the time periods of collection, the calculation methodology, data accessibility and reporting obligations. In the NLI the new topic – material flow accounting – has been introduced, giving clear and precise instructions for the development of material flow accounting indicators.

The data for material flow accounts are collected by Croatian Bureau of Statistics (CBS) who, in the process of the harmonisation with the EU statistics, has conducted a survey on economic material flow accounts. Since 2014 the Croatian Bureau of Statistics has published first release economic material flow accounts on its web page (http://www.dzs.hr/default_e.htm).

Optional questions

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

Croatia is finalizing some of the major documents such as new National Environmental Action Plan. The new Waste Management Plan will be adopted in 2016. The Strategy on adaptation to climate change for the period until 2040 with a view to 2070 and the Action Plan are being drafted. The Ministry of Construction and Physical Planning together with Croatian Institute for Spatial Development made the new Spatial Development Strategy which was adopted by the Croatian Government in September 2015 and forwarded it to the Parliament on further action. Reference to all these documents is already given in the relevant headlines of this document.

However, there are some major documents in force for quite some time.

Sustainable Development Strategy of the Republic of Croatia (OG 30/09) prescribes major objectives for resources:

- conservation of biological and landscape diversity, which implies rational management and protection of natural values;
- Planning economic activities, and especially exploitation projects, in a manner to ensure the rational use of non-renewable natural resources and sustainable use of renewable natural resources;
- balanced and stable economic growth which would have as little impact as possible on environmental degradation and waste generation. Growth must be accompanied by a change in unsustainable behaviour patterns in households and in the public and private sector;
- stable energy supply, with the necessary reduction of adverse effects on the environment by increasing the share of renewable energy and implementation of energy efficiency measures in all sectors;
- sustainable management of the Adriatic Sea, coast and islands, and conservation of marine ecosystems, which implies reducing inputs of waste material, foreign micro-organisms and pathogens into the sea from all pollution sources

The Waste Management Strategy of the Republic of Croatia (OG 130/05) establishes the framework for waste reduction and sustainable waste management. The Waste Management Plan of the Republic of Croatia (OG 85/07, 126/10, 31/11, 46/15 ; ;) is a major waste management planning document introducing the concept of waste management hierarchy.

The Water Management Strategy (OG 91/08) takes into account the main benchmarks:

Water is a fundamental natural resource

- water is an essential substance for life and a prerequisite for the maintenance of all ecosystems;
- drinking water is a foodstuff and necessary for the human life and the functioning communities;
- water is a natural resource and a factor of production in many economic sectors;
- water is subject of intense care from all relevant European and international institutions, and proper care for water and the water environment is a prerequisite for the desired international integration

Water management, within the concept of sustainable development, strikes a balance between the use of resources to improve living conditions and stimulate economic development, and protection of resources and the conservation of their natural functions and features. The Water Management Strategy establishes a unified water management policy and defines strategic goals, establishes current and future needs and services, and identifies how they might be met through management plans for the country's four river basins.

In September 2014, the Croatian Government adopted regulation about drafting and implementing the **Marine Environment and Coastal Areas Management Strategy** (OG 112/14) that, in addition to provisions of the Marine Strategy Framework Directive, transposes the provisions of the Protocol of Integrated Management of Coastal Zone Management (Barcelona Convention) on to a draft national strategy of integrated coastal management. Regulation, therefore, brings the draft Marine Strategy together with the Integrated Coastal Zone Management Strategy in one document – the Marine Environment and Coastal Zone Management Strategy. Preparatory procedures and/or documents that will provide a professional background and elements for the development of a strategy include the Initial assessment of the state of the environment and coastal zone management, a set of characteristics of good environmental status, and a set of goals for protection of the marine environment and coastal zone management. An Initial assessment of the marine environmental status has already been made, but it is necessary to carry out a second part of the assessment relating to the environment of the coastal zone and a third relating to the management of coastal zones.

Since the Adriatic Sea and coast are considered a resource of strategic importance for sustainable development, the Croatian Government adopted in the December 2014 **Action Programme for Marine Environment and Coastal Zone Management Strategy** (OG 153/14, http://narodne-novine.nn.hr/clanci/sluzbeni/dodatni/434153.pdf), which establishes constant monitoring and observation of the Adriatic Sea (Monitoring programme).

The **Strategy and Action Plan for the Protection of Biological and Landscape Diversity** of the Republic of Croatia (OG 143/08) is a fundamental document for nature protection, which sets long-term goals and guidelines for the conservation of biological and landscape diversity, and protected natural values, including implementation methods, in accordance with the overall economic, social and cultural development of Croatia.

Croatian **Tourism Development Strategy** until 2020 (OG 55/13) was adopted by the Croatian parliament in April 2013.

Tourist development is based on ten principles, among which is:

- environmentally responsible development, which implies decreasing heat loss, energy efficient heating/cooling systems, increasing use of renewable energy, rational use of available space respecting destinations' carrying capacity

One of the key conditions of tourist development is the long-term space protection and sustainable ecosystem management. It is important to emphasise that tourism development should be based on improving environmental protection, preserving natural resources, and the responsible and sustainable management of tourist development.

The **Agriculture Act** (OG 30/15), adopted by Croatia Parliament in March 2015, defines objectives and measures of agriculture policy, for example, ensuring sustainable management of natural resources and measures for climate change mitigation. and regulates the implementation of EU agricultural regulations.

For more information please see section on national policies

Which way should resource efficiency go in the future?

- Circular economy and new business models
- To shift focus from waste policies to resource policies and consumption patterns
- Integration of established EU policies and their direction to the resources efficiency targets (EU/national)
- Revision and improvement of economic instrument to support resource efficiency

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

After continuous growth up to 2008, a significant reduction in domestic material consumption followed, primarily as a result of the economic crisis and a resulting reduction in production: since 2008, GDP has declined. Resource productivity shows a strong upward trend from 2008 caused by a significant decline in domestic material consumption compared to a more moderate decline in GDP.

A disaggregated analysis of domestic material consumption (DMC) shows that the consumption of non-metallic minerals is dominant in the economy (19,1 million tonnes in 2014), constituting almost a half of Croatia's total DMC (39,1 million tonnes in 2014). The consumption of non-metallic minerals is strongly dependent on economic development. After 2008. the consumption of non-metallic minerals has shown a significant decline as a result of the decrease in consumption of materials for

construction and industrial use. The consumption of biomass shows annual fluctuations due to weather conditions (climate), while the consumption of metal ores and fossil energy material have remained rather stable over the period. Metal ores constitute the smallest part of the main categories.

Non-metallic minerals are the dominant category in Croatia's DMC, with share of 48.5% of DMC in 2014,almost at the same level as in European Union (46%in2014). With share of 33,7%, biomass makes up approximately a third of DMC in Croatia, much more than the EU-28 average (26.7%). Fossil energy materials/carriers had a share of 15.8% in 2014, while the share in EU-28 amounts to almost a quarter (23.2%). Metal ores make up the smallest share, approximately 1% of the total DMC in Croatia, compared to a much higher share in the EU-28 (approximately 4%).

Resource productivity increased by 4.4% between 2000 and 2014, from EUR 1.051 per kilogram in 2000 to EUR 1.097 in 2014. Although there is an upward trend in resource productivity in Croatia, it is still much below the EU-28 average of EUR 1.982 per kilogram in 2014 – almost double that in Croatia.

Total petroleum products are dominant in primary energy consumption, with share of 41.9% in 2014 compared to the EU-28 average of 39.8%. Follow electrical energy with share of 20.4%. Renewable energies with 17.7% have a significantly larger share in primary energy consumption than in the EU-28 (7.7% in 2014). Gas contributes with 15% while waste (non-renewable) has the smallest share in primary energy consumption, just 0.2%.

Total recycling significant increased between 2007 and 2014, from 3.1% in 2007 to 16.5% in 2014, but is still a much below total recycling in European Union (EU-28 43.4 % in2014). The largest share in total recycling has material recycling (14.4% in 2014) while composting and digestion are negligible, 2% in 2014 compared to 15.8% in EU-28.