

Twinning Light Project

HR/2009/IB/EN/02TL

"Improvement of Waste Reporting in Croatia"

IMPROVEMENT OF WASTE REPORTING IN CROATIA

Assessment of CEA's Waste Information
Dissemination System and CEA's website

Final Report from 22.11.2013



CROATIAN
ENVIRONMENT AGENCY

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Twinning Project	
Project title	Improvement of Waste Reporting in Croatia
Project number	HR/2009/IB/EN/02TL
Project duration	May 2013 – October 2013
Project budget	160.000 €
Beneficiary country (BC)	Republic of Croatia
Commissioned/financed by	European Commission, Instrument for Pre-accession Assistance (IPA) of the European Union
Project partners	Croatian Environment Agency (CEA) Umweltbundesamt (Environment Agency Austria)
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Overall project objectives	Support to environmental protection in Croatia through strengthening capacities of the Croatian Environment Agency (CEA).
Project purpose	Development of integrated waste management system through improvement of waste reporting and strengthening the capacities of Croatian Environment Agency.

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1 INTRODUCTION

This report describes the results of the activities 3 and 4.1 of the Twinning Light Project “Improvement of Waste Reporting in Croatia”. In these activity the existing waste information dissemination system of the Croatian Environment Agency (CEA or AZO = Agencija za zaštitu Okoliša) and especially the waste related parts of CEA’s website (<http://www.azo.hr>) are analysed with the objective to derive recommendations for the improvement of this system.

Among the core tasks of the Croatian Environment Agency are

- To collect data on waste generation, collection, treatment, landfilling, prevention, re-use and recycling,
- to produce concise, reliable information out of these data and other sources,
- to disseminate this information to
 - the experts of the Ministry of Environmental and Nature Protection, of other national authorities, of regional and local competent authorities for their planning and monitoring tasks
 - to experts of the waste management sector including public and scientific institutions as well as public and private businesses,
 - to industries
 - to interested and affected parties and
 - to the wider public
- to fulfil corresponding reporting obligations with regard to different EU waste directives.

The core of the present report is the assessment of the Croatian Environment Agency’s (CEA’s) waste information dissemination system. The central parts of this system are the waste information parts of CEA’s homepage (<http://www.azo.hr>). Further parts are the reports prepared by CEA and answers to direct requests from experts and citizens on waste matters.

While CEA’s system for disseminating waste information lies in the focus of this report, also the data collection, storage and processing system and the fulfilment of the reporting obligations are shortly described.

In addition, CEA’s waste information system cannot be analysed completely on its own. It is complemented by the waste information system of the Ministry of Environmental and Nature protection and by waste information system of other Croatian institutions. Thus also these need to be shortly introduced.

After the description of the Croatian waste information systems an overview is given of the corresponding Austrian systems. In addition internet pages on waste of environment agencies from different EU-Member States are introduced. The Austrian waste information dissemination system serves as benchmark for the evaluation of CEA’s waste information dissemination systems. The waste homepages of the other environment agencies serve as benchmarks for the evaluation of CEA’s waste page.

The evaluation finally leads to conclusions and recommendations on the improvements of CEA's waste information dissemination system as a whole and more specifically on the CEA's internet-waste-page.

2 TASKS OF CEA AND ITS WASTE MANAGEMENT INFORMATION SYSTEM

The Croatian Environmental Protection Act (Official Gazette No. 80/13) defines both

- in Article 38 the general tasks which have to be fulfilled by the Croatian Environment Agency (CEA) (see Box 1 for a selection of these tasks) and
- in Article 152 the obligations of all public authorities regarding the dissemination of environmental information (see Box 2 for a selection of these tasks).

Box 1: Selected tasks of the Croatian Environment Agency (CEA) according to Article 38 of the Croatian Environmental Protection Act (Official Gazette No. 80/13)

- collection and integration of collected environmental data and information for the purpose of ensuring and monitoring the implementation of the environmental protection and sustainable development policy
- establishment, development, maintenance and coordination of an environmental information system for Croatia,
- maintaining appropriate environmental data bases,
- monitoring and reporting on environmental status and on the environmental effects on health,
- preparation of data for drawing up documents and reports in relation to environmental protection and sustainable development,
- drawing up technical bases for developing or cooperating on developing documents on sustainable development and environmental protection as well as reports submitted on the implementation of those documents,
- developing the Environmental Status Report
- developing and updating the National indicator list,
- cooperation with public authorities and other persons, international bodies (such as the European Commission and the European Environment Agency), institutions and associations in the development and realisation of environmental protection projects and programmes,
- fulfilling reporting obligations,
- ensuring open access to environmental information, held by it and under its supervision.

Box 2: Selected obligations of public authorities with respect to dissemination of environmental information according to Article 152 of the Croatian Environmental Protection Act (Official Gazette No. 80/13)

- texts of relevant international regulations and their implementation in Croatia
- strategies, plans, programmes and other documents related to environmental protection, including reports on the implementation of these strategies/plans/programmes
- environmental status reports,
- data relating to environmental monitoring,
- permits/approvals which have a significant impact on the environment as well as treaties concluded with the aim of environmental protection,
- studies and risk assessments related to environmental components,
- other data relevant for environmental protection.

The legal basis for the public information system on waste management is provided by Article 137 of the Act on Sustainable Waste Management (Official Gazette No. 94/13). This information system shall serve for the monitoring and control of the waste management system in the Republic of Croatia. and shall contain in particular the following elements:

- data from the Records of Rulings on Declassification of Waste;
- data from the register of by-products and the register of rulings on the end-of-waste status;
- data from consolidated reports of the local self-government units;
- data on educational and informative activities;
- data on waste collection drives;
- data on the charge for the proximity of non-compliant landfills;
- data from the Register of Managing Special Waste Categories;
- data on the quantities, types and streams of waste contained in the register of the generation and flows of waste;
- data on persons responsible for drawing up plans for the management of waste coming from the waste producer;
- data on waste management education certificates;
- a list of accredited test laboratories;
- data on special waste categories and data contained in the register of persons liable to payment of a special waste management charge;
- data from the registers for carrying out waste management operations;
- data from the registers, rulings and reports on the transboundary movement of waste;
- data on permits and certificates issued for waste management operations and other data contained in the Register of Waste Management Operations;
- data on the Croatian waste management facilities;
- indicators on the state of waste generation, waste management and on the compliance with waste management targets, and
- data on regulations, guidelines, plans and projects in the field of waste management, including other data of relevance to waste management issues.

The waste information system shall also include:

- The electronic register on waste generation and flows (e-onto);

- A register of the applications for permits on waste management operations;
- A register of the applications for accredited laboratories;
- A register of the applications for the Pollutant Emission Register under a special law;
- A register of the applications for transboundary movement of waste;
- A register of the applications for permits to manage special waste categories; and
- A register for discarded waste locations.

The data for the waste management information system are to be provided by competent authorities of the local and district (regional) self-government units and legal persons with public powers.

The task to maintain the waste management information system is given by Article 137 of the Act on Sustainable Waste Management (Official Gazette No. 94/13) to CEA. This task shall be fulfilled by using electronic software solutions which enable network input, processing and display of data.

CEA shall take measures to ensure that data are collected and entered into the information system in a timely and integrated manner. On the basis of the data collected CEA shall draw up a report on waste management as a constituent part of the state of the environment report.

According to Article 138 of the Act on Sustainable Waste Management CEA is responsible for the coordination of reports required by the waste management legislation of the European Union and especially for the reporting on the implementation of the EU Waste Framework Directive (2008/98/EC). CEA shall especially report on the achievement of the recycling targets prescribed by EU waste legislation.

In total CEA's waste information dissemination model is the part of the waste management information system as defined in Article 137 of the Act on Sustainable Waste Management which implements the obligations on waste information dissemination as defined in Article 152 of the Environmental Protection Act (Official Gazette No. 80/13) (see Box 2 above).

3 BASIS FOR INFORMATION DISSEMINATION – DATA COLLECTION AND STORAGE

3.1 Waste data collection

Most data regarding the generation, collection and treatment are collected by direct on-line input of waste data to CEA's Environmental Pollution Registry (EPR) by the waste owners and waste management companies.

Additional data are collected for those waste streams for which Extended Producer Responsibility was introduced by EU directives – that is for packaging waste, end-of-life-vehicles, waste from electrical and electronic equipment, waste batteries, waste tyres and waste oil. For these Extended Producer Responsibility Systems the Croatian Environmental Protection Fund acts as a clearing house and receives the market, product and waste flow data from the producers, importers, waste collection systems and waste treatment companies. Aggregated annual waste flow data are forwarded to CEA by means of Excel-tables.

In a similar way data on asbestos waste collection are made available via the Croatian Environmental Protection Fund to CEA.

Further waste management data are retrieved from permit applications and other sources.

3.2 Waste data storage

3.2.1 The Environmental Pollution Registry (EPR)

At present, the EPR is the largest of CEA's databases. It contains a set of data on the sources, types, quantity, method and points of release, transfer and disposal of pollutants and waste into the environment that are stored for 10 years. It contains the quantities of generated, collected, recovered/disposed, by waste types including municipal, industrial, hazardous and other waste.

The EPR monitors pollution in Croatia by collecting data on the release of 128 pollutants, including heavy metals, pesticides, GHGs, particulate matter, and waste into the environment (air, soil and water). The pollutants that are monitored have been selected because they pose a potential public health and environmental risk according to European and international standards, which stipulate the keeping of the Pollutant Release and Transfer Registers.

Data submitted by entities that have a data submission obligation has a wide range of users, including county and City of Zagreb authorities, inspectors, the Ministry of Environmental Protection, Physical Planning and Construction (now the Ministry of Environmental and Nature Protection), other ministries, the Environmental Protection and Energy Efficiency Fund, the professional community, and the concerned public.

Pursuant to the provisions of the Ordinance on the Environmental Pollution Registry (OG 3 5/08), the obligation to enter the required data demands intensive communication between users and CEA's staff. Therefore, CEA improved its user support during the last years (CEA 2012).

3.2.2 Other waste management data bases

CEA's waste management information system comprises following further data bases:

- **GIS browser Waste Management - Landfill Inventory**

The Landfill Inventory is a GIS database on landfills in Croatia, used for landfill monitoring and as a source of information for the preparation of waste management plans, plans for remediation and closing down landfills, as well as in the process of setting up regional waste management centres. The database was improved, which resulted in an increase in GIS application capacities (CEA 2012).

- **The Waste Management Plans Database** contains a list of the waste management plans of waste producers, including.

- adopted Plans of counties/ cities/ municipalities,
- data on waste management plans prepared by companies producing more than 150 t/year non-hazardous, or 200 kg/year hazardous waste.

As of 2011, the database contained 109 waste management plans (CEA 2012).

- **Databases on the waste types**

- WEEE,
- waste oils,
- end-of-life vehicles

These data base contain data on production/imports of products put on the Croatian market and on the amount of waste collected, recovered and treated.

- **Transboundary Movement of Waste Database** includes data on carried out imports/ exports of waste and granted licenses

- **Waste Management Permits Register** - data on waste management permits (hazardous, non-hazardous, municipal waste), concessionaires, transporters, mediators, exporters

- **List of laboratories accredited for waste analyses - chemical and physical characteristics of waste**

The Laboratory Database was created on the basis of the Database on Institutions Involved in Soil-Related Field Work and Laboratory Analyses. Its objective is to record the current situation in laboratories for the analysis of soil and plant material, to prepare a list of laboratories and the analyses they carry out, the methods they apply, and their hazardous waste management procedures.

Mostly these data bases are designed for being used by competent authorities. However, the landfill inventory is also designed as information system for the wider public which can be accessed by CEA's internet site.

In addition the waste management plans of public institutions and aggregated data on waste flows including asbestos, permits and recycling installations can be retrieved from these data bases via CEA's internet site.

Further data from these data bases are made available to the wider public by means of reports, which are prepared by the CEA.

4 CEA'S WASTE INFORMATION DISSEMINATION SYSTEM

Figure 1 provides an overview of the information flows through Croatia's waste management information system and of CEA's Waste Information Dissemination system. (For ease of understanding plausibility checks by counties, the Ministry of Environment, the Environmental Protection Fund and CEA itself are omitted from Figure 1). Figure 1 shows the 4 main elements of CEA's waste information waste information dissemination model – CEA's internet site, direct access to selected parts of waste data bases, CEA's reports and direct consultation by means of email and telephone – as well as the central hub-function of CEA's internet-site for getting access to the data bases and the reports.

In Figure 1 it is also indicated that not all of the data collected and stored in CEA's data bases are accessible by the general public. Only the GIS landfill inventory is fully accessible. The other data bases can only be partly accessed by the internet. The CEA reports contain summary tables and information but not the primary raw data.

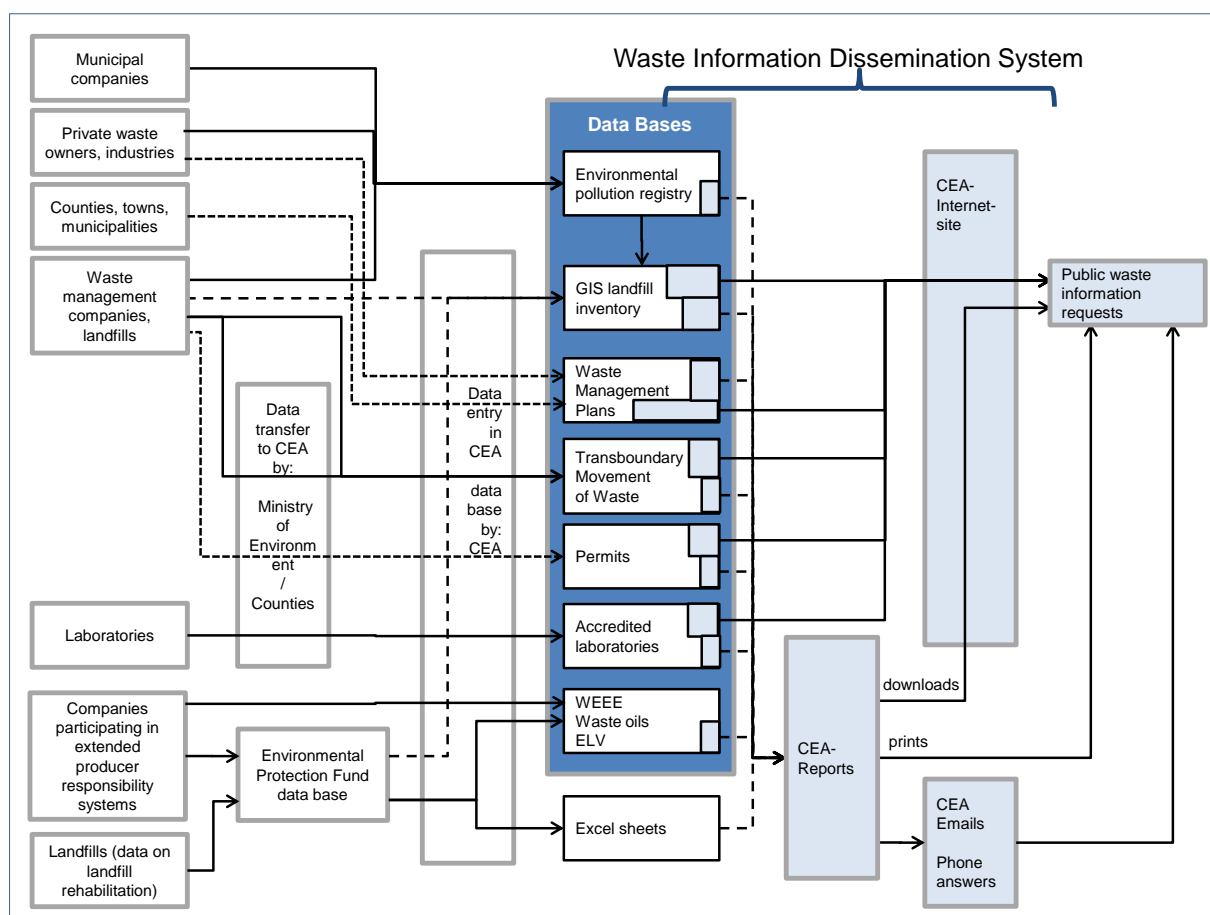


Figure 1: Information flow through Croatia's waste management information system and CEA's Waste Information Dissemination System

4.1 CEA's Internet Site

Figure 2 shows the home-page of CEA's internet site www.azo.hr. It can be seen that the topic "waste" is a prominent issue which can be easily accessed from the home-page. The "waste" button is also shown on all other levels of the internet-site, so that the waste top-page can be accessed from all sub-pages of CEA's internet-site.

The home-page and also the frames of the pages below feature

- a switch between Croatian and English,
- a search button,
- a button for access to explanatory notes on CEA's Environmental Information System ISZO
- and buttons which provide access to reports (mainly the state of environment report) and publications (e.g. the publications "Environment in your Pocket" and CEA's "Annual Report").

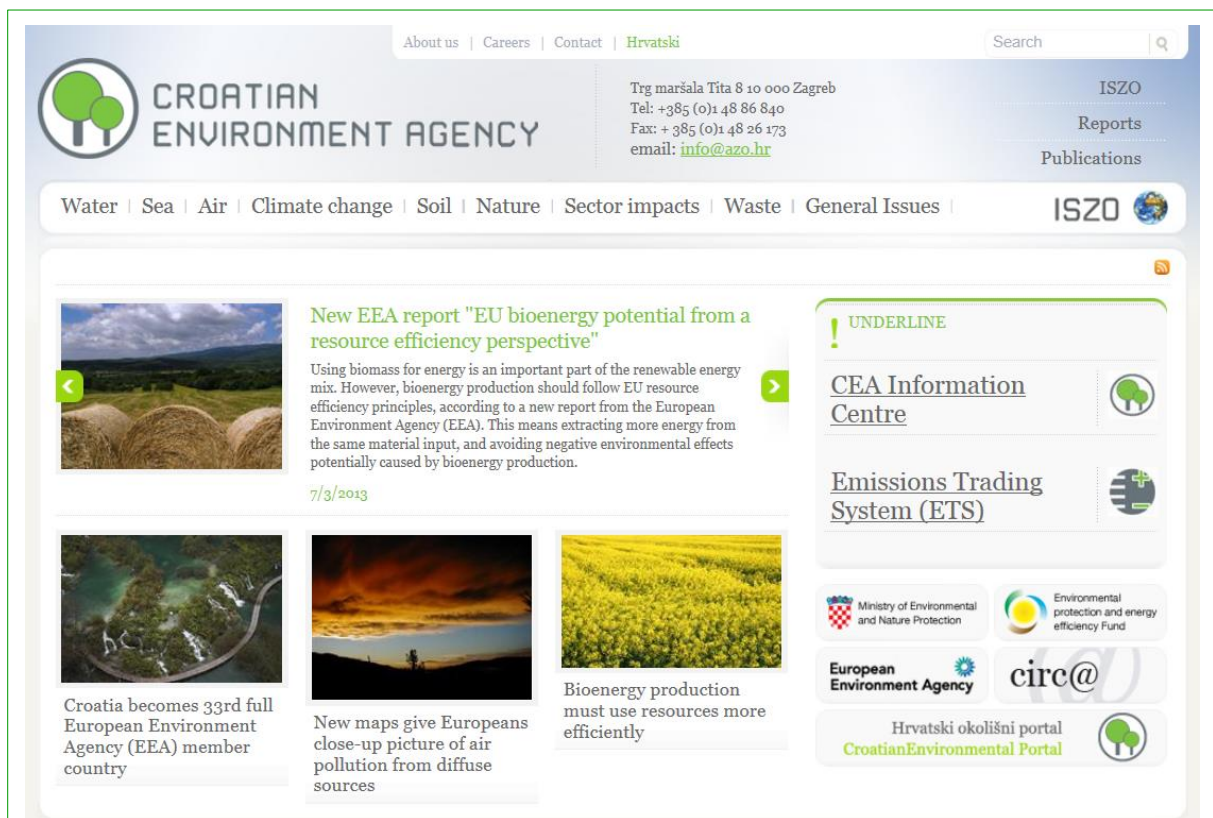


Figure 2: Top-page of CEA's internet site (<http://www.azo.hr/English>)

4.1.1 CEA's top-web-page on waste

The main waste page of CEA's internet site gives a short introduction on waste the information which can be accessed by this web-page (see Figure 3). The information can be accessed

- either via links directly within the introduction texts
- or via a menu bar on the right side of the page.

The menu bar contains following buttons:

- Indicators (Pokazatelji)
- Databases (Baze podataka)
- Reports (Izvešća)
- Publications (Publikacije)
- Projects (Projekti)
- Collaboration with others (Suradnja s drugim institucijama)
- Additional Information (Dodatne informacije).

In this context "publications" means "publications which are not reports". These publications include waste management manuals and information brochures.

The link which can be activated by clicking on the last sentence of the text "...more on Waste Management in Croatia" directly leads to the page "Additional Information".

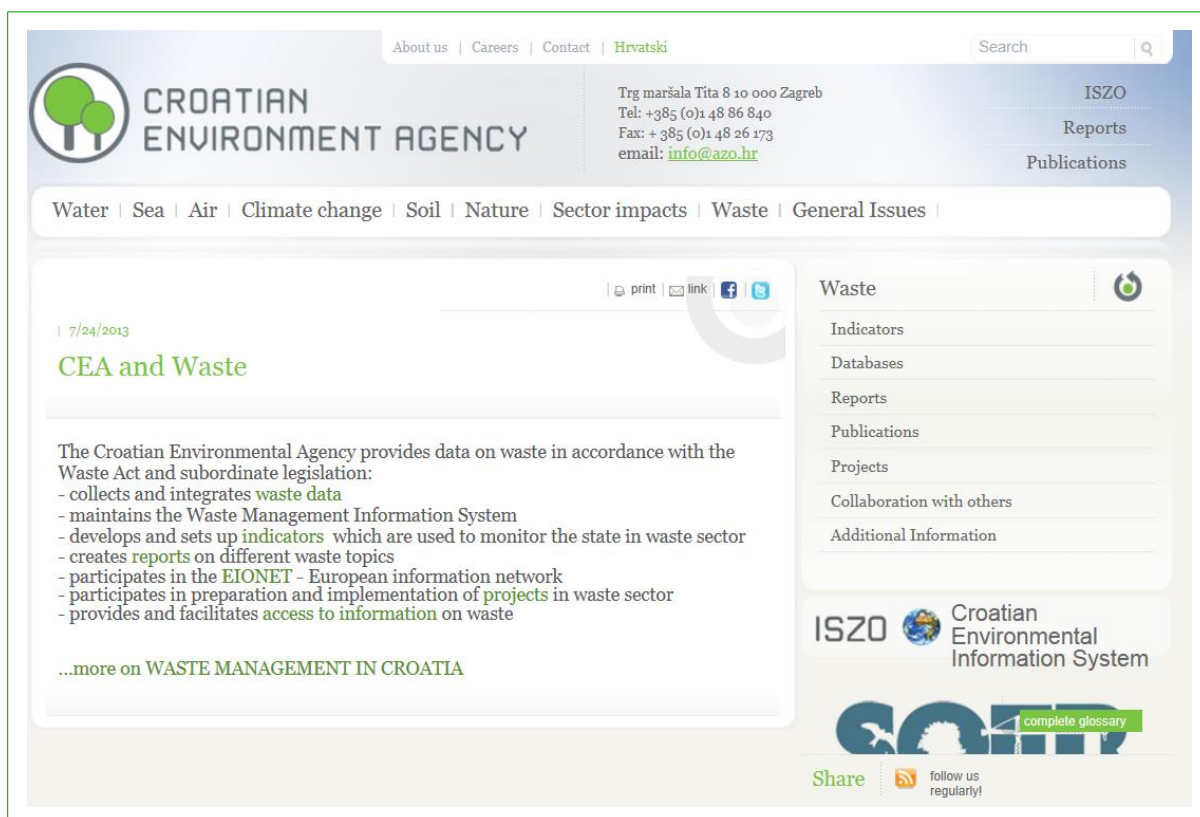


Figure 3: The waste top-page of CEA's internet-site (<http://www.azo.hr/Waste>)

4.1.2 CEA's web page on waste indicators

CEA's web page on waste indicators gives an overview of the Croatian waste indicator systems and provides links to

- The list of Croatian National Indicators
- And the waste chapter on Croatia of the State of Environment Report of the European Environment Agency

The Croatian version of CEA's web page on waste indicators also provides links to the chapters on sewage sludge, asbestos and waste incineration of the publication "The Environment in your Pocket".

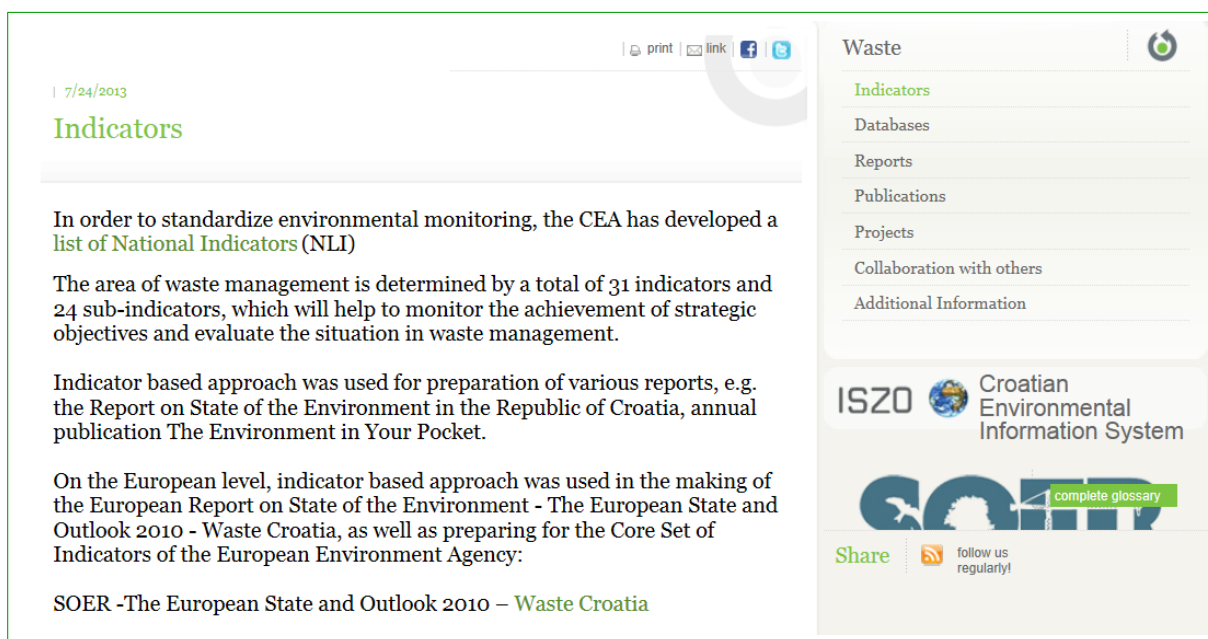


Figure 4: The waste indicator page of CEA's internet-site (<http://www.azo.hr/Indicators07>)

4.1.3 CEA's web page on waste data bases

CEA's web page on waste data bases shortly introduces the 7 waste data bases of CEA and gives partly access for the wider public to 5 of them:

- The Waste Management Permits Register provides information on which waste management company has the permission to collect, transport or treat which type of waste.
- With the GIS browser Waste Management interested persons can access a year 2010 extract of the landfill inventory and see a map of Croatia with all operational and closed landfills (see Figure 15) with their core data (see Figure 7).
- 375 waste management plans of counties, towns and other municipalities of the period 2006 to 2013 can be downloaded from the Waste Management Plans Data Base.

- From the Transboundary Movement of Waste Data Base it can be seen which waste management company has the permission to export/import which type of waste
- The list of laboratories accredited for waste analysis can be downloaded as pdf-file.

Summaries from the data bases which are not publically accessible are published by reports.

Waste Act and subordinate legislation determinate the legal basis upon which the CEA develops and maintains the Waste Management Information System.

CEA Databases (data available on the website or upon request):

Waste Management Permits Register - data on waste management permits (hazardous, non-hazardous, municipal waste), concessionaires, transporters, mediators, exporters

GIS browser Waste Management – GIS application with overview of waste management facilities

Waste Management Plans Database
 - adopted **Plans of counties/ cities/ municipalities**,
 - data on waste management plans prepared by companies producing more than 150 t/year non-hazardous, or 200 kg/year hazardous waste.

Environmental Pollution Registry (EPR) - data on emissions into air, emissions into water and waste data - quantities of generated, collected, recovered/disposed, by waste types.

Transboundary Movement of Waste Database - data on carried out imports/ exports of waste and granted licenses

List of laboratories accredited for waste analyses - chemical and physical characteristics of waste

Databases on specific waste categories – data on WEEE, waste oils, end-of-life vehicles
 - data on production/ imports of products and/ or of the collection and recovery/waste treatment.


Landfill Inventory - GIS database that contains data on landfills


Publications

Projects

Collaboration with others

Additional Information

ISZO  Croatian Environmental Information




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Figure 5: The waste data base page of CEA's internet-site
 (<http://www.azo.hr/Database07>)

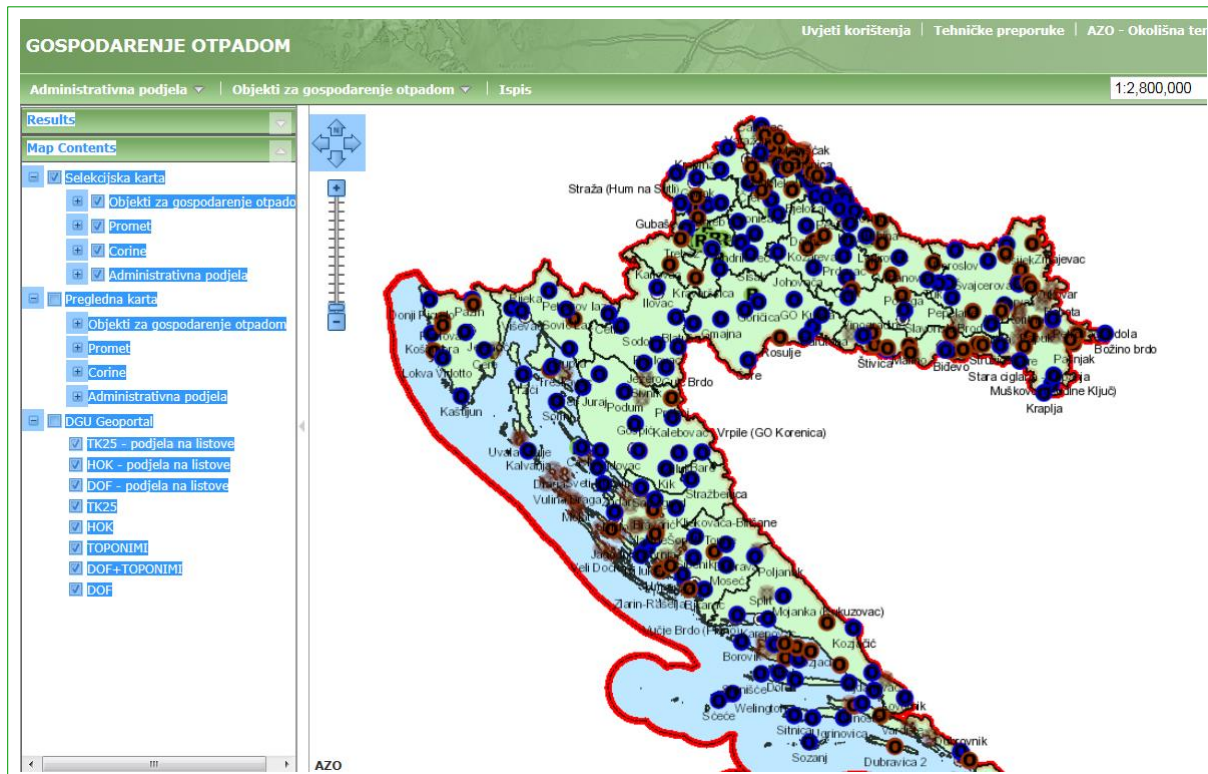


Figure 6: GIS browser waste management (<http://gospodarenje-otpadom.azo.hr/>)

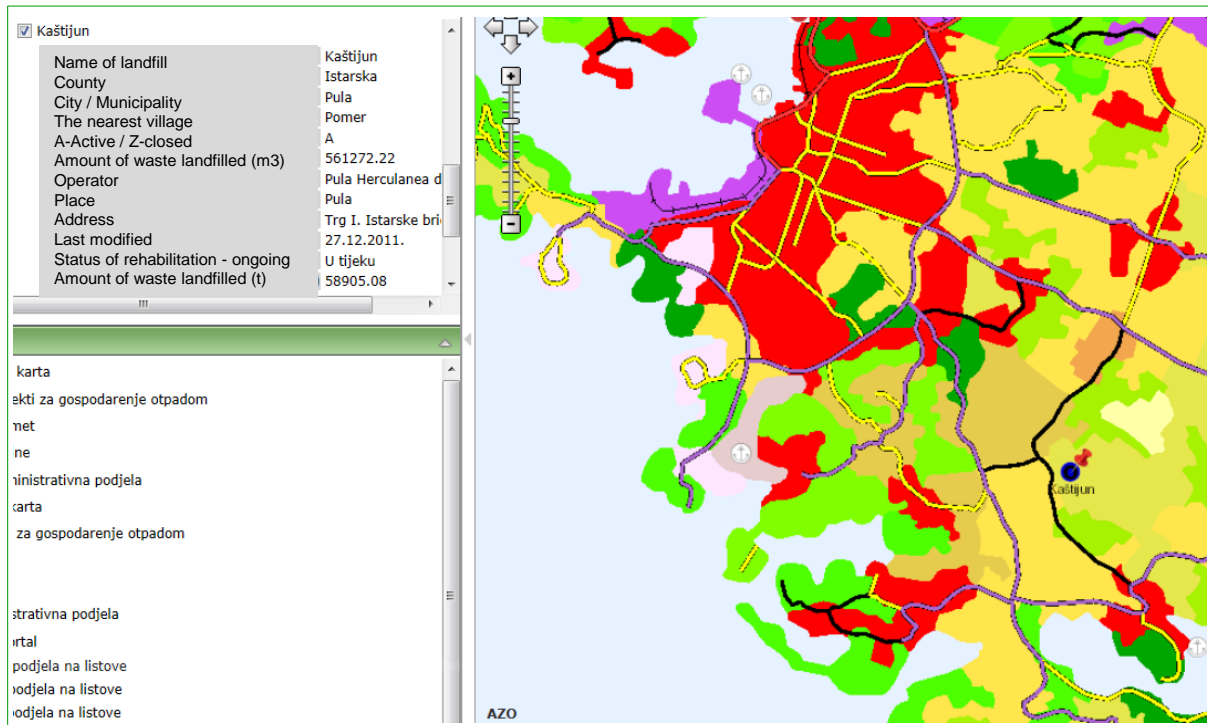


Figure 7: One landfill as example from the GIS browser waste management (<http://gospodarenje-otpadom.azo.hr/>)

On the whole the waste data base page seems to be targeted mainly for interested and affected parties which need general information and for waste management experts to gain an overview of certain waste topics. For detailed planning data the waste management experts, however, either need to get a password for a more extended access to the data bases or must refer to the special reports provided by CEA's web page on waste reports.

The advantage of receiving data by reports over direct data base access is that data in the reports are already quality assured, while in many instances, the data in the data base are not yet checked.

4.1.4 CEA's web page on waste reports

While most of CEA's web-pages on waste are similar in the English and in the Croatian version, the English version of the web-page on reports differs greatly from the Croatian version.

The English version of the web-page on reports gives access to 3 reports in English language (see Figure 8 and Table 1). These reports seem to be made available more for international comparisons and more targeted towards the international audience. In addition the English version of the web-page on reports links to the Croatian version of this web page and to the homepage of the Croatian Ministry of Environment and Nature Protection (<http://www.mzoip.hr/>).

The Croatian version of the web-page on reports provides access to approximately 20 waste reports (see Table 2). Most of these reports provide highly specific information on the Croatian waste flows and the Croatian waste management system. Many of them are updated annually. While these reports may be also interesting for interested and affects parties they seem to be mainly targeted towards waste management experts.

For the experts working professionally with waste management, the 20 reports shown in Table 2 form the backbone of the Croatian waste data dissemination system.

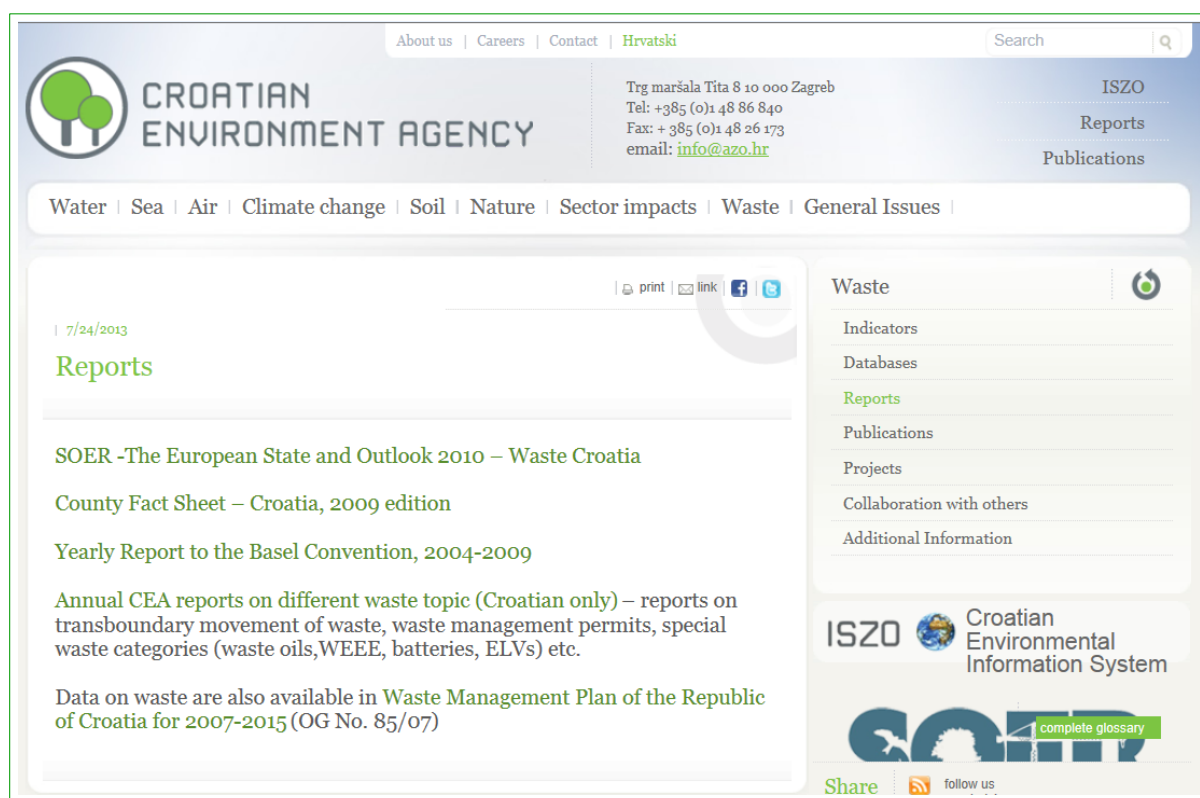


Figure 8: The waste report page of CEA's internet-site (<http://www.azo.hr/Reports09>)

Table 1: Waste reports in English language accessible from CEA's English waste reports page (<http://www.azo.hr/Reports09>)

Title	Summary of contents
SOER – The European State and Outlook 2010 – Waste Croatia	Status of the Croatian Waste Management System as of 2008 with state, impacts, major waste flows, key drivers and year 2020 outlook
Country Fact Sheet – Croatia, 2009 edition	Overview of Croatian waste management legislation, waste management plans, waste prevention policies and biodegradable municipal waste
Yearly Report to the Basel Convention	Information on the implementation of the Basel Convention in Croatia and mass balances on the generation, export and import of hazardous waste

Table 2: Waste reports accessible from CEA's Croatian waste reports page (<http://www.azo.hr/lzvjesca14>)

Croatian title	English title (own translation)	Annual reports for the years:	Summary of contents
Pregled podataka iz Registra dozvola za gospodarenje otpadom i potvrda za prijevoz/posredovanje i izvoz neopasnog otpada	Report on the registry of waste management permits and transport certificates	2006 - 2012	Lists all Croatian waste management companies and the waste types which they are allowed to collect, transport or treat (434 pages).
Izvjješće o komunalnom otpadu	Report on municipal waste	2006 - 2011	Development of municipal waste generation, collection, disposal and treatment by waste type 1995 – 2011

Croatian title	English title (own translation)	Annual reports for the years:	Summary of contents
			with focus on 2011, including review by county (210 pages).
Pregled podataka o odlaganju otpada i odlagalištima otpada Republike Hrvatske	Review of data on waste disposal and landfills	2012	Amount of waste disposed in 2010 per Croatian landfill (98 pages).
Registar onečišćavanja okoliša – izvješće o proizvodnom otpadu	Pollutant Emission Register - report on manufacturing waste	2007	Year 2007 balance of hazardous waste and non-hazardous industrial waste generation (119 pages).
Izvješća za katastar otpada	Report on waste balance	2003 - 2006	Year 2006 balance of hazardous waste and non-hazardous industrial waste generation (90 pages).
Izvješće o prekograničnom prometu otpada	Report on waste shipments	2004-2011	Year 2004- 2011 waste import and export balances by partner country (30 pages).
Pregled tvrtki koje su izradile i imaju važeći Plan gospodarenja otpadom	Overview of companies which have submitted a valid waste management plan	2013	List of companies which have submitted a valid waste management plan by county (124 pages).
Pregled podataka o planovima gospodarenja otpadom	Overview of waste management plans	2011, 2012	Summary of regional/local waste management plans plus list of companies which have submitted a valid waste management plan by county (106 pages).
Pregled laboratorija koji obavljaju analize fizikalnih i kemijskih svojstava otpada	Overview of the laboratories performing the analysis of the physical and chemical properties of waste	2006 - 2012	List of accredited laboratories (7 pages).
Rješenja za umanjenu vrijednost nekretnine vlasnicima nekretnina i jedinicama lokalne samouprave u zoni građevine za zbrinjavanje otpada s popisom vlasnika građevina za zbrinjavanje otpada	Solutions for the reduced value of real estate property owners and local governments in areas of construction waste management with a list of owners of facilities for waste disposal	2011	This is no report but an own internet page: http://www.azo.hr/RJESENJAZAUMANJENU
Izvješće prema Baselskoj konvenciji o nadzoru prekograničnog prometa opasnog otpada	Report under the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes	2003 - 2010	Information on the implementation of the Basel Convention in Croatia and mass balances on the generation, export and import of hazardous waste (4 parts).
Izvješće o stanju okoliša u RH za razdoblje– poglavlje Otpad <ul style="list-style-type: none"> • 2001. – 2004 • 2005. - 2008 	Croatian state of Environment Report for the periods: <ul style="list-style-type: none"> • 2001-2004 • 2005-2008 		See chapter 4.2.2 (28 pages)
POSEBNE KATEGORIJE OTPADA	SPECIAL WASTE CATEGORIES		
Izvješće o otpadnim baterijama i akumulatorima	Report on waste batteries and accumulators	2006 - 2011	This report describes the balances of batteries put on the market, as well as collected by extended producer responsibility system and county (41 pages).
Izvješće o otpadnim uljima	Report on waste oils	2007 - 2011	This report describes the mass balances of lubrication oils and edible oils put on the market, collected and

Croatian title	English title (own translation)	Annual reports for the years:	Summary of contents
			recovered (45 pages).
IPOP I, IPOP II	WEEE I, WEEE II (Report on the implementation of regulations on waste from electrical and electronic equipment)	2012	Tables with masse balances of electrical and electronic equipment put on the market, collected, recovered and exported (2 pages).
Izvešće o električnom i elektroničkom otpadu	Report on waste from electrical and electronic equipment	2007 – 2011	This report describes the balances of electrical and electronic equipment put on the market, as well as collected by extended producer responsibility system and county (36 pages).
Izvešće o otpadnim vozilima	Report on End of Life Vehicles	2007 - 2011	This report describes the mass balances of vehicles put on the market, collected and treated (34 pages).
Mulj iz uređaja za pročišćavanje otpadnih voda kada se mulj koristi u poljoprivredi	Wastewater treatment sludge for use in agriculture	2010, 2011	This "report" is a one page internet site (http://www.azo.hr/GospodarenjeMuljemIzUredaja) on the amount of sewage sludge used in agriculture.
Pregled podataka o medicinskom otpadu	Review of data on medical waste	2010	This report assesses the year 2010 generation and treatment of medical waste in Croatia (11 pages).
Pregled izvršenja obveza sukladno Pravilniku o polikloriranim bifenilima i polikloriranim terfenilima	Review of implementation of obligations on PCB and PCT (polychlorinated biphenyls and triphenyls)	2012	This "report" is a 1 page internet site (http://www.azo.hr/PregledIzvršenjaObveza) assessing the generation and treatment of PCB containing waste in Croatia.
Pregled podataka o nusproizvodima životinjskog podrijetla koji nisu za prehranu ljudi	Information on products of animal origin not intended for human consumption		This report provides mass-balances on the generation of animal by-products not intended for human consumption by county for the years 2007 to 2011 (15 pages).

4.1.5 CEA's web page on waste publications

CEA's web-page on waste publication includes all "non-report"-publications, that is mainly manuals for the management of waste and leaflets.

The English version of this page links to:

- a summary report of the year 2007 State of Environment Report
- the publication "Environment in Your Pocket" (see chapter 4.2.1)
- the "Reports" page (hidden under the caption "CEA annual reports on waste" and
- the Croatian version of the waste publications web page, which contains many more publications in Croatian language (see Table 3).

Except from the publication "Environment in Your Pocket" the English version of the web-page on waste publication seems to be rather a transitional solution, which may be filled with more substantial English publications in future.

The Croatian version of the web-page on waste publication, however, contains important guidelines for professionals dealing with waste management and for the wider interested public as well (see Table 3).

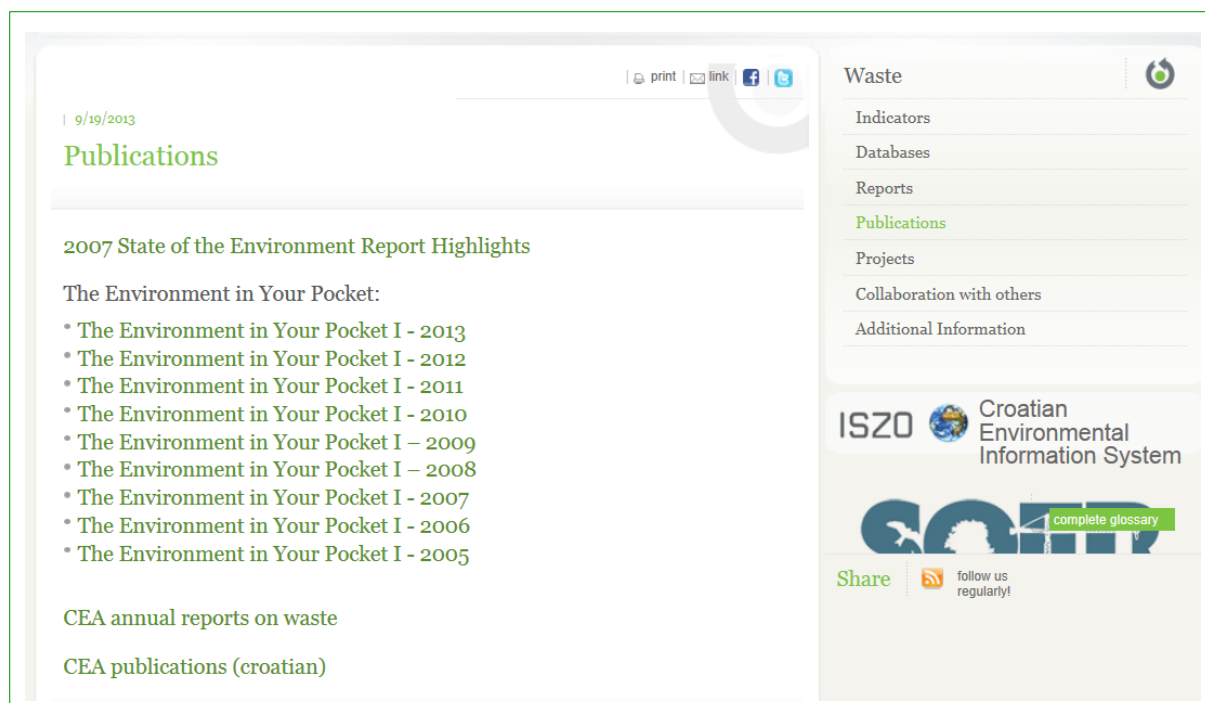


Figure 9: The waste publication page of CEA's internet-site (<http://www.azo.hr/Publication07>)

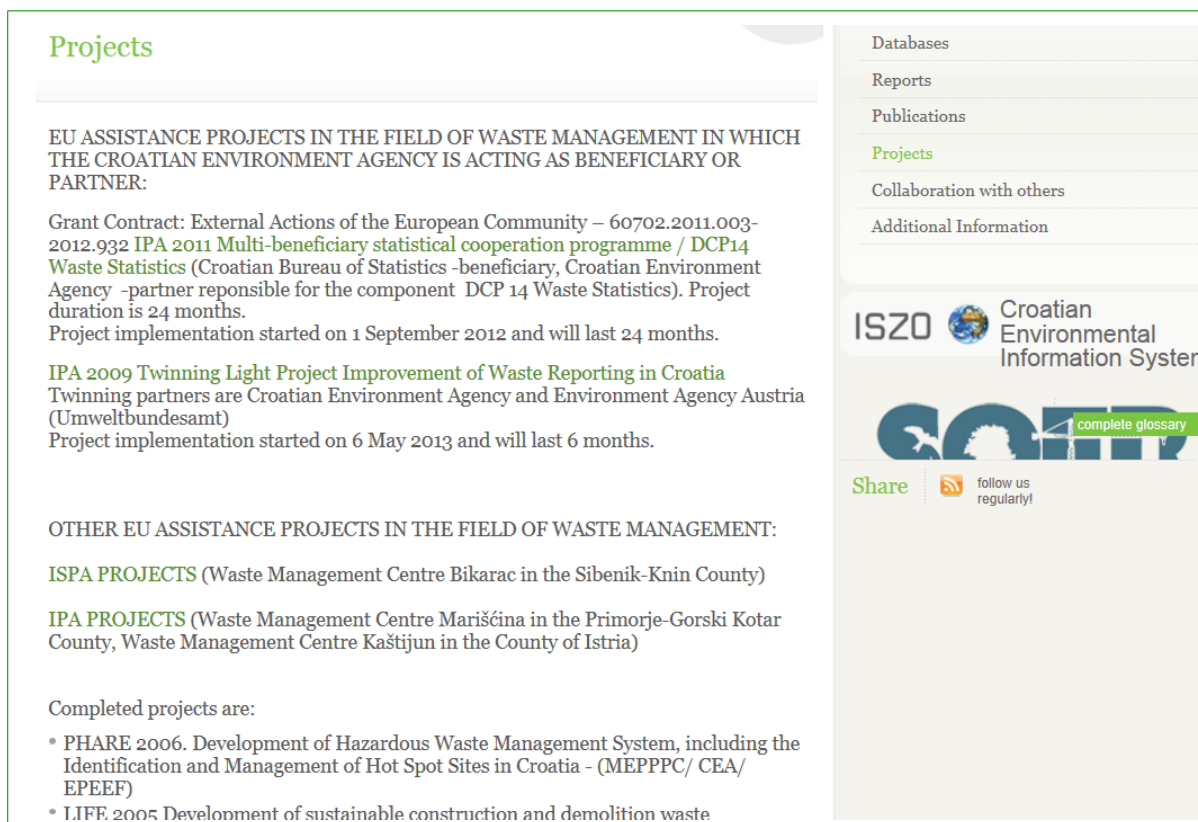
Table 3: Waste publications accessible from CEA's Croatian waste publications page (<http://www.azo.hr/Publikacije10>)

Croatian title	English title (own translation)	Remarks
Handbooks		
Priručnik za automehaničare	Manual for automobile mechanics	
Upute i pojmovnik za određivanje otpada prema Katalogu otpada	Instructions and glossary to determine the waste type according to the Waste Catalogue	Manual for waste classification
Priručnik za vođenje podataka o otpadu	Manual for waste data management	
Priručnik za vođenje Registra onečišćavanja okoliša	Handbook of the Environmental Pollution Register	
Preporuke za određivanje statusa otpad / ne-otpad	Recommendations for determining the status of waste / non- waste	
Upute za određivanje i tehnički opisi postupaka oporabe R i zbrinjavanja D	Instructions for the classification of recovery and disposal processes (R- and D-Codes)	
Pojmovi iz zakona i propisa za tematsko područje otpad	Glossary of terms from the waste management area	
Pokazatelji za područje gospodarenja otpadom (radni materijal)	Data for the area of waste management (hand-out)	
Leaflets		
Kako planiranjem unaprijed spriječiti nastanak otpada od hrane	How to plan ahead to prevent the generation of waste from food	
AZO za bolje gospodarenje otpadom	CEA for better waste management	
Registar dozvola i potvrda	Register of licenses and certificates	
Otpad u brojkama	Waste in numbers	Versions from 2011,

Croatian title	English title (own translation)	Remarks
		2012, 2013
Kako smanjiti količine otpada?	How to reduce waste?	Waste prevention guide
Publications of the Department of Waste		
Komunalni otpad i odlagališta otpada: 2012.	Municipal waste and landfills 2012	This 175 booklet gives more detailed statistics on the amount of municipal waste landfilled on the different Croatian landfill sites in the year 2010.
Indicator reports		
Okoliš na dlanu	Environment in Your Pocket	Selected waste topics for every year from 2005 to 2012 (see chapter 4.2.1 below)
Publications of other institutions related to waste		
Smjernice za pripremu i financiranje projekata izgradnje centara za gospodarenje otpadom uz sufinanciranje sredstvima Fonda za zaštitu okoliša i energetske učinkovitost i fondova Europske unije	Guidelines for the preparation and financing of the construction of waste management centers with co-funding from the Environmental Protection and Energy Efficiency Fund and European Union funds	
Minivodič za poslovnu zajednicu „Zaštita okoliša“	Mini Guide to the business community on "Environmental Protection"	
Brošura: Održiva potrošnja i proizvodnja	Brochure : Sustainable Consumption and Production	
Kompost - Smanjimo svoj otpad za 30%!	Compost - reduce your waste by 30%!	

4.1.6 CEA's web page on waste projects

CEA's waste project page (see Figure 10) introduces the international projects which were performed in recent year in co-operation with CEA in order to improve the waste management system and to make Croatia fit for EU accession. Links lead to more detailed descriptions of these projects.



Projects

EU ASSISTANCE PROJECTS IN THE FIELD OF WASTE MANAGEMENT IN WHICH THE CROATIAN ENVIRONMENT AGENCY IS ACTING AS BENEFICIARY OR PARTNER:

Grant Contract: External Actions of the European Community – 60702.2011.003-2012.932 **IPA 2011 Multi-beneficiary statistical cooperation programme / DCP14 Waste Statistics** (Croatian Bureau of Statistics -beneficiary, Croatian Environment Agency -partner responsible for the component DCP 14 Waste Statistics). Project duration is 24 months.
Project implementation started on 1 September 2012 and will last 24 months.

IPA 2009 Twinning Light Project Improvement of Waste Reporting in Croatia
Twinning partners are Croatian Environment Agency and Environment Agency Austria (Umweltbundesamt)
Project implementation started on 6 May 2013 and will last 6 months.

OTHER EU ASSISTANCE PROJECTS IN THE FIELD OF WASTE MANAGEMENT:

ISPA PROJECTS (Waste Management Centre Bikarac in the Sibenik-Knin County)

IPA PROJECTS (Waste Management Centre Marišćina in the Primorje-Gorski Kotar County, Waste Management Centre Kaštijun in the County of Istria)

Completed projects are:

- PHARE 2006. Development of Hazardous Waste Management System, including the Identification and Management of Hot Spot Sites in Croatia - (MEPPPC/ CEA/ EPEEF)
- IJFF 2005 Development of sustainable construction and demolition waste

Databases
Reports
Publications
Projects
Collaboration with others
Additional Information

ISZO Croatian Environmental Information System

complete glossary

Share follow us regularly!

Figure 10: Waste project page from CEA's internet site (<http://www.azo.hr/Projects08>)

4.1.7 CEA's web page on waste co-operations

The page on CEA's co-operations explains with whom CEA works internationally on which topics.

4.1.8 CEA's web page on other waste information

The page on "Additional Information" (see Figure 11) mainly links to different waste management topics and documents from the Ministry of Environmental and Nature Protection and from the European Environment Agency. In addition links are set to a page on the institutional set up of environmental protection in Croatia and to a page on the transboundary movement of waste.

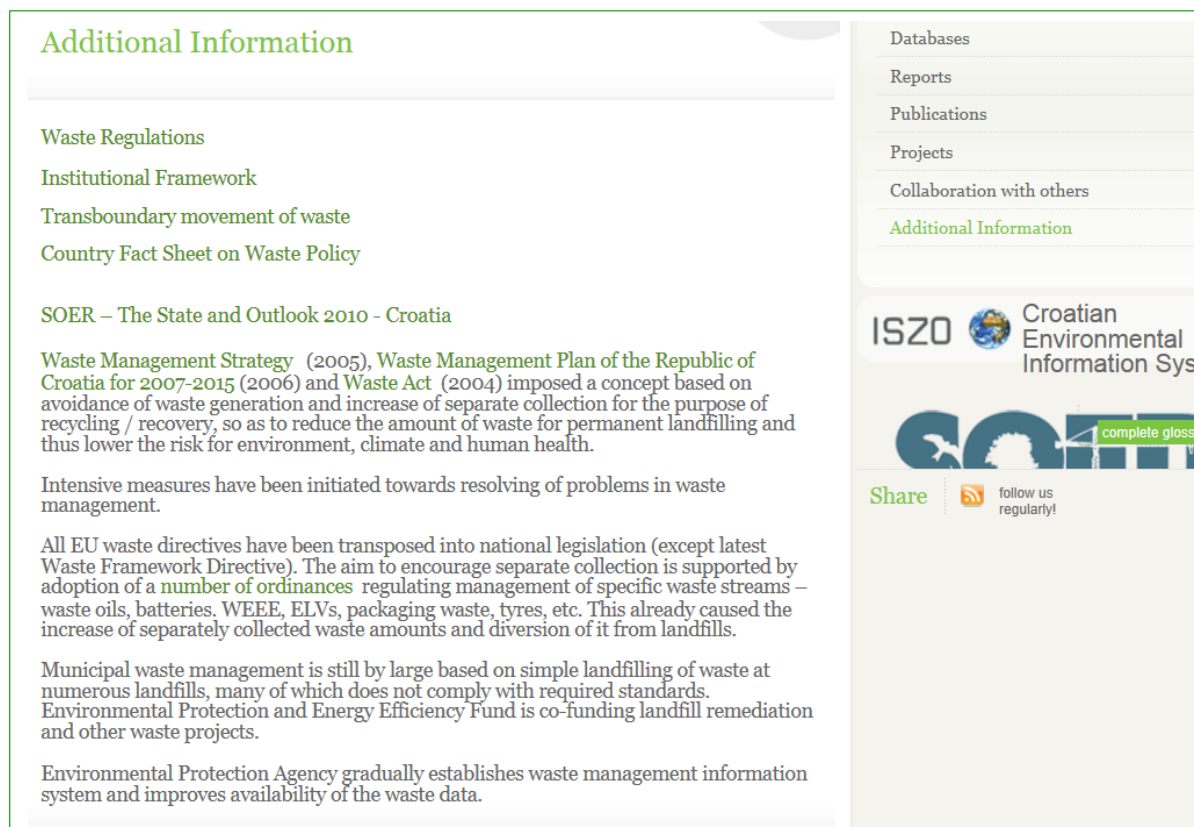


Figure 11: Additional waste information page from CEA's internet site (<http://www.azo.hr/AdditonalInformation07>)

The Croatian version of the “additional waste information page” (<http://www.azo.hr/DodatneInformacije07>) connects to following topics:

- Regulations in the field of waste management
- Basic Waste
- Waste management in Croatia
- Institutions and their jurisdiction
- Special categories of waste
- Transboundary movement of waste
- Waste Management Plans
- Information for taxpayers.

The page on “Special categories of waste” (<http://www.azo.hr/PosebneKategorijeOtpada01>) in turn connects to pages on the special waste streams:

- Packaging waste
- Waste tires
- Life vehicles
- Waste oils
- Electrical and electronic waste
- Waste batteries and accumulators
- Waste containing asbestos.

These pages on special waste streams summarise the regulations applying for the waste streams and provide definitions which are needed for managing the waste. The page on packaging waste also links to a page on packaging waste statistics, showing a time series of packaging masses put on the market and packaging waste collected (see Figure 12).

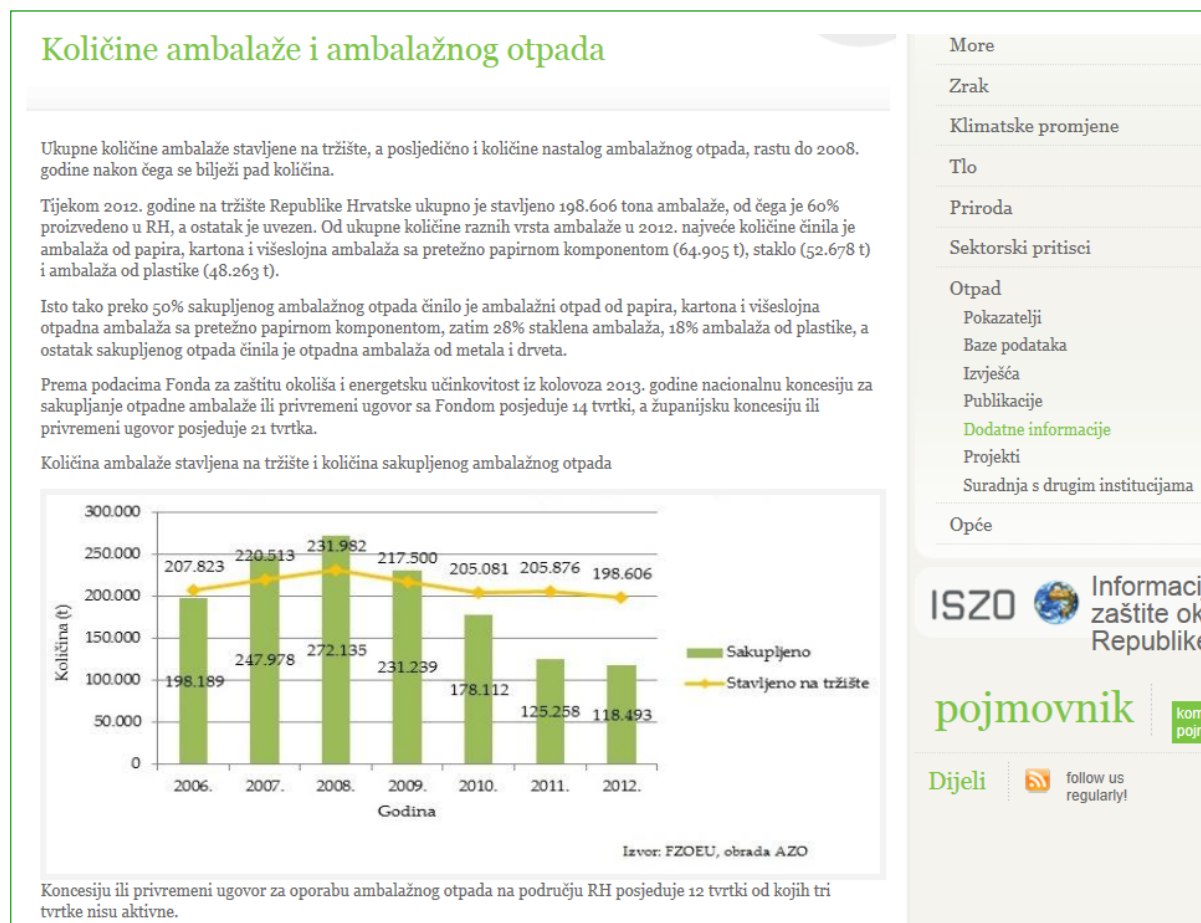


Figure 12: CEA's web-page on packaging waste statistics
(<http://www.azo.hr/KolicineAmbalazel>)

4.1.9 Search function

CEA's internet site features on the top right a search area. The manual for automobile mechanics (Priručnik za automehaničare), for example, is found by both, CEA's search function and Google.

4.2 Publications

The reports and other publications disseminated by CEA are shown and shortly summarised in Table 1 through Table 3. These publications can be downloaded. But, as shown in Table 4, some of them were also disseminated as printed publications.

Table 4: Printed waste publications

Croatian title	English title (own translation)	Number of prints
Kako smanjiti količine otpada?	How to prevent waste generation?	2,000
Otpad u brojkama 2013	Waste in numbers (updated every year)	1000 every year
Komunalni otpad i odlagališta otpada 2012.	Municipal waste and landfills 2012	800
Okoliš na dlanu	Environment in your pocket	300 Croatian + 150 English

In order to sharpen the picture of CEA's publications for the wider audience, here a more extended summary shall be given for 2 selected reports.

4.2.1 Waste pages in the booklet “Environment in Your Pocket”

“Environment in Your Pocket” is a 38 page booklet on different environmental topics, which is updated annually (CEA 2013). This booklet usually contains two or three waste management topics with a short introduction, a one page text on “Trend and Current State” and a graphic supporting the text. The topics are changed from year to year so that pressing issues can be tackled. The year 2013 booklet treats the topics:

- Quantity of PCB containing equipment and
- Remediation of sites contaminated by waste.

The topics of the preceding years are shown in Table 5.

Table 5: Waste topics/pages in Environment in Your Pocket

Croatian title	English title (own translation)	In “Environment in Your Pocket” from the year
Mulj iz uređaja za pročišćavanje otpadnih voda kada se mulj koristi u poljoprivredi	Sludge from wastewater treatment used in agriculture	2012
Otpad koji sadrži azbest	Waste containing asbestos	
Spaljivanje/suspajivanje otpada	Incineration / co-incineration	
Naknade u gospodarenju otpadom	Fees in waste management	2011
Nusproizvodi životinjskog podrijetla	Animal by-products	
Odlagališta otpada	Landfills	2010
Ambalažni otpad	Packaging waste	
Komunalni otpad	Municipal waste	
Biorazgradivi komunalni otpad	Biodegradable Municipal Waste	2009
Električni i elektronički otpad	Electrical and electronic waste	
Izrađenost planova gospodarenja otpadom	Produced waste management plans	2008
Otpadna vozila	End-of-life vehicles	
Otpadna ulja	Waste oils	
Prekogranični promet otpadom	Transboundary movement of waste	2007
Broj dozvola za gospodarenja otpadom	Number of permits for waste management	
Količine otpadnih baterija i akumulatora	Quantities of waste batteries and ac-	

Croatian title	English title (own translation)	In "Environment in Your Pocket" from the year
	cumulators	
Sakupljanje komunalnoga otpada	Municipal waste collection	2006
Oporaba otpadnih guma	Recycling of waste tires	
Medicinski otpad	Medical waste	
Odlagališta: broj i kapacitet	Landfills: number and capacity	2005
Proizvedeni opasni otpad	Produced hazardous waste	

4.2.2 Waste chapter of the Croatian State of Environment Report

The waste chapter of the Croatian State of Environment Report 2005-2008 (CEA 2010) shows the development of the Croatian waste generation and waste management sector for the period 2005 to 2008. In some case the time series provided start even before 2005. The main part of the chapter is the assessment of the year 2008 waste generation and management and of the developments which led to this year. Included are assessments of municipal waste with its different waste fractions, of industrial waste and of different other waste types. There is also a small subchapter on waste prevention and on industrial waste management plans. An overview is given on waste management permits, landfills and waste management centres. In addition core information is given on the transboundary movement of waste, on greenhouse gas emissions from waste, on the remediation of contaminated sites and on the application of economic instruments for improving the waste management system. Finally the waste chapter summarises measures from the National Environmental Strategy and the National Environment Action Plan and qualifies the achievement of objectives from the latter.

In total the waste chapter of the Croatian State of Environment Report seems to be a good source for all interested persons who want to get an overview on the status of the Croatian waste management system and the way it works.

As the next State of Environment Report is to be prepared by 2014 and as the beneficiary asked for recommendations for this report, we here include a short comparison with similar reports prepared for Austria.

In scope, function and length the waste chapter of the Croatian State of Environment Report 2005-2008 (CEA 2010) lies between the waste chapter of the Austrian State of Environment Report and the status report of the Austrian Federal Waste Management Plan.

The waste chapter of the **Austrian State of Environment Report** (UMWELTBUNDESAMT 2013) is limited to 10 pages while also including an assessment of resource = material consumption. Thus the Austrian waste chapter is highly focussed on the most important developments and problems to be solved. It summarizes waste and material related environmental policy objectives, describes the status of core aspects of the resource and waste management systems, qualifies core developments by comparing them to the objectives and derives recommendations for measures to be taken during the coming years. Thus the waste chapter of the Austrian State of Environment Report is mainly a document for supporting the design of waste management policy.

In contrast the **Austrian Federal Waste Management Plan** (LEBENS MINISTERIUM 2011) with its 426 pages is a much more extended document. The Plan has several different functions:

- It gives an overview of the Austrian waste management system (20 pages)
- It provides detailed information on the generation, treatment and prevention of 25 waste streams and on the different types of waste treatment plants including landfills (85 pages) and thus is the main Austrian data source for waste management planning
- It explains the public measures planned for improving the waste management system (86 pages)
- It presents the Waste Prevention Programme (36 pages)
- It introduces rules for the treatment of specific waste streams and for the shipment of waste (160 pages) and
- It assesses the remediation of contaminated sites (23 pages).

Elements of the waste chapter of the Austrian State of Environment Report and the Austrian Federal Waste Management Plan which may be considered for the future waste chapter of the Croatian State of Environment Report:

- The inclusion of the topics material consumption and resource efficiency (e.g. the development of domestic material consumption of biogenic materials, minerals, metals and fossil materials over GBP);
- More focus on waste prevention, reuse and recycling;
- More focus on waste treatment;
- The inclusion of expected future developments and possibly capacity planning;
- Recommendations for future policy measures derived from policy objectives.

However, while adding one or the other of these topics the waste chapter should not become longer.

4.2.3 Contributions to the Croatian Waste Management Plan

The current Croatian Waste Management Plan (that is the plan for the period 2007 to 2015) contains both

- an analysis of the present (that is year 2005) status of the Croatian waste flows and waste management system
- and a plan for developing the waste management system till 2015 (GOVERNMENT OF THE REPUBLIC OF CROATIA 2007).

The analysis of the present status among others provides statistics for the year 2005 on the generation, collection, treatment and landfilling of following waste types:

- Paper, plastics, tyres, metals, glass and packaging
- Municipal waste
- Non-hazardous industrial waste
- Hazardous waste

- Medical waste, waste oils, batteries, PCBs, asbestos, mining waste, construction waste, animal waste, sewage sludge, end-of-life-vehicles, waste from electrical and electronic equipment

The analysis of the present status also provides information on the legal framework and the waste flow monitoring system. As such the Croatian Waste Management Plan is a valuable source for historic developments of the Croatian waste management system.

In the plan for future activities also waste prevention measures are discussed.

CEA provided the main data and information describing the status of the Croatian waste management system.

4.2.4 International reporting

CEA already in 2011 submitted 92% of the so-called Priority Data Flow to the European Environment Information and Observation Network, EIONET (CEA 2012). However, as a full member, CEA now coordinates a considerably larger set of reports for the European Environment Agency (EEA) and other relevant European Commission bodies.

Core CEA reports published by EEA are summarised in Table 1 above.

4.3 Reports to fulfil reporting obligations

While reports which fulfil reporting obligations according to different European Union directives are not directly published, some of data provided is published on Eurostat data bases for the general public (http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database).

These data include:

- Biannual data on waste generation by waste type and economic sector
- Biannual data on the amount of waste treated by treatment type
- Annual data on special waste types generated, treated and/or recycled for the waste types:
 - municipal waste,
 - packaging waste,
 - waste electrical and electronic equipment,
 - end of life vehicles,
 - hazardous waste,
 - waste excluding major mineral waste.

Up to 2012 these data had been provided by the statistical office. From 2013 these data are reported to Eurostat directly by CEA.

4.4 Other information carriers

CEA supports the dissemination of waste information by frequent answers to phone calls and email-requests by specialists and the wider public. In 2012

CEA via its central email address info@azo.hr received 500 email requests of which 249 were answered by the Waste Unit. In the first 9 months of 2013 CEA received 294 email requests of which 179 were on waste topics.

This underlines the high level of interest of experts and the wider public in waste matters and the importance of waste management as part of environmental protection.

4.5 Target groups

The following institutional groups belong to the target group of CEA's waste information dissemination system:

- The Ministry of Environmental and Nature Protection
- Other ministries and national competent authorities which are tasked with the development or control of the Croatian waste management sector economy, infrastructure and health protection.
- Regional competent authorities (counties)
- Local competent authorities (municipalities, including their waste collection organisations)
- The waste management sector (including waste collection, treatment, landfilling and recycling companies)
- Academia and other waste management consultants
- Non-government organisations
- The general public as group of interested and potentially affected stakeholders.

According to the waste hierarchy of the EU waste framework directive (2008/98/EC) waste prevention and preparation for re-use are priority tasks of the waste management system (see Figure 13). Therefore groups which should be targeted by waste prevention and re-use should also be targeted by CEA's waste information dissemination system. These target groups include:

- private consumers,
- public service institutions,
- service businesses,
- trade and commerce, and
- the production industry.

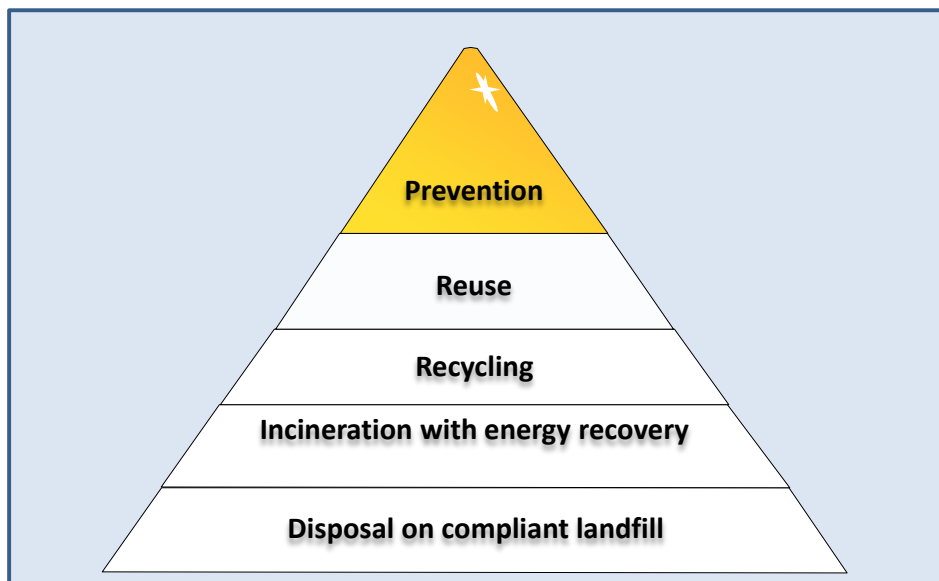


Figure 13: Waste hierarchy according to EU waste framework directive (2008/98/EC).

4.6 Feedback from users

In early November 2013 CEA distributed a questionnaire which had the aim to get feedback on the satisfaction of potential users with CEA's waste page and waste dissemination information system. The Croatian and the English version of the questionnaire are shown in the Appendix (chapter 11) to this report.

Though the potential respondents had only about 1 week for answering the questionnaire, 54 completed and 1 more or less completed questionnaire were received. From the incomplete questionnaire only the allocation of the type of interest group is missing.

Table 6 shows the quantifiable answers of the survey, Table 7 CEA's waste information which is most important to the respondents, Table 8 proposals for improving the quality of CEA's waste information system and Table 9 requests for information which should be provided in addition to the one already given.

From the 55 respondents approximately a third are from waste producing companies and approximately a forth each from competent authorities and waste management companies. 4 scientists, 1 NGO and 3 citizens complement the sample (see Table 6).

All respondents use CEA's web page on waste; 60 % use it several times a month. CEA's waste information products which are used the most are

- the Data browser from the Environmental Pollution Register,
- the Register of licenses and certificates for waste management and
- the Manuals / instructions for waste management.

Each of these products is used by approximately three quarter of the respondents. But even the most specialised product "the report on the transboundary movement of waste" is used by approximately one quarter of the respondents.

About 60 % of the respondents use the email for further requests with CEA, also about 60 % the telephone.

Almost all respondents find the information provided useful. Nearly 90 % are satisfied with the quality of the information provided.

91 % support the provision of information on waste prevention and resource efficiency measures by CEA.

Table 6: „Quantitative“ answers of the survey

Topic		Positive answers	
		Number	Share in %
Total answers		55	100
Affiliation to interest group	competent authority in the field of waste management	13	24
	waste producing company	18	33
	waste management company	15	27
	scientific research institution / professional association	4	7
	NGO	1	2
	None of the above / citizens	3	5
Use of the waste page of CEA's web-site		55	100
Use CEA's web-site several times a month		33	60
These CEA products are used	GIS viewer Waste / Landfill	17	31
	Register of licenses and certificates for waste management	41	75
	Data browser from the Environmental Pollution Register / WASTE	43	78
	Report on municipal waste and / or publication of "municipal waste and landfills"	24	44
	Annual reports on electrical and electronic waste / waste batteries and accumulators / end-of-life vehicles / waste oil	16	29
	Report on the transboundary movement of waste	12	22
	Overview information on permits for waste management	29	53
	Manuals / instructions for waste management	38	69
	State of Environment Report (Chapter Waste)	29	53
	Brochure "Environment in Your Pocket"	16	29
	Something else	4	7
Have used info@azo.hr mail		33	60
Have phoned CEA for inquiries		32	58
Find the information on waste provided by CEA useful		54	98
Are Satisfied with the quality of information		48	87
CEA should provide information on waste prevention and resource efficiency measures		50	91

From the quantitative answers shown in Table 6 and the “qualitative” answers given in Table 7 to Table 9 one gets the overall impression that most users are highly satisfied with the waste information provided by CEA and their waste information dissemination system. The scope of the information provided by CEA, that is primarily waste statistics, information on licenses and permits, information on waste regulation and manuals on how to implement these regulations seems to be supported. It is also supported that general information is given for

the general public and more specialised information for the waste management experts and industrial waste producers.

The proposals for improvement (see Table 8 and Table 9) seem to ask primarily for an improvement and more timeliness of the information already provided. Nevertheless, there also are request for new topics such as waste prevention, recycling, best practices on resource efficiency, home-composting, waste handling and waste treatment of additional waste streams, international comparisons and supporting material for school education.

Most critical seems to be the lack of understanding how the waste information dissemination system is split between the Agency, the Ministry and Environmental Protection Fund. Some information seems to be available from several sources, while others can be found only after a prolonged search. Some users believe that the structure and lay-out of CEA's homepage can be improved, so that information is found easier.

Table 7: Products of CEA which have been qualified as being most important for the users

- Manuals and instructions;
- Annual reports on specific categories of waste;
- Waste statistics including generation, import and export of waste;
- Requirements of the environmental pollution register;
- All deadlines to be observed;
- Interpretation of regulations related to waste;
- Regulations on the import of special wastes;
- Register of licenses and permits;
- Way of obtaining permits;
- Glossary to determine the waste according to the waste catalogue;
- Overview of corporate waste management

Table 8: Selected proposals for improving the quality of CEA's waste information and waste information dissemination system

- List of companies by county (of all Croatia), which are specialized for the collection of different types of waste (waste wood, bio waste, etc.)
- Provide more up-to-date information on changes in waste legislation
- Harmonizing deadlines for the submission of individual reports
- Separate reports by county on the implementation of the county waste management plans
- Support in waste categorization and in working with the waste catalogue, maybe by improved search functions
- Although the www.azo.hr includes a lot of information, it is difficult to find as the web-page is counterintuitive; the font, and the way the text is formatted does not allow information to be easily found (although the colour choice pleasant).
- Intensified and faster cooperation with the Ministry of Environmental and Nature Protection; many waste related laws, regulations, and requirements are missing.
- The support service needs improvement as nobody in the Agency, the Ministry or with the Environment Fund was found who could give an answer.
- An easier way to search by various parameters in the database of the Environ-

mental Pollution Register and the permissions register.

- Update of the guidance for taxpayers on maintaining data in the Environmental Pollution Register
- Frequent contacts with the local authorities for reviewing data.
- Improve the maintenance of the database of authorized waste management companies. Better keep the information up-to-date.
- Expand Web site
- The agency should improve the display of information supported by other media such as TV, internet portals, life events, prints and others.

Table 9: Selected requests for additional information

- Support in getting a better understanding on the requirements of the Act on Sustainable Waste Management. New regulations on waste management. Instructions on the implementation of certain laws.
- Information regarding the rules governing the law on environmental protection and for the issuance of new permits for waste management.
- A short presentation about all the waste related obligations which a waste producing company and a waste management company has to observe (e.g. registration of waste transport company, etc.).
- A separate report on the quantity of generated, recovered and exported industrial waste by county.
- A single table of all the key waste numbers which are necessary for the trans-boundary movement of waste, e.g. from the OECD catalogue, the customs tariff number and the waste number from waste catalogue.
- Information about recycling yards in the cities and municipalities.
- Brochure on home-composting
- Supporting material for school education
- Everything about textile waste.
- Generation statistics of certain types of waste, the actual amount.
- Guidelines for the establishment of separate collection systems.
- Best practice examples for waste management.
- Waste management in other EU countries.
- It is confusing that sometimes the same information is shown in 5 different ways.
- Greater promptness is necessary. To get year 2010 data in 2013 is not fast enough.
- Some information is outdated and need to be up-dated.

4.7 Summary of CEA's waste web-site and waste information dissemination system

The core of CEA's waste information dissemination system is CEA's web-site and the reports, handbooks and leaflets which can be downloaded from this site. In addition CEA contributes to reports from the Ministry of Environmental and Nature protection and submits statistics to the Eurostat and implementation reports for different waste directives to the European Commission. The whole information dissemination system is completed by the answering of telephone and email requests.

By this information dissemination system both, the wider interested public and the experts of the waste management system (including experts from private companies, public administration, consulting and research) get the information they need in an efficient and effective way.

The focus of the waste information collected and disseminated in Croatia lies with the generation, collection and landfilling of waste. This probably reflects the current state of the Croatian waste management system. While some information is already provided on waste prevention, it is likely that more should be done in future towards this direction as well as re-use and recycling, including the recovery and environmentally friendly discarding of hazardous substances from the economy.

However, CEA is not the only source of information for the waste management sector in Croatia. Other institutions starting with the Ministry of Environmental and Nature protection complement the information provided by CEA. The next chapter will have a look at these additional waste information sources.

5 FURTHER CROATIAN INSTITUTIONS PROVIDING WASTE INFORMATION

5.1 Ministry of Environmental and Nature Protection

The waste page of the internet-site of the Ministry of Environmental and Nature Protection is mainly a hub of links which connects to different downloadable documents on waste management and to information pages on different waste topics (see Table 10). Of special interest for practical waste management are information pages on different waste streams (see Table 11).

When comparing the web-pages of CEA and of the Ministry of Environmental and Nature Protection there seems to be some specialisation, CEA providing most of the statistical data and the Ministry providing more of the information on general strategies and the regulatory background. When it comes to advice, however, how to practically manage different waste types there seems to be some overlap (compare Table 3 and Table 10).

Table 10: Documents and links accessible from the waste page of the internet-site of the Ministry of Environmental and Nature Protection
(<http://www.mzoip.hr/default.aspx?id=5296>)

Croatian title	English title (own translation)	Remarks
Strategija gospodarenja otpadom Republike Hrvatske	Waste Management Strategy of Croatia	Downloadable document
Plan gospodarenja otpadom u Republici Hrvatskoj za razdoblje 2007. do 2015. godine	Waste Management Plan of the Republic of Croatia for the period of 2007 to 2015	Downloadable document
Izmjene i dopune Plana gospodarenja otpadom u Republici Hrvatskoj za razdoblje 2007. do 2015. godine	Amendments to the Waste Management Plan of the Republic of Croatia for the period of 2007 to 2015	Downloadable document
Propisi iz područja otpada	Regulations in the areas of waste	Links to a list of waste regulations from which these documents can be downloaded
Prekogranični promet otpadom	Transboundary movement of waste	Links to a web-page which provides information on the rules for the transboundary movement of waste; from this page further documents can be downloaded
Katalog otpada - Smjernice za korištenje Priloga III-V Uredbe (EZ) 1013/2006 o otpremi pošiljaka otpada (pdf)	Catalogue of waste - Guidance on the use of Schedule III-V of Regulation (EC) 1013/2006 on shipments of waste (pdf)	Downloadable document
Želite se riješiti otpada, a ne znate gdje i kako?	Want to get rid of waste, but do not know where and how?	Links to a web-page on which further links can be found to web-pages which provide information on the proper management of different waste streams (see Table 11).
Izgradnja Centara za gospodarenje otpadom	Construction of the waste management centre	Links to press-releases which report on the construction of different local/regional waste management centers
Postupanje s otpadom koji sadrži az-	Treatment of waste containing as-	Links to a web-page which

best	bestos	provides information on the management of asbestos
Sanacija azbestnog otpada bivše tvornice Salonit u Vranjicu	Remediation of asbestos waste in the former factory Salonit Vranjic	Links to different documents on the remediation of this site
Zahtjev za izdavanje dozvole za gospodarenje otpadom (pdf)	An application for a license for Waste Management (pdf)	Downloadable document
Registar dozvola i potvrda za gospodarenje otpadom	Register of licenses and certificates for waste management	Links CEA's information page on this register
Očevidnik izvoznika neopasnog otpada (pdf)	Register of Exporters of non-hazardous waste (pdf)	Downloadable document
Očevidnik prijevoznika (pdf)	Register of carriers (pdf)	Downloadable document
Očevidnik posrednika (pdf)	Register of intermediaries (pdf)	Downloadable document
Kompost - Smanjimo svoj otpad za 30%!	Compost - reduce your waste by 30%!	Downloadable document

Table 11: Information pages on the web-site of the Ministry of Environmental and Nature Protection for the management of specific waste streams
(<http://www.mzoip.hr/default.aspx?id=8562>)

Names of waste streams in Croatian	Names of waste streams in English
Ambalažni otpad (staklo, papir, karton,...)	Packaging waste (glass, paper, cardboard, etc.)
Električni i elektronički otpad	Electrical and electronic waste
Baterije i akumulatori	Batteries and accumulators
Otpadna vozila	End-of-life vehicles
Otpadne gume	Waste tyres
Otpad koji sadrži azbest	Waste containing asbestos
Građevinski otpad	Construction waste
Otpadni lijekovi i medicinski otpad	Waste medicines and medical waste
Ostali otpad (glomazni otpad,...)	Other waste (bulky waste, etc.)

5.2 Other Croatian institutions providing waste information

The Environmental Protection and Energy Efficiency Fund (abbreviated “the Fund”), among other tasks, organises the take back systems on

- Packaging
- End-of-life vehicles and tires
- Waste oil
- Batteries and accumulators
- Waste from electrical and electronic equipment and
- Asbestos.

The Fund provides documents on the management of these waste streams on its web-page www.fzoeu.hr. As can be seen in Table 12 these documents are mostly regulations (decisions and ordinances).

Table 12: Most recent documents on the packaging waste extended producer responsibility system of Croatia, accessible via the homepage of the Fund (<http://www.fzoeu.hr/hrv/index.asp?s=otpad>)

Name of document in Croatian	Name of document in English (own translation)
Uputa prodavateljima - nagradna igra DUKAT d.d.	Operating sellers - giveaway Dukat dd
Pravilnik o izmjenama i dopunama Pravilnika o ambalaži i ambalažnom otpadu NN 86/13	Ordinance amending the Ordinance on packaging and packaging waste NN 86/13
ODLUKA o cijeni preuzimanja otpadne ambalaze za zbrinjavanje i uporabu u 2013.god.	DECISION on the acquisition price of packaging waste for disposal and recovery in 2013
OBAVIJEST prodavateljima o postupanju -Coca-Cola HBC Hrvatska d.o.o	Inform your dealer about treatment - Coca- Cola HBC Croatia
Dodatak Uputi -Isporuke ambalažnog otpada u namjenskim vrećama Fonda	Addendum - Deliveries of packaging waste in dedicated sacks Fund
Pravilnik o ambalaži i ambalažnom otpadu -uputa, daje se	Ordinance on packaging and packaging waste directive
Odluka o cijeni preuzimanja otpadne ambalaze za zbrinjavanje i uporabu u 2012. god.	Decision on the acquisition price of packaging waste for disposal and recovery in 2012
Obavijest daje se -voda raznih okusa "Sun gold"	Notice is given to water with different flavours, "Sun Gold"

A further institution which provides information related to waste management is the Croatian Chamber of Economy (HGK) (<http://en.hgk.hr>). The Chamber of Economy with its different sector organisations together with 20 County Chambers organizes events, education programmes and similar activities.

The Department on Industry (Sektor za industriju), for example, frequently organize professional training or workshops on waste topics for the manufacturing or construction industry. The Department for Construction and Municipal Activities (Sektor za graditeljstvo i komunalno gospodarstvo) runs among other associations the Association of Municipal companies (Udruženje komunalnog gospodarstva) which is responsible for organising the collection of municipal waste.

Also the Croatian Chamber of Trades and Crafts (www.hok.hr) the Association of Cities (<http://udruga-gradova.hr>) and the Association of Counties (www.hrvzz.hr) sometimes disseminate waste related information and educate their members including counties and local communities.

The Croatian Association for Waste Management (Hrvatska Udruga Gospodarenja Otpadom) (<http://hugo.com.hr>) organizes together with the City of Zagreb and the Zagreb University the biannual "International Symposium on Waste Management Zagreb".

6 AUSTRIAN INSTITUTIONS PROVIDING WASTE INFORMATION

In Austria the core tool for collecting waste data is the Electronic Data Management System (EDM) of the Federal Ministry of Agriculture, Forestry, Environment and Water Management (EDM). The core tool for waste information dissemination is the Federal Waste Management Plan (in German language Bundes-Abfallwirtschaftsplan abbreviated BAWP) also published by the Lebensministerium. As compared to Croatia in Austria more weight is given to waste information by the Ministry than by the Austrian Environment Agency. However, also in Austria the Environment Agency has an important role in waste information dissemination.

6.1 Waste information dissemination by the Austrian Environment Agency

6.1.1 The web-page of the Austrian Environment Agency

The idea of the Austrian Environment Agency's homepage is less to provide primary data but to act as an information hub which gives an introduction to the topic of interest and then links to special reports and external internet sites for more detailed information.

The Austrian Environment Agency's internet site on waste (see Figure 14) provides information on:

- Waste generation
- Waste treatment
 - Thermal
 - Mechanical-biological
 - Landfilling
 - Recycling
- Waste prevention
- Waste data
- Special Events.

All of these topics are introduced by a text ranging from a quarter page to several pages (see Figure 15). The main texts are accompanied by an information-box each, which provides links to downloadable reports (authored by the Austrian Environment Agency) and external internet sites for more detailed information (see Figure 16). For waste flow data and statistics on waste treatment and landfilling links are provided to the Electronic Data Management System of the Lebensministerium and to the Federal Waste Management Plan web-page.

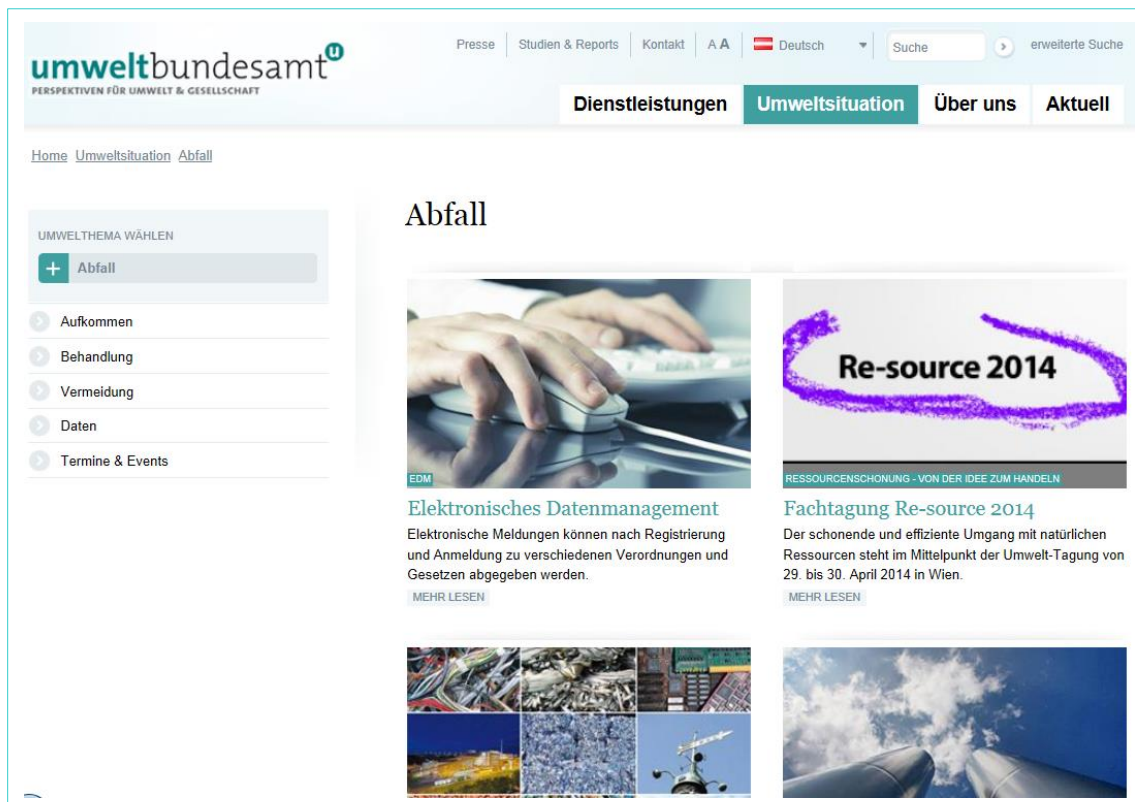


Figure 14: Main waste page of the Austrian Environment Agency's internet site (<http://www.umweltbundesamt.at/umweltsituation/abfall/> from 01.01.2013 to 30.10.2013)



Figure 15: Main text of the Agency's web-page on mechanical biological treatment (<http://www.umweltbundesamt.at/umweltsituation/abfall/behandlung/mba/>)

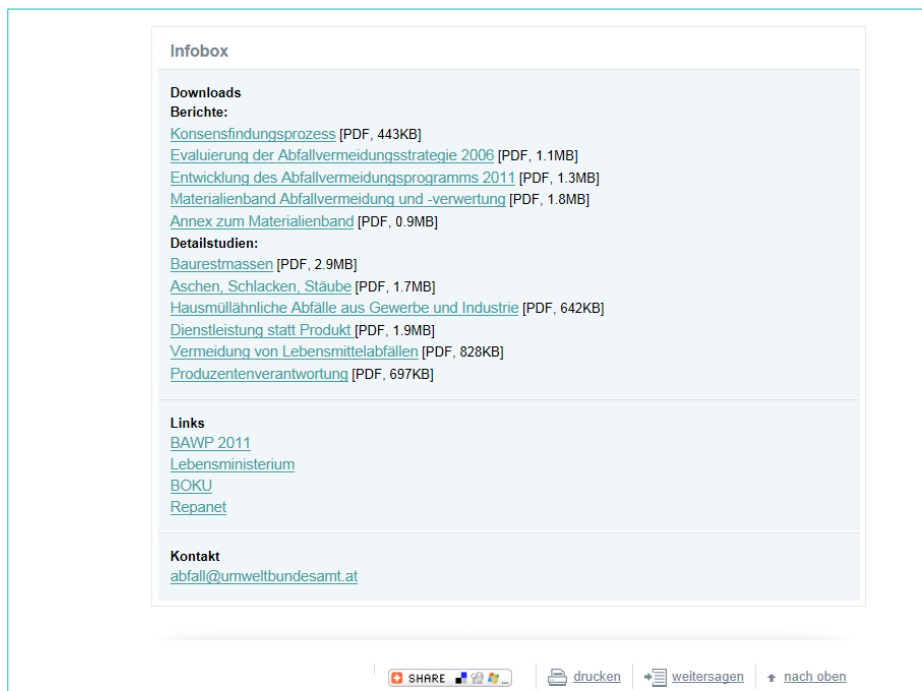


Figure 16: Information-box of the Agency's web-page on the preparation of Austria's waste prevention programme 2011
 (<http://www.umweltbundesamt.at/umweltsituation/abfall/vermeidung/strategie/>)

All waste related reports prepared by the Austrian Environment Agency (see Table 13 in the next subchapter below) can be found by the button "Studien & Reports" (studies & reports) which is situated on top of the web-pages and by selecting the button "Abfall" (waste) (see Figure 17).

The English version of the Austrian Agency's internet-site on waste (http://www.umweltbundesamt.at/en/soer/soer2010_partc/soer2010_resources/) provides the same information as the Austrian waste chapter of the European Environment Agency's State-of-Environment-Report 2010 (http://www.eea.europa.eu/soer/countries/at/soertopic_view?topic=waste).

On an additional page (http://www.umweltbundesamt.at/en/services/services_resources/services_waste/) selected international resource and waste related projects are introduced.

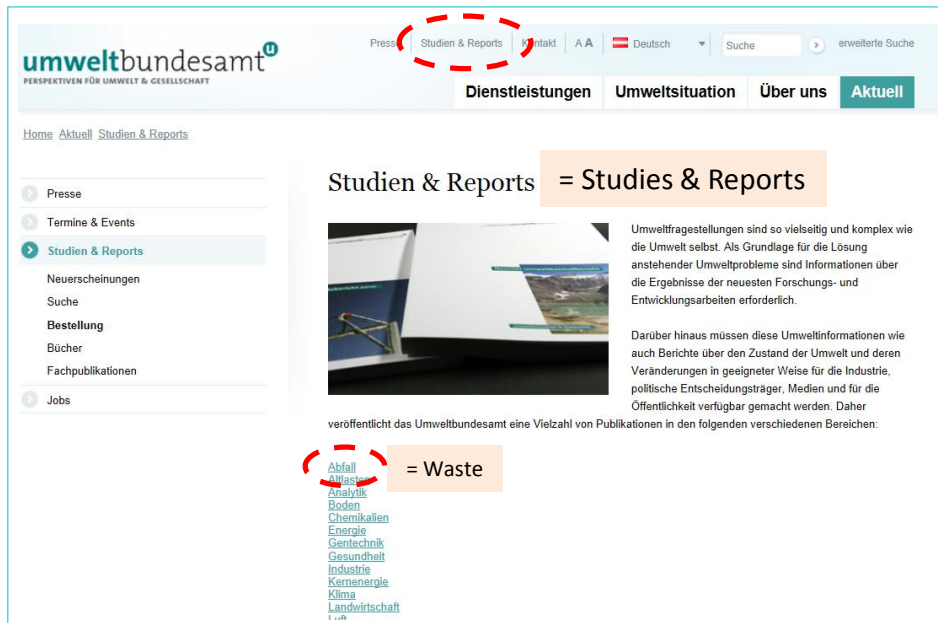


Figure 17: How to find the waste reports of the Austrian Environment Agency on its web-site (<http://www.umweltbundesamt.at/aktuell/publikationen/>)

6.1.2 Reports and other activities

The most important waste information carrier from Austria's Environment Agency targeted towards the wider public is the chapter on resource and waste management of the Austrian State of Environment Report (UMWELTBUNDESAMT 2013). This report has been shortly described in chapter 4.2.2 above.

The most important task of the Austrian Environment Agency in waste information dissemination for professionals is the support the Agency provides to the Lebensministerium. The Agency assesses different information sources to prepare those parts of the Federal Waste Management Plan (see chapter 4.2.2 above) which provides

- detailed information on the generation, treatment and prevention of 25 waste streams and on the different types of waste treatment plants including landfills
- information on waste prevention (LEBENS MINISTERIUM 2011).

The information on the waste streams and waste treatment plants is yearly updated by status reports. The status reports are published on the website of the Federal Waste Management Plan

In addition some 35 special waste reports have been prepared and published on its internet by the Austrian Environment Agency (see Table 13). These reports describe

- Waste prevention and recycling techniques and measures
- Special waste streams including generation and treatment flows, treatment and prevention techniques/technologies
- Special waste treatment techniques and technologies or
- Treatment standards.

Table 13: Reports of the Austrian Environment Agency on waste prevention and waste management

(http://www.umweltbundesamt.at/aktuell/publikationen/publikationsliste/?pub_category_id=1)

Name of document in German	Name of document in English (own translation)
Rückstände aus der Nahrungs- und Genussmittelproduktion	Residues from the food and beverage production
Ex-Situ Behandlung von kontaminierten Böden	Ex-situ treatment of contaminated soils
Klimarelevanz der Abluftreinigung bei der Mechanisch-Biologischen Abfallbehandlung (MBA)	Climate impact of air purification in the mechanical-biological treatment (MBT)
Flachbildschirmaltgeräte	Flat screens
Deponierückbau	Landfill mining
Klimarelevanz und Energieeffizienz der Verwertung biogener Abfälle	Climate impact and energy efficiency of the recycling of organic wastes
Entwicklung des Abfallvermeidungsprogramms 2011	Development of waste prevention program in 2011
Evaluierung der Abfallvermeidungsstrategie 2006	Evaluation of waste prevention strategy in 2006
Klimarelevanz ausgewählter Recycling-Prozesse in Österreich	Climate impact of selected recycling processes in Austria
DOC/TOC im Eluat von Abfällen aus der MBA	DOC / TOC in the leachate of waste from MBT
Chemisch-Physikalische Behandlungsanlagen in Österreich 2009	Physical - chemical treatment plants in Austria in 2009
Aufkommen und Behandlung von Deponiesickerwasser	Generation and treatment of landfill leachate
Porosierungsmittel in der Österreichischen Ziegelindustrie	Pore-forming agents in the Austrian brick industry
RUSCH - Ressourcenpotenzial und Umweltbelastung von Schwermetallen	RUSCH - Resource potential and environmental impact of heavy metals
Klärschlamm	Sewage sludge
Behandlung von gemischten Siedlungs- und Gewerbeabfällen in Österreich	Treatment of mixed municipal and commercial waste in Austria
Elektroaltgerätebehandlung in Österreich	WEEE treatment in Austria
Tierische Nebenprodukte 2004-2006	Animal-by-products 2004-2006
Leitfaden für Abfallverbrennungsanlagen	Guidelines for waste incineration plants
Thermische Kraftwerke und Feuerungsanlagen	Thermal power plants and combustion plants
Dienstleistung statt Produkt	Services instead of products
Asbest	Asbestos
Erfasste Deponiegasmengen auf Österreichischen Deponien - Zeitreihe für die Jahre 2002 bis 2007	Collected landfill gas quantities on Austrian landfills - time series for the years 2002 to 2007
Mechanische Abfallbehandlung (MA) von gemischten Siedlungs- und Gewerbeabfällen in Österreich	Mechanical treatment of waste (MA) of mixed residential and commercial waste in Austria
Stand der Umsetzung der Abfallverbrennungsverordnung	Implementation status of the Waste Incineration Ordinance
Abfallverbrennung in Österreich	Waste incineration in Austria
Evaluierung des Abfallannahmeverfahrens für mechanisch-biologisch behandelte Abfälle zur Deponierung	Evaluation of the waste acceptance procedure for mechanically - biologically treated waste to landfill
Weißbuch Abfallvermeidung und -verwertung in Österreich	White Paper - Waste prevention and recycling in Austria
Ist-Stand der Mechanisch-Biologischen Abfallbehandlung (MBA) in Österreich	Actual state of the mechanical-biological treatment (MBT) in Austria
Erarbeitung eines Beprobungskonzeptes für Ersatzbrennstoffe	Development of a sampling concept for alternative fuels
Abfallvermeidung und -verwertung in Österreich	Waste prevention and recycling in Austria
Konsensfindungsprozess	Consensus-building process
Vererdung von Abfällen: Vorarbeiten für eine rechtliche Regelung	Humification of waste : preliminary work for a legal regime
Abfallvermeidung und -verwertung: Baurestmassen	Waste prevention and recycling - Construction and demolition waste
Abfallvermeidung und -verwertung. Aschen, Schlacken und Stäube in Österreich.	Waste reduction and recycling - Ash, slag and dust in Austria

The Austrian Environment Agency organises together with the Lebensministerium and their sister organisations in Switzerland and Germany the conference Re-source 2014. On this conference latest developments of the circular flow economy are discussed among waste management and resource efficiency experts. The conference is accompanied by an own webpage (see Figure 18).

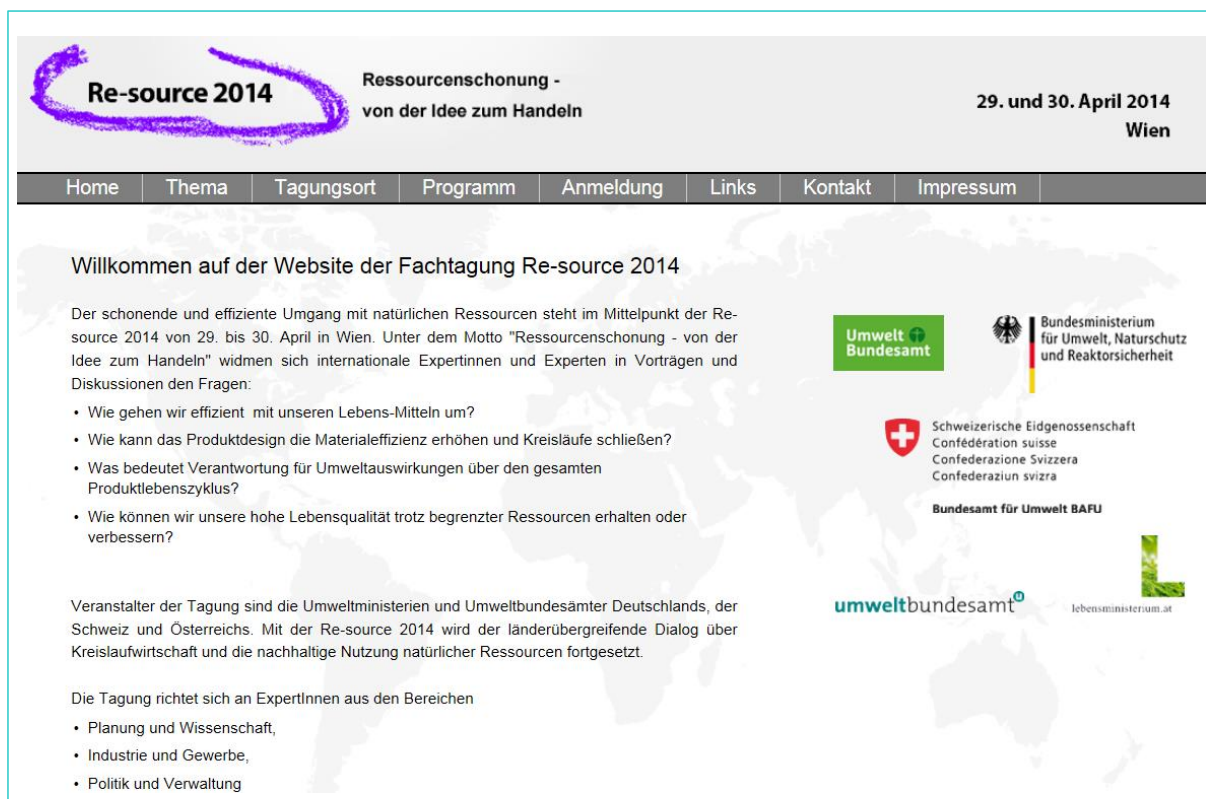


Figure 18: Main page of the Re-source 2014 website (www.re-source2014.at)

6.1.3 Feedback from users

Studies authored by other institutions (universities, consultants and waste management companies) which take reference to the waste generation and treatment data and the waste prevention measures published in the Federal waste management plan, as well as personal requests for additional information and personal feedback are evidence that following publications prepared or supported by the Austrian Environment Agency are of special use for the waste management sector and the wider public:

- The waste generation and treatment data and the waste prevention measures of the Federal Waste Management Plan – including the yearly updates of the waste generation and treatment data
- Studies on specific waste streams – especially the study on asbestos

The popularity of the Austrian Environment Agency's internet-site on waste can be derived from Table 14, which shows the number of site visits by sub-page, the average duration a visitor was on the page and the total duration of all visits, for the first ten months of 2013.

In total in this period the waste pages were opened nearly 15,000 times, some 2,600 visitors opened the main page (General waste) and around 1,000 visitors the sub-pages each. Judged from the number of visits, all, the Federal Waste Management Plan, Recycling, all waste treatment topics, waste data and waste generation were of considerable interest. The average duration of all waste site visits was 1 minute 14 seconds. Sub-pages with longer texts, such as the page on the recycling of WEEE were studied longer. This is an indication that the texts of the internet site are actually read.

Table 14: Access to the internet-site

<http://www.umweltbundesamt.at/umweltsituation/abfall/> from 01.01.2013 to 30.10.2013

Sub-Page	Number of site visits	Average duration of visit	Total duration of visits in days
Federal Waste Management Plan	1,476	00:02:07	2.17
Recycling	1,383	00:01:54	1.82
Recycling/WEEE	909	00:02:43	1.71
Waste prevention	1,101	00:02:13	1.70
General waste	2,633	00:00:47	1.43
Landfilling	736	00:02:16	1.16
Waste data (bases)	1,420	00:00:57	0.94
Mechanical-biological treatment	741	00:01:45	0.90
Waste treatment	1,397	00:00:47	0.76
Waste generation	1,197	00:00:46	0.64
Thermal waste treatment	488	00:01:46	0.60
Other waste topics	1179	00:01:01	0.83
Total	14,660	00:01:14	14.66

6.2 Waste information dissemination by Lebensministerium

The waste information dissemination system of the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (Lebensministerium) mainly consists of

- The Federal Waste Management Plan with an own web-site (see chapter 4.2.2 and Figure 19)
- Several further web-sites of the Lebensministerium and
- The Electronic Data Management System (EDM) also with an own web-site.



Figure 19: Website of the Austrian Federal Waste Management Plan (<http://www.bundesabfallwirtschaftsplan.at>)

6.2.1 Lebensministerium's web pages

The top web-page of Lebensministerium on "Waste and Resource Management" (see Figure 20) links to following topics:

- Waste prevention
- Separate waste collection
- Treatment of waste
- Landfilling
- Transboundary movement
- Remediation of contaminated sites
- Legal aspects
- Federal Waste Management Plan
- Electronic data management
- End-of-life-vehicles
- WEEE
- Batteries
- Packaging
- Industrial waste management.

Under each of these topics a multitude of information, including summaries on current development, reports, information on support programs, application forms and links to other information sources can be found.

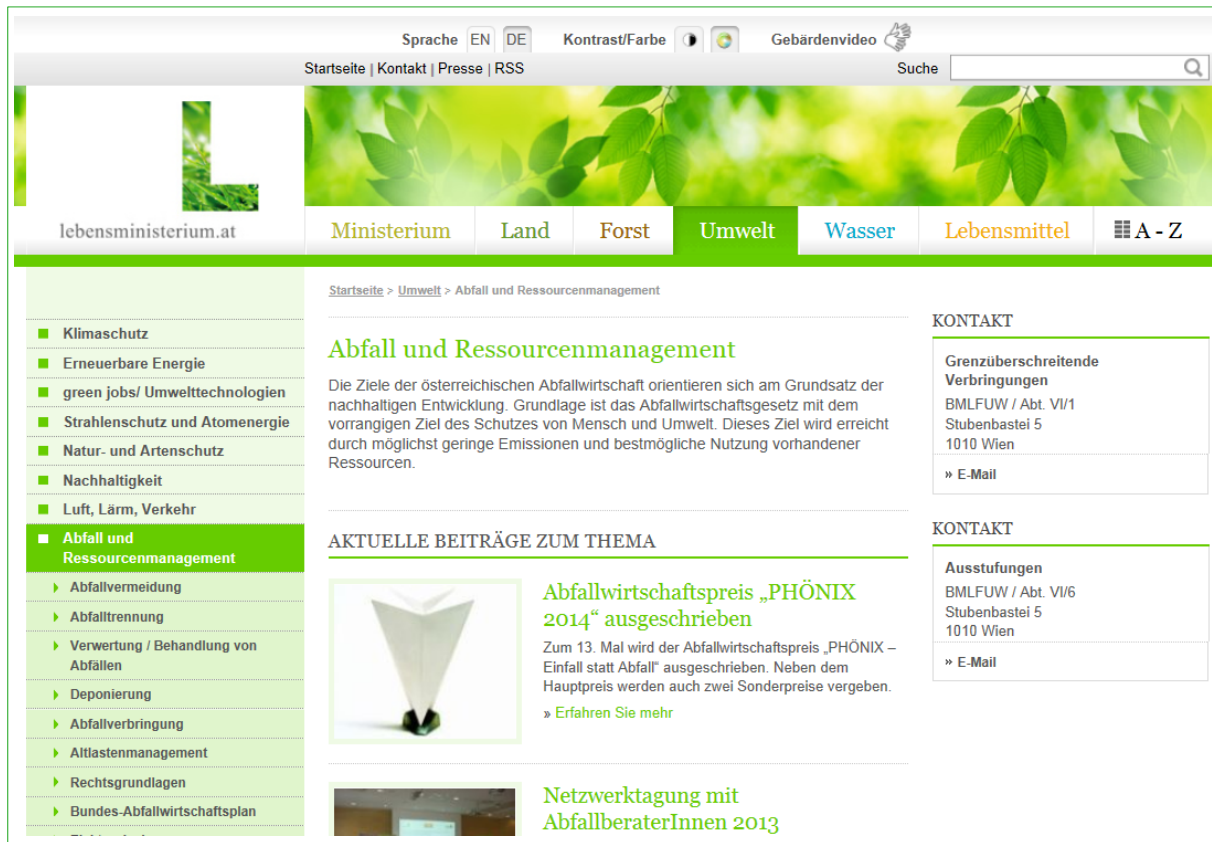


Figure 20: Top web-page on waste and resource management of Lebensministerium (<http://www.lebensministerium.at/umwelt/abfall-ressourcen.html>)

A special area of the Lebensministerium website is dedicated to the initiative “Food is precious” (Lebensmittel sind kostbar). The corresponding web-pages provide information on how to prevent food wastage (see Figure 21).

Lebensministerium also features an own web-page on resource efficiency (see Figure 22).

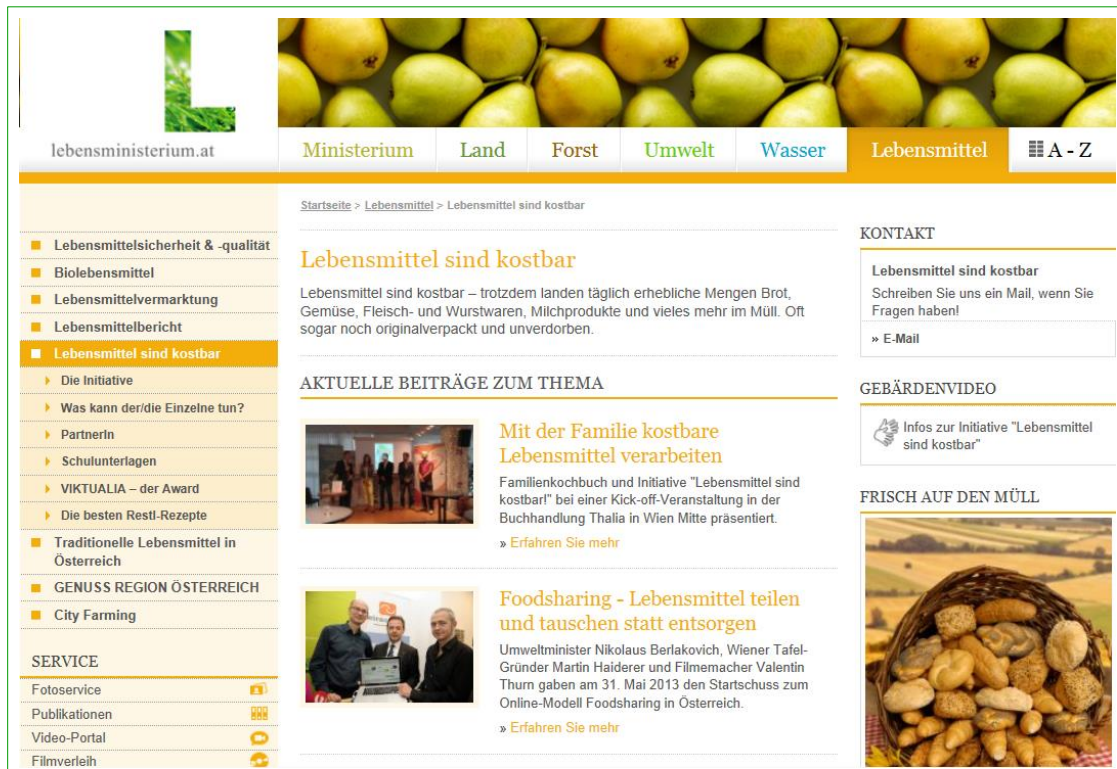


Figure 21: Main web-page on the food waste prevention initiative „Food is precious“ (http://www.lebensministerium.at/lebensmittel/kostbare_lebensmittel.html)

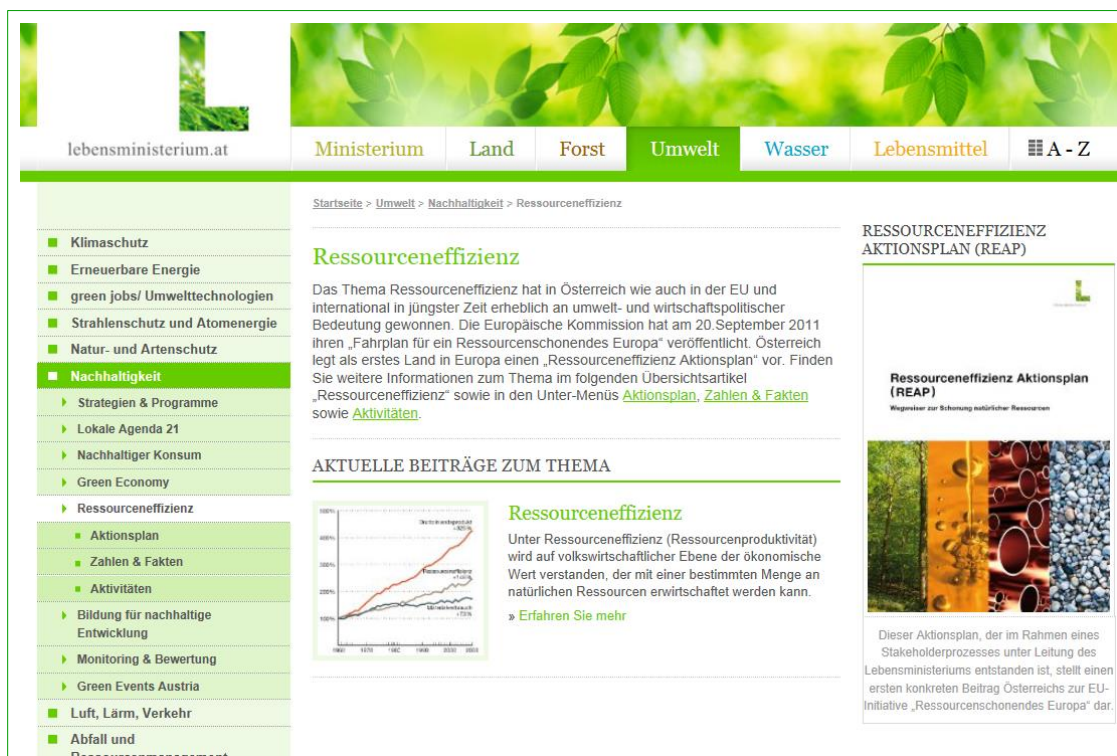


Figure 22: Lebensministerium's web-page on resource efficiency (<http://www.lebensministerium.at/umwelt/nachhaltigkeit/ressourceneffizienz.html>)

6.2.2 EDM

The Electronic Data Management (EDM) System of Lebensministerium is a data base designed to store all waste related data which has to be reported by waste producers and waste management companies to Lebensministerium. A small part of this data base can be searched by the public to identify waste management companies and plants with the license to handle the different waste types. This search is accessible via an own internet-site (see Figure 23).

Figure 23: Search-page of Lebensministeriums Internetsite of the Electronic Data Management (EDM) System (<https://secure.umweltbundesamt.at/eras/register-abfrageSammlerBehandlerSearch.do>)

6.3 Other Austrian institutions providing waste information

Further Austrian institutions which provide information on waste management are:

- The Austrian Water and Waste Management Association (ÖWAV) organises seminars and the biggest annual waste conference, runs discussion groups and issues a newsletter on waste, (<http://www.oewav.at/page.aspx>)
- The “Coordination Unit on WEEE” (Elektroaltgeräte Kordinierungsstelle) publishes an annual report on the amounts of electrical equipment and batteries put on the market and on the amount of WEEE and waste batteries collected (EAK 2013) and newsletters on the collection systems
- ARA (Altstoff Recycling Austria) publishes an annual report on its part of the packaging waste collection system and on waste prevention activities (ARA 2013).
- The Austrian Chamber of Commerce (<https://www.wko.at/Content.Node/Service/Umwelt-und-Energie/Abfall/Abfall-allgemein/Abfall->

allgemein---Themenstartseite.html), regional governments and large cities, among others, support industries in preparing waste management concepts, which are required to be prepared by institutions with more than 20 employees and by waste producing plants.

An example for a city which is very active in providing waste related information is the City of Vienna. The City of Vienna

- publishes studies, e.g. on urban mining, construction and demolition waste and packaging waste;
- provides guidelines for the preparation of waste management concepts;
- finances the program “Eco-Business-Plan” in which more than 800 industrial enterprises have been consulted in improving their production processes (<http://www.wien.gv.at/umweltschutz/>) and
- runs the waste prevention program “Less waste, naturally” (Natürlich weniger Mist) (see Figure 24).



Figure 24: Top-page of Vienna's waste prevention program web-site “Less waste, naturally” (Natürlich weniger Mist) (<http://www.wenigermist.at/>)

6.4 Comparison between Croatia and Austria

In Croatia CEA's internet site is the main source of waste data for public and expert use.

In Austria the main waste data source is the Federal Waste Management Plan, with its yearly updates, published by the Austrian Ministry of Environment on an own internet site. Consequently the Austrian Environment Agency's internet site provides only complementary waste management data but acts primarily as information hub linking to the Federal Waste Management Plan and other data source. However, Austrian Environment Agency's internet site also links to downloadable reports prepared by the Agency itself, which give detailed information on best available technologies for waste treatment including recycling and analyses of waste prevention options.

Both the Austrian Environment Agency and Lebensministerium put much emphasis on a good “look and feel” of their websites (see Figure 14 and Figure 20).

7 INTERNET-WASTE-SITES OF ENVIRONMENT AGENCIES FROM OTHER EU MEMBER STATES

7.1 Umweltbundesamt Deutschland

Also the internet waste pages of the German Umweltbundesamt (German Federal Environment Agency) deal with waste and resources (see *Figure 25*).

While the English version of the German Umweltbundesamt's waste pages provide summaries on important current topics such as bioplastics or planned obsolescence the German version (see *Figure 26*) is much more detailed. *Figure 27* shows the waste topics which are tackled on the German Umweltbundesamt's internet-site by an own page each. For each of these topics

- an introduction is given including
 - legal requirements,
 - modes of collection, treatment and recycling
 - generation, collection and treatment/recycling statistics
 - current challenges
- downloadable reports are provided; for packaging, for example, these reports are on:
 - generation and treatment of packaging waste statistics
 - the evaluation of the packaging ordinance
 - environmental impacts of biodegradable packaging
 - multi-use and low impact single-use beverage packaging
 - plastic bags
- links to other related web-pages of the German Umweltbundesamt, to other homepages and to other reports are provided
- a contact person is shown.

The users of the German Umweltbundesamt's internet-site also can express their opinions by participating in a continuous opinion poll.

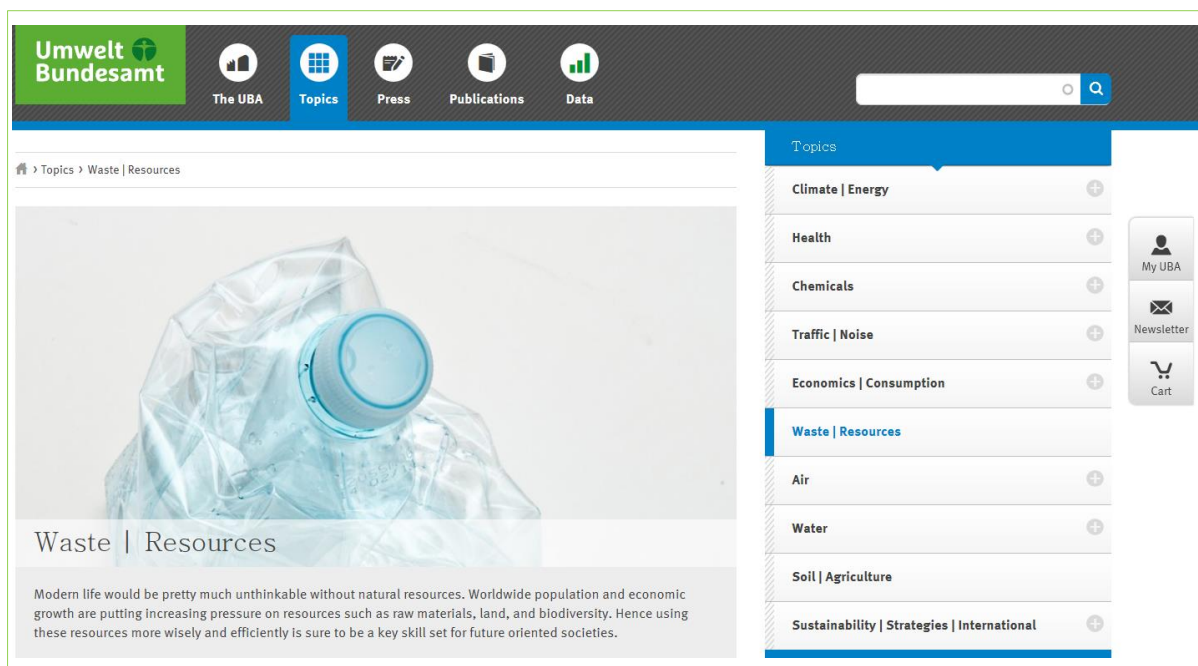


Figure 25: English version of the waste-top-page of the German Umweltbundesamt internet site (<http://www.umweltbundesamt.de/en/topics/waste-resources>)

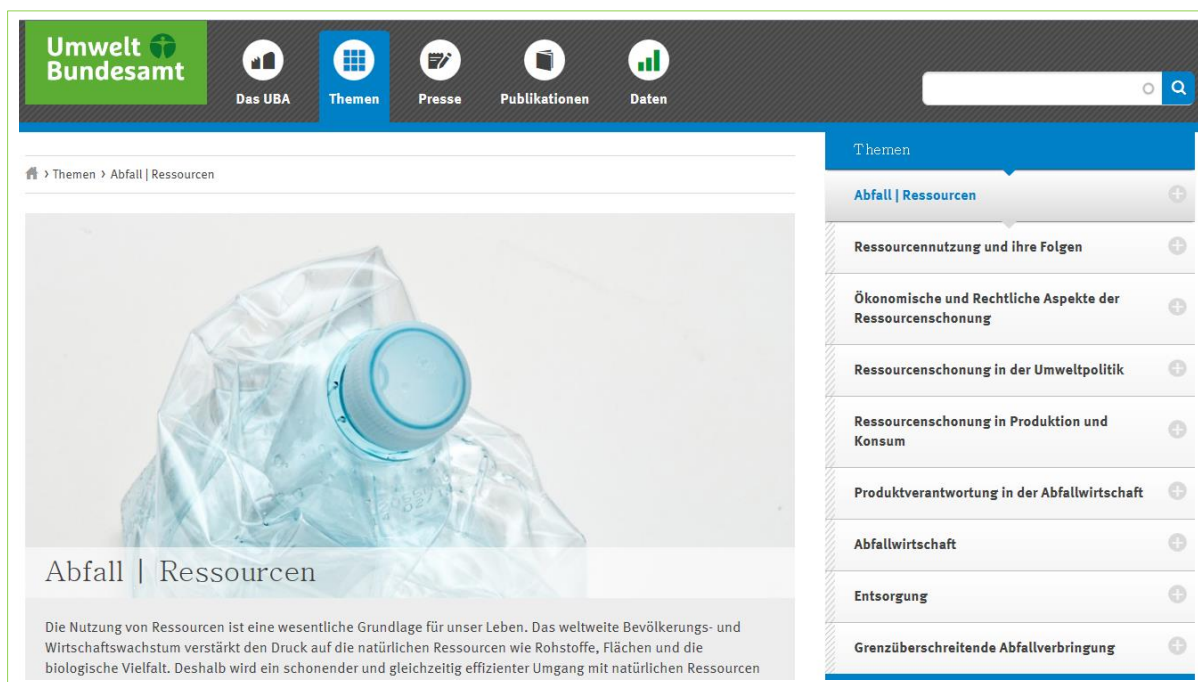


Figure 26: German version of the waste-top-page of the German Umweltbundesamt internet site (<http://www.umweltbundesamt.de/themen/abfall-ressourcen>)

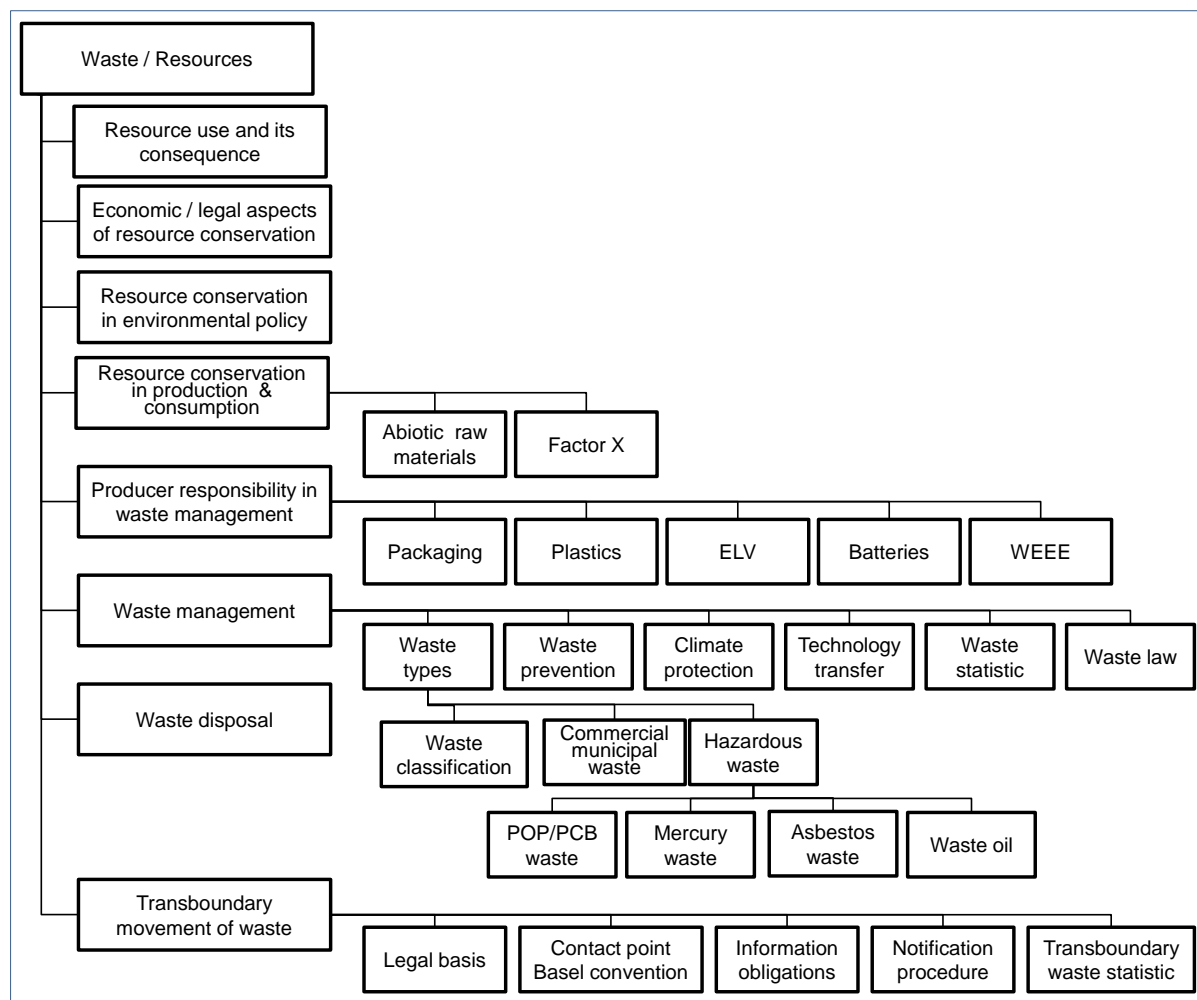


Figure 27: Topics of the German Umweltbundesamt's internet waste pages (<http://www.umweltbundesamt.de/themen/abfall-ressourcen>)

7.2 Environmental Protection Agency Ireland

The top-waste-page of the Irish Environmental Protection Agency's (EPA's) internet-site is very much focused on presenting a good "look and feel" (see Figure 28). The further waste pages are more focused on providing detailed information (see Figure 29). The Irish Environmental Protection Agency's waste pages give much information on waste prevention (see Figure 29). However, also many other waste topics are tackled (see Figure 30). One speciality is that one part of the Irish EPA web-waste-pages is dedicated directly for giving advice for households.

The Irish EPA's reports are listed on own web-pages each, for each waste topics (see Figure 31). Similar to the Austria Federal Waste Management Plan the Irish National Waste Report publishes most waste statistics in one document which is updated annually. In the year 2013 the year 2011 statistics are made available.



Figure 28: Top waste page of the Irish EPA's internet site (<http://www.epa.ie/#&panel1-4>)



Figure 29: Waste prevention page of the Irish EPA's internet site (<http://www.epa.ie/waste/nwpp/>)

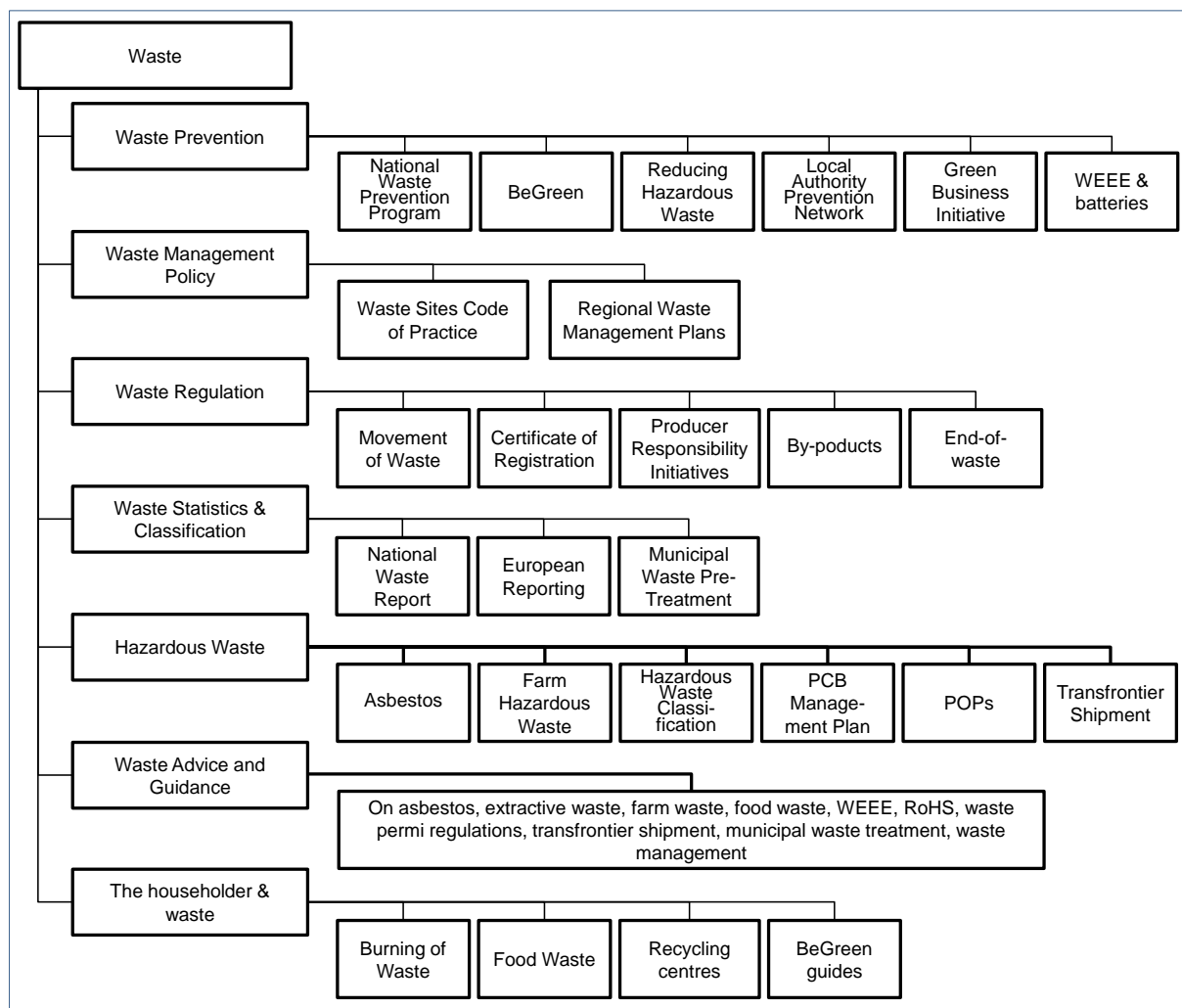


Figure 30: Topics of the Irish EPA's internet-waste-pages (<http://www.epa.ie/waste/nwpp/>)

▼ Publications & Reports

Air

▼ Waste

Waste Management Planning

► National Waste Reports

Waste Prevention

Waste Prevention Project Outputs

Hazardous waste

Unauthorised Waste

Waste Electrical & Electronic Equipment

European Week For Waste Reduction

Waste Characterisation

Stop Food Waste

Water

Land

Biodiversity

Enforcement

Research Reports

Climate Change

National Waste Reports

Year	Title
2013	National Waste Report for 2011 – Errata National Waste Report 2011 errata
2013	National Waste Report 2011 This report presents information on waste generation and management in 2011.
2012	National Waste Report 2010 This report presents information on waste generation and management in 2010.
2012	Tuarascáil Náisiúnta Dramhaíola 2010 Achoimre feidhmiúcháin, conclúidí and moltaí an Tuarascáil Náisiúnta Dramhaíola 2010
2011	National Waste Report 2009 This report presents information on waste generation and management in 2009.
2011	Tuarascáil Náisiúnta Dramhaíola 2009 Cuireann an tuarascáil seo faisnéis maidir le giniúint agus bainistiú dramhaíola i 2009.
2010	Focus on Landfilling in Ireland This report examines landfilling in Ireland
2009	National Waste Report 2008 This report presents information on waste generation and management in 2008
2009	Tuarascáil Náisiúnta Dramhaíola 2008 Cuireann an tuarascáil seo faisnéis maidir le giniúint agus bainistiú dramhaíola i 2008
2009	National Waste Report 2007 This report presents information on waste generation and management in 2007
2008	National Waste Report 2006 This report presents information on waste generation and management in 2006.
2006	National Waste Report 2005 This report presents information on waste generation and management in 2005
2005	National Waste Report: Compost facilities 2005 This factsheet describes composting infrastructure in Ireland in 2005.

Figure 31: List of downloadable reports on waste statistics from the Irish EPA's internet site

7.3 Environment Agency Scotland

As compared to Ireland the waste web-page of the Scottish Environment Agency (SEPA) (see Figure 32) is more focused on waste data and waste data collection (see Figure 33). Resulting waste statistics are published rather in single page tables than in reports. Information on the treatment of different waste types is provided mainly in the form of 2 page factsheets.

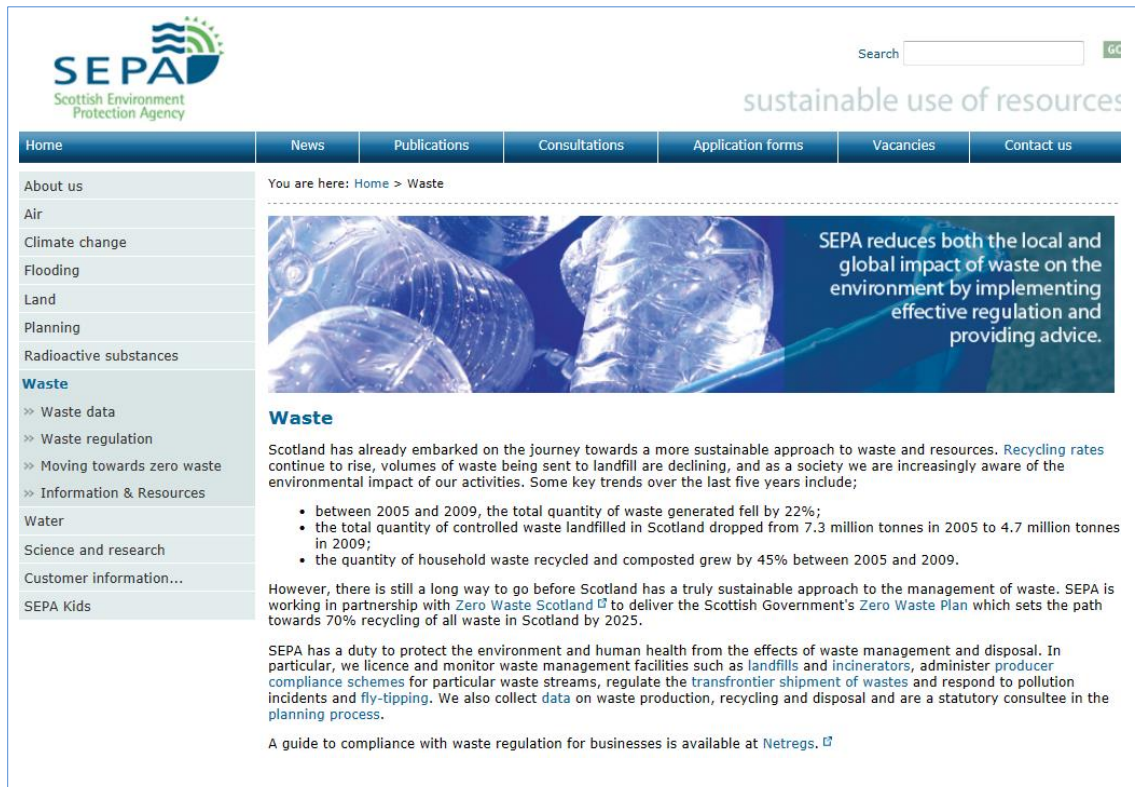


Figure 32: Waste-top-page of the Scottish Environment Agency's internet site (<http://www.sepa.org.uk/waste.aspx>)

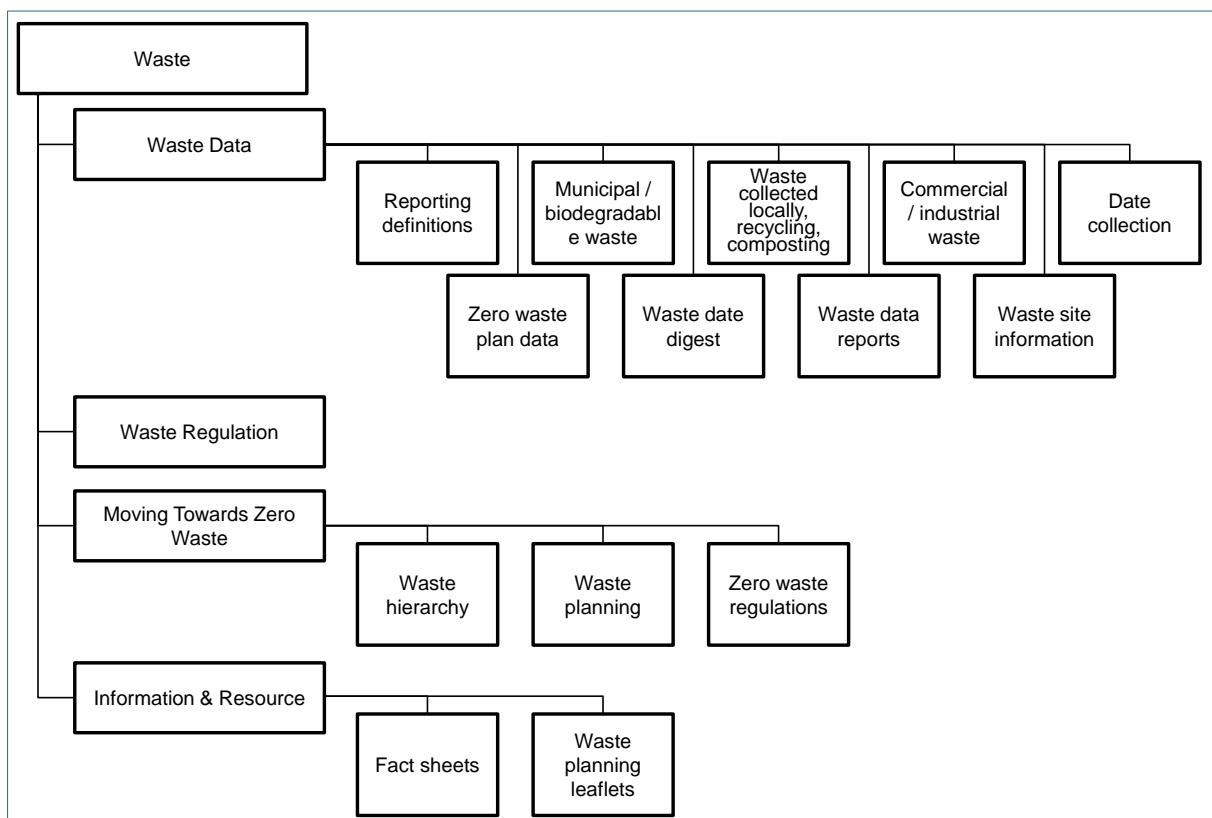


Figure 33: Topics of the SEPA's internet-waste-pages (<http://www.epa.ie/waste/nwpp/>)

7.4 OVAM Flanders

OVAM (Openbare Vlaamse Afvalstoffenmaatschappij) is the Flemish Waste Agency. As it only deals with waste management, materials management and soil remediation, the total OVAM web-site is exclusively dedicated to these topics. This allows for an easier navigation through the web-site than through websites of other environmental protection agencies. The English version of OVAM's website (see Figure 34) provide introduction for several waste streams, occasionally accompanied by a report. The Flemish version of OVAM's website (see Figure 35) is much more detailed, and does not only provide information on traditional waste management topics, but also on efficient resource managements, eco-design, waste prevention and recycling (see Figure 36). OVAM has clearly developed from an institution which provided primarily waste statistics to an institutions which effectively supports industries, public institutions and citizens to consume less materials, to generate less waste and to close material cycles.

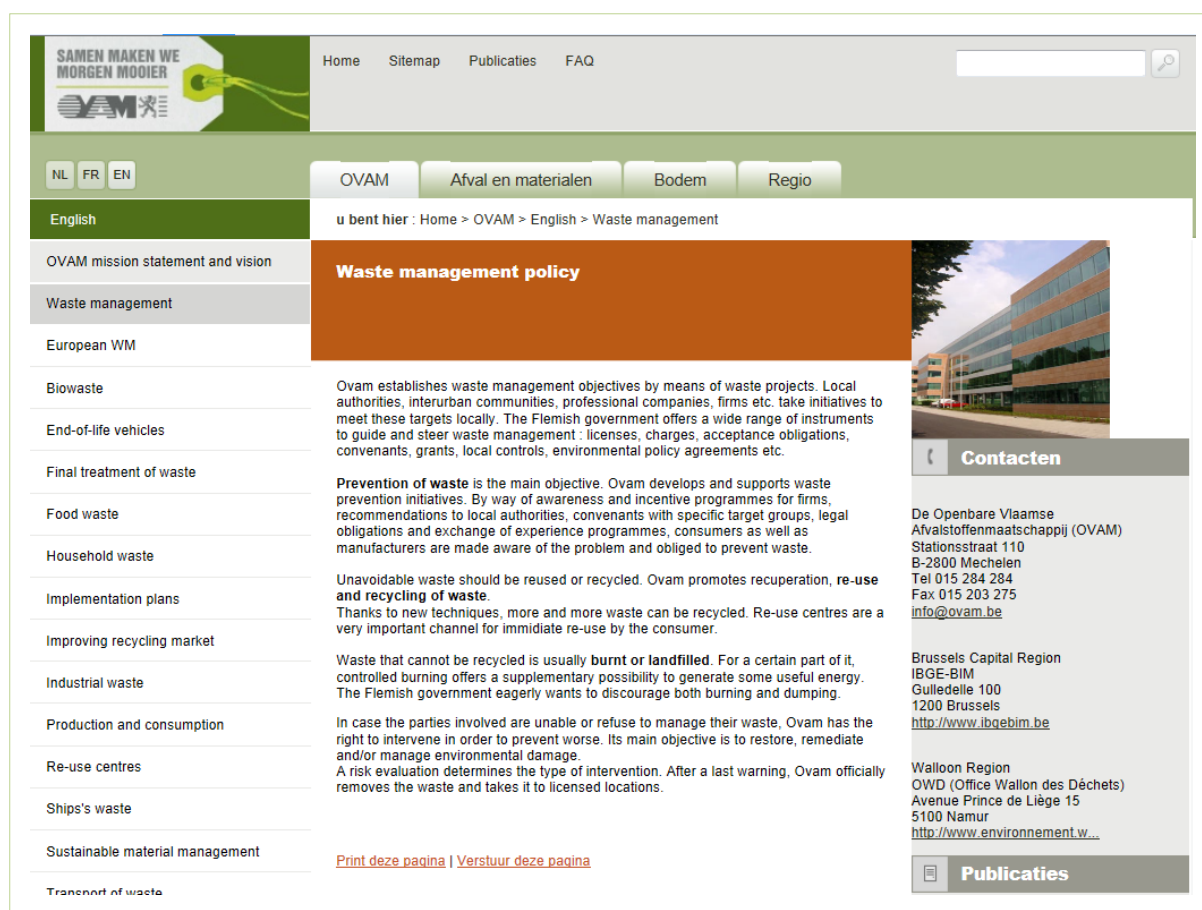


Figure 34: English version of OVAM's internet site (<http://www.ovam.be/jahia/Jahia/pid/975?lang=en>)

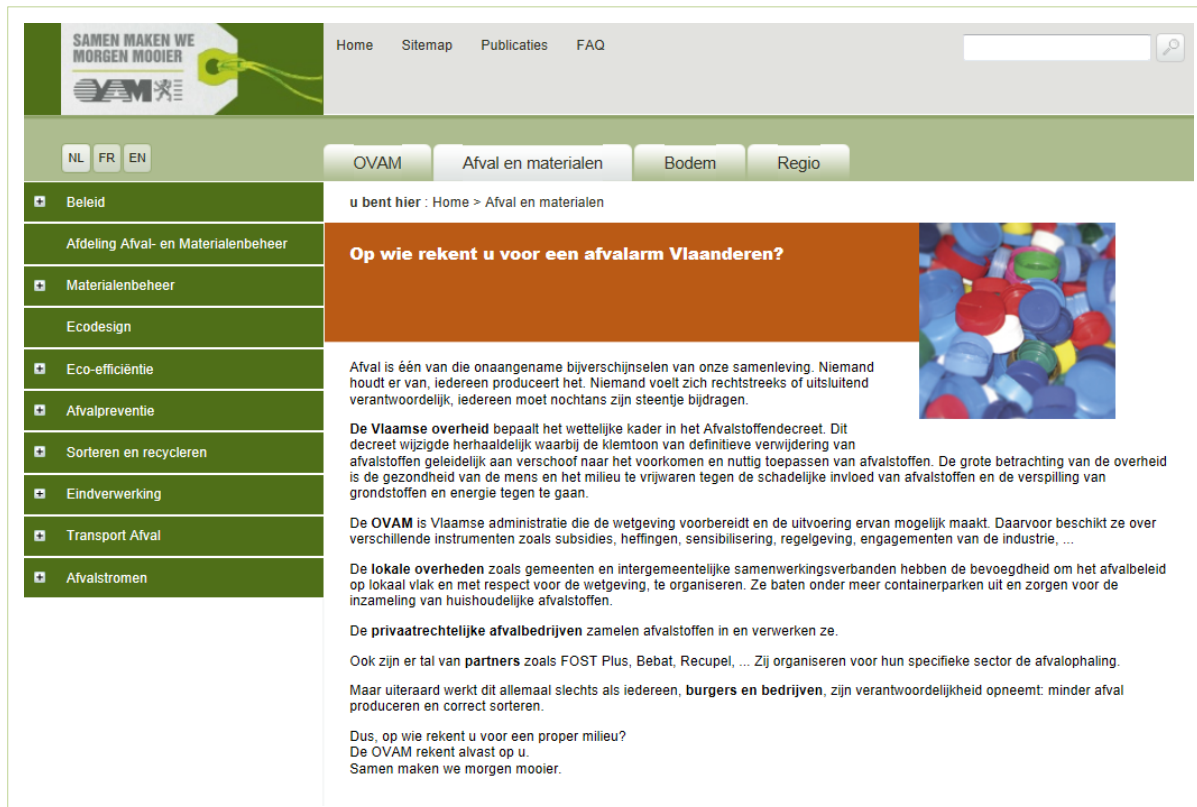


Figure 35: Flemish version of OVAM's internet site (<http://www.ovam.be/jahia/Jahia/pid/6>)

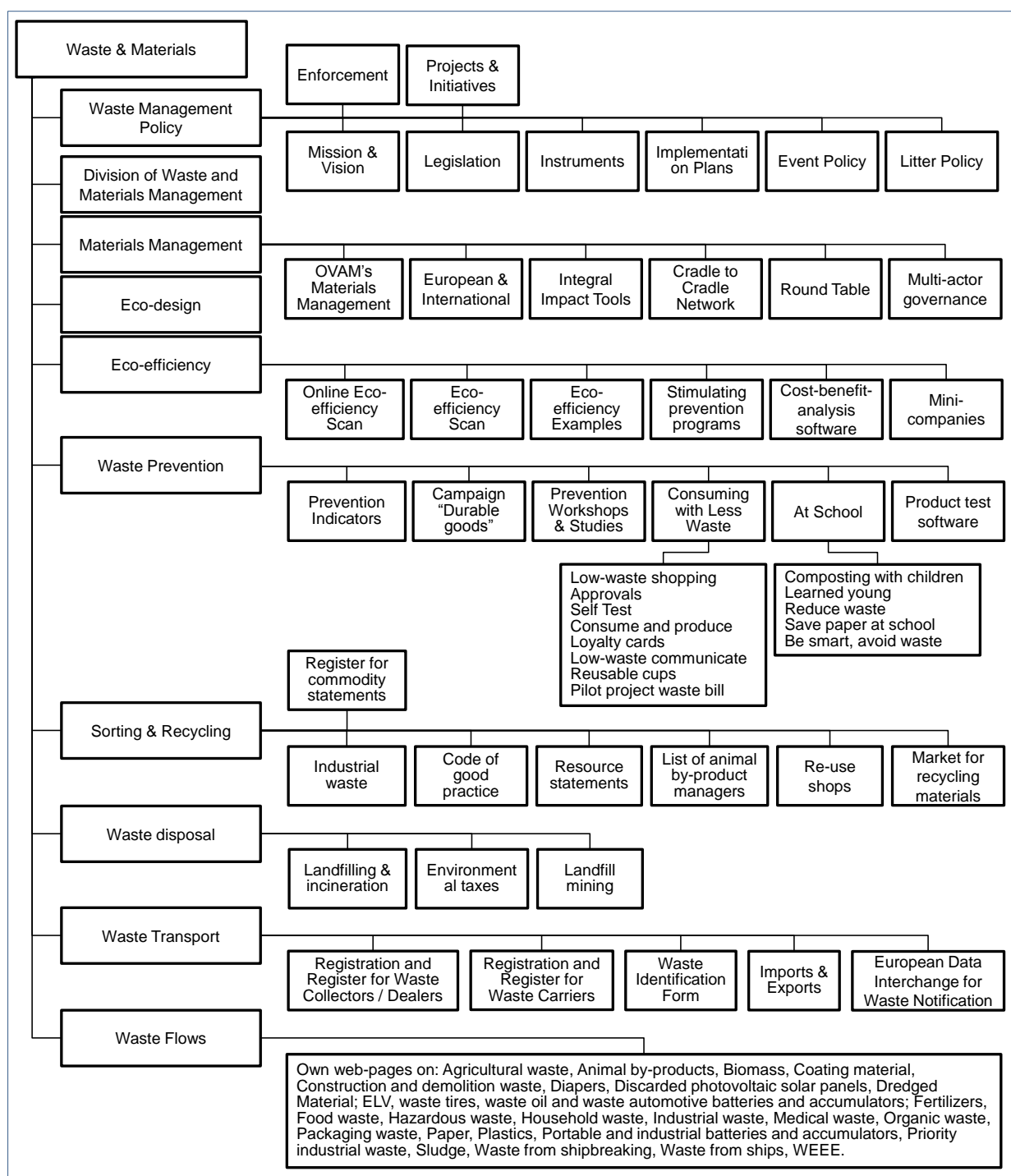


Figure 36: Topics of the OVAM's internet-waste-&-materials-pages
(<http://www.ovam.be/jahia/Jahia/pid/6>)

8 EVALUATION, CONCLUSIONS AND RECOMMENDATIONS

8.1 Contents

Up to now CEA's waste information dissemination system is focused

- on providing data on waste generation and landfilling and treatment
- and on helping to find proper institutions for managing a certain waste.

In addition manuals for the handling of certain waste types are provided.

CEA's internet page and publications provide the best available data on the Croatian waste management system. Thus CEA is likely the most important data source for analysing the present status of the Croatian waste management system and for planning its future development.

According to the "Assessment Report on the Availability of Environmental Information in the Republic of Croatia" (EEA 2007) and the EEA core set of indicators Croatia should be able to provide data on:

- Municipal waste generation
- The generation and recycling of packaging waste.

CEA provides annual reports on municipal waste generation and submits corresponding data to the Eurostat. For the generation and recycling of packaging waste, however, more limited data are published. The most recent data referring to packaging waste seem to be year 2012 statistics on the amount of packaging put on the market and the amount of packaging waste collected.

While the information provided by CEA is very important for the development of the Croatian waste management system, and while CEA should continue in providing these data on a high level of quality, efforts should be considered to widen the product range. In order to

- implement the waste hierarchy as defined in the EU waste framework directive (2008/98/EC),
- help especially small and medium sized enterprises minimising their waste generation and environmental impacts
- support public and private consumers in consuming efficiently
- enable the establishment of repair and re-use systems
- improve separate waste collection
- make sure that the best available technologies are applied to their full potential in waste treatment and
- increase recycling rates,

information should be disseminated on

- efficient planning and production processes
- the replacement of hazardous substance by low impact substances
- eco-design principles and efficient, low-impact, long-living products
- the replacement of products by efficient services

- efficient consumption and covering of needs
- best available waste treatment and recycling technologies and techniques
- organisational, legal, financial, voluntary, information instruments to promote waste prevention, re-use, recycling, efficient waste treatment and effective separate waste collection.

In addition a web-page on Croatia's waste reporting obligations and a page on the twinning light project "Improvement of Waste Reporting in Croatia" may be of interest for citizens and experts.

8.2 Dissemination Method

The waste information dissemination method, by combining internet-based information dissemination with downloadable reports and access to selected areas of data bases is state of the art. The survey executed during this project reveals a high level of satisfaction with CEA's waste information dissemination system. Thus the general direction of the waste information dissemination system should be maintained.

Taking into account comments provided by users of CEA's internet waste page and comparing CEA's waste information dissemination system / CEA's web-site with similar systems in Austria and other EU Member States, improvements seem to be possible:

- With the timeliness of the reports/information made available
- With the "look and feel" CEA's internet waste page
- With the ease to find requested information
- With avoiding redundancies and "white spots" within the combined waste information system of CEA, the Ministry of Environmental and Nature Protection and the Environmental Protection Fund.

Thus it is recommended to explore ways

- For faster updating existing reports and for faster putting prepared reports on the internet
- For making the "look and feel" CEA's internet-site more attractive to potential users
- For displaying and structuring the information on CEA's waste web pages in a way which can be more easily grasped
- For better harmonising the waste information systems of the Ministry of Environmental and Nature Protection, the Environmental Protection Fund and CEA.

Possibly CEA's website could act as information hub, from which all other waste information related websites in Croatia can be accessed.

9 LIST OF ABBREVIATIONS

AZO	Agencija za zaštitu Okoliša (= CEA)
BAWP	Bundes-Abfallwirtschaftsplan (Federal Waste Management Plan of Austria)
CEA	Croatian Environment Agency (= AZO)
EDM	Electronic Data Management System
EEA	European Environment Agency
EIONET	European Environment Information and Observation Network
ELV	end-of-life-vehicles
EPA	Environmental Protection Agency
EPR	Environmental Pollution Registry
HGK	Croatian Chamber of Economy
PCB	polychlorinated biphenyls
SEPA	Scottish Environment Agency
WEEE	waste from electrical and electronic equipment

10 REFERENCES

- ARA - Altstoff Recycling Austria (2013): ARA performance report 2012. Vienna.
<http://www.ara.at/e/home.html>.
- AZO - AGENCIJA ZA ZAŠTITU OKOLIŠA (2012): Komunalni Otpad i Odlagališta Otpada. Zagreb. <http://www.azo.hr/KomunalniOtpadI>.
- CEA – Croatian Environment Agency (2010): Waste chapter of the Croatian State of Environment Report 2005-2008 (Gospodarenje otpadom - Izvješće o stanju okoliša u Republici Hrvatskoj 2005-2008). Zagreb.
<http://www.azo.hr/Izvjesca14>
- CEA – Croatian Environment Agency (2012): Annual Report 2011 (summary). Zagreb.
- CEA – Croatian Environment Agency (2013): Environment in Your Pocket I. Zagreb. <http://www.azo.hr/Publication07>
- EAK - Elektroaltgeräte Koordinierungsstelle (2013): Tätigkeitsbericht 2012. Wien.
<http://www.eak-austria.at/presse/>.
- EEA – EUROPEAN ENVIRONMENT AGENCY (2007): Assessment Report on the Availability of Environmental Information in the Republic of Croatia.
http://nfp-hr.eionet.europa.eu/publications/fol359324/Beogradsko_web.pdf.
- GOVERNMENT OF THE REPUBLIC OF CROATIA (2007): Waste Management Plan in the Republic of Croatia - For the period from 2007 to 2015. Zagreb. (Official Gazette No. 85/07, 126/10, 31/11).
<http://www.mzoip.hr/default.aspx?id=7259>
- LEBENSMINISTERIUM (2011): Federal Waste Management Plan 2011. Vienna.
<http://www.bundesabfallwirtschaftsplan.at/>
- UMWELTBUNDESAMT (2013): Umweltkontrollbericht 2013 (State of Environment Report 2013). Vienna.
<http://www.umweltbundesamt.at/umweltsituation/umweltkontrollbericht/ukb/>.

Croatian legal acts

Act on Sustainable Waste Management (Official Gazette No. 94/13).

Environmental Protection Act (Official Gazette No. 80/13).

Ordinance on the Environmental Pollution Registry (Official Gazette No. 3 5/08)

EU regulations

Waste Framework Directive (2008/98/EC): Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives. OJ L 312, 22.11.2008, p. 3–30

Links:

<http://en.hgk.hr/about/professional-associations-and-their-activities/>
http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/search_database
<http://hugo.com.hr/prijava-za-simpozij/symposium/>
<http://udruga-gradova.hr/Default.aspx?art=311&sec=29>
<http://www.azo.hr/>
<http://www.bundesabfallwirtschaftsplan.at>
<http://www.environment-agency.gov.uk/business/topics/waste/>
<http://www.epa.ie/#&panel1-4>
<http://www.epa.ie/waste/nwpp/>
http://www.hok.hr/eng/about_hok/organization
<http://www.hrvzz.hr/>
<http://www.lebensministerium.at/umwelt/abfall-ressourcen.html>
<http://www.mst.dk/English/Waste/>
<http://www.mzoip.hr/default.aspx?id=7259>
<http://www.oewav.at/page.aspx>
<http://www.ovam.be/jahia/Jahia/pid/975?lang=en>
<http://www.sepa.org.uk/waste.aspx>
http://www.umweltbundesamt.at/aktuell/publikationen/publikationsliste/?pub_category_id=1
http://www.umweltbundesamt.at/en/services/services_resources/services_waste/
http://www.umweltbundesamt.at/en/soer/soer2010_partc/soer2010_resources/
<http://www.umweltbundesamt.at/umweltsituation/abfall/>
<http://www.umweltbundesamt.de/themen/abfall-ressourcen>
<http://www.wenigermist.at/>
<http://www.wien.gv.at/umweltschutz/>
<https://secure.umweltbundesamt.at/eras/registerabfrageSammlerBehandlerSearch.do>

11 APPENDIX – QUESTIONNAIRE – CUSTOMER SATISFACTION WITH CEA'S WEB-PAGE ON WASTE

Both, the Croatian and the English version of the questionnaire used to get feedback on the satisfaction of users of CEA's web-page on waste are shown here.

Istraživanje zadovoljstva korisnika u sklopu IPA Twinning Light projekta "Unapređenje izvješćivanja o otpadu u Hrvatskoj"

Hvala što sudjelujete u istraživanju zadovoljstva korisnika informacija koje osigurava Agencija za zaštitu okoliša, a koje se provodi u sklopu IPA Twinning Light projekta "Unapređenje izvješćivanja o otpadu u Hrvatskoj". Više o projektu: <http://www.azo.hr/IPA2009Twinning>

Rezultati ovog istraživanja omogućiti će nam uvid u kojoj mjeri podaci i informacije **o otpadu i gospodarenju otpadom** koje osigurava Agencija za zaštitu okoliša trenutno zadovoljavaju vaše potrebe te u kojem smjeru ćemo provoditi poboljšanja. Zahvaljujemo na suradnji i molimo da upitnik ispunite do 14. studenog



AGENCIJA ZA
ZAŠTITU OKOLIŠA

Molimo da označite odgovarajuću interesnu grupu kojoj pripadate ? *

- ☐ nadležna tijela u području gospodarenja otpadom
- ☐ tvrtke proizvođači otpada
- ☐ tvrtke koje gospodare otpadom
- ☐ znanstveno istraživačke institucije / stručna udruženja
- ☐ nevladine udruge
- ☐ nijedno od gore navedenog / građani

1. Koristite li internetske stranice Agencije za zaštitu okoliša /tema Otpad ? *

- ☐ Da
- ☐ Ne

Ako da, koliko često posjetite internetske stranice Agencije za zaštitu okoliša ? (označite jedno) *

☐ jednom mjesečno ili manje

☐ više puta mjesečno

2. Jeste li koristili neke od sljedećih proizvoda Agencije za zaštitu okoliša ? (označite jedno ili više) *

☐ GIS preglednik Gospodarenje otpadom /Katastar odlagališta

☐ Registar dozvola i potvrda za gospodarenje otpadom

☐ Preglednik podataka iz Registra onečišćavanja okoliša/dio otpad

☐ ništa od navedenog

3. Jeste li ikada koristili neki od sljedećih proizvoda Agencije ? (označite jedno ili više): *

☐ Izvješće o komunalnom otpadu i/ili publikacija "Komunalni otpad i odlagališta otpada"

☐ Godišnja izvješća o električnom i elektroničkom otpadu / otpadnim baterijama i akumulatorima / otpadnim vozilima / otpadnim uljima

☐ Izvješće o prekograničnom prometu otpadom

☐ Pregled podataka o dozvolama za gospodarenje otpadom

☐ Priručnici / upute za obveznike o vođenju podataka

☐ Izvješće o stanju okoliša (poglavlje Otpad)

☐ Brošura "Okoliš na dlanu"

☐ ništa od navedenog

☐ Nešto drugo (publikacije/ izvješća/ info letci/ baze podataka...)

molimo upišite što

4. Koristite li info@azo.hr mail za dobivanje informacija o otpadu ? *

☐ Da

☐ Ne

5. Postavljate li Agenciji za zaštitu okoliša telefonske upite ? *

☐ Da

☐ Ne

6. Da li su vam korisne informacije o otpadu koje osigurava Agencija za zaštitu okoliša ? *

☐ Da

☐ Ne

Koje su vam informacije najvažnije (od onih koje osigurava Agencija za zaštitu okoliša ? *

7. Da li ste zadovoljni kvalitetom informacija o otpadu koje vam pruža Agencija za zaštitu okoliša ? *

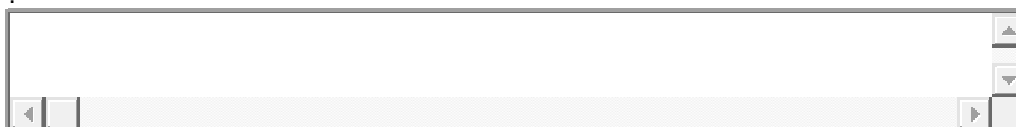
☐ Da

☐ Ne

Molimo vas za prijedlog koji bi doprinio unaprjeđenju kvalitete informacija



8. Koje bi vam dodate informacije o otpadu i gospodarenju otpadom bile korisne ?



Treba li Agencija za zaštitu okoliša osiguravati informacije o provedenim mjerama sprječavanja nastanka otpada / učinkovitosti provedenih mjera ? *

☐ Da

☐ Ne

9. Dodatni komentari



Polja označena s (*) su obavezna.

Customer satisfaction surveys as part of IPA Twinning Light project "Improvement of reporting on waste in Croatia"

Thank you for participating in the survey of customer satisfaction information provided by the Environmental Protection Agency, which is being implemented under the IPA Twinning Light project "Improvement of reporting on waste in Croatia." More about the project: <http://www.azo.hr/IPA2009Twinning>

The results of this research will provide an insight into the extent to which data and information on waste and waste management, which provides the Environmental Protection Agency currently meet your needs, and in which direction we will implement improvements. Thank you for your cooperation and please fill out the questionnaire to 14 November



Please check the appropriate interest group to which you belong*

- ☐ competent authority in the field of waste management
- ☐ waste producing company
- ☐ waste management company
- ☐ scientific research institution / professional association
- ☐ NGO
- ☐ None of the above / citizens

1. Do you use the waste page of CEA's web-site?*

- ☐ Yes
- ☐ No

If yes, how often do you visit the website of the Environmental Protection Agency? (check one)*

- ☐ once a month or less
- ☐ several times a month

2. Did you use any of the following CEA products? (check one or more)*

- ☐ GIS viewer Waste / Landfill
- ☐ Register of licenses and certificates for waste management
- ☐ Browser data from the Environmental Pollution Register / WASTE
- ☐ None of the above

3. Have you ever used any of the following products of the Agency? (check one or more)*

- ☐ Report on municipal waste and / or publication of "municipal waste and landfills"
- ☐ Annual reports on electrical and electronic waste / waste batteries and accumulators / end-of-life vehicles / waste oil
- ☐ Report on the transboundary movement of waste
- ☐ Overview information on permits for waste management
- ☐ Manuals / instructions for waste management
- ☐ State of Environment Report (Chapter Waste)
- ☐ Brochure "Environment in Your Pocket"
- ☐ None of the above
- ☐ Something else (publications / reports / info leaflets / database ...)

Please enter here

4. Do you use info@azo.hr mail to obtain information on waste?*

- ☐ Yes
- ☐ No

5. Do you ask CEA by telephone inquiries?*

- ☐ Yes
- ☐ No

6. Do you find the information on waste provided by CEA useful?*

- ☐ Yes
- ☐ No

What the most important information (from those provided by CEA) for you?*

7. Are you satisfied with the quality of information on waste provided by the Environmental Protection Agency?*

- ☐ Yes
- ☐ No

Kindly add proposals for improving the quality of information

8. Which additional information would be useful for you?

Should the Environmental Protection Agency provide information on measures to prevent the generation of waste / resource efficiency measures?*

- ☐ Yes
- ☐ No

9. Other comments



Fields marked with (*) are required.
