R4R
REGIONS FOR RECYCLING

Green Week 2014 satellite event

CIRCULAR ECONOMY

INTERREGIONAL TRAINING SESSION

GOOD PRACTICE EXAMPLES FROM EUROPE

May 14th, 2014

Rittersaal, Landtag Steiermark

Graz / Austria

ORDIF

Odense Renovation

Das Land Steiermark

tallinn

Agència de Residus de Catalunya

European Union

INTERREG IVC

Editor and responsible for the content

Dipl.-Ing. Dr. Wilhelm Himmel

Das Land Steiermark

Abfallwirtschaft und Nachhaltigkeit

Office of the Federal State Government of Styria

Department 14

Division Waste Management and Sustainability

Bürgergasse 5a, A-8010 Graz, Austria

www.abfallwirtschaft.steiermark.at

Photo: Schiffer

Welcome in Styria

As responsible Member of the Styrian Government, the sustainable management of waste is one of my special concerns. Networking on the European level enables an exchange of know-how and expertise in the field of recycling. I recognize the growing importance of recycling as an essential factor for the protection of resources as well as for climate-protection. Styria ranks among the countries with the highest recycling rates all over Europe.

The existence of 400 waste collection centres all over Styria contributes to a very high level of separate collection. The well-established Styrian waste management system is an important factor in order to present the region as a clean and healthy environment not only for its citizens but also for visitors appreciating Styria´s touristic values.

I am sure, that the R4R project and this Interregional Training Session will contribute to an improvement of the recycling standards on an international level and therefore enhance the attractiveness of the participating regions.

Johann Seitinger
Minister for Forest- and Agricultural Affairs, Water- and Waste Management and Sustainable Development in the Styrian Provincial Government

Greetings by the Organizers

Photo: Fischer

The Province of Styria is glad to host the 5th R4R Partner Meeting and to welcome guests from all partner regions in Europe. We appreciate that about 90 experts from 12 different countries all over Europe (and even some guests from Nepal and the Dominican Republic) followed our invitation to come to Graz / Austria for the next 3 days in order to learn more about the Austrian waste management system and to exchange their experiences and good practices in the field of recycling.

Styria is the origin of many innovations in the field of waste management. We are very proud that Styrian organisations and enterprises active in the various fields of waste management and in the development of new technologies are recognized as global players today.

Some examples of innovation originating in Styria:

- Composting – development of machines for crushing, screening and sorting of biogenous waste (Komptech – www.komptech.com)
- Sorting technology for glass (Binder+Co – www.binder-co.com)
- Sorting technology for old plastics (BT-Wolfgang Binder GmbH – www.bt-wolfgangbinder.at)
- Technology for the production of biodiesel (BDI-BioEnergy International AG – www.bdi-bioenergy.com)
- Waste disposal logistics (Saubermacher – www.saubermacher.com, A.S.A. – www.asa-group.com)
- Re-Use (BAN – www.ban.at, CARLA – www.carla.at)
- Training of municipal waste consultants (ARGE Müllvermeidung – www.arge.at)

I highly appreciate to be involved in the project R4R as a partner, the exchange of know-how and experience between the partner countries is an essential feature in order to gain new ideas for our local waste management.

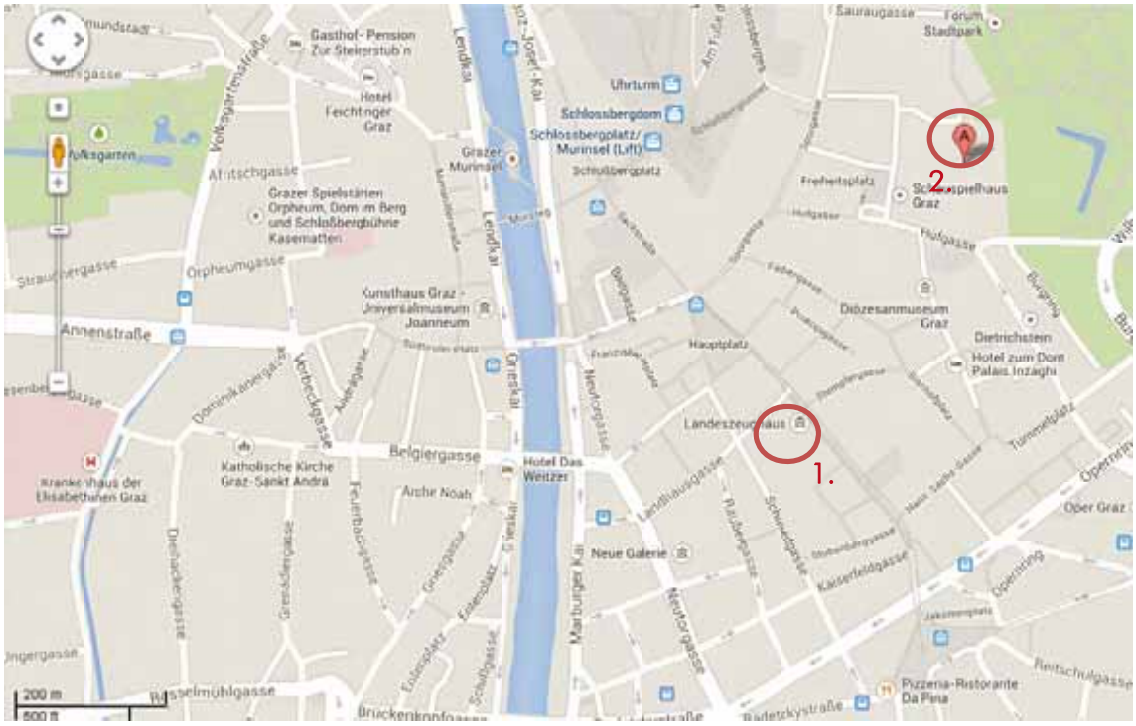
Wilhelm Himmel
Sustainability coordinator of Styria

AGENDA

Wednesday 14th May 2014		
Time	Public Conference and Interregional Training Session on Good Practice Examples from Europe	Location
08:30	**Registration** **Welcome by the Military Music Styria** ("Zero Waste March")	Rittersaal, Landtag Steiermark Herrengasse 16 A-8010 Graz
09:00 – 09:45	**Welcome to Styria** **Franz Majcen** *President of the Styrian Parliament* **MMag. Barbara Eibinger** *Leader of the parliamentary group Steirische Volkspartei* **Mag. Siegfried Nagl** *Mayor of the City of Graz* **Introduction to the R4R Project** Jean-Benoit Bel – ORDIF	
09:45 – 10:10	**Waste Management in Austria – does today's practice fulfil the ambitious goals?** Prof. Dr. Paul Brunner Technical University Vienna	
10:10 – 11:00	**Good Practices Session 1:** × **Material Flow Analysis with Freeware STAN** DI Oliver Cencic Technical University Vienna × **Separate Waste Collection = Climate Protection! The Styrian Climate Balancing Tool** Mag. Therese Schwarz Montanuniversity Leoben × **EDM – Electronic Data Management Environment** Mag. Franz Mochty Federal Ministry of Agriculture, Forestry, Environment and Water Management Discussion	
11:00 – 11:30	Coffee Break	

11:30 – 13:00	**Good Practices Session 2:** × **Packaging waste collection in Austria** Prof. Dr. Christoph Scharff ARA AG × **Door to door collection of municipal solid waste in Catalonia** Francesc Giró ARC Agència de Residus de Catalunya × **Analysis of residual waste in Styria** DI Karl Harather IUT – Innovative Umwelt Technik Discussion	Rittersaal, Landtag Steiermark Herrengasse 16 A-8010 Graz
13:00 – 14:00	Lunch Break	
14:00 – 15:30	**Good Practices Session 3:** × **Waste consultancy in Austria** Berthold Schleich ARGE Association for Waste Prevention × **The economic perspective of municipal waste management in Austria** Dr. Franz Prettenthaler Joanneum Research × **The Pay-as-you-throw system and differentiated tariffs** Maarten de Groof OVAM – Public Waste Agency of Flanders Discussion	
15:30 – 16:00	Coffee Break	
16:00 – 17:45	**R4R Interregional Training Session** **Presentation of the R4R Online Tool and the Relevance for Good Practices** Janna Vandecruys & Koen Smeets OVAM – Public Waste Agency of Flanders	
17:45 – 18:00	**Closing round**	
18:00 – 19:00	Guided City Walk	
19:00	**Official Welcome by Johann Seitinger** Minister for Forest- and Agricultural Affairs, Water- and Waste Management and Sustainable Development in the Styrian Provincial Government	Orangerie im Burggarten Hofgasse 15 A-8010 Graz-Burg

The Venues



1.) Wednesday, 14th May 2014 (8:30 – 18:00)

Public Conference / Interregional Training Session
Rittersaal, Landtag Steiermark (Styrian Parliament)
Herrengasse 16
A-8010 Graz

2.) Wednesday, 14th May 2014 (19:00)

Official Welcome by Minister Johann Seitinger
Orangerie im Burggarten
Hofgasse 15
A-8010 Graz

Saubermacher

Abfälle verwerten. Umwelt aufwerten.

Abstract

What makes life worth living? We at Saubermacher have been preoccupied with this question for more than three decades and have found a clear answer to it: sustainable and responsible use of available resources, retrieval of raw materials from waste materials and the closing of material cycles. Aiming for «Zero Waste», our recycling plants process refuse and make it available to the industry as a substitute for nonrenewable resources.

For example, in the E-Cycling-Park in Unterpremstätten 20,000 tonnes of old electrical appliances are processed each year and 85 % of these collected materials are recycled. The fluorescent light processing plant in Vienna is able to process 4 tonnes of fluorescent lights and 4 tonnes of flat screens each day. About 91 % of the recovered iron, aluminium, copper and glas can be reused by industry.

Saubermacher has also the possibility to process 30,000 tonnes of plastic waste per year in the high-tech plant in Graz. By the use of near-infrared technology the waste can be separated precisely to guarantee the recycling of more than 80 % of the materials.

ThermoTeam GmbH, a joint venture between Lafarge Perlmooser and Saubermacher, treats waste with high energy content and transforms it into high-quality solid recovered fuels (SRF). The utilization of these SRF saves about 116,000 tonnes of black coal and reduces the CO_2 consumption by 150,000 tonnes per year.

About the author

As pioneer in its industry, with its knowledge Saubermacher contributes decisively to the further development of environmental standards. Since the foundation in 1979 with 5 employees Saubermacher advanced to an international enterprise with 3.200 employees and about 70 participations in Austria, Slovenia, Hungary and the Czech Republic.

Contact:
Saubermacher Dienstleistungs AG
T: +43 59 800 | E: office@saubermacher.at | www.saubermacher.at

AUSTRIA IS EUROPEAN CHAMPION!

st-stephens.at

640.000t CO_2 SAVED THANKS TO ARA SYSTEM

Austria is one of the best recyclers in Europe. Rank 1 and 2 in two independent studies on waste management are something to be proud of.

We of ARA, Austria's leading collection and recovery system for packaging, are happy to do our part: 830,000 tonnes of packaging waste per year serve as valuable raw materials and help save 640,000 tonnes of CO_2.

To deliver this top performance, we need strong private and public sector partners, and we need our customers to place their trust in us. *A sincere thank-you to all of you!*

ARA.recycling **www.ara.at**

RECYCLING DONE RIGHT.

RECYCLING FOR AUSTRIA

ARA

Altstoff Recycling Austria

Name: Jean-Benoit BEL
Organisation: ORDIF – Paris Region Waste Observatory
Title of presentation: Introduction to the R4R project

Abstract

Regions for Recycling is an INTERREG IVC project bringing together 13 EU territories willing to optimize municipal waste recycling. Its unique approach is based on the establishment of a common language among EU local and regional authorities to help them share their experiences and difficulties.

After comparing their own waste statistics, R4R partners discovered their data were not fully comparable due to differences in the scope of data and calculation methods. The partnership has designed a common method to limit statistical biases, by defining a common scope, a common terminology and a new calculation method. This new method is centered around a new concept: "Destination Recycling", or DREC, which includes all homogeneous fractions sent by local authorities to recycling. This means both fractions separated at the source and material waste going out of sorting centers or of mechanical biological sorting units are recorded as DREC, while sorting residues are included in residual fractions as mixed residual waste. R4R's partners wish to make their results available to all EU territories wishing to share their experience. To do so, an online tool has been made public where public authorities can input their data and compare their performances as well as their local strategies with others. Moreover, more than 30 factsheets detailing concrete implementation of effective good practices will be published, detailing both resources needed and results that can be expected. The project wishes to help public authorities with the identification of local instruments that could help them optimize their waste recycling performances and provide inspiration for their implementation.

About the author

Jean-Benoit is an environmental engineer specialized in waste management who has been working for ORDIF for 7 years. After having worked on the environmental impact assessment of waste management, he is now in charge of ORDIF's European activities and coordinates the Regions for Recycling project. He also works on other issues such as waste prevention and hazardous waste monitoring.

R4R

REGIONS FOR RECYCLING

DIFFERENT LOCAL STRATEGIES

DIFFERENT CONTEXTS

STATISTICAL BIAS ?

STATISTICAL BIAS ?

HOUSEHOLD WASTE

COMMERCIAL WASTE

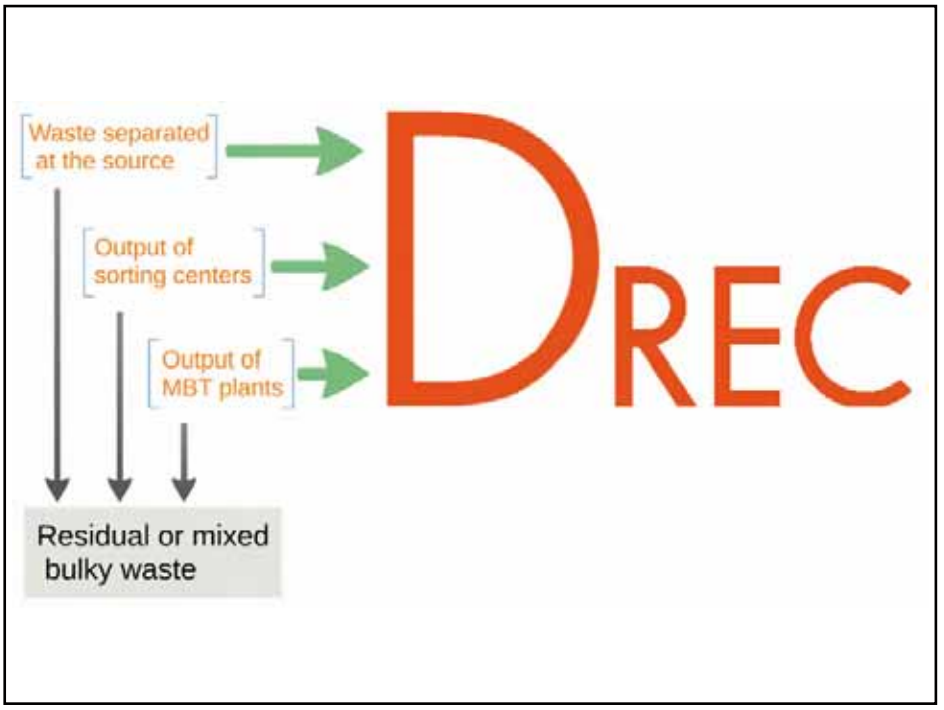
MUNICIPAL WASTE

COLLECTED BY LOCAL AUTHORITIES

COLLECTED BY OTHERS

RECYCLING

DESTINATION RECYCLING


Waste separated at the source
Output of sorting centers
Output of MBT plants
DREC
Residual or mixed bulky waste


EMPOWER
REGISTER !
KEY IN YOUR DATA !
COMPARE !

INSPIRE

R4R
REGIONS FOR RECYCLING

See you on
Prezi regions4recycling.eu

INTERREG IVC

Name: Paul H. Brunner, Astrid Allesch
Organisation: Vienna University of Technology, Institute for Water Quality, Resource and Waste Management, Vienna, Austria
Title of presentation: Waste management in Austria - does todays practice fulfil the ambitious goals?

Abstract

In Austria, the first law on waste management was introduced in 1990 with the following three goals: (1) prevent harmful or adverse effects on humans, animals, and plants (2) conserve resources and (3) ensure that only such waste remains that can be landfilled without endangering future generations. In the year 2002 the waste management act was revised and supplemented with two additional goals: (4) minimize air pollution and gaseous emissions affecting the climate and (5) ensure that materials reclaimed do not present a greater risk than comparable primary raw materials.

During the last two decades, Austrian waste management has been continuously improved in order to fulfil these goals. Legislation was refined by introducing several ordinances to keep organic wastes out of landfills, to recycle recoverable materials, and to incinerate hazardous and energy-rich wastes. New and clean technologies were developed to improve waste to energy (WTE), landfilling, and recycling processes. And stakeholder dialogs and strategic environmental assessments were applied to ensure public acceptance of new plants and systems.

As a result, emissions from waste management are decreasing, and the reuse of secondary materials is increasing. Two examples are: (1) Within the period from 1990 to 2011, greenhouse gas (GHG) emissions decreased substantially from 3.3 Tg CO_{2equ} to 1.3 Tg CO_{2equ} (EEA 2013). (2) The recycling rate of 66 % (2011) for packaging waste is among the highest in the European Union (EEA 2013).

While the success of Austrian waste management is obvious, it is still worthwhile to look for means to improve the present system and to adopt it to new boundary conditions. Main questions of concern are: (i) Does the established legislative, technological and social system fulfil the ambitious goals of the waste management act? (ii) Is the chosen waste management concept effective, that is: does it reach the goals at least costs? (iii) And how can we further improve the effectiveness of this system? To answer these three questions is mainly a methodological challenge: Goals and waste management system are known, but an analytical concept or metric how to assess quantitatively if and at what costs the goals are achieved is lacking today. In order to bridge this gap, Austrian Federal and State authorities

together with key stake holders have commissioned a benchmarking study to develop the necessary metric and to compare if the current state of waste management fulfils the goals of the Austrian Waste Management Act in an effective way. The project is carried out by four Austrian Universities engaged in waste management research (TU Vienna, BOKU Vienna, Montan University Leoben, and University Innsbruck).

The concept developed for this study comprises the following: The benchmarks for measuring success or failure of the waste management system are the goals of waste management. For comparing the actual waste management with the given objectives stated by law, the five goals of waste management listed above are further broken down into sub-goals and indicators. A material flow and stock system is defined that comprises all wastes, residues, emissions, and products as well as processes, flows and stocks relevant for the Austrian waste management system. This Material Flow Analysis (MFA) according to (Brunner and Rechberger, 2004) serves as a tool to model the current flows and stocks, and to identify sources of secondary resources, of landfill materials, and of emissions. The main advantage of this approach is the mass balance principle ensuring that all wastes entering waste management are tracked to the final outflow from waste management, no matter if the outflow consists of secondary resources (products), landfill material, or emissions. No substance gets lost in this analysis.

The combination of MFA and assessment methodology permits to identify the degree of target achievement. Also, the project will assess the economic viability (efficiency and effectiveness) of the measures taken for reaching the goals. Especially in a multi stakeholder system with individual optimizers a macro-economic view is essential.

While the work for this study is still in progress and results are not yet available, some highlights of the expected outcomes can be anticipated. Globally, natural reserves are decreasing and anthropogenic reserves are increasing. Recycling rates in Austria are on a high level. In the future, they will rise even more when the old, obsolete stock will supply growing amounts of secondary resources to the markets. Hence, urban mining, the management of anthropogenic stocks, will become a key strategy to protect the environment and conserve resources. This will be a fascinating new field of activity for Austrian materials management: It means to transform a waste oriented material management strategy to a sustainable resource management strategy based on a comprehensive urban mining concept.

The results of the benchmarking project will allow questioning a purely quantitative recycling strategy: Since products and resulting wastes contain both valuable as well as hazardous substances, recycling technologies and management schemes must be able to separate the two. The study will show to what extent this has been accomplished, and if new priorities such as “clean cycles” should be defined. First examples show that these issues might be critical for

recycling: In Vienna or example, up to 20 % of the endocrine flame retardant octabrominated biphenyl ether is possibly returned back to consumption by recycling of plastics (Vyzinkarova and Brunner, 2013). The waste hierarchy, favouring quantitative recycling targets, gives no guidance for qualitative recycling issues. With increasing complexity of products and corresponding wastes, there is a growing demand for processes and logistic systems facilitating "clean cycles".

If future cycles are established as clean cycles, it follows that besides new clean secondary resources, dirty residues will be produced, too. These residues cannot be recycled but must be disposed of in safe "final sinks". Modern waste management can supply such sinks that either destroy hazardous organic substances completely like WTE, or that hold substances for very long time periods (Kral et al, 2012). After all, for sustainable waste management, waste related problems should not be deferred to the next generation, but should be solved here and now. Hence, the benchmarking project has the potential to expand the waste hierarchy; it may well represent a first step towards a new strategy of "clean cycles" and "safe final sinks".

References

Brunner P.H., and H. Rechberger (2004) Practical Handbook of Material Flow Analysis, CRC Press LLC, Boca Raton

EEA (European Environment Agency)(2013) Annual European Union greenhouse gas inventory 1990–2011 and inventory report 2013. Technical report No 8/2013.

Kral U., K. Kellner, and P.H. Brunner (2012) Sustainable resource use requires "clean cycles" and safe "final sinks". Science of the Total Environment 461–462 : 819–822.

Vyzinkarova D., and P.H. Brunner (2013) Substance Flow Analysis of Wastes Containing Polybrominated Diphenyl Ethers. Journal of Industrial Ecology 17(6): 900-911.

About the authors

Paul H. Brunner is heading the Institute for Water Quality, Resource and Waste Management, and holds the chair for Waste Management at the Vienna University of Technology.
Astrid Allesch is a PhD candidate and research associate at the Institute for Water Quality, Resource and Waste Management at the Vienna University of Technology.

Name: Oliver Cencic
Organisation: Vienna University of Technology

Title of presentation: Material Flow Analysis with Freeware STAN

Abstract

STAN (short for subSTance flow ANalysis) is a freeware that supports material/substance flow analysis (MFA/SFA) according to the Austrian standard ÖNorm S 2096 (Material flow analysis - Application in waste management). It was developed at the Vienna University of Technology, Institute for Water Quality, Resource and Waste Management in cooperation with inka software.

STAN can be used to build graphical MFA/SFA models by using predefined components (processes, flows, system boundary, text fields) from a toolbox. Subsystems offer the opportunity to model the inner structure of processes in more detail by disaggregating into sub-processes. Known data (mass flows, stocks, concentrations, transfer coefficients) can be entered for different layers (goods, substances, energy) and periods. To facilitate this operation STAN offers an interface for semi-automatic data import/export from/to Microsoft Excel. The given information will be used simultaneously to try to calculate unknown quantities. All flows can be displayed in Sankey-style, i.e. the width of a flow is proportional to its value. The graphs of the models can be printed or exported.

The main advantage of STAN is the possible consideration of data uncertainties. If sufficient data about a system is available, the calculation algorithm of STAN allows to make use of redundant information to reconcile uncertain "conflicting" data (data reconciliation) and subsequently to compute unknown variables including their uncertainties (error propagation). Gross errors in a given data set can be detected by statistical tests integrated in the software. For more detailed information and to download the software visit www.stan2web.net.

About the author

Oliver Cencic studied environmental engineering at the University of Natural Resources and Life Sciences (BOKU) where he made his master in 2000. Since 2001 he works at the Vienna University of Technology in the field of resources and waste management. He is an expert in modeling of material flow systems under consideration of data uncertainties. Since 2004 he has been responsible for the development of STAN, a freeware for substance flow analysis.

TECHNISCHE UNIVERSITÄT WIEN
Vienna University of Technology

Material Flow Analysis (MFA) with Freeware STAN

Oliver Cencic

R4R - Regions for Recycling,

Goal of MFA

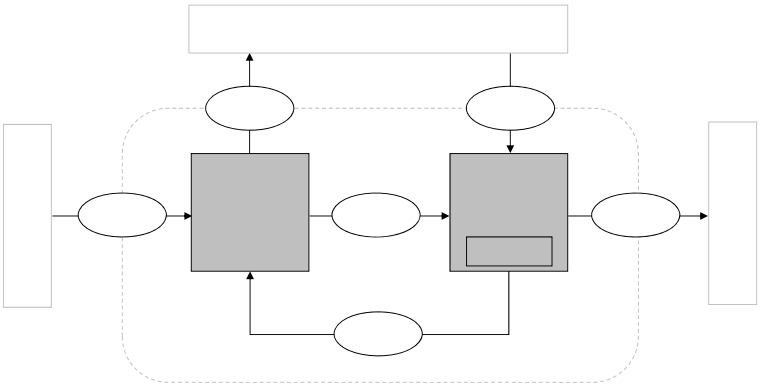
model & quantify

flows & stocks

goods & substances

mass conservation

Model



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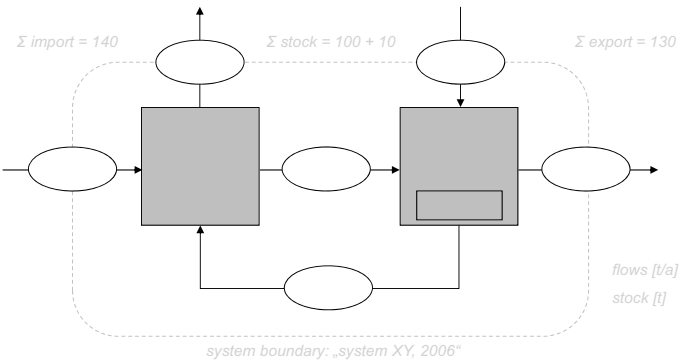
Data



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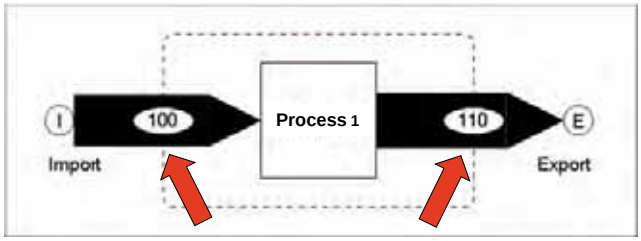
Data Reconciliation (1)



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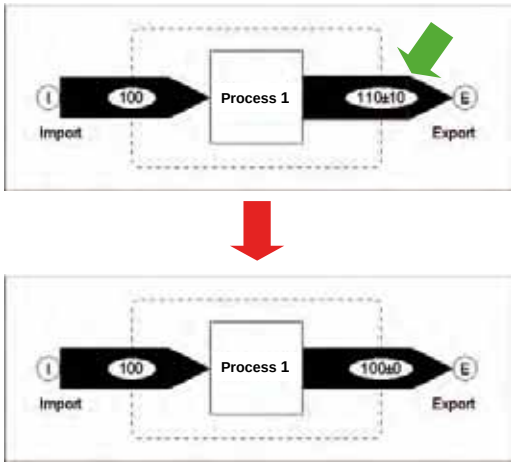

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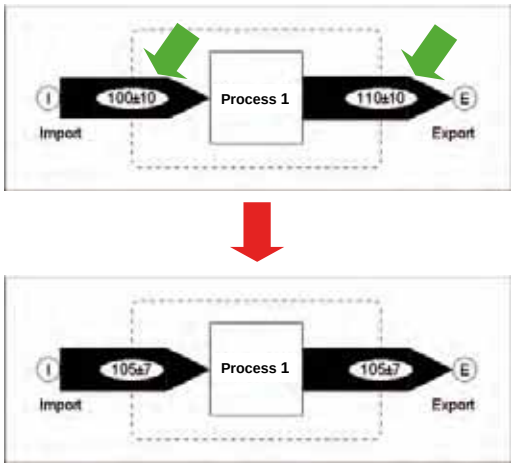

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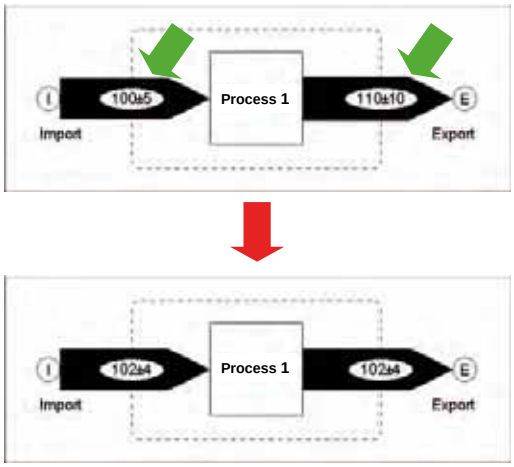

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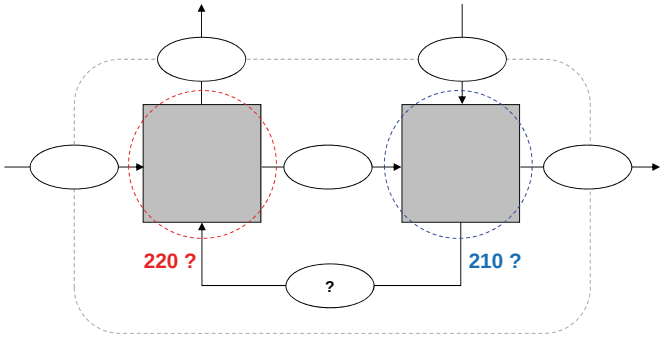

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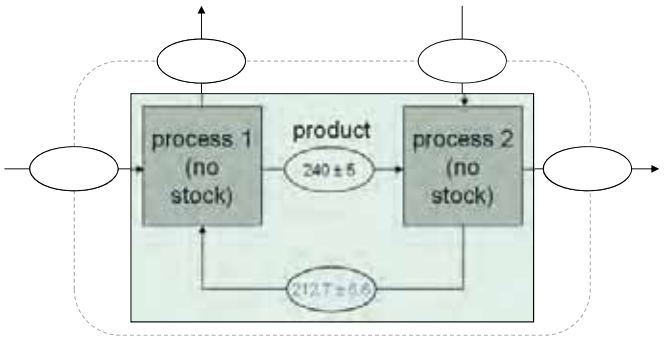
Data Reconciliation (6)

data reconciliation



calculation
+ error propagation

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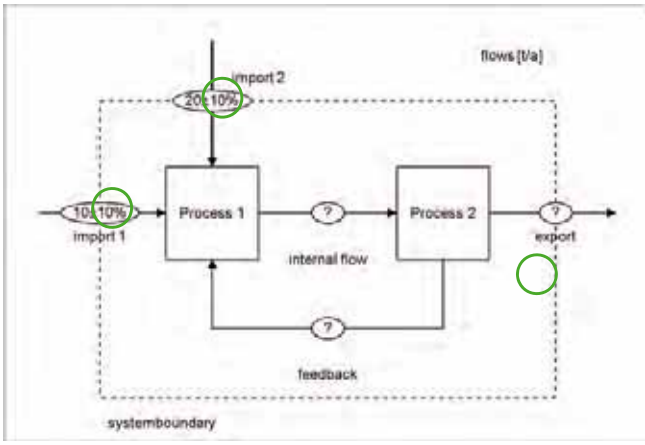
Limits of Common Sense (1)



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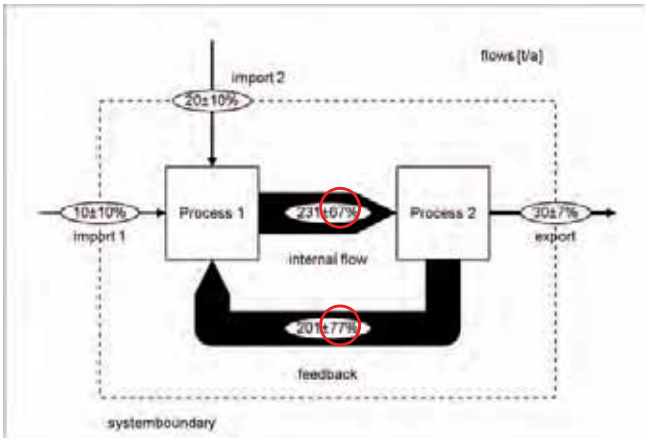
Limits of Common Sense (2)



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bi.iwr

Software for Substance Flow Analysis

STAN 2

Vienna University of Technology

www.stan2web.net

bl.iwr

Facts

Freeware

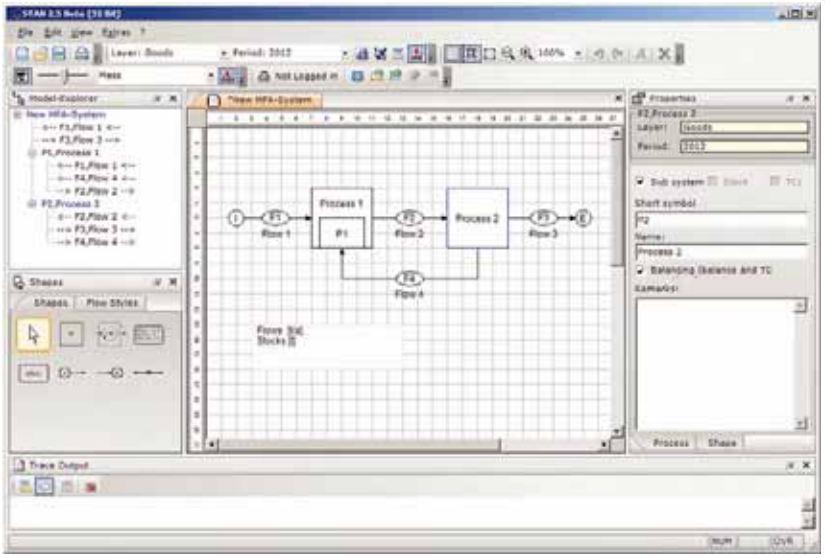
since 2006

€ 400.000

12.000 users

bl.iwr

User Interface



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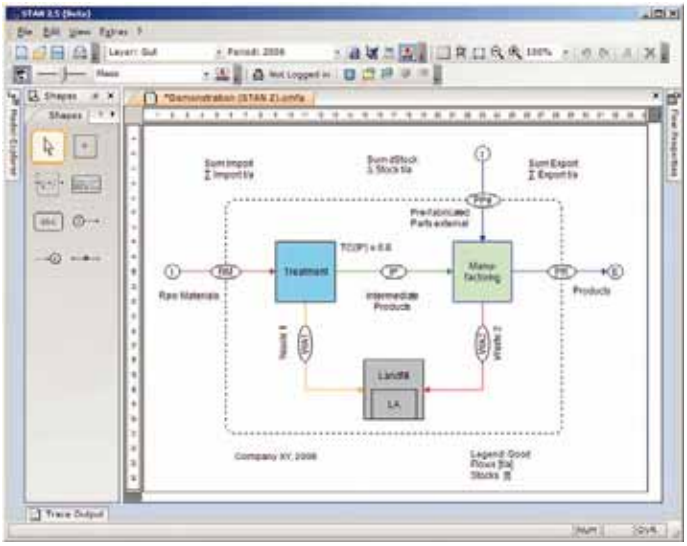
Easy Modelling



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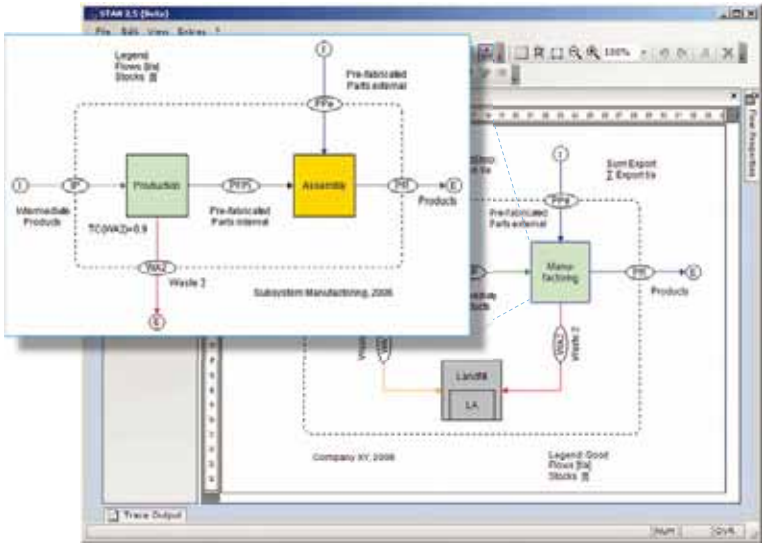
Subsystems



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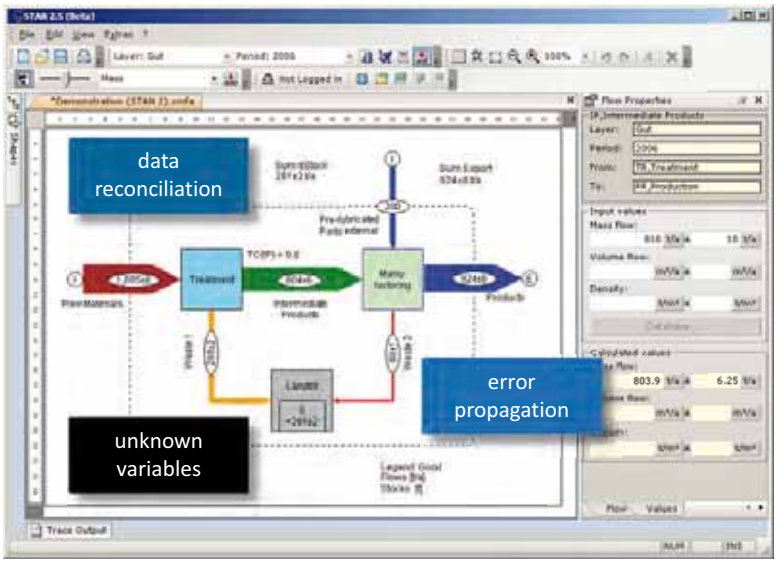
Calculation



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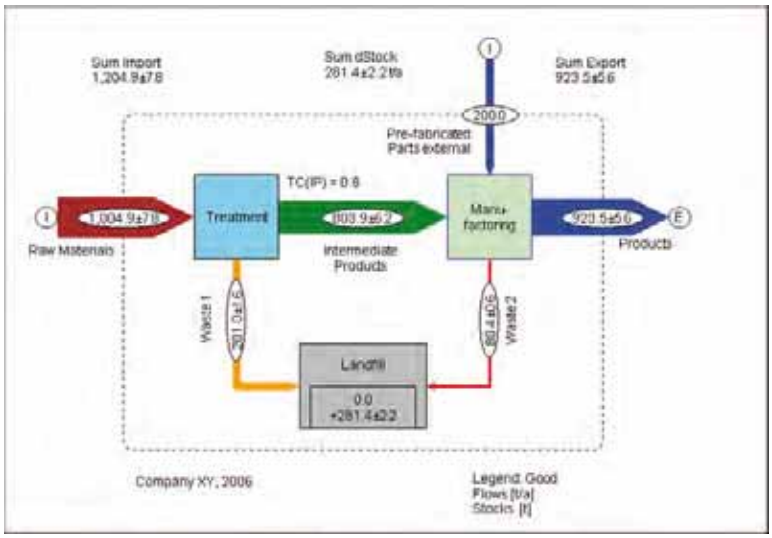
Graph (mass flows of goods)



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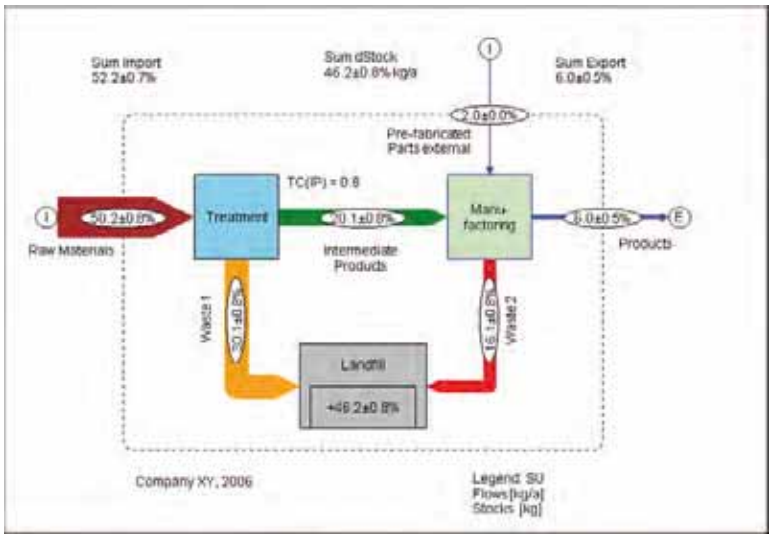
Graph (mass flows of a substance)



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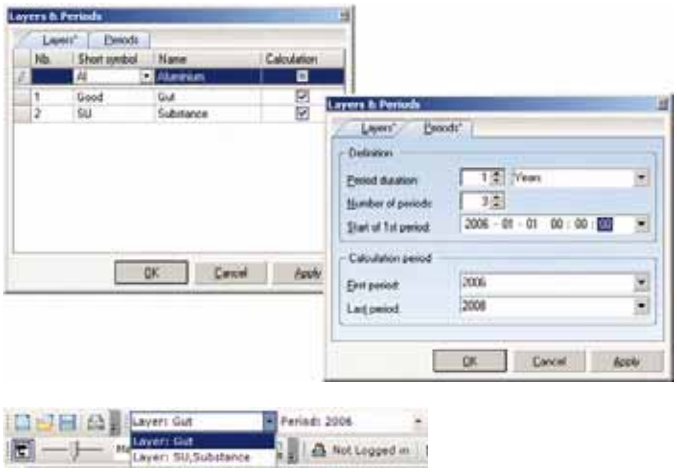
Layers and Periods



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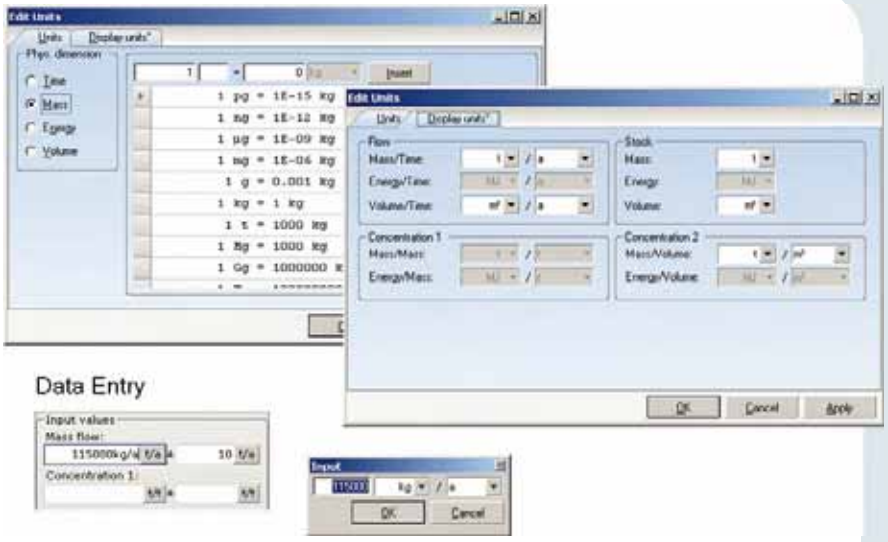
Units and Uncertainties



Data Entry

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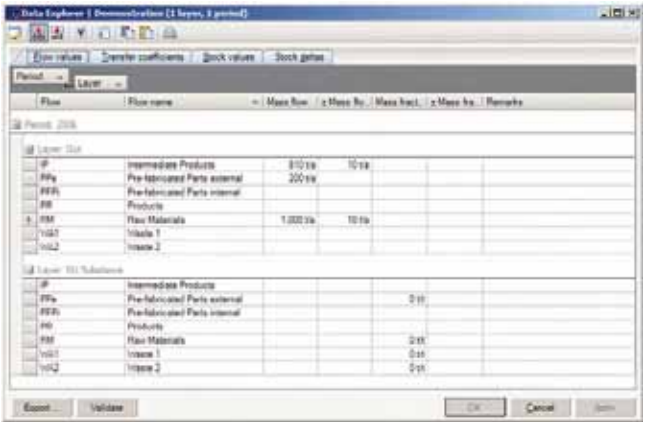
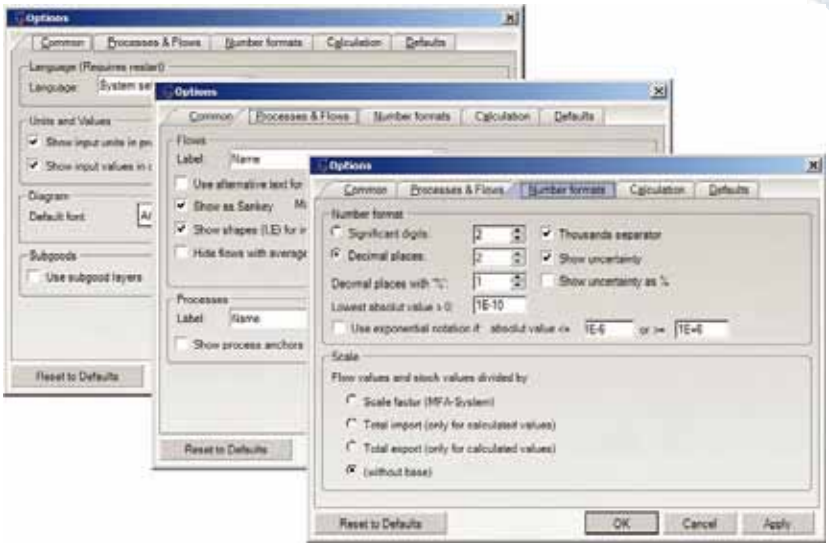
Data Import/Export



	A	B	C	D	E	F
1	2006 Gut	IP	Intermediate Products	810 t/a	10 t/a	
2	2006 Gut	PPe	Pre-fabricated Parts external	200 t/a		

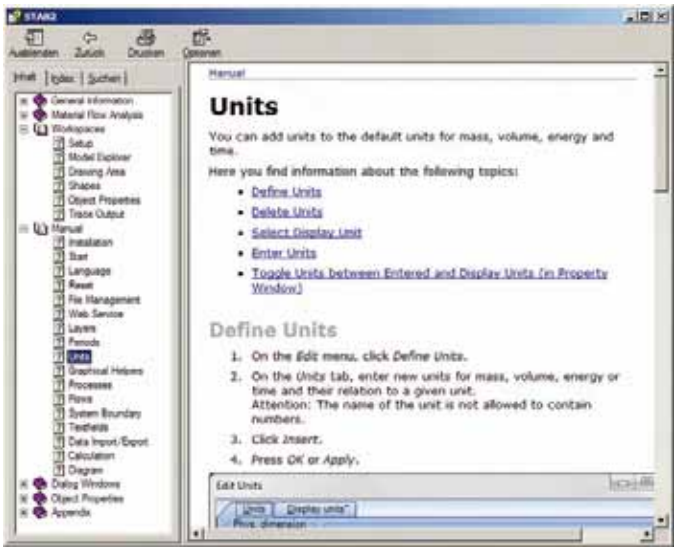
bl.iwr

Options



bl.iwr

Help (F1)



Website: stan2web.net

Web Interface

bl.iwr

Supported by

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ARA
Altstoff Recycling Austria

MINISTERIUM
FÜR EIN
LEBENSWERTES
ÖSTERREICH

bl.iwr

Thanks for your attention!

Name: Mag. Therese Schwarz
Organisation: Department of Environmental and Energy Process Engineering, Montanuniversity Leoben

Title of presentation: Separate Waste Collection = Climate Protection! The Styrian Climate Balancing Tool

Abstract

The contribution of waste management operations to environmental protection is mostly looked at in terms of the collection of waste and its treatment. Due to international contract as Kyoto Protocol and national emission reduction objectives Stakeholder are confronted with collecting data, calculation of emissions and communicating them within sustainability reports. Generation of this data is time consuming and expensive, therefore the developed tool give the possibility to model carbon footprints of a plant or region within little time and no expert knowledge.

Based on transport data and waste quantities, originating from regional statistics or evaluations, the carbon footprint model calculates the CO_2-equivalents (consisting of CO_2, CH_4, N_2O) of each municipal waste flow. The presented tool has been built for regional data analysis and should help to investigate the annual impact of waste management within the whole sector; so there was a general approach chosen to be clear, intuitive and general applicable. Seven waste categories (mainly for municipal waste flows) were considered. The internet tool should help the interested parties to communicate their results, raise awareness for the topic and to motivate society to collect separately.

Waste can be clearly stated as a valuable resource compared to the primary material production or energy amount needed comparatively. The resource saving potential for secondary resource usage and environmental protection due to separate collection should be demonstrated.

About the author

Therese Schwarz studied environmental system sciences in Graz with focus on energy and electromobility. Since 2012 she is junior researcher at the Chair of Waste processing technology and waste management, at Montan Universitaet Leoben. Her field of interest is now material flow analysis, life cycle assessment, ecodesign as well as waste management.

SEPARATE WASTE COLLECTION = CLIMATE PROTECTION!

THE STYRIAN CLIMATE BALANCING TOOL

Mag. Therese Schwarz
Department of Environmental and Energy Process Engineering,
Montanuniversity Leoben
Franz-Josef-Straße 18, 8700 Leoben, Austria
Therese.schwarz@unileoben.ac.at
http://avaw.unileoben.ac.at

What will you hear in the next 10 mins?

- Waste Management and climate change
- LCA concept
- Project Description
- Project Results
- Overview of internet tool

[1] Source: http://www.environmentmagazine.org/sebin/z/v/not-co2-emission-photo6.jpg

Climate change and Waste Management - where are the challenges?

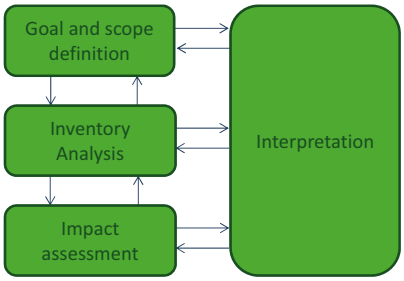
[2] Source: http://www.umweltbundesamt.at/fileadmin/site/publikationen/REP0416.pdf

What is the aim of the project?

[3] Source: http://volksanwaltschaft.gv.at/sprechtage/steiermark

Which method was used to assess this aim?

- Life Cycle Assessment - presents the environmental burdens of products/processes
- Carbon footprint – focus on green house gases



[4,5] ISO 14040, http://science.howstuffworks.com

What is the main function of the tool?

- Intuitive presentation of emissions due to waste management activities
- Reduction potential of waste management compared to raw material extraction
- Instrument to motivate and communicate
- Designed for Styrian stakeholders
- General approach - not designed to evaluate special conditions of a certain plant or region

[6,9] Source: http://office.microsoft.com/de-AT/images/ www.klimabilanz.steiermark.at

What is a functional unit and why needed?

Type of waste	Quantities 2010 [t/a]	Type of waste	Quantities 2010 [t/a]
Residual waste	163,269	Packaging	
Organic waste	101,230	glass	37,422
Bulky waste	76,015	lightweight	26,793
Paper/cardboard	94,833	Scrap metal	5,445

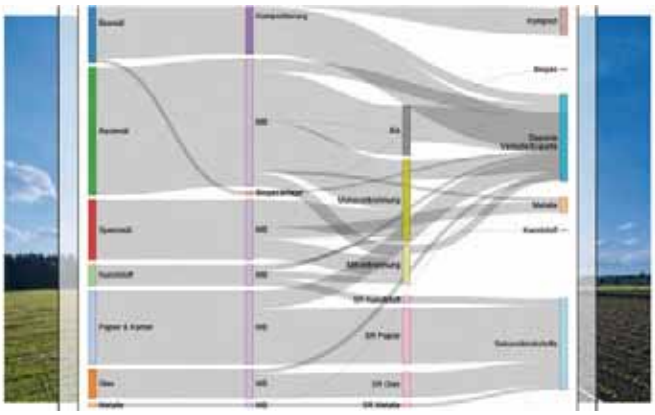
Total 2010: 505,007 t/a

[8] A. Ledersteger

Input of waste quantities and transport data

[9] Source: www.klimabilanz.steiermark.at

Waste quantities within a flow diagramm



[9] Source: www.klimabilanz.steiermark.at

Division of waste quanties

[9] Source: www.klimabilanz.steiermark.at

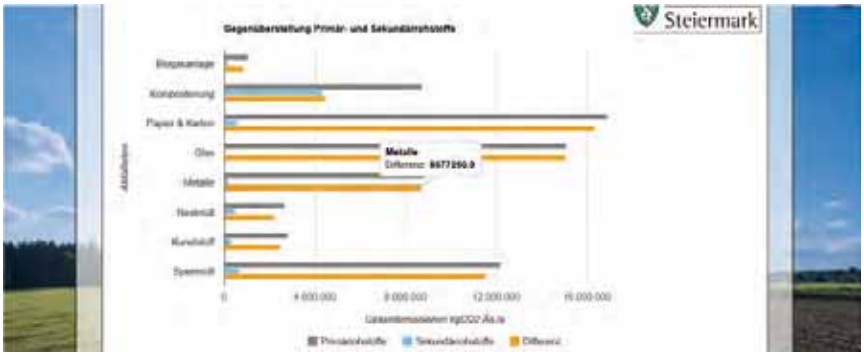
Greenhouse gas emissions

Used greenhouse gas emission factors [IPCC]	
Carbon dioxid (CO_2)	1
Methane (CH_4)	25
Nitrous oxide (N_2O)	298

- Plants and flows are calculated for a Styrian average
- Carbon footprint concept
- Crediting method used – emissions from primary and secondary material production

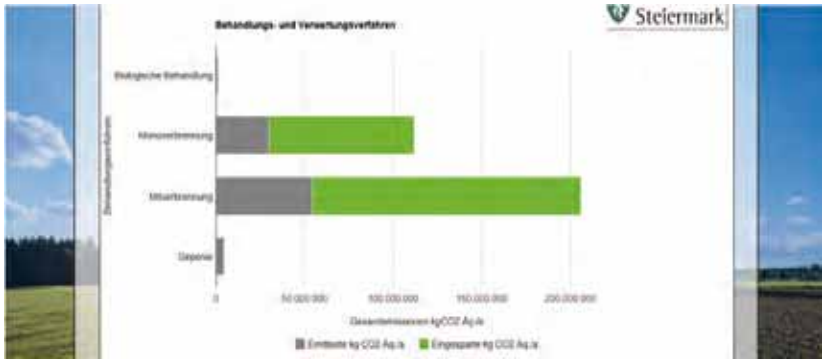
[10] IPCC, http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html

Comparing emissions from raw materials' extraction and waste treatment activities



[9] Source: www.klimabilanz.steiermark.at

Emissions due to waste treatment



[9] Source: www.klimabilanz.steiermark.at

Results

- Design of an intuative tool to calculate CO_2 äquivalents for waste management activities
- Communication and motivation tool
- Export of results possible
- Environmental protection on regional level focused

[6,8] Source: A. Ledersteger, http://office.microsoft.com/de-AT/images

Thank you for your attention!

Mag. Therese Schwarz
Therese.schwarz@unileoben.ac.at

www.regions4recycling.eu

Name: Franz Mochty
Organisation: Federal Ministry of Agriculture, Forestry, Environment and Water Management of Austria
Title of presentation: Electronic Data Management

Abstract

EDM is a future orientated eGovernment solution for the entire environmental sector fully integrated in the comprehensive eGovernment environment of Austria. EDM serves as a knowledge database - as a single point of information concerning environmental data like waste generation, collection, treatment, and recycling data as well as permit information, emission data to air and water, and information on radioactive sources. It ensures a high level of environmental protection despite reduced administration staff. As an instrument for verifying the achievement of goals EDM will play a key role in the introduction of effect-orientated administration in the environmental sector.

EDM standardises and simplifies the cooperation between companies and the authorities with regard to the implementation of legal obligations in the field of environmental protection. Harmonization has been achieved mainly by employing existing United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) standards, especially by basing data formats on Core Components from the UN/CEFACT Core Component Library (CCL). The unique basis for identification of all objects (e.g. companies, locations, installations but also waste types, treatment procedures, etc) is the identification system of GS1 - the Global Location Numbers and Global Trade Item Numbers.

About the author

Head of unit "Electronic Data Management - Environment"; study: Chemistry at the University of Vienna; since 1991 in the department "Waste Management and Cleaning of Contaminated Sites" of the Federal Ministry for the Environment of Austria; 1994 head of unit "Cleaning of Contaminated Sites and Waste Characterization"; 1996 Head of unit "Recycling and Waste Characterization".

ELECTRONIC DATA MANAGEMENT –

AN INTEGRATED eGOVERNMENT-APPLICATION IN THE ENVIRONMENTAL FIELD IN AUSTRIA

Franz Mochty

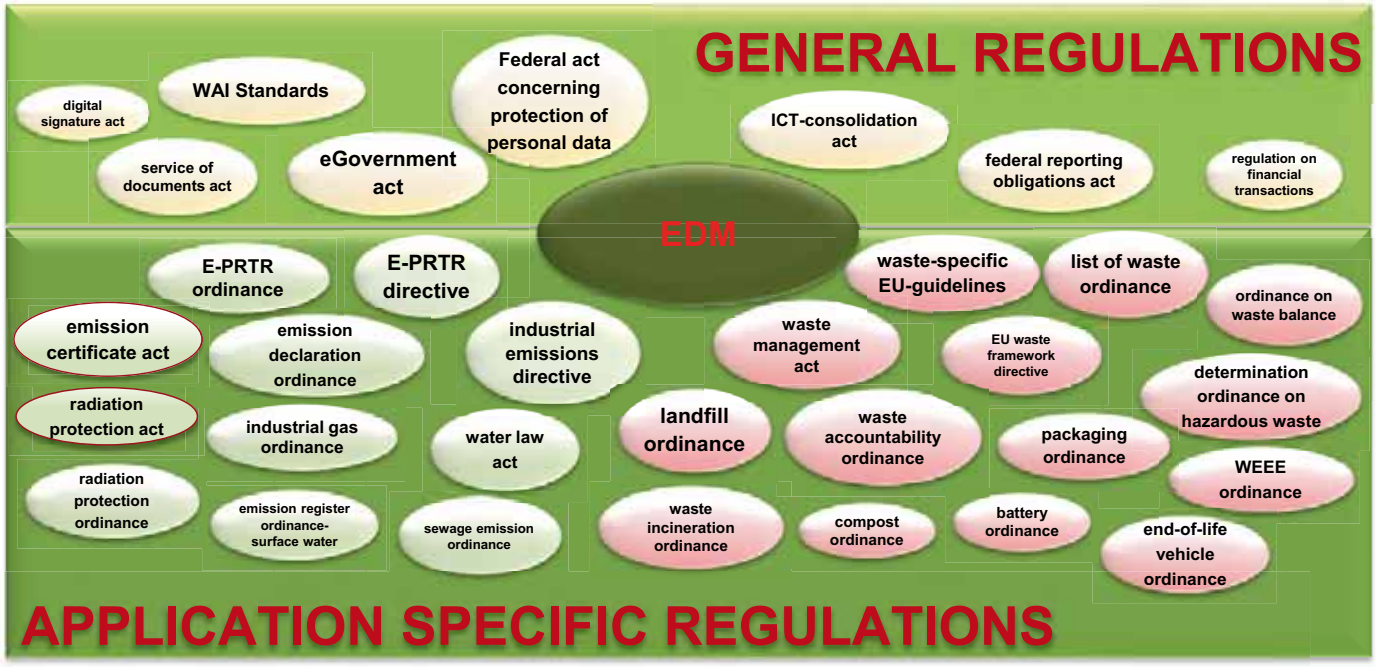
Federal Ministry of Agriculture, Forestry, Environment and Water Management Austria

14.05.2014

EDM - an Austrian Success Story

- An eGovernment application fully integrated into the comprehensive Austrian eGovernment system :
  - Replaces conventional paper-based records and reports (including applications submitted to the authorities) through **efficient electronic data management** in line with **international standards** in the **environmental field**
  - **Single point of information** concerning environmental data
  - Makes **complex legal provisions manageable** through menu guided processes, automated cross checks, and validation
- 23 applications online,
  > 45.000 registered companies / persons,
  > 17.000 locations,
  > 20.000 installations,
  > 800.000 messages per year,
  > 20 millions accesses per year

EDM – legal background



single sign-on
EDM PORTAL

Interfaces to other important eGovernment registers

Companies, natural persons, statistics
CRAFTS AND TRADE REGISTER

persons, locations and installations
CENTRAL MASTERDATA REGISTER

eLicence
eWaste-Balance
eHazardous Waste Transport
eWEEE
eCertificate
WASTE REGISTER

person related licenses
permits for installations
PERMIT REGISTER

Emission-Trading
eWater Emissions
eIncineration
EPRTR
EMISSION REGISTER

Radiation Source
RADIATION REGISTER

EDM PROGRAMM and SUBPROJECTS

MASTER DATA REGISTER

EDM Waste Management		Environment	Key Cross-Cutting Issues	
eWaste-Balance	eEnd-of-Life Vehicles	Emission Certificate Act	eGov. Integration	Usability
eShipment/EUDIN	eWEEE	Industrial emissions	Data protection	EDM user data
eLandfill	ePackaging	ePRTR	Data security	communication/ notification
eIncineration	eBatteries	EMREG/ Surface Water	roles and rights	Creation of documents
eCompost	Substitute fuels	ZDR/SQR	Identification/ authentication	Data upload/ export
eConsignment note	eExpert Report	HFC/FC/SF6	Data requirement/ harmonisation	Intermediate storage
ePermit			Overall architec. of EDM	Template project

R4R REGIONS FOR RECYCLING

Objectives of EDM

- **One-time manual input** of data into the electronic system – where the information is **initially collected** – then only electronic transfer and processing
- Efficient and effective support of **complex processes** in the **entire disposal chain**
- Integrated set of applications designed to
  - promote lawful and environmentally sound waste management
  - ensure a uniform application of Austrian and European legislation in the environmental sector
  - make the many procedures involved in waste management and environmental protection in general more transparent

Interregional Training Session, 14th May 2014 – Graz, Styria

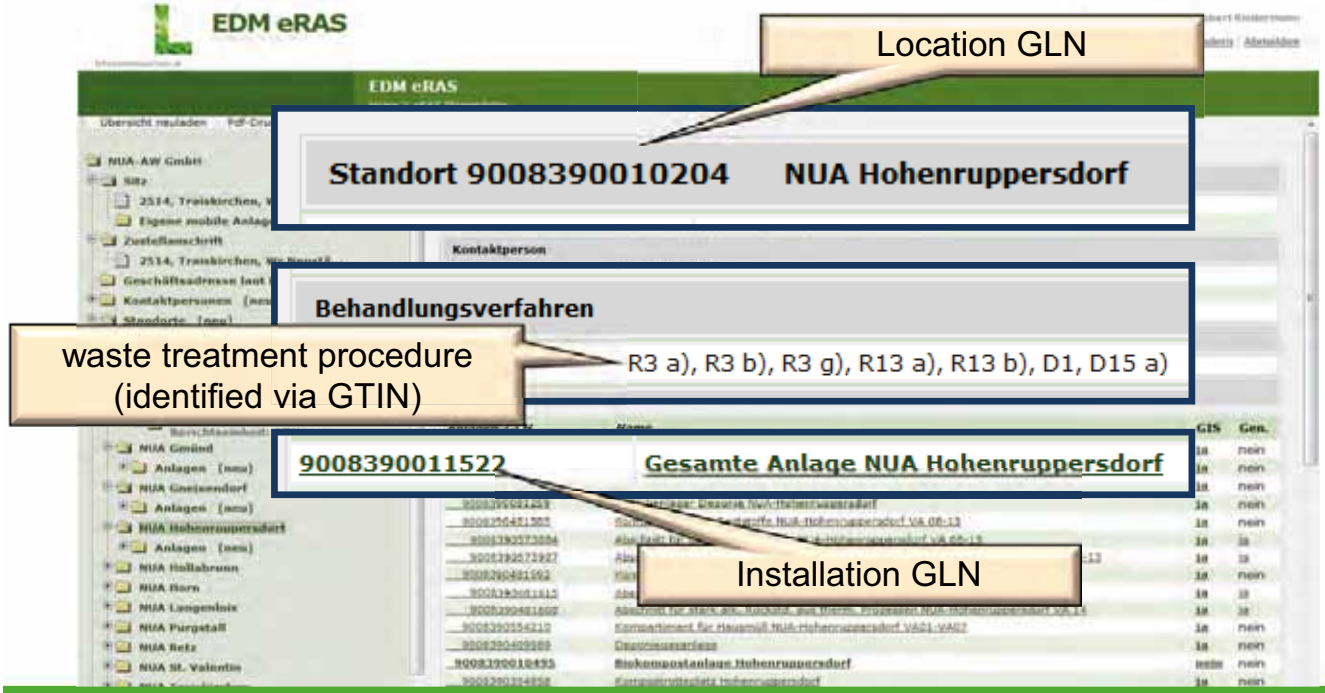
Basic principles of EDM

- Electronic interchange of **structured data** using **recognized message standards** directly between IT applications with a **minimum of human intervention**
- **Multisectoral** data and message definitions
- **International standardisation** (UN/CEFACT)
- Utilisation of **internationally unique, cross-sectoral identification** system GS1 for **all identifiable objects** within EDM
  - **Global Location Number** for companies, locations, installations
  - **Global Trade Item Number** for types of services, treatment operations, wastes, …
- Consideration already in draft legislation

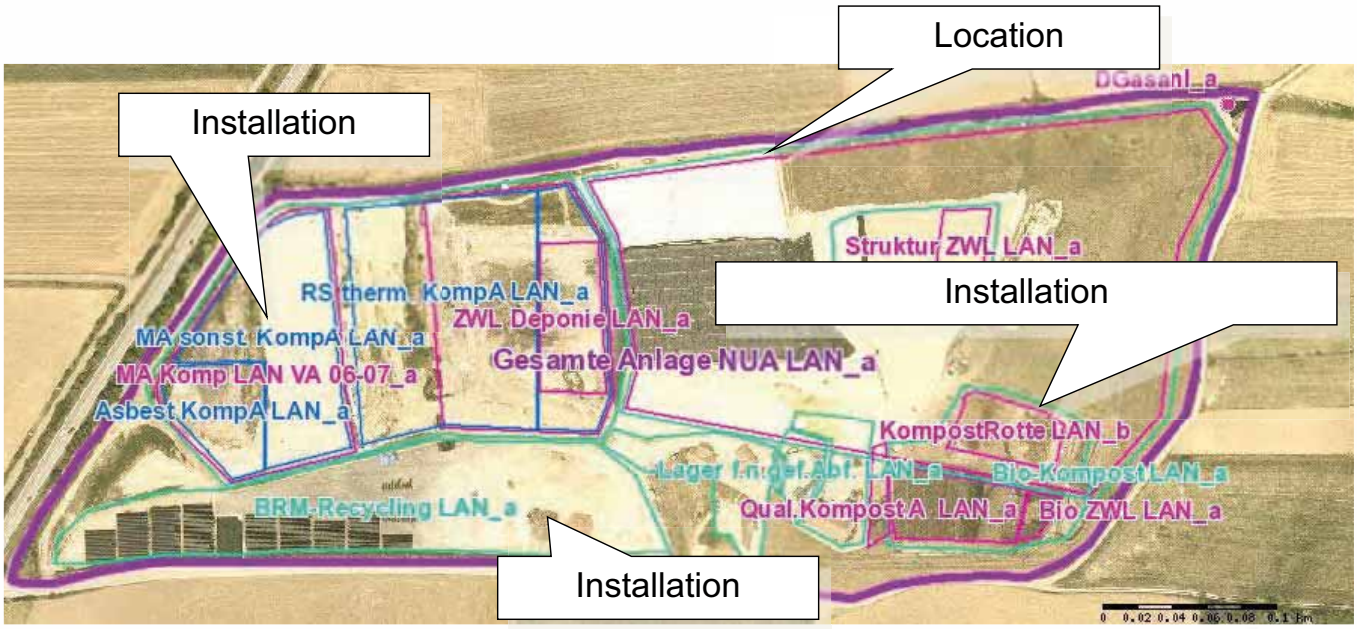
  ⇨ **Improved regulatory quality**

Master Data Maintainance

Master Data Maintainance



Visualisation of Locations and Installations



Permits: Company related / for Installations

containing wastes types to be treated

limit values (for input materials, emission to air and water)

Genehmigte Abfallarten | Input GW

Example: Installation related Permit

Abfallarten

Schl.-Nr.	Spez.	Bezeichnung	Ruhend	Wirksam von	Wirksam bis	I	Kont.-gr.	Behandl.-verf.	GTIN
14401		Äschereisc...	Nein	14.01.2011				D1, D15	9008390011539
14402		Gerbereisc...	Nein	14.01.2011				D1, D15	9008390011560
18102		Rückstände...	Nein	14.01.2011				D1, D15	9008390011997
31102		SiO2-Tiege...	Nein	14.01.2011				D1, D15	9008390012581
31103		Ofenausbru...	Nein	14.01.2011				D1, D15	9008390012604
31104		Ofenausbru...	Nein	14.01.2011				D1, D15	9008390012628
31105		Ausbruch a...	Nein	14.01.2011				D1, D15	9008390012642
31106		Dolomit	Nein	14.01.2011				D1, D15	9008390012666
31107		Chrommagne...	Nein	14.01.2011				D1, D15	9008390012680
31108		Ofenausbru...	Nein	14.01.2011				D1, D15	9008390012703
31109		Ofenausbru...	Nein	14.01.2011				D1, D15	9008390012727
31111		Hütten- un...	Nein	14.01.2011				D1, D15	9008390012741
31202		Kupolofens...	Nein	14.01.2011				D1, D15	9008390012789
31203		Schlacken ...	Nein	14.01.2011				D1, D15	9008390012819
31204		Bleikrätze	Nein	14.01.2011				D1, D15	9008390012840
31207		Schlacken ...	Nein	14.01.2011				D1, D15	9008390012932

Permits: Company related / for Installations

containing wastes types to be treated

limit values (for input materials, emission to air and water)

Genehmigte Abfallarten | Input GW

Example: Installation related Permit

Abfallarten

Schl.-Nr. 14401

Behandl.-verf. D1, D15

GTIN 9008390011539

Austrian waste-code

treatment operation

GTIN for waste-code

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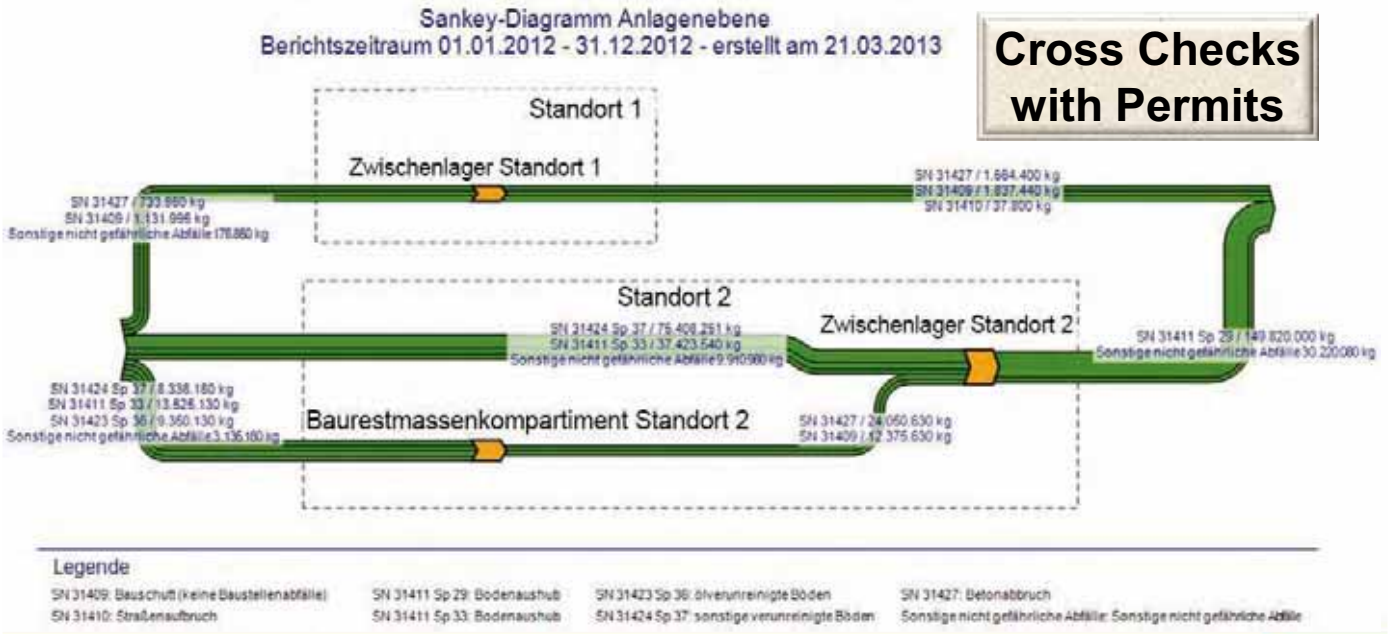
eWaste-Balance: Sankey - Chart



eWaste-Balance: Reporting

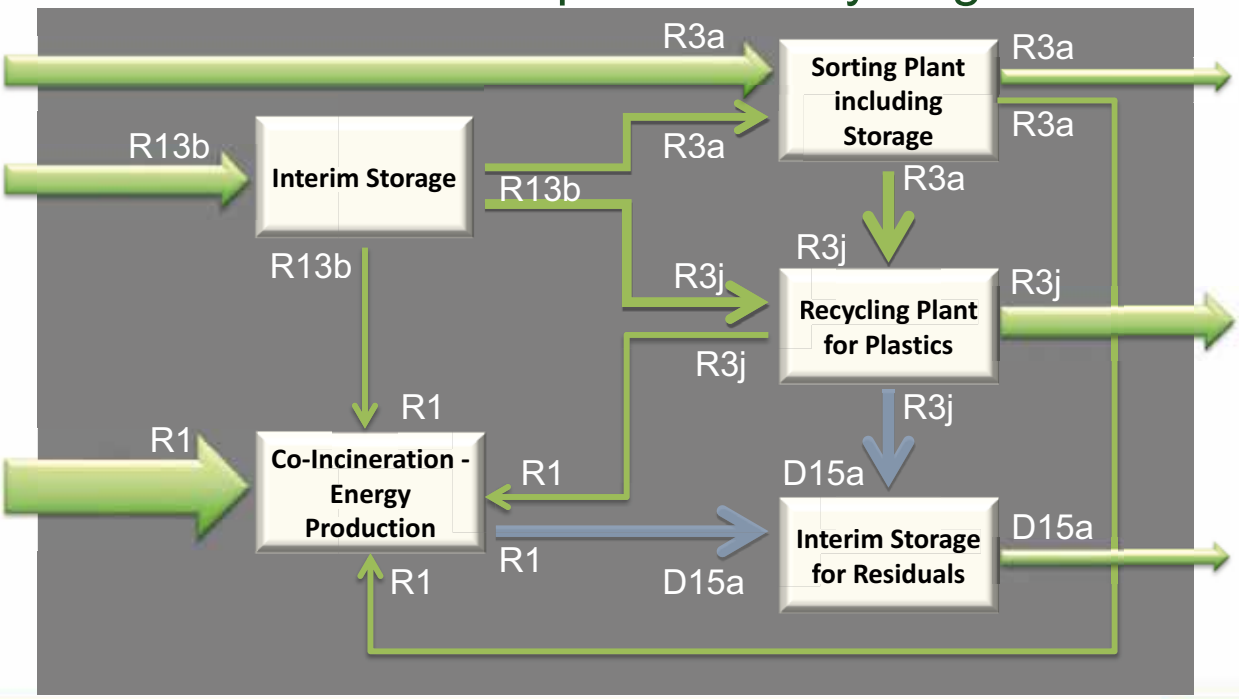
Origin

Destination

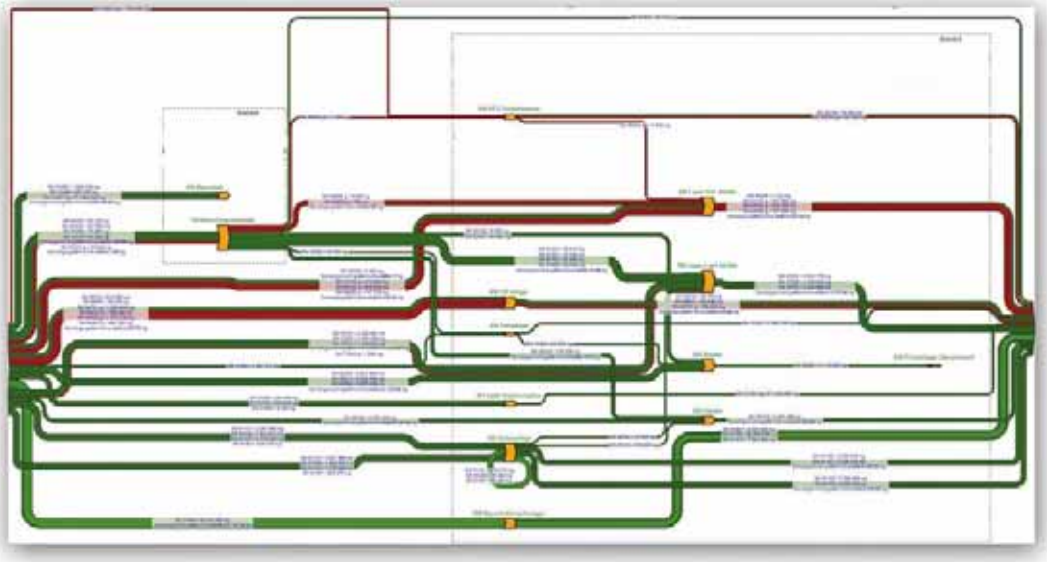
Buchungsart	SN Sp	Abfallart	Masse (kg)	Bezugsperiode	Person	Herkunft Standort	Verbleib Standort	Anlage	Verfahren
Übernahme	31424 37	sonstige verunreinigte Böden	1.550.080,00	01.01.2012 - 31.12.2012			Standort 2	Zwischenlager Standort 2	R5c
Übernahme	31409	Bauschutt (keine Baustellenabfälle)	1.352.380,00	01.01.2012 - 31.12.2012			Standort 2	Zwischenlager Standort 2	R5c
Übernahme	31409	Bauschutt (keine Baustellenabfälle)	7.260,00	01.01.2012 - 31.12.2012			Standort 2	Baurestmassen-kompartiment	D1
Übernahme	31409	Bauschutt (keine Baustellenabfälle)	846.215,00	01.01.2012 - 31.12.2012			Standort 1	Zwischenlager Standort 1	R5c
Übernahme	31427	Betonabbruch	15.700,00	01.01.2012 - 31.12.2012			Standort 2	Zwischenlager Standort 2	R5c
Übernahme	31427	Betonabbruch	27.000,00	01.01.2012 - 31.12.2012			Standort 1	Zwischenlager Standort 1	R5c
Übernahme	31427	Betonabbruch	142.440,00	01.01.2012 - 31.12.2012			Standort 2	Zwischenlager Standort 2	R5c

Movement Type | Waste Type | Mass | Location | Installation | Treatment Operation

eWaste-Balance: Example of a Recycling Location



eWaste-Balance: realistic Sankey



Statistics Styria

At the moment, the following data are available in EDM for the Federal State of Styria:

- Registered companies: ~ 6.400
- Locations: ~ 2.600
- Installations: ~ 2.500
- Landfill installations: ~ 210
- Producers of electric equipment: ~ 150

Statistics Styria

- Collection sites of used electric equipment: ~ 500
- Producers of batteries: ~ 50
- Collection sites of batteries: ~ 500
- Producers of compost: ~ 70
- Reports according to European pollutant release and transfer register: ~ 350
- Waste balances of waste collecting or treatment companies: ~ 850
- Reports of transports of hazardous waste: ~ 1.016.000

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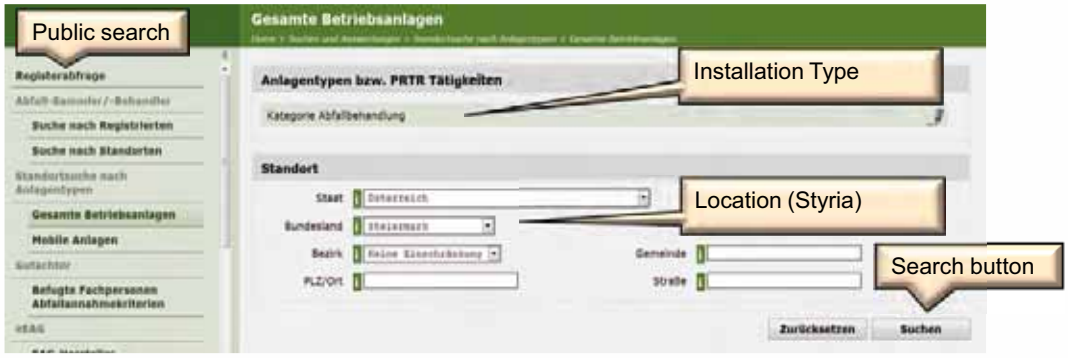
Public Query for Waste Management Companies

- Results displayed in addition in WebGIS View



In search results use the link: „Show entries of this page in WebGIS-Viewer „

Interregional Training Session, 14th May 2014 – Graz, Styria

THANK YOU FOR YOUR ATTENTION !

Franz Mochty

Federal Ministry of Agriculture, Forestry, Environment and Water Management of Austria

Stubenbastei 5, A-1010 Vienna

e-mail: franz.mochty@bmlfuw.gv.at

www.regions4recycling.eu

Name: Christoph Scharff
Organisation: Altstoff Recycling Austria AG
Title of presentation: Packaging waste collection in Austria

Abstract

In 1989, almost two-thirds of Austria's municipal solid waste went straight to landfill, and only a small fraction of domestic waste was collected separately and recovered. Today, more than 50% of domestic waste is recycled.

The Packaging Ordinance and Extended Producer Responsibility (EPR) brought about a sharp increase in separate collection and recycling. Today, well above 800,000 tonnes of recovery of packaging help reduce emissions by more than 640,000 tonnes of CO_2 equivalents per year. Austria is one of the leading EU member states with respect to MSW management and packaging waste recycling, serving as an excellent example of successful cooperation between businesses, consumers and municipalities over the past 20 years.

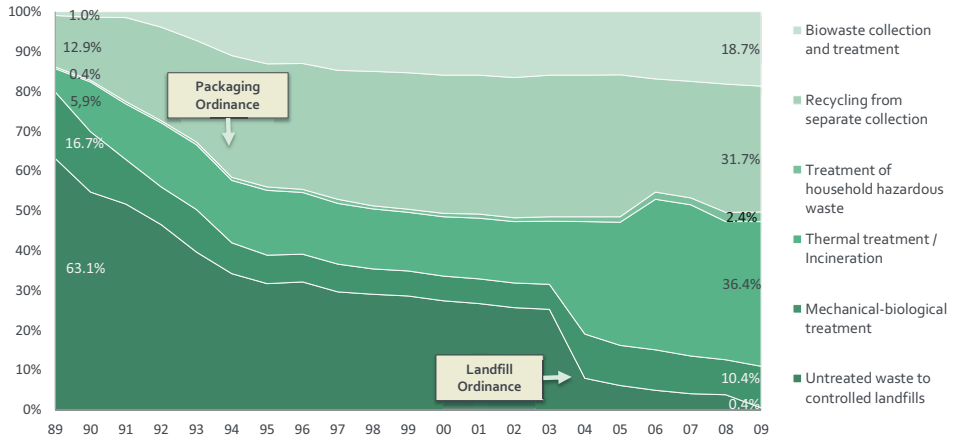
The presentation explains the principals of effective and efficient waste collection logistics with practical examples of separate collection of post-consumer waste and the effects on unit cost. Public acceptance as a further key performance indicator is monitored by long run opinion polls.

The introduction of producer responsibility contributed substantially to waste prevention with packaging consumption decoupled from GDP growth.

About the author

Christoph Scharff has been dedicated to waste management in both research and practice since 1984. He holds a doctoral degree in economic science and was instrumental in setting up the nationwide separate collection of packaging in Austria. Christoph Scharff is CEO of ARA AG, Austria's leading compliance scheme for packaging wastes. He is honorary professor for waste management at the Vienna University of Technology. From 2000 – 2002, Christoph Scharff was President of the International Solid Waste Association (ISWA).

MSW IN AUSTRIA: TWO REGULATIONS FOCUS ON ENVIRONMENTAL PROTECTION AND RESOURCE CONSERVATION



Source: Federal Environment Agency Austria, 2011.

RECYCLING DONE RIGHT.

ARA

ARA'S BUSINESS MODEL: PRODUCERS RESPONSIBILITY ORGANISATION (PRO) WITH NON-PROFIT STATUS

More than 15,000 license partners transfer to ARA AG their obligation to take back used packaging.

Member-owned non-profit ARA System organises the nationwide collection and recovery of packaging from households and businesses in line with the requirements specified by the Austrian Ministry of Environment.

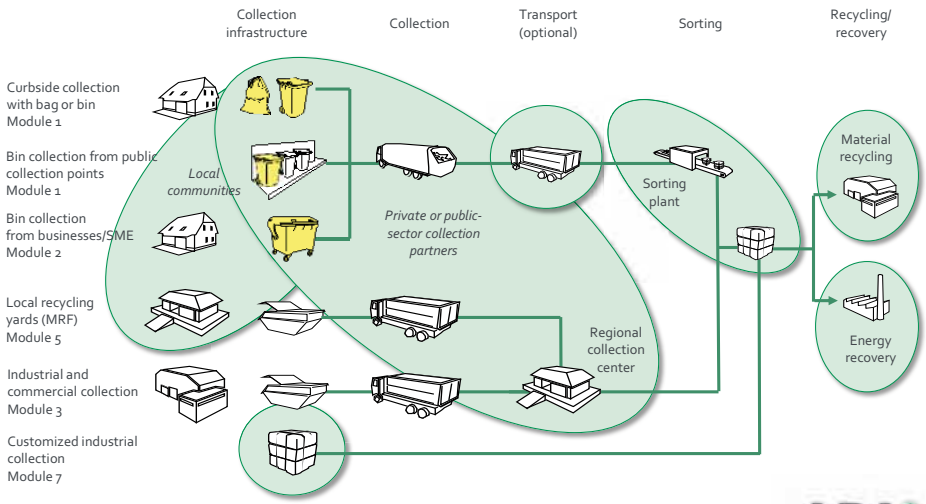
Cities, municipalities, waste associations and more than 200 waste management/recycling companies perform collection, sorting, recovery and PR activities.

ARA Altstoff Recycling Austria AG
AGR Austria Glasrecycling GmbH

* System operator in line with Art. 29 Waste Management Act for the respective materials.

RECYCLING DONE RIGHT.

ARA'S LIGHT-WEIGHT PACKAGING COLLECTION: VALUE-ADDED CHAIN AND CONTRACT SCOPE



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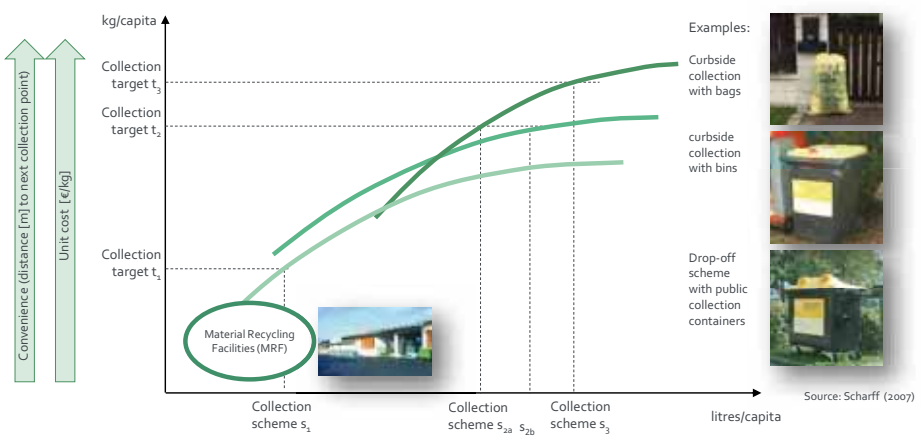
CONVENIENT COLLECTION SCHEME LEADS TO HIGHER COLLECTION RATES



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ARA

CREDIBLE RESULTS: COLLECTION AND RECOVERY IN 2013

Packaging material	Collection containers	Containers per 1,000 residents	Collection [tons]	Recovery[1] [tons]
Paper, cardboard	1.161.900	138	328.500	328.500
Glass	79.800	9	223.300	216.800
Plastics and lightweight packaging (container collection)	250.900	54	222.900	183.400
Households serviced by curbside (bag) collection	1.520.400	793[2] (sets of bags)		
Metals	48.500	7	42.000	35.400
Wood	--	--	18.900	18.900
Total (containers)	1.541.100		835.600	783.000

ARA March 2014

[1] Net figures.
[2] 6 Bags / Set, excluding additional distribution

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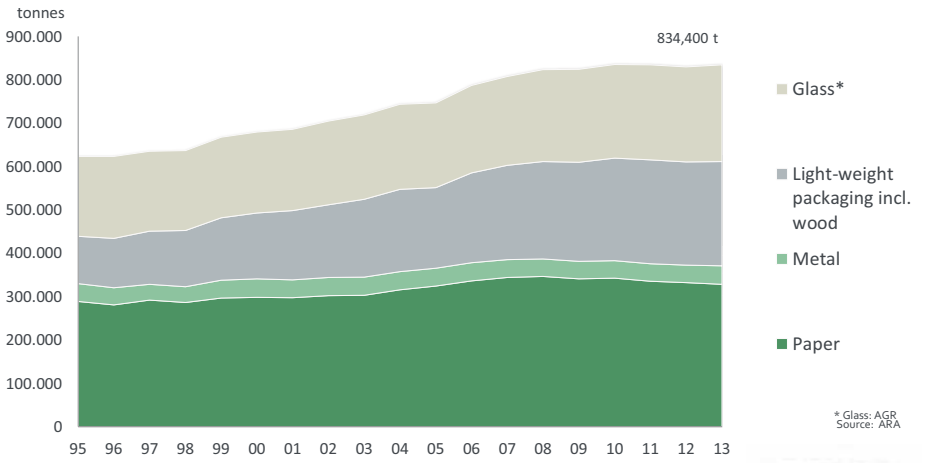
PACKAGING COLLECTED BY ARA, 1995 – 2013: +33% SECONDARY RAW MATERIALS AND RDF SAVE 640,000 t/a IN CO_2 EQUIVALENTS



* Glass: AGR
Source: ARA

RECYCLING DONE RIGHT.

ARA

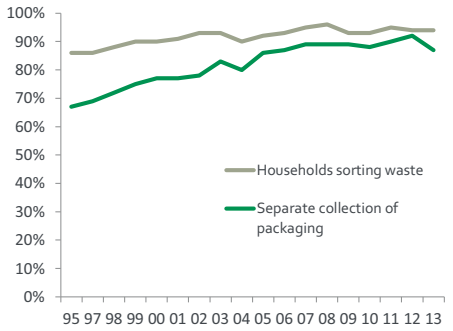
STANDARDIZED CORPORATE DESIGN SUPPORTS BRAND RECOGNITION AND SEPARATE COLLECTION

RECYCLING DONE RIGHT.

ARA

HIGH LEVEL OF ACCEPTANCE AMONG BUSINESSES AND CONSUMERS

A "very good" or "good" solution (Austrians aged 14+)



– Between 2004 and 2012, the share of non-licenced packaging in the household system („free riders") decreased from 14% to 10%

Source: TB Hauer (2013): Verpackungsaufkommen in Österreich - Fortschreibung für 2012

	Paper	Light-weight packaging	Metal	Glass
A very good or good solution	93%	81%	84%	89%
No changes necessary	81%	76%	87%	85%
Overall rating on a scale from 1 (best) to 5 (worst)	1.3	1.6	1.6	1.5

Source: IMAS (2013).

RECYCLING DONE RIGHT.

ARA

R&D AS A DRIVER OF INNOVATION – EXAMPLES

– Collection bins and logistics for the separate collection of plastic bottles for NIR sorting

– Inclusive design

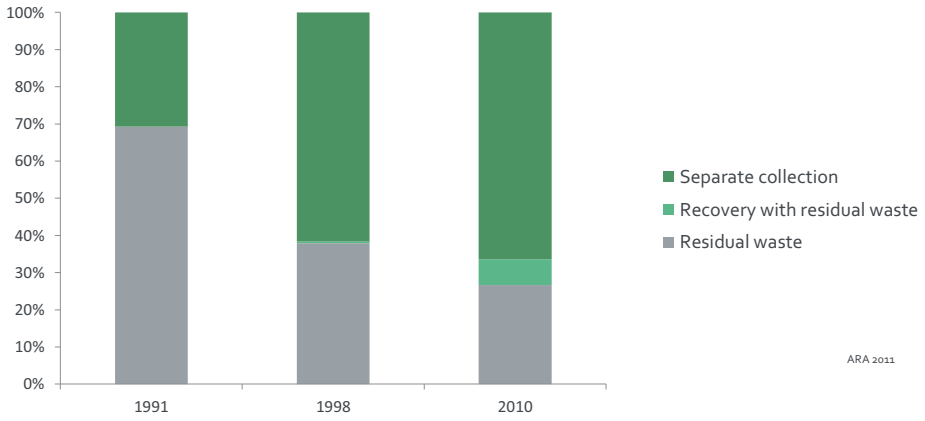
– Zero emission: Real-world testing ans simulation of alternative drive systems

– Improved logistics and communications through Mobile Crowd Behavior research

RECYCLING DONE RIGHT.

ARA

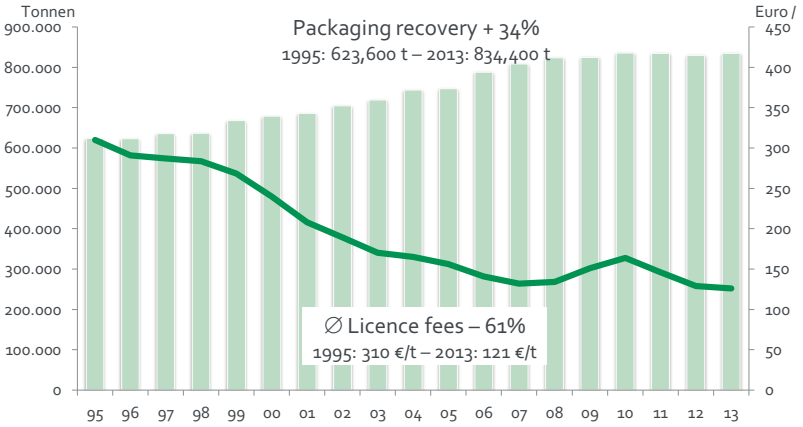
PRODUCER RESPONSIBILITY IN PRACTICE: 66% OF PACKAGING SOURCE-SEPARATED, 73% FINANCED



ARA 2011

RECYCLING DONE RIGHT.

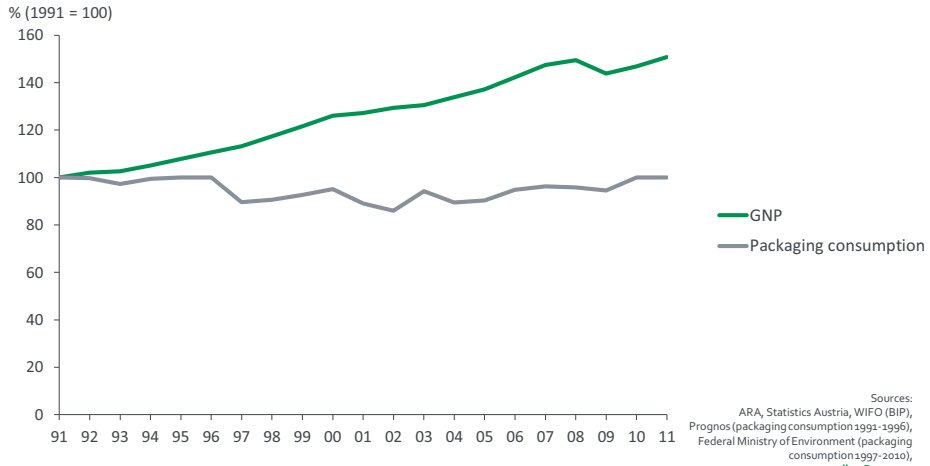
ARA EFFECTIVENESS AND EFFICIENCY 1995 – 2013: RECOVERY + 34%; UNIT COST – 61%



Source: ARA, AGR 2013

RECYCLING DONE RIGHT.

DE-COUPLING OF GNP AND PACKAGING CONSUMPTION

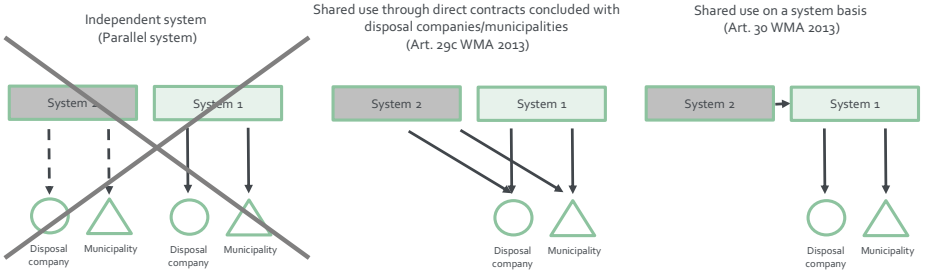


Sources:
ARA, Statistics Austria, WIFO (BIP),
Prognos (packaging consumption 1991-1996),
Federal Ministry of Environment (packaging consumption 1997-2010),
reading Dec. 2012

RECYCLING DONE RIGHT.

ARA

THE 2013 AMENDMENT TO THE AUSTRIAN WASTE MANAGEMENT ACT REGULATES TWO ALTERNATIVE FORMS OF SHARED USE.

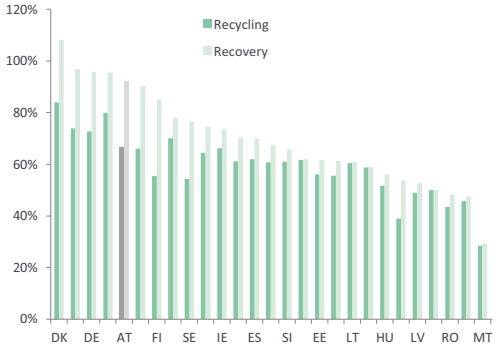


RECYCLING DONE RIGHT.

ARA

PACKAGING RECOVERY IN THE EU: AUSTRIA IS RANKED AT THE TOP

- A European Commission report shows that Austria is top of the table in terms of municipal waste management. [1)]
- According to the European Environment Agency, Austria has the highest recycling rate in Europe. [2)]
- Austria's packaging recovery system and ARA have contributed significantly to this success.
- Austria was chosen as one of six case studies for packaging waste for drawing up recommendations on producer responsibility for the European Commission. [3)]



Source: DG ENV 2013
(Data for 2010)

1) BIPRO [2012]: Screening of waste management performance of EU Member States
2) EEA Report No 2/2013: Managing municipal solid waste — a review of achievements in 32 European countries
3) Bio IS *et al.* [in Arbeit]: Development of guidance on Extended Producer Responsibility (EPR)

RECYCLING DONE RIGHT.

ARA

Name: Francesc Giró Fontanals
Organisation: Waste Agency of Catalonia
Title of presentation: Door to Door Collection of MSW in Catalonia

Abstract

Door to Door collection in Catalonia started more than ten years ago and is at present implemented in over 100 municipalities. It is a separate collection system which allows and requires adjustment to the particular geographic, social and urban context of each municipality.

D-t-D helps to make citizens of their role in generation and management of MSW, and requires the implication of citizens, administration and waste collectors; therefore a well-designed communication strategy is essential for its success.

Almost any domestic waste stream can be collected from the streets by a door-to-door system. However, at least bio-waste and residual waste have to be collected D-t-D. The collection follows pre-established time schedules, and D-t-D of some waste streams can be combined with bring-systems (road containers) for others.

The results of monitoring of MSW management in municipalities that have implemented D-t-D show a spectacular increase of separate collection. The quality of the separately collected materials also improves notably with respect to purity, which has positive effects on the subsequent recycling processes.

About the author

Francesc Giró i Fontanals is Deputy Director of the Waste Agency of Catalonia (ARC). He is graduated in Agricultural Engineering by the Polytechnic University of Catalonia, and was involved in research on organic waste composting and compost quality.

Since 1993, as technician at the Waste Agency of Catalonia in 1993 he has been committed to develop and promote the implementation of separate collection of bio-waste and planning the net of biological treatment plants.

Since February 2011, he is working as deputy-director of Waste Agency of Catalonia.

He is also the representative member of Spain in the ECN (European Compost Network).

DOOR TO DOOR COLLECTION OF MSW IN CATALONIA

Francesc Giró
Agència de Residus de Catalunya
14/05/2014

What is Door to Door Collection?

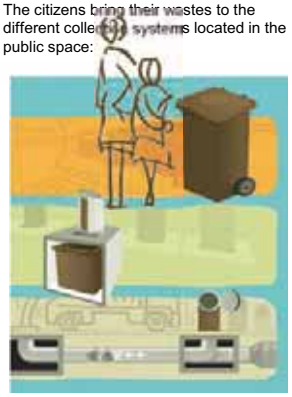
- Much more than a waste collection system
- Allows to exert and demand shared responsibility for waste management by establishing a "pact" between citizens and administration
- A system based on technical and common sense

What is NOT Door to Door Collection

- A waste collection system that automatically works wonders on the collection results
- An excentric whim of waste management officials and/or politicians
- A collection system only fit for small municipalities and rural areas
- A collection system entailing higher costs than others

Road Containers

The citizens bring their wastes to the different collection systems located in the public space:



Door to Door Collection

The different municipal waste streams are collected directly at their point of origin, according to an established schedule and time table..

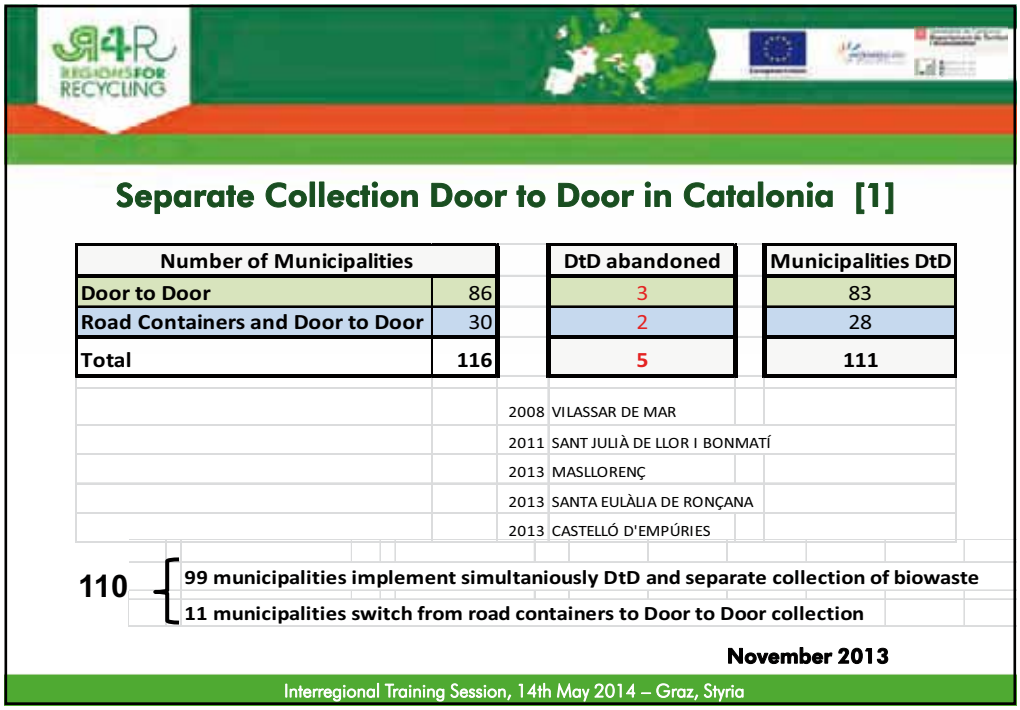
- **The results of more than 10 years of experience with D-t-D in over 100 municipalities lead to the following CONLUSIONS :**
  - It is a drastic and sudden change
    - Of concepts and customs
    - Of citizens' habits -> requires thorough preparation: Training + Awareness
    - Of quantitative and qualitative results -> satisfies everyone
    - Of attitude -> requires alliance of all stakeholders (citizens, administration, collection company)
    - Of improved results for Biowaste, Glass, Paper-Cardboard, mixed Packaging
  - It requires adjustment to particular geographic,social, urbanistic, etc. contexts,
    - D-t-D is feasible in different circumstances. It just requires enough understanding to adapt it to the particular conditions.
  - It is well accepted by
    - Citizens: for its convenience, in spite of the inevitable effort of separation at source.
    - Politicians: consider it beneficial in general terms
    - Some municipalities switch to Door-to-Door Collection

- **Reduction of Total MSW Generation**
  - 5 - 20 % reduction
  - Reasons: waste form small industries are excluded from collection, awareness of citizens, shift in consumption patterns, waste exportation
- **Improved results regarding quantity and quality of Biowaste, Glass, P/C, Packaging**
  - Increase of separate collection of Biowaste increases the other waste streams
  - Global separate collection rate: 60-85 %.
  - Immediate compliance with collection targets (PROGREMIC and FWD)
  - Immediate compliance with reduction targets for biodegradable waste (Landfill Directive)
  - Less contamination in Biowaste [< 5 %] (or < 2% when the use of compostable bags is compulsory), what improves the operation of biological treatment and the quality of the compost.
  - Lower cost for treatment infraestructures and operations.
- **Long term results that tend to improve over time**

- **Costs are equivalents**
  - An integrated (not addditive) view on waste management is required,
  - Collection frequency needs to be adjusted to the real arising of each waste stream, in order to restrict collection cost
  - The cost increase for the collection is balanced by the decrease of treatment cost and revenues from recyclable materials (EPR schemes) and refunding of the disposal tax
  - An integrated financial balance is required:
    - Costs
      - Collection: D-t-D helps to optimize costs.
      - Treatment:
        - » Biowaste. Better input quality lowers operation costs
        - » Residual waste. Treatment cost will rise substantially over the coming years
      - Disposal Tax: will rise substantially over the coming years
    - Revenues
      - Fees: Tend to keep stable
      - Refund of Disposal Tax: Tends to rise for high quality material
      - EPR revenues (Ecoembes, Ecovidrio): New agreements for 2013

Success Factors

- **Conviction and commitment to D-t-D**
- **Political consens**
- **Participation process**
- **Implication of all stakeholdersde (City Council, political groups, collection company, associations, etc.)**
- **Well designed technical - financial implementation of D-t-D**
- **Comunication+Training+Awareness campaigns**
- **Monitoring of D-t-D performance and feedback to the citizens**



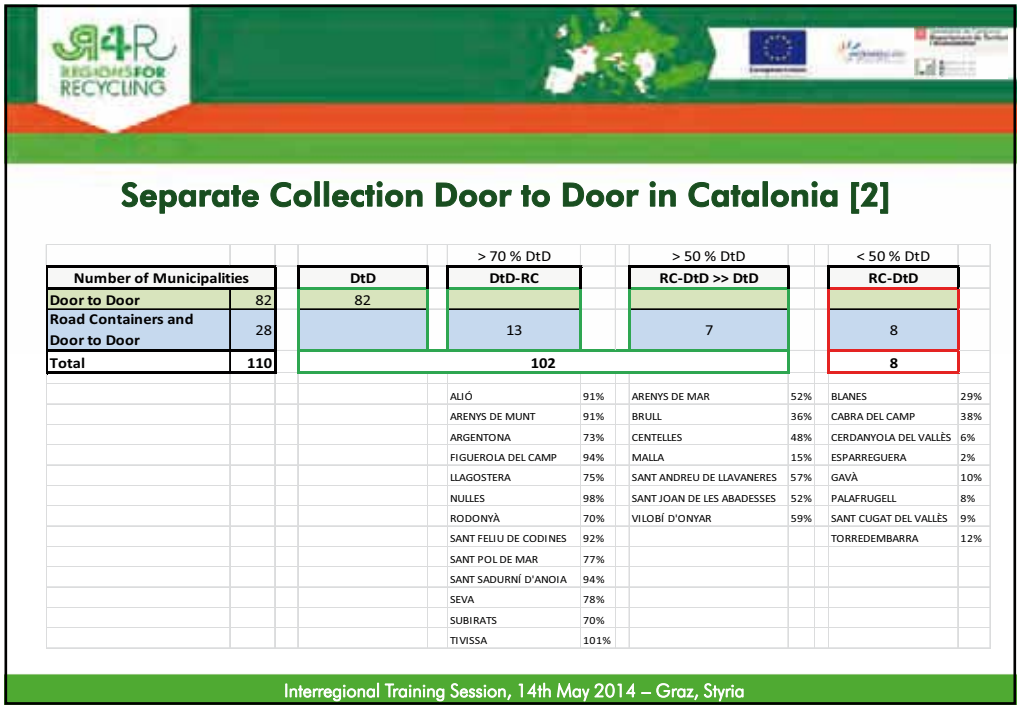
Separate Collection Door to Door in Catalonia [1]

Number of Municipalities		DtD abandoned	Municipalities DtD
Door to Door	86	3	83
Road Containers and Door to Door	30	2	28
Total	116	5	111

2008	VILASSAR DE MAR
2011	SANT JULIÀ DE LLOR I BONMATÍ
2013	MASLLORENÇ
2013	SANTA EULÀLIA DE RONÇANA
2013	CASTELLÓ D'EMPÚRIES

110
- **99 municipalities implement simultaniously DtD and separate collection of biowaste**
- **11 municipalities switch from road containers to Door to Door collection**

November 2013

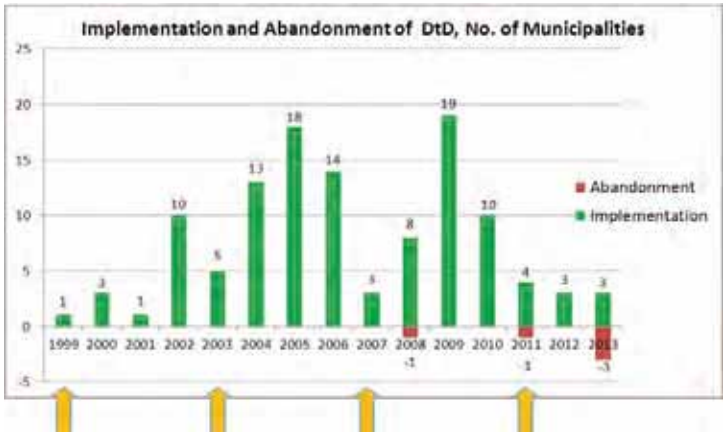


Separate Collection Door to Door in Catalonia [2]

Number of Municipalities		DtD	> 70 % DtD DtD-RC		> 50 % DtD RC-DtD >> DtD		< 50 % DtD RC-DtD	
Door to Door	82	82						
Road Containers and Door to Door	28		13		7		8	
Total	110	102					8	
			ALIÓ	91%	ARENYS DE MAR	52%	BLANES	29%
			ARENYS DE MUNT	91%	BRULL	36%	CABRA DEL CAMP	38%
			ARGENTONA	73%	CENTELLES	48%	CERDANYOLA DEL VALLÈS	6%
			FIGUEROLA DEL CAMP	94%	MALLA	15%	ESPARREGUERA	2%
			LLAGOSTERA	75%	SANT ANDREU DE LLAVANERES	57%	GAVÀ	10%
			NULLES	98%	SANT JOAN DE LES ABADESSES	52%	PALAFRUGELL	8%
			RODONYÀ	70%	VILOBÍ D'ONYAR	59%	SANT CUGAT DEL VALLÈS	9%
			SANT FELIU DE CODINES	92%			TORREDEMBARRA	12%
			SANT POL DE MAR	77%				
			SANT SADURNÍ D'ANOIA	94%				
			SEVA	78%				
			SUBIRATS	70%				
			TIVISSA	101%				

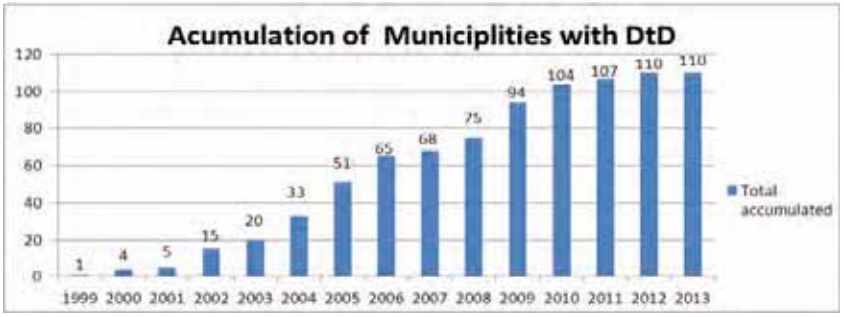
Separate Collection Door to Door in Catalonia [3]

n=115

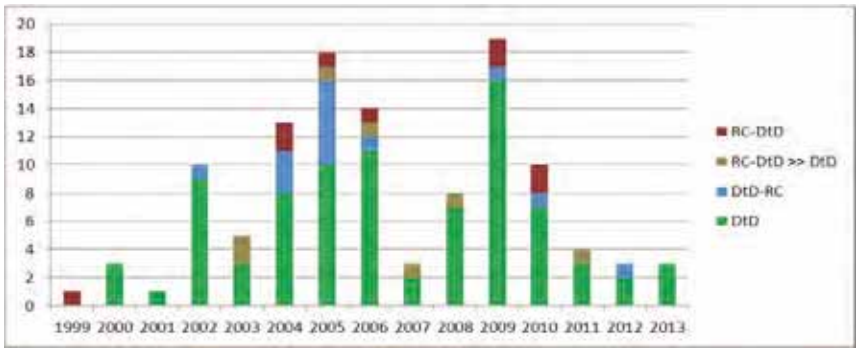


Separate Collection Door to Door in Catalonia [4]

n=110



Separate Collection Door to Door in Catalonia [5]



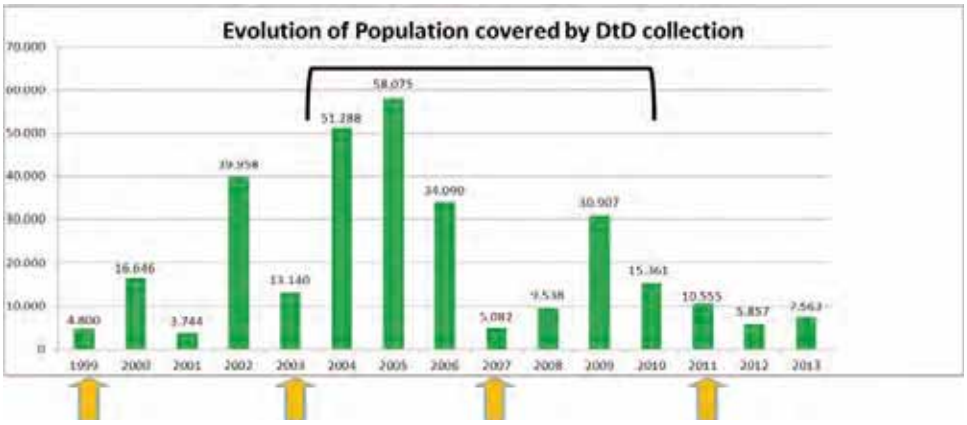
Separate Collection Door to Door in Catalonia [6]

n=110 / 102

	Inhabitants_DtD	Households_DtD	Commerce/Industry_DtD
Considering 110 municipalities	306.604	131.443	3.951
Considering 102 municipalities	274.433	116.385	2.777

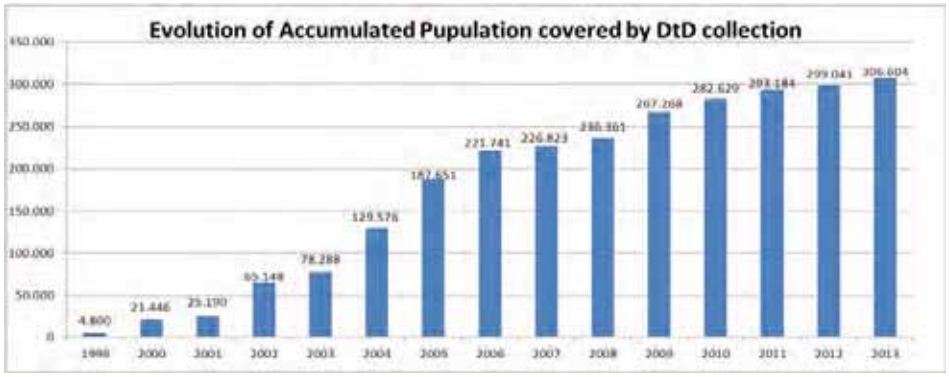
Separate Collection Door to Door in Catalonia [7]

n=110



Separate Collection Door to Door in Catalonia [8]

n=110



Separate Collection Door to Door in Catalonia [9]

n=110

	DtD	DtD-RC	RC-DtD >> DtD	AV-PAP	Total		Bio	R	G	P/C	PK	MP	FI
2 [Bio+R]	15	3	3	3	24	2 Waste Streams	●	●					
3 [Bio+MP+R]	13	1	2		16	Multiproduct	●	●				◐	
4 [Bio+MP+GL+R]	1				1	Multiproduct	●	●	●			◐	
3 [Bio+P/C+FIRM]	1				1	Residu Mínim	●			●			◐
4 [Bio+R+P/C+PK]	21	9	1	1	32	4 Waste Streams	●	●		●	●		
5 [Bio+R+GL+P/C+PK]	31		1	4	36	5 Waste Streams	●	●	●	●	●		
Total	82	13	7	8	110								

Strategic Waste Streams

Results of Waste Generation and Separate Collection in Catalonia. 2012 [1]

Indicator MSW Generation Expressed in:

- kg / inh / day
- kg / inh / year

Average CAT 2012:

- 1,35 kg/inh/day

DtD << RC

Results of Waste Generation and Separate Collection in Catalonia. 2012 [2]

Indicator GSC and NSC

Includes:

ORDINARY: Bio,Glass,P/C, Pack.

Other: Bulky, Wood, WEEE, Metal, Cooking Oils, Textile, C&D, Haz. Waste, Batteries, Medicines, Asbestos, Mineral oils, Tyres, etc.

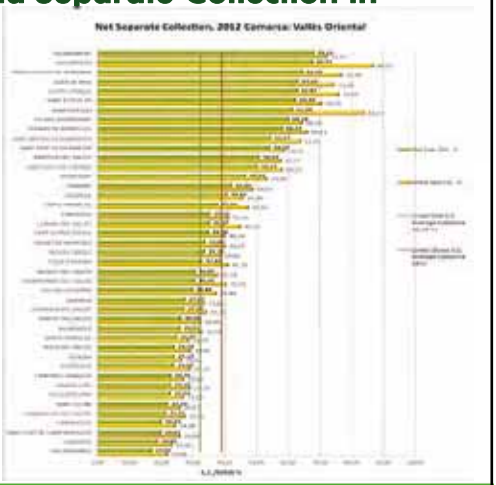
NSC= GSC- Contaminants

Expressed in: %

Average CAT 2012:

GSC: 39%

NSC: 32%



Results of Waste Generation and Separate Collection in Catalonia. 2012 [3]

Indicator NSC [Bio+Glass+P/C+Pack]

NSC= GSC-Contaminants

Expressed in: kg/inh/year

Average CAT 2012:

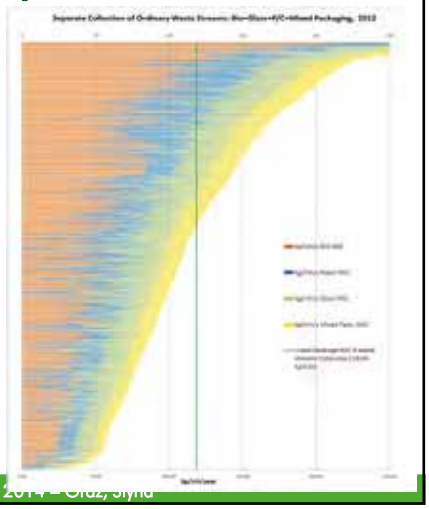
BIO: 51,8 kg/inh/year

P/C: 28,4 kg/inh/year

Glass: 28,5 kg/inh/year

Mixed Pack: 14,6 kg/inh/year

BIO+Glass+P/C+Pack: 123 kg/inh/year



Results of Waste Generation and Separate Collection in Catalonia. 2012 [4]

- Indicator NSC [Bio+Glass+P/C+Pack]
- NSC= GSC-Contaminants
- Expressed in: kg/inh/year
- Average CAT 2012:
  - BIO+Glass+P/C+Pack: 123 kg/inh/year
- Average CAT 2012 by Collection System
  - RC: 115 kg/inh/year
  - RC-DtD: 104 kg/inh/year
  - RC-DtD>>DtD: 176 kg/inh/year
  - DtD-RC: 183 kg/inh/year
  - DtD: 195 kg/inh/year

Carbon Footprint of MSW Management in Catalonia. 2012 [1]

Calculation tool CO_2 ZW

developed by sostenipra Sostenibilitat i Prevenció Ambiental

for the calculation of the

Carbon Footprint of Waste Management

Ramon Farreny | Carles M. Gasol | Xavier Gabarrell

inèdit sostenipra UAB Agència de Residus de Catalunya Oficina Catalana del Canvi Climàtic

Carbon Footprint of MSW Management in Catalonia. 2012 [2]

Emissions generated per inhabitant 2012

206 kg CO_2 eq/inh·year

Emissions avoided per inhabitant 2012
-102 kg CO_2 eq/inh·year
Carbon Footprint per inhabitant 2012
104 kg CO_2 eq/inh·year considering emissions avoided

Total Emissions generated 2012

1.558.560 t CO_2 eq/year

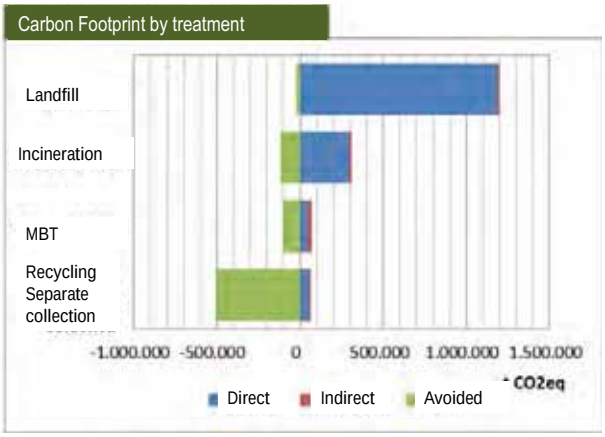
Total Emissions avoided 2012
-769.167 t CO_2 eq/year
Total Carbon Footprint 2012
789.393 t CO_2 eq/year considering emissions avoided

Emissions generated per tonne 2012

418 kg CO_2 eq/tonne·year

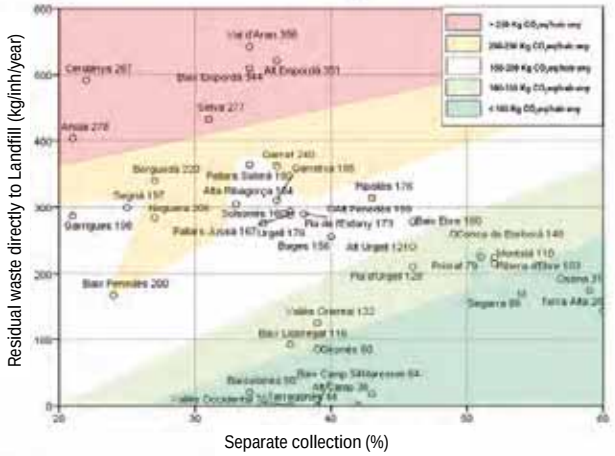
Emissions avoided per tonne2012
-206 kg CO_2 eq/tonne·year
Carbon Footprint per tonne 2012
212 kg CO_2 eq/tonne·year considering emissions avoided

Carbon Footprint of MSW Management in Catalonia. 2012 [3]

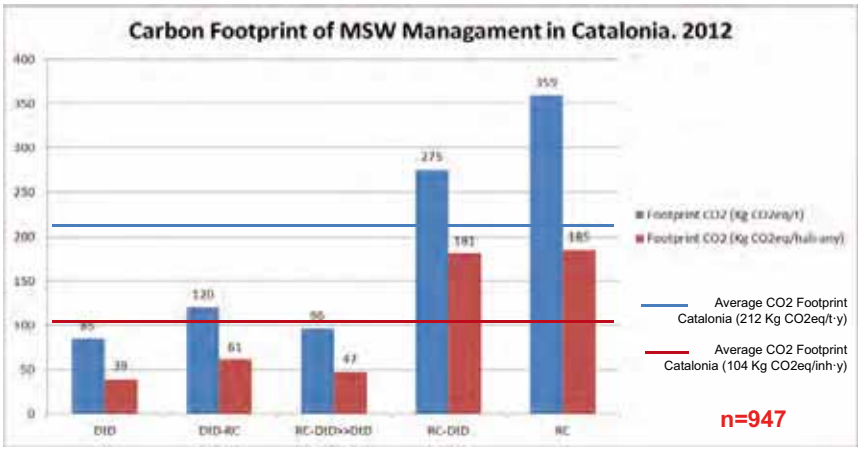


Carbon Footprint of MSW Management in Catalonia. 2012 [4]

Carbon Footprint of MSW Management in Catalonia. 2012 [5]



Carbon Footprint of MSW Management in Catalonia. 2012 [6]



THANK YOU FOR YOUR ATTENTION !

www.regions4recycling.eu

Name: Karl Harather
Organisation: IUT Ingenieurgemeinschaft Innovative Umwelttechnik GmbH
Title of presentation: Analysis of residual waste in Styria

Abstract

ARGE Ingenieurgemeinschaft Innovative Umwelttechnik GmbH (IUT) and Saubermacher Dienstleistungs AG (SDAG) were engaged by the Office of the Styrian State Government to conduct state-wide sorting analyses of residual waste. These were conducted on the basis of the analyses performed in 1993/94, 1997/1998, 2002/2003 and 2008.

In order to take into account seasonal variations, the analyses were conducted in three sessions:

- October/November 2012 (preliminary heating period)
- February/March 2013 (heating period)
- July/August 2013 (non-heating period)

For the random sampling plan sub-districts were selected within all the districts in Styria and the individual communities to be sampled were assigned to a rural or urban structure. A total of 104 part samples of about 1.0 m3 each were studied.

The results were subjected to a comprehensive assessment so as to detect any seasonal and structurally determined differences and changes compared with the prior sorting analyses performed. Comparisons were also carried out with separately collected packaging waste and scrap materials so as to be able to judge the efficiency of the separate collection systems. The detailed results yield information for evaluating the effectiveness of waste management measures already in place and provide bases for future decisions.

About the author

Mr. Karl Harather is manager and companion of IUT. He has worked in the field of waste management throughout his entire career (since 1989). He became a leading Austrian expert in design and engineering of waste treatment plants and organisation and execution of sorting analyses of waste. Since 2009 he is a generally sworn and court certified expert for waste management and packaging waste management, landfilling and remediation of contaminated sites.

ANALYSIS OF RESIDUAL WASTE IN STYRIA

Karl Harather

IUT Ingenieurgemeinschaft
Innovative Umwelttechnik
www.ig-iut.at

14th May 2014

IUT INGENIEURGEMEINSCHAFT INNOVATIVE UMWELTTECHNIK GMBH

onsultants an engineers in waste anage ent, fire protection, e plosion protection, safety engineering

- Licenses
  - Environmental engineering
  - Mechanical engineering
  - Water management
- Location: Seebenstein / Austria
- References: main area **Austria**, but also **Greece**, **Romania**, **Bulgaria**, Slovenia, **Croatia**, Slovakia, **Denmark**, **Estonia**, …

DRIVERS FOR THE EXECUTION OF THE SORTING ANALYSIS ON RESIDUAL WASTE

- Evaluation of the **remaining potential** for the **separate collection** (incl. costs and revenues for waste paper, waste glass, scrap metal, waste wood and packaging)
- **Comparison** with the result of the last **analysis** in the year **2008**
- Assessment and evaluation of **developments and trends** („separation-habits of people")
- Evaluation of the **essentials to improve the separate collection system**

STYRIA

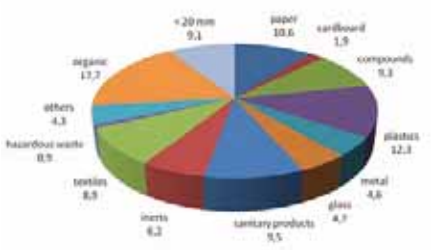
- **1.210.971 inhabitants** (January 2013)
- **512.200 households**
- **Source separate collection** of **biowaste**, **paper, packaging waste** (plastics, metals, glass), **hazardous waste**
- **Residual waste from households**: 155.850 tons or **128,9 kg/capita** per year (2012)

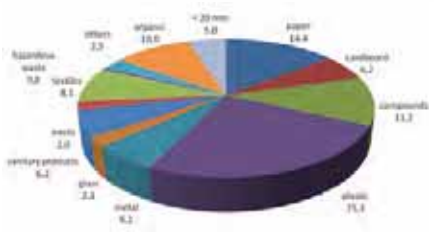
EXECUTION OF THE ANALYSIS

- Contractors: IUT & Saubermacher
- Containers for residual waste have been emptied in order to receive **representative samples** of approx. 1 m³ in all districts of Styria
- 3 analysis sessions
  - Pre-heating period Okt Nov
  - Heating period eb March
  - Post-heating period uly Aug
- 104 spot samples have been collected and manually sorted into each 62 fractions

RESULTS SEPARATED INTO MAIN FRACTIONS

- Composition according to the weight in %
- Composition according to the volume in %





RESULTS IN RELATION TO THE SETTLEMENT STRUCTURE

- **Rural municipalities** are showing a **significant lower quantity of residual waste** of 82,0 kg/capita,a compared to **urban municipalities** with 153,8 kg/capita,a
- **Rural municipalities** are having a **significantly lower quantity of secondary raw materials** in the residual waste compared to **urban municipalities**
- **Rural municipalities** are also having a **significantly lower quantity of packaging waste** in the residual waste compared to **urban municipalities**
- The **calorific value** of waste **in urban structures** is **generally higher than in rural structures**

NEWSPAPER, PAPER AND CARDBOARD

- Quantity in residual waste >20 mm: **12,5 W%** or 16,1 kg/capita,a
- No changes to the results from 2008
- Coverage by separated collection: 79,9 kg/capita,a
- Rate of separated collection is 83,2 %

PLASTICS AND COMPOUNDS

- Quantity in residual waste >20 mm:
  21,6 W% or 27,8 kg/capita,a
- Lower quantities than 2008
- Coverage by separated collection:
  22,1 kg/capita,a
- Rate of separated collection is
  44,0 %

GLASS

- Quantity in residual waste >20 mm:
  4,7 W% or 6,1 kg/capita,a
- No changes to the results from 2008
- Coverage by separated collection:
  31,0 kg/capita,a
- Rate of separated collection is
  83,6 %

METALS

- Quantity in residual waste >20 mm: **4,6 W%** or 5,9 kg/capita,a
- Increase by 22% compared to 2008
- Coverage by separated collection: 6,1 kg/capita,a
- Rate of separated collection is 50,8 %

BIO WASTE

- Quantity in residual waste >20 mm: **24,1 W%** or 31,1 kg/capita,a
- **57% or 17,7 kg/capita,a** of the above mentioned quantity are **avoidable,** partially original packed **food waste**
- Coverage by separated collection: 64,9 kg/capita,a
- Rate of separated collection is 67,7 %

HAZARDOUS WASTE

- Quantity in residual waste >20 mm: **0,5 W%** or 0,6 kg/capita,a
- Small decrease from 0,8 kg/capita,a to 0,6 kg/capita,a compared to 2008
- Coverage by separated collection: 2,2 kg/capita,a
- Rate of separated collection is 78,6 %

PACKAGING WASTE

- **Packaging** in residual waste is **17,3 W%** or **42,7 Vol%**
- Almost no differences to the results from 2008
  - **Plastics- and Compound packaging** **8,9 W%** or **30,7 Vol%**
  - **Paper- and Cardboard packaging** **2,0 W%** or **6,5 Vol%**
  - **Packaging made of glass** **3,5 W%** or **1,4 Vol%**
  - **Packaging made of metal** **2,4 W%** or **3,9 Vol%**

PACKAGING – TREND SINCE 2008

- The **total content of packaging**, the **sum of all glass packaging** and the quantity of **plastic and compound packaging** are on the **same level**
- The content of **paper and cardboard packaging** has slightly decreased
  7,1 Vol.% → 6,5 Vol.% !
- Total amount of all **metal packaging** has increased
  2,8 Vol.% → 3,9 Vol.% !

RATES OF SEPARATELY COLLECTION OF PACKAGING WASTE

- **Styria** is **performing well** at the **separately collection.** But there is still **potential to improve,** which would also pay off!
- **Rates** of packaging waste, which are collected by the **separate collection system** (weight):

Plastic packaging:	72%
Metal packaging:	66%
Glass packaging:	89%
Paper packaging:	84%

CONCLUSIONS

- The high develompent level of the Styrian waste management has been confirmed by the result of the residual waste analysis 2013
- Styria is performing well at the separately collection. But there is still potential to improve, which would also pay off!
- Potential of valuables: At optimized separated collection approx. 65 W% or 80 Vol% of the residual waste are utilizable fractions such as paper, plastics, glass and metals
- The resulting revenue of the valuables would be 11 Mio. □ !

THANK YOU FOR YOUR ATTENTION !

www.regions4recycling.eu

Name: Berthold Schleich
Organisation: ARGE – Association for Waste Prevention
Title of presentation: Waste Consultancy in Austria

Abstract

As an innovative solution to severe waste problems of the 1980ies, the NGO ARGE-Association of Waste Prevention introduced the concept of "municipal environment & waste consultants" and implemented it within the next years all over Austria. Today 340 consultants - employed by the municipalities or local authorities - are the backbone of public waste management, raising separate collection rates from around zero (1980) up to over 70% in some regions, saving costs and generating thousands of new follow-up jobs. The everyday-work of Waste Consultants is manifold, ranging from consultation of small and medium sized enterprises, schools and kindergardens, to waste controls and analysis and the coordination and planning of events.

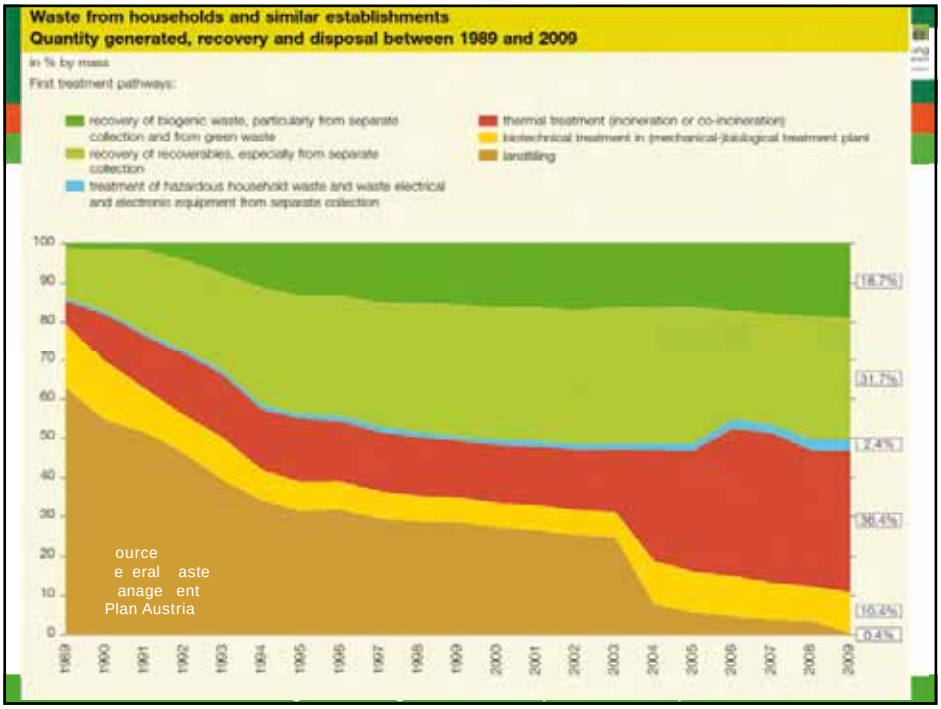
Using human resources prior to legal restrictions and industrial investments in order to minimize environmental problems and reduce public expenses is one of the key success factors of Environment and Waste Consultants. In total, the implementation of waste consultants is one of the biggest success stories of Employment Service funding projects in Austria.

About the author

Berthold Schleich is head of ARGE-Association for Waste Prevention and ÖKO-Service Gemeinnützige Beschäftigungsgesellschaft m.b.H. In the 1980ies he developed and implemented the first training concept for Municipal Environment and Waste Consultants in Austria. Berthold Schleich is an expert in the field of developing new business fields in the environmental sector, especially for social enterprises and in the field of managing EU-funded projects in the environmental sector.

MUNICIPAL WASTE CONSULTANTS IN AUSTRIA

Berthold Schleich
ARGE – Association for Waste Prevention
14th May 2014



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Plan Austria

Background

- 1980ies: severe waste problems in Austria: rising amounts, rapidly shrinking landfill capacities
- ARGE-Association for Waste Prevention, founded in 1982, introduced waste prevention strategies

Solution

- **Prevention** instead of „end of pipe technology“
- The Way: educating/training the people
- The Tool:
  Municipal Environment & Waste Consultants in every region
- The Offer:
  concept and training course
- National Employment Service financed the start!

What is a municipal environment and waste consultant?

- Public employee
- Main field of employment = municipal waste management
- Main tasks: public relations, communication, marketing, management, organization

„formula for success“ = public relation

Waste avoidance, waste separation, sustainable consumption patterns and regional appropriate collection systems need qualified, specialized and

locally based experts

Where waste consultants are employed:

- Municipalities / local authorities
- townships with more than 3000 inhabitants
- cities
- associations of towns / districts
- provincial authorities
- associations (under public contract)
- communal waste management entities

Purpose of waste consultants:

- Reduction of waste for treatment
- Optimizing the amount of waste for Recycling
- Stabilization or reduction of the overall amount of waste
- Establishment of regional collecting systems that are customer-friendly and cost-saving
- Creation of public acceptance for necessary steps, like treatment plants, less convenience, higher fees

Qualification of a Waste Consultant:

- High motivation to serve the „common welfare“
- intelligent, responsible work
- Experience in any profession (not „fresh from college“)
- Talent for communication
- Organizing talent
- Holistic thinking in cross-linked systems (environmental topics)
- positive attitude towards ecology and sustainability

Everyday-work of Waste Consultants I

- Public awareness for environmental protection, PR, promotion of collection systems
- service-hotline
- on-site advising (e. g. home-composting)
- conception, planning, organizing collection-systems
- supervision & support of collection-centres
- Consulting of public decision-makers
- events / activities
- educational work (schools, kindergardens)

Everyday-work of Waste Consultants II

- consultation of small and medium sized enterprises (SMEs)
- waste management concepts for towns, SMEs, schools,…
- environment-magazines / newsletters
- energy consulting
- water- and waste-water consulting
- participating in the development of innovative strategies and concepts („sustainable development“)
- networking for local actors in the fields of sustainability, environment

Everyday-work of Waste Consultants III

- motivate, train and supervise the waste-management personnel of the local authority
- Waste controls and -analysis
- documentation, statistics, evaluation
- controlling of waste management finances
- Management of all relevant activities and contracts
- „crisis management“
- environmental „pastoral care“

Financing of Waste Consultants I

- 1984 – 1986: Initial funding of concept, development of training, dissemination by National Employment Service, Ministry of Environment, Province of Styria
- 1986 – ~2000: Initial funding of implementation of the first ~200 consultants (6 months training costs, 100% staff costs during training, 50 – 75% staff costs for initial 12 – 24 months of work) by National Employment Service

Financing of Waste Consultants II

today:

- Public waste-fee of municipality (Styria: ~50 - 70 %)
- Co-Funding by private packaging-collection system (ARA) (Contract between ARA and single authorities) (Styria: ~30 - 50%)
- only in Styria: co-funding by Provincial authority: ~10 - 30 %

Results I

- Today ~340 permanent consultants in Austria
- ~ 1 waste consultant per 25.000 inhabitants (target: 1 per 10.000 inhabitants)
- separate waste collection rate raised from near zero to over 70% within 15 years in many regions (for example Styria)
- recovery rate (including energy recovery): 70% in all Austria
- Disposal rate: less than 3%!
- recovery-income reduces costs for municipalities and waste fees for households

Results II

- 30.000 jobs in Austrian waste management (public and private) = 20.000 more compared to countries with very low separate collection
- 1 job in Waste Management for 270 inhabitants
- 1 municipal waste consultant per 88 employees in Waste management
- 1,5% of Gross National Product = Waste Management

Lessons learnt

- Investment in human resources in the form of supporting behavioural change towards wasting less material and costs creates new jobs and added value for regions and states
- Investment in the change of human behaviour is cheaper than investment in technologies / strategies, that have to compensate the results of unwanted human behaviour

THANK YOU FOR YOUR ATTENTION !

More information here:
www.arge.at
Berthold.Schleich@arge.at

Name: Dr. Franz Prettenthaler
Organisation: JOANNEUM RESEARCH-POLICIES
Title of presentation: The Regional Economics of Municipal Waste Management

Abstract

The study analyses some macroeconomic effects of the Styrian waste management sector, that comprises 136 firms, 660 waste collection and treatment sites, an annual turnover of 450 Mio. and employs 2.600 persons at annual wages of 72 Mio. . The annual value added amounts to 290 Mio. and acquired investments of 900 Mio. . In the last 11 years 2000 to 2010. The sector is responsible for a comparably high domestic macroeconomic multiplier of 0,9 concerning value added (direct and indirect effects) and 1,1 if induced effects are also taken into account.

The workforce comprises also a surprisingly high share of persons with tertiary education (6 %), this is +0,9 %-points compared to the average of the secondary sector. In average, a Styrian inhabitant generates waste of 456 kg, this sums up to 550.000 tons, that is treated in a very decentralized waste management network. In a hypothetical scenario with centralized collection and treatment the ton-kilometers and associated emissions would double.

The annual value of the recovered materials amounts to 23,5 Mio. , with waste paper contributing the major share of 10,6 Mio. .

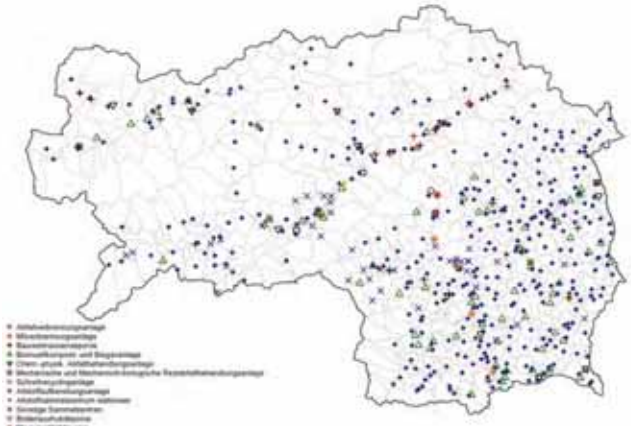
About the author

Senior Researcher (Post Doc) and Head of Regional Science, Risk and Ressource Economics Research Group, Joanneum Research Graz, Lecturer (Graz University of Technology), Lecturer in Competition Policy (University of Graz), previous positions Economics Department, University of Graz, UFR Economics, University of Cergy-Pontoise (F), Dr.rer.soc.oec 2002 (Economics), D.E.A. 2000 (Cergy, Public Economics), Mag.rer.soc.oec. 1999 (Environmental System Sciences, major Economics), M.Litt 1998 (St.Andrews, Philosophy). His research topics include macroeconomic assessment of sustainable economic structures, vulnerability assessment and adaptation policy for economic sectors facing climate change (focussing on Energy, insurance, tourism, agriculture), optimal regulation, e.g. in the Water and Waste Sector and other natural Monopolies, Risk Transfer and Global Change, Regional Economic Analysis and sectoral Impact Analysis with quantitative Methods (CGE).

Guiding principles of the study

- isplay municiplal waste management in the value chain
- Macroeconomic perspective taking account of driect and indirect effects employment value added
- Look into the value of recovered ressources
- Grasp the entire network and the e isting infrastructure

Municipal waste infrastructure



- Sites

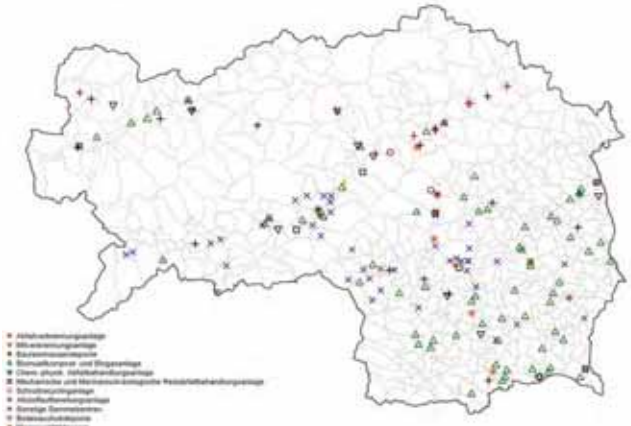
davon

- Sammel entren
- Behandlungs- und Aufbereitungsanlagen
- ompost-, Biogas-, und l rschlamm-behandlungsanlagen
- erbrennungs- b w Mitverbrennungsanlagen
- eponien

Quelle: Katalog der abfallwirtschaftlichen Anlagen, CC-BY-3.0-AT: Land Steiermark - data.steiermark.gv.at, Darstellung JR-POLICIES.

THE INNOVATION COMPANY

Municipal waste infrastructure



- Anlagen

davon

- eponien
- ompostanlagen
- Biogasanlagen
- Abfallsortieranlagen
- wischenlager
- erbrennungsanlagen
- Splittinganlagen

Quelle: Katalog der abfallwirtschaftlichen Anlagen, CC-BY-3.0-AT: Land Steiermark - data.steiermark.gv.at, Darstellung JR-POLICIES.

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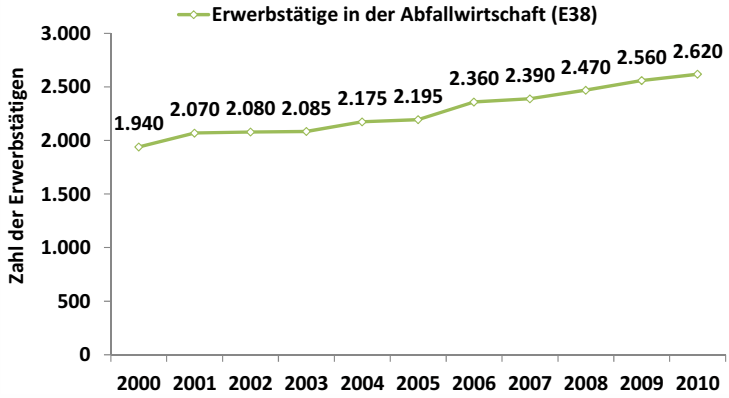
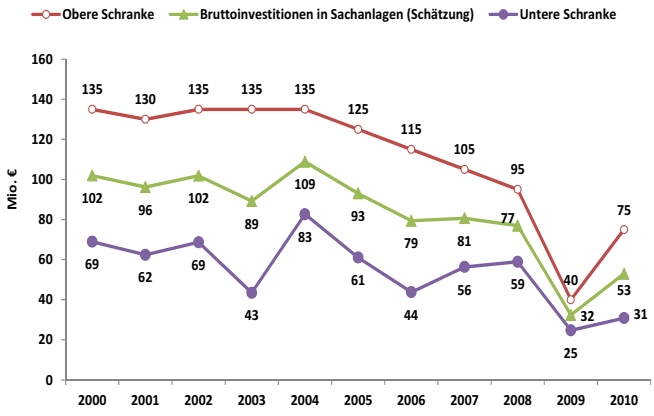
Employment in the Styrian municipal waste managment



uelle Statistik Austria , Regionale Gesamtrechnung, Hauptverband der So ialversicherungstr ger
Berechnung R-POLICIES

Investment in the Styrian municipal waste managment

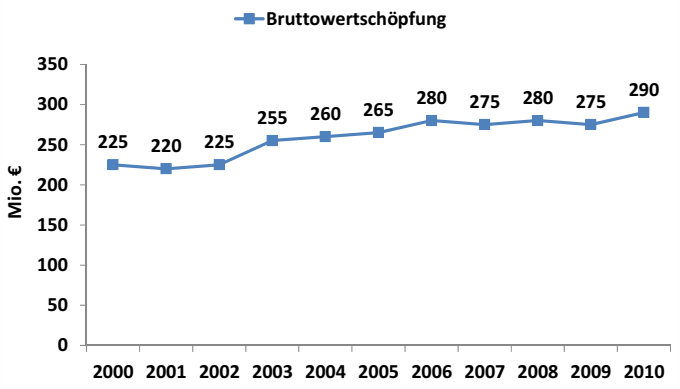


Summe über alle Jahre

Rund 870 Mio. € an Investitionen in der Steiermark in 11 Jahren

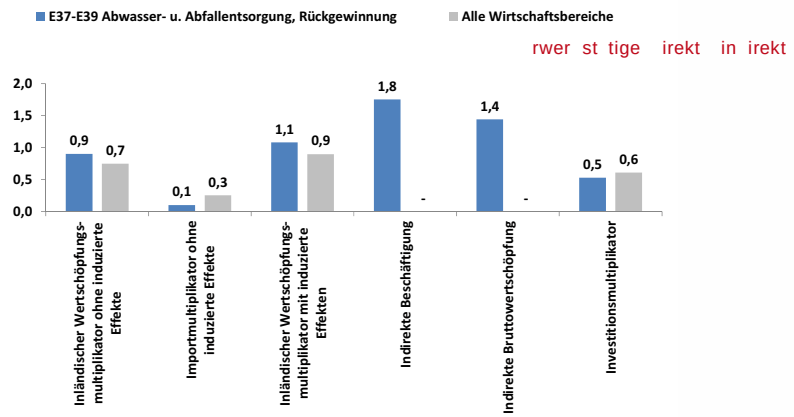
Quelle: Statistik Austria (2012), Regionale Gesamtrechnung, Unternehmensbefragung, Berechnung JR-POLICIES.

Wertsch pfung der steirischen Abfallwirtschaft



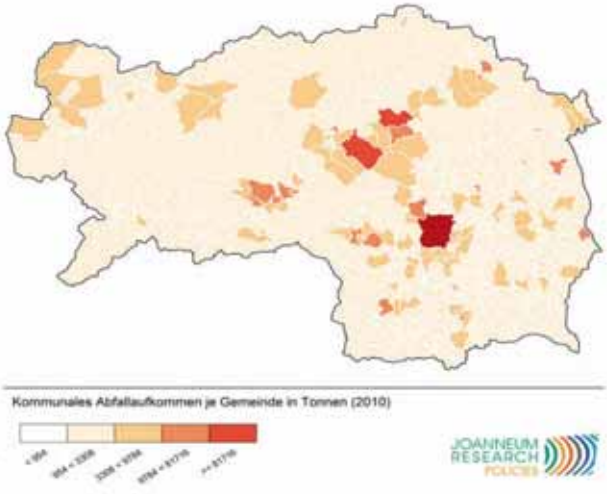
Quelle: Statistik Austria (2012), Regionale Gesamtrechnung, Unternehmensbefragung, Berechnung JR-POLICIES.

Multipliers in the Styrian municipal waste managment



Quelle: Statistik Austria (2012), Input-Output-Tabellen 2008, Berechnung JR-POLICIES.

Regional structure of waste generated in Styria



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Scenarios of centrali ed disposal factors in tonne-kilometre tkm

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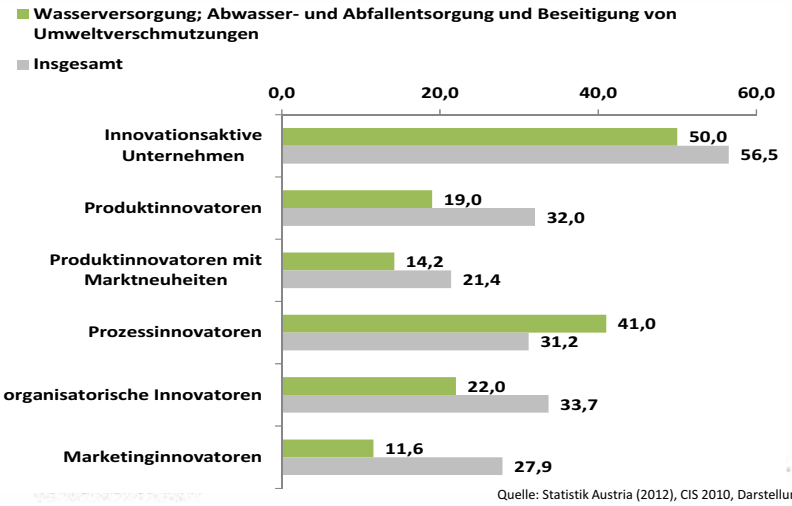
THE INNOVATION COMPANY

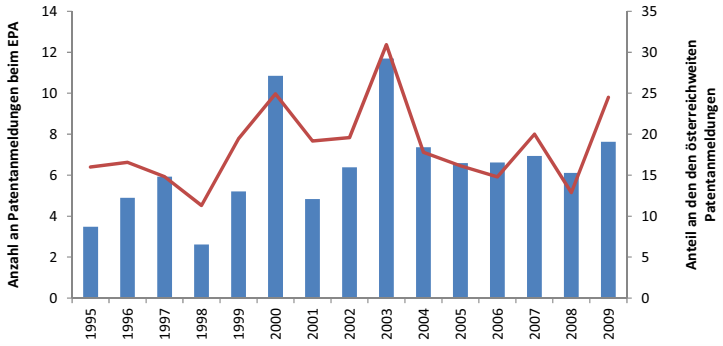
Innovative activities in waste management



Quelle: Statistik Austria (2012), CIS 2010, Darstellung JR-POLICIES.

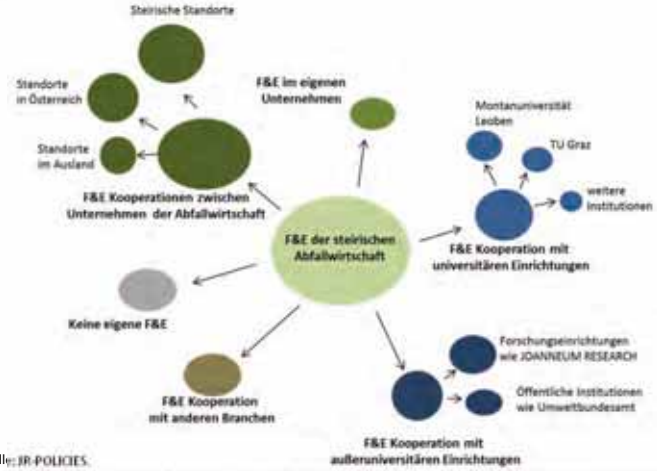
Patents relevant for waste management

- in the last years, out of patents in Austria originated in Styria



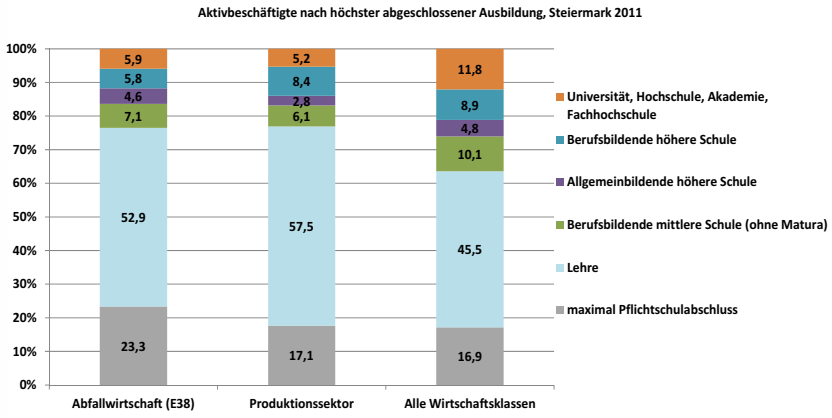
Quelle: EUROSTAT (2013), Patentanmeldungen beim EPA.

orms of cooperation in &E in the waste managment sector



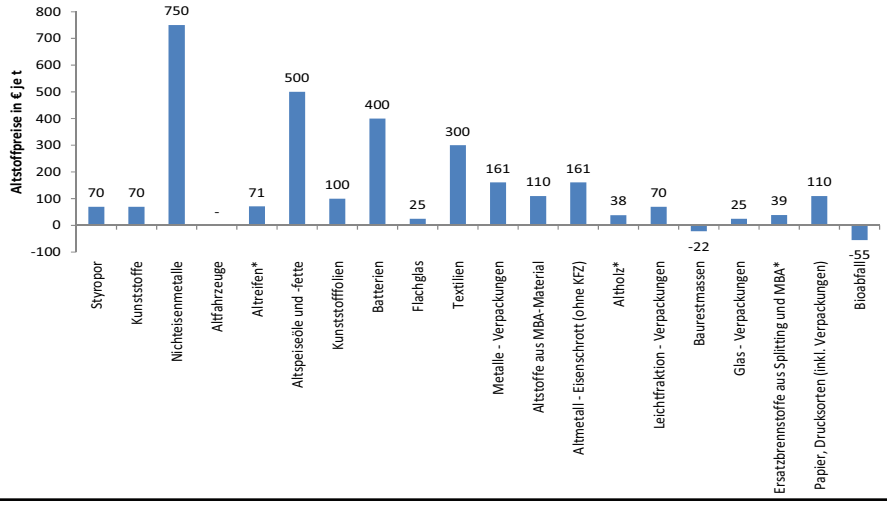
Quelle: JR-POLICIES.

Work force and educational level in waste managment

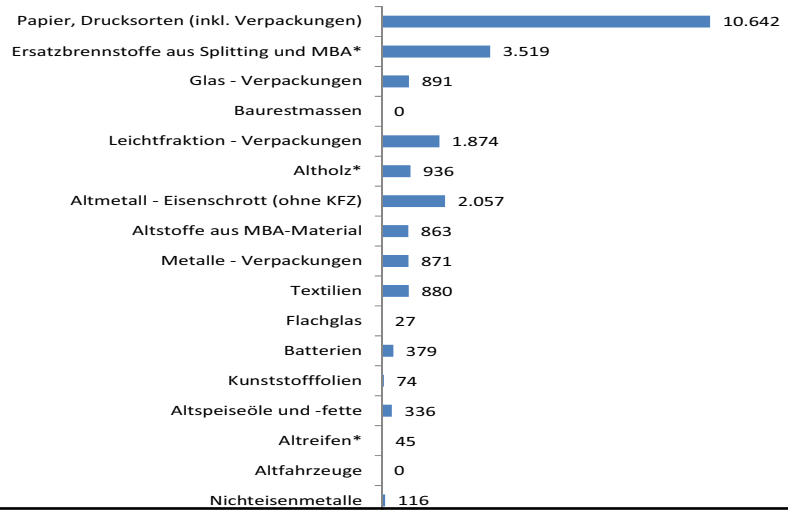


Quelle: AMS-BMASK Arbeitsmarktdatenbank, AMS-Datenbank, Berechnung JR-POLICIES.

Market prices for different kinfd of waste st halfyear per ton



, Mio annual ressource value

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Name: Maarten De Groof
Organisation: Public Waste Agency of Flanders (OVAM)
Title of presentation: The Pay-as-you-throw system and differentiated tariffs

Abstract

The Public Waste Agency of Flanders, better known as OVAM, is a dynamic Flemish Government institution that was established in 1981. OVAM prepares legislation on waste, material and soil management on behalf of the Flemish Minister for the Environment. Once the legislation has been approved by the Flemish Government, OVAM implements the legislation and supervises the implementation thereof.

Over the past 30 years, the way in which we handle waste has fundamentally changed. The policy advocated by OVAM is continuously evolving. Whereas this policy initially focused on cleaning up waste and setting up an efficient waste management infrastructure, the focus has now shifted to waste prevention and sustainable material use.

For the Flemish municipalities one of the most important instruments to stimulate prevention and selective collection is the principle 'the polluter pays', where differentiated tariffs are used. The Pay-as-you-throw-principle (or the Polluter-pays-principle) is enacted to make the producer of the waste more and more financially responsible for the collection and treatment of his or her waste materials.

Nevertheless, the Pay-as-you-throw systems may cause a number of negative side effects, such as illegal dumping or illegal incineration and other methods of tax evasion. Therefore, the PAYT-system has to be part of complete set of policy instruments to support citizens to prevent, sort and deposit their waste.

About the author

Since 2008, Maarten De Groof is involved in the municipal waste policy, including the collection, calculation and reporting of municipal waste statistics.
As an expert in municipal waste management, he is project manager for the R4R-project for OVAM. OVAM is the leading partner of R4R for component 3, which deals with the technical aspects of the project.

THE PAY-AS-YOU-THROW SYSTEM AND DIFFERENTIATED TARIFFS

Maarten De Groof
OVAM

14/05/2014

Pay as you throw (PAYT)

- OVAM (Flanders)
- Flemish waste policy
  - Goals
  - Financing
- Results
- Side effects and solutions

Flanders (Belgium)

Population: 6 M
Area: 13.599 km²
Provinces: 5
Municipalities: 308
Inhabitants/km²: 445

– Densily populated
– Industrialised
– Regional environmental policy

OVAM

- Public Waste Agency of Flanders
- Established in 1981
- Public institution headed by the Flemish Minister for the environment
- Task : To prepare legislation, implement and supervise the implementation of the Flemish legislation on waste management and soil remediation
- From waste policy towards material policy
  - Look at the entire lifecycle

Municipal waste in Flanders

- 13 599 km², 6.25 million inhabitants
- 308 municipalities, united in 25 intermunicipal associations for waste management
- Municipalities or associations are responsible for the collection and treatment of the household waste (waste decree 1981)
- Municipalities are the competent authorities for local rating, taxation on household waste management

Goals

- 2008-2015: 3rd household waste implementation plan:
  - introducing C2C
  - 2% prevention/year, decoupling growth of waste with economic growth
  - 75% selective collection and 70% recycling
  - Max. 150 kg/inhabitant residual waste on Flemish level/year
  - Max. 180 kg/inhabitant residual waste on municipality level from 2010
  - 2015: no more landfilling of combustible waste.

How do we reach these goals?

Mix of policy instruments

- Awareness raising and information campaigns
- Organizing an obligatory, optimal, uniform selective collection
- Subsidizing and financial support of re-use centers and municipalities
- Stimulating intermunicipal co-operation

Mix of policy instruments (2)

- Applying the **principle the polluter pays** (PAYT).
  - → differential tarification
- Implementing the producer's responsibility
- Installing environmental levies on landfill and incineration at Flemish level
- Implementing landfill and incineration bans
- **This mix of instruments is the key to success!**

Pay-as-you-throw

- Introduction: mid 1990s
- The producer of the waste (citizen) becomes gradually financially responsible
- Residual/bulky waste is more expensive than waste streams selective collected

How is the household waste collection and treatment financed?

1,50 €/ 60L bag + 0,125 €/ 60L bag + 40 €/120L yearly

Financing household waste collection and treatment

- Municipalities finance their waste services by imposing
  - fixed tax (yearly)
  - cash tax (Pay-As-You-Throw, PAYT)
  - + part is paid by general municipal tax income
- Yearly total cost of household waste management (average) 225 EUR per household (2,4)

Total cost of household waste management

- 225 EUR per household (2.4 persons)
  - 36 paid through the producers responsibility
  - 189 paid at municipality
    - 1/3 fixed household waste tax/household (fixed cost), max.55-60 EUR
    - 1/3 general taxes related to household income
    - 1/3 taxes related to the amount of waste (variable cost) = PAYT
- The polluter pays!
  - **Dif**ferential **Tar**ification (DifTar)
  - Highest tariffs for residual waste
  - Lower tariffs for selectively collected waste

PAYT tax

Residual waste bag (60 l) - evolution average price (EURO)

Year						
Euro						

Harmonisation tariffs Door to Door collection – 01.07.2013

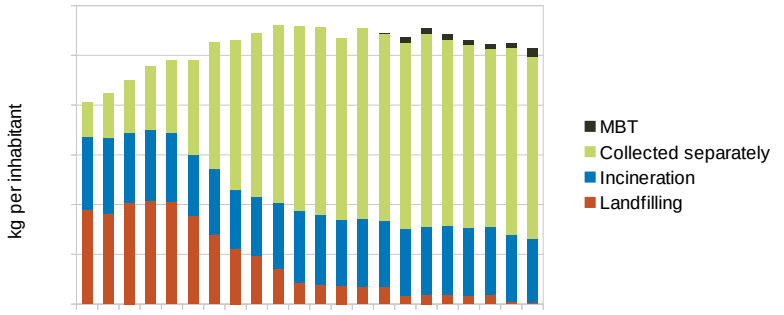
oor to oor collection			
		Minimum	Ma imum
Residual waste		, kg	, kg
L	, kg	,	,
L	kg	,	,
Bulky waste		, kg	, kg
	m = kg		

Diftar weigth chip: kerbside collection

Pay-as-you-throw

Results

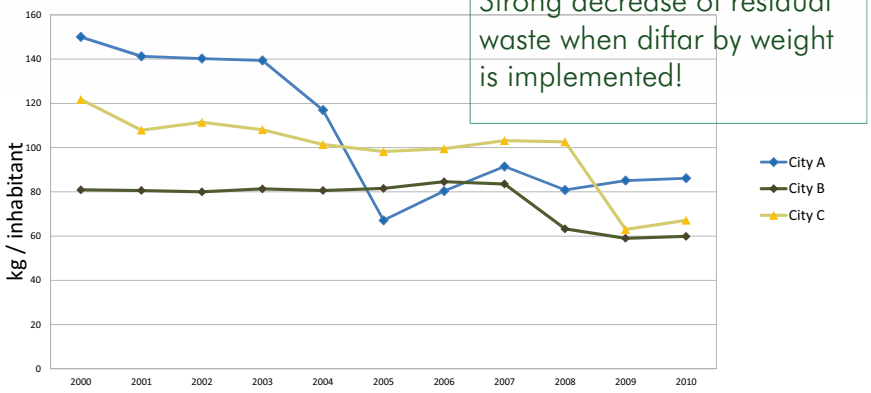
Evolution municipal waste



Residual waste versus tariffs

Diftar (container with weigth chip

Strong decrease of residual waste when diftar by weight is implemented!



Negative side effects

- Illegal dumping and incineration
- "Waste tourism"
  - Towards less expensive areas
- Deliberately deposit waste into less expensive recipient
  - E.g. residual waste in packaging waste bag

Measures against negative side effects

- Good and convienent collection system
- Continuous awareness campaigns
- Fines for illegal dumping/incineration
- Refuse to collect incorrect sorted waste

Conclusions: PAYT

- A good choice in Flanders
- A fair system: the less waste you produce, the less you pay
- Together with the other instruments, PAYT reduces the residual waste for incineration below 150kg/inhabitant
- PAYT does not stand on its own: A mix of instruments is necessary for waste prevention
- Needs to be introduced slowly and well-thought-out!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Name: Janna Vandecruys/ Koen Smeets
Organisation: OVAM
Title of presentation: Presentation of the R4R Online Tool and the Relevance for Good Practices + Training Session

Abstract

For the R4R project an online tool is set up: https://services.ovam.be/r4r/. It is developed by Hemmis commissioned by OVAM, the Public Waste Agency of Flanders. The tool is free to use for European local and regional authorities. It allows users to input data, assess recycling performances and have access to benchmarking and good practices related to their context. The good practices are a combination of local instruments being technical and communication tools, legal and economic instruments…

The tool will be presented followed by a training session so users learn to work with it. Users can input and save their data, make data and instrument reports and consult good practices. Multiple users can be assigned to one region.

About the author

Janna Vandecruys, M.Sc., is involved in the R4R project since November 2012. She has previous experience in industrial waste statistics. She worked on the R4R data methodology, indicators, local instruments, external factors and the design and testing of the tool.

Koen Smeets, PhD, is head of service of the administrative and data centre of the waste department at the Public Waste Agency of Flanders (OVAM). He is involved in collection of waste data and calculation of waste statistics since 1997 and is responsible for the automation of administrative processes at OVAM.

R4R ONLINE TOOL

Janna Vandecruys
OVAM

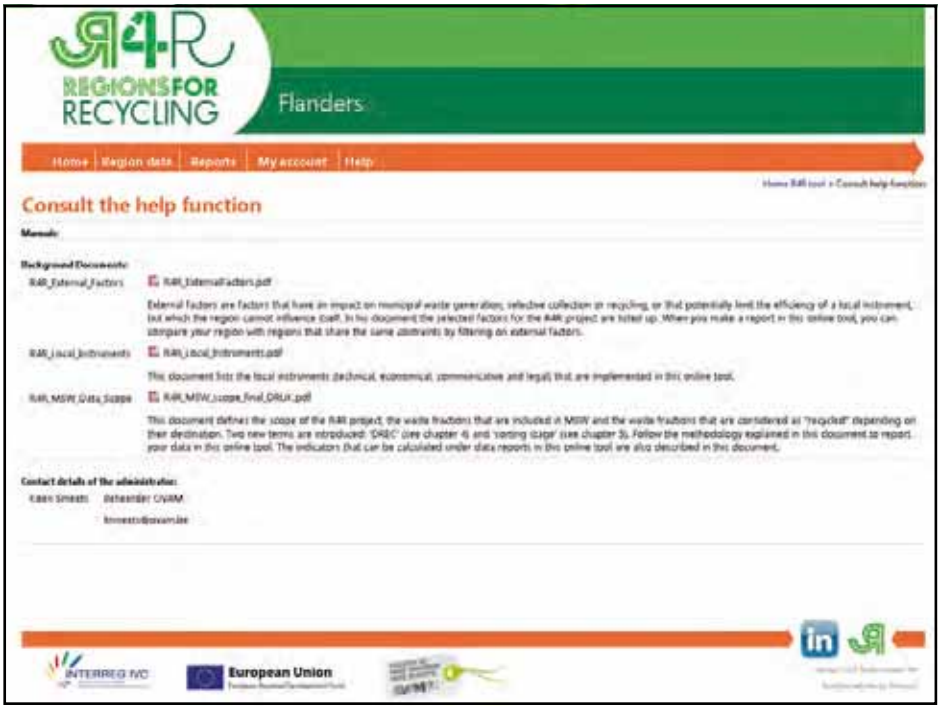
14/05/2014

R4R Online tool possibilities

- Input general info & external factors
- Input data following R4R methodology
- Indicate which LI are being used in your region & fill in parameters for these LI
- Data benchmark or evolution report
- Instrument report
- Consult good practices


Regions for recycling - Mozilla Firefox
File Edit View History Bookmarks Tools Help
Regions for recycling
https://services.ovam.be/r4r


REGIONS FOR RECYCLING
R4R Tool
Sign in to the R4R tool:
European Union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Flanders
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Region data
Reports
My account
Help
Consult the help function
Manuals:
Background Documents:
RAR_External_Factors
RAR_External Factors.pdf
External factors are factors that have an impact on municipal waste generation, selective collection or recycling, or that potentially limit the efficiency of a local instrument, but which the region cannot influence itself. In his document the selected factors for the R4R project are listed up. When you make a report in this online tool, you can compare your region with regions that share the same constraints by filtering on external factors.
RAR_Local_Instruments
RAR_Local_Instruments.pdf
This document lists the local instruments (technical, economical, communicative and legal) that are implemented in this online tool.
RAR_MSW_Data_Scope
RAR_MSW_scope_final_DRUK.pdf
This document defines the scope of the R4R project, the waste fractions that are included in MSW and the waste fractions that are considered as "recycled" depending on their destination. Two new terms are introduced: 'DREC' (see chapter 4) and 'sorting scope' (see chapter 3). Follow the methodology explained in this document to report your data in this online tool. The indicators that can be calculated under data reports in this online tool are also described in this document.
Contact details of the administrator:
Koen Smeets
Beheerder OVAM
INTERREG IVC
European Union


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Bulky waste
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Mineral oils
Multilayer packaging
Paper and cardboard
Plastic
Residual waste
Textiles
Tyres
Used cooking oils
WEEE
Wood
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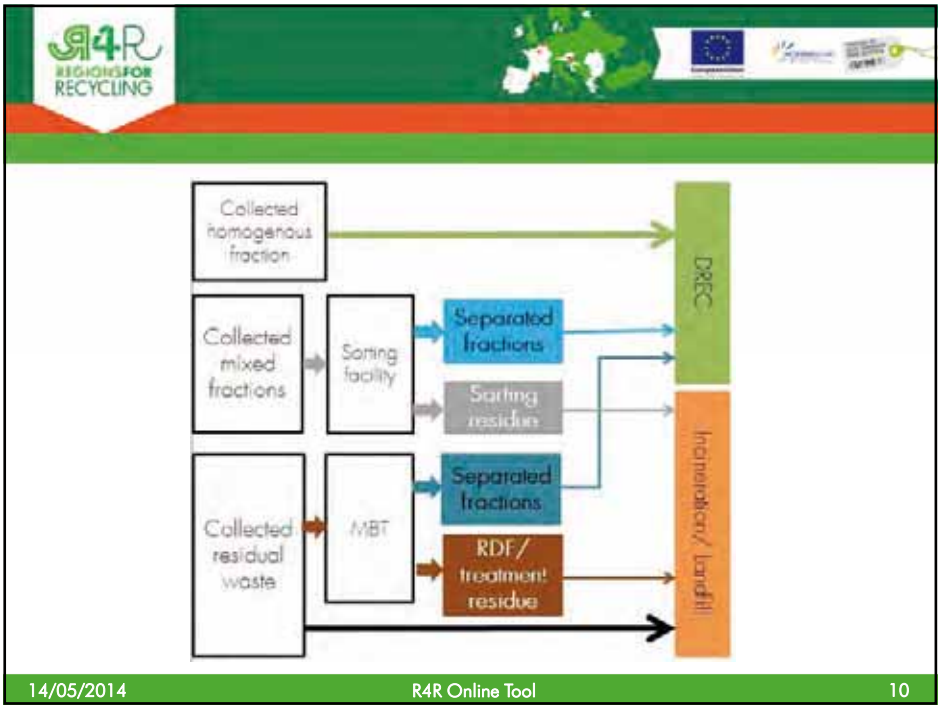
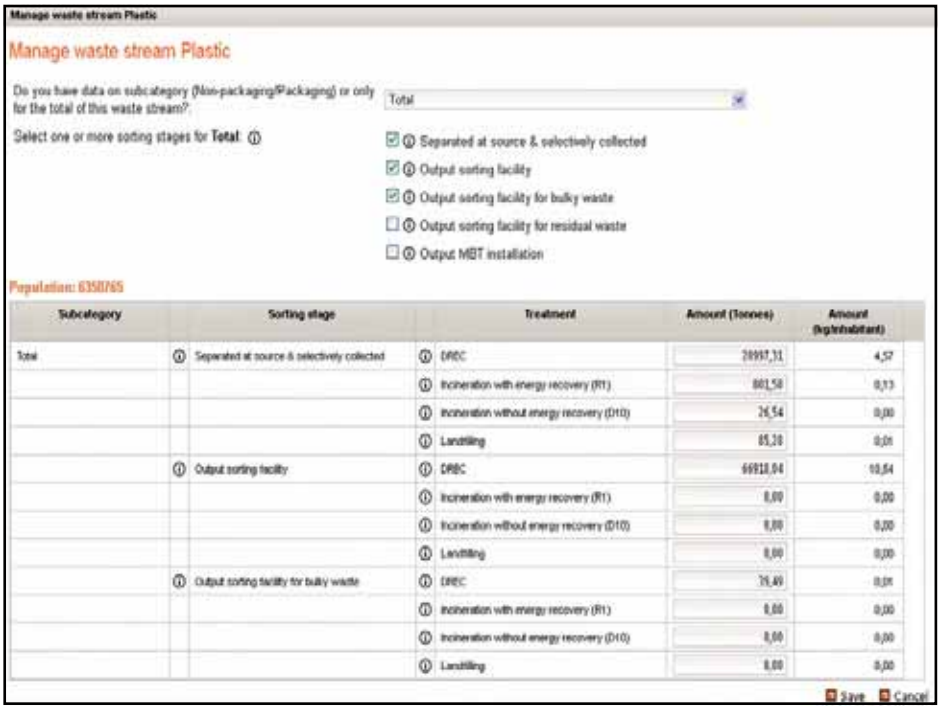

R4R
REGIONS FOR RECYCLING
Collected homogenous fraction
Collected mixed fractions
Sorting facility
Separated fractions
Sorting residues
Collected residual waste
MBT
Separated fractions
RDF / treatment residue
DREC
Incineration / Landfill



Manage waste stream Plastic

Manage waste stream Plastic

Do you have data on subcategory (Non-packaging/Packaging) or only for the total of this waste stream?: Total

Select one or more sorting stages for **Total**:

- [x] Separated at source & selectively collected
- [x] Output sorting facility
- [x] Output sorting facility for bulky waste
- [ ] Output sorting facility for residual waste
- [ ] Output MBT installation

Population: 6358765

Subcategory	Sorting stage	Treatment	Amount (Tonnes)	Amount (kg/inhabitant)
Total	Separated at source & selectively collected	DREC	28997,31	4,57
		Incineration with energy recovery (R1)	801,58	0,13
		Incineration without energy recovery (D10)	26,54	0,00
		Landfilling	85,28	0,01
	Output sorting facility	DREC	66918,04	10,54
		Incineration with energy recovery (R1)	0,00	0,00
		Incineration without energy recovery (D10)	0,00	0,00
		Landfilling	0,00	0,00
	Output sorting facility for bulky waste	DREC	39,49	0,01
		Incineration with energy recovery (R1)	0,00	0,00
		Incineration without energy recovery (D10)	0,00	0,00
		Landfilling	0,00	0,00

Save Cancel

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Composition analysis for waste stream Residual waste

Composition analysis for waste stream Residual waste

Fraction	%	Measured or estimated
Residual waste	100.00 %	Estimated
(Other) hazardous waste		
Batteries		
Batteries - From cars		
Batteries - From households and similar		
Bio-waste		
Bio-waste - Green waste (including pruning wood)		
Bio-waste - Kitchen waste		
Glass		
Glass - Non-packaging		
Glass - Packaging		
Medicines		
Metal		
Metal - Non-packaging		
Metal - Packaging		
Mineral oils		
Multilayer packaging		
Multilayer packaging - Beverage cartons		
Multilayer packaging - Other		
Paper and cardboard		
Paper and cardboard - Non-packaging		

Composition analysis for waste stream Residual waste

Composition analysis for waste stream Residual waste

Fraction	%	Measured or estimated
Residual waste	77.00 %	Estimated
(Other) hazardous waste		
Batteries		
Batteries - From cars		
Batteries - From households and similar		
Bio-waste	20,00	Estimated
Bio-waste - Green waste (including pruning wood)		
Bio-waste - Kitchen waste		
Glass	3,00	Estimated
Glass - Non-packaging		
Glass - Packaging		
Medicines		
Metal		
Metal - Non-packaging		
Metal - Packaging		
Mineral oils		
Multilayer packaging		
Multilayer packaging - Beverage cartons		
Multilayer packaging - Other		
Paper and cardboard		
Paper and cardboard - Non-packaging		


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Completed
Save
Code
Category
Subcategory
Instrument
General parameters
Waste streams
Parameters per waste stream
Extra information
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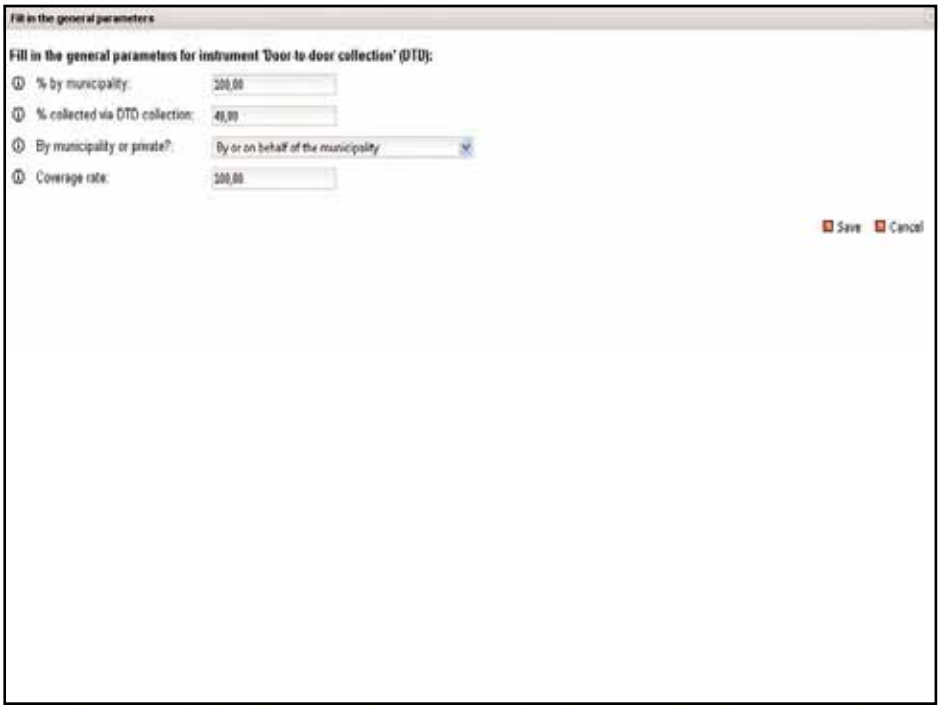
Fill in the general parameters
Fill in the general parameters for instrument 'Door to door collection' (DTD):
% by municipality:
100,00
% collected via DTD collection:
40,00
By municipality or private?:
By or on behalf of the municipality
Coverage rate:
100,00
Save
Cancel


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Add instrument
Completed
Save
Add the instruments that are being used in your region. (You can find a document describing the available instruments under 'Help'.) After you have added an instrument, you can fill in some region-specific information about this instrument by clicking on the magnifier.
Code
Category
Subcategory
Instrument
General parameters
Waste streams
Parameters per waste stream
Extra information
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Select the waste streams for instrument 'Door-to-door collection'
Select the waste streams that are collected via door-to-door collection
Waste stream
(Other) hazardous waste
Batteries
Bio-waste
Bulky waste
digestate
Glass
Medicines
Metal
Mineral oils
Multilayer packaging
Paper and cardboard
Plastic
Residual waste
Textiles
Tyres
Used cooking oils
WEEE
Wood
Save
Cancel


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Completed
Save
Code
Category
Subcategory
Instrument
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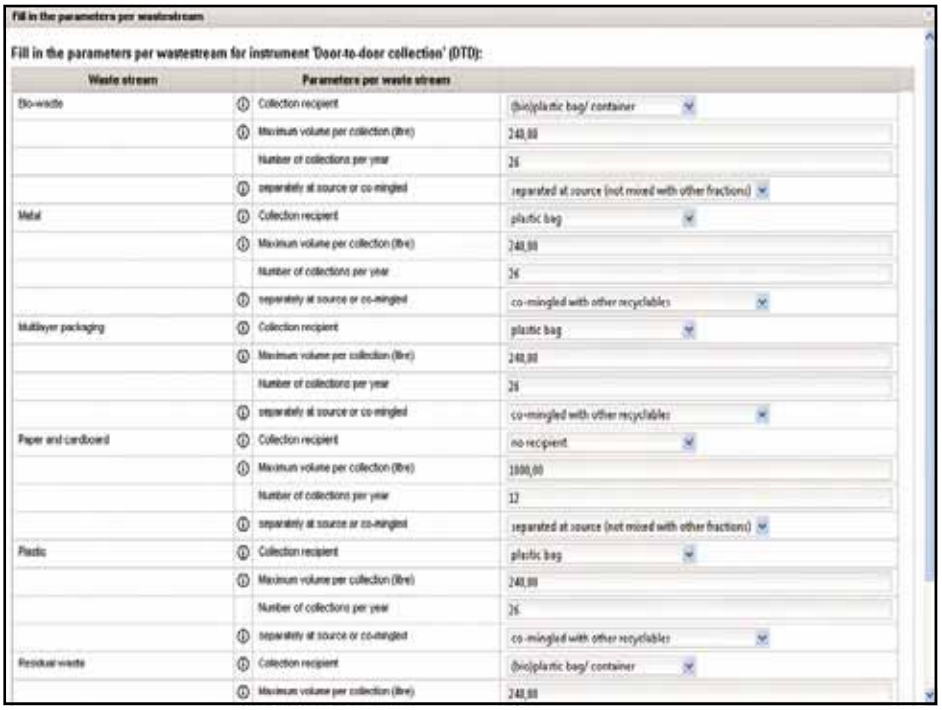
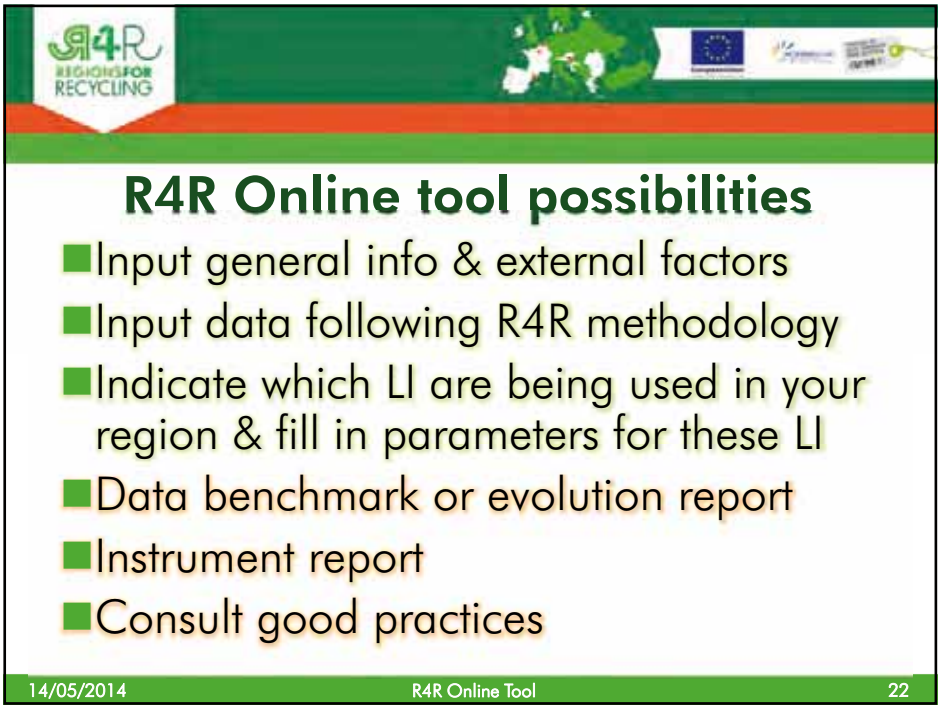

Fill in the parameters per wastestream
Fill in the parameters per wastestream for instrument 'Door-to-door collection' (DTD):
Waste stream
Parameters per waste stream
Bio-waste
Collection recipient
(bio)plastic bag/ container
Maximum volume per collection (litre)
240,00
Number of collections per year
26
separately at source or co-mingled
separated at source (not mixed with other fractions)
Metal
Collection recipient
plastic bag
Maximum volume per collection (litre)
240,00
Number of collections per year
26
separately at source or co-mingled
co-mingled with other recyclables
Multilayer packaging
Collection recipient
plastic bag
Maximum volume per collection (litre)
240,00
Number of collections per year
26
separately at source or co-mingled
co-mingled with other recyclables
Paper and cardboard
Collection recipient
no recipient
Maximum volume per collection (litre)
1000,00
Number of collections per year
12
separately at source or co-mingled
separated at source (not mixed with other fractions)
Plastic
Collection recipient
plastic bag
Maximum volume per collection (litre)
240,00
Number of collections per year
26
separately at source or co-mingled
co-mingled with other recyclables
Residual waste
Collection recipient
(bio)plastic bag/ container
Maximum volume per collection (litre)
240,00


R4R
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R4R Online tool possibilities
Input general info & external factors
Input data following R4R methodology
Indicate which LI are being used in your region & fill in parameters for these LI
Data benchmark or evolution report
Instrument report
Consult good practices
14/05/2014
R4R Online Tool
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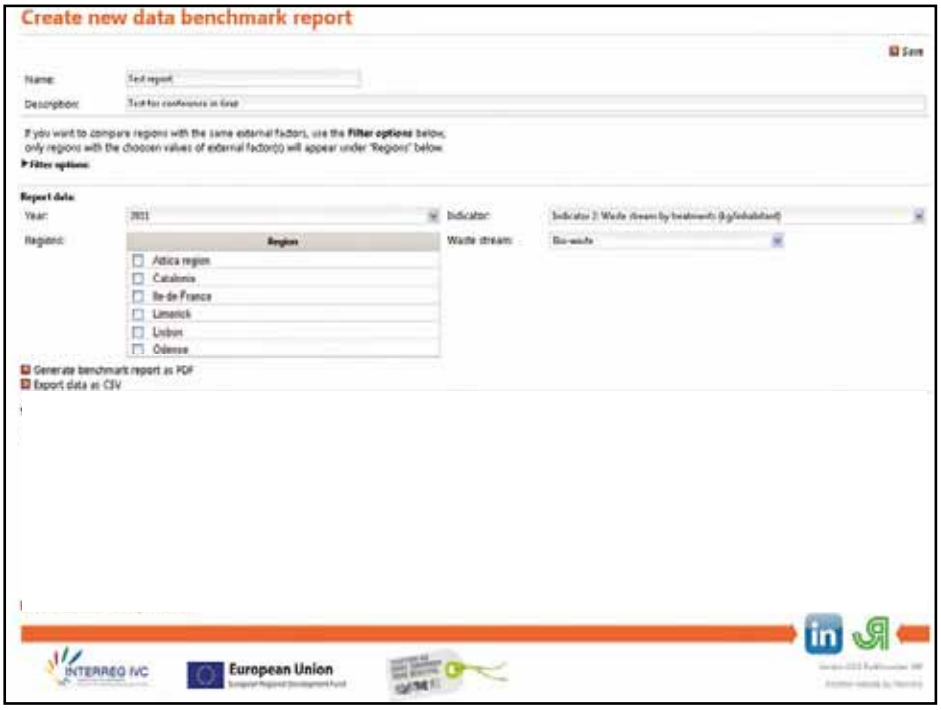
Create new data benchmark report
Save
Name:
Description:
If you want to compare regions with the same external factors, use the Filter options below,
only regions with the choosen values of external factor(s) will appear under 'Regions' below.
Filter options
Report data
Year:
Indicator:
Regions:
Region
Waste stream:
Attica region
Catalonia
Ile-de-France
Limerick
Lisbon
Odense
Generate benchmark report as PDF
Export data as CSV
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Biowaste by treatments, 2011
Landfilling
incineration without energy recovery (D10)
incineration with energy recovery (R1)
MBT


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No data found
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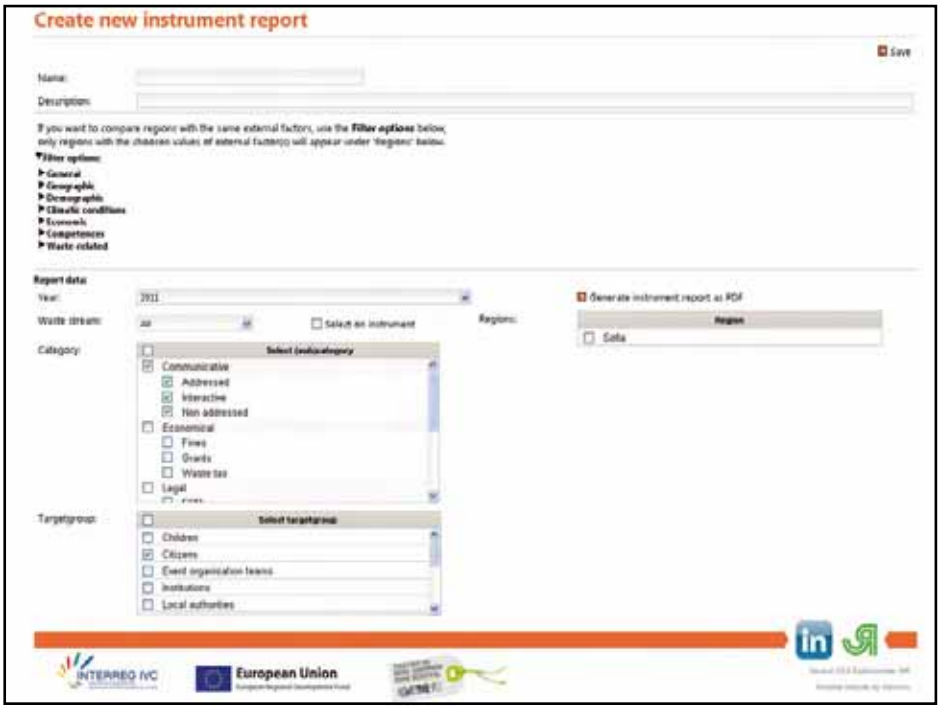
Create new instrument report
Save
Name:
Description:
If you want to compare regions with the same external factors, use the Filter options below,
only regions with the choosen values of external factor(s) will appear under 'Regions' below.
Filter options:
General
Geographic
Demographic
Climatic conditions
Economic
Competences
Waste related
Report data:
Year:
2011
Waste stream:
All
Select an instrument
Category:
Select (sub)category
Communicative
Addressed
Interactive
Non addressed
Economical
Fines
Grants
Waste tax
Legal
Targetgroup:
Select targetgroup
Children
Citizens
Event organization teams
Institutions
Local authorities
Generate instrument report as PDF
Regions:
Region
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Consult good pra
Filter options:
Instruments
Waste streams
Regions
Name
Description
Date of creation
Instruments
Waste streams
Regions
PDF
No data found
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14/05/2014
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