

Integral Treatment of Urban Waste Centre of Zaragoza



European Green Capital Award 2016

7. Waste production and management



An initiative of the
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Zaragoza
AYUNTAMIENTO

Spain

7. WASTE PRODUCTION AND MANAGEMENT

7A. Present Situation

Describe the present situation in relation to waste production and management, including any relevant disadvantages or constraints resulting from historical, geographical and/or socio-economic factors which may have influenced this indicator area. Where available information should be provided from previous years (5 – 10) to show trends.

Include details on:

1. *Waste Strategies or Plans in place;*
2. *Waste Prevention Measures;*
3. *Amount of waste household and municipal generated per capita;*
4. *Proportion of total waste sent to landfill;*
5. *Proportion of biodegradable waste sent to landfill;*
6. *Existing thermal treatment or similar: localisation and energy recovery;*
7. *Percentage of recycled municipal waste;*
8. *Recycling and/or recovery rates for Packaging waste;*
9. *Types of waste collected separately and extent of roll-out (% coverage) of source separated collection systems;*
10. *How separately collected waste is treated;*
11. *Application of the "polluter pays" principle, including "pay as you throw" (PAYT) initiatives*

Zaragoza is applying a strategy for managing urban waste in order to reach an important reduction of waste in dumps and turn recycling and its energy valuing into the central axis of its management policy.

Thanks to the opening in 2009 of the Waste Treatment Complex, the systems of selective collection and the municipal campaigns of public awareness, there has been an increase from 7% of waste recycled at home in 2002 to a 21%. The number of clean point users has also increased a 64% compared to 2010.

The management in Spain of dangerous and industrial waste depends on the regional governments. It is forbidden by the Government of Aragon the incineration of urban waste which has conditioned the municipal system. Therefore Zaragoza has opted for biomethaning and for the incineration of the rejection-fraction for the exploitation of energy potential.

(1) Zaragoza complies with these national and regional plans:

- National Waste Integrated Plan 2008-2015
- Integral Waste Management Plan of Aragon 2009-2015

The revision of Aragon Plan (2014-2019) incorporates the system that Zaragoza has already set up to reach the goals established by the Directive 2008/98/CE.

(2) Zaragoza strategy for home waste prevention focuses on:

- Make people aware and foster habits for the reduction, recycle and reuse of waste
- Selective recycling at home and specialised collection in fix and mobile centres
- Energy recovery and waste composting
- Minimise the delivery of waste dumping.

(3) Home waste by person and year:

2012	375.7 kg/person/year
2013	356.7 kg/person/year

The data refer to home waste treated by the Municipality. In the case of selective collection, it is necessary to take into account that there are other systems applied by the producers of certain waste that make their own recycling.

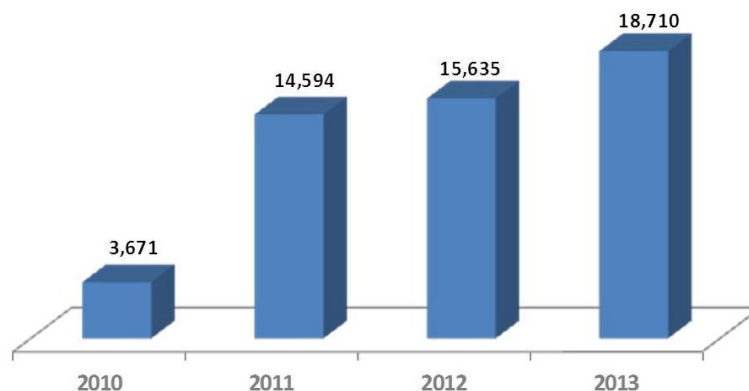
(4)

Year	Home waste produced. Ton/year	Waste dumped. Ton/year	% waste dumped
2012	263.695,455	96.903,558	36,75%
2013 (january-july)	146.895,132	52.555,639	35,78%

(5) Six years ago nearly the 100% of biodegradable matter was dumped, supposing almost the 50% of the total of waste.

In 2012 that percentage has been reduced to the 18.5%.

(6) In 2010 the Waste Treatment Centre had four digesters with a capacity to treat 1,836 t/weeks of waste produced by the unity of mechanical classification and pre-treatment. A biomethaning process allows us now to generate the double of energy consumed by the Centre (*graphic 1*)



Graphic 1. Energy produced by biomethaning in the Waste Treatment Centre. Mwh/year.

(7,8,9) The Waste Collecting Service has a system of side-loading to increase the volume collected and the frequencies of collection. This service employs more sustainable technology and reduces sound impact too.

It also collects specific materials in containers placed in public thoroughfares with clean points or with door-to-door systems for shops or particulars asking for it (*graphic 2*)

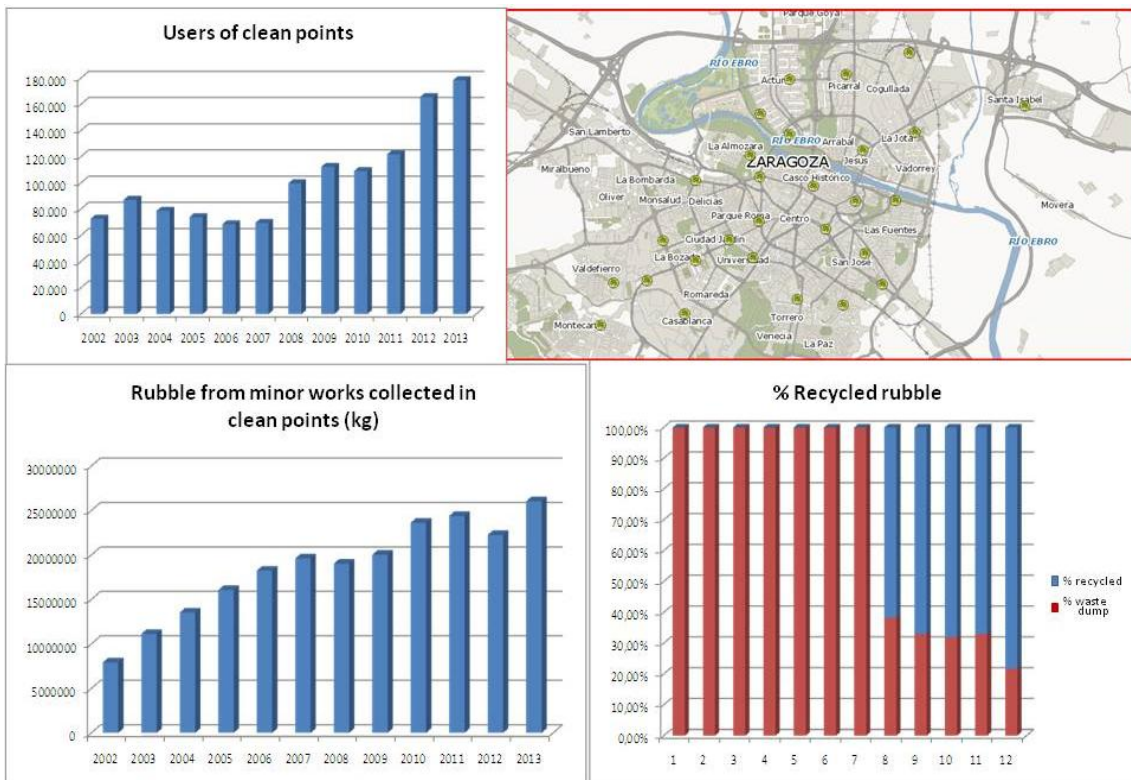
Selectively collected materials	Collecting method			Door-to-door (shops in the city centre)	Population covered
	Containers in streets	Fix Clean Points	Mobile Clean Points		
Rubble (minor works)		X			100%
Scrap		X			100%
Electric and electronic waste		X	X		100%
Used clothes		X	X		100%
Furniture and fittings		X	X	X	100%
Paper/cardboard	X	X	X		100%
Glass	X	X	X	X	100%
Batteries		X	X		100%
Light containers	X	X	X		100%
Vegetable oil used at home	X	X	X	X	100%
Fluorescents		X	X		100%
Tin cans: cola, varnish, solvent, insecticide, painting,....			X		100%
Mineral oil used at home			X		100%
X-rays		X	X		100%
Mercury thermometer		X	X		100%

Graphic 2. Selective collection. City of Zaragoza

Paper and cardboard collection is made from 1994. The volume collected is carried to the corresponding treatment centre.

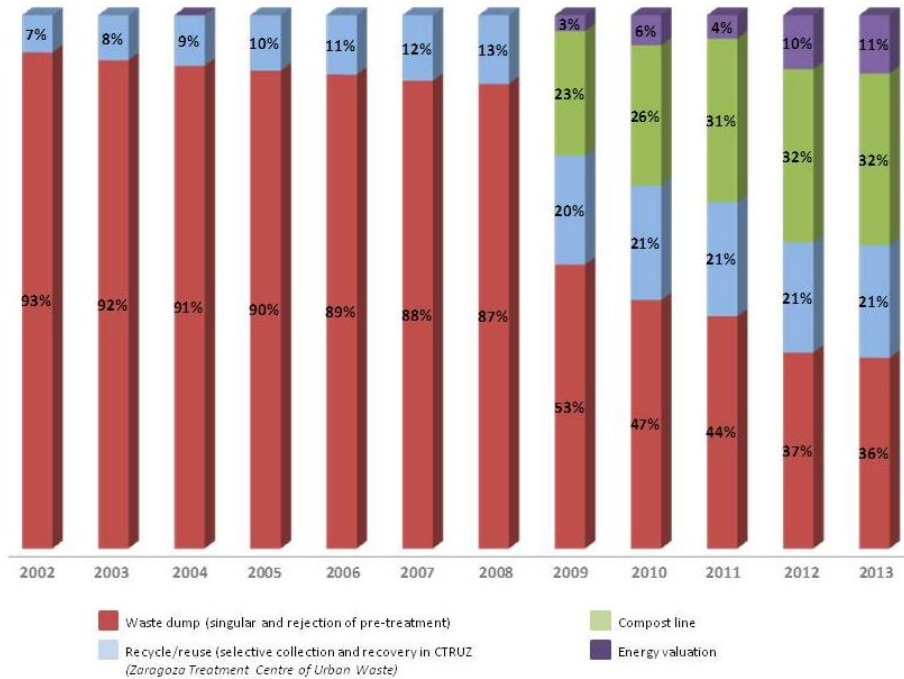
All the waste collected selectively is sent to the corresponding SIG for being treated. The clothes and oil is collected and given to NGO or social firms for being reused/recycled.

As the waste produced by minor works at home is concerned, it is directly recycled in the Treatment Complex (graphic 3).



Graphic 3 Waste treatments from minor home works

(10) A 35.8% of the waste collected is taken to the waste dump, a 32.1% to composting, a 21.2% to a recycling/reuse process and a 10.5% is sent for energy assessment (*graphic 4*).



Graphic 4 Evolution on the percentage of the different treatments used.

(11) The City of Zaragoza has been including in its Municipal Byelaws for several years the principle *pay as you throw*.

The Municipal Fiscal Byelaw regulates the taxes by means of six different prices, depending on the quantity of waste produced.

7B. Past Performance

Describe the measures implemented over the last five to ten years for improving waste management. Comment on which measures have been most effective.

Make reference to:

1. Measures or programmes which have promoted waste prevention;
2. Reduction of the amount of waste produced;
3. Type and scale of infrastructure put in place to manage waste;
4. How residual waste is managed including the amount of waste sent to landfills, particularly biodegradable waste.

In the last years the City of Zaragoza has implemented a total restructuring of its waste management and treatment, replacing its system of collection and deposit in dumps for a process of global management. A special attention is given to the hierarchical organization of waste collection according to the corresponding the European legislation and its incorporation into Spanish national law.

The main axes this change is based are:

- Construction of Zaragoza Centre of Urban Waste Treatment, with a capacity for processing in a separate way 450,000 tons/year of urban waste and more than 15,000 t/year of light containers from selective collection. This new facility gives service to the more than 750,000 citizens of Zaragoza and 61 nearby municipalities.
- Reinforcement of actions on dissemination and public awareness by specific annual campaigns in collaboration with the waste management firms contracted and the Government of Aragon. A special mention deserves the new specific website on waste, the presence of those action in social networks as well as the classroom for public awareness opened in the CTRUZ with over 5,000 visitors/year from schools, universities and other city associations
- Implementation of selective collection to reach the 100% of the people living in Zaragoza. The average distance from home to the containers for selective collection is 75m.
- The new firm contracted by the City has established a new system based on side loading collection that has produced an evident improvement in the efficacy and performance of the system. The acoustic impact of the system and the use of low polluting vehicles has also been improved



Graphic 5 "The Four Top"

- Underground containers put in urban areas that need it
- Installation of a system of pneumatic collection at Eco-city Valdespartera district (20,000 homes).

Thanks to all these actions, a substantial improvement in the prevention and management of waste has been obtained in the last years:

- The number of users of clean points has been increased in a 127% from 2002 to 2012
- The production of waste by person has been reduced from 2002 in a 23.5%. Comparing it with the last data published (2010) by the Ministry of Environment, the production by person and day in Zaragoza is a 16.31% under the national average
- The kilogram recycled by person and year has increased a 59% from the year 2002
- From the 92% taken directly to dumps in 2002 we are now in the 36.75% in 2012.
- Pilot experience of collecting used clothes in collaboration with Tiebel organization.

7C. Future Plans

Describe the short and long term objectives for waste production and management and the proposed approach for their achievement. Emphasize to what extent plans are supported by commitments, budget allocations, and monitoring and performance evaluation schemes.

Make reference to:

- 1. Constraints – economic, scale, institutional;*
- 2. Measures to improve statistical data on waste collection & treatment;*
- 3. Waste prevention and awareness initiatives;*
- 4. Quality of recycling, and by type i.e. glass, paper etc;*
- 5. Waste collection charges;*
- 6. Measures to promote public participation;*
- 7. Measures to meet EU legislation.*

The future plan of the City of Zaragoza forms part of the revision of the Regional Plan of Waste Integrated Management GIRA (2014- 2019).

Its application will turn Zaragoza into the Region of Aragón focal point of waste treatment. Present premises are prepared to assume the potential increase of tons received but work is being done to reduce the percentage of people who is against the dump by these actions:

- The Treatment Centre is making a project called PROCSR (with CEMEX, ITENE, APPLUS and CIEMAT) (2011-2014), funded by the Ministry of Science and Innovation by the program INNPACTO 2011, with these goals:
 - Obtain a valid waste characterization process able to allow us to define the conditioning procedure for obtaining recovered solid fuel
 - Obtain a specific fitting-out process for every fraction of the USW target
 - Obtain an exploitable Solid Recovered Fuel CSR (≥ 4.000 kcal/kg) for the cement industry able to be applied to other energy demanding industries
 - Make and analysis of the life cycle (analysis of CO₂ emissions and comparison with other fuels) and possibility to obtain the accreditation that this material will not be considered as a waste anymore.

For fostering this project, the City and the managing firm URBASER are foreseen to sign an agreement for opening in Europe in 2014 a pioneer R&D&i centre of waste management in the Treatment Centre.

- Increase of energy production for 2004, complementing the present biomethanation with a subsequent process of incineration for energy valuing.

Another goal is to reach in the next seven years the quantity of 50% of recycled material for 2018 as well as the decrease of a 15% of the quantity of waste sent to dumps.

In order to reach the above mentioned goals, the City of Zaragoza is right now contracting a new service for the management of the fix clean points as well as dealing with specific contracts with social companies to create extended systems in public areas for collecting clothes and vegetable oil used at home (both foreseen in 2014).

These new contracts include a remodeling of the Municipal Byelaw on Waste Management and Public Cleaning of Zaragoza to make it easier and accompany the application of the principles included in the legislation on waste (passing foreseen in 2014).

7D. References

Waste legislation and planning

- State Act on Polluting Waste and Land
<http://www.boe.es/boe/dias/2011/07/29/pdfs/BOE-A-2011-13046.pdf>
- National Integrated Plan on Waste
<http://www.boe.es/boe/dias/2009/02/26/pdfs/BOE-A-2009-3243.pdf>
- Aragon Integral Waste Management Plan
http://www.aragon.es/estaticos/ImportFiles/06/docs/%C3%81reas/Residuos/GestResidArag/PlanGesti%C3%B3nIntegralResiduosArag%C3%B3n%202009-2015/PLAN_GESTION_RESIDUOS_2009_2015.pdf
http://www.aragon.es/DepartamentosOrganismosPublicos/Departamentos/AgriculturaGanaderiaMedioAmbiente/Ar easTematicas/MA_Residuos/ci.01_Plan_Gestion_Integral_Residuos_detalleDepartamento?channelSelected=0b5890292fb3a210VqnVCM100000450a15acRCRD

Municipal waste management

- Municipal Waste Regulations
<http://www.zaragoza.es/ciudad/limpia/normativa.htm>
- Zaragoza Sustainability Indicators
<http://www.zaragoza.es/ciudad/medioambiente/agenda21/observatorio/indicadores.htm>
- Official page of the Zaragoza Council
<http://www.zaragoza.es/ciudad/limpia/tratamiento/presentacion.htm>
- Waste treatment. Zaragoza Council
<http://www.zaragoza.es/ciudad/limpia/recogida/residuo.htm>
- Waste treatment processes. Zaragoza Council
<http://www.zaragoza.es/ciudad/limpia/tratamiento/Procesos.htm>
- Zaragoza Sustainability Indicators
<http://www.zaragoza.es/ciudad/medioambiente/agenda21/observatorio/indicadores.htm>

Public awareness, presence in the Internet and social networks

- 'Zaragoza Recicla' programme
<http://www.zaragozarecicla.org>
- Awareness Classroom
<http://www.zaragozarecicla.org/el-aula-de-formacion/#.UjiA-dJGS2U>
- Blog of Zaragoza Centre for the Treatment of Urban Waste
<http://www.zaragozarecicla.org/blog/#.UjiA19JGS2U>