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Collection of Good Practices for Waste Management in Urban Heritage Sites



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1. Good Practices for Waste Disposal in Heritage Areas

Waste Houses/ Stores/ Ecopoints



CITY OF TALLINN (ESTONIA)

Section	Description
Title of the practice	1.1. Waste Storehouses in Tallinn Old Town
Photograph	
Proposers	City of Tallinn.
Contacts	Representatives of city district governments: <ul style="list-style-type: none"> • Haabersti District Government, head of the administration department, Tonu.Kivimaker@tallinnlv.ee • Tallinn City Centre District Government, head specialist of the urban department, Kylylly.Annus@tallinnlv.ee • Kristiine District Government, senior specialist, Marju.Korts@tallinnlv.ee • Lasnamäe District Government, deputy head of the urban department, Diana.Buchmann@tallinnlv.ee • Mustamäe District Government, head specialist of the urban department, Urmas.Kopp@tallinnlv.ee • Nõmme District Government, head specialist of the city property department, Mart.Miidu@tallinnlv.ee • Pirita District Government, head specialist of the urban department, Merike.Kalam@tallinnlv.ee • Põhja-Tallinna District Government, deputy head of the urban department, Arvo.Soorand@tallinnlv.ee • Tallinn Environment Department, keskkonnaamet@tallinnlv.ee • Tallinn Municipal Engineering Services Department, kommunaalamet@tallinnlv.ee
Useful links	http://www.tallinn.ee/est/hoovidkorda/ (only in Estonian)
Start date	2000.
Current Status	Ongoing.
Location	City of Tallinn.
Inhabitants in the area	445,000

Description of the practice

Origin:

The waste holder has an obligation to own a sufficient number of waste containers (the city of Tallinn does not own the containers). The first waste storehouses were constructed in Tallinn at the beginning of 2000. In 2004, the city of Tallinn started to support the construction of waste storehouses with the “Fix up the courtyard” project.

The location of waste storehouse has to be chosen in such a way that the waste truck can empty the waste containers very easily. The storehouse size must be planned according to the number of waste containers. Waste storehouses must cover all sides and be lockable. Waste storehouses can be built from variety of materials, e.g. wood, metal and stone, and it is particularly important that the waste storehouse fits into its surroundings.

Development and Timescale:

Apartment associations interested in constructing waste storehouses has increased every year. The application for the “Fix up the courtyard” programme can be submitted twice a year. The City of Tallinn intends to continue to support the construction of waste storehouses.

Actors involved:

- Tallinn City District Governments.
- Tallinn Urban Planning Department.
- Tallinn Environment Department.
- Municipal Engineering Services Department.

Legal framework:

Waste containers must be placed on the waste holder property. Construction of waste storehouses is not mandatory, but it is recommended.

If the property does not have enough space for waste containers, it is possible to place them, with agreement from the local government, in the city street. In the Old Town area it is forbidden to place waste containers on the street. It is only allowed if a waste storehouse is built.

Financial framework: (activities´ cost, activities´ revenues (if any), model/s of financing used)

Tallinn City Government has been supporting the construction of waste storehouses since 2005. Due to high interest from the apartment associations, the city of Tallinn decided to continue the support. That is why, in 2006, regulations came into force for the procedure supporting apartment associations with the “Fix up the courtyard” project. Apartment associations can apply for support of up to 70 % of the cost of constructing or improving waste storehouses within the framework of the “Fix up the courtyard” project. In last 11 years Tallinn City Government has allocated more than €8 million of the city’s budget to the “Fix up the courtyard” project. The “Fix up the courtyard” project is very successful, and interest from apartment associations has increased every year.

Results**Proven results (using indicators):**

Waste storehouses hide waste clutter away and keep the local surroundings tidy. Waste storehouses must be enclosed on all sides to prevent the waste from flying around, and lockable to keep out unauthorised persons. Waste storehouses with good architectural solutions help to keep birds away from waste containers and there is also the air flow needed to stop bad smells emerging. Good quality waste storehouses can last approximately 20 years.

Possible success factors:

Constructing waste storehouses has become customary, which is why, in the process of planning new buildings, they are often built, although it is not mandatory.

Main difficulties encountered:

It is not possible to construct waste storehouses at some properties due to the lack of space.

<p>Main lessons learnt from the practice</p>	<p>Waste holders are more interested in waste storehouses if local government supports their construction.</p> <p>Waste storehouses have to be constructed in such a way that in the future there is an enough space to add extra waste containers, if waste management requirements change.</p> <p>Waste storehouses are only constructed for waste containers – storing bicycles and pushchairs, for example, is not allowed.</p> <p>Waste storehouses prevent the waste from flying around and also keep unauthorised persons away.</p> <p>They are much more visually pleasing.</p>
<p>Additional information</p>	<p>http://www.tallinn.ee/est/hoovidkorda/</p>

CITY OF CORDOBA (SPAIN)

Section	Description
Title of the practice	1.2. Ecopoints-Waste Rooms in Cordoba
Photograph	
Proposers	Sanitation Cordoba (SADECO). Municipal Company for Sanitation.
Contacts	Jesús Diz. buzon@sadeco.es
Useful links	www.sadeco.es
Start date	Since 2011.
Current Status	Constantly improving.
Location	Cordoba historical area.
Inhabitants in the area	32,000 (2015).

Description of the practice

Origin:

The integration of the containers on the streets in the world heritage site of Córdoba old town is work which has been going on since the 1980s, when this waste collection system was put in place in Córdoba. Various actions have been taken over time in order to integrate the containers and improve their image, tailoring them to the historic surroundings and cultural heritage they are installed in.

- In 1995 the first container housings, structures covering the container with an external appearance which was more in keeping with the surroundings, were installed around the Mosque.
- In 1999 a series of agreements began to be signed with mass waste producers in the Mosque area and the old town (hotels, residences and restaurants) whereby they agreed to keep their containers inside their buildings, removing them from the streets.
- In 2003 an agreement was signed with the Córdoba Tourism organisation to finance underground containers and the installation of new container housings in the whole of Córdoba's old town.

- The latest progress in this connection is ecopoints. Since 2011, with funding from the 2009 State Local Investment Fund and the 2010 State Fund for Local Employment and Sustainability, SADECO has designed sites for storing containers and for waste disposal by local residents which we call ecopoints. We used the funds to install a total of 6 of these sites.

The ecopoints are sites which are specially designed to house containers (which are, therefore, removed from the streets) and for waste disposal by local residents.

Two models were developed:

- a) One with openings onto the street. Waste is disposed of by the local residents from the street, using openings in the site wall.
- b) One with openings inside. In this case, there are no openings or drop boxes outside apart from the entrance door. Users access the ecopoint by the main door and dispose of their waste using drop boxes inside.

The main features of the ecopoints are as follows:

- The containers are never visible. This is either because waste is disposed of from the street using external drop boxes or, in the case of disposal inside, because the containers are sited behind walls, or screens, which have drop boxes inside. Locals never see the containers or the waste disposed of in them.
- They are insulated spaces, from the thermal and acoustic point of view. All the inside walls are covered with insulation panels.
- The sites have an air conditioning system to maintain the temperature and prevent fermenting and bad smells.
- They have a Fire Extinguisher System.
- They have an automatic wall washing system in the container area.
- In certain cases systems have been installed which detect how full the containers are.

We currently have 8 ecopoints and 4 more are under construction, which are expected to be operational in 2019.

Actors involved:

Neighbours and neighbourhood associations, businesses, hotels, restaurants, local companies in the historic town centre.

Legal framework:

Cordoba City Council Urban Hygiene Ordinance. Apart from the ecopoints (municipal waste disposal rooms open to the public), in keeping with the policy to remove containers from the streets, the Córdoba City Council Urban Hygiene Ordinance sets out the scope and applicable rules of the Technical Building Code, with respect to the storage of containers in buildings. It regulates the obligation to install storage rooms for private bins in the old town, in areas where pneumatic collection is installed, on industrial estates and for mass waste producers in the whole of Córdoba city centre.

Financial framework: (activity costs, activity revenues (if any), financial model/s used)

The ecopoints were funded by the Spanish Government and Córdoba City Council. The 6 ecopoints opened in 2012 received funding from the State Local Investment Fund, set up by the Spanish Government with the aim of increasing public investment locally, by funding re-planning works for immediate execution coming under the remit of local bodies.

The other ecopoints were directly funded by Córdoba City Council through its municipal company, SADECO.

The average cost of these facilities is €75,000, not including the cost of the plot or site. If we have to buy premises to tailor them for use as an ecopoint, the cost increases by around €100,000-150,000.

Use level: (%) or number of users (if possible):

100% of the historic town centre: 32,000 inhabitants

Results

Proven results (using indicators):

Elimination of containers on public streets in the World Heritage Area. The total volume available in the containers at these facilities, including the 4 new ecopoints under construction, will reach 152,960 litres, which is 23% of the installed volume in the old town.

Reduction of the impact of containers on public streets.

Possible success factors:

Financial collaboration with different bodies and public authorities; the integration and support of neighbours and businesses in the World Heritage area (SMOT project interest groups).

Main difficulties encountered:

Physical difficulties in finding spaces to place the underground containers or storage spaces for containers (eco-points), narrow streets, archaeological remains, etc, and the reluctance of locals and businesses to install fixed waste collection points near their properties. Cost of commercial premises, in case of purchase.

Main lessons learnt from the practice	The need to stay in regular contact with the area's neighbours, neighbourhood associations and main financial players, in order to include them as interest groups for the common benefit of council initiatives.
Additional information	https://www.youtube.com/watch?v=IFtDP6T1tXM https://www.sadeco.es/

CITY OF IBIZA (SPAIN)

Section	Description
Title of the practice	1.3. Implementation of a domestic waste disposal service with a Mobile Clean Point.
Proposers	Island Council of Ibiza.
Contacts	<p>Island Council of Ibiza. Department of the Environment and Rural and Marine Environment. Montserrat Ruiz Costa. Environmental Specialist. Postal address: Av. de Espanya, 49 - 07800 Ibiza (Ibiza, Balearic Islands). Telephone (switchboard): 971 19 59 00. E-mail: dep.agricultura@conselldeivissa.es</p> <p>Company managing the Clean Points: Ca Na Negreta, S.A. Postal address: Ctra. San Juan Km 6,100 - 07840 Santa Eulalia del Rio (Ibiza, Balearic Islands). E-mail: reciclanegreta@reciclanegreta.com Telephone: 971 31 13 13 / Fax: 971 31 69 26.</p>
Useful links	<p>Ibiza City Council, Construction of six clean points on the Island of Ibiza and purchase of two Mobile Clean Points. Available: <http://www.conselldeivissa.es/portal/RecursosWeb/DOCUMENTOS/1/0_8833_1.pdf></p> <p>Island Council of Ibiza, Xarxa de Deixalleries d'Eivissa, Estadístiques (online) [Ibiza Waste Network, Statistics]: <http://www.deixalleriesivissa.com/images/cm.es.pdf></p> <p>Island Council of Ibiza, Xarxa de Deixalleries d'Eivissa, Residus Admesos (online) [Ibiza Waste Network, Waste Admitted]: <http://www.deixalleriesivissa.com/services.html></p> <p>Island Council of Ibiza, El Punto Limpio Móvil en mi centro (centros educativos), online [The Mobile Clean Point at my centre (educational centres)]. Available: http://www.conselldeivissa.es/portal/p_20_contenedor1.jsp?codbusqueda=439&codResi=1&codMenu=642&seccion=s_fdes_d4_v2.jsp&language=es</p> <p>Ibiza City Council, Horaris del PLM, online [MCP timetables]. Available: http://www.eivissa.es/portal/index.php/es/punto-de-recogida-m%C3%B3vil</p>
Start date	<ul style="list-style-type: none"> - Presentation of the project to the general public: 2010. - Start-up of the service: 2013.
Current Status	Ongoing service.
Location	<ul style="list-style-type: none"> - Tuesday: Plaza de Antoni Albert i Nieto, from 3 pm to 7 pm (540 metres in a straight line from the Old Town). - Wednesday: C/ Jondal, next to Can Cantó school, from 3 pm to 7 pm (900 metres in a straight line from the Old Town). - Thursday in the Parque de la Paz, from 3 pm to 7 pm (570 metres in a straight line from the Old Town).

	- Saturday in the Cas Dominguets car park, from 9 am to 1 pm (900 metres in a straight line from the Old Town).
Inhabitants in the area	Population of Ibiza: 49,549 (2016) Inhabitants of the Old Town (Dalt Vila, La Marina, Vara del Rei and Plaça del Parc): approximately 800 inhabitants. * * <i>Data pending confirmation by the relevant authority.</i>

Description of the practice

What does it consist of?

The Mobile Clean Point is a waste collection vehicle adapted for use by the public, collecting different types of waste at various locations on the island of Ibiza. This service allows the selective collection of domestic waste, similar to that collected at the clean points in Ibiza, from areas that do not have containers placed on public thoroughfares. It means that more remote locations on the island of Ibiza can be reached, as well as the old town in the city.

The waste that can be deposited is the same as at the fixed clean points, in small quantities. To be able to selectively collect all the waste, the vehicle used for the Mobile Clean Point service must meet specific requirements.

Origin:

To encourage the selective collection and separation of domestic waste by providing the public with facilities where this waste can be disposed of.

Development and Timescale:

Status	Task	Months											
		1	2	3	4	5	6	7	8	9	10		
1. Preliminary study	Scope of the area covered by the action defined	•											
	Analysis of possible alternatives for collecting hazardous waste	•	•										
	Waste generation analysis	•	•										
	Analysis of the distribution of the population by zone and district	•	•	•									
	Analysis of the type and distribution of streets and squares	•	•	•									
	Study of possible locations to set up the Mobile Clean Point and service routes			•	•								
	Analysis of alternative vehicles to carry out the service			•	•								
2. Procedure to locate the mobile clean point (Special Protection and Regeneration Plan or P.E.P.R.I.) *	Identification of the level of conservation and environmental permits				•	•	•	•					
	Processing licences				•	•	•	•					
3. Implementation and start-up of the service	Tender for the waste collection service via the Mobile Clean Point							•	•	•			
4. Monitoring and evaluation	Readjustment of location according to users									•	•		
	Readjustment of Mobile Clean Point spaces according to the type and amount of waste collected									•	•		
	Improvement of cleaning services											•	
5. Introduction of improvements												•	

* More information about P.E.P.R.I. regulatory procedures in Good Practices on Aesthetical Integration.

Actors involved:

- Island Council of Ibiza.
- Ibiza City Council.
- Intermunicipal Association of Island Public Services of Ibiza.
- The company licensed to collect waste on Ibiza via the Mobile Clean Point.
- The population and commercial premises close to the Mobile Clean Points.

Legal framework:

Autonomous community regulations:

- Government of the Balearic Islands, Normativa del Plan Director Sectorial para la Gestión de los Residuos Urbanos de Ibiza y Formentera (online) [Regulations of the Sector Master Plan for the Management of Urban Waste on Ibiza and Formentera]. Available:
<<http://dgrer.caib.es/www/DirEivisa/cast/PDSGRUEFcast.pdf>>

Local regulations:

- Ibiza City Council. Ordenanza Municipal de Gestión de Residuos Municipales, of 21 December 2004, published in BOIB no. 181 (online) [Municipal Waste Management Municipal Ordinance]. Available:
<<http://www.eivissa.es/portal/images/stories/ordenances/residuos.pdf>>
- Island Council of Ibiza, Reglament de Participació Ciutadana del Consell Insular d'Eivissa, of 29 November 2008 and published in BOIB no. 167 (online) [Regulation on Citizen Participation by the Island Council of Ibiza]. Available:
<http://www.conselldeivissa.es/portal/RecursosWeb/DOCUMENTOS/1/0_4363_1.pdf>

Financial framework: (activity costs, activity revenue (if any), financial model/s used)

The investment totals €1,964,758.96 (for the construction of 6 Clean Points on the island of Ibiza and the purchase of 2 Mobile Clean Points), 80% co-financed by the EU's 2007-2013 Operational Programme Cohesion Fund. The maximum price of the equipment is €80,000 (€160,000 for 2 MCP). The construction and purchase of the fixed and mobile clean point network on the island of Ibiza complements the investment made with the 2000-2006 Cohesion Fund.

There is no direct financial return relating to the initiative, but it contributes to the financing model established by potentially increasing income due to the model's results. The model's income comes from: local taxes for collection and treatment, income per tonne of selective waste collected and from selling materials.

Degree of use: (%) or number of users (if possible):

The number of waste deposits at the Mobile Clean Points in 2017 was 362 in Vila d'Eivissa (data from January to August). For all municipalities on the island, 12,870 kg of waste was disposed of by the public.

Results**Proven results (using indicators):**

The Island Council of Ibiza and Ibiza City Council monitor the following parameters (see the Useful Links section to consult these). The trends in the service for the Old Town can be monitored.

- Number of users of the Mobile Clean Point, by postcode.
- Number of users of the Mobile Clean Point, by month.
- Number of users of the Mobile Clean Point, by day of the week.
- Amount and type of waste collected.
- Suitable location for easy assembly and dismantling of the Mobile Clean Point.
- Acceptance of the location by local residents.
- Number of guided tours to the Clean Points and MCP visits to educational centres.

Possible success factors:

- City Council staff directly control and regulate the Mobile Clean Point locations and timetables.
- Appropriate communication and publicising of Mobile Clean Point locations and timetables from the start of the project (specific website, specific visits to educational centres, informative guides published, sessions for the public).
- The public can use any Mobile Clean Point in any municipality.
- The same waste is collected as at fixed Clean Points.
- Wide range of collection points and timetables.

Main difficulties encountered:

- Investment required by the City Council (installation, maintenance, promotion).
- Placing the Mobile Clean Point close to the Old Town, due to its narrow streets.
- Slower decision-making due to the paperwork and licensing procedures involved for the service, as well as the application of specific P.E.P.R.I. regulations.
- Maintenance and cleaning requirements for Mobile Clean Point sites at the end of their specific day.
- The relative volume of this kind of waste is small, although it has high pollutant potential, so it is very important to prevent this from being deposited in the environment.

Main lessons learnt from the practice

- The Mobile Clean Point means that a collection service can be provided for waste for which no containers are provided on the streets in the Old Town, without affecting or altering the space permanently, thereby increasing the amount of waste handled and reducing the presence of this waste in containers located on the street or in the environment.
- It also means that people with impaired mobility, or who cannot go to conventional clean points, can dispose of their waste so it can be handled correctly.
- It should be noted that, in the first 5 months of 2017, the Mobile Clean Point collected more than 8 tonnes of waste and received more than 400 visits from users throughout the island of Ibiza.
- To improve the service, a closer location should be found, within the area of Dalt Vila, La Marina, Vara del Rei or Plaça del Parc (Old Town).
- The Mobile Clean Point sites could also be signposted with informative panels specifying the days, times and type of waste that can be disposed of, as well as providing users with a contact telephone number.

Additional information**Bibliography**

- Island Council of Ibiza, Pliego de prescripciones técnicas para la contratación del suministro de 2 Puntos Limpios Móviles para complementar el servicio de la red de Puntos Limpios de la isla de Ibiza, 2012 (online) [Technical specifications for procuring the supply of 2 Mobile Clean Points to complement the Clean Point service network of the island of Ibiza]. Available:
<http://www.conselldeivissa.es/portal/contratante/RecursosWeb/DOCUMENTOS/1/0_6641_1.pdf>
- Island Council of Ibiza, Gestión de residuos de Ibiza (online) [Ibiza waste management]. Available:
<http://www.conselldeivissa.es/portal/p_20_contenedor1.jsp?codbusqueda=435&codMenu=637&seccion=s_fdes_d4_v2.jsp&language=ca>

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- Decree 46/2001, of 30 March, definitively approving the Sector Master Plan for the Management of Urban Waste on Ibiza and Formentera (BOIB no. 45, 14 April 2001; corrections of errors BOIB no. 111, 15 September 2001 and BOIB no. 105, 31 August 2002), online. Available:
<<http://www.caib.es/sacmicrofront/archivopub.do?ctrl=NTCS059123Z1183908&id=183908>>
 - MAGRAMA, Estudio sobre modelos de gestión de residuos en zonas insulares, 2011 (online) [Study of waste management models in island zones]. Available:
<http://www.mapama.gob.es/imagenes/en/Estudio%20sobre%20modelos%20de%20gesti%C3%B3n%20de%20residuos%20en%20entornos%20insulares_tcm11-183310.pdf>
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Special procedures and agreements arranged



CITY OF FLORENCE (ITALY)

Section	Description
Title of the practice	1.4. The implementation of the Underground Waste Collection (UWC) project and its contribution to research into the city's history
Photograph	
Proposers	Quadrifoglio Servizi Ambientali Area Fiorentina spa City of Florence.
Contacts	Dr. Giuseppe Ponzini, +393479656523, g.ponzini@quadrifoglio.org
Useful links	www.quadrifoglio.org
Start date	2008.
Current Status	Ongoing.
Location	Florence UNESCO Site.
Inhabitants in the area	377,539 (Municipality); 53,323 (UNESCO Site) - around 9,000,000 tourists per year.

Description of the practice

Origin:

The construction process of the UWC project has had a long and complex genesis: the UWC (Underground Waste Collection project) was set up as a public utility project to put an infrastructure network of underground stations in place for separated waste collection.

To implement the project, Quadrifoglio took the role of lead player (Executor) and technical consultant for the best operation of the collection service.

Development:

Among the requirements to be adhered to when Quadrifoglio Spa carried out the work, by law, there had to be archaeological supervision during the execution of the excavation.

Archaeological Surveillance was carried out by the Archaeological Superintendence of Tuscany, with collaborating archaeologists, who assisted the work, recorded the findings of the surveys, and reported back to the Superintendent who, subsequently, gave consent for further work, even if this resulted in the eventual demolition of some findings.

Actors involved:

- Quadrifoglio Servizi Ambientali Area Fiorentina spa.
- City of Florence.
- Office of the City of Florence Historic Centre UNESCO World Heritage site.
- Archaeological Superintendence of Tuscany.

Legal framework:

Once the requirements and guidance from the Service Conference had been accepted, the final design for the project was approved by the City Council (City of Florence Mayor's Committee – the developer). Therefore, Quadrifoglio Spa (executor) was able to initiate construction on the site to build the underground station in the historical centre of Florence.

Results**Proven results:**

The digs were an opportunity to analyse the different stages of urban transformation of the city of Florence by a stratification involving:

- Roman Era;
- Late Roman Empire;
- Early Middle ages;
- Middle Ages;
- Renaissance period;
- Ninth century.

Possible success factors:

The collaboration between the Archaeological Dig and Quadrifoglio Spa, instead of being seen as an obstacle to the execution of the works, was, instead, seen as a unique opportunity to enrich our knowledge of the history of the city.

Main difficulties encountered:

Implementing an urban infrastructure in complex, sensitive, crowded contexts.

Main lessons learnt from the practice	Refinement of authorisation and Executive processes.
Additional information	n/a

CITY OF KRAKOW (POLAND)

Section	Description
Title of the practice	1.5. Deposit and recovery of waste in Krakow from 6am to 10am
Photograph	
Proposers	Municipal Service Company - the administrator of the waste management system in the Municipality of Krakow.
Contacts	Piotr Odorcuk – a press officer at the Municipal Service Company, +48 12 646 2380, +48 12 646 22 22, rzecznik@mpo.krakow.pl, mpo@mpo.krakow.pl
Useful links	www.mpo.krakow.pl
Start date	1 July 2013 – the change of the waste management system in the Municipality of Krakow according to the law passed on maintaining cleanliness and order in municipal districts.
Current Status	Ongoing.
Location	The Heritage City Centre.
Inhabitants in the area	1,536 inhabitants in the Heritage City Centre – 0.2 % of the Municipality of Krakow's inhabitants.
Description of the practice	
Origin:	
According to the Regulations for maintenance of the cleanliness and order in the Municipality of Krakow, waste collection in the Municipality of Krakow is provided on weekdays from 6 am to 10 pm. However, in the Heritage City Centre, vehicles for waste collection only collect waste from property owners until 10 am, which is better for tourists.	

Development and Timescale:

The administrator of the waste management system in the Municipality of Krakow – the Municipal Service Company - was obliged to adapt the schedule for waste collection from property owners to the rule that waste may only be collected in the Heritage City Centre until 10 am. This is connected to maintaining a suitable amount of vehicles for waste collection, and employees of the service company.

Factors involved:

As a result of the tender for collection and transport of waste in the Municipality of Krakow a consortium of 4 companies was chosen: Remondis Kraków Ltd., A.S.A. Eko – Polska Ltd., Małopolskie Przedsiębiorstwo Gospodarki Odpadami (MPGO) Ltd., and Suez Małopolska Ltd. (the leader of the consortium). MPGO Ltd. collects waste (Suez Małopolska Ltd. collects kitchen waste) in the Heritage City Centre. Two waste management system inspectors head up control of proper execution of the services.

Legal framework:

The legal framework relating to waste management in the Municipality of Krakow includes: the law on maintaining cleanliness and order in municipal districts and the act of local law – the Regulations on maintenance of cleanliness and order in the Municipality of Krakow established by the Krakow City Council. The obligation with respect to only collecting waste from property owners in the Heritage City Centre between 6am and 10 am is the result of an agreement between Municipal Service Company – the administrator of the waste management system in Krakow - and the consortium. Failure to comply with the agreement is subject to a penalty of 200 PLN (~46 EUR) for each hour of delay. The penalty must be less than 600 PLN (~139 EUR) daily.

Financial framework:

2,592,000 PLN per year (~598,739 EUR).

Use level:

1,536 inhabitants in the Heritage City Centre – 0.2% of Municipality of Krakow's inhabitants

Results**Proven results (using indicators) and success factors:**

On the latest poll regarding inhabitants' satisfaction with waste collection in the Heritage City Centre on a scale of 1-10:

- 62 respondents gave an average score of 8.27 out of 10 for waste collection in the Heritage City Centre.

Waste collection from property owners from 6 am to 10 am in the Heritage City Centre does not affect tourist traffic. It is also related to preventing smells and noise, and not providing a negative aesthetic experience either. Time-limited waste collection minimises waste collection vehicle traffic in the Heritage City Centre, which is environmentally friendly. Handling is carried out by small waste collection vehicles, which cost less for the Municipality of Krakow waste management system.

Main difficulties encountered:

The main difficulty is the compact housing within the network of narrow streets in the Heritage City Centre. Waste collection vehicles have difficulty providing services. The other problem is narrow passages to courtyards, where waste rooms are placed. Property owners sometimes do not put waste containers in front of the property, which makes waste collection impossible.

Main lessons learnt from the practice	Waste collection from property owners in the Heritage City Centre from 6am to 10am does not affect tourist traffic. It is also related to preventing smells and noise, and not providing a negative aesthetic experience either. Time-limited waste collection minimises waste collection vehicle traffic in the Heritage City Centre, which is environmentally friendly. Handling is carried out by small waste collection vehicles, which cost less for the Municipality of Krakow the waste management system.
Additional information	www.mpo.krakow.pl , the law on maintaining cleanliness and order in municipal districts, the Regulations on maintenance of cleanliness and order in the Municipality of Krakow.

CITY OF CORDOBA (SPAIN)

Section	Description
Title of the practice	1.6. Agreements with bulk waste producers for door-to-door collection in Cordoba
Photograph	
Proposers	Sanitation Cordoba (SADECO). Municipal Company for Sanitation.
Contacts	Jesús Diz. buzon@sadeco.es
Useful links	www.sadeco.es
Start date	1999.
Current Status	Ongoing.
Location	Cordoba historical area.
Inhabitants in the area	32,000 (2015).

Description of the practice

Origin:

Adopting voluntary agreements with the main producers of waste in the area, particularly restaurants and hotels, who commit to maintaining their own containers, and those required by close neighbours, on their premises until the door-to-door waste collection takes place.

Development and Timescale:

The experiment began in 1998, following a year-long development plan, and it continues to expand to neighbouring areas thanks to the collaboration of businesses and local residents.

Actors involved:

Traders, hotels and accommodation facilities and restaurants located in the World Heritage area.

Legal framework:

Cordoba city council's Urban Hygiene regulation. Agreements with large producers of waste in the World Heritage area.

Financial framework: (activity costs, activity revenues (if any), financial model/s used)

No cost.

Use level: (%) or number of users (if possible):

12 bulk producers and 5% of the residents in the historic town centre (1500 inhabitants).

Results**Proven results (using indicators):**

The proven result is the elimination of 78 1000L containers from public streets in the world heritage area.

Possible success factors:

Commitment and willingness of the businesses to reduce the impact of containers on public streets.

Main difficulties encountered:

Difficulty in maintaining the number of extra containers for locals over time and locating spaces on the premises to store the containers during the day.

Main lessons learnt from the practice	The need to stay in regular contact with the main financial players in the area, in order to include them as interest groups for the common benefit of council initiatives.
Additional information	www.sadeco.es

CITY OF PORTO (PORTUGAL)

Section	Description
Title of the practice	1.7. Agreements with bulk waste producers for door-to-door collection in Porto
Photograph	
Proposers	Municipality of Porto.
Contacts	Pelouro da Inovação e do Ambiente: pelouro.ia@cm-porto.pt +351 222 097 161
Useful links	www.cm-porto.pt
Start date	February 2015.
Current Status	Ongoing.
Location	Portugal, Porto, Heritage City Centre, Ribeira.
Inhabitants in the area	7,000

Description of the practice

In the Heritage City Centre, we do selective waste collection from businesses using a door-to-door collection system. With this system, we collect sorted packaging waste fractions – paper and cardboard, plastic and metal and glass – and also food waste.

For packaging, we give the business owners colourful plastic bags for waste separation. Every day, twice a day, the business owners, or employees, place the bags in the street, usually at a back entrance to their establishment, where they are collected by our teams. In some special cases, our employees go inside the customer facilities. The three different fractions are collected all at the same time, by hand, and loaded onto a box truck. Afterwards, when the service is done, the collection team goes to the civic amenity site, where they separate the waste fractions by the colour of the bags. At the civic amenity site the waste collected by this service is placed together with materials from elsewhere, until storage capacity is reached. At this point the materials are transported to the recycling plant.

For the organic fraction we give the business owners small plastic bins (50L to 120L). In the same way as packaging waste collection, every day, twice a day, we do the organic collection in the business sector in Ribeira. The business establishments place the bins in the street along with the packaging bags, or, in some cases, our employees go inside the customer facilities. In this case, the collection is carried out with a small electric vehicle, which collects the full bins and replaces them with clean, empty ones. The full bins are then moved to storage nearby where they are unloaded to a back-loading collection vehicle. The organic waste fraction is then transported in this truck to the composting plant.

Origin:

The waste problem in Ribeira that drove us to develop and implement this system related to the overload of street bins in the area. The high tourism levels, and consequent high volume of businesses, in Ribeira results in the production of large amounts of waste, particularly from the business sector. Before the implementation of the door-to-door collection system for businesses, we were forced to empty the street bins in Ribeira several times a day. Even so, it was highly likely to come across waste left around the bins because they were already full.

Development and Timescale:

At the moment the door-to-door selective collection system from businesses in the heritage city centre has already passed the development and implementation phase. We started this service in February 2015 so the collection system is now fully operational.

Actors involved:

After the design and planning phases, we started to implement the system. In order to ensure the operability of the service we had to involve the business establishments' owners and employees. The first step was to explain the changes that were about to happen in the systems to them and ask for their collaboration. We tried to emphasise the advantages of this new system by heightening awareness, and also involving the Parish Councils and restaurant and bar owners. The system works based on the direct collaboration of the municipality and the business owners and also with the collaboration of Parish Councils.

Legal framework:

There is no specific legal framework that applies to the system, or the area where it is implemented.

Financial framework:

We cannot be precise about the costs and revenues associated with the system. Nevertheless, we know for a fact that the amount of selective waste recovered in the area covered by the door-to-door system increased significantly with the system implementation. This behaviour results in a decrease of unsorted waste sent to incineration, therefore decreasing the waste treatment cost. On the other hand, since the operational requirements are higher, the operation cost is increased.

There is no different financial model applied to this system. The taxation model for business users covered by the door-to-door scheme is the same that is applicable in the entire city. The individual waste management fee depends on water consumption.

Use level:

In Ribeira the coverage of the door-to-door selective collection system for businesses is 100%, corresponding to approximately 100 commercial premises served by the system. However, the system is not implemented in the entire heritage city centre. We still have the potential to extend the system to more commercial premises, although with a different model – the particularities of Ribeira made the system unique and unrepeatable, but it can be adjusted and adapted to some other areas in the heritage city centre.

Results

Proven results (using indicators):

In one year, the door-to-door selective collection service in the Ribeira resulted in the recovery of approximately:

- 250 tonnes of paper and cardboard, plastic and metal packaging and glass.
- 300 tonnes of food waste.

Possible success factors:

Selective collection of commerce waste using a door-to-door system promotes waste separation at source. The focus on bulk producers allows large amounts of materials to be recovered and minimises the pressure on the collective container systems which already have a high impact on heritage city centres.

Main difficulties encountered:

The main difficulty in operating this system in Ribeira is the lack of space in the commercial premises. Due to the particular features of the area relating to its historical context, commercial premises have very little space to store waste until collection. This is the reason why we have to do the collection twice a day.

<p>Main lessons learnt from the practice</p>	<p>We learned that, with hard work and heightening awareness, it is possible to change ways of thinking and behaviour. Separation at source done by the system users prior to implementation of the door-to-door collection was minimal, if not zero. However, we made it possible to recover almost 1,500 kg per day of selective fractions, proving that, even given all the limitations of the area, it is possible to get great results.</p>
<p>Additional information</p>	<p>Not applicable.</p>

Different container systems in Heritage Areas



CITY OF FLORENCE (ITALY)

Section	Description
Title of the practice	1.8. Underground Stations at Florence Heritage Sites
Photograph	
Proposers	Quadrifoglio Servizi Ambientali Area Fiorentina spa City of Florence.
Contacts	Dr. Giuseppe Ponzini, +393479656523, g.ponzini@quadrifoglio.org
Useful links	www.quadrifoglio.org
Start date	2008.
Current Status	Ongoing.
Location	Florence UNESCO Site.
Inhabitants in the area	377,539 (Municipality); 53,323 (UNESCO Site) - around 9,000,000 tourists per year.

Description of the practice

Origin:

The problem for Florence is not the production of waste itself, but the concentration of its production in confined spaces with little room for manoeuvre, due to the high number of pedestrians and vehicles.

In this context, the solution adopted until the start of the new project was to use roadside waste bins, intended for unsorted waste, polyethylene “bells” for “mixed materials” and door-to-door paper and cardboard collection. However, over time this system created problems, such as aesthetic impact, deterioration of the decor and hygiene of the urban area, and inefficiency in the performance of separate collection, in general.

Development and Timescale:

Current status and planning of underground stations in the UNESCO Historical Centre in June 2016: 42 stations built; 2 under construction; 4 approved to be achieved by 2016.

Actors involved:

- Quadrifoglio Servizi Ambientali Area Fiorentina spa.
- City of Florence.
- Office of the City of Florence Historic Centre UNESCO World Heritage site.

Legal framework:

Once the requirements and guidance from the Service Conference had been accepted, the final design for the project was approved by the City Council (Mayor's Committee of the City of Florence – the developer). Therefore, Quadrifoglio Spa (executor) was able to initiate construction on the site to build the underground station in the historical centre of Florence.

Financial framework: self-financing and from fees charged for waste collected from users.

Use level: (%) or number of users (if possible): 23,922 domestic and 8,865 non-domestic users.

Results**Proven results (using indicators):**

- Separate Collection Ratio in Florence's Historic Centre: 74% (59% in the UNESCO area).
- Coverage of the historical centre: 60%.
- Instead of 400 dirty spots, only 42 of them to clean.

Possible success factors:

Maintain the decorum and historic character of the city's architectural heritage.

Main difficulties encountered:

Implementing urban infrastructure in complex, sensitive, crowded contexts.

Main lessons learnt from the practice	Refinement of authorisation and Executive processes.
Additional information	n/a.

CITY OF TALLINN (ESTONIA)

Section	Description
Title of the practice	1.9. Underground containers for mixed waste in Tallinn.
Photograph	
Proposers	City of Tallinn.
Contacts	<p>Representatives of city district governments:</p> <ul style="list-style-type: none"> • Haabersti District Government, head of the administration department, Tonu.Kivimaker@tallinnlv.ee • Tallinn City Centre District Government, head specialist of the urban department, Kylly.Annus@tallinnlv.ee • Kristiine District Government, senior specialist, Marju.Korts@tallinnlv.ee • Lasnamäe District Government, deputy head of the urban department, Diana.Buchmann@tallinnlv.ee • Mustamäe District Government, head specialist of the urban department, Urmas.Kopp@tallinnlv.ee • Nõmme District Government, head specialist of the city property department, Mart.Miidu@tallinnlv.ee • Pirita District Government, head specialist of the urban department, Merike.Kalam@tallinnlv.ee • Põhja-Tallinna District Government, deputy head of the urban department, Arvo.Soorand@tallinnlv.ee
	<ul style="list-style-type: none"> • Tallinn Environment Department, keskkonnaamet@tallinnlv.ee • Tallinn Municipal Engineering Services Department, kommunaalamet@tallinnlv.ee
Useful links	http://www.tallinn.ee/est/hoovidkorda/ (only in Estonian)
Start date	2005.
Current Status	Ongoing.
Location	City of Tallinn.
Inhabitants in the area	445,000

Description of the practice

Origin:

In Tallinn, it is a waste holder's obligation to own enough waste containers (containers are not owned by the city). Underground containers are an alternative solution to ordinary wheelie bins. Underground containers blend into the surrounding milieu much better than ordinary plastic wheelie containers, they have a lot of different exterior options and they are significantly more hygienic. In a similar way to waste storehouses, the city of Tallinn also subsidises apartment associations with up to 70% of the cost of setting up underground containers within the "Fix up the courtyard" project.

Development and Timescale:

Since 2005 apartment associations have set up over 400 underground containers. One apartment association usually owns 3 containers (for residual waste, biodegradable waste and paper/cardboard). The size of the containers varies from 1.3 m³ to 5 m³.

Actors involved:

- Tallinn City District Governments.
- Tallinn Urban Planning Department.
- Tallinn Environment Department.
- Municipal Engineering Services Department.

Legal framework:

It is not mandatory to set up underground containers, but it is recommended. Containers have to be located on the waste holders' property.

Financial framework: (activity costs, activity revenue (if any), financial model/s used)

Tallinn City Government has been supporting the construction of underground containers since 2005. Due to high interest from the apartment associations, the city of Tallinn decided to continue the support. That is why, in 2006, regulations came into force for the procedure supporting apartment associations with the "Fix up the courtyard" project. Apartment associations can apply for support of up to 70% of the cost of constructing underground containers within the framework of the "Fix up the courtyard" project. In last 11 years Tallinn City Government has allocated more than €8 million of the city's budget to the "Fix up the courtyard" project. The "Fix up the courtyard" project is very successful, and interest from apartment associations has increased every year.. In 2017 the city of Tallinn is planning to support the project with €502,500 of the city's budget.

Results

Proven results (using indicators):

Installation of underground containers has helped to achieve an aesthetic appearance in the city's surroundings. There is no need to empty underground containers as often as ordinary wheelie bins. Over 400 containers have been set up in the city of Tallinn. Underground containers are compact and give more free space in courtyards.

Possible success factors:


Apartment associations are ready to construct more underground containers when the local government financially subsidises their installation. Installation of underground containers is promoted by city as being the most aesthetic and hygienic solution.

Main difficulties encountered:

It is hard to construct underground containers in some areas due to heritage protection or difficulties with excavation. It is not possible to construct underground containers in some areas, because there are utility networks underground. Furthermore, enough space is needed to empty the underground containers. It is also very complicated to move the containers afterwards.

Main lessons learnt from the practice	Underground containers ensure better sanitary conditions and an improved aesthetic look. There is more room in apartment buildings' courtyards, when underground containers have been set up. Using underground containers saves an estimated 30% on fuel compared with regular wheelie bins with same capacity. Underground containers take longer to dilapidate than ordinary wheelie bins.
Additional information	http://www.tallinn.ee/est/hoovidkorda/

CITY OF PORTO (PORTUGAL)

Section	Description
Title of the practice	1.10. Underground containers in the Porto Heritage Area
Photograph	
Proposers	Municipality of Porto.
Contacts	Pelouro da Inovação e do Ambiente: pelouro.ia@cm-porto.pt +351 222 097 161
Useful links	www.cm-porto.pt
Start date	2010.
Current Status	Ongoing.
Location	Portugal, Porto, Heritage City Centre.
Inhabitants in the area	7,000

Description of the practice

Origin:

The use of underground waste containers in the heritage city centre arises because of the high waste production in the area, which means the street bins must be high capacity. Although we recognize this need for storage capacity, we also have to take into account that we are dealing with a very important area, with a very high cultural value. Because of this, we could not install a large number of surface bins to cover storage needs due to the visual impact that this would create.

Furthermore, the heritage city centre did not have a sufficient number of "Ecopontos" for local needs ("Ecoponto" is a group of bins intended for disposal of the main three selective waste fractions – paper and cardboard, plastic and metal packaging and glass). With the installation of underground containers, we tried to deal with this issue by increasing the availability of waste separation points.

Development and Timescale:

We have been installing underground containers in the heritage city centre (as well as in the entire city) since 2010. At the moment, in the heritage city centre, we do not plan to install any more than the ones already in place.

Actors involved:

The implementation of this system and the equipment installation was promoted and executed by the municipality, including some of the equipment within the scope of urban rehabilitation works.

In some cases, the underground containers were installed by private companies in their building restoration works.

Legal framework:

The municipal legal and regulatory framework addressing waste management issues defines this kind of bins as being the preferential system to be used when new bins are installed.

Financial framework:

We cannot be precise about the costs and revenues associated with the system. However, we know that the increase in the storage capacity of street bins decreased the demand for operational interventions. The number of visits needed to empty the bins decreased significantly, which has an impact on operational costs.

There is no different financial model applied to this system. The taxation model is the same in the entire city. The individual waste management fee depends on water consumption.

Use level:

We cannot specify the number of users served by these containers, but we can state that all users in this area have 1 container less than 100 meters (the national reference value) away from their home or business.

Results**Proven results:**

1. Number of containers.

In 2010, the heritage city centre had 106 containers, of which 94 were for disposal of unsorted waste and 12 for selective disposal.

In 2016, we have only 76 containers, of which 59 are for disposal of unsorted waste and 17 for selective disposal.

We reduced collection points by 28%. Nevertheless, although we reduced the total number of collection points, we installed more bins for selective collection. Therefore, the number of points that are now equipped with bins for the selective fractions is higher than it was in 2010.

2. Disposal capacity.

In 2010, the heritage city centre had a total capacity of 258,500 litres for waste storage, of which 163,000 litres were intended for unsorted waste and 95,500 litres for selective disposal.

In 2016, we had a total capacity of 352,300 litres for waste storage, of which 158,800 litres are for unsorted waste and 193,500 are for selective disposal.

We increased storage capacity by 36% and we were able to double capacity for selective disposal.

Possible success factors:

The use of underground waste containers is a good solution for waste collection, particularly in heritage city centres which are exposed to high levels of tourism and economic activities causing bulk waste production. These systems provide a large storage capacity underground with small, discreet receptors on the surface which are more aesthetically pleasing and integrate better into the urban structure.

Main difficulties encountered:

The main difficulty associated with the installation of underground containers in the heritage city centre relates to location selection. The location has to be selected considering strategic factors, such as the proximity to the producers, but always bearing the aesthetic issues in mind. When we are talking about the heritage city centre, the bins cannot interfere with the visual context and must be integrated into the urban structure.

Main lessons learnt from the practice	By installing underground containers in the heritage city centre, we realised that is possible to ensure a higher storage capacity in the street bins with minimal visual impact. This kind of bin facilitates integration of the waste management system into urban dynamics and minimises constraints associated with it.
Additional information	Not applicable.

CITY OF KRAKOW (POLAND)

Section	Description
Title of the practice	<p>1.11. Unified container system in Krakow:</p> <ul style="list-style-type: none"> • Single-family houses: yellow waste collection sack for selective waste fractions and blue container for mixed wastes. • Multi-family houses: yellow container for selective waste fractions and blue container for mixed waste.
Photograph	
Proposers	Municipal Service Company - the administrator of the waste management system in Municipality of Krakow.
Contacts	Piotr Odorcuk – a press officer of the Municipal Service Company, +48 12 646 23 80, +48 12 646 22 22, rzecznik@mpo.krakow.pl, mpo@mpo.krakow.pl
Useful links	www.mpo.krakow.pl
Start date	1 July 2013 – the change of the waste management system in the Municipality of Krakow according to the law passed on maintaining cleanliness and order in municipal districts.
Current Status	Ongoing.
Location	Municipality of Krakow including the Heritage City Centre.
Inhabitants in the area	768,000 – inhabitants of the Municipality of Krakow (including 1,536 inhabitants of the Heritage City Centre).

Description of the practice

Origin:

Selective waste collection rules are set out in the Regulations for maintenance of cleanliness and order in the Municipality of Krakow. The Regulations were adopted by resolution of the Krakow City Council. The Regulations establish rules for selective waste collection, frequency of waste collection and types of containers for residents. The main aim of the issue is to maintain clear waste management rules for residents.

Development and Timescale:

The Municipality of Krakow Council has established frequencies for waste collection from properties. These are set out in the Regulations for maintenance of cleanliness and order in the Municipality of Krakow and in the waste collection schedule. Each type of property has various frequencies of waste collection and different types of containers:

- multi-family houses:
 - mixed waste: twice a week – blue container max. 1.1 m³.
 - selective waste (paper, plastic, metal): twice a week – yellow container min. 0.12 m³.
 - selective waste (glass): min. twice a month, max. once a week – green container ('igloo' type) min. 1.2 m³.
- single-family houses:
 - mixed waste: twice a month – blue container min. 0.12 m³.
 - selective waste: once a month – yellow bag 0.12 m³.

Factors involved:

According to the law on maintaining cleanliness and order in municipal districts and the Regulations for maintenance of cleanliness and order in the Municipality of Krakow, owners of properties are obliged to equip the property with containers. They have two ways of doing so: either purchase containers, or hire them.

Legal framework:

The legal framework relating to waste management in the Municipality of Krakow includes: the law on maintaining cleanliness and order in municipal districts and the act of local law, the Regulations for maintenance of cleanliness and order in the Municipality of Krakow established by the Krakow City Council.

Financial framework:

Hiring containers from INTHERWASTE stakeholder Municipal Service Company – the administrator of the waste management system in Krakow – costs, for example:

- Container 0.12 m³ – 3.90 PLN per month (~0.88 EUR).
- Container 1.1 m³ – 12.95 PLN per month (~2.93 EUR).
- Container 1.2 m³ – 29.53 PLN per month (~6.69 EUR).

Use level:

All residents of the Municipality of Krakow.

Results

Proven results (using indicators) and success factors:

On the latest poll regarding inhabitants' satisfaction with waste collection in the Heritage City Centre on a scale of 1-10:

- 62 respondents gave an average score of 8.27 out of 10 for waste collection in the Heritage City Centre.

Unified containers in the Municipality of Krakow mean that all residents follow the same rules for waste management. This makes the waste management system in the Municipality of Krakow clear for both residents and the Municipality. It also facilitates waste collection vehicles. Their design means that they can load containers from the entire Municipality, including the Heritage City Centre.

Main difficulties encountered:

Under the law on maintaining cleanliness and order in municipal districts property owners are obliged to equip the property with containers themselves – it is not a duty of Municipality of Krakow. The Municipal Service Company and Municipal Police control proper execution of the duty.

<p>Main lessons learnt from the practice</p>	<p>Unified containers in the Municipality of Krakow mean that all residents follow the same rules for waste management. This makes the waste management system in the Municipality of Krakow clear for both residents and the Municipality. It also facilitates waste collection vehicles. Their design means that they can load containers from the entire Municipality, including the Heritage City Centre.</p>
<p>Additional information</p>	<p>www.mpo.krakow.pl, the law on maintaining cleanliness and order in municipal districts, the Regulations on maintenance of cleanliness and order in the Municipality of Krakow.</p>

CITY OF IBIZA (SPAIN)

Section	Description
Title of the practice	1.12. Adaptation of waste glass deposit containers with an IWBT mechanism to improve commercial waste disposal in Ibiza
Photograph	
Proposers	Ibiza City Council.
Contacts	<p>ISLAND COUNCIL OF IBIZA Department of the Environment and Rural and Marine Environment. Montserrat Ruiz Costa. Environmental Specialist. Postal address: Av. de Espanya, 49 - 07800 Ibiza (Ibiza, Balearic Islands). Telephone (switchboard): 971 19 59 00. Email: dep.agricultura@conselldeivissa.es</p> <p>ECOVIDRIO Roberto Fuentes, Manager of Ecovidrio in the Balearics. Postal address: C/ Miguel Ángel, 23, 5º planta – Madrid 28010 (Madrid). Telephone (switchboard): 91 411 83 44. Fax: 91 411 83 45.</p>
Useful links	<ul style="list-style-type: none"> - Memoria Departamento de Medio Ambiente del Consell Insular d'Eivissa, 2007. [Annual Report. Island Council of Ibiza Department of the Environment]. Available: http://www.conselldeivissa.es/portal/RecursosWeb/DOCUMENTOS/1/0_4447_1.pdf

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Start date	<ul style="list-style-type: none"> - 2007: pilot plan. - 2010: implementation of the service.
Current Status	Regulations and implementation of the containers: ongoing service.
Location	Vila d'Eivissa, Ibiza, Balearic Islands.
Inhabitants in the area	<ul style="list-style-type: none"> - Inhabitants of Vila d'Eivissa: 49,975 (Ibestat, 2015). - Inhabitants of the Old Town (Dalt Vila, La Marina, Vara del Rei and Plaça del Parc): approximately 800 inhabitants .

Description of the practice

Description of the Practice.

How does the IWBT system work?

The mechanism consists of two complementary elements which attach to the wheelie bin, and to the waste glass container in the street to help unload the bin. This system is known as VACRI in Spanish (Individual Wheelie Bin Tipper or IWBT in English).

The bin is hooked onto the IWBT tipping device using a metal attachment on the top at the front and also via a small metal tab on the bottom at the front of the IWBT. The bin remains securely anchored and cannot fall accidentally (see Photos 3, 4 and 5).

IWBT containers have two openings: the traditional one for individuals to deposit their waste glass, as usual, and also an opening designed for the IWBT system, making it easier for bulk waste generators to handle their waste glass (see Photos 1 and 2).

Pilot test and implementation of the service.

In 2007 the Island Council of Ibiza (CIE) and Ecovidrio ran a pilot test of the IWBT waste glass collection system based on putting the following elements in place:

- Bell-shaped base container with a capacity of 3,000 litres, on which the IWBT system was mounted.
- IWBT lifting and tipping system.
- Wheelie bins with a capacity of approximately 90 litres, adapted for the system.

The pilot test consisted of placing 20 containers in the street in areas of Ibiza where there is a high density of leisure establishments, and providing more than 100 wheelie bins for the commercial premises close to the containers.

The success of this pilot test meant that, in 2010, the CIE distributed 50 waste glass containers adapted for the IWBT system and 7 bell-shaped waste glass containers, as part of the agreement with Ecovidrio, in order to improve selective waste collection on the island of Ibiza, accompanied by 195 wheelie bins.

The containers and bins were allocated as follows:

- Sant Joan de Labritja: 5 IWBT and 18 bins.
- Santa Eulària: 13 IWBT, 49 bins and 3 bell-shaped containers.
- Sant Josep: 10 IWBT, 40 bins and 2 bell-shaped containers.
- Sant Antoni: 10 IWBT and 40 bins.
- Vila d'Eivissa: 12 IWBT, 48 bins and 2 bell-shaped containers.

Origin:

According to the waste glass recycling data for 2016, provided by Ecovidrio, the Balearics is the main generator of waste glass in Spain with a rate of 33 kg per inhabitant per year. Moreover, 48% of all disposable packaging is consumed by the hotel and restaurant sector.

This project was created to provide bulk generators of waste glass, such as shops, hotels, bars and restaurants, with wheelie bins for their exclusive use, encouraging selective collection of commercial waste glass.

Development and Timescale:

Status	Task	Months											
		1	2	3	4	5	6	7	8	9	10		
1. Preliminary study	Scope of the action (SCOPE)	•											
	Analysis of the alternatives proposed to improve the commercial collection of waste glass.	•	•										
	Waste generation analysis	•	•	•									
	Analysis of the waste generated and located by bulk waste glass generators.		•	•	•								
	Location of the points to install containers and collection routes.			•	•	•							
2. Procedure to locate the mobile clean point (Special Protection and Regeneration Plan or P.E.P.R.I.)*	Identification of the level of conservation and environmental permits					•	•	•	•				
	Processing permits.					•	•	•	•				
3. Implementation and start-up of the service	Study of ways to include the commercial collection service (specifications, modification of agreement, etc)								•	•			
4. Monitoring and evaluation	Adjustments to the location and number of containers installed									•	•	•	
	Improvement to the cleaning service									•	•	•	
5. Introduction of improvements													•

* More information about P.E.P.R.I. regulatory procedures in Good Practices on Aesthetical Integration.

Actors involved:

- Island Council of Ibiza (CIE).
- Ibiza City Council.
- Supervisory committee of the P.E.P.R.I. and Heritage Committee of the Island Government (depending on the type of procedure).
- Ecovidrio (non-profit organisation responsible for managing the recycling of all waste from glass containers in Spain).
- Licensed waste collection company for Ibiza.
- Population in the zone of action.
- Commercial premises, hotels, bars and restaurants in the zone of action.

Legal framework:

Autonomous community regulations:

- Government of the Balearic Islands, Normativa del Plan Director Sectorial para la Gestión de los Residuos Urbanos de Ibiza y Formentera (online) [Regulations for the Sector Master Plan for the Management of Urban Waste of Ibiza and Formentera]. Available:

<<http://dgrer.caib.es/www/DirEivisa/cast/PDSGRUEFcast.pdf>>

Local regulations:

- Ibiza City Council. Ordenanza Municipal de Gestión de Residuos Municipales, of 21 December 2004, published in BOIB no. 181(online). [Municipal Bye-Law on Municipal Waste Management]. Available:

<<http://www.eivissa.es/portal/images/stories/ordenances/residuos.pdf>>

Financial framework: (activities' cost, activities' revenue (if any), model/s of financing used)

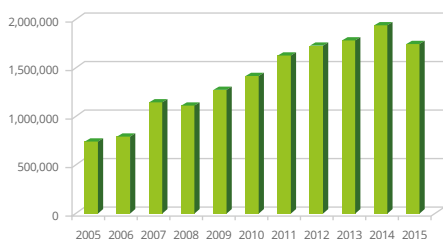
The waste company hires the IWBT containers from Ecovidrio (complete waste glass container management system in Spain). There is the cost of acquiring the IWBT model, which in Ibiza's case is provided by Ecovidrio in return for their management.

Level of use: (%) or number of users (if possible):

The number of users will be all bulk generators requesting wheellie bins in order to use the IWBT system container, as well as all the population in the area using the container via the traditional glass container hole, since this is the only model in place.

Results

- The 2007 pilot test was highly satisfactory for all users and resulted in a 45% increase in the selective collection of waste glass in the municipality of Vila d'Eivissa.
- Thanks to the pilot test, since 2010 more containers with the IWBT system have been put in place. In 2015, 1,738 tonnes of waste glass were collected in the municipality of Vila d'Eivissa, 54.38% more than in 2006 (before the pilot test and the subsequent implementation).



Selective waste collection trends in Vila d'Eivissa: (2005-2015).

Data provided by the licensed company (unit of measurement: tonnes).

The system has proved to be a success. At present there are a total of 70 IWBT containers installed in Vila d'Eivissa (out of a total of 174 side-loading waste glass containers), 4 of these are located in the Old Town (2017).

Main lessons learnt from the practice

- The IWBT system has improved the selective waste collection model in Vila d'Eivissa and has increased the amount of glass collected selectively since its implementation, especially in the more popular zones with tourists and those with a higher density of commercial premises, hotels, bars and restaurants.
- Proposed improvements would be an increase in the number of wheelie bins to be used with the IWBT system in the Old Town, as well as checking whether more IWBT containers are required.
- Linking the registration of new waste generators in the Old Town with the delivery of wheelie bins would be a useful measure to consider at municipal level.
- A timetable should also be established to be able to empty wheelie bins and deposit glass in containers located on the street. This would reduce the acoustic impact when bell-shaped containers are emptied, reducing noise pollution and therefore inconvenience for local residents at night time, helping the population to sleep better and creating a quieter, more, peaceful town.

Additional information

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- Decree 46/2001, of 30 March, definitively approving the Sector Master Plan for the Management of Urban Waste on Ibiza and Formentera (BOIB no. 45, 14 April 2001; corrections of errors BOIB no. 111, 15 September 2001 and BOIB no. 105, 31 August 2002), online. Available:
<<http://www.caib.es/sacmicrofront/archivopub.do?ctrl=NTCS059123Z1183908&id=183908>>
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2. Good Practices for Selective Waste Collection in Heritage Areas

Use of specific facilities for separate collection



CITY OF KRAKOW (POLAND)

Section	Description
Title of the practice	2.1. 700 Bring-in sites with igloo-type containers for different waste fractions in Krakow
Photograph	
Proposers	Municipal Service Company Ltd. - the administrator of the waste management system in Municipality of Krakow.
Contacts	Piotr Odorczyk – a press officer at the Municipal Service Company, +48 12 646 23 80, +48 12 646 22 22, rzecznik@mpo.krakow.pl, mpo@mpo.krakow.pl
Useful links	www.mpo.krakow.pl www.mpo.krakow.pl/firma/selektywna-zbiorka-odpadow
Start date	1995.
Current Status	Ongoing.
Location	Municipality of Krakow.
Inhabitants in the area	768,000 – inhabitants of the Municipality of Krakow (including 1,536 inhabitants of the Heritage City Centre).

Description of the practice

Origin:

The idea for 'Bring-in sites' was inspired by the Vienna solution. Selective waste collection rules are the result of an agreement between the Municipality of Krakow and the Municipal Service Company – the administrator of the waste management system in Krakow. 'Bring-in sites' are in addition to the operational Civic Amenity Sites – 'LAMUSOWNIA' and 'Selective Waste Collection Point BARYCZ'.

Development and Timescale:

There are around 700 'Bring-in sites' in the Municipality of Krakow. 'Bring-in sites' contain four igloo-type containers for collection of selective waste fractions:

- paper/beverage cartons – blue container.
- plastic and metal – yellow container.
- white glass – white container.
- coloured glass – green container.

The frequency waste collection from 'Bring-in sites' depends on the accumulated waste in the containers. Some of them are emptied daily.

Factors involved:

The Municipal Service Company – the administrator of the waste management system in Krakow - does the handling. The company has waste collection vehicles, which are customised for waste collection from 'Bring-in sites'. Moreover, the Municipality of Krakow controls the proper execution of the service and bears the costs of it.

Legal framework:

The legal framework relating to 'Bring-in sites' service is as follows:

- the law on maintaining cleanliness and order in municipal districts.
- the Regulations on maintenance of cleanliness and order in the Municipality of Krakow.
- Directive 2008/98/EC on waste (Waste Framework Directive).

Financial framework:

In 2016 the cost 'Bring-in sites' maintenance was around 6,750,000 PLN (~1,600,000 EUR).

Use level:

768,000 inhabitants of the Municipality of Krakow (including 1,536 inhabitants of the Heritage City Centre).

Results

Proven results (using indicators) and success factors:

In 2016 the percentage of selective waste collection from 'Bring-in sites' was 7% of the total amount of total amount. The Municipal Service Company has control staff, who head control of the 'Bring-in sites' inventory and technical and sanitary conditions, and propose new locations, if needed. 'Bring-in sites' containers increase the availability of selective waste collection services for locals.

Main difficulties encountered:

There are cases of throwing waste into wrong containers. Some inhabitants are ill-informed about selective waste collection in 'Bring-in sites' – they contaminate the selective fractions by throwing the wrong waste into the bin (e.g. glass cullet or porcelain into the glass container). There are also occasionally acts of vandalism at 'Bring-in sites', which are recorded by the Municipality of Krakow. Locals sometimes leave waste around the container, which can make their collection difficult.

Main lessons learnt from the practice	'Bring-in sites' are in addition to the operational Civic Amenity Sites. They enable collection of selective waste fractions, such as paper, plastic, metal and glass. 'Bring-in sites' containers increase the availability of selective waste collection services for locals. They contribute to the increase in the rate of 'selective waste fractions (paper, metal, plastic, glass) recycling and preparation for reuse'.
Additional information	www.mpo.krakow.pl www.mpo.krakow.pl/firma/selektywna-zbiorka-odpadow

CITY OF BERGEN (NORWAY)

Section	Description
Title of the practice	2.2. Underground Waste System
Photograph	
Proposers	Municipality of Bergen, Waste Management company BIR AS.
Contacts	BIR Nett AS Terje Strøm terje.strom@bir.no phone +47 957 26 290. BIR AS Toralf Igesund toralf.igesund@bir.no phone +47 915 68 613.
Useful links	http://bir.no http://bir.no/bossnett/startsiden.aspx http://bir.no/bossnett/Documents/Bossnett_engelsk_brosjyre.pdf https://www.youtube.com/watch?v=djN372nDy2Q&feature=youtu.be
Start date	First pipe in trench in 2008, officially opened Oct. 2015, construction ongoing
Current Status	Bergen inner city is divided into three areas: Blue: opened Oct 2015, still expanding. Green: will open 2018. Red : not yet decided.
Location	Bergen, the second largest city in Norway. Medieval inner city with a large proportion of wooden houses. Fire hazard. Limited area traffic, parking, waste bins & containers. Attractive tourist locations.
Inhabitants in the area	

Description of the practice

Origin:

The city of Bergen is one of the first in the world to build an underground pipe system to collect waste from the entire city centre. The city centre covers several square kilometres, more than twelve thousand households, and a network of pipes that will exceed 7.5 kilometres after construction is completed. A project of this magnitude requires innovative and experimental technology. Innovation within the waste management industry.

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Development and Timescale:

2008: Bergen city council decided the all future waste collection in the medieval city centre should shift from bins and containers, to underground pipes.

2015: Official opening of BIR Nett – the underground waste collection system.

2017: The network is expanding and work will be ongoing for many years to come.

Actors involved:

BIR Nett AS, a fully owned subsidiary of BIR AS, is implementing the project in close collaboration with a consultant working for the municipality of Bergen. Municipal departments such as the civil engineering department, water & sewage department, the parks commission, building authorities, the public health department and representatives from city hall have all been consecutively involved within this urban development project. It is crucial to collaborate with the other municipal departments, such as the water & sewage department and district heating department as they are also interested in renewing and extending their existing underground pipes and cables.

Users have to use an ID-key chip to access their allocated inlet. The inlets are multifunctional, i.e. users from private households (shopping bags), business customers (100l bags) and passers-by can all use three different hatches.

Legal framework:

Underground collection systems for waste are not legally defined as infrastructure in Norway. BIR is lobbying for modernisation of the relevant laws.

Household fee: covers a large part of the investment, and all 9 municipalities in BIR take part in this.

Commercial waste: can volunteer to use the system, and will cover rest of the investment.

Financial framework: (activity costs, activity revenue (if any), financial model/s used)

The estimated construction cost for the underground waste collection system is NOK1,239,860,000.

These costs include the development of the pipe system, costs for all inlets and the construction of two waste collection stations.

Use level: (%) or number of users (if possible):

As at May 2017, 3,897 private households have been connected to 124 inlets for residual waste and 83 inlets for paper, beverage cartons and plastic, as well as one special inlet for cardboard. In addition, 15 business customers have been connected to the underground waste collection system. BIR registers approximately 1,000 inlet openings each day. This number will increase, as even more customers are being connected to *the new system*.

Results

Proven results (using indicators):

In areas with the new system in place, the old waste bins and containers have been removed, giving the inhabitants of Bergen more space, better hygiene and lower risk of fire. In addition:

The new system has had very few technical problems since being put into operation. At the same time, it has contributed to a higher level of recycling amongst residents living in the city centre.

There are two main reasons for this: More opportunities to recycle, and integrated pay-as-you-throw fee.

Possible success factors:

Bold political decision in 2008: all waste handling in the city centre shall be underground.

The underground waste system is constructed alongside other infrastructure: district heating, rehabilitation of Water/waste water, cabling infrastructure.

Pay-as-you-throw fee integrated into the system with ID-registration.

High quality system with no down-time, good-looking inlets, with higher service level results in satisfied customers.

Main difficulties encountered:

Establishing good cooperation from all infrastructure bodies, the "Digging club".

Since Bergen has a medieval city centre, it was often uncertain what would be found underground when construction of the underground waste system began. The natural geography of Bergen, along with the pre-existing infrastructure can be challenging at times.

Main lessons learnt from the practice

Bergen city centre has narrow roads and limited space for waste storage, There are many wooden houses (fire hazard) Recycling was limited before introducing the underground waste system with the integrated PAYT-fee.

Installing the underground pipe system is only possible with good cooperation from other infrastructure utilities.

Collecting household and commercial waste together is possible with ID-tracking.

CITY OF BERGEN (NORWAY)

Section	Description
Title of the practice	2.3. Flexible fee model
Proposers	BIR AS.
Contacts	Toralf Igesund, +47 915 68 613, toralf.igesund@bir.no
Useful links	http://bir.no/birprivat/Sider/FleksibelgebyrmodelliBergen.aspx
Start date	<ul style="list-style-type: none"> - 2009: 8 municipalities around Bergen. - 2016: Bergen.
Current Status	Implemented.
Location	9 municipalities in and around Bergen.
Inhabitants in the area	350,000

Description of the practice

Origin:

The goal was to reduce the amount of general household waste by rewarding customers for being environmentally aware and optimising selective collection.

Development and Timescale:

The process began in 2004, and all waste bins were tagged by the end of 2007. The pilot project was completed in one municipality in 2008. There was full-scale implementation in 8 municipalities from 2009.

Bergen implemented the model in January 2016.

Actors involved:

- 7 - The 9 owner municipalities of BIR AS.
- 8 - Suppliers; IT system and tags.
- 9 - Team of personnel installing the tags.

Legal framework:

BIR's regulations.
Pollution Act.
National guidelines.

Financial framework: (activity costs, activity revenue (if any), financial model/s used)

Ref. Ove Knudsen.

Use level: (%) or number of users (if possible):

- 100% in surrounding municipalities.
- Approximately 70% in Bergen. Target of 91% by 2018.

Results

Proven results (using indicators):

Difference between 2015 and 2016 in the municipality of Bergen:

- General waste reduced by 8.4%.
- Selective collection of plastic increased by 28%.
- Selective collection of glass and metal increased by 10%.
- Selective collection of paper and cardboard reduced by 5% (reflects the general reduction in use of paper).

Possible success factors:

Use of financial incentives for users rather than penalties.

Main difficulties encountered:

- Tagging all bins.
- Correctly tagging all bins.
- Software development.


Main lessons learnt from the practice

- The "tag" team must take ownership of the software and system.
- This is extremely important for good co-operation across the company organisation.

Additional information

Ongoing project developing existing software to include additional waste handling systems.

CITY OF TALLINN (ESTONIA)

Section	Description
Title of the practice	2.4. Packaging deposit refund system
Photograph	
Proposers	Ministry of the Environment.
Contacts	<ul style="list-style-type: none"> • Eesti Pandipakend, info@eestipandipakend.ee • Ministry of the Environment, keskkonnaministeerium@envir.ee • Tallinn Environment Department, keskkonnaamet@tallinnlv.ee
Useful links	http://eestipandipakend.ee/en/ http://www.envir.ee/en/
Start date	Year 2005.
Current Status	Ongoing.
Location	Republic of Estonia.
Inhabitants in the area	1,317,800

Description of the practice

Origin:

The packaging deposit collection system is organised at state level. All retailers of soft drinks and low-alcohol beverages (such as beer bottles, soft drink bottles, bottles for beverages with a low concentration of ethanol) whose POS has an area of >200 m² are obliged to accept a packaging deposit at their POS or on its service land.

In Estonia, the responsible producers' organisation Eesti Pandipakend, is active in organising the recycling of packaging marketed by producers, importers and traders. Their task is to manage and organise collection, transport, sorting, counting and recycling of packaging subject to deposit throughout Estonia, i.e. they deal with plastic, glass and metal packaging for water, fizzy drinks, beer and low-alcohol beverages.

Eesti Pandipakend is acting with accreditation from the Ministry of the Environment (issued on 11.03.2005).

Deposit emblem	Package type	Volume	Deposit in Euros
	Non-refillable plastic package	Up to 0.5 l (inc. 0.5 l)	0.10
	Non-refillable plastic package	Over 0.5 l (excl. 0.5 l)	0.10
	Non-refillable metal package	All volumes	0.10
	Non-refillable glass package	All volumes	0.10
	Refillable glass package	All volumes	0.10

Figure 4. All beverage packaging in the Eesti Pandipakend system bears the emblem shown in the table. This packaging can be returned to packaging deposit collection points

Packaging is collected by the retail seller. Transport of the packaging collected to the counting and sorting centre is organised by Eesti Pandipakend. Packaging without the Eesti Pandipakend marking cannot be accepted for return and no deposit is refundable. This packaging can be taken to public packaging containers, and consists of bottles from strong alcoholic beverages, glass jars, salad boxes, foodstuff packaging, and Tetrapak packaging, etc.

Development and Timescale:

The packaging deposit was established by the Minister of the Environment for glass and plastic bottles in year 2005. The packaging deposit refund system has been working in Estonia for 12 years and until now a total of 3.2 billion deposit packages have been collected.

Actors involved:

- Ministry of Environment.
- Eesti Pandipakend, the responsible producer's organisation.

Legal framework:

Deposit-packaging is one type of overall packaging and it is regulated at state level by several laws such as the Packaging Excise Duty Act, Packaging Act, Consumer Protection Act and Waste Act.

Financial framework:

According to the Packaging Act a packaging undertaking shall collect and recover the packaging of packaged goods placed on the market and the resulting packaging waste in such a way that recovery targets are complied with, and bear the resulting costs. Collection costs for deposit packaging are also covered by deposits not returned.

Results

Proven results (using indicators):

The quantity of returned deposit packaging is very high. Due to the financial incentive, residents gather a large number of packages together and return them to the collection points. The return percentage of reusable packaging is particularly important in order to ensure the longest possible lifetime of the package.

The deposit-packaging refund system gives particularly good results in countries with a lower environmental awareness or in sparsely populated areas, where it is not possible to develop a suitable abundance of container networks for public packaging collection.

Deposit packaging	Actual rate		Rate required by law	
	2007	2013	2007	2013
Sales, unit (million)	298	330		
Returned, unit (million)	204	241		
Rate of plastic bottles returned	90%	87%	65%	85%
Rate of cans returned	48%	64%	40%	50%
Rate of glass bottles returned	72%	89%	65%	85%

Figure 5. Deposit packaging recovery rates in Estonia in 2007 and 2013. No separate data is collected for Tallinn.

Possible success factors:

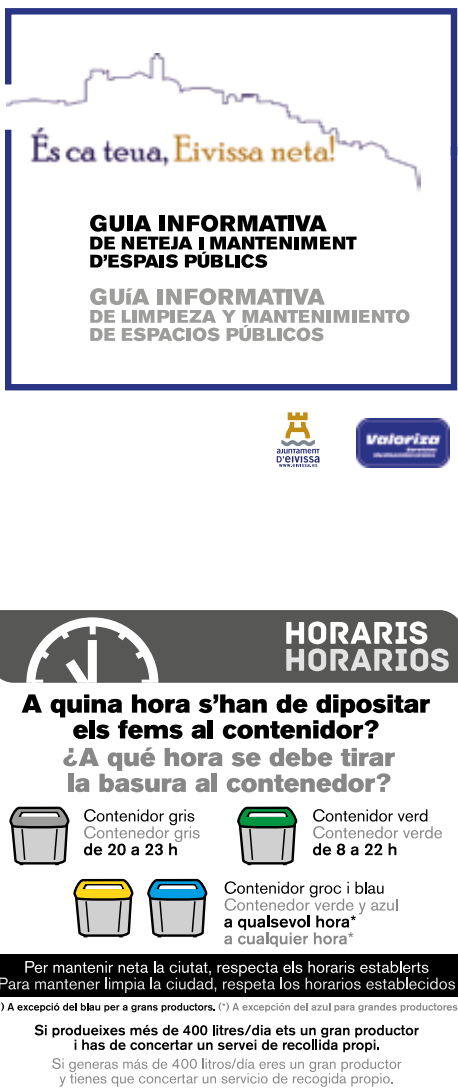
Soft drinks and low-alcohol beverages (such as beer bottles, soft drink bottles, bottles for beverages with a low concentration of ethanol) are included under packaging deposit refund system and more packaging is collected, reused and recycled.








Main difficulties encountered:

It is quite expensive for companies, who are obliged to accept deposit packaging at their POS or on its service land. The main costs are associated with buying and maintaining packaging vending machines. Deposit-packaging is only one kind of packaging and this system does not affect the overall collection and recycling of other packaging.

Main lessons learnt from the practice	The packaging deposit refund system is very effective and helps packaging waste not to end up in the environment. The Deposit-packaging collection rate is very high - up to 90% - due to fact that people pay the deposit when buying beverage which automatically motivates them to return these packages to the collection point to get a refund. The vending machine used at deposit- packaging collection points compresses the plastic and metal cans on site which minimises transport use and also CO2 emissions.
Additional information	http://eestipandipakend.ee/en/ http://www.envir.ee/en/

CITY OF IBIZA (SPAIN)

Section	Description
Title of the practice	2.5. Awareness campaigns on selective collection
Photograph	 <p>Ès ca teua, Eivissa neta!</p> <p>GUIA INFORMATIVA DE NETEJA I MANTENIMENT D'ESPAYS PÚBLICS</p> <p>GUÍA INFORMATIVA DE LIMPIEZA Y MANTENIMIENTO DE ESPACIOS PÚBLICOS</p> <p>ajuntament D'EIVISSA Valoriza</p> <p>HORARIS HORARIOS</p> <p>A quina hora s'han de dipositar els fems al contenidor? ¿A qué hora se debe tirar la basura al contenedor?</p> <p>Contenidor gris Contenedor gris de 20 a 23 h</p> <p>Contenidor verd Contenedor verde de 8 a 22 h</p> <p>Contenidor groc i blau Contenedor verde y azul a qualsevol hora* a cualquier hora*</p> <p>Per mantenir neta la ciutat, respecta els horaris establerts Para mantener limpia la ciudad, respeta los horarios establecidos</p> <p>(*) A excepció del blau per a grans productors, (*) A excepción del azul para grandes productores.</p> <p>Si produeixes més de 400 litres/dia ets un gran productor i has de concertar un servei de recollida propi. Si generas más de 400 litros/día eres un gran productor y tienes que concertar un servicio de recogida propio.</p>

	<div style="text-align: center;">  <h2 style="margin: 0;">FRACCIONS FRACCIONES</h2> <h3 style="margin: 0;">Cada residu al seu contenidor! ¡Cada residuo en su contenedor!</h3> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>BLAU AZUL</p>  <p>PAPER I CARTÓ PAPEL Y CARTÓN</p> </div> <div style="text-align: center;"> <p>GROC AMARILLO</p>  <p>ENVASOS (llaunes, brics, porexpan, paper d'alumini o film, etc.) ENVASES (latas, brics, porexpan, paper de alumini o film, etc.)</p> </div> <div style="text-align: center;"> <p>VERD VERDE</p>  <p>ENVASOS I AMPOLLES DE VIDRE ENVASES Y BOTELLAS DE VIDRIO</p> </div> </div> <hr/> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p>GRIS GRIS</p>  <p>RESTA DE RESIDUS RESTO DE RESIDUOS</p> </div> <div style="text-align: center;"> <p>TARONJA NARANJA</p>  <p>OLI ACEITE</p> </div> <div style="text-align: center;"> <p>BLANC o VERMELL BLANCO o ROJO</p>  <p>ROBA I JUGARROIS ROPA Y JUGUETES</p> </div> </div> </div>
Proposers	Municipality of Ibiza.
Contacts	Ibiza Municipal Environment Department, mediambient@eivissa.es Ibiza Municipal Communication Department, comunicacio@eivissa.es
Useful links	http://www.eivissa.es/ https://es-es.facebook.com/AjuntamentEivissa
Start date	Summer 2016.
Current Status	On-going.
Location	Municipality of Ibiza.
Inhabitants in the area	1,487 inhabitants in La Marina and Dalt Vila (this good practice extends to the entire municipality).
Description of the practice	

Origin:

Residents, tourists and an important business sector, with a high turnover of owners and employees from one season to the next, coexist in the Heritage area. The lack of information causes non-compliance with waste regulations, problems with waste collection and an overall bad image of the heritage area.

For quite some time, the town hall has been distributing letters, informing about the waste regulations, to the business in the La Marina neighbourhood. The letters were rather long and usually the business sector did not pay too much attention to them. The economic resources of the town hall for awareness campaigns were limited.

Development and Timescale:

In June 2016 Ibiza renewed its waste collection service. An external company provides this new waste collection service. Part of the company's fees (0.4%) has to be allotted to awareness campaigns.

In the summer of 2016 a corporate image was designed for all the awareness campaigns with the aim that they would be highly visual and easy to understand.

The first campaign was directed at social networks. It consisted of short messages about good practices in waste collection and keeping roads and beaches clean.

In September 2016, specific brochures for the business sector were published. Environmental educators distributed and explained them.

In May 2017, specific posters for locals were published, to be put up in the communal areas of buildings. The town hall recruited a social insertion company to put these posters up.

The business awareness campaign continues this year too.

Actors involved:

- Ibiza Municipal Environment Department.
- Ibiza Municipal Communication Department.
- Waste Collection Company (Valoriza Servicios Medioambientales S.A.).

Legal framework:

There is no legal framework of application.

Financial framework:

The awareness campaigns are financed with part of the remuneration of the municipality waste collection company - approximately €20,000 per year.

Level of implementation:

The awareness campaigns are designed for the entire municipality: locals and the business sector. During the winter season the campaigns are directed at locals and the business sector that opens all year round. Early on in the season the campaigns are directed at people coming to the municipality on holiday or to a second home and at the business sector that only opens during the tourist season.

The aim, every year, is to reach the entire business sector and as many people as possible.

Results

Proven results:

The awareness campaigns are designed for the entire municipality, so it is not possible to extract the results for the heritage area. However, as the heritage area is more compact than the rest of the municipality every year can be visited almost the 100% of the business sector.

Possible success factors:

The information is communicated through short, clear messages and visual language has an important role in the awareness campaigns.

The information is specific and differs for the business sector and locals.

The awareness campaigns are designed in several languages due to number of foreign nationals living and working in the heritage area.

The awareness campaigns are repeated every year.

Main difficulties encountered:

In La Marina there is a significant turnover of commercial and bar and restaurant owners and employees from season to season. Many residents also change from season to season.

The lack of space on premises makes storing waste and respecting schedules difficult.

Most of the businesses are only open during the tourist season and during this season they are too busy to pay attention to environmental educators or to the brochures.

Main lessons learnt from the practice	<p>The best time to start the awareness campaigns is at the start of season when businesses and locals are less busy.</p> <p>The messages have to be short, easy to understand and visual. It is better if they are in several languages (English, as a minimum) to reach as many people as possible.</p> <p>The awareness campaigns have to be supplemented with police control.</p>
Additional information	Not applicable.

Different strategies relating to selective collection scheme



CITY OF CORDOBA (SPAIN)

Section	Description
Title of the practice	2.6. Separate Wet and Dry waste collection
Photograph	 
Proposers	SADECO/Municipality of Cordoba.
Contacts	Jesús Diz Pérez. +34 957762000. buzon@sadeco.es
Useful links	www.sadeco.es
Start date	1994.
Current Status	Ongoing.
Location	City of Cordoba.
Inhabitants in the area	328,000 inhabitants.

Description of the practice

Origin:

The organic fraction is, in some city areas, 50% of the total waste deposited in containers.

From 1994 onwards the separation of the 2 main fractions was planned at origin, at homes: the organic fraction on the one side (wet) and packaging and inert on the other (dry).

Development and Timescale:

The pilot test took place in a highly populated district in the city of Cordoba and later, progressively, it was extended to the rest of the city, finally covering the entire city and population. Nowadays 100% of collection in public spaces is based on this separation.

Actors involved:

Residents and associations.

Legal framework:

Circular economy directives.

Cordoba city council Ordinance on Urban Hygiene.

State framework for waste management in Spain.

Financial framework:

- This type of collection costs 30% more than the average ordinary cost, and is calculated at €78/tonne (instead of €60/tonne).
- Furthermore, awareness raising campaigns are necessary to make the new model popular (around €30,000/year).

Use level: (%) or number of users (if possible):

100% - 328,000 inhabitants of the city of Cordoba are users of the separation model.

Results**Proven results (using indicators):**

Compared to the average for Andalusia, there was a 230% increase in packaging recovered from 2010 to 2014, rising from 7.2 to 23.8 kg/inhabitant/year.

Possible success factors:

Only 2 waste bins/containers needed in homes and on streets for collection of the main fractions.

High potential for recycling.

Work with different associations and civil groups, communication campaigns, wide distribution of 2-section recipients.

Main difficulties encountered:

The main difficulty was changing people's deep-rooted habits.

It is necessary to persevere, with ongoing campaigns to raise awareness about the importance of changing habits.

Main lessons learnt from the practice

Need for citizen engagement.

Need to persist with campaigns.

CITY OF PORTO (PORTUGAL)

Section	Description
Title of the practice	2.7. Integration of different systems for selective collection in line with Ribeira's unique features
Photograph	  

Proposers	Municipality of Porto.
Contacts	Pelouro da Inovação e do Ambiente: pelouro.ia@cm-porto.pt +351 222 097 161
Useful links	www.cm-porto.pt
Start date	Not applicable.
Current Status	Ongoing.
Location	Portugal, Porto, Heritage City Centre.
Inhabitants in the area	7000

Description of the practice

The Heritage City Centre is a highly diverse area for several reasons. First of all, the people who go to the heritage city centre do so for different purposes: there are people who live there, people who work there, people that go there in their free time and tourists getting to know the city. With respect to building occupation and use, there are residential properties, restaurants, coffee shops and bars, shops and hotels, etc. Nevertheless, the urban structure is also highly diverse throughout the entire area of the historic centre. All these factors depend on their location in the Heritage City Centre. There are some areas where tourist and recreational activities are more intense than others, where residential occupation prevails. Because of this, we are forced to have different waste collection and management systems, operating in parallel as an integrated system.

Origin:

In order to respond to the different requirements for waste management, over time we have been adjusting the system and developing specific schemes for specific areas in the Heritage City Centre. At the moment, for the commerce sector, we have a door-to-door selective collection system which is specific to Ribeira, which we have already presented and explained. However, as Ribeira's occupational and infrastructure features are unique, we have a slightly different system for door-to-door selective collection of business waste in the rest of the historic area. On the other hand, we needed to address household waste production as well as the waste produced by people working in, of visiting, the historic centre. To manage this waste, we use various types of street bins, adjusted to the location according to the urban structure and the amount and type of waste production. As we have said before, the preferential type of street bin is underground containers but we have also some semi-underground containers and surface bins. At the moment we are also carrying out studies in order to implement a door-to-door selective collection system for household waste. However, even in a scenario where door-to-door collection systems are fully operational in both sectors, they will always have to coexist with street bins. Therefore, the integration and interaction of different waste management systems in Heritage City Centre is inevitable and of the utmost importance.

Development and Timescale:

Selective collection in the Heritage City Centre began exclusively with surface street bins, for business and household waste. Over time, we have been improving this equipment by installing other kinds of bins - semi-underground and underground (2010).

We started door-to-door collection from businesses in the city in 2008, with around 190 users located only in the main commercial street of the city, and we called it “Baixa Limpa”. Since then, the system’s operational area and the number of users have been growing throughout the city, including the Heritage City Centre. Once we realised that the standards we had developed for the system could not be applied in Ribeira, we started adjusting the system and developing different strategies for Ribeira’s unique features. The specific system for multi-material selective door-to-door collection in Ribeira was put in place in 2015. In 2016 we started to study the applicability of a similar approach for household waste, in order to develop a system that suits all the inhabitants of the Heritage City Centre.

At the moment all the collection systems used in the Heritage City Centre are mature and completely operational. However, we are aware that there is still potential for expansion of the door-to-door collection system for businesses. Besides that, the behaviour of waste production is continuously changing because of city development, especially in the Heritage City Centre where tourism patterns have been evolving drastically in the last few years. Nevertheless, targets for waste recovery are getting higher and higher. Therefore, the integrated waste management system has to be permanently adjusted and evolving in order to keep up with city development and waste recovery targets.

Actors involved:

Once we had discussed the various components of an integrated system, each one of them was developed with the involvement of different actors. The street bin location selection and installation works required the collaboration of several City Council departments, such as planning and archaeology. For the door-to-door collection systems we had to involve not only the owners and employees of the commercial premises, but also the Parish Councils. Lipor (inter-municipal waste management system) gave great support too, by providing the necessary material and awareness campaigns. If, in the future, we go ahead with the door-to-door collection system for the residential sector, we will have to involve all the inhabitants of the Heritage City Centre directly and we will definitely need the support given by Lipor, which is also collaborating in the studies that we are working on.

Legal framework:

Apart from all the issues relating to street cleanliness, fulfilling users’ needs and the operational aspects of the waste management system, all the efforts we put into improving the selective collection system were based on legal obligations imposed by the European waste framework legislation. In order to achieve the targets set by the European Commission for waste management with respect to waste recovery, reuse and recycling, our action plan includes several actions to be developed and implemented until 2020. Two of these actions are directly related to the work that we described: the expansion of the door-to-door selective collection systems in the business sector and implementation of the system in the residential sector.

Financial framework:

We cannot calculate the cost associated with the integrated waste management system operating in the Heritage City Centre.

Regarding the financing model, since the expansion of the door-to-door selective collection system for businesses, and its implementation in the residential sector, are addressed by the municipal action plan developed within the scope of the legal framework, the development of these actions is dependent on approval of our application for Community funds.

The taxation model is the same for all users, regardless of the waste management model. The individual waste management fee depends on water consumption.

Use level: (%) or number of users (if possible):

According to the standards defined by the national regulatory body for waste management systems, the selective collection system in the Heritage City Centre has a coverage rate of 100%. This means that all 7,000 inhabitants of the historic centre have access to the selective collection system.

Regarding the door-to-door collection in the business sector, in Ribeira the coverage of this system is 100%, relating to approximately 100 commercial premises which are served by it. The other door-to-door selective collection system has around 515 users in the entire city, 65 of them are located in the Heritage City Centre.

Finally, in the studies that we are carrying out to put a door-to-door selective collection system in place in the residential sector, we are considering all the houses located in the historic centre and the entire population of the area.

Results

Proven results (using indicators):

We cannot measure the amount of waste collected specifically in the Heritage City Centre, so it is not possible to quantify the waste recovery results associated with selective collection in the historic centre.

Possible success factors:

By adjusting the selective collection system to the urban characteristics and user needs we can ensure better results in terms of waste recovery, and also better operational conditions. If the system is adapted to urban characteristics, then its operation is easier and more efficient. If the system suits user needs, then collaboration is better and the participation rate is higher.

Main difficulties encountered:

The main difficulty associated with an integrated system, where several waste collection models have to coexist, is to ensure that each user uses the system component that is meant for them. When this does not happen problems may arise in relation to scaling the systems and also may be reflected in the expected results.

Main lessons learnt from the practice	The performance of a waste collection system is directly related to its suitability for the environment where it operates. Each place is unique in one way or another and the waste collection system has to be built on that uniqueness. The better a system fits into a specific place, the better the results achieved.
Additional information	Not applicable.

CITY OF KRAKOW (POLAND)

Section	Description
Title of the practice	2.8. Selective waste collection services for bulky and green waste, WEEEs and waste textiles
Photograph	
Proposers	Municipal Service Company Ltd. - the administrator of the waste management system in Municipality of Krakow.
Contacts	Piotr Odorcuk – a press officer of the Municipal Service Company, +48 12 646 2380, +48 12 646 22 22, rzecznik@mpo.krakow.pl, mpo@mpo.krakow.pl
Useful links	www.mpo.krakow.pl www.mpo.krakow.pl/firma/selektywna-zbiorka-odpadow www.mpo.krakow.pl/aktualnosci/program-odbioru-odpadow-zielonych-od-3-kwietnia www.mpo.krakow.pl/nowe-zasady/harmonogramy www.mpo.krakow.pl/elektrobrygada www.100procentkorzysci.pl
Start date	<ul style="list-style-type: none"> • 1st July 2013 – bulky waste collection service. • January 2014 – green waste collection service. • May 2014 – WEEE collection service. • December 2015 – waste textiles collection service.
Current Status	Ongoing.
Location	Municipality of Krakow including the Heritage City Centre.
Inhabitants in the area	768,000 – inhabitants of the Municipality of Krakow (including 1536 inhabitants of the Heritage City Centre).

Description of the practice

Origin:

Selective waste collection services for bulky waste, green waste, WEEE – ‘Electroteam’ and waste textiles – ‘100% benefits’ are the result of:

- adjusting to the rules of local law, especially the law on maintaining cleanliness and order in municipalities and the act of local law,
- ensuring selective collection of each type of waste in exchange for a fee,

- improving the effectiveness of selective collection,
- facilitating disposal of difficult waste by property owners.

Development and Timescale:

The administrator of the waste management system in the Municipality of Krakow set up a schedule for bulky waste and green waste collection. The collection service is carried out at the road side. Bulky waste is delivered to a transfer station and green waste to a composting plant.

The 'Electroteam' programme involves collection of WEEE directly from the citizens of Krakow after a telephone call. The team arrives at the property to collect WEEE and then delivers them to a transfer station.

The '100% benefits' programme provides reception of waste textiles. Residents can call to request textile collection. On the agreed date, textiles are collected directly from the property and then go to Polish Red Cross workers who select collected textiles that can be passed to the needy. Other textiles are disposed of as waste in the Municipal Service Company installations.

Factors involved:

The services are provided by the Municipal Service Company. The '100% benefits' programme includes collaboration with the Polish Red Cross.

Legal framework:

The legal framework relating to providing selective waste collection services includes: the law on maintaining cleanliness and order in municipal districts and the act of local law - the Regulations on maintenance of cleanliness and order in the Municipality of Krakow established by the Krakow City Council.

Financial framework:

In 2016 the cost of selective bulky waste and WEEE collection services were around 6,661,000 PLN (~1,560,000 EUR), including the 'Electroteam' programme. The cost of the selective green waste collection service was around 11,358,000 PLN (~2,660,000 EUR).

Use level:

768,000 – inhabitants of the Municipality of Krakow (including 1,536 inhabitants of the Heritage City Centre).

Results

Proven results (using indicators) and success factors:

The success factors of proper selective waste collection are:

- selective waste management education.
- ensuring collection of each type of waste.
- production of:
 - alternative fuel (RDF) from selectively collected bulky waste.
 - compost from selectively collected green waste.
- raw materials recovery from WEEE.
- minimisation of negative environmental impact (hazardous waste treatment).
- charity work with reuse of second-hand clothes.

Main difficulties encountered:

Property owners accidentally put green or bulky waste in an inappropriate place with difficult access for collection, where a waste collection truck is unable to drive in. This makes waste collection either impossible or the waste needs to be removed manually. Property owners sometimes do not follow the schedule for selective waste collection.

<p>Main lessons learnt from the practice</p>	<p>Selective waste collection services for bulky waste, green waste, WEEE and waste textiles ensure selective collection of each type of waste, including problematic and hazardous ones. They minimise negative environmental impact, improve the effectiveness of selective collection and enable production of RDF, compost and recovery of raw materials. Thanks to the cooperation between the Municipal Service Company and the Polish Red Cross in the '100% benefits' programme, the needy receive useful clothes which are the result of reusing waste textiles.</p>
<p>Additional information</p>	<p>www.mpo.krakow.pl www.mpo.krakow.pl/firma/selektywna-zbiorka-odpadow www.mpo.krakow.pl/aktualnosci/program-odbioru-odpadow-zielonych-od-3-kwietnia www.mpo.krakow.pl/nowe-zasady/harmonogramy www.mpo.krakow.pl/elektrobrygada www.100procentkorzysci.pl</p>

Specific fractions



CITY OF TALLINN (ESTONIA)

Section	Description
Title of the practice	2.9. Separate collection of used clothing
Photograph	
Proposers	City of Tallinn.
Contacts	<ul style="list-style-type: none"> • Tallinn Environment Department, keskkonnaamet@tallinnlv.ee • Tallinn Waste Centre, info@prugi.ee • Humana Estonia info@humanae.ee • Non-profit organization Riidepunkt, riidepunkt@gmail.com • Haabersti District Government, head of administration department, Tonu.Kivimaker@tallinnlv.ee • Tallinn City Centre District Government, specialist in the City Environment Department, Henri.Jurlau@tallinnlv.ee • Kristiine District Government, specialist in the City Economy Department, Anu.Sygis@tallinnlv.ee • Lasnamäe District Government, deputy head of the urban department, Diana.Buchmann@tallinnlv.ee • Mustamäe District Government, head specialist of the urban department, Urmas.Kopp@tallinnlv.ee • Nõmme District Government, head specialist of the city property department, Mart.Miidu@tallinnlv.ee • Piritä District Government, head specialist of the urban department, Merike.Kalam@tallinnlv.ee • Põhja-Tallinna District Government, deputy head of the urban department, Arvo.Soorand@tallinnlv.ee
Useful links	Tallinn Waste Centre. https://www.prugi.ee/portal/en/riidekonteinerid/

	<p>City of Tallinn http://www.tallinn.ee/est/Kasutatud-riided-8 (only in Estonian)</p> <p>Humana Estonia http://www.humanae.ee/?lang=en</p> <p>Non-profit organization Riidepunkt https://www.facebook.com/Riidepunkt-142102075814413/</p>
Start date	Year 2010.
Current Status	Ongoing.
Location	City of Tallinn.
Inhabitants in the area	445,000

Description of the practice

Origin:

Tallinn is the only municipality in Estonia with a network of used clothing collection containers. Used clothing, shoes, and also toys, are collected in special containers installed by Tallinn Waste Centre non-profit organization MTÜ Riidepunkt. Collection from containers installed by Tallinn Waste Centre is organised by Humana Estonia. There are 23 containers installed by Tallinn Waste Centre and 18 by the non-profit organization, Riidepunkt.

The clothing and shoes are sold in second-hand shops or donated to local charity organisations (homeless shelters and animal shelters, etc.). The size of the container is about 200 l. Containers are weatherproof, safe and very easy for everyone to use. The locations for the containers are chosen according to where they are presumed to be used most actively, e.g. next to large supermarkets/shopping malls.

These 41 containers, which are located in different locations throughout the City of Tallinn are only used for collection of old, but still usable and decent, clothes, shoes and toys, so that these items may be sent for reuse.

Development and Timescale:

The first containers for collecting used clothing were set up in 2010 by the non-profit organisation Riidepunkt in the Kristiine city district. Today the number of containers established by the non-profit organization is 18. In 2013 Tallinn Waste Centre set up an extra 23 containers for selective collection of old used clothes. Today, in 2017, the statistics show that the amount (kg) of items collected through this kind of collection system increases every year and selective collection works.

Actors involved:

- Tallinn Environment Department.
- Tallinn City District Governments.
- Tallinn Waste Centre.
- Non-profit Organisation (MTÜ Riidepunkt).

Legal framework:

There is no direct legal framework for this type of used clothing collection system. This system minimises the quantity of items such as old clothes, shoes, toys etc. in mixed municipal waste and contributes to overall waste reduction.

Financial framework:

Revenue from the sale of used clothing covers collection expenses.

Results

Proven results (using indicators):

Containers which are set up to collect old clothes are designed to be weatherproof, safe and also very easy to use. The containers' appearance is suitable to the city surroundings and they are usually placed near to public packaging containers or supermarkets/malls. Clothes and other items collected with these containers are given to charity organisations or people in need. The majority is sent to the Humana Sorting Centre OÜ organisation, which then sends all suitable items for reuse.

Clothing containers have become very popular among citizens and the quantities collected using this system have almost tripled in two years.

	2014	2015	2016
Tallinn Waste Centre	134,654	332,257	350,875
Non-Profit organisation MTÜ Riidepunkt	n/a*	41,500	55,700
Total (kg)	134,654	373,757	406,575

*No data

Figure 5. Quantity of old clothing collected from containers in 2014-2016.

About 5% of the quantity of old clothing collected is not suitable for reuse and is incinerated.

Possible success factors:

The popularity of clothing containers among citizens shows that it is a very successful way to promote selective collection and to contribute to waste reduction through reuse.

Main difficulties encountered:

The main difficulty with containers used for clothes collection is that some people tend to put waste into the containers (such as municipal waste, construction waste and packaging waste) that does not belong there.

Main lessons learnt from the practice	<p>There is an opportunity to increase selective collection of old clothing, shoes, and other similar items, by increasing the number of containers in the city districts.</p> <p>Container collection of old clothing, textiles and toys offers the chance to decrease quantities of this waste type in mixed municipal and packaging waste.</p> <p>Containers should be located near to places which are more actively used by the public (e.g. supermarkets /malls, public recycling containers).</p> <p>Containers have to be weatherproof and easy to use to provide decent items for reuse.</p>
Additional information	<p>Tallinn Waste Centre. https://www.prugi.ee/portal/en/riidekonteinerid/</p> <p>City of Tallinn. http://www.tallinn.ee/est/Kasutatud-riided-8 (only in Estonian)</p> <p>MTÜ Riidepunkt. https://www.facebook.com/Riidepunkt-142102075814413/</p>

CITY OF IBIZA (SPAIN)

Section	Description
Title of the practice	2.10. Specific collection of commercial cardboard
Photograph	
Proposers	Municipality of Ibiza.
Contacts	Ibiza Municipal Environment Department, mediambient@eivissa.es
Useful links	http://www.eivissa.es/ (only in Spanish and Catalan)
Start date	Summer 2012.
Current Status	Ongoing.
Location	Neighbourhood of La Marina.
Inhabitants in the area	910

Description of the practice

Origin:

Different waste producers co-exist in the neighbourhood of La Marina: residents, businesses and the catering sector. Each of them has different working hours and specific requirements for disposing of their waste, but businesses, bars and restaurants share the fact that their premises are very small and they generate large quantities of cardboard that they are unable to store.

In this neighbourhood, the waste containers are underground and it is difficult for the business sector to deposit cardboard in the containers. As a result, the waste collection company found cardboard in all the containers, not just in the cardboard container and there was cardboard all over the streets and pavements. If cardboard is mixed with organic waste it cannot be recycled.

To try and solve this problem, Ibiza city council installed specific deposits for commercial cardboard in certain areas and increased the frequencies for collection.

To try and solve this problem, Ibiza city council installed specific deposits for commercial cardboard in certain areas and increased the frequencies for collection.

Development and Timescale:

Since 2012, shops and restaurants must leave their cardboard folded next to the containers or on their doorstep at closing time. Different closing times, lack of space to store the paperboard on the premises, narrow pavements and the amount visitors compounded the problem.

In 2012 Ibiza city council installed 3 specific containers for commercial cardboard, which were well received by the business sector and, in 2013, 3 more containers were installed.

In June 2016 the municipality of Ibiza renewed its waste collection service and the frequencies for cardboard collection were increased from twice daily to three times a day (14.00, 18.00 and 02.00).

Actors involved:

- Ibiza Municipal Environment Department.
- Ibiza Municipal Heritage Department.
- Waste Collection Company (Valoriza Servicios Medioambientales S.A.).
- Commercial and catering sector associations.
- Commercial and catering sector owners and employees.

Legal framework:

All items to be installed in the heritage area have to be approved by the Heritage Department.

Containers installed in squares and on pavements have to respect accessibility regulations.

Financial framework:

The Ibiza city council bears the cost of the containers and the cost of the cardboard collection frequency.

The total cost of the six containers installed in La Marina was €9,000.

It is not possible to calculate the cost of cardboard collection in the heritage area because it is included within the municipality's total waste collection costs.

Degree of implementation:

The commercial cardboard containers and increased collection frequencies cover all the commercial and catering businesses in the neighbourhood.

Results

Proven results:

Due to the selective collection rate being calculated for the entire municipality, it is not possible to measure the increase of cardboard collection since the specific containers were installed.

Possible success factors:

The specific containers for depositing cardboard are convenient, so they are used more by businesses. Cardboard collection frequencies are higher than waste collection frequencies to make up for the lack of space at the premises, making it easier for the business and catering sectors to recycle cardboard, rather than mixing it with waste.

Environmental awareness has increased over time.


Main difficulties encountered:

Two types of cardboard collection coexisted in La Marina: underground containers for residents and specific containers for the business and catering sectors. It is important for each stakeholder to use the correct container.

In La Marina there is a significant turnover of business, bar and restaurant owners and employees from season to season, so new owners or employees may not know about the cardboard collection system.

Main lessons learnt from the practice	<p>Waste collection systems and frequencies have to be adapted to the requirements of the stakeholders.</p> <p>Awareness campaigns are needed every year to promote selective collection and good practices in waste collection.</p> <p>Police control is needed to ensure a correct management of waste.</p>
Additional information	Not applicable.

CITY OF CORDOBA (SPAIN)

Section	Description
Title of the practice	2.11. Promotion of separation in the organic fraction
Photograph	
Proposers	SADECO / Municipality of Cordoba.
Contacts	Jesús Diz Pérez. +34 957762000. buzon@sadeco.es
Useful links	www.sadeco.es
Start date	1994.
Current Status	Ongoing.
Location	City of Cordoba.
Inhabitants in the area	328,000 inhabitants.
Description of the practice	
<p>Origin, development and timescale:</p> <p>The starting point was the city plan to separate the organic fraction to make compost. The initiative is ongoing today.</p> <p>Throughout the year, several initiatives are announced and implemented, compost bags are distributed and information is provided in the streets and at other social points.</p> <p>In parallel, in schools, during the academic year, there are also various initiatives to promote recycling and the use of compost.</p> <p>Associations and locals receive Sadeco compost in return for promoting separation of organic waste at home.</p> <p>Actors involved:</p> <p>Residents, schools, inmates of the provincial prison, local bodies and associations.</p> <p>Legal framework:</p> <p>Circular Economy Directives. Cordoba City Council Ordinance on Urban Hygiene. State framework for waste management in Spain.</p>	

Financial framework:

The budget allocated for the action is €30,000/year which covers events raising awareness, public interventions for separation, the participation of the SADECO Educational Service and agreements with different city organisations to reproduce the initiative.

Use level: (%) or number of users (if possible):

100% - the 328,000 inhabitants of the city of Cordoba are potential addressees of the action.

Results**Proven results (using indicators):**

Increase of 19% in compost at composting sites thanks to better separation at source from 2010 to 2014.

Possible success factors:

Workshops with school pupils.

Demonstrations and samples shared with locals to illustrate the use of compost.

Main difficulties encountered:

The main difficulty consists of changing people's deep-rooted habits.



It is necessary to persevere and continue raising awareness about the importance of changing habits.

Main lessons learnt from the practice

Need for citizen engagement.

Need to persist with effective campaigns.

CITY OF PORTO (PORTUGAL)

Section	Description
Title of the practice	2.12. Food Waste Selective Collection
Photograph	 
Proposers	Municipality of Porto.
Contacts	Pelouro da Inovação e do Ambiente: pelouro.ia@cm-porto.pt +351 222 097 161.
Useful links	www.cm-porto.pt
Start date	2008.
Current Status	Ongoing.
Location	Portugal, Porto, Heritage City Centre.
Inhabitants in the area	7000

Description of the practice

Origin:

The Heritage City Centre is a highly diverse area for several reasons. First of all, the people who go to the heritage city centre do so for different purposes: there are people who live there, people who work there, people that go there in their free time and tourists getting to know the city. With respect to building occupation and use, there are residential properties, restaurants, coffee shops and bars, shops and hotels, etc. The urban structure is also highly diverse throughout the entire area of the historic centre. All these factors depend on their location in the Heritage City Centre and on the waste collection system needed, as well as the potential for food waste collection.

At the moment we do selective collection of commercial food waste in the entire city, using a door-to-door collection system. However, different locations have different characteristics and different needs for the waste management system. This kind of differentiation is present in the Heritage City Centre because of its diversity. In order to respond to the different requirements of each area, over time we have adjusted the food waste collection system and developed specific schemes for specific areas in the Heritage City Centre. At the moment, we have a specific system for Ribeira, that we have already presented and explained, and a slightly different system for the rest of the historic area.

Development and Timescale:

In order to recover the organic fraction of urban waste, in 2008 we started to collect food waste selectively from some commercial premises producing food waste. After the implementation phase, we began to expand the system intervention area throughout the city, including the Heritage City Centre. Once we realised that the standards we had developed for the system could not be applied in Ribeira, we started adjusting the system and developing different strategies for Ribeira's unique features. The specific system for selective food waste door-to-door collection in Ribeira was implemented in 2015.

As has been explained in the case of the selective collection system, at the moment the food waste door-to-door collection systems are mature and completely operational. However, we are aware that there is still potential for expansion. Besides that, waste production behaviour is changing continuously because of city development, especially in the Heritage City Centre where tourism patterns have been evolving drastically in the last few years. Nevertheless, the targets for waste recovery are getting higher and higher. Therefore, we continue to carry out studies to expand the system, to include new users and increase the system's coverage rate in the entire city.

Actors involved:

After the design and planning phases we started to implement the system. In order to ensure the operability of the service, we had to involve commercial premises' owners and employees. The first step was to explain the changes that were about to happen in the systems to them and ask for their collaboration. We tried to emphasise the advantages of this new system by heightening awareness, and also involving the Parish Councils and restaurant and bar owners. The system works based on the direct collaboration of the municipality and the business owners, but also with the collaboration of the Parish Councils.

Legal framework:

Apart from all the issues relating to street cleanness, fulfilling users' needs and the operational aspects of the waste management system, all the efforts we put into improving the selective collection system were based on legal obligations imposed by the European waste framework legislation. In order to achieve the targets set by the European Commission for waste management with respect to waste recovery, reuse and recycling, our action plan includes several actions to be developed and implemented until 2020. One of these actions are directly related to the work that we described: the expansion of the door-to-door selective food waste collection systems in the business sector.

Financial framework:

We cannot be precise about the costs and revenues associated with the system. However, we can be sure that no food waste was recovered before the system was put in place, as previously it was thrown away with unsorted waste. Therefore, putting the system in place meant a decrease in general waste sent for incineration and a subsequent decrease in waste treatment costs. On the other hand, operational requirements are greater and therefore operational costs increased.

Regarding the financial model, since the expansion of the door-to-door selective collection system for businesses is addressed by the municipal action plan, developed within the scope of the legal framework, the development of these actions is dependent on approval of our application for Community funds.

The taxation model is the same for all users, regardless of the waste management model. The individual waste management fee depends on water consumption.

Use level: (%) or number of users (if possible):

In Ribeira the coverage of this system is 100%, relating to approximately 100 commercial premises which are served by it. The other door-to-door selective food waste collection system has around 525 users in the entire city, 32 of them are located in the Heritage City Centre.

Finally, in the studies that we are carrying out to put a door-to-door selective collection system in place in the residential sector, we are considering all the houses located in the historic centre and the entire population of the area.

Results**Proven results (using indicators):**

The door-to-door selective collection system in Ribeira recovers around 330 tonnes of food waste per annum. For the users located in other places in the Heritage City Centre, we estimate that the amount of waste collected is around 165 tonnes (we cannot be precise about this value because the collection service is not exclusive of the historic centre, as it includes several users outside the heritage area). Therefore, in the Heritage City Centre, we recover a total of approximately 500 tonnes per year, which would not be recovered at all if this system did not exist.

Possible success factors:

By adjusting the food waste selective collection system to the urban features and the user's needs we can ensure better results in terms of waste recovery and also better operational conditions. If the system is adapted to the urban features, then its operation is easier and more efficient. If the system suits user needs, then collaboration is better and the participation rate is higher.

Main difficulties encountered:

The main difficulty in planning an expansion of the door-to-door collection system is the perception of what will be the best strategy and the most suitable configuration for the system. Determining the critical aspects and the major struggles that may occur is a very complex task entailing a lot of hard work.

Main lessons learnt from the practice	The performance of a waste collection system is directly related to its suitability for the environment where it operates. Each place is unique in one way or another and the waste collection system has to be built on that uniqueness. The better a system fits into a specific place, the better the results achieved.
Additional information	Not applicable.



3. Good Practices for Integrating Waste Management Solutions into Urban Décor of Heritage Areas

Location of containers



CITY OF PALMA DE MALLORCA (SPAIN)	
Section	Description
Title of the practice	3.1. Removable Mobile Bin Areas in Palma de Mallorca
Photograph	
Proposers	<p>Case studies and application.</p> <p>Case 1: Granollers Council, Catalonia (ES). Case 2: Palma Council, Balearic Islands (ES).</p>
Contacts	<p>Case 1: Granollers Council, Catalonia (ES). Servei de Serveis i Via Pública. C. Sant Jaume 16-25 5a Despatx 504. 08401 Granollers Spain. Tel: +34 938603206.</p> <p>Case 2: Palma Council, Balearic Islands (ES). Oficines Centrals – Edifici Joan Maragall. Tel: +34 971774300. emaya@emaya.es</p>
Useful links	<p>Case 1: Granollers Council, Catalonia (ES). Granollers Council, Environment: Reciclar a l'illa de vianants (online), 2017. [Recycling in the pedestrian area] Available: http://www.granollers.cat/medi-ambient/reciclar-illa-vianants</p> <p>Case 2: Palma Council, Balearic Islands (ES). Palma Council, EMAYA, Services: Nou servei de recollida selectiva mòbil (online), 2017. [New mobile selective collection service] Available: https://www.emaya.es/ca/recollida/nousistemarecollidaselectivamobil</p>
Start date	Case 1: Granollers: March 2012. Case 2: Palma: May 2017.
Current Status	Ongoing.
Location	<p>Area of application.</p> <p>In towns where this kind of collection is already underway, it is used in zones where there is not enough space to place bins and where these must be well-integrated due to the environment where they are located. Such zones tend to be the historical centres of towns, many of them pedestrianised, and where there is a lot of commercial activity and tourism.</p>

<p>Inhabitants in the area</p>	<p>Case 1 - Granollers: 1,478 inhabitants in the Old Town (2014). The number of business activities in the Old Town is not available. General data on the city of Granollers:</p> <ul style="list-style-type: none"> - 2,273 economic activities open at street level (shops, bars and restaurants) at 2017 (official data from Granollers Council). - 307 empty premises at 2017 (official data from Granollers Council). - 17,407 people registered with Social Security as working in the services sector in June 2017 (Idescat data). <p>Case 2 - Palma de Mallorca: 25,561 inhabitants in the Old Town (2017). The number of business activities in the Old Town is not available. General data on the city of Palma:</p> <ul style="list-style-type: none"> - 38,705 registered with Social Security with hotels and catering as their place of work (lbestat data).
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Description of the practice

The practice consists of creating a new separate waste collection service in the city's historical centre where bins cannot be permanently sited due to the features of the area (narrow streets and inaccessible zones, etc) or for aesthetic reasons (presence of historical monuments and business areas, etc.). Bins are placed on public thoroughfares on a daily basis and left there for a specific length of time. The most appropriate period is during the evening/night (between 6 pm and 11 pm).

The bins are transported using electric vehicles to reduce noise pollution for residents. The bins are transported and placed at specific points in the zone and users must place their waste in them during the length of time specified. At the end of this period, the bins are taken to the transfer station and emptied. They are then stored at the same station, or at another suitable location. In order to make the service more efficient, the bins make up a single platform which is easier and faster to install and remove.

This mobile platform can be made up of different bins, with a minimum of one bin for each type of waste (general, organic, plastic, paper and glass), of different sizes. Depending on the waste produced, more bins for any of these types of waste can be added.

Origin:

The need to increase access for locals and business premises to selective waste collection in zones of historical or aesthetic interest and given the little space available to locate the bins (and even more limited vehicle access).

Development and Timescale:

- Phase 1: Preliminary study carried out (months 1, 2 and 3).
 - Zone of action defined.
 - Waste production analysed (commercial and residential premises).
 - Size of human and material resources assessed.
 - Location of the installation points for platforms and service routes.
 - Additional bins defined in periphery zones.
- Phase 2: Communication campaign (months 3, 4 and 5).
- Phase 3: Implementation & start-up of the service: removal of the bins (months 5 and 6).
- Phase 4: Follow-up & Evaluation (months 6, 7, 8 and 9).
 - Adjustment of location points & number of bins.
 - Reinforcement for street cleaning.
- Phase 5: Improvements produced (month 10).

Actors involved:

- Local administration.
- Company licensed to carry out the service or public corporation.
- Island government (Consell insular).
- Local police (Environment Unit).
- Inhabitants of the zone of action.
- Business premises in the zone of action.

Costs:

There is no direct financial return relating to this initiative, but it contributes to the established financial model by potentially increasing income based on the model's results. The model's income comes from: local taxes for waste collection and treatment, income per tonne of selective waste collected and from selling materials.

Item - Unit cost (including VAT):

Platforms: €18,000.

Truck: €36,000.

Bins (240 -360 l): €70.

Bins (1,100 l): €300.

Communication campaign- Depending on the actions planned. A benchmark value would be €3-€5/inhabitant.

Level of use:

The percentage use of the new waste collection service is expected to be 80% (specific data are not available from the case studies).

Only those who cannot adapt to the timetable established for the service will use the bins located on the periphery, outside the Old Town.

Results**Case 1: Granollers Council, Catalonia (ES)**

Selectively collected waste currently accounts for approximately 40% of the total waste collected in the Old Town. For the municipality as a whole this percentage is 30%.

More specific data on the selective waste collected via mobile platforms are not available for the Old Town. For the municipality as a whole, the 2016 data are as follows.

- 70% (16,000 tonnes) non-separated waste.
- 30% (7,355 tonnes) selectively collected waste: 927 tonnes of glass, 1,866 tonnes of organic, 422 tonnes of paper/cardboard, 677 tonnes of light packaging and the remaining other types of waste (3,463 tonnes).

Case 2: Palma Council, Balearic Islands (ES)

After the first month of implementation, the results achieved were 75% selective waste collection in the area where the mobile platforms were installed (Old Town).

Of the total waste collected during the first month of the initiative:

- 25% (15,860 kg) was non-separated waste.
- 75% (63,440 kg) was selectively collected waste: 5,900 kg of light packaging, 24,740 kg of organic, 7,740 kg of paper and cardboard and 9,460 kg of glass, the remaining other types of waste (15,600 kg).

Possible success factors:

- Given that the bins are removed from the public thoroughfare during the day, there is more space on public streets and waste does not spill out of fixed bins, as can happen in the Urban Area.
- The visual impact is reduced because the bins are removed.
- More users have access to a selective waste collection system (impact on the percentage of selectively collected waste).
- It is a flexible system which is adaptable to local needs at any given time (tourist season, local festivals, etc.).
- Little impact is expected in terms of air and noise pollution due to the use of electric vehicles and the fact that the bins are unloaded at a plant outside the Old Town.

Main difficulties encountered:

- The times when users can deposit waste are limited.
- Coordination is required with other collection services, such as commercial routes and the collection of bulky items, among others.
- Bins on the periphery need to be monitored and controlled for those users who cannot adapt to the timetable established.

A system is required that can update the number of users (such as during the tourist season) and can notify users of any changes in location (e.g. due to road works).

Main lessons learnt from the practice

In general, there were few incidents and the system has been welcomed by both local residents and shopkeepers. However, at times the fixed bins on the periphery (Urban Area) overflowed and a small number of users did not separate their waste properly.

For these reasons, this system requires regular information/awareness-raising campaigns, as well as supervision by the Environmental Units of the Local Police.

Additional information**Information about collection models:**

- Ezeah, C., Fazakerley, J. & Byrne, T. Tourism Waste Management in the European Union: Lessons Learned from Four Popular EU Tourist Destinations. American Journal of Climate Change (online), vol. 4, 431-445. 2015. Available: http://file.scirp.org/Html/4-2360302_61933.htm
- URBAN-WASTE. Urban strategies for Waste Management in Touristic Cities (online). 2017. Available: <http://www.urban-waste.eu/>
- Grau Maquinària (supplier), website (online). 2017. Available: <http://www.grau-maquinaria.com/urbaclic%20s10ic8.htm>

Case 1: Granollers Council, Catalonia (ES)

- Granollers Council, Environment: Recollida selectiva en illa de vianants (online) [Selective collection in the pedestrian area] 2017. Available: http://www.granollers.cat/sites/default/files/importades_d6/pagina/2012/03/Ubicaci%C3%B3%20plataformes%20illa%20vianants_2.pdf
- Granollers Council, Environment: Mapa de l'illa de vianants i horaris (online). [Map of the pedestrian area and timetables] 2017. Available: <http://www.granollers.cat/medi-ambient/reciclar-lilla-vianants#docs>

Case 2: Palma Council, Balearic Islands (ES)

- Palma Council, EMAYA: Calendari de recollida (online) [Collection timetable] 2017. Available:
<<https://www.emaya.es/media/3784/presentacio-recollida-centre-1.pdf>>
 - Palma Council, EMAYA: Díptic de recollida selectiva mòbil al centre de Palma (online) [Leaflet on mobile selective collection in the centre of Palma] 2017. Available:
<<https://www.emaya.es/media/3738/fullet-recollida-centre-a5.pdf>>
 - Palma Council, EMAYA: Ubicació i nombre actualitzat de plataformes (online) [Location and updated number of platforms] 2017. Available:
<<https://www.emaya.es/media/3988/situacion-contenedores-dia-29-05-2017.pdf>>
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CITY OF TALLINN (ESTONIA)

Section	Description
Title of the practice	3.2. Location of waste containers in Tallinn Old Town
Photograph	
Proposers	City of Tallinn.
Contacts	<p>Representatives of city district government:</p> <ul style="list-style-type: none"> • Haabersti District Government, head of the administration department, Tonu.Kivimaker@tallinnlv.ee • Tallinn City Centre District Government, head specialist of the urban department, Kyly.Annus@tallinnlv.ee • Kristiine District Government, senior specialist, Marju.Korts@tallinnlv.ee • Lasnamäe District Government, deputy head of the urban department, Diana.Buchmann@tallinnlv.ee • Mustamäe District Government, head specialist of the urban department, Urmass.Kopp@tallinnlv.ee • Nõmme District Government, head specialist of the city property department, Mart.Miidu@tallinnlv.ee • Pirita District Government, head specialist of the urban department, Merike.Kalam@tallinnlv.ee • Põhja-Tallinna District Government, deputy head of the urban department, Arvo.Soorand@tallinnlv.ee • Tallinn Environment Department, keskkonnaamet@tallinnlv.ee • Tallinn Municipal Engineering Services Department, kommunaalamet@tallinnlv.ee
Useful links	Waste management act of Tallinn.
Start date	Year 2008.
Current Status	Ongoing.

Location	City of Tallinn.
Inhabitants in the area	448,700

Description of the practice

Origin:

Waste containers must be placed on the waste holder property. In the Tallinn Old Town area, it is forbidden to place waste containers on the street. It is only allowed if a waste storehouse is constructed. In this way the containers are almost invisible and do not spoil the Old Town's visual aspect. The Old Town's streets have more space to move. This regulation also helps to reduce the risk of unpleasant smells in the Old Town's streets.

The main locations where Old Town inhabitants keep their waste containers are courtyards, basements or staircases.

Development and Timescale:

The city of Tallinn has had the policy for a long time and will continue it in the future.

Actors involved:

- Tallinn Environment Department.
- Tallinn City District Governments.

Legal framework:

According to the Tallinn Waste Management Act, it is forbidden to place waste containers on the street in the Old Town area. It is only allowed if a waste storehouse is built.

Financial framework: (activities´ cost, activities´ revenues (if any), model/s of financing used)

Old Town Residents must find the proper location for their containers. If there is not enough space, one option is to share their containers with other property owners. If there is no room at all, then City District Government can allow containers to be put on public land, but only if it is possible to build a waste storehouse.

Results

Proven results (through indicators):

There is more free space in the Old Town, waste containers don't "spoil" the Old Town visual appearance or spread bad smells. The Old Town streets look aesthetic, clean and tidy.

Possible success factors:

Some cases need a special approach and an open mind to find the solution, e.g. in one property the old sewage well is used as a waste container.

Main difficulties encountered:

In some properties it is hard to find space for waste containers.

Main lessons learnt from the practice	The location of waste containers has to be planned before construction, but sometimes in the Old Town area it is not possible and each case needs a special approach and sometimes also an open mind.
Additional information	www.tallinn.ee

CITY OF PORTO (PORTUGAL)

Section	Description
Title of the practice	3.3. Creating the “Perfect Spot” from urban renewal in Porto
Photograph	

Proposers	Municipality of Porto.
Contacts	Pelouro da Inovação e do Ambiente: pelouro.ia@cm-porto.pt +351 222 097 161
Useful links	www.cm-porto.pt
Start date	Year 2017.
Current Status	Finished.
Location	Portugal, Porto, Heritage City Centre – Miadouro do Codeçal.
Inhabitants in the area	70

Description of the practice

Origin:

Porto Heritage City Centre is located on a hill, with its main characteristics being the steep slopes and the accentuated height differences.

Therefore, in this area, there are several streets which are completely covered with stairs. In these places waste collection is a challenge. Over time we have been developing different strategies to face these challenges and overcome their obstacles.

One of these cases is a place called Escarpa do Codeçal (Codeçal Cliff).

This cliff connects Ribeira, the riverfront area, to a higher point in the Historic Centre, creating a passageway of stairs – Escadas do Codeçal. We estimate that there are 29 residences on this passageway and surrounding area, where about 70 people live. To collect the waste produced by these inhabitants, we have a special collection system placed in the middle of the stairs, right after the last house. This system consists of a duct that takes the waste to a compartment located on the riverfront, on a street where the collection vehicle can circulate with no restrictions.

Until January 2017, the access to the duct was via two receptors placed in a concrete wall, with an opening/closing mechanism. However, these devices and all the other system structures were very old and dilapidated.

The household wastewater collection system was also in need of renovation.

Furthermore, as the wall was covering a beautiful view, we saw the opportunity to rehabilitate the place and explore its potential. Therefore, a renovation project for the wastewater and waste collection systems was developed, also including rehabilitation of the surroundings and creation of a gazebo.

With this renewal significant improvement was possible to the aesthetics and the urban integration of a waste collection device that was very dilapidated, and had a heavy negative visual impact. The collection point was indispensable in that location but, in terms of appearance, it was clearly damaging the local aesthetic.

After the works, with the elimination of an obsolete structure, this singular element of the waste management system became perfectly integrated into the local urban structure, enabling not only minimal interference with the surrounding environment but also acting as a booster to create a place of interest.

Development and Timescale:

The project included the waste and wastewater collection systems and local rehabilitation works. With respect to the waste collection system, the renovation was based on adapting a common surface receptor to the duct system, usually associated with underground containers. The ducts, which were made from asbestos cement, were replaced by a new, stainless steel one. The duct leads to two polyethylene waste bins with 1,100L storage capacity each, located on a closed compartment.

The project was developed in 2016. The implementation phase and construction works started in November 2016 and lasted for 75 days. The system has been operational since January 2017.

Actors involved:

The development was a collaboration between the Urban Cleaning Office of the Municipality of Porto, the municipal water management company (Águas do Porto – AdP) and the municipal public works management company (Gestão de Obras Públicas – GOP).

Legal framework:

There is no legal framework on waste that applies directly to this intervention. However, the need to keep the collection point in this location, apart from local waste production, relates to the obligations imposed by the national regulator for water and waste services (Entidade Reguladora dos Serviços de Águas e Resíduos – ERSAR).

This entity defines the standards for accessibility to the waste system. According to ERSAR, a residence has access to the waste system if there is a collection point at a maximum linear distance of 100 meters. Therefore, to comply with the standard, the collection point could not be removed. Moreover, the structural characteristics and installation process had to comply with planning regulatory instruments.

Financial framework:

The global project budget was around €65,000 and it was financed by the municipal water management company.

Although the waste management system and urban structures were also included in the project, it was considered an intervention falling within the scope of the wastewater management system.

The cost associated with the operation is unaffected by the system renovation. The operational requirements are the same as they were before.

Results

Possible success factors:

The main contributor to the success of this project was the fact that it brought advantages for all the parties involved. Besides the renovation of the dilapidated systems and their functional upgrading, the project also promoted significant improvement to the aesthetics of the place.

Main difficulties encountered:


The difficulty with this project was to find a suitable solution for renovation of the existing waste collection system. Because of its uniqueness, the system required equipment that could be adapted to the duct structure and local features, creating, at the same time, the minimum possible visual impact.

Main lessons learnt from the practice	Even in the most complicated places it is possible to design a waste collection system, or element, that responds to all the needs and is perfectly integrated into the urban décor. With a little imagination you can transform a dilapidated and unpleasant place into a “perfect spot”.
Additional information	Not applicable.

Aesthetical containers and devices



CITY OF IBIZA (SPAIN)

Section	Description
Title of the practice	3.4. Aesthetical integration of the bins in the area of Dalt Vila in Ibiza
Photograph	
Proposers	<p>Ibiza Council. Environment Department. C. de Canàries, 35 - 07800 Ibiza Spain Tel: +34 971 397 600. Email: eivissa@eivissa.es</p>
Contacts	<ul style="list-style-type: none"> - Montse García Cuenca (councillor for the Environment) mediambient@eivissa.es - (+34)971.39.75.22 - Sandra Romero (environmental specialist) sandra.romero@eivissa.es- (+34)971.39.75.22 - Raimon Ollé (architect assigned to the historical centre) raimon.olle@eivissa.es- (+34)971.39.75.22
Useful links	<p>Autonomous community regulations:</p> <ul style="list-style-type: none"> - Ibiza Council Llei 12/1998, de 21 de desembre, del Patrimoni històric de les Illes Balears (BOCAIB, 165, 29/12/1998, p. 19765-19779) [Law 12/1998 of 21 December, on the Historical Heritage of the Balearic Islands: http://www.eivissa.es/portal/images/stories/pdfnucli/peprimarina.pdf <p>Local regulations:</p> <ul style="list-style-type: none"> - PEPRI. Ibiza Council. Pla Especial De Protecció y Reforma Interior De Sa Penya, La Marina i Zona D´Eixamples (online) [Special Plan for Protection and Interior Reform of Sa Penya, La Marina and the Eixamples: http://www.eivissa.es/portal/images/stories/pdfnucli/peprimarina.pdf - Ibiza Council. Ordenanza De Protección Del Conjunto Histórico De Dalt Vila [Bye-Law to Protect the Historical Complex of Dalt Vila] Conservación, Renovación Y Uso (Título IV) (online) [Conservation, Renovation and Use]: http://www.eivissa.es/portal/images/stories/pdfnucli/pepridaltvila.pdf

	<p>Town Planning Regulations:</p> <ul style="list-style-type: none"> - Ibiza Council. General Plan for Urban Planning 1987: http://www.eivissa.es/portal/index.php/es/pgou-vigente - Revision of the General Plan 1987: http://www.eivissa.es/portal/index.php/es/pgoucas <p>Environment, Waste:</p> <ul style="list-style-type: none"> - Ibiza Council. Municipal Decree for Municipal Waste Management: http://www.eivissa.es/portal/images/stories/ordenances/residuos.pdf
Start date	<ol style="list-style-type: none"> 1. Ibiza Council. Plan Especial de Protección y Reforma Interior de “Sa Penya, La Marina i zona d’Eixample” [Special Plan for Protection and Interior Reform of “Sa Penya, La Marina and the Eixamples Zone”] Commencement 1994. 2. Ibiza Council. Plan Especial de Protección i Reforma Interior de “Dalt Vila” [Special Plan for Protection and Interior Reform of “Dalt Vila”] Commencement 1997. 3. Ibiza Council. Revisión del Plan General Municipal, Normas Urbanísticas [Revision of the General Municipal Plan, Town Planning Regulations] Initial Deed of Approval March 2016.
Current Status	Ongoing.
Location	Dalt Vila, La Marina, Vara de Rey Ibiza, Spain.
Inhabitants in the area	Dalt Vila, La Marina, Vara del Rei and Plaça del Parc (Old Town): approximately 800 inhabitants (data pending official confirmation). Ibiza Town: 49,975 inhabitants (2015, according to Ibestat).

Description of the practice

The P.E.P.R.I. establishes the conditions for action and use and the procedures to be applied in any initiative affecting the assets it covers, including waste deposits.

The decision to put bins in place (type of bins and location), is one of the measures in the old town that needs to be submitted and approved by the PEPRI Committee.

Origin:

The need to preserve the values of the historical centre and have a tool that coordinates and harmonises the criteria for elements located on public thoroughfares, such as street furniture (waste bins, litter bins, etc.).

Development and timescale:

Phase	Task	Months			
		1	2	3	4
1. Application by the Territory and Sustainability Area of Ibiza Council	Request for action, including any modifications or adaptations requested by the licence specialists, who check the documents and whether the requirements have been met.	•			
2. Technical management analysis of the licence	Preliminary report issued		•		
	Regulatory compliance determined		•		
3. Decision by the Control Committee	Decision by the Technical Committee			•	•
	Final decision and approval of the Policy Committee				•
4. Action	Adjustments to the location and number of containers installed				•

Actors involved:

- Environment department. Area for Territory and Sustainability. Ibiza Council Maintenance service for parks and gardens (depending on the aesthetic option implemented).
- Licensed waste collection company for Ibiza Town.
- P.E.P.R.I Supervisory committee the Island Government Heritage Committee (depending on the type of procedure).

Legal framework:

- Ibiza Council. Plan Especial de Protección y Reforma Interior de “Sa Penya, La Marina y zona d’Eixample” [Special Plan for Protection and Interior Reform of “Sa Penya, La Marina and the Eixample Zone”].
- Ibiza Council. Plan Especial de Protección y Reforma Interior de “Dalt Vila” [Special Plan for Protection and Interior Reform of “Dalt Vila”].
- Ibiza Council. Revisión del Plan General Municipal, Normas Urbanísticas [Revision of the General Municipal Plan, Town Planning Regulations], Initial Approval (March 2016).

Costs:

P.E.P.R.I is a technical regulation so it doesn't have a specific cost.

Level of use or number of users:

This regulation affects 100% of the projects and acts to be implemented in the old town.

Results**Proven results (using indicators):**

The action's general results were as follows:

- Bins / Elements integrated into the zone's appearance following the criteria established by the P.E.P.R.I.
- Aesthetically and functionally uniform.
- Visual impact reduced.

In quantitative terms, the Committee meets once a month and, on average, 10 applications are processed. Approximately 60% are passed and the rest are rejected, usually due to incorrect or incomplete documentation. The specialists responsible for managing licences are in charge of notifying the outcome.

Possible success factors:

- The elements located in the zone are directly controlled and regulated by those responsible for the historical centre.
- Different levels of conservation and procedures are established depending on the elements, where applicable. This ensures the assessment is adapted to each of the elements, guaranteeing optimum results.

Main difficulties encountered:

- Slower decision-making (since the P.E.P.R.I. procedure must be carried out).
-

**Main lessons
learnt from
the practice**

The application of a specific regulation that governs actions to be carried out in the historical centre of Ibiza helps to ensure clear and transparent coherence between the actions and decisions affecting street furniture and the zone's maintenance.

This regulation controls any action to be carried out in the zone so that, in the specific case of implementing bins, the areas are standardised aesthetically, adapting the materials to the type of public space and buildings in the area.

As the P.E.P.R.I. covers many different municipal departments in its procedures, and there are no specific criteria for bins, it takes time to reach decisions and conclusions, particularly because there are a lot of applications every year. This also affects any incidents resulting from the installation and its subsequent use.

CITY OF GHENT (BELGIUM)

Section	Description
Title of the practice	3.5. Compacting bins in Ghent
Photograph	
Proposers	City of Ghent, IVAGO (intercommunal association for waste management in Ghent and surrounding area).
Contacts	Tom Claeys, tom.claeys@ivago.be, 00(32)476749513. Didier Naessens, Didier.naessens@ivago.be
Useful links	www.ivago.be
Start date	2017.
Current Status	Ongoing.
Location	Belgium, Ghent.
Inhabitants in the area	257,000

Description of the practice

Summary of what the practice is about:

Introducing compacting bins (holding up to 7 times more volume) within the city centre, reducing the number of bins needed and times we have to go empty them. Remote monitoring. The process, in short, happens in the following order:

- Sensor detects waste above certain level.
- Compresses.
- Detects fill level.
- Sends message to back office when almost full.

These bins are located in strategic locations such the historic centre with high volume pedestrian traffic and in public BBQ spots.

Development and Timescale:

It started in the beginning of 2017 and there are currently already 30 installed, mostly in areas with a large volume of pedestrian traffic and in public BBQ spots. We will install 80 of them by mid-2018.

What is currently being explored is their aesthetic integration with appropriate colours (green/grey), wrapping a compacting bin with colours/pictures of surrounding buildings in the historic centre or integrating bin into street furniture.

Actors involved:

City of Ghent (aesthetic evaluations), IVAGO, OVAM (Flemish waste association, sets the waste management policy). Heritage Department.

Legal framework:

City rules on urban integration.

Financial framework:

Cost of bin purchase and installation. Subsidy from OVAM (Flemish Waste Management regulator). Financing through our annual public funding.

Tender currently ongoing. In tendering, specific criteria & evaluation on aesthetics are included.

Results

Proven results (using indicators):

Not yet available.

Possible success factors:

Good collaboration between all parties already involved in the tendering process.

Simple aesthetic construction.

Easy installation.

Further visual integration into the streets (colours?).

Main difficulties encountered:

Permission to install within the (protected) historic sites.

New (unproven) technology – hiccups in the beginning.

Main lessons learnt from the practice	Working together. Integrating aesthetics starting with the tendering phase. Using technology and IoT (Internet of Things) but integrated within a user-centred approach.
Additional information	www.ivago.be https://www.facebook.com/ivago.gent/ https://www.youtube.com/channel/UCKyA9XLfxs4IIaKhf56fe0w

CITY OF CORDOBA (SPAIN)

Section	Description
Title of the practice	3.6. Painted containers in Cordoba
Photograph	
Proposers	Municipal Company SADECO (Sanitation Cordoba) – Municipality of Cordoba.
Contacts	Jesus Diz Pérez. buzon@sadeco.es
Useful links	www.sadeco.es
Start date	2017.

Current Status	Completed.
Location	Cordoba.
Inhabitants in the area	23,000

Description of the practice

Origin:

The misuse of waste containers is affected by their general deterioration and aesthetic aspect. To get more involved with the population and make these elements more attractive, cooperation with neighbourhood associations and school groups was promoted, with designing activities and to make the exterior more attractive so that it fits in with these elements.

The schools in the affected areas have designed and done the decoration and painted the containers alongside Sadeco monitors and support staff. As a result, students, families, and the neighbourhood in general, feel that these elements are their own. They feel proud of the work done and encourage respect for these items, which are needed for waste disposal.

Development and Timescale:

After the work was done with teachers in a week, the bins were placed outside during the following week.

Six months after the activity began, decoration of the containers was finished by students from 3 schools in Cordoba.

Actors involved:

Schools, Parents' associations, Neighbourhood associations, local shops, Sadeco.

Legal framework:

Cordoba Council municipal bye-laws.

Financial framework:

The approximate cost of supplying the containers was €0 per container, as the containers were being reused. Therefore, it was only necessary to calculate the cost of dissemination, posters and the team of teachers plus the painting and decorating materials. Approximate price: €135 per container. Funded by Sadeco.

Results

Proven results:

Education and awareness of the school community, particularly the schoolchildren themselves, as well as parents and locals, in waste recycling values, and respect for street furniture for public use. A decline in container vandalism on the street.

Possible success factors:

Visibility of the work. Civic behaviour by locals after the containers have been decorated.

Main difficulties encountered:

Difficulties in choosing the groups of students and the initial involvement of community associations in starting the project. Choosing model locations, because, during the first stage, the work could not be done on all containers or in all areas of the neighbourhoods.

Main lessons learnt from the practice	The importance of the participation of different actors in making common waste collection elements their own.
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CITY OF CORDOBA (SPAIN)

Section	Description
Title of the practice	3.7. Aesthetic covers for containers in Cordoba historical city centre
Photograph	
Proposers	Municipal Sanitation Company Cordoba (SADECO) – Municipality of Cordoba.
Contacts	Jesus Diz Pérez. buzon@sadeco.es
Useful links	www.sadeco.es
Start date	2001-2017.
Current Status	Continuous improvement.
Location	Cordoba.
Inhabitants in the area	32,000 (2015).

Description of the practice

Origin:

Eradicate the visual impact of waste collection elements, as well as waste, for the longest possible time in highly sensitive areas in the historical area of the city.

This is done by hiding the containers in decorative housing, with less visual impact than waste containers in the street.

Development and Timescale:

The first designer housings were installed in the area around the Mosque Cathedral in Cordoba in 1995. The housing was designed and created by SADECO to cover waste containers.

A tender was announced, in 2003, for the design and metal machining, to choose a new bin housing model to become an integral part of the monumental and historical area of the city, under an agreement with the "Consortio de Turismo de Cordoba" (Cordoba Tourist Consortium), an organisation consisting of tourist sector enterprises that collaborate with the Cordoba Council. The model chosen (designed by the company Garza Diviloc) was installed throughout the entire historical area of Cordoba, changing the image of the normal waste containers.

In 2010 the bunkers were redesigned, to change the door that the waste containers are taken out of and installing a pedal which serves as a system for opening them by activating it. This made waste collection and taking the waste containers out of the bunkers easier for the municipal services, and putting the waste into the containers easier for locals, because they no longer need to lift the waste container cover by hand, as it can now be opened by pressing the foot pedal.

In 2007 the housing covering the waste containers was redesigned again making an opening in the cover, which is protected by rubber, so that waste can be put into container without having to open the cover. Identification of the housing was also improved, with an enhanced image that indicates the type of waste, depending on the type of waste that can be put into the container.

Actors involved:

Locals, shopkeepers.

Legal framework:

Municipal Bye-Laws for Public Hygiene.

Financial framework:

Approximately €1,200 for each waste container housing, with a total of 548 containers
Self-financing, Town council, Tourism Consortium, European funds.

Results

Proven results (using indicators):

Elimination of the visual impact of waste during the day and visual elimination of waste containers on the street.

Possible success factors:

A better image in the area for locals, businesses and for those visiting the area.

Main difficulties found:

As the models were specifically created for Cordoba, the design had to be gradually adapted for better usability and acceptance by locals.


The cost of implementation and maintenance may be a limiting factor for the installation of these elements.

Main lessons learnt from the practice

Improving aesthetics of waste deposit elements, in line with the historical and monumental environment, is considered to be a benefit by the locals who use these elements, and by tourists, who greatly appreciate the cleanliness of this special part of the city.

Working with tourism-related economic agents is a positive experience, which helps to promote the city.

CITY OF PORTO (PORTUGAL)

Section	Description
Title of the practice	3.8. Housing solutions to improve urban integration in Porto
Photograph	
Proposers	Municipality of Porto.
Contacts	Pelouro da Inovação e do Ambiente: pelouro.ia@cm-porto.pt +351 222 097 161
Useful links	www.cm-porto.pt
Start date	Year 2014.
Current Status	Finished.
Location	Portugal, Porto, Heritage City Centre.
Inhabitants in the area	420

Description of the practice

Origin:

Over time we have been working to improve the waste management system of the Heritage City Centre. As we explained previously, in this area the system is an integration of various subsystems to enhance its adaptability to the area's peculiarities and unique requirements. Knowing that underground containers are the best solution in terms of urban integration, storage capacity and operational efficiency, we have been installing this type of bin in some locations in the Historic Centre, trying to replace as many surface bins as possible. However, because of all the factors involved in installing an underground container, at some collection points it was impossible to replace the surface bins.

One of these points is located at a crossing path to Ribeira, the riverfront area, one of the most visited places in Porto. This specific collection point used to have several problems from the point of view of aesthetics and causing a negative visual impact. Due to local waste production, the collection point could not be removed. Furthermore, as we could not replace the surface bins with underground containers, we were forced to get find an alternative solution to minimise the aesthetic problems.

After studying the available options, we decided to go for a housing solution: a metal structure was built covering the bins, so they were not visible from the pavement. The structure design is very neat and simple, and is not attention grabbing. With this structure, the bins go unnoticed by those walking by and even if there is some waste left outside the bins, it is not visible. Therefore, the collection point is now blended into the urban structure and its negative visual impact is not a problem anymore.

Regarding integration into the urban décor, this kind of solution is not ideal. If it was not for the local features and constraints, the best solution would have been to remove the collection point, or replace the bins for more suitable ones. However, the local constraints could not be disregarded and, therefore, in this specific case, the housing solution proved to be the best one to deal with the problem and adapt to the local characteristics.

Development and Timescale:

The structure installation was part of a much bigger project. It was included in a rehabilitation project for an area with around 11,000 m², located in the Heritage City Centre.

The structure was built in 2014.

Actors involved:

The project was developed and promoted by the Urban Rehabilitation Society (Sociedade de Reabilitação Urbana - SRU). However, because of the project size and the diversity of structures and services involved, SRU needed the collaboration of several entities. Where the waste management system was concerned, it had collaboration from the Urban Cleaning Office of the Municipal Directorate for Civil Protection, Environment and Urban Services. The public works were carried on by the municipal company concerned (Gestão de Obras Públicas - GOP).

Legal framework:

There is no legal framework on waste that applies directly to this action. However, the need to keep the collection point in this location, in addition to local waste production, is related to the obligations imposed by the national regulator for water and waste services (Entidade Reguladora dos Serviços de Águas e Resíduos - ERSAR). This entity defines the standards for accessibility to the waste system. According to ERSAR, a residence has access to the waste system if there is a collection point at a maximum linear distance of 100 meters. Therefore, to comply with that standard, the collection point could not be removed. Moreover, the structural characteristics and installation process had to comply with urban planning regulatory instruments.

Financial framework:

The project was executed within the scope of an Urban Rehabilitation Programme. The budget for the entire project was around €31.5M and it was partly financed by the European Regional Development Fund (ERDF).

Results

Possible success factors:

Elimination of a source of several, repeated aesthetic problems and improvement of the waste management system's urban integration, with a simple, minimal intervention.

Main difficulties encountered:

The main difficulty in this process was to find a solution that could solve the aesthetic problems with the collection point, keeping the surface bins in the same location and, simultaneously, improving urban integration and minimising visual impact.

Main lessons learnt from the practice	With minor works, installing a very simple structure, we were able to solve a problematic situation, overcoming the repeated aesthetic problems and integrating an element of the waste management system into the urban décor. With simple solutions it is possible to achieve great improvements.
Additional information	Not applicable.

CITY OF KRAKOW (POLAND)

Section	Description
Title of the practice	3.9. Aesthetic solutions in the Municipality of Krakow: <ul style="list-style-type: none"> aesthetic waste rooms and bins. stickers on waste collection vehicles with the city image. smaller waste collection vehicles in the Heritage City Centre. Municipal Police control as a tool for increasing waste management aesthetics.
Photograph	
Proposers	Municipal Cleaning Company Ltd. - the administrator of the waste management system in Municipality of Krakow.
Contacts	Piotr Odorcuk – a press officer of the Municipal Cleaning Company, +48 12 646 2380, +48 12 646 22 22, rzecznik@mpo.krakow.pl, mpo@mpo.krakow.pl
Useful links	www.mpo.krakow.pl
Start date	1 August 2013 – Municipal Police and Municipal Cleaning Company control launch. 2004 – purchase of BELWEDER type waste bins. 2016 – purchase of TALLIN type waste bins.
Current Status	Ongoing.
Location	Municipality of Krakow including the Heritage City Centre.
Inhabitants in the area	768,000 – inhabitants of the Municipality of Krakow (including 1,536 inhabitants of the Heritage City Centre).

Description of the practice

Origin:

In 1978, the Old Town with Wawel, Kazimierz and Stradom was included in the UNESCO World Heritage List. Over 12,000,000 tourists visit the Municipality of Krakow every year. That is why the Municipality needs to handle the aesthetic aspect of the city, including the waste management field e.g. aesthetic waste bins (BELWEDER and TALLIN types) and waste rooms (iron, panel and net types).

Waste collection in the Heritage City Centre is handled by smaller waste collection vehicles, because of high tourist traffic. This improves the aesthetic value of the city and tourists' comfort.

Several cultural events take place in the Heritage City Centre, e.g. the Christmas market or Dumplings Festival. During the events waste bins are covered with a wooden housing, which goes perfectly with the wooden market stalls.

The Municipal Cleaning Company – the administrator of the waste management system in the Municipality of Krakow – has a fleet of waste collection and cleaning vehicles which identify with the Municipality by having a sticker which the Main Square with the most important monuments.

In the structure of the Municipal Cleaning Company, the Department Controlling the Waste Management System was separated. Two control specialists are assigned to each sector in collaboration with the Municipal Police. It helps to ensure the proper look of the containers placed in the waste rooms and forces property owners to keep them in good condition. The correct technical conditions of the bring-in sites are also controlled by two inspectors from the Municipality of Krakow.

Development and Timescale:

Aesthetics in the field of waste management in the Municipality of Krakow increases. In 2016 the Municipal Cleaning Company, on behalf of the Municipality of Krakow, purchased 1100 Tallinn-type waste bins, which improved the aesthetics of the city. Newer, more aesthetic waste rooms are emerging in housing estates.

Factors involved:

The administrator of the waste management system in the Municipality of Krakow – the Municipal Cleaning Company – is responsible for the purchase of waste bins, which it invoices the Municipality of Krakow for. Property owners are required to place containers in waste collection places in such a way that facilitates selective waste collection.

Property owners (including housing co-operatives) are also responsible for building a waste room and keeping the room and containers in good condition, and this comes under the control of the Municipal Cleaning Company and Municipal Police workers.

Legal framework:

The legal framework relating to waste management in the Municipality of Krakow includes: the law on maintaining cleanliness and order in municipal districts and the act of local law – the Regulations for maintenance of cleanliness and order in the Municipality of Krakow established by the Krakow City Council. Waste room regulations are included in the Regulations for maintenance of cleanliness and order in the Municipality of Krakow and the Regulation of the Minister of Infrastructure on technical conditions to be met by buildings and their location. The Municipal Cleaning Company came to an agreement with the Municipal Police on implementation and monitoring compliance with the application of the Law on the maintenance of cleanliness and order in municipal districts.

Financial framework:

Tallinn-type single waste bin cost – 1000 PLN (232 EUR). The total cost of the 1100 bins was around 1,000,000 PLN (~232,000 EUR).

BELWEDER-type single waste bin cost – 4,450 PLN (~1,030 EUR).

Panel waste room cost – 7,500 PLN (~1,750 EUR).

Average cost of the waste management controlling system / Municipal Police side – 1,000,000 PLN/year (~232,000 EUR/year).

- 2015: 1,313,000 PLN (~305,000 EUR).
- 2016: 785,000 PLN (~182,000 EUR).

Results

Proven results (using indicators) and possible success factors:

The proven result of waste management control in properties carried out by the Municipal Police and Municipal Cleaning Company are the amount of offences and fines imposed by the Municipal Police:

- 2016: 3 609 controls, 1,118 offences, 464 fines totalling 45,000 PLN (10,500 EUR).

The success factors have been the following:

- improving the aesthetic of waste rooms and containers by providing control activities.
- improving the comfort and satisfaction of tourists as well as the aesthetic value of the Heritage City Centre by using smaller waste collection vehicles.
- increasing the aesthetic of the city with aesthetic bins and waste rooms.

Main difficulties encountered:

- acts of vandalism to bring-in sited containers and waste rooms (burning, graffiti).
- high costs of the control system, bins, etc.
- highly restrictive procedures and rules connected with the implementing the new aesthetic solution in the Heritage City Centre (e.g. obtaining approval from the urban monuments curator).
- difficult access to controlled property which decreases control results.

Main lessons learnt from the practice	Aesthetic solutions in the Waste Management System in the Municipality of Krakow, like aesthetic bins and waste rooms, stickers on the waste collection vehicles, smaller waste collection vehicles in the Heritage City Centre and the control tool improve the city's aesthetics. They also improve the comfort and satisfaction of tourists, as well as the aesthetic value of the Heritage City Centre.
Additional information	www.mpo.krakow.pl

ISLAND OF BORNHOLM (DENMARK)

Section	Description
Title of the practice	3.10. Experiences from Bornholm
Photograph	
Proposers	Bofa, The Municipal Solid Waste Management Company of Bornholm in collaboration with the Institute Of Planning and Development, Aalborg University - Resourcelab Bornholm.
Contacts	Resourcelab Bornholm, Hans-Christian Holmstrand, +45 51 41 80 01, hch@plan.aau.dk / hch@bofa.dk.
Useful links	www.bofa.dk ; www.aau.dk .
Start date	2015.
Current Status	Ongoing.
Location	Denmark, Bornholm.
Inhabitants in the area	40,000 inhabitants (500,000 tourists).

Description of the practice

Summary of what the practice is about:

The Danish Government has communicated, in a governmental Resource Strategy paper based on the EU Waste Directive, that, by 2025, Danish municipalities should recycle at least 50% of household waste. In 2015, the MSWM company Bofa, owned by the municipality of Bornholm and responsible for waste handling, established a pilot project with the aim of testing two alternative MSWM design strategies for reaching the 50% recycling target.

The first design strategy was a re-design strategy, testing the existing collection equipment (solutions) available on the market. The second strategy tested was a co-design strategy, where the need for new solutions were developed by a team of designers in collaboration with the users (locals and stakeholders).

The pilot project showed that the re-design strategy, using existing solutions, was not effective or responsive in the context of Bornholm. The existing collection systems and implementation approach were not functional in the old heritage cities of Bornholm and did not respond to the demand for social, cultural and aesthetic collaboration and integration of the cities and their communities.

On the other hand, the pilot project showed that the co-design strategy could develop new collection solutions that would be both effective and responsive in the context of Bornholm. For a month, the co-design strategy developed a system of arch-type solutions, all addressing the special needs and challenges of Bornholm.

The experiences of the pilot project have been integrated into a project application addressing the Interreg South Baltic programme with partners from Poland, Denmark and Lithuania (under the programme evaluation). The project methodology includes three guidelines:

- **OECD:** Systems Approaches to Public Sector Challenges - Working with Change. 2017.
- **World Bank:** Citizen-Driven Innovation - A guidebook for city mayors and public administrators. 2015.
- **WASTE:** Putting Integrated Sustainable Waste Management into Practice - Using the ISWM Assessment Methodology. 2004.

Origin:

The origin of the project is in the municipality and island of Bornholm. The special heritage conditions and challenges of the island's small towns and villages come from the historic development of the island's coastal cities established in relation to fishing.

Development and Timescale:

The pilot project, testing the two design strategies, was developed as part of the official municipal waste plan. The timeframe of the pilot project was 6 months. The expanded development project addressing the South Baltic programme has a timeframe of 2.5 years.

Actors involved:

The pilot project management was carried out by Resourcelab Bornholm. The project included the citizens of Hasle, the private waste collection company, a group of designers and several stakeholders, including the local school, local trade, the local community, the local cultural institution and the local media.

Legal framework:

The pilot project was a part of the formal municipal waste management plan.

Financial framework:

The pilot project was financed by Bofa, the Bornholm Municipal Solid Waste Management Company.

Use level: (%) or number of users (if possible):

The pilot project included 933 households.

Results

Proven results (through indicators):

The Re-Design strategy proved that the existing waste service solutions and waste management approach did not work responsively, effectively or efficiently – and did not live up to the strategic challenge of the circular economy.

The Co-Design strategy proved that it is possible to innovate and provide technically feasible, economically viable and socially desirable waste solutions – in a co-creation between citizens, designers and waste management companies.

Possible success factors:

The key to success is co-designing waste management solutions in a collaboration between designers, citizens, waste management companies and stakeholders. The two main success factors are 1) high effectiveness on the recycling potential (targets) and 2) high responsiveness to the meaning of recycling communicated by citizens.

Main difficulties encountered:

The special conditions of the heritage cities of Bornholm are partly the narrow and usually steep streets as well as the small houses, with extremely limited space outside for waste collection facilities. Furthermore, the cultural heritage of the city's aesthetics demands collection facilities that are designed on the same aesthetic criteria. This is only possible based on a co-design strategy.

Main lessons learnt from the practice	The traditional waste management systems - redesigning collection solutions on the basis of the existing market supply- do not address the new, expanded recycling targets of the EU Waste Directive - particularly not in the EU's heritage cities. The pilot project shows that a sustainable way to develop and implement new solutions should be based on a co-design strategy including citizens and stakeholders in the innovation process.
Additional information	Websites. www.bofa.dk

Organisational solutions



CITY OF TALLINN (ESTONIA)

Section	Description
Title of the practice	3.11. Restrictions on waste collection in Tallinn Old town
Photograph	
Proposers	City of Tallinn.
Contacts	<ul style="list-style-type: none"> • Tallinn City Centre District Government, head specialist of the urban department, Kylly.Annus@tallinnlv.ee • Tallinn Environmental Department, keskkonnaamet@tallinnlv.ee
Useful links	Waste management act of Tallinn.
Start date	2008.
Current Status	Ongoing.
Location	Tallinn Old Town.
Inhabitants in the area	Tallinn Old Town is a part of City Centre District where 62,600 inhabitants live.

Description of the practice

Origin:

In Old Town area waste collection is only allowed only between 6.00am and 12.00am. At other times, waste collection is only permitted with the permission of Tallinn Environmental Department (eg, road closures because of big events). Waste collection starts early in the morning from Toompea Hill, which is an area of government buildings and embassies, and afterwards proceeds to the city centre.

In the Old Town the main residential activity is located in the city centre and is more modest in Toompea Hill. In this way the waste truck does not disturb city centre residents' peace early in the morning and, in the daytime, when there are lots of tourists, waste trucks stay out of people's way and sight. Furthermore, by the time bigger masses of people come out the waste containers are emptied and clean. All this helps to leave an aesthetic, clean and spacious look in the Old Town.

The waste truck's gross vehicle weight cannot exceed 12 tons in Tallinn Old Town. Overall, gross vehicle weight cannot exceed 7 tons in the Old Town, but there is an exception for waste trucks. This way a bigger amount of waste is collected with one collecting circle and fewer trucks are needed. Moreover, waste collection is more invisible and causes less nuisance to people, creating an aesthetic and clean look of Old Town.

Development and Timescale:

Practice started at 2008 and it works well.

Actors involved:

- Tallinn Environment Department.
- Tallinn City Centre District Government.
- Waste collection service provider.

Legal framework:

Collection times are set up in the Tallinn Waste Management Act. Earlier waste collection is only allowed with permission from the Tallinn Environmental Department. This permit is only issued on special occasions.

Financial framework:

The regulation does not require additional costs.

Results

Proven results:

Waste trucks and tourists do not disturb each other. The Old Town is clean, waste trucks can manoeuvre in the narrow streets more easily. Residents of the Old Town are not disturbed early in the morning.

Possible success factors:

Waste trucks and tourists do not disturb each other. The collection service provider and Old Town residents and visitors are satisfied; waste trucks are more invisible (they do not stand by). The Old Town is neat and tidy.

Main difficulties encountered:

Earlier collection time does not suit some embassies and it requires an extra effort from them, because their opening hours are not so early.

Main lessons learnt from the practice	Waste collection service and logistics have to be well organised.
Additional information	www.tallinn.ee

CITY OF KRAKOW (POLAND)

Section	Description
Title of the practice	<p>3.12. The maintenance of cleanliness and order in Krakow:</p> <ul style="list-style-type: none"> mechanical/manual cleaning of streets, pavements and squares. maintenance of green areas. emptying street waste bins. removing unauthorised landfill sites. 24hr shift work mobile groups.
Photograph	
Proposers	Municipal Cleaning Company - the administrator of the waste management system in Municipality of Krakow.
Contacts	Piotr Odorcuk – a press officer of the Municipal Cleaning Company, +48 12 646 23 80, +48 12 646 22 22, rzecznik@mpo.krakow.pl, mpo@mpo.krakow.pl
Useful links	www.mpo.krakow.pl
Start date	1 July 2013 – the change of the waste management system in the Municipality of Krakow according to the law passed on maintenance, cleanliness and order in municipal districts.
Current Status	Ongoing.
Location	Municipality of Krakow including the Heritage City Centre.
Inhabitants in the area	768,000 inhabitants of the Municipality of Krakow (including the 1,536 inhabitants of the Heritage City Centre).

Description of the practice

Origin:

In order to organise a new waste management system, Krakow City Council entrusted the Municipal Cleaning Company with its obligatory duty to maintain, clean and keep the Municipality of Krakow in order. Krakow is an academic and tourist centre. Different events often take place in the city centre which cause increased demand for this kind of work, especially in places with a high cultural value.

Development and Timescale:

The service is provided by the administrator of the waste management system in the Municipality of Krakow – the Municipal Cleaning Company. The obligation relating to maintenance, cleanliness and order is the result of an agreement between the Municipal Cleaning Company and Municipality of Krakow.

The company has technical vehicles, which are adapted for various kinds of activities such as: mechanical/manual cleaning of squares and streets, cleaning green spaces, emptying trash bins and removing unauthorised landfill sites.

The Municipal Cleaning Company carries out the services according to a schedule. The average frequency of the services is once or twice a day. Additionally, the Municipal Cleaning Company ensures maintenance, cleanliness and order in the Heritage City Centre with 24 hour work done on a shift system.

The service's development constantly evolves. Currently, the employees of the Municipal Cleaning Company have been testing an innovative electric vacuum cleaner removing dust and small waste. Additionally, the Municipality Cleaning Company has a control room which serves to coordinate maintenance, cleanliness and order in the city and receives notifications about irregularities 24 hours/day. The role of Krakow is to control proper execution of the services and the city also bears the costs of it.

Actors involved:

The service is provided by the Municipal Service Company (about 300 employees).

Legal framework:

The legal framework relating to maintenance, cleanliness and order in the Municipality of Krakow includes the law on maintenance, cleanliness and order in municipal districts and the acts of local law passed by Krakow City Council.

Financial framework:

A budget for maintenance, cleanliness and order was planned for 2017 for a total of 64,468,000 PLN (~14,500,000 EUR). The cost of the service for the Heritage City Centre is about 20% of the entire budget.

Use level:

768,000 inhabitants of the Municipality of Krakow (including the 1,536 inhabitants of the Heritage City Centre).

Results

Proven results and possible success factors:

According to the latest poll on locals' satisfaction with the maintenance, cleanliness and order in the Heritage City Centre, 75.2% of the respondents considered Krakow to be a very clean city. The specific nature of the tasks, and the pursuit of higher standards, led to the need to upgrade the equipment base. The company successively purchases specialist vehicles to clean streets and pavements.

All cars meet the EURO 6 emission standards and the sweepers are equipped with special PM10 – certified filters which trap pollutants and do not allow their secondary emissions into the air. The company has in total 187 equipment units to clean the city. The company also carries out the tasks of limiting secondary emissions of harmful PM10. Works consist of increasing the frequency of clean-ups of streets, pavements and squares and introducing additional washing for streets and pavements. This limits the spread of dust from car traffic. The good standard of cleanliness and order in the city is a hallmark of the city, which increases the comfort of tourists.

Main difficulties encountered:

The main difficulty is compact housing development within the network of narrow streets in the Heritage City Centre. Maintenance, cleanliness and order vehicles have difficulty providing the services. Additional problems are tourist traffic, public transport and bad weather conditions.

These factors require a lot of caution to be taken while doing the work.

<p>Main lessons learnt from the practice</p>	<p>The good standard of cleanliness and order in the city is a hallmark of the city, which increases the comfort of tourists. The specific nature of the tasks, and the pursuit of higher standards, led to the need to upgrade the equipment base. The company successively purchases specialist vehicles to clean streets and pavements.</p> <p>All cars meet the EURO 6 emission standards and the sweepers are equipped with special PM10-certified filters which trap pollutants and do not allow their secondary emissions into the air. The company has in total 187 equipment units to clean the city.</p> <p>The good standard of cleanliness and order in the city is a hallmark of the city, which increases the comfort of tourists. The company also carries out the tasks of limiting secondary emissions of harmful PM10.</p> <p>Works consist of increasing the frequency of clean-ups of streets, pavements and squares and introducing additional washing for streets and pavements. This limits the spread of dust from car transport.</p>
<p>Additional information</p>	<p>www.mpo.krakow.pl</p>



4. Good Practices for Waste Minimisation in Heritage Areas

Financial Tools



CITY OF CORDOBA (SPAIN)

Section	Description
Title of the practice	4.1. Pay-as-you-throw for businesses
Photograph	
Proposers	Sanitation Cordoba (SADECO) and Cordoba Municipality.
Contacts	Jesus Diz Pérez. buzon@sadeco.es
Useful links	www.sadeco.es
Start date	2001-2017.
Current Status	Continuous improvement.
Location	Cordoba.
Inhabitants in the area	32,000 (2015).

Description of the practice

Origin:

The philosophy for reducing waste generation is to penalise the amount of waste that is generated, with each user only paying for what they produce. Penalising and increasing payment for waste generation, therefore, contributes to reducing the waste that the producer gives to the waste collector.

Development and Timescale:

This system has been set up in Cordoba in two specific areas:

- **Industrial Estates:**

In 2002 the waste collection model was modified for this sector, through the installation of 3,160 containers for door-to-door waste collection and payment for its production. The system has achieved a reduction in collected waste, so that, in 2016, the number of containers for collection was 2,458, which represents a reduction of 22.2%.

- **Historical quarter of the city:**

The concentration of shops in the HORECA network in the Historical Quarter of the city, which are considered to be "bulk producers" of waste resulted, in 1999, in door-to-door collection of the waste produced by these establishments and payment for generating it.

The current Municipal Urban Hygiene Ordinance for Cordoba (April 2016), establishes the obligation for large producers to install container storage rooms for their own use, and the 2017 Tax Ordinance 105 "Tax for Services and for the Implementation of activities related to public health" established payment for waste generation in containers for exclusive use.

On a local level, these two legislative instruments establish the municipal policy for minimising the management of urban waste and, in itself, constitutes a good practice.

In 2011 waste container storage rooms, called ecopoints, were installed in the Historical Quarter of Cordoba, for public and private use. On these premises, a reserved area is established for private producers of large quantities to deposit their waste in exchange for payment of an amount of money, based on the surface area occupied, which in itself constitutes payment for the generation of waste.

Actors involved:

Traders, small industries, residents in the Historical Quarter.

Legal framework:

Municipal Bye-Laws for Public Hygiene.

Financial framework:

The cost for use of the waste container rooms for public/private use is €10,000 per m2 of surface area occupied by the waste containers.

Self-Financing: Financing is mainly by self-funding or through ad hoc aid from European programmes for public waste rooms and for private rooms belonging to business establishments.

Results

Proven results (using indicators):

The total number of private containers under this system reached 25.5% of the total available in the Historical Quarter.

Contenedores CH	ARCONES	SOTERRADOS	ECOPUNTOS	PRIVADOS	Suma materias
<i>Materia Orgánica</i>	126	20	15	88	249
<i>Envases inertes</i>	158	22	15	63	258
<i>Papel-Cartón</i>	27	5	6	5	43
<i>Vidrio</i>	29	7	6	2	44
<i>Suma sistemas</i>	340	54	42	158	594

Reduction in the percentage of containers on the street and in the total volume of occupation and collection.

Possible success factors:


Businesspeople, shop owners and the hotel and catering industry understand that paying for waste generation is fair, coinciding with the business philosophy. Keeping waste inside their establishments helps improve their business image by eliminating the impact of containers and waste on the streets.

Main difficulties found:

Some businesspeople and shop owners are against storing waste inside their business premises, either due to a lack of space, or because they think that it could be used for other purposes.

Main lessons learnt from the practice	<p>Improving aesthetics of waste deposit elements, according to the historical and monumental environment, is considered to be a benefit by the residents using them, and by tourists, who greatly appreciate the cleanliness of this special part of the city.</p> <p>Working with tourism-related economic agents is a positive experience, which helps to promote the city.</p>
Additional information	

CITY OF BARCELONA (SPAIN)

Section	Description
Title of the practice	4.2. Fee-rebate scheme in the Metropolitan Area of Barcelona
Photograph	
Proposers	Metropolitan Area of Barcelona.
Contacts	Joan Miquel Trullols, Metropolitan Area of Barcelona, <trullols@amb.cat>
Useful links	http://www.amb.cat
Start date	2009.
Current Status	Finished.
Location	Metropolitan Area of Barcelona.
Inhabitants in the area	3.3 million.

Description of the practice

Summary of what the practice is about:

The Metropolitan Tax on Waste Treatment (TMTR) is charged by the Metropolitan Area of Barcelona to households and business activities in the area.

A municipal coefficient is applied to the basic tariffs defined for households and commercial activities, which depends on the per capita generation of unsorted waste. Taxpayers living in municipalities whose per capita generation of unsorted waste is higher than the average pay more, and vice versa.

	2009-2013	2014-2016
Formula to calculate the municipal coefficient (Cfmi)		
Years of reference for the calculation of the generation index per capita of refuse	Last year available	Average of the previous three years available
n	15%	20%

Origin:

Adopted by the Plenary of the Metropolitan Area of Barcelona in 2008.

Development and Timescale:

Implemented in 2009 with no major changes until 2013. From 2014 to 2017 a sliding scale average (3 years) of the per capita waste generation of unsorted waste was adopted.

In 2018 the system was abandoned for another type of incentive.

Actors involved:

Metropolitan Area of Barcelona.

Legal framework:

This was adopted through a taxation ordinance approved in the Plenary of the Metropolitan Area of Barcelona in 2008. This was in line with the provisions of the Spanish Local Tax Offices Act (Real Decreto Legislativo 2/2004, de 5 de marzo, por el que se aprueba el texto refundido de la Ley Reguladora de las Haciendas Locales).

Financial framework:

The system is revenue neutral for the Metropolitan Area of Barcelona, but is not neutral for the taxpayers of the different municipalities.

Use level:

100%.

Results**Possible success factors:**

Very easy and cheap to adopt and monitor.

Main difficulties encountered:

The waste charge is paid in the same bill as the water charge, so it is not very visible to the taxpayers. Most taxpayers are not aware of the incentives introduced by the fee-rebate system.

Main lessons learnt from the practice

There are some incentives which are very easy and cost-effective to introduce. Results are difficult to assess if the effects are cross-sectoral.

To be effective, taxpayers need to be informed of the existence of the incentives.

Additional information

Puig Ventosa, I. "Fee and rebate systems to foster ecologically sound urban waste management" (p. 527-534) dins Cavaliere, A., Ashiabor, H., Deketelaere, K., Kreiser, L., Milne, J. (Eds.) Critical Issues in Environmental Taxation: International and Comparative Perspectives. Volume III. 2006. Richmond Law & Tax.

CITY OF KRAKOW (POLAND)

Section	Description
Title of the practice	4.3. Obligatory fee for plastic bag consumption in Krakow
Photograph	
Proposers	Ministry of the Environment in Poland.
Contacts	Karolina Laszczak – Director of the Department of the Regional Policy at The Marshall's Office of the Malopolska Region, +48 12 6306140.
Useful links	www.mos.gov.pl http://www.baterie.malopolska.pl/
Start date	Obligatory payment for using plastic bags – 1 January 2018. Controls on entrepreneurs who bring out packaging and products in packages. – 1 January 2013.
Current Status	Ongoing
Location	Country, region, city, area within city where activities have been developed. Poland including the Municipality of Krakow.
Inhabitants in the area	The citizens of Poland (around 38,000,000 people), including the 768,000 inhabitants of the Municipality of Krakow.

Description of the practice

Origin:

1. Obligatory fee for plastic bag consumption (15-50 µm thick).

The problem of plastic bag waste and its impact on the environment has been discussed in many countries for years. Consumption of plastic bags in the European Union, including Poland, is huge, and there are difficulties with their processing and management.

Around 11 billion plastic bags are consumed every year in Poland, which works out at around 300 units per capita. It is foreseen that a 0.25 PLN fee for 15-50 µm thick plastic bags will cause a decrease in plastic bag consumption of 30% in the first year. The fee implements a rule of EC Directive itself.

2. Controls on entrepreneurs who bring out packaging and products in packages.

The problem of packaging waste is increasing due to the economic growth in Poland. In 2016 entrepreneurs brought out around 300,000 pieces of packaging and products in packages in Krakow, while 7,000 tonnes of packaging waste was produced. According to the management of packaging and packaging waste Act:

- an entrepreneur who brings out packaging is obliged to limit its amount and negative environmental impact, e.g. the volume and weight should be reduced to a packaging limitation minimum;
- the entrepreneur is obliged to bring out packaging which allows their further recovery and recycling;
- everyone who brings out packaging is obliged to reach the recovery and recycling level, as well as to carry out educational campaigns related to the minimisation of waste.
- in case of a failure to reach the recovery and recycling level, the entrepreneur pays a packaging fee in the maximum amount of 4.50 PLN/kg (~1 EUR/kg).

Development and Timescale:

1. Obligatory fee for plastic bag consumption (15-50 µm thick).
Free plastic bags were available at every point of sale until the end of 2017. The fee aims to bring in the good habit of using reusable cloth bags.
2. Controls on entrepreneurs who bring out packaging and products in packages
Controls on entrepreneurs who bring out packaging and products in packages have been introduced to limit bringing out of packaging and products in packages since 2013.
 - in 2016 in the Municipality of Krakow 9 entrepreneurs who bring out packaging and products in packages were controlled and fined a total of 77,000 PLN.
 - in 2017 in the Municipality of Krakow 12 entrepreneurs were controlled and fined a total of 22,000 PLN.

Actors involved:

- Shop owners, who charge a fee for plastic bags. Revenue from the fees is income for the country's budget. It must be forwarded by the leading retail or wholesale unit, who is responsible for fee charging, by 15th March of the year following the collection period.
- Entrepreneurs who bring out packaging and products in packages. They are obliged to submit reports and pay a packaging fee by 15th March of the following year.

Legal framework:

- Management of packaging and packaging waste Act.

Financial framework: (activities´ cost, activities´ revenues (if any), model/s of financing used)

- According to the rules, the maximum fee for a plastic bag is 1 PLN. Recently, the fee is 0.25 PLN. Funds obtained from the proceeds of the fee will be donated to environmental education in reducing the use of plastic bags.
- The maximum packaging fee is 4.50 PLN/kg (~1 EUR/kg). A packaging fee of 2-4 PLN (0.5 - 1 EUR) is usually charged. The packaging fee is used for environmental protection-related activities.

Use level:

The citizens of Poland (around 38,000,000 people) including 768,000 inhabitants of the Municipality of Krakow.

Results

Proven results (using indicators):

- Decrease in the use of plastic bags from 300 to 200 per capita.
- Decrease in the amount of bringing out packaging and products in packages.
- Increase in recovered and recycled packaging waste.

Possible success factors:

- A fee for plastic bag consumption and controls of entrepreneurs who bring out packaging and products in packages contribute to the reduction of waste as well as environmental protection. It relates to circular economy principles and waste management hierarchy when it comes to minimisation.
- Obligation to finance educational campaigns, which will promote good habits in society.

Main difficulties encountered:

- People are unaccustomed to using reusable cloth bags.
- The lack of a control tool causes failures to comply with the law, especially by sellers in marketplaces or small shops.
- There is a lack of knowledge amongst entrepreneurs about the obligation to submit reports and to charge a packaging .


Main lessons learnt from the practice

A fee for plastic bag consumption and controls of entrepreneurs who bring out packaging and products in packages contribute to the reduction of waste as well as environmental protection. Furthermore, it relates to circular economy principles and the waste management hierarchy when it comes to minimisation. A fee for plastic bag consumption aims to create the good habit of using reusable cloth bags. The adoption of these solutions contributes to the decrease in plastic bag use from 300 to 200 per capita, decreases the amount of packaging waste, and therefore helps to reduce environmental pollution.

Additional information

<https://www.mos.gov.pl/>

CITY OF MIRAVET (SPAIN)

Section	Description
Title of the practice	4.4. Pay-as-you-throw and incentives for prevention at municipal level: the case of Miravet (Spain)
Photograph	
Proposers	Municipality of Miravet . Consorci per la Gestió dels Residus Municipals de les Comarques de la Ribera d'Ebre, el Priorat i la Terra Alta. Agència de Residus de Catalunya.
Contacts	Toni Borrell Vives (Mayor).
Useful links	http://www.miravet.cat/
Start date	10 January 2011.
Current Status	Ongoing.
Location	Town of Miravet (Tarragona, Spain).
Inhabitants in the area	900

Description of the practice

Summary of what the practice is about:

Implementation of a pay-as-you-throw waste charge for refuse and packaging, based on the use of prepaid standardised bags.

Origin:

The idea was conceived by the Municipality of Miravet, Consorci per la Gestió dels Residus Municipals de les Comarques de la Ribera d'Ebre, el Priorat i la Terra Alta and Agència de Residus de Catalunya, with the technical support of ENT Environment and Management.

Development and Timescale:

In 2004 door-to-door collection was implemented for refuse and biowaste.

In 2008 consultancy studies started to design PAYT implementation.

Before adoption of PAYT, the door-to-door collection system was extended to include packaging, paper/cardboard, and glass.

On 27 December 2010 a two-week testing phase began, before full implementation on 11 January 2011.

Actors involved:

Municipality of Miravet, Consorci per la Gestió dels Residus Municipals de les Comarques de la Ribera d'Ebre, el Priorat i la Terra Alta and Agència de Residus de Catalunya, with the technical support of ENT Environment and Management, and the active participation of locals within the framework of a publicity campaign.

Legal framework:

This type of waste charge falls perfectly within the Spanish Local Tax Offices Act (Real Decreto Legislativo 2/2004, de 5 de marzo, por el que se aprueba el texto refundido de la Ley Reguladora de las Haciendas Locales).

Financial framework:

€89,328.64 according to

http://www.arc.cat/ca/publicacions/pdf/ccr/prevencio_rm/09_Q0301_022.pdf

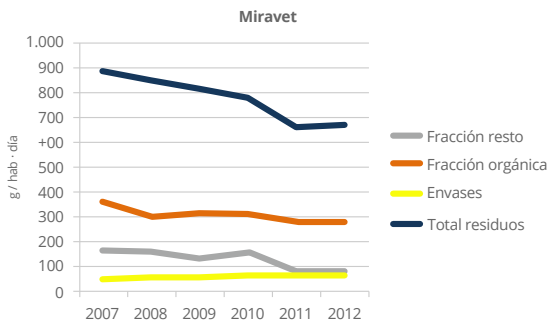
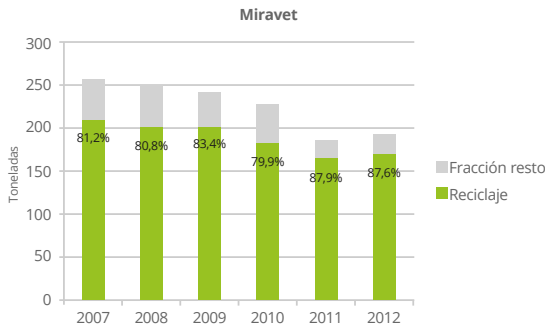
(although this includes two other municipalities and possibly does not include other costs incurred directly by the municipality).

Use level:

100% of the population.

Results

Proven results (using indicators):



<p>Main lessons learnt from the practice</p>	<p>Possible success factors: Political commitment from the Mayor. Support from the Catalan Waste Agency. Population already used to door-to-door collection.</p> <p>Main difficulties encountered: It was one of first municipalities in Spain to implement PAYT. The concept of prepaid bags was not easy to convey.</p>
<p>Additional information</p>	<p><i>http://residus.gencat.cat/web/.content/home/ambits_dactuacio/prevenio/planificacio_de_la_prevenio/recull_transversals/T_26_Taxes.pdf(p 7)</i></p> <p>Puig Ventosa, I., Calaf Forn, M. (2011), "La implantación de un sistema de pago por generación en Miravet y Rasquera (Tarragona) convierte en más justa la tasa de residuos", InfoEnviro (Actualidad y Tecnología de la Industria Medioambiental) 52, 56-57. March 2011.</p>

Reuse



CITY OF TALLINN (ESTONIA)

Section	Description
Title of the practice	4.5. Reusable deposit system cups at public events in Tallinn
Photograph	
Proposers	City of Tallinn.
Contacts	<ul style="list-style-type: none"> • Tallinn Environment Department, keskkonnaamet@tallinnlv.ee • Topsiring info@topsiring.ee
Useful links	CupCycle http://www.topsiring.ee/ (only in Estonian).
Start date	2015.
Current Status	Ongoing.
Location	Republic of Estonia.
Inhabitants in the area	1,318,700

Description of the practice

Origin:

Disposable cups make up 2/3 of the waste collected from different festivals and public events in Estonia. Replacing disposable cups with reusable ones significantly decreases the amount of resources needed for collecting and handling waste.

The reusable cup service is simple and has been widely used at many public events in Western Europe for over 10 years. CupCycle replaces disposable cups with reusable, washable cups at public events and in coffee shops and takeaways, etc. The Smart NFC chip on the bottom of the cup enables automated return and mobile deposit repayment on the spot. The customer receives their drink in a reusable cup and, at the same time, pays a deposit for the cup. Used cups can be returned to designated locations at the event, and a new cup may be obtained or the deposit repaid. CupCycle offers a full service for public events with three different types of cups with logistics, washing up, and if necessary, bringing their own service staff for big events.

Development and Timescale:

CupCycle EST was founded in December 2015 and its Estonian name is Topsiring. CupCycle tested its pilot project at the Haapsalu Yoga Festival in 2016 and for that occasion the cups were ordered from Taiwan and China. The cups have been produced in Estonia on Hiiumaa island since the autumn of 2017. After the pilot test they have provided their services at numerous events every year. Most recently, the service was used at a free concert on Tallinn's Freedom Square that marked the beginning of the Estonian Presidency of the Council of the European Union, featuring various Estonian artists and greetings from Donald Tusk and Jean-Claude Juncker.

Actors involved:

- Tallinn City District Governments.
- Tallinn Environmental Department.
- Non-governmental Organisation (MTÜ Tervikring).

Legal framework:

This system allows the quantity of used plastic cups in mixed municipal waste to be minimised and contributes to overall waste reduction. According to the Tallinn Waste Management Plan 2017-2021, the use of disposable cups will be prohibited at public events from 1 January 2019.

Financial framework:

Initial investments were made by the owner, Estonian PackCycling Ltd and also the National Foundation of Civil Society gave two grants.

CupCycle earns money in two main ways:

- a service fee from event organisers or caterers €0.10/used cup.
- the deposit money from non-returned cups. The €2 deposit per cup is higher than the cost of the cup.

The main expenses are washing up, logistics, storing the cups and staff costs. CupCycle is financially sustainable because festival organisers are motivated to pay the service fee since they cut waste management costs.

Results

Proven results (using indicators):

In the summer of 2016 the biggest festival CupCycle attended had 24,000 visitors and 20 caterers involved in the reusable cup system. During the pilot project in the summer of 2016, they prevented at least 55,000 disposable cups from being thrown away.

Possible success factors:

Introducing the initiative to festival organisers and visitors was easy as customers understood the need to reduce waste.

Early widespread media attention (online radio and online TV performances and numerous articles published).

Main difficulties encountered:

Some beverage companies are not too eager to use the reusable cup service at their counters, because they consider it to be more complicated than using disposable cups. While public event visitors are getting used to the reusable cup service, providing the service can be slowed down due to the additional explanatory work.

Main lessons learnt from the practice

Replacing disposable cups with reusable ones significantly decreases the amount of resources needed for collecting and handling waste.

The local service has a smaller footprint for cup logistics and washing up when compared to the international service. Cups have been produced in Estonia on Hiiumaa island since the autumn of 2017.


CupCycle is financially sustainable because festival organisers are motivated to pay the service fee as they cut waste management costs. Furthermore, the environmentally-friendly appearance of an event is very attractive to visitors.

The service offered by CupCycle helps to raise public awareness about environmental concerns by giving a very specific, practical solution for reuse and saving resources.

Additional information

CupCycle.
<http://www.topsiring.ee/>(only in Estonian)

CITY OF NICE (FRANCE)

Section	Description
Title of the practice	4.6. Giving bulky waste a second life through repair and resale in Nice
Photograph	
Proposers	Waste Management : public authority (Metropole Nice Cote d'Azur).
Contacts	Gilles Passeron. Yoann Billon.
Useful links	
Start date	May 2018.
Current Status	Recycling plant : circular economy and social interest waste collection.
Location	Nice – Les Moulins.
Inhabitants in the area	12,000

Description of the practice

Summary of what the practice is about:

The association deals with the collection of bulky waste throughout the “Les Moulins” district. The waste is sorted to retrieve what can be repaired and sold in the retail space. All the bulky waste is brought into the repair area to be tested, repaired or revamped.

The recycling plant also has a special area for collective composting, the creation and maintenance of a shared, educational garden and waste-themed activities and awareness.

Origin:

This project arose out of the Energy Transition for Green Growth Act, passed on 17 August 2015, which aims to reduce the quantity of waste disposed of in landfill by 50%.

Development and Timescale:

It took about more than 3 years from the first project study to its execution.

The first year was dedicated to the project feasibility study and the soil study. In the meantime, the request for the building permit was made, which was granted in September 2015, allowing the budget to be discussed and possession to be taken of the ground. The works started in November 2016 and lasted 11 months.

Actors involved:

The financial partners helping to fund this project were the Caisse des Dépôts et Consignations-Programme Ecocité (€150,000 before tax), Contrat Plan Etat Région (€30,000 before tax), FEDER région PACA programme ITI (€390,066 before tax), CRET région PACA (€100,000 before tax – current file). Within this organisation, more than 80% of the project that was subsidised by our partners.

The technical management of the site was awarded to the Association GALICE.

Legal framework:

- A social solidarity economy structure for to drive and manage the recycling plant by means of a reserved public tender defining management systems, operation and remuneration.
- Bring in the social stakeholders for the project and set up a convention to define their technical and financial participation.
- Hand over the plant to the operator. The running costs (water, electricity, rent, variable taxes and building maintenance, etc) to be paid for by the Metropole.
- Provide the material means to process the collection of bulky waste.

Financial framework:

Running costs :

- €45,000/year for operating expenditure, such as waste treatment, water, electricity and various other costs;
- €187,500/year for operating expenditure for site management in a public tender framework reserved to social solidarity economy enterprises.

Use level:

The area where the recycling plant is has approximately 12,000 inhabitants. For this kind of activity, we expect at least 5% of the locals to visit each month. The association should also work to propose educational activities for schools.

Results**Proven results (using indicators):**

Work in progress.

Possible success factors:

A circular economy in a difficult area that will provide locals with low cost furniture.

It is a point of interest for sustainable development with a shared garden. One of the site's most significant activities is education and awareness building.

Main difficulties encountered:

Work in progress.

Main lessons learnt from the practice	Not yet available: the recycling plant only opened in May 2018.
Additional information	http://www.nicecotedazur.org/actualite/2017/10/27/recyclerie-dans-le-quartier-des-moulines-%C3%A0-nice http://recycleriedesmoulines.org/

Composting



CITY OF PORTO (PORTUGAL)

Section	Description
Title of the practice	4.7. Home composting support scheme in Porto
Photograph	
Contacts	Susana Freitas. Susana.freitas@lipor.pt +351 229 770 100
Useful links	www.lipor.pt
Start date	2007.
Current Status	Ongoing.
Location	Northern Portugal (Espinho, Gondomar, Maia, Matosinhos, Porto, Póvoa de Varzim, Valongo e Vila do Conde).
Inhabitants in the area	1 million inhabitants.

Description of the practice

Origin:

The Home Composting scheme is an awareness project that promotes home/community composting and worm composting. This process transforms biowaste into a chemical-free, natural fertilizer that can be used in all types of gardens and for all kinds of plants.

Through the composting process, biowaste is transformed into compost organically and without the need for machinery. This project aims to promote a reduction in centralised collection and treatment of bio waste within the Lipor area of intervention, thus reducing the environmental impact of the process and improving the quality of life of the population it serves. By promoting workshops on composting locally, residents are encouraged to start the process.

Development and Timescale:

This project started in 2007 as a response to the organic waste problem. Since then, Lipor and its Municipalities have developed an ongoing home composting scheme as an addition to the Integrated Waste Management Strategy. The Home Composting scheme holds a privileged position as it represents a method of prevention at the waste production source, reducing the significant economic and environmental costs associated with the collection, transportation and treatment of such waste.

Actors involved:

The development was a collaboration between the Municipalities and Lipor.

Legal framework:

There is no legal framework on waste that applies directly to this intervention.

Financial framework:

This is a “free-of-charge” project to all the participants/gardeners who are willing to put the composting process in place correctly. The implementation costs relate to the purchase of composting bins and to human resources. The control of the project – which includes its administration, the development of awareness campaigns, composting courses and monitoring - is done by Lipor, and its engineers and technicians.

Results**Proven results (using indicators):**

Regarding environmental indicators, overall we estimate that we avoided 273.3kg waste/year per Worm composter put in place and 423.3kg waste/year for each compost bin put in place.

The Porto Municipality has put 39 Worm composters and 2,052 compost bins in place, preventing the incineration of more than 870 tons of biowaste/year.

Possible success factors:



Taking National and European politics into account, Lipor developed sustainable management of the municipal solid waste (MSW) produced by its associated municipalities, for which preventing waste production is considered to be the starting point. The Home Composting scheme holds a privileged position, as it represents a method of prevention at the waste production source, reducing the significant economic and environmental costs associated with collection, transportation and treatment and final disposal of such waste. We are also reducing the amount of organic waste in landfill and, consequently, greenhouse gas emissions, improving the quality of life of the population involved.

Main difficulties encountered:

The main difficulty has been making the solution successfully available for everyone depending on different space limitations.

Main lessons learnt from the practice	The key is to connect both perspectives: sustainable food production and healthy food consumption.
Additional information	Not applicable.

CITY OF CORDOBA (SPAIN)

Section	Description
Title of the practice	4.8. Composting and gardening at school in Cordoba
Photograph	 
Proposers	E.M.Sanitation Cordoba - Ayuntamiento de Cordoba.
Contacts	Jesus Diz Pérez. buzon@sadeco.es
Useful links	www.sadeco.es
Start date	2001-2017.
Current Status	Continuous improvement.
Location	Cordoba.
Inhabitants in the area	32,000 (2015).

Description of the practice

Origin:

Giving a new use to waste produced also reduces waste. The organic portion of waste in a rubbish bag also represents almost half of the weight of the total amount of waste that we throw into the bin.

Sadeco is committed to correct separation in order to be able to make compost from this waste, so that they can return the organic matter to our soil, because there is a lot of land needing it and, in this way, they can also close the cycle. That is why compost bins are being distributed to schools, and social areas, to make compost and for "The Little Garden" Educational project. In this project pupils and students see the complete waste cycle, from waste production, separation, composting and the use of compost for plants in the vegetable garden.

Development and Timescale:

In 2017, "The Little Garden" project began and 20 reused containers were distributed for small gardens. In 2018, 20 bins were given to pupils in 20 schools leaning planting techniques, with the help of the use of compost obtained from waste in Sadeco's Environmental Complex.

In 2017, a new collaboration began with the Cordoba Prison Centre and associations for the distribution of compost bins so that they could be used to make compost and fertilise the vegetable gardens.

In 2018 smaller compost bins are also going to be distributed to schools taking part in the Little Garden project, in order to completely close the waste cycle as an awareness and educational activity.

Actors involved:

Schools, associations, Cordoba Prison Centre.

Legal framework:

Municipal Bye-Laws for Public Hygiene.

Financial framework:

The Project, including all the compost bins and containers for Little Gardens for 20 schools and educational talks in collaborating centres, cost approximately €12,000.

Self-financing.

Results**Proven results (using indicators):**

20 schools and Cordoba prison centre are trained to recycle waste by making compost from organic matter.

Possible success factors:

Cooperation of educational centres and learning through hands-on school activities.

Main difficulties found:

Difficulty of sufficient space in some schools. Difficulty with organic waste management for some school leaders.

Main lessons learnt from the practice

Learning from an early age about respecting the environment and about what community compost making is, through close hands-on work, is fundamental to making a population aware and willing to cooperate.

The participation of the educational community must be reflected in ongoing programmes, with the support of the municipal authorities, and be part of the school curriculum.

Campaigns



CITY OF KRAKOW (POLAND)

Section	Description
Title of the practice	4.9. Targeted campaign in the Vistula River District
Photograph	
Proposers	John Pitcher (Advertising Agency).
Contacts	Agata Zambrowicz, agata.zambrowicz@johnpitcher.pl, +48 692 478 090.
Useful links	http://johnpitcher.pl/dzielnica-wisla-2016/ https://www.facebook.com/dzielnicawisla/
Start date	December 2015.
Current Status	Ongoing.
Location	Poland, Warsaw.
Inhabitants in the area	1,758,000 inhabitants of Warsaw.

Description of the practice

Origin:

1. Vistula bank is a new trendy place in Warsaw. For many years it was not so popular and it was rather a dodgy place. Over the last few years, Vistula bank in Warsaw has changed its image and is now a vibrant place where young people like to spend their free time: summer fun, culture, art, sport, music, dancing, alcohol and parties, etc. Unfortunately the area is covered with waste after weekend nights.

2. The Vistula river is covered by several districts in Warsaw, so there is no one main mayor for the area. People do not care about it because in their minds it is a no man's land. It is a place where freedom comes close to anarchy.
3. That is why the idea appeared – the Vistula District needed to be set up, where all the people need to be the mayors and take care of the space.

Development and Timescale:

Vistula District was set up in 2015. Social media communication was run and functioned throughout the year. The main activities take place in the summer. There have already been 3 summer seasons during the project. The project was built on: EDUCATION & REWORKING, DIALOGUE & PARTNERSHIP, PROMOTION. Main activities:

- EDUCATION – Educators give away waste bags and pocket ashtrays; The idea was to give people a useful tool for keeping the place clean. Educators handed out bags and ashtrays and introduced people to the Vistula District idea.
- REWORKING – 2 waste exchange points were built. People could exchange their waste for useful prizes (drinking water, plants, taxi vouchers, boat vouchers, mosquito spray, firewood) there; The idea was to strengthen positive attitudes by giving rewards.
- PARTNERSHIP – We were working with all the stakeholders – boaters, local business, locals. Everybody could participate, everybody was a part of the project;
- DIALOGUE – the Vistula District office – a place was created where everybody could find out more about all the activities in the Vistula District, and people also could bring their own ideas for the area;
- PROMOTION – Communication and promotion - PR, Social Media, Viral video, Cultural Festival, Ambient, cooperation with independent artists – video art. We ran a Facebook communication through the project, produced a viral video about Wisław – a Super Hero who looks after the Vistula District; The second viral video was produced by an independent artist who supported the message of the campaign; We set up the Vistula District eco Festival – an eco event, which lasted one week. It included concerts, workshops, meetings, exhibitions and cruises, etc. Old bins were upcycled and put in the area.

Factors involved:

- Warsaw City Council – principal.
- John Pitcher – Creative agency – originator & coordinator.
- Ngo – partners in the project (Educators, Eco Festival, bin upcycling project).
- Boaters – stakeholders.
- Small local businesses (clubs and restaurants on the river banks) – stakeholders.
- Big business – (Danone, Innogy, myTaxi) - sponsors.

Legal framework:

The project is run by a Warsaw City Council.

Every year they announce an unlimited tender to choose a coordinator. The first and second editions were coordinated by the John Pitcher agency.

Financial framework: (activity costs, activity revenue (if any), financial model/s used)

2016 budget = €77,846.17

Use level: (%) or number of users (if possible):

1,758,000 inhabitants of Warsaw.

Results

Proven results (using indicators):

- Over 320 nationwide and regional media publications about the campaign.
- Publication expenditure and Unique User 115 969 040 (increase by 100% compared to the first edition).
- AVE: PLN 256 354 EURO.
- Daily communication on Facebook reached 67,457 people and involved 24,705 of them.
- The movie "With the camera among the waste" has been watched over 2,400,000 times; The film "Wisław" has had over 602,000 views.
- 1,800 pieces of waste were exchanged daily, with a total of over 25,000 pieces of waste were exchanged.
- 10,000 ashtrays and over 15,000 waste bags were distributed.

Possible success factors:



- Increased awareness.
- People took more care with the common space, there was a change of social attitude – people reacted to littering.
- "No littering" trend.
- Eco awareness.
- Decrease in the amount of waste.

Main difficulties encountered:

- The number of litter bins – even though there were a lot of bins, people would always say "there are not enough bins". The difficulties were in people's heads. Our challenge was to teach them that it is not about the bins, they can always take their waste away with them, or take it to the nearest bin.
- Cooperation with a waste disposal company - Due to local regulation it was impossible to use a private company - a company contracted by the city had to be used. When the city signed a contract with them, they did not take our project as part of their service. Therefore, when the company was told to collect extra waste from our exchange points, they often forgot about it. Furthermore, they did not report to us, so communication difficulties appeared.
- Cooperation with bar and club representatives, who were focused on their own business.

Main lessons learnt from the practice	<ol style="list-style-type: none"> 1. A change of social attitude takes time. 2. Infrastructure first – there was no point in taking any action without litter bins in the area. 3. Combining all interests and visions (boaters, ecologists, owners of nightclubs and the authorities) is a great challenge but it must be done. 4. The project was effective when it focused on education and promotion.
Additional information	<p>http://johnpitcher.pl/dzielnica-wisla-2016/</p> <p>https://www.youtube.com/watch?v=CKGWMiM75EI</p> <p>https://www.youtube.com/watch?v=rsl0uThh8LQ</p>

CITY OF IBIZA (SPAIN)

Section	Description
Title of the practice	4.10. Campaign for reusable packaging at school in Ibiza: Llençat! No em llencis. (Hold up! Don't throw me away).
Photograph	 
Proposers	Environment Councillor, Ibiza City Council, GEN-GOB (environmental association).
Contacts	Montserrat Garcia Cuenca: montse.garcia@eivissa.es Sandra Romero Ramón: sandra.romero@eivissa.es GEN-GOB Ibiza: educacio@gengob.org
Useful links	www.eivissa.es www.gengob.org
Start date	14/09/2017.
Current Status	Finished.
Location	The schools in the municipality.
Inhabitants in the area	650 students.

Description of the practice

Origin:

Students have lunch at school and they usually bring their meal in plastic bags or aluminium foil. If we take into account all the times that they have lunch at school (177 days a year) and all the years that they will be at school, they will be responsible for generating a significant amount of plastic and aluminium waste.

If we show students the importance of their environmental behaviour and its consequences in the future, they will be responsible citizens in the future.

Development and Timescale:

The environmental association GEN-GOB Ibiza contacted the councillor of Ibiza and proposed an action to minimise waste production in schools. They proposed giving a reusable “bock & roll bag” made of cloth to the students to take their lunch to school.

The councillor thought this was a very good idea, but also proposed that work be done with the students to make them aware of their responsibility and also the effects of the amount of waste that they may generate just with their lunch.

At the beginning of the course (September-/October) an awareness campaign was organised at all the schools with 6 year old students (approximately 650 students). In this campaign the students got a bock & roll bag, and they also took part in an activity where they selected and weighed the amount of packaging that they take with their lunch and had to think about the amount of waste that they will generate during their entire time at school.

Actors involved:

The actors involved in this campaign were:

- Ibiza Environment Councillor.
- Association GEN-GOB Ibiza.
- Students.
- Schools' Directors and Teachers.

Legal framework:

Directive 2008/98/EC on waste.

The Spanish Waste Act 22/2011.

Financial framework:

The awareness campaign including the bock and roll bags cost €2,612.39.

Use level: (%) or number of users (if possible):

The potential users are the 650 students who have the bock & roll bags.

Results**Proven results (using indicators):**

Not all the students are using the bock & roll bag at the moment, but most of them do. They and their parents have found it handy.

Possible success factors:

Working with young children is easy because they are very receptive and are highly aware about the environment and the effects of pollution and waste.

School directors and teachers had shown interested in this campaign and collaborated with the organization.

Main difficulties encountered:

No difficulties were come across in this campaign. It had a low budget and students and schools were eager to take part.

Main lessons learnt from the practice

- Awareness campaigns with young children work well.
- Schools are the best way to get to and work with the students.

Additional information

<http://www.eivissa.es/portal/index.php/ca/actualitat/noticies/12186-presentacio-campanya-mediambiental-llecat-no-em-lleca>
<https://rolleat.com/es/>

CITY OF IBIZA (SPAIN)

Section	Description
Title of the practice	4.11. Food waste reduction campaign in restaurants in Ibiza: Aprofita'Mmm (Make the most of me).
Proposers	Government of Ibiza Island: Consell d'Eivissa.
Contacts	dep.agricultura@conselldeivissa.es
Useful links	www.conselldeivissa.es
Start date	November 2015 and 2016.
Current Status	Finished.
Location	Restaurants on the island.
Inhabitants in the area	132,637 inhabitants.

Description of the practice

Origin:

Restaurants produce a large amount of food that has to be thrown into waste containers. Customers frequently do not finish their meal and all this food ends up in containers. In a world where a lot of people have hunger problems this situation should not be allowed to happen.

Development and Timescale:

In 2015 and 2016, during the European Week for Waste Reduction, the Government of the Island developed an awareness campaign to encourage customers to take away the food that they have not eaten in restaurants.

The government contacted the restaurants beforehand, to present the campaign and invite them to participate. The government prepared and distributed paper bags and some containers that the restaurants could put the food in and give to the customers.

Citizens were informed about the campaign through the media and on social networks.

Actors involved:

The actors involved in this campaign were:

- Government of the Island: Consell d'Eivissa.
- Restaurants.
- Customers.

Legal framework:

Directive 2008/98/EC on waste.

The Spanish Waste Act 22/2011.

Financial framework:

The awareness campaign cost approximately €5,000.

Use level:

Almost 40 restaurants participated in the campaign and more than 1,000 customers each year.

Results

Proven results (using indicators):

If each customer taking part in the campaign took home approximately 100g of food from the restaurant, this campaign prevented 1,000kg of food waste each year.

Possible success factors:

Some restaurants, particularly the restaurants that are open all year, collaborate with the campaign and they have continued to offer the possibility of taking home the food that customers have not eaten in the restaurant.

Main difficulties encountered:

When the campaign took place, due to the season, some restaurants were closed.

Some restaurants refused to take part in the campaign.

Some customers, especially the older ones, were unwilling to take the food home.


Main lessons learnt from the practice

Restaurants produce a significant amount of food waste that could be avoided by offering customers the opportunity to take away the food that they did not eat.

Stakeholders' cooperation to address food waste



CITY OF TALLINN (ESTONIA)

Section	Description
Title of the practice	4.12. Cooperation with the National Food Bank Network
Photograph	
Proposers	Estonian-Netherlands Charity Foundation and Swedbank.
Contacts	Estonian Food Bank info@toidupank.ee
Useful links	www.toidupank.ee http://www.eurofoodbank.eu/
Start date	11.03.2010.
Current Status	Ongoing.
Location	Republic of Estonia.
Inhabitants in the area	1,318,700

Description of the practice

Origin:

In Estonia, about 24% of food waste is produced by commercial and catering companies and in the food industry.

The Estonian Food Bank collects food that will soon pass the “Best before” date from food trading and manufacturing companies, divides it up, with the help of volunteers, into food parcels and distributes it to the most deprived people and families on the basis of lists received from local social departments. Collected food is also distributed to soup kitchens, social housing, shelters and social projects (in total, more than 30 NGOs and charitable organisations).

The Estonian Food Bank is collective name for the network of food banks operating in Estonia, which includes 14 food banks. Each of them is established as a different charitable organisation.

The Estonian Food Bank is a full member of the European Food Bank Federation.

Development and Timescale:

The Food Bank in Tallinn was the first one in Estonia and it follows examples from other European countries. It was established on 11 March 2010 by the Estonian-Netherlands Charity Foundation and Swedbank. They provided financial support for the initial expenses and investments in order to establish the Food Bank organisation in Estonia.

Actors involved:

- Local food stores, food manufacturers and farmers.
- Local City districts, City or rural social departments.
- Volunteers.

Legal framework:

There is no legal framework for Food Bank activity. In its activities, the Food Bank follows the ethical principles for the activities of non-governmental organisations.

All food trading companies, including food retailers, must comply with the Waste Act, Food Act and their subsidiary acts. In Tallinn, according to Tallinn Municipal Waste Act, it is mandatory to collect food waste separately from other waste.

Food Donation is primarily affected by tax laws (Income Tax Act, Value Added Tax Act).

Financial framework: (activity costs, activity revenue (if any), financial model/s used)

The Food Bank does not receive any subsidies. It receives financial donations from foundations, companies and private people. These constitute the income from which the running costs of the warehouse and office are paid.

The City of Tallinn and the Food Bank have signed a Good Attention Agreement, according to which the city supports the Food Bank by giving them the use of a warehouse in the Lasnamäe District to store the food collected and, if possible, Tallinn also supports the activity with money.

Results**Proven results (using indicators):**

Approximately 1.2 million kilos of food was saved last year by the Food Bank from being turned into waste.

Possible success factors:


The Food Bank has more than 80 co-partners and supporters. Apart from the environmental aspect there is also the social aspect. The Food Bank organises food collecting campaigns.

Main difficulties encountered:

While many trading companies today co-operate with the Food Bank, the food industry is donating very little. Food donation from commercial and manufacturing companies is mostly hampered by the lack of suitable transportation, supply of labour and storage facilities. Furthermore, the vague legal requirements are one of the reasons for abandoning food donations. Moreover, there are no tax benefits for companies donating food, which, to some extent, reduces the incentive for companies to donate.

Main lessons learnt from the practice	Companies need more information about the opportunities and legal framework for donating food which is not suitable for sale.
Additional information	Estonian Food Bank. www.toidpank.ee Ministry of Environment research about food waste in Estonian trade and food industry enterprises. https://www.envir.ee/sites/default/files/toidujaatmed_ii.pdf (only in Estonian)

CITY OF PORTO (PORTUGAL)

Section	Description
Title of the practice	4.13. Food waste reduction in restaurants in Porto
Photograph	
Proposers	Lipor – Greater Porto Intermunicipal Waste Management.
Contacts	Susana Freitas. Susana.freitas@lipor.pt +351 229 770 100
Useful links	www.lipor.pt
Start date	2008.
Current Status	Ongoing.
Location	Northern Portugal (Espinho, Gondomar, Maia, Matosinhos, Porto, Póvoa de Varzim, Valongo e Vila do Conde).
Inhabitants in the area	1 million inhabitants.

Description of the practice

Origin:

Over the last few decades, the management, treatment and recovery of Municipal Waste (MW) has become more and more important, mostly due to population growth and the increase in overall consumption.

A significant part of this waste consists of food waste, either from meal preparation, food storage, bad stock management or end of expiry dates. Another part of food waste consists of processed/cooked food that is not eaten, which does not actually get to be served or goes back to the kitchen as scraps, when menus include excessive amounts of food. This means not only that food in good condition is thrown away every day, which is a waste of money, but also that every day people are acting irresponsibly, which has a negative impact on the environment.

The “Dose Certa” and Embrulha Projects are included in LIPOR’s prevention policy, which aims, fundamentally, to reduce waste production at source by changing mindsets. The target is to reduce and fight food waste by raising awareness and encouraging restaurants/canteens and their clients to change their eating habits.

Development and Timescale:

This project started in 2008 with the Dose Certa Project. Dose Certa project started as a pilot experiment as the “Menu Dose Certa” in which a restaurant was invited, and agreed, to participate. After quantifying the waste produced in May and June 2008 the size of the portions served was changed, so there would be less food wasted. Given that the “Menu Dose Certa” project was a success, in February 2009, the Dose Certa project was created and some adjustments to its strategy were made. As a companion project, in 2016, we created the Embrulha, in partnership with Porto Municipality. Even with the Right Portion some foods are still served in large portions, as is traditional, so it was imperative to find a way for customers to feel comfortable about asking to take their leftovers home. We did this by bringing in a leftovers pack, which very different to the ones used in takeaway or fast food establishments.

Actors involved:

The development was a collaboration between Lipor and the Porto Municipality. We also had a private company (Hidurbe) and APHORT Association as partners.

Legal framework:

There is no legal framework on waste that applies directly to this intervention .

Financial framework:

All activities linked to the projects are financed by Lipor and has the contribution of our partners. The costs for the project are mainly generated by transport, human resources, awareness materials, consultancy training and the Embrulha. Biodegradable Boxes.

Results

Proven results (using indicators):

Dose Certa has 41 Restaurants/Canteens, 18 of which are located in the Porto Municipality. Additionally we estimate that it showed a reduction potential of $\approx 30\%$ and the biggest issue is calculating the leftovers on the plates: 1.40kg/meal year.

With regard to Embrulha., in the last quarter of 2017 there was a reduction of 3.24 tonnes of food waste, resulting in a saving of 680 kg of CO₂-equivalent emissions.

Possible success factors:

Taking into account National and European politics, Lipor developed sustainable management of the municipal solid waste (MSW) produced by its associated municipalities, where preventing waste production is considered to be the starting point. The Food Waste project holds a privileged position, as it represents a method of preventing waste production at source, reducing the significant economic, social and environmental costs associated with food production and waste treatment. Furthermore, we reduced the amount of organic waste in landfill and, as a result , greenhouse gas emissions, improving the quality of life of the population involved.

Main difficulties encountered:

Both projects are adaptable to all types of catering establishment and easily repeatable. The main difficulties are motivating establishments to join and get involved, raising awareness and getting people to eat a more balanced diet, bringing about a change in waste generation.

Main lessons learnt from the practice	The key is linking different perspectives/issues: sustainable food production and healthy food consumption.
Additional information	Not applicable.

CITY OF BRUGES (BELGIUM)

Section	Description
Title of the practice	4.14. Food waste reduction in health care institutions in Bruges
Photograph	
Proposers	City of Bruges.
Contacts	City of Bruges, Environmental department. leefmilieu@brugge.be +3250475380 karine.debatselier@brugge.be +3250475388
Useful links	https://foodlab.brugge.be/
Start date	2017.
Current Status	Ongoing.
Location	Belgium, City of Bruges.
Inhabitants in the area	117,000

Description of the practice

Summary of what the practice is about:

Together with multiple stakeholders, the city of Bruges wanted to develop solutions to food waste in health care institutions by using an innovative and participatory approach, based on international tools and methods. Our overall objective was to reduce food waste in health care institutions.

To accomplish this we:

- Measured and analysed current food waste and its economic impact in four health care institutions in Bruges;
- Supported them in reducing food waste by coaching them through an innovation process;
- Developed and disseminated at least three successful methodologies to reduce food waste in health care institutions; and
- Raised awareness among health care institutions about food waste, its impact and solutions to it.
- We were also aiming at Co2 reduction.

Origin:

In 2015, the city of Bruges facilitated a bottom-up process to build a sustainable food policy. This resulted in the establishment of the Bruges Food Lab, a platform where local 'food' stakeholders drew up the food guidelines for Bruges. One of their two guidelines targeting food waste was reducing food waste in public organisations.

Development and Timescale:

The city of Bruges department of the environment facilitates and coordinates this project. Bruges has nineteen health care institutions. Following four institutions actively, our overall objective was to reduce food waste in health care institutions. To accomplish this we:

- Measured (using Soethoudt en Snels method) and analysed current food waste and its economic impact in four health care institutions in Bruges; (Sept 2017).
- Supported them in reducing food waste by coaching them through an innovation process;(16 Nov 2017).
- Developed and disseminated at least three successful methodologies for reducing food waste in health care institutions; and (April-May 2018).
- Raised awareness among health care institutions about food waste, its impact and solutions to it. (Sept 2018 - seminar).

Actors involved:

Involved in this project: AZ Sint Jan, AZ Sint Lucas, Ruddersstove and De Kade.

Apart from the health care institutions, FoodWIN (through tender) and the Bruges Food Lab will also be involved in the innovation process. OVAM (public waste agency of Flanders) provided 50% funding. WVG is the department of Welfare, Public Health and Family of the Flanders region. They help in transferring the solutions developed to health care institutions in the region by distributing the manual and by co-organising the dissemination event.

Legal framework:

The City of Bruges has a sustainable food strategy, with various themes: farm to fork, Fair Trade, gardening, urban and rural agriculture and food waste.

The City of Bruges signed the Covenant of Mayors, and with this project they also want to reduce CO₂ emissions.

Financial framework:

Total cost of the project: €67,670.

OVAM is the public waste agency of Flanders, they co-finance 50% of the project within the framework of 'innovative sustainable material management: 50% funding.

Use level: (%) or number of users (if possible):

- Hospital AZ Sint Jan, with 909 beds on 3 sites;
- Hospital AZ Sint Lucas, with 412 beds;
- Ruddersstove, a catering operator serving six care institutions associated with the public centre for social welfare (OCMW); and
- 'De Kade' day centre, which hosts 158 patients, of whom 112 are children.

This represents about 485,884 hot meals/year.

Results**Proven results (using indicators):**

First measurements show about 30-45% food waste (comparable to amounts found in international studies).

The solutions are now implemented with the second measurement forecast for June 2018.

Possible success factors:

A participatory approach is successful, with more communication and awareness amongst staff. Measurements of every category (meat, vegetables, etc) are necessary for complete analysis. We expect an average food waste reduction of 30%.

Main difficulties encountered:

The sector faces unique challenges such as non-voluntary consumers and unpredictable numbers of clients.

This makes food waste reduction a complicated effort.

The communications factor is a very important factor in every institution.

Main lessons learnt from the practice

- Still in progress.
- A participatory approach is necessary for staff involvement (not only kitchen staff!).
- Detailed measurement is important.
- Inclusion of other facts: malnutrition, food waste prevention, CO2 reduction.

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