R4R
REGIONS FOR RECYCLING

GOOD PRACTICE

Paris Region

Underground Containers

April 2014

Content table

1. GENERAL INFORMATION ON THE GOOD PRACTICE (GP)

1.1 General information

Region	Île-de-France (the Paris Region)
Country	France
Short name of the good practice	Underground containers for selective collection in vertical housing
Geographical level of implementation (country, region, municipality…)	Municipality
Target group	Population
Date of implementation/duration	Implementation in 2006 – pilot study: 1 year. Ongoing
Waste stream (and subcategory)	Glass packaging Mixed packaging and materials including: - Paper and cardboard - Plastic packaging - Metal packaging - Multi-layered packaging Residual waste
Legal framework	-
Main local instruments involved	- Bring banks - Composition analysis - Communication: sorting guides, pre collection bags, public meetings
Scale (pilot/partially roll out /roll out)	Pilot phase + roll out
Initiator/coordinator	Syndicat Emeraude

Demography	
Population	270 000 inhabitants
Number of households	107 250
Area (km²)	64
Population density (number of inhabitants/km²)	1 685
General waste data (Not necessarily related to the GP but to give some background information. Data about the GP should be included under 3.1)	
Year of the following waste data	2012
Sum of all waste streams excl. residual & bulky waste (kg/inhabitant/year) (indicator 1 or 2 from the R4R Online Tool)	145
Residual waste (including sorting residues) (kg/inhabitant/year) (indicator 8 or 9 from the R4R Online Tool)	335
Total waste (sum of the previous two)	480
Sum of all waste streams excl. residual & bulky waste to DREC (kg/inhabitant/year) (indicator 3 of the R4R Online Tool)	145

1.2 Context

Syndicat Emeraude is an intermunicipal organisation bringing together 17 municipalities, in charge of municipal waste collection and treatment for a population of about 270 000 inhabitants. The territory encompasses dense areas and a rate of vertical housing of about 55%.

The local authority faced several difficulties for the organisation of waste management and selective collection, especially with vertical housing and apartment blocks: very low collection rates, odours, interference of collection with parking areas…

To overcome difficulties linked with high density and vertical housing, the first underground containers were implemented in 2006 as a pilot project. Following the success of the pilot action, there was an increasing demand on the territory.

1.3 Short description

The good practice detailed here is the implementation of an important network of underground containers in dense areas of Syndicat Emeraude's territory.

Underground containers differ from traditional containers from the fact that most of their volume is situated below the surface. The visible part is similar to a street bin and presents an opening allowing inhabitants to insert their waste. The volume of the containers goes from 3 to 5 m^3, which is equivalent to around ten 500-litre wheelie bins.

The description of the good practice will focus on two aspects:

The evolution of selective collection in parallel with the introduction of underground containers (2006 – present) ;
A punctual study comparing the evolution of performances in an area with underground containers and an area with a traditional door-to-door system. The study lasted about 1 year and focused on "difficult" residences where inhabitants did not show any interest in selective collection.

The first introduction of underground container was made in 2006 in a single apartment block. By the end of 2012, around 850 containers were installed.

1.4 Objective

Underground containers are seen as an interesting solution to overcome difficulties linked with the implementation of selective collection in dense areas and vertical housing. They offer several advantages over traditional wheelie bins: less handling needed, less space consumption, better integration into the landscape, cleaner surroundings, higher capacities leading to less overflowing and lower collection frequencies, less odours.

Underground containers are also regarded as a good way to raise awareness and inform citizens about selective collection since they bring a more positive image of waste collection. The study aiming at assessing the efficiency of such containers was conducted on "sensitive" areas where inhabitants did not show any interest in selective collection.

1.5 Method used to identify the good practice

This good practice was selected based on the analysis of the evolution of selective collection

Underground containers are often regarded as a relevant solution for the difficulties linked with high density areas. This good practice is interesting since it included an assessment of its efficiency: during a 3-month period, several test-zones were monitored and composition analyses were conducted in order to assess the efficiency of the containers and of communication activities. Moreover, underground containers have been used since 2006, so the local authority has an important hindsight of their impact.

1.6 External factors

This good practice was implemented to overcome difficulties linked with one particular external factor: high density.

2. IMPLEMENTATION

2.1 Preparation phase

The first installation of underground containers was made with the collaboration of the Syndicat Emeraude, one of the municipalities in its territory, and a lessor. Underground containers were already a well working system by then. The first set of installations consisted in 55 containers in 2006 and 2007.

Each introduction of underground containers is done after the approval of the concerned lessors. Prior to the introduction, a contract is signed between the Syndicat, lessors and possibly the municipality. The contract includes various elements, such as the right for the Syndicate to install, collect, and maintain the containers, mutual obligations regarding the maintance, details for the sharing of investment and running costs, and the conditions for collection of the containers.

2.2 Technical implementation

Following the first installation of containers, other installations were conducted. In 2009, it was decided to set up a detailed study in order to assess the effective efficiency of these equipments and of the communication activities.

The study consisted in a comparative analysis of 4 different sectors, each of them showing a different configuration:

1. classical door-to-door collection and normal communication activities;
2. classical door-to-door collection and "advanced" communication activities;
3. underground containers with normal communication activities;
4. underground containers with "advanced" communication activities.

The detailed results of this study are presented in the "results" part of this factsheet (section 3.1). While no conclusion could be drawn for communication activities, the study confirmed the impact of underground containers on both collected quantities of recyclable materials and the reduction of contamination.

This pilot study was followed by the continuation of underground containers installations in the different dense areas of the territories.

For each location, three containers are installed next to the staircase: 1 for residual waste (5 m^3), 1 for packaging waste and newspapers (4 to 5 m^3), and 1 for glass packaging (3 m^3). Then collection frequencies are adjusted depending on the filling rate. Collection is made with a collection truck equipped with a crane and a compaction system. The collection truck can be operated by a single driver instead of 1 driver and 2 garbage collectors.

It has to be noted that the installation of such containers entails important works (especially for the creation of undergrounds networks), which can be time consuming.

2.3 Communicative implementation

The main method of communication relies on the involvement of caretakers (persons employed by the lessors to maintain the building and assist people living in the apartments), who then act as ambassadors of the system. Constant communication activities during the implementation of the system toward every main stakeholder is also a key for success.

During the previously mentioned experimentation, 2 levels of communication were tested to assess their efficiency:

- Moderate communication, which consisted in a sorting guide distribution in mailboxes, as well as the distribution of pre-collection bags for households to use at home.
- Advanced communication added direct communication activities: public meetings and communication activities, in communal ground floor spaces of the apartment blocks.

However, results did not allow to distinguish the effectiveness of advanced communication activities over the moderate ones. Both systems have been judged too close afterwards, and direct communication activities proved difficult to organise; very little participation was noted for public meetings. It seems to be a better strategy to take advantage of other events in the neighbourhood to promote the system rather than to organise a special event.

2.4 Organisations involved

Different organisations were involved in the implementation of the good practice. Besides the local authority, the accredited body in charge of the French packaging EPR system, Eco-Emballages, contributed through a partnership bringing both financial and technical assistance.

For every installation of underground containers, a contract is signed by several actors: the Syndicat Emeraude, lessors, and the municipality. This contract lasts for 10 years and includes a servitude allowing the Syndicate to install, collect and maintain the containers and detailing the different obligations of each signatory and the separation of costs: the containers themselves, maintenance and communication for the Syndicate and the works, cleaning and handling of illegal dumping for lessors.

Caretakers are one of the key stakeholders of the system, being in charge of its proper functioning, its maintenance, direct communication toward householders and other important aspects such as the collection of large cardboard that cannot fit in the containers' opening.

It is important to involve municipalities for various reasons, such as the installation of the containers and potential modifications of parkings areas.

The experimentation phase was conducted in collaboration with other stakeholders as well: a consulting agency was appointed to help with the installation and monitoring of the action (observation phase before and after the implementation of containers and communication activities), and a subcontractor in charge of waste collection was also involved to help with composition analyses.

2.5 Key success factors

Several key success factors were identified during the implementation:

- The involvement of lessors is essential, so a special effort should be made to convince them and promote the system;
- Since the system relies on a collection truck with a compactor, it requires a certain number of collection points to be made profitable;
- The containers should be located within 20 and 30 m from the entry door of the apartment block, so that it is not too inconvenient for users and it reduces noise issues for the surrounding apartments.

One of the main success factors of such a practice is the involvement of caretakers, who are an interesting way to raise inhabitants' awareness but also handle the maintenance of the containers. The good condition of the containers will make citizens want to keep using them.

2.6 Resources

The investment is about 11 000 € per container (ex. Tax), half of the cost being for the equipment and the other half for works. The running cost is assessed between 60 and 100 € per container per year (ex. Tax), mainly for emptying and cleaning purposes. Technical maintenance is done once per year and mainly consists in pumping out rainwater and cleaning the containers.

Regarding the number of containers, for a frequency of collection of twice a week, the following numbers are given:

- For 4-storey apartment blocks: 1 container for 30 households;
- For 10-storey apartment blocks: 1 container for 50 households.

The fact that collection operations were faster, less frequent and only required one driver instead of one driver and two collectors has led to financial savings which were calculated to about 30%.

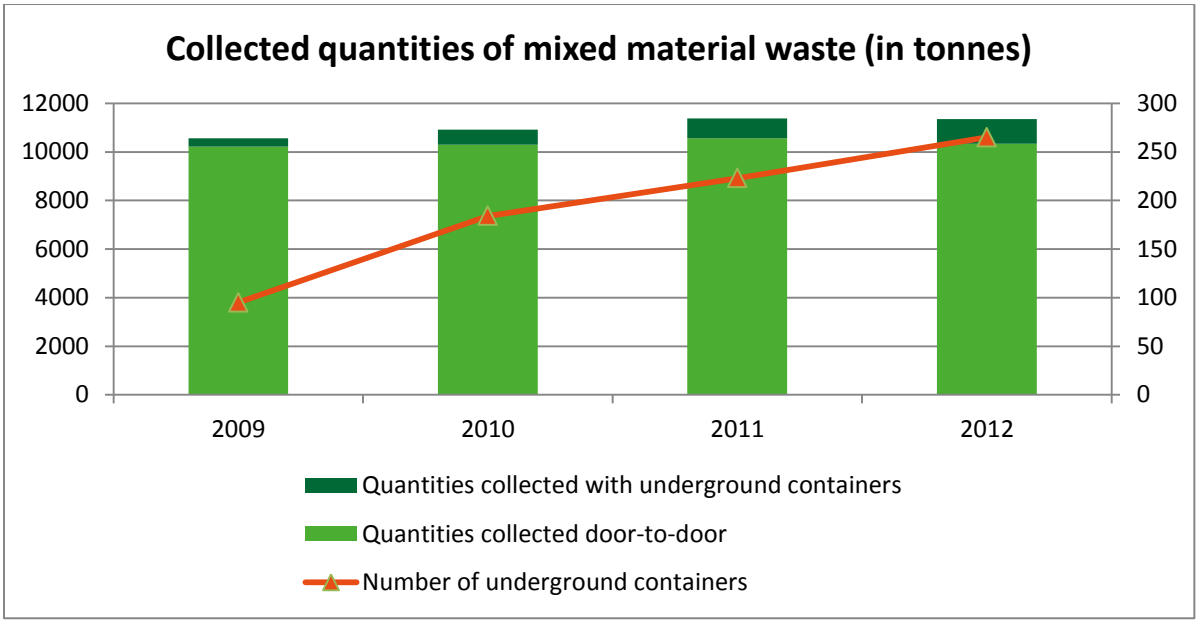
The financing of the system (both investments and running costs) is shared between the Syndicate and the lessors. Indeed, lessors are legally supposed to provide both a facility to allow waste collection (i.e. a place for households to bring and store waste and the provision of collection bins on the kerbside). The sharing of costs is about 50/50 between the lessors and the syndicate.

3. RESULTS

3.1 Monitoring of the progress of the GP

The experimentation conducted in 2010 showed the positive impact of underground containers on both collected quantities and contamination rates. Collected quantities rose from almost nothing to about 75 kg/hhld/year for mixed material and to 20 kg/hhld for glass. After the installation of containers, contamination rates were similar to other municipalities. For large carbdoard, collection is less effective unless caretakers facilitate their placement in the containers.

It is possible to show results of the implementation of underground containers over time by looking at the evolution of collected quantities between 2009 and 2012. The implementation is concomitant with an increase of +7.5% of recycled quantities and a slight decrease of contamination, going from 20% in 2009 to 17.7% in 2012.

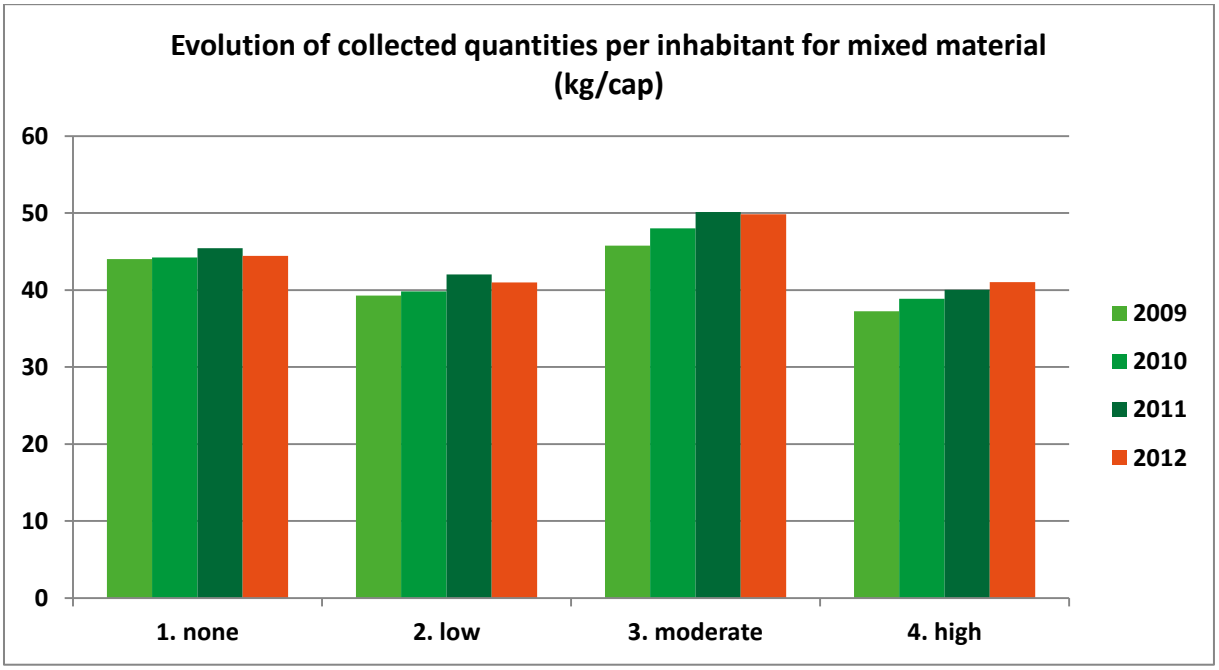


As shown on the graph, the quantities collected via underground containers represent a small fraction of the total quantities collected, and they increase proportionally to the increasing number of containers. However, it is possible to show the evolution of collection for the different municipalities, and so to distinguish municipalities experiencing the implementation of underground containers to municipalities collected via door-to-door collection schemes.

To make the analysis a bit more precise, 4 categories were created according to the number of underground containers installed in 2012 for 10 000 inhabitants:

1. None: 0
2. Low: between 0 and 5
3. Moderate: between 5 and 10
4. High: over 10

The evolution of collected quantities per inhabitant for these 4 categories can be seen on the graph below:



The graph shows that municipalities experiencing a moderate or high installation of underground containers had increasing collected quantities per capita (respectively +9 and +10%), whereas other municipalities' performances were more stable.

3.2 Other results

Other positive outcomes were reported:

- Cleaner living environment for residents: as waste is being stocked underground, it consumes less public space. It sends a positive image of selective collection to the inhabitants.
- The fact all containers are grouped together makes it easier for users to understand the sorting guidelines. Having a complete view of the different collected fractions at the same place apparently eases sorting habits.
- Bigger containers leading to less collection, savings could be made. The Syndicat calculated a decrease of 30% for the costs of collection. The collection route is also shorter.
- The system is also less constraining for caretakers, who do not have to take out containers on the kerbside anymore.

Implementing the system also helped to strengthen the links between the Syndicat, municipalities and lessors, which is interesting for further communication activities.

4. LESSONS LEARNT

4.1 Negative effects

Besides the relatively significant investments needed and the fact that the installation entails important construction work (underground networks…) that can take considerable time, very few negative effects were noted by the different stakeholders. One of the main difficultes is the the monitoring of the quality of selective collection inside the container, unlike with traditional wheelie bins.

4.2 Challenges

The system seems to be working well long after its implementation. The main challenges are centred on the installation of the containers and were detailed above (convincing lessors, time and resources for the technical implementation).

One of the main challenges is for the large cardboards that do not fit in the opening of the container. Unless the inhabitant cuts the cardboard so that it fits (which is not a common behaviour), cardboards are generally left next to the container. At first a decrease of about 25% of the quantities of large cardboard could be observed. However, it is possible for caretakers to open the container and put them directly inside. This confirms the importance of caretakers for the success of such equipment.

5. FURTHER INFORMATION

Organisation	ORDIF
Address	Cité Régionale de l'Environnement 90, avenue du Général Leclerc 93500 Pantin
Contact person	Jean-Benoit Bel
Phone	+33 1 83 65 40 64
E-mail address	Jb.bel@ordif.com
Website	www.ordif.com

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