

MANUSCRIPT ATHENS WASTE MANAGEMENT LIFE+ CONFERENCE

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Waste On A Diet: reducing waste, increasing circular economy & preserving household purchasing power

Abstract

Purpose

"Waste on a diet" aims to achieve three goals by 2015:

1. a 25% reduction in the weight of residual household waste to reduce from 217 kg / year / capita in 2009 to 150 kg in 2015;
2. to increase material recycling (recycling and composting), rising to 55% recycling, or an increase of 17 points in 5 years (38% in 2009);
3. to control costs, that is to say, to limit the increase of the fees charged to the user and remain below € 90 per capita in 2015.

Methods

To achieve significantly the reduction of waste production in its territory, the SYBERT sets up five major complementary actions: supporting for waste disposal management in collective housing, preventing with awareness campaigns in collective housing, developing composting facilities on collective housing, optimizing of household waste recycling centres, creating a dismantling centre for bulky objects.

Results

At the halfway mark of the project, the gamble of the reduction of residual household waste has almost paid off: from 48,741 tons in 2009, to 36 242 tons in 2013. So we are not very far from our goal of 35,000 tons and the fee charged to the user was 72€ per capita in 2013.

The collective composting is booming with citizens.

We must not ease up in their efforts : we must intensify the reduction of non-recycled waste in order to achieve 55% of material recovery in 2015 compared to 40% in 2009 and 45% in 2013.

Conclusion

The multistream waste management system chosen by the Sybert seems to be an effective solution to implement the hierarchy of waste treatment. The citizens involvement works and costs are under control. We have few months to confirm this pattern.

Context

The project entitled "Waste on a diet" is based on two key elements:

- to seek alternatives to not renew the two old incineration furnaces;
- to carry the waste incentive bill (depending on weight or volume basis) on the SYBERT area.

On 17 September 2012, the grant agreement was signed by the EU, amounting to € 1,777,810, for a total of € 4,877,000. "Waste on a diet" is number LIFE11 ENV/FR/000751.

The SYBERT is the local authority in charge of waste treatment in the mid-sized city Besançon (120 000 inhabitants, France). It is part of the Franche-Comté region, quite unheard of. Its area is a very contrasted territory : half of the inhabitants lives in a very high density city, Besançon, which counts over than 80% of collective housing within the other half lives in rural areas with 198 towns, a 1,500 km² rugged terrain. The SYBERT counts 8 members (local authorities) in charge of waste collection. One of them, the Greater Besançon is part of the project as the associated beneficiary.

The SYBERT

has taken a gamble putting the emphasis on the human being at the centre of its waste treatment strategy. This project is really integrated and concerns all the ways of waste management. We bet on a solution which includes every kind of waste streams with coherence and complementarities between all our different actions.

There are different stages in the waste treatment hierarchy : to prevent (to minimize the waste production), to reuse, to recycle, to recover (energy and organic valorization) and the disposal which is only considered once all other possibilities have been explored before. The increase of the amount of waste being sorted and recycled results in high costs. The system for the treatment chosen by the EU must now favour this hierarchy.

This project's ambition is to reduce waste production, encourage re-using, to recycle organic matter and to increase recycling generally so as to diminish the quantity of residual waste incineration and the amount of waste needing to be stored in landfill sites. "Waste On A Diet" is based on an important local problem: one of the two incineration furnaces is becoming old. The local elected representatives have decided to look for alternatives which avoid having to replace it.

The project is composed of five main actions, which have been well implemented overall, even if not all are making the progress initially considered.

After its installation on our territory, the incentive bill has a very positive effect. The production of residual household waste has indeed declined by 26 % in tonnage in 2013 compared to 2009. Besançon is the first (and still the only one) French urban area having implemented an incentive charging for waste (depending on weight and on each collection) and the whole SYBERT area is concerned as well. The weight of waste bins has fallen from about 217 kg per capita in 2009 to 159 kg per capita in 2013. In 2011, a French household produced on average 288 kg per capita according to the Ministry of ecology.

In 2009, the good practices and the behaviour of the people living in individual housing in the rural part were more developed. The waste prevention and the solutions offered by the SYBERT were well represented. For example, 50 % of rural inhabitants already used individual composting facilities. They were 75 % in 2013.

Concerning the people living in collective housing, it is way more difficult to attract them and to reach them. On the ground, particular difficulties can be observed when the collective housing is particularly dense (especially in social housing). For the most part of them, their concerns and priorities are far away from waste. The SYBERT and its partner "Grand Besançon" have decided to put the stress on the prevention awareness and the development of local composting facilities in collective housing.

Table 1. SYBERT 2009 initial baseline and 2015 targets EU project

	2009	2015
Residual waste (tons)	48 741	Min. 35 000
Storage (bulky, non-dangerous waste (tons)	11 682	Min. 6 000
Recycling rate (%)	39	Min. 55
Monitored buildings in collective housing	0	Min. 100
Collective composting sites	0	Min. 300
Cost per inhabitant (€)	66	Min. 90

Actions

ACTION B1: support for waste disposal management in collective housing

The Greater Besançon is leading this action. This action aims to guide residents in dense social collective housing to help them understand how waste incentive charging works, enabling them to use the different means at their disposal to manage their waste and therefore their bills.

Waste management support actions in social communal housing are organised in six-monthly periods during which those selected sites benefit from needs analyses, propositions and actions aimed at improving waste management, notably informing people of what they need to do following the implementation of waste incentive charging since September 2012.

There are different operations done in collective housing: door to door, exchanges during waste awareness events or training courses and distributing documents like waste sorting memo, “no advertising” stickers, “waste incentive charge” newsletter and guide...

At the end of 2013, 100 collective housing sites (5 517 households), managed by four social landlords were given support in the Greater Besançon area. This support represents a whole range of significant operations organized on each site, the purpose of which is to understand the how they function, their potential, the necessary actions to be carried out, and an evaluation of their effects.

ACTION B2: Prevention awareness in collective housing

The SYBERT leads this action. This action aims at raising awareness of waste reduction, in terms of both toxicity and quantity, among residents in dense social collective housing.

The programme of the activities organized by SYBERT’s addresses five themes concerning waste reduction:

- Composting
- eco-consumption
- food waste
- toxic waste and waste electric and electronic equipment (WEEE)
- re-use

Between 2012 and 2013, the prevention awareness activity events were held in social housing zones, reaching 4 000 inhabitants (children at primary school and adults).

The SYBERT calls on local associations who provide their services (Trivial Compost, TRI and CPIE) or through partnership programmes (CLCV), to organize awareness activities.

Action B3: Development of local composting facilities in collective housing

This action aims to develop local composting tools within collective housing zones.

Several tools have been put in place to complete this action successfully: composting facilities at the foot of apartment buildings, composting sheds and rotary drum composters.

At the end of the second semester of 2013, 169 composting facility sites at the foot of apartment buildings were in service. In total, these concerned about 15,000 residents: 6,342 households had access to these facilities, 40.5 % of whom were actively participating in communal composting.

At the end of 2013, 6 composting sheds were in service, concerning 2,830 households. 16.5 % of them used it.

The city centre of Besançon is subject to a plan which protects and maintains its heritage (housing the Vauban ramparts and the Citadelle, included in UNESCO’s World Heritage list): the urban planning procedures are therefore complex, involving a multitude of restrictions. We have constraints of urban area, the space is coveted (parking, gardens ...).

The rotary drum composter was installed at ‘Les Oiseaux’ centre and hostel for young people at the end of 2013. This site enables the recycling of bio-waste for the surrounding residents as well as that for the ‘Oiseaux’ hostel restaurant, around 800kg of bio-waste per week, 600kgs produced by the hostel. The rotary drum

composter was installed on 2 December, and started operating on 3 December. Those officers responsible for the composter have been trained.

An initial period of loading the composter has been started: the composter was firstly loaded with the catering waste, then unused food waste from the meals. The installation was finally opened up to the residents from the surrounding neighbourhood in the middle of December 2013. The residents can bring in their bio-waste during the hostel's opening hours, where they are received by the officer responsible for the machine.

A large number of people involved in developing collective composting awareness have been deployed. Thanks to a SYBERT subsidy, the association, Trivial Compost runs an exchange network between composting guides. This network currently has 365 members. The half of them were trained, free of charge, during a SYBERT training day. The association has created a half-nearly newsletter and organises promotional activities including visits to operational sites. For example, the International Composting Week was able to raise awareness among 600 collective housing residents. Trivial Compost puts branch grinding equipment and an electric sieve at the disposal of these members for their compost production. An internet site also provides a lot of information on the subject.

As a result for this action, 2,973 tons of kitchen biowaste had been diverted through local composting in rural area and 227 tons through local composting in urban area. There is a big difference between the two figures because the individual composting is the result of a 20 years politic. Some good side effects had been observed like no damaged composters, exchanges about waste management in social housing and more links between the inhabitants.

Action B4: Optimising the household waste recycling centre network

This involves installing a system which controls access to household waste recycling centres (badges, barriers, software) in order to measure their use in terms of quality and quantity (average number of users per site, average number of visits per user etc.) and to bill those non-household users who do not participate in the financing of the service. The aim is to target messages and to measure their impact on the behaviour of users.

First we had to create a database of users with several categories: 'SYBERT' households (still called domestic users), households from outside the SYBERT area and non-household users (public administrations, companies, associations etc.). Then, issue the badges to users.

Then, badge application forms have been issued to users at household waste recycling centres and town halls. The badges were made and sent out to the home addresses of these users during the last week of June. These cards are non-contact RFID badges, the size of a credit card. Next, we had to put the physical and computer-based arrangements into place. On July 1st 2013, all of the sites had been equipped. The SYBERT head office has been equipped with dedicated software for the management of the database and billing, and a unit for resetting the badges.

The 18 household waste recycling centres (HWRC) have been equipped with an access control system which includes a card reader and entry barrier, a vehicle size detector, a sound alarm, a loop-based counting system and exit barrier, a mobile card reader and a modem for transmitting the data.

In September and October, the tolerance shown by HWRC staff receded progressively, with access for non badge-holders no longer being possible. At the end of 2013, the SYBERT had distributed 53,140 household badges and created 926 non-household badge accounts (for 1,466 badges).

We have experimented some difficulties (delays, works...). These difficulties have gradually been resolved.

Two prevention awareness appeals (2 000 flyers) were made to HWRC users, one during September concerning the management of domestic 'green' waste and the other during December concerning re-use.

The year 2013 presented some big developments:

*605,168 visits, a fall of nearly 8% in relation to 2012, 47,352 metric tons of waste deposited, a drop of 5 % compared to 2012.

*Two new waste treatment sectors enabling the recovery of bulky waste, diverting it from the HWRCs, were put into place in 2013, first as a test :

- bulky waste capable of being incinerated for energy recovery
- the new national furniture recovery scheme

The setting up of these treatments has enabled the diversion of nearly 1000 metric tons of bulky waste away from HWRCs, around 10%.

At the end of an observation phase, this process will be extended to other HWRCs, optimizing the location of available skips.

If the visible number of non-household visits has, in reality, dropped by nearly 13 %, the setting up of the access control system has generated a more systematic identification of non-householders who are sorting their waste more effectively (incentive charging encouraging this) and the departure of some of them towards specialist waste recycling sites (1 new site opened in 2013.)

The amount of 'green' waste deposited in HWRCs has fallen by nearly 5%, but this flow is closely affected by weather conditions and only measuring the long term trend would be meaningful.

The number of objects destined to be re-used, has risen by nearly 25%, much more than in previous years. New messages towards the households will follow the ones we sent last year.

With the access control system only having been in place since the middle of 2013, comparisons will only be meaningful soon. Big changes have been observed, however, since its inception.

Action B5 : development of a dismantling centre for bulky objects

This action is being directed by the SYBERT.

This involves setting up a facility for dismantling bulky waste to concentrate waste flows. It aims to sort bulky waste and, if necessary, to dismantle it, in order to consolidate and increase the part destined for recycling and energy recuperation.

A first study was cut short. We had to set up new material streams (furniture...). Consequently, the "dismantling stream" has been reduced to sort more which is the most economic way and guarantees a higher rate of recycling.

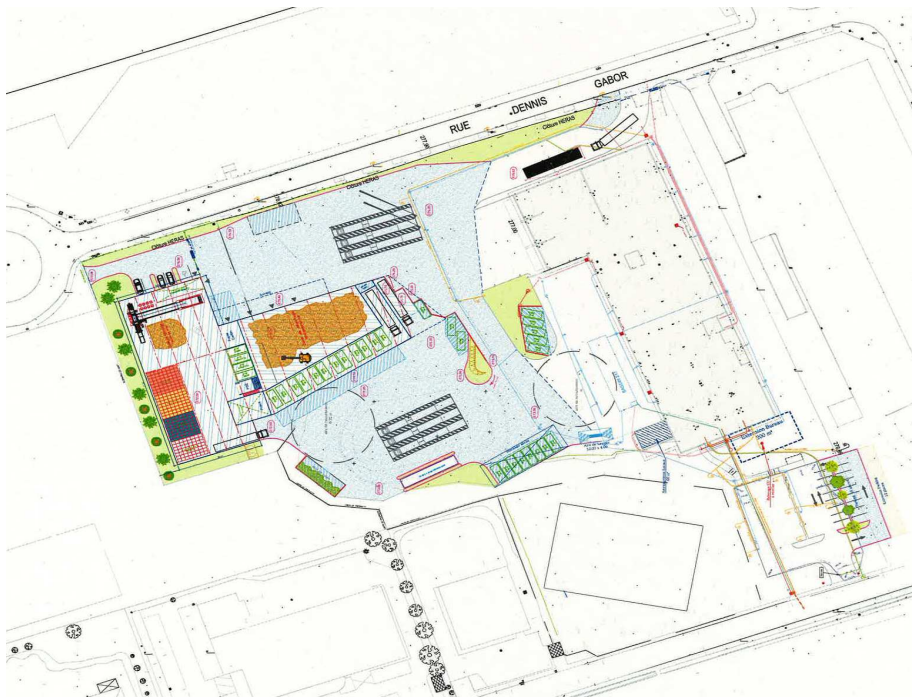
A second study, launched in December 2012, has provided a satisfactory project for this facility. The amount of bulky waste concerned, after the setting up of the national furniture recycling system, is estimated at 11,000 metric tons per year in a dozen of valorization streams (reduction of 80% of the storage).

The project was presented to the state regulatory authority (DREAL) in the autumn of 2013. At the outcome of discussions and in view of the latest regulations in force, it appears that this facility cannot be considered as a new installation, independent of the existing sorting facility. It must be considered as an extension of the existing collective waste recycling centres, being an activity regulated under the same ICPE subheading.

The project was presented to the Joint Management Committee of the SYBERT in June 2013. the building permit has been accepted at the beginning of this year. The subvention from the ADEME (Agency for the Environment and Energy Management) has been accepted too. We are currently launching the consultations for the companies, and we are waiting for the prefectoral order. The works will begin in October and the facility should be in service by the middle of 2015.

Investment is estimated at 3.7 million euros, of which 1 million Euros for the equipment (presses, grapples, loaders, skips, etc.). The economic equilibrium of this facility will be ensured by the cost difference between the current storage system and the new recycling systems rendered possible.

The installation project is as follows:



The installation project is composed of an elevated zone (shaded in violet) where bulky waste is unloaded into a hangar. Here, a hydraulic grapple and shovel will sort out the material and dismantle the door and window frames. In a central zone (shaded in blue), skips and separate compartments will be filled with the sorted and dismantled materials: cardboard, metals, plastic film, rigid plastic, energy recuperation, polystyrene, textiles, paper, glass etc. Plastic film and cardboard will be stored in bulk in another part of the building for baling; the bales will be stocked there until removal. An inclusion worker, using a special press, will compact polystyrene there.

A space has been included in this zone where recycled glass will be stored in bulk before being removed by large trucks destined for the glass recycling sector. In this zone, a simple unloading platform for contingencies has been planned for, in the event of equipment breakdowns at the SYBERT's industrial facilities (incineration plant and waste recycling facility).

Waste will be unloaded into skips situated in the lower zone (shaded in grey). These skips could then be removed. This transfer facility is not included in the LIFE project.

This lower zone (in grey) includes a reversing zone for coupled vehicles (trucks and trailers) bringing the bulky waste. It is situated at the same level as the waste recycling facility roadways, allowing for repair/mutual assistance in the case of breakdowns, for vehicles which are not authorised to use public highways (especially loaders and dollies).

Conclusion

As a conclusion, the gamble seems to be a good one and SYBERT is not far to reach its targets.

Table 2. Comparison between 2009 initial baseline, 2013 progress and 2015 targets

	2009	2013	2015
Residual waste (tons)	48 741	36 242	35 000
Storage (bulky, non-dangerous waste (tons)	11 682	11 749	6 000
Recycling rate (%)	39	45	55
Monitored buildings in collective housing	0	75	100
Collective composting sites	0	176	300
Cost per inhabitant (€)	66	72	90

Some efforts are still needed : we have 2 years left to finish our project !

You can consult the English newsletters on our EU project "Waste On A Diet" LIFE11ENV/000751 on www.sybert.fr.