



**URBAN
WASTE**
URBAN STRATEGIES FOR
WASTE MANAGEMENT
IN TOURIST CITIES



On-site composting in tourist establishments

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On-site composting in tourist establishments

What is the measure about?

Description and scope of the measure

The following measure promotes the implementation of on-site composting of organic waste (i.e. vegetable and fruit peelings, egg shells, coffee bags, etc.) generated in tourist establishments such as restaurants, hotels, camping sites, etc. It is estimated that around 12% of the total food waste in Europe is generated at these type of establishments.¹

Whenever organic waste is not collected separately in your city or region, on-site composting is presented as a sustainable alternative to recycle food waste generated in canteens, restaurants, buffets, etc. and turn it into a valuable fertilizer.

For tourist establishments with sufficient space outside there exist compost bins that facilitate the degradation of organic waste into a high-quality compost. Another option to treat organic waste is to implement worm composting bins (also called vermicomposters), which make use of earthworms to digest food waste and produce vermicompost. It is estimated that 1 kg of earthworms can consume up to 1 kg of organic waste per day². Therefore, a small area in the backyard, rooftop, garden, etc. should be provided and dedicated to composting activities.

In case outdoor composting cannot be carried out due to limited space available, there are other options to undertake on-site composting, such as the use of electric composters. These are compact electronic appliances which have a reduced size and do not produce odors or leakages. Although these systems require an electricity supply, they can be easily installed in the kitchen or maintenance room, do not require labour intensive activities and produce a high-value natural fertilizer.

Besides food waste from the kitchen, green waste from gardens, green roofs, etc. such as plant cuttings, leaves and dead plants can be mixed and composted, which is actually necessary to obtain a good compost.

For food safety and hygiene issues, it is essential that putrescible waste that cannot be composted is periodically collected. In this sense, raw fish or meat and leftovers of cooked food should be avoided and not included in the compost bin.

Compost should be ready for use after 6-12 months (depending on the system, climate conditions, etc.), once it has turned dark brown and smells earthy. A great variety of outdoor

¹ Stenmarck, A., Jensen, C., Quedsted, T., Moates, G., Buksti, M., Cseh, B., Juul, S., Parry, A., Politano, A., Redlingshofer, B. and Scherhauser, S., 2016. *Estimates of European food waste levels*. IVL Swedish Environmental Research Institute. (<http://eu-fusions.org/phocadownload/Publications/Estimates%20of%20European%20food%20waste%20levels.pdf>)

² *Vermicomposting* (FAO) (<http://www.fao.org/docrep/007/y5104e/y5104e08.htm>)

bins as well as indoor electric composters are available nowadays so it is worth researching the market for each specific region.

The produced compost can be used as a fertilizer in green roofs, decorative plants, urban gardens, etc. providing an additional benefit to the establishment together with the decrease in organic waste disposed. This is of great importance for establishments growing their own plants and food, as it implies cost savings in fertilizers and it contributes to closing the nutrients' cycle (returning nutrients from vegetables and fruits back to the soil). In addition, compost could be sold in the market or donated to community gardens (using public/private areas), farmers associations, restaurant employees, non-profit organisations, etc.

Integration in a waste management plan

The proposed measure can be adopted and included in the waste management plan of the restaurant, hotel, camping site, etc. Environmental Management Systems, such as ISO 14001 or EMAS, which tourist establishments can be certified against include waste management plans and strategies where food waste prevention and recycling measures can be integrated.

How to implement this measure?

Economic aspects to consider and potential solutions for the financing of the measure

Costs

- The cost of composting bins varies greatly depending on the type of bin/composter. As illustrative examples, the Municipality of Bristol provides at a reduced prices simple composting bins to households and restaurants for 12-15 pounds (depending on size)³. Moreover, as for electric composters, Trafalgar's Bistro and Sweet Obsession bakery in Vancouver installed a \$25,000 composter⁴.

Possible costs savings

- Installing composting bins in hotels and restaurants will contribute to the reduction of food waste generated, therefore, reducing or avoiding costs related to the treatment of residual waste. In average, the general costs of incineration and landfilling of residual waste in EU are⁵:
 - Incineration of residual waste: 64€/ton
 - Landfilling residual waste: 56€/ton
- *Costs of fertilizers*: If restaurants or hotels grow their own food, the compost produced could be used for these crops instead of buying fertilizers (organic or non-organic), translating into cost savings. The average price in EU for ammonia fertilizers is 352.5 €/ton⁶.

Revenues

- If restaurants or hotels do not grow their own food, the compost produced could be labeled and sold to interested actors, like farmers, after a quality control process has taken place. In average, the selling market price in Europe for agricultural purposes is 6.1 €/ton⁷.

Financing options

- Municipalities could provide interested hotels and restaurants with composting bins free of charge in return of the compost produced, which could be used for fertilizing public

³ Source: <https://www.bristol.gov.uk/bins-recycling/buy-a-compost-bin>

⁴ Source: <http://vancouversun.com/news/staff-blogs/25000-composter-helps-vancouver-restaurants-reduce-waste-stream-by-98-per-cent>

⁵ Source : IPCC (https://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch10s10-4-7.html)

⁶ Source : FAO (http://www.fao.org/fileadmin/templates/AMIS/images/Market_Monitor/fertilizer_prices.pdf)

⁷ J. Barth, F. Amlinger, E. Favoino, S. Siebert, B. Kehres, R. Gottschall, M. Bieker, A. Löbig and W. Bidlingmaier (2008). *Compost Production and Use in the EU. Report for the European Commission DG/JRC*

parks. In the same way, restaurants could finance the initiative with the benefit obtained from the compost sold to farmers.

- Moreover, if restaurants and hotels would show customers that they are undertaking this initiative with stickers, for instance, it would serve as a marketing tool to increase the number of customers. The benefits obtained could help finance the investment made for the installation of the compost bins or electric composters.

Type of stakeholders to involve

For the effective introduction and successful implementation of the proposed measure, the following key stakeholders should be involved:

- Municipal government
- Waste management department of local authorities
- Waste management company/local authority in charge of municipal waste collection
- Tourist establishment (i.e. hotel, restaurant, etc.) manager
- Kitchen, buffet, canteen, etc. staff (i.e. chef, kitchen assistants, etc.)
- Local farmers, non-profit organisations, urban farming associations, etc.
- Suppliers of composting bins (e.g. outdoor composting bin, worm composting bin, electric composting bin, etc.)

Description of the operational steps to follow

At municipal level

- Regulative support to encourage food waste generators to implement on-site composting (for instance, by reducing waste collection service taxes).
- Support for composting activities could consist in providing composters to interested tourist establishments and in organizing periodical controls of their correct use
- The municipality could create and update a map locating all the restaurants/hotels involved in such a measure

At restaurant/bar/hotel level⁸

- Definition of responsibilities
 - Appointing of a responsible person (coordinator) to coordinate and promote the preparation, implementation and assessment of the measure
 - Training and appointing of a responsible person in charge of maintenance of composting bin and supervision of composting phases. Additionally, a “green team” including other staff members could support this task.
 - Keeping periodic meetings between coordinator and person in charge of composting
- Baseline analysis
 - Quantification assessment
(it is important to involve all workers in this step so that they believe in the measure as it was their responsibility too and they commit to its implementation)
- Place the bins for collection of organic waste close to where food waste is generated e.g. kitchen, bar area, etc. Make sure the bins are clearly labelled and train and inform staff of what can be composted.
- Depending on the type of on-site composting system carried out, follow specific instructions so as to periodicity to feed the composter, parameters to be controlled (e.g. humidity, temperature, balance between green and food waste), potential problems (e.g. odours, insects), etc.
- Awareness activities and training of kitchen staff. Stimulate and motivate workers and staff in the preparation and implementation of the measure (e.g. separation of food waste). Staff could be encouraged in the participation if they can receive part of the compost obtained and take it to their own house.
- Communication of results
 - It can be interesting to finally publish or release the results obtained after implementing the measure to motivate workers and encourage other tourist establishments, as well as to increase the number of customers.

NB: New trusted workers should be periodically designated to be the eyes and ears for supervision and management of the measure as well as to identify areas where participation is not taking place (either by specific area or staff members). Afterwards, keep a conversation with those not cooperating so as to determine if they understand the importance of the measure and the reasons behind their low interest.

⁸ *Guía de hoteles más sostenibles (2010). Ajuntament de Barcelona – Agenda 21 – Publicacions – Guías de Educación Ambiental*

(http://w110.bcn.cat/MediAmbient/Continguts/Continguts_Transversals/Educacio_Ambiental/Documents/Fitxers/Guia_Hotels_Sostenibles_CAT.pdf)

Gender aspects to consider

Attention has to be paid regarding gender balance during the mobilization of stakeholders. In hotels and restaurants, who will do the additional work required, and will this increase the work load? Attention needs to be paid with who sorts the material.

Examples of good practices

- The French Metropole “Nice Côte d’Azur” (MNCA) in partnership with the chamber of commerce and industry, in the framework of the European project MED3R (2012-2015), tested in one hotel and several restaurants in Nice a thermal dryer that transforms food residues into dry, fertilizing organic matter. A food waste degrading digester has been tested also at the central kitchen of the University Hospital Center of Nice to produce compost⁹.
- The Business Hotel Bratislava (Premium ****) in Slovakia (with 84 beds and 150 meals served per day) has been generating a total of 2 000 kg of food waste per year, including recurrent costs such as collection and landfilling taxes. In order to cope with this problem, the implementation of an electric composting system resulted in costs savings of approximately 330 €/year due to the reduction of collection and landfilling of biodegradable waste, administrative costs and cooling equipment. Moreover, the electric composter is able to generate 198 kg of substrate per year and the general return on investment was 2.3 years.¹⁰
- The Tower Hotel in Perthshire (Scotland) installed in 2006 an automated composting system that consumes less than 4 kWh per day and converts organic waste to compost in around 14 days (compared with 12 – 18 months for the basic compost heaps it replaced). Thanks to this initiative, 1.25 tons of food waste from the hotel kitchen and 1.25 tons of garden waste could be processed to produce 1.5 tons of compost in the first year after installation.¹¹

⁹ European project MED3R (<http://ccitv.cote-azur.cci.fr/video-579-projet-europeen-med-3r--dechets-de-la-restauration> & <http://www.nicecotedazur.org/environnement/propret%C3%A9/plateforme-euro-m%C3%A9diterran%C3%A9enne-med3r>)

¹⁰ Solutions for catering equipment: Hotel Premium **** (JRK Waste Management s.r.o.) (<https://www.forlesswaste.com/wp-content/uploads/2015/12/hotel-premium-en.pdf>)

¹¹ Best Environmental Management Practice in THE TOURISM SECTOR (Organic Waste Management) (<http://ec.europa.eu/environment/emas/takeagreenstep/pdf/BEMP-8.2-FINAL.pdf>)

Guidance for setting up monitoring indicators

Two groups of indicators are to be set:

1. The first group aims at monitoring involved stakeholders:

- Restaurants involved **[number]**
- Total number of restaurants in the pilot area **[number]**

These two data will enable to compute the following indicator:

- Percentage of restaurants involved: $\text{Restaurants involved} / \text{Total number of restaurants in the pilot area}$ **[%]** (the pilot area can be the whole city or a part of it: down town, old town, port area...)
- Mapping of restaurants that implement the measure **[Name and address]**
- Employees trained on composting **[%]**

- Composter distributed to participating hotels or restaurants **[number]**

2. The second group aims at monitoring organic waste sent to the composter:

- Organic waste sent to the composter **[kg]** or **[number of bins or garbage bags]**: the number of bins or garbage bags can be chosen as a unit of measurement if it is not possible to weight waste produced, the average weight of a fulfilled bin or bag will have to be estimated beforehand for further calculation
- Number of customers **[number]**

These last two data will enable to compute the following indicator:

- Quantity of organic waste sent to composter per capita: $\text{Quantity of organic waste sent to composter} / \text{Number of customers}$ **[kg / customer]**

Time frame

It is recommended to start the monitoring at least one week before on-site composting is implemented to assess the effect of the measure on waste production.

Quantity of waste produced and number of customers can be registered **continuously** (every day every week) or **randomly** (one day per week or every day one week per month).

Gender considerations:

- Who makes ultimate decisions in establishment? **[male-female]**
- Who sorts the material? **[%female]**
- Approximate gender distribution of extra work involved? **[% female]**

Lessons learnt from the implementation phase and fine tuning



Pilots implementing on-site composting within URBAN-WASTE

In **Tenerife**, 1 hotel implemented the measure. One electric composting machine, shredder and biofilters were installed in the premises of the hotel.

15 employees were trained on the whole process (sorting organic waste correctly, use of the composter).

3,069 kg of food waste (fruits and vegetables) have been sent to the composter out of the 16,189 kg of organic waste produced in the hotel. Roughly 19% of food waste transformed into compost.

1,563 kg of compost has been produced and used in the hotel's gardens.

20,800 tourists potentially reached by the measure.

Keypoints

- **Putting effort in the training and the motivation of the team is crucial for the success of the measure implementation**
- **As far as possible rely on a stable team, turn-over of employees implies the multiplication of training sessions.**