

**CEN/WS KEY-BIOWASTE**

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Key factors for the successful implementation of urban biowaste selective collection schemes

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## 1 Introduction

2

3 Every year each European citizen produces on average 200 kg of municipal biowaste. This means that  
4 between 118 and 138 million tons of biowaste arise annually in the EU. The municipal biowaste  
5 management systems that currently exist in Europe, such as landfilling, do not give a second life to  
6 materials or resources contained in the biowaste. Other alternatives such as incineration and  
7 composting do not allow to take full advantage of the biowaste potential.

8

9 With the increase in biowaste production, the EU's priorities are to reduce food waste, increase  
10 separate collection and reuse or recycling. One of the main challenges for biowaste management is  
11 to integrate a valorization system in a city context, and to recover strategic products with a market  
12 value that offsets the global cost of biowaste valorization.

13

14 Thus, the recovery and valorization of biowaste is one of the main lines of several EU-funded projects,  
15 like VALUEWASTE<sup>1</sup>, which proposes an integrated system for urban biowaste valorization into key  
16 strategic products for the EU.

17

18 In order to implement successful valorization schemes to produce high value products with attractive  
19 and sustainable business cases, it is imperative to feed the processes with high quality biowaste. High  
20 quality biowaste relies on efficient selective collection systems and pre-treatments. Unfortunately,  
21 such systems to ensure high quality biowaste are scarce in Europe, making current valorization  
22 systems uneconomical and therefore underutilizing the potential of urban biowaste.

23

24 Standardization of the influencing key factors for the improvement of the selective collection and  
25 management of urban biowaste will help city managers and waste management service providers to  
26 increase the quality of the selectively collected biowaste, enabling the development of robust  
27 biowaste valorization processes. The influencing key factors will focus on actions to promote  
28 biowaste collection and improve the perception of citizens on urban biowaste as a local source of  
29 valuable materials.

30

31 Therefore, standardization will bring citizens' sorting and recycling efforts to increase the biowaste  
32 quality and contribute to pave the way for the transition of cities to a circular economy.

33

34 Part of this CWA is based on the biowaste selective collection experience implemented in the  
35 VALUEWASTE project. This research project has received funding from the European Union's  
36 HORIZON 2020 research and innovation programme under grant agreement number 818312.

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<sup>1</sup> <https://valuewaste.eu/>

## 38 1. Scope

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40 This CWA provides guidance for the implementation of biowaste selective collection schemes.

41 This CWA also paves the way to increase citizen engagement, as this is crucial for the successful  
42 implementation of urban biowaste selective collection schemes.

43 It is intended to be used by city managers and municipal waste managers with interest in  
44 implementing the selective collection of urban biowaste to produce high quality biowaste (i.e.,  
45 minimal presence of non-required fractions) which can be then used in robust valorization  
46 processes with attractive business cases.

47

48

## 49 2. Terms and definitions

50

51 For the purpose of this document, the following terms and definitions apply:

52

### 53 2.1 Biowaste

54

55 Waste that is composed chiefly of organic matter and typically comprises biodegradable garden and  
56 park waste, food and kitchen waste from households, restaurants, caterers and retail premises, and  
57 comparable waste from food processing plants.

58

59 NOTE For further information see Annex A.

60

### 61 2.2 Non-required fraction

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63 Waste fraction affecting negatively the valorization process.

64

65 NOTE For further information see Annex A

66

### 67 2.3 Customer

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69 Biowaste producer.

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71 NOTE In this CWA there are two types of customers: citizen and large producer.

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### 73 2.4 Collection point

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75 Place where the customer deposits the biowaste on public areas for collection.

76

### 77 2.5 Mixed fraction

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79 This is the fraction of the waste where the biowaste is actually being deposited before the selective  
80 collection of biowaste begins.

81

### 82 2.6 D-Day

83

84 Day on which the selective collection of biowaste begins. All previous and subsequent planning is  
85 done in reference to this day.

86

87 **2.7 Biopatrols.**

88 Staff whose mission is to interact with the customer, usually in a face-to-face mode. Their aim is to  
89 change customer attitudes to increase the quantity and quality of biowaste.

90

91 **3. General**

92

93 This document sets out a methodology for obtaining high quality biowaste and is intended to be  
94 of use to those municipalities where separate collection of biowaste has not started and already  
95 have collection systems in place.

96 In order to achieve high quality biowaste there are short- and long-term objectives. The short-  
97 term objectives are oriented towards planning and implementation and include the  
98 development of the plan, the definition of biowaste, the method of serving the different types  
99 of customers and the destination of this biowaste after it has been treated.

100 There is no single programme that works for all areas. Each target area may have its own  
101 geographic and demographic identity, way of collecting waste, market requirements, and legal  
102 and financial constraints. For a biowaste collection scheme to be successful, all of these variables  
103 must be accounted and planned for.

104 In this document, the factors common to all areas will be analyzed. However, the market  
105 requirements and legal and financial constraints of a biowaste collection service are not within  
106 the scope.

107 The first decision to be taken is to decide the day on which the selective collection of biowaste begins  
108 in an area (D-day). From this day onwards, there are a series of actions that shall be carried out  
109 before (Clause 4) and after (Clause 5) this day.

110

111 Clause 6 establishes a contingency plan to correct the deviations which may arise in terms of  
112 quantity and quality of biowaste.

113 Clause 7 is a summary of the key factors for the successful implementation of urban biowaste  
114 selective collection schemes.

115

116 **4. Steps to follow before starting the collection (pre-planning)**

117

118 Pre-planning is crucial to the success of a biowaste collection scheme. Aspects not considered  
119 in this phase are very difficult to change in the next phase, which is when the biowaste collection  
120 service begins.

121

122 Planning for biowaste collection begins with knowing the waste stream in a community,  
123 determining the sources, quantities and characteristics of biowaste in the area in question.

124

125 Before D-day and in the order sets out here, the following actions shall be carried out:

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127 **4.1 Biowaste typology**

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129 There are two ways to know the amount of biowaste in the mixed fraction:

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- a) Selecting the biowaste from each type of customer and taking samples of these. This way is more expensive but more accurate. When taking samples, the seasonality of the biowaste must be taken into account, so the characterizations of the residual fraction must be carried out, at least, for each of the seasons of the year (spring, summer, autumn and winter). This characterization will normally be carried out at the treatment center where the mixed fraction is taken.
- b) Other more economical option is to use existing data on biowaste composition assuming that it reflects the reality.

Once the amount of biowaste in the residual fraction is known, it is time to set a Key Performance Indicator (KPI) for quantity:

$$\text{KPI quantity} = \% \text{ of biowaste collected over total biowaste.}$$

The measurement of this KPI of quantity will be given by the data provided by the scales of the waste treatment center and the estimation of biowaste contemplated according to the analysis of the rest fraction.

This index indicates the percentage of participation in the selective collection of biowaste.

This KPI should be established for the different types of customers: citizens and large producers, separating if it is possible both collections if there are weighing systems in the collection vehicle.

Another KPI which must be also analyzed, the quality KPI for biowaste. This measurement will be carried out by taking a sample of biowaste when the vehicle arrives at its destination and will be:

$$\text{KPI quality \%} = \text{amount of biowaste in the sample (kg)} / \text{Total sample (kg)}$$

#### 4.2 Customer types

There are two types of customers for biowaste: citizen customer and large producer customer.

They are differentiated by the amount of biowaste they generate daily. An average house produces a volume of less than 10 litres of biowaste per day. If a customer generates more than 10 liters of biowaste per day, it is considered as a large producer of biowaste.

A large producer customer will normally generate a higher quality biowaste than a citizen. It is a priority to incorporate this type of customer into a selective biowaste collection programme.

#### 4.3 Proposed location of collection points

Biowaste collection points should be placed next to the customer's usual waste collection point. To improve the quality of the biowaste, the priority is to place the biowaste collection point where there are other collection fractions such as paper, glass, packaging, etc.

The proposal for the location of collection points will determine the means to be used by the biowaste collection service.

#### 4.4 Characteristics of the collection points.

183 The collection point is important because it is the meeting point between the customer and the  
184 collection service. It should have its own identity.

185 This site must be sized to accommodate all biowaste generated by customers. The frequency of  
186 biowaste collection will therefore affect the storage capacity of the biowaste at the collection point.  
187 It is advisable to visit all the large producers in the area to find out the quantity and type of biowaste  
188 they generate and thus determine more accurately the volume of biowaste to be collected.

189

190 The size of the lid of the element to deposit biowaste is a critical factor to obtain better biowaste  
191 quality. The larger the size of the lid, the poorer the quality of the biowaste.

192

193 It is therefore advisable to differentiate, if the collection point is on a public street, two types of lids  
194 of the biowaste into the collection element:

195

- 196 • Citizen, lid of no more than 25 x 25 cm
- 197 • Large producer, closed lid of at least 40 x 40 cm. This lid is opened with a key previously  
198 delivered to the waste-generating establishment.

199

200 As biowaste is quite heavy, it is advisable to keep the height of the discharge lid as low as possible,  
201 especially for large producers. Underground biowaste containers make it easier for large producers  
202 to deposit biowaste.

203

204 In the case of having several waste fractions at the collection point, it is advisable not to place the  
205 biowaste collection point at the end of the collection point. This increases the quality of the biowaste  
206 because it prevents the customer from depositing their waste at the first bin to which they have  
207 access.

208

209 The following order is recommended: mixed fraction, organic, packaging, paper and glass. That which  
210 generates odor on one side and that which does not generate odor on the other. This order should  
211 be respected as far as possible. In this way the customer gets used to always having the biowaste  
212 collection point in the same place, avoiding errors when depositing the biowaste.

213

#### 214 4.5 Communication to stakeholders of the initial planning

215

216 Once the customers, the location of the collection point and its characteristics have been studied, it  
217 is essential to involve the interested parties in the decision to be taken.

218

219 The main stakeholders in this project are:

220

221

222

223

- Customers
- Technicians
- City managers

224 Non-participation at this stage may mean that after starting the biowaste collection service, there is  
225 no participation from customers or no budget to address the separate collection of biowaste.

226

227

All stakeholder suggestions should be listened to. Some may be accepted, some may not.

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At this stage, if needed, it is probably necessary to consider adapting the municipal legislation on  
waste collection, establishing the obligation to separate waste. The date of the change of the  
legislation has to be set before starting the collection of biowaste.

#### 232 4.6 Customer communication process.

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234 Customer's participation is crucial to the success of a biowaste collection scheme. The  
235 communication process must have the following characteristics:

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- There must be a personal and direct interaction with the citizen.
- Actions must be creative and well designed.
- They must have the right technology for intelligent information management.

There is resistance to shift to recycle biowaste so public attitudes and objections to biowaste recycling need to be identified.

There will be a proportion of customers who will participate in biowaste recycling regardless of the quality of the campaign or the recycling facilities. This type of customer is usually environmentally motivated. It is for this reason that a biowaste collection program should be linked to the municipal circular economy concept and strategy. This type of customer should be offered the possibility to participate in the communication process of the biowaste collection project.

On the other hand, there will be another proportion of customers who will not be willing to participate in this type of program, so the effort should not be focused on this group.

However, the majority of customers can be made aware through specific programs and it is to this segment that effort, knowledge and understanding should be dedicated.

To motivate these customers, the following considerations should be taken:

- The sources of information should be credible and come from relevant reference groups.
- Recommendations made should be related to beliefs and practices accepted by the individual.
- The information should raise awareness through the communication of the negative impacts associated to traditional management schemes, and, at the same time, inform about the advantages of the new proposed approach.
- The information should provide specific recommendations.

Prior to the starting of the collection service, it is important to know the degree of customer acceptance of biowaste collection. This issue will be addressed later through the surveys.

In order to know the customer of an area in advance, it is recommended to use information that is normally in the databases of the City Councils:

- How many customers are there?
- what kind of customers are there in the area?
- what is the age of the customers?
- income from customers?
- Do they have experience in recycling other waste fractions?

When to start a campaign is a critical issue, if it starts early it is forgotten; if it starts late it does not reach the customer.

The start of an awareness campaign should not be timed to coincide with events that diminish its effect, such as local holidays, Christmas, the start of school, etc.

It is recommended to always start by talking about the quality of the biowaste. Quantity will come later. A customer who starts off with a bad biowaste selection process will be difficult to change in the future.

The following subclauses establish how to manage the communication process with the customer.



290 *4.6.1 Letter from the Mayor*

291

292 The mayor is the highest representative in a municipality, so it is recommended that the project of  
293 the new biowaste collection is announced by him/her (credible source of information, personal  
294 interaction) through an official letter.

295

296 The purpose of this letter is to involve the customers in the new project.

297

298 It is advisable that this letter is delivered to each home/business in the area. This delivery also serves  
299 to get to know the area better and know the number and type of customers. If a database of  
300 customers in the area is not available, this section is mandatory.

301

302 This letter should include the following information:

303

- 304 a) It should be explained that there is going to be a new biowaste collection point in the area.  
305 b) That we should avoid wasting food and that biowaste that are not usable should go to home  
306 composting (if possible) and if not to the biowaste collection point.  
307 c) It must be explained why this new service is going to be carried out:  
308 o Environmental reasons: circular economy, climate change, use of resources.  
309 o Legal reasons: European Regulations.  
310 d) It is necessary to explain what is going to be done with this biowaste after it has been  
311 collected and to set objectives.  
312 e) It is advisable to explain what is going to happen in the next few days:  
313 o Face to face communication with customers (biopatrols).  
314 o Establishment of a meeting point for doubts, indicating where it will be located and  
315 its timetable.  
316 o It is necessary to clarify which are the channels of communication in case of doubts:  
317 free hotline, social media...  
318 f) All the customers of the area should be congratulated for their collaboration, making them  
319 participants of what their collaboration contributes.

320

321 Details of how to separate biowaste, where the collection point is, etc. are shown in the following  
322 clauses.

323

324 *4.6.2 Communication through press, radio, TV, social media. From the general to the*  
325 *particular.*

326

327 Reliance on traditional media alone does not change behaviors unless you have personalized  
328 communication. Therefore, focus all messages on personalizing them as much as possible.

329

330 It is advisable to start with the mass media (press, radio, TV) and then move on to more personal  
331 media (website, social media, etc.).

332

333 The advertising campaign must unify all the elements of the biowaste collection in order to be easily  
334 recognizable by the customer. These elements are:

335

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337

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339

340 In the messages the following information should be reported:

341

342

- That we all generate biowaste.
- It is the waste that we produce the most by weight.

- 343
- That we cannot continue to exploit nature and the collection of this waste comes to solve this issue. Link it with circular economy.
- 344
- What is biowaste and should go to the collection point and what is not biowaste.
- 345
- Advice on how to separate in the home/business.
- 346
- What is done with the collected biowaste.
- 347
- 348

#### 349 *4.6.3 Face to face communication, from the particular to the general.*

350

351 This is the most important part of the communication process. The goal is to reach those customers  
352 who have doubts to adhere to separating their biowaste.

353

354 The aim is that by the time citizens are informed, most of them already know about the new  
355 collection of biowaste because they have already been informed by their children or by the large  
356 producers or by the community around them.

357

358 The communication process should be carried out by the biopatrols, staff who will inform to the  
359 different types of customers.

360

361 The communication process in a given area starts from the particular to the general:

- 362
- 1) Schools and institutes.
  - 2) Large producers.
  - 3) Associations in the neighborhood.
  - 4) Municipal services operating in the neighborhood.
  - 5) Citizens.
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##### 370 **4.6.3.1 Communication process in schools in the area.**

371 The pupils should be informed about the separation of biowaste in the schools in the area.  
372 What these children learn will have a double effect as they will remember what they learn at home  
373 and help educate their parents and other family members.

374

375 Students should be taught the words and definitions used in biowaste, so that over time all  
376 customers will speak the same language.

377

378 The following actions are recommended:

- Provide the schools with bins of the color that identifies the collection point for biowaste in the different classrooms of the school.
  - If there is the possibility of composting at school, then activities should be carried out in this respect.
  - Messages to be launched for students:
    - Include biowaste in the health programs that schools usually have.
    - Encourage local consumption of biowaste and bring it to the collection point.
  - The process of communication to schoolchildren should be repeated annually, always choosing the same school year to ensure that all pupils have received the training over time.
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##### 389 **4.6.3.2 Communication process to large producers.**

390 According to the general to specific communication approach, large producers such as food markets,  
391 restaurants, bars, shops, etc., should be visited before the general campaign to the citizen. These are  
392 the customers who are going to produce the best quality of biowaste, so special personalized  
393 attention shall be devoted to this customer.

394

395 It is advisable to design a survey model for this type of customer. It should be similar to that of the  
396 citizen, which is explained in Subclause 4.6.3.5.

397

398 It is important to take into account that there is no specific model of bin for the large producer to  
399 deposit the biowaste within their facilities. Each type of large producer has to check for the container  
400 that best suits their business.

401

402 Due to the amount of biowaste they generate and that this waste is heavy:

403

404 • No bags with biowaste weighing more than 20 kilograms should be lifted. If they generate  
405 more than that amount, they must be distributed in several bags with the maximum weight  
406 indicated.

407

408 • It should be made as easy as possible to ensure that the height of the biowaste dump at the  
409 collection point is as low as possible. With these criteria, the use of underground containers  
410 is appreciated by this type of customers as they have a low height to deposit the waste while  
411 preventing access to this type of waste once it has been deposited.

411

412 • If the collection point is on the public street, it is advisable to provide it with a lock so that  
413 the citizen does not contaminate the biowaste. Therefore, each large producer must be  
414 given a key to open the item at the collection point.

414

415 Recommended messages for large producers:

416

417 • Public markets as the heart of biowaste.

418

419 • Circular economy, the biowaste you recycle returns as a new product to the market.

420

421 • If they participate in the separation of biowaste it can be made a line of advertising through  
422 social networks, stickers in shops, etc. It is important to take this step if there is commitment  
423 and reality of recycling, so it is necessary to negotiate with these customers when to give  
424 them publicity. For example, when the collection point is at 50% capacity. Giving large  
425 producers publicity before they have achieved their targets can be a disincentive for this  
426 type of project.

425

#### 426 **4.6.3.3 Associations in the neighborhood**

427

428 These customers are, for example, cultural associations, senior citizens' clubs, women's associations  
429 and neighborhood meeting centers.

429

430 Associations are the gateway to citizens and in general it is easier to reach an association than a  
431 citizen, requiring fewer resources for the same task.

432

433 It is often the case that an association expects something in return for their participation. Therefore,  
434 if they get involved, they should be rewarded. The reward should be linked to biowaste (a compost  
435 bin, containers for the household, visits to the waste plant, etc.).

436

#### 437 **4.6.3.4 Training for municipal services in the area.**

438

439 These services comprise cleaning, collection, gardening, police services and others.

439

440 Once the collection service has started in the area, they can inform the customer of incorrect  
441 behavior, so they have to be trained in:

442

443 • What is a biowaste?

444

445 • When this biowaste is collected.

445

446 • How this waste is deposited.

446

447 • What is done with this biowaste after it is collected.

447

448 These are very basic questions, but if they do not know how to answer them, it gives an image of  
449 disorganization at the municipality.

450

451 These operators must be informed of the communication channels established with customers (free  
452 hotline, social media, etc.) in case they do not know how to respond to customer concerns.

453

#### 454 **4.6.3.5 Citizens**

455 The citizen is the most numerous customers in a given urban area, so they can provide a large amount  
456 of biowaste. The quality of the biowaste is more difficult to control, especially if the collection point  
457 is at the sidewalk, so the biopatrols should emphasize the message about how to obtain quality  
458 biowaste.

459

460 It is important to check the citizen's opinion before starting the biowaste collection service. The best  
461 tool for this is to carry out surveys in the street and online (participatory process of the City Council).  
462 These surveys should also be carried out with large producers.

463

464 Surveys should include the following information:

465

466 a) Customer data: Type of customer, age, occupation, address, email. It is important to get the  
467 customer's email address. It is the basis to continue to be informed when the biopatrols  
468 disappear from the area.

469 b) What do I do to minimize climate change? For example:

470

○ Reduce, reuse, recycle,

471

○ Reduce water consumption,

472

○ Reduce plastic consumption,

473

○ Sustainable purchasing,

474

○ Use of renewable energies.

475

c) Do I currently separate waste? which ones? why?

476

d) Are you willing to separate and deposit biowaste at the collection point? If not, please  
477 specify why not.

477

478

e) What environmental benefits can be obtained from biowaste?

479

f) Questions or suggestions.

480

481 The customer must previously accept the privacy conditions of the survey and it is advisable that the  
482 information is hosted on the portal of the City Council.

483

484 With this type of survey, previous information is obtained about what the customer thinks, an  
485 expected percentage of participation and there will be a database with the customer's emails for  
486 future communications. This is the information that will be used mainly to communicate with the  
487 customer after starting the biowaste collection service. If this information is not available, part of the  
488 follow-up of the next phase will not be possible.

489

490 There are two main motivations for citizens to recycle:

491

492 • Internal: they are usually environmental in nature and are stable over time. Thus, biopatrols  
493 must interact with customers through this type of motivations.

494

• External: they are usually economic. These motivations usually decrease when the economic  
495 incentive stops working.

496

497 Biowaste separation starts at home. According to VALUEWASTE surveys, the main reason for not  
498 separating biowaste at home is not finding the right space for biowaste separation.

499

500 One way to help in this regard is to deliver a bin to each household to deposit biowaste. Its  
501 characteristics are:

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- No more than 10 liters if the biowaste is collected daily.
- It should be accompanied by a pack of biodegradable plastic bags. A quality biowaste is advisable to go inside this type of plastic.

Biopatrols should advise on how to place this container at home and what goes into it.

The delivery of this bin involves a great logistical effort, so it is advisable that the bin is delivered at the meeting point established in the area. This point will be attended by the biopatrols and its timetable will depend on the activity in the area.

At the time of delivery of the bin, the survey mentioned above will be made. If the customers do not want to do it at that moment, they will be told that they can do it whenever they want through the City Council's portal, indicating the web address.

Once the process has been completed, the bin collection areas should be analyzed. If the number of bins delivered in an area is low, it is advisable to carry out a visit by the biopatrols in that area and, if necessary, create a temporary bin drop-off point for that area.

Communication with the customer at this level is established by building or business.

The messages that should be launched for this type of customer are:

- Avoid food waste.
- Message: "everything that comes out of the earth returns to the earth".
- What is biowaste and what is not biowaste.
- Importance of the biodegradable bag.

## 5. Steps to follow after starting the collection

The day on which the biowaste collection service starts is an important day. If all of the above has not been taken into account, the quantity and quality of the biowaste may be low. And making changes is much more complicated at this stage of the project than at the previous one.

From this day on, the project must be monitored using the quantity and quality KPIs explained above. The evolution of these two parameters will determine the actions to be taken in the future.

The actions to be carried out at this point must have the appropriate technology for an intelligent management of the information, based on the information obtained in the surveys prior to the collection. These actions come as follows:

### 5.1 Face-to-face actions

During the first week from the start of collection it is necessary for the biopatrols to establish face-to-face communication interaction with the customer to find out if they are participating in the separation of biowaste and, if they are not, to find out the reasons why.

At those collection points where there is a low quality and/or quantity of biowaste, the biopatrols should follow up in order to check the causes of the deviation. Information on the quality and quantity at the different collection points should be transmitted from the collection service to the biopatrols. There needs to be fluid communication between the collection and the awareness service.

555 **5.2 Establish a meeting point**

556

557 Inform the customer of the existence of a meeting point in their neighborhood and its opening hours.  
558 Normally it will coincide with the one in the previous phase.

559

560 **5.3 Conducting surveys**

561

562 In this phase, surveys should be carried out to analyze the degree of acceptance of the new service.  
563 These surveys should be carried out when the amount of biowaste collected has stabilized and will  
564 serve to gather new ideas with which to relaunch the selective collection of biowaste.

565

566 Surveys may be physical if biopatrols are in the area or using information contained in the database  
567 from previous surveys.

568 The contents of the surveys should focus on:

569

- 570 • Degree of acceptance of the new service. It is necessary to know if the customer continues  
571 to recycle biowaste.
- 572 • In the event that it does not continue, know why.
- 573 • What improvements would be necessary to incorporate more customers to this service?  
574

575 **5.4 Customer service hotlines**

576

577 Due to economic reasons, the presence of biopatrols in the targeted area should be reduced as  
578 collection progresses. Their presence will only be necessary in those areas where the expected  
579 quantities/qualities are not achieved.

580

581 The use of personalized communication technologies is essential at this stage of the project.

582

583 Based on the information collected in the street by the biopatrols and the previous surveys, it is  
584 necessary to create a database of customers so that they are informed of the evolution of the project.  
585 An informed customer is a more participative customer.

586

587 Examples of best practices related to customer service are:

588

- 589 • To have its own website for biowaste, a website of active listening where you learn from  
590 customers. This website must be simple, resolve doubts and be linked to social networks.
- 591 • Use of social media:
  - 592 ○ Try to keep the project alive. Create a lot of small news informing about the day to  
593 day of the project. It is better a lot of small news than a few big ones.
  - 594 ○ If there are influencers in the area, it is interesting to contact them to add them to  
595 the project.
- 596 • Place a QR code at each biowaste collection point. This point leads to a web address where  
597 the customer is informed of the following:
  - 598 ○ Evolution of the quantity collected in the area and, if possible, at the collection  
599 point.
  - 600 ○ Quality evolution.
  - 601 ○ What is being done with the biowaste after it is collected.
  - 602 ○ Survey on participation in the project.
  - 603 ○ Other comments.  
604

605 This information should be updated monthly and has to be transparent.

606

## 607 6. How to correct deviations

608

609 In any biowaste collection scheme, a contingency plan is necessary, especially if the results are not  
610 as expected for the two parameters considered: quantity and quality of the biowaste.

611

612 The communication process between the biopatrols and the biowaste collection service is essential.  
613 This collection service must inform at which service points there are quality and quantity deviations  
614 to the biopatrols.

615

616 The following aspects should be considered in this plan:

617

618 a) Monthly monitor during 6 months after D-Day the Quantity and Quality KPI's. If the expected  
619 results are achieved, follow up every three months.

620 b) If there is a new need for more collection points in the area, consider eliminating those with  
621 little biowaste.

622 c) If at a collection point non-required waste appears constantly and in appreciable quantity,  
623 this collection point must be eliminated if the causes of this deviation cannot be solved.

624 d) Face to face communication (biopatrols) where there is deviation in quantity and/or quality.  
625 If not, inform the customer through social networks and website.

626 e) It is necessary to consider whether the collection point is adapted to the customer's needs.

627 f) Inform to the customers of their actions where there are quantity and quality deviations  
628 using information as personalized as possible.

629 g) As new areas are added to the collection, it is advisable to maintain comparative indicators  
630 between them.

631 h) It is advisable to organize visits to the plant where the biowaste is treated so that customers  
632 can see what is done with it. In areas where there is less quantity/quality of biowaste, these  
633 visits are necessary.

634

635

## 636 7. Summary

637

638 In this Clause the key factors for the successful implementation of urban biowaste selective collection  
639 schemes are summarised.

640

641 One of the most important steps is to establish a day (D-day) for the beginning of the selective  
642 collection of biowaste in an area. Actions can be then divided in two: before and after this day.

643

### 644 **Before D-day:**

645

646 • Establish quality and quantity KPIs of collected biowaste.

647 • Identify large customers in the area, they are the key to obtain a high quality and quantity  
648 biowaste.

649 • Make a proposal for the location of biowaste collection points. The priority is to place them  
650 next to other selective collection bins.

651 • The collection point must be adapted to the type of customer:

652 ○ citizen, lid no more than 25 x 25 cm,

653 ○ large producer: lid of at least 40 x 40 cm with key opening and the lowest possible  
654 discharge height.

655 • Communicate the proposals of this initial plan to those interested and listen to them. Make  
656 changes to the proposal if applicable.

657

658 Once the proposal is known, the communication process starts. Its characteristics are:

659 • There must be a personal a direct interaction with the customers (biopatrols).

- 660
- 661
- 662
- 663
- 664
- It has an order, going from the particular to the general: schools, large producers, associations, municipal services and citizens.
  - In this phase, try to collect as much information as possible about customers: name, e-mail, address, dates, etc. Create your own database of customers. Online surveys are a good tool to obtain this information.

665

666

667 **After D-day.**

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680

- Start monitoring and using KPIs designed before.
- During the first week, biopatrols must establish a face-to-face communication with the customer to know if they are participating and if not, find out why not.
- Establish surveys and customer service hotlines to analyze the degree of acceptance of the new service.
- If there are KPI's deviations use biopatrols to know why. In this case the communication between the biowaste collection service and the biopatrols is essential.
- Inform to the customer of the result of the biowaste collection, using the information from the database created at the stage before.



## Annex A (Informative) Optimal biowaste typology

681

682

683 The following waste fractions can be considered as biowaste:

- 684 • Fruit and vegetables scrap.
- 685 • Cooked food leftovers.
- 686 • Eggshells, shellfish and nuts.
- 687 • Coffee grounds and infusions.

688

689 The main characteristic of this waste is that it occupies little volume, has a high amount of water and  
690 if the temperature is high, it decomposes quickly generating leachates and odors.

691

692 The density of the biowaste that is deposited in the biowaste bin depends on its quality. According  
693 to VALUEWASTE experience, the average density of the biowaste in the biowaste bin is about  
694 350kg/m<sup>3</sup>.

695

696 An effective communication campaign should explain what a biowaste is and which biowaste  
697 should not be managed in a biowaste collection (non-required waste) like:

- 698 • Dirty paper towels and napkins.
- 699 • Wipes.
- 700 • Diapers
- 701 • Pet excrement.
- 702 • Pruning and vegetable waste. Although classified as a biowaste, they should not be  
703 introduced into the collection point as their volume and different composition affect the  
704 subsequent treatments to be carried out. This waste should be collected using another  
705 collection system.

706

707