

Desired Performance Characteristics

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1. PROJECT BACKGROUND

PPI4Waste aims to achieve resource efficiency, sustainable waste management and sustainable consumption throughout Europe by increasing innovative public procurement through networking, capacity building, and dissemination. The project covers the complete cycle of preparation activities to implement PPI in urban waste management.

The task 3.4 “Performance characteristics” is a continuation of the deliverable D3.3 “Roadmap for Progressive Improvement” and part of the necessary steps to help decision-making when preparing for a PPI. To complement the roadmap for progressive improvement, a report describing desired performance characteristics is developed in this task. Such a document will enable eco-innovators to deliver waste procurement alternatives responding to the needs and actions of the pilot organizations through performance characteristics.

2. OBJECTIVE OF THE PERFORMANCE CHARACTERISTICS

The “Roadmap for Progressive Improvement” (PPI4Waste D3.3) identifies potential context-specific actions and future interventions which the pilot partners Zagreb City Holding and Mancomunidad Del Sur can take to face their challenges associated with bio-waste and plastic waste respectively. The identified actions are related to market uptake of innovative solutions, and performance characteristics are used to describe performance-based requirements of these solutions.

In a PPI approach, performance characteristics are identified and presented to the market in order to explain what solutions the organizations need. The need for solutions are specified by the functional or performance sought and not prescriptive. **The focus lies in describing the problem to be solved and defining clear outcomes by setting a number of functionalities or performance characteristics rather than determining what technical solution that should be used.** This will enable eco-innovators in the market to apply a wider range of solutions and provide innovative solutions. Solutions can only meet performance targets if expected outcomes are clearly specified by the procurer. This report, based on desktop research and pilot partner actions, will define, describe and provide examples of performance characteristics from a PPI approach.

Performance characteristics are either requirements or set as a requirement of performance up to or beyond a specific level. The performance characteristics defined in this task and deliverable will be used as input to task 4.1, where a feasibility plan for a real PPI will be developed to assess possible solutions that procurers are willing to purchase.

3. METHOD FOR DETERMINING PERFORMANCE CHARACTERISTICS

The definition of performance characteristics is an important preparation activity and a step towards the test of the launch of a PPI.

The definition of performance characteristics aims to find performance targets responding to actions from the “Roadmap for Progressive Improvement” while avoiding to formulate a technically described demand. A general work process for determining performance characteristics within the framework of the PPI4Waste project can schematically be described as follows:

- The process starts with identifying unmet needs or challenges for a public organisation. These should be clearly described to provide input to coming steps. Describing the needs in a relevant and proper manner will eventually enable the market suppliers to respond accordingly.
- In the PPI4Waste project, a thorough identification and assessment of needs were conducted in WP 2. The output of this work was five broad “themes” in which detailed needs and demands could be grouped. From these themes, each pilot partner selected *one* needs theme to provide a basis for coming work (in the “Roadmap for progressive improvement”).
- The challenge for pilot partners is now to describe these selected needs in a way that will provide relevant information for coming work and coming steps in the PPI process. To this end the needs will be defined in terms of function and performance and performance characteristics will be introduced.
- In the next step in the PPI approach the pilot partners will develop the functional procurement specification including the performance characteristics and engage the market.

3.1 DETERMINING PERFORMANCE CHARACTERISTICS FOR NEEDS

The necessary steps that the pilot partners in the PPI4Waste project will take to determine Performance Characteristics - from the needs in “Roadmap for Progressive Improvement” to functional procurement specification - is described schematically in figure 1 below¹.

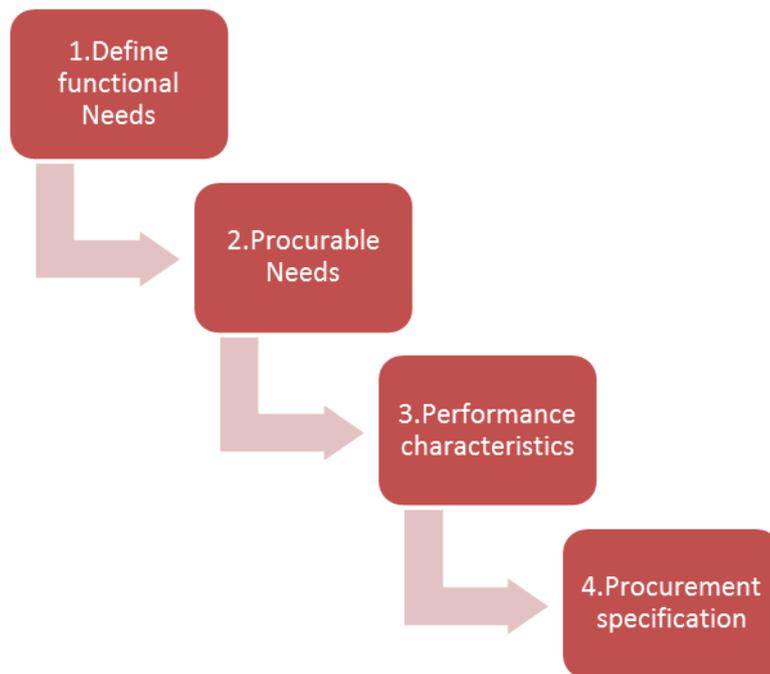


Figure 1: Illustration of the PPI4Waste methodology for determining Performance Characteristics

1. Describe actions to fulfil the need in functional terms

Looking at needs and actions from a PPI perspective should set the function in focus. Some of the needs and actions from the “Roadmap for Progressive Improvement” are already described in a functional approach. However, a more focused development of functional descriptions is desired in order to develop performance characteristics in the next step.

Descriptions of needs should²:

- Be clear and simple
- Focus on describing the problem to be solved and defining clear outcomes that are required rather than a prescribed technical solution
- Not be over-specified, as market actors need space to be creative
- Be broad or narrow, but a conscious choice (see below)
- Describe the function of the wanted solution

Needs can either be described from a broad or narrow perspective depending on the procuring organisation, available information and preferences of the person/group describing the need.

A broad description is easier to develop and requires less work initially, but will demand more resources when conducting a state-of-the-art, IPR searches and open market consultations. Broad descriptions can eventually attract more suppliers of a solution but comparison between solutions will be more difficult. Such a scope might induce risk avoidance behaviour with the procurer.

¹ Inspired by EAFIP Toolkit Module 2, see <http://eafip.eu/toolkit/module-2/>

² EAFIP Toolkit module 2, <http://eafip.eu/toolkit/module-2/>

A narrow description could lead to more effective competition between providers of solutions, as bids are easier to compare. It will be a more resource-consuming task to describe the need, but following activities such as state-of-the art, IPR search and open market consultations will be less demanding.

For each action in the PPI4Waste pilot partner lists, there are corresponding functional measurements describing possible ways to measure the future (wanted) solution. These measurements will be developed in an iterative interaction between project partners and experts.

2. Select a specific action for procurement

The scope will be narrowed down even further by selection of one action from each pilot partner action lists that can be solved with a PPI approach. These specific actions will provide a basis from which detailed performance characteristics will be developed. The reason for selecting *one* of the actions from the roadmap and proceeding with performance characteristics just for this action is that the performance characteristics need to be rather detailed.

The main selection criterion for determining specific actions for each pilot partner is if the action can be used in a PPI approach. The solution to that type of need might not be procured today, but it could be possible to procure. Is there is a possible solution available to procure? The answer requires a market engagement where the procurer formulates a problem/challenge and enters into a dialogue with the market where the market proposes solutions. Is a possible solution to the need something the organisation can procure? The procurer sets functional performance criteria within the limits of what the market has proposed (including ongoing R&D close to market) and reflects on its own value chain / objectives and strategies.

In choosing the action for procurement the pilot partner should recapitulate their own organisations' targets and strategies, using them as the basis for the performance criteria to ensure there is a strong need and a budget to run the PPI process and assure there is a real demand for the solution.

3. Set performance characteristics

The PPI4Waste pilot partners who are the experts of their systems and challenges will thereafter provide performance-based (quantifiable) requirements for future solutions. Working out what performance or result that should actually be achieved is a critical step. As mentioned above, a future tender shouldn't pre-define a technical solution but provide enough detail to enable relevant solutions to be developed.

The idea is to develop performance-based characteristics that will stimulate development of innovative and alternative solutions in the market. These solutions shall generate an expected value and thereby fulfilling the set requirements.

When determining performance characteristics, focus should remain on a value chain (in this case, the specific waste management chain) rather than a specific component to be procured. Life cycle impact and performance should be taken into consideration. Requirements should be defined in such a way that they will not limit the ability and creativity of potential suppliers to provide innovative solutions to the requested challenges. Performance in the value chain can ideally also address non-key process elements such as "employment generated", "impact on CO₂", "impact on internal and external transport/logistics".

After defining the performance characteristics it is important to also consider how much the organisation is willing to pay for the level of performance required from the innovative solutions. In other words define a real demand for solutions.

4. Procurement specification

The performance characteristics of the needs for actions will be used in the procurement specification. A functional specification is a document containing the aggregate of organised requirements and description of the available solution space or the chosen solution with the solution margin that applies to a system (product or service). The functional procurement specification describes the functions that

the product, service or solution must fulfil for the procuring organisation. Functional specifications say little about “how” this need should be met. The performance characteristics are used to define to what level the solution must perform to solve the need.

A functional procurement specification should allow freedom for both suppliers and the buying organisation. With functional procurement specifications more suppliers can usually be found than with detailed specifications. Using performance characteristics will allow ambition levels to be differentiated and to evolve in step with technological and other developments as they emerge. Functional requirements can enable existing innovative solutions into the market and position the procurer as the first customer.

Step 1-3 of this method has been implemented in each of the PPI4Waste pilot partner organisations. The resulting lists of Performance Characteristics are found in chapter 4 and 5 of this report.

3.2 COMING STEPS AND MARKET ENGAGEMENT

In the PPI4Waste deliverable D2.4 the partners have studied the state-of-the art for solutions to their needs and a basic understanding of available solutions has taken shape. In the meet the market activities the partners have exchanged needs and solutions with the market.

In the next step in the PPI approach the pilot partners will develop the functional procurement specification (step 4 in the method described above) containing the performance characteristics.

After identifying and expressing needs in terms of function and performance, the market should be engaged at an early stage through appropriate channels to identify what is possible to demand, and to allow suppliers time to prepare for an upcoming PPI approach.

In most procuring organizations the PPI approach requires a focus shift from what’s on the market to what’s almost on the market. In looking beyond the market it is not only the technology that needs to be ready as the innovations can also be social or consist of an old technology in a new business model. In the EU project “Innovation seeds⁴” a scale is developed describing the Generic Maturity Level GML of a concept. This includes all kinds of possible variety of mechanisms or instruments, including (but not limited to): business models, organizational changes, and policy measures, social, civil, institutional or corporate good practices.⁵

In general, the PPI procurement process should have clear objectives and a work plan indicating activities, timing, responsibilities and resources. In addition, high-level support within the organisation has proven valuable for procurements of innovation. To ensure this high-level support, the top management of the organisation should be involved in the process from an early stage, certainly if non-key process criteria are used.

In tendering and contracting, the full life-cycle costs of the solutions should be considered. Non-key process performance criteria might result in higher costs. Care should be taken in setting evaluation criteria to avoid that a proposed solution that meets all criteria with the highest score fails in the end due to price factors. Further, many innovative solutions come from SMEs. This is a potential market that shouldn’t be excluded and the tender might have to be adopted to fit smaller companies. Risks should be identified and managed, both technical and financial.⁶

Within the PPI4Waste project, such issues are considered within the following tasks in WP 4.

⁴ www.innovationseeds.eu

⁵ http://www.innovationseeds.eu/Virtual_Library/Knowledge/Generic-Maturity-Levels.kl

⁶ <http://www.innovation-procurement.org/about-ppi/implementing-ppi/>

4. PERFORMANCE CHARACTERISTICS FOR MANCOMUNIDAD DEL SUR

4.1 NEED FOR ACTIONS

The “Roadmap for Progressive Improvement” listed a number of potential actions and future interventions for Mancomunidad del Sur related to the needs theme of “**plastic packaging, brick and cardboard waste**”. These actions are recapitulated in the table below.

Action	Description
A.1. Determination of the initial state	<p>Municipalities and Government:</p> <ul style="list-style-type: none"> - To develop prevention plans of municipal waste (with planning, specific measures adapted to the reality of the municipality and a proper budget). - To increase and improve the awareness campaigns. - Implement concrete and effective measures for reducing single-use bags as indicated by the European Parliament. - Implement effectively the eco-design and work for the elimination of products with harmful impacts on the environment and health (e.g. microplastics and oxofragmentables). - Set targets for reuse for beverage packaging, protecting its survival in the HORECA sector (hospitality, restaurant and catering). - Implement deterrents environmental taxes: payment for waste generation. <p>Mancomunidad del Sur</p> <ul style="list-style-type: none"> - Apply stricter deterrent environmental taxation: tax by disposal in landfill or incineration and payment for the waste generation.
A.2. Implementation/adaptation waste collection scheme for appropriate waste management.	<p>Municipalities:</p> <ul style="list-style-type: none"> - To assess the enlargement of the yellow bin to plastics packaging and plastics non packaging. For this situation it would be necessary to prepare the sorting plants. - To improve the selective separation and the quality of the collected materials: analyze and choose the model of collection and separation (door to door, fifth container, wet-dry, SDDR etc.) most appropriate depending on the circumstances.
A.3. Transportation	<p>Municipalities:</p> <p>Economize the transport:</p> <ul style="list-style-type: none"> - Changing collection routes. - Modernize the fleet of trucks. - More sustainable driving
A.4. Treatment (MS)	<p>Mancomunidad del Sur:</p> <ul style="list-style-type: none"> - Prepare the facility for the possibility of receiving non-packaging plastic waste. - To find end markets for recycled plastic of high added value outside the agreement with Ecoembes (Integrated Management System of plastic packaging waste). - To incorporate technological improvements in treatment plants. - To solve the technological limitations of optical separators such as limitations of colour, label, metallized surfaces, multi-layer materials or blown errors.
A.5. Recycling	<p>Recyclers or Integrated Management System (Ecoembes):</p> <ul style="list-style-type: none"> - Improvement of recovery and recycling equipment. - To find terminal markets for recycled plastic of high added value.

The functional description for the desired actions can be measured through different dimensions. Some of these functional measurements are listed in the table below.

Action	Measurements of actions' impact on needs
A.1. Determination of the initial state	<p>Municipalities and Government:</p> <ul style="list-style-type: none"> - Quality of prevention plans of municipal waste (with planning, specific measures adapted to the reality of the municipality and a proper budget). - Number of awareness campaigns. - Quality of awareness campaigns - Citizens awareness campaigns and prevention campaigns through ecodesign measures for companies. - Number of implemented concrete and effective measures for reducing single-use bags as indicated by the European Parliament (law 22/2011). - Percentage of products with eco-design and work for the elimination of products with harmful impacts on the environment and health (eg microplastics and oxofragmentables). - Percentage of reused beverage packaging, protecting its survival in the HORECA sector (hospitality, restaurant and catering).
A.2. Implementation/adaptation waste collection scheme for appropriate waste management.	<p>Municipalities:</p> <ul style="list-style-type: none"> - A working scheme or plan for including plastics in yellow bin system. - Budget for paying for sorting function in order to include plastics from yellow bin.
A.3. Transportation	<p>Municipalities:</p> <ul style="list-style-type: none"> - Reduced cost of transport. - Increased efficiency of transport.
A.4. Treatment (MS)	<p>Mancomunidad del Sur:</p> <ul style="list-style-type: none"> - Amount of treated non-packaging plastic waste in facility. - Number of identified end markets for recycled plastic of high added value. - Number and quality of incorporated technological improvements in treatment plants. - Number and quality of solved technological limitations of optical separators. - Number and quality of stricter acceptance criteria adopted regarding quality of waste treated in the plant. - Number and quality of actions taken to push the municipalities to use collection systems resulting in higher quality of waste collected.
A.5. Recycling	<p>Recyclers or IMS (Ecoembes):</p> <ul style="list-style-type: none"> - Amount of recycled plastic of high added value in terminal markets.

4.2 SELECTION OF SPECIFIC ACTION

As determined in the “Roadmap for Progressive Improvement”, Mancomunidad del Sur has chosen to target the theme of “**plastic packaging, brick and cardboard waste**”. When proceeding to the process of determining performance characteristics, a more narrow scope has been set to focus on the action “**to incorporate technical improvements in treatment plants**”. Such improvements would include increasing the capacity and improving the selection and effectiveness of the plant.

It will be necessary to increase the capacity of the plant in order to face a forecasted increase in the amount of waste to be treated in the facility. In addition, the storage conditions of the packaging waste must be improved to prevent any deterioration. Since the plant has a limited space any improvements must be integrated into the existing space, and this might imply a limitation for innovation.

An innovative public procurement process can provide opportunities to small businesses or entrepreneurs with wide knowledge but neither financial means nor materials to compete with large companies. Thus, a PPI might result in novel and possibly improved solutions compared to conventional procurement procedures and could therefore be an appropriate measure to take.

4.3 PERFORMANCE CHARACTERISTICS – PLASTIC WASTE MANAGEMENT

The required performance and outcome of the targeted action is described by performance characteristics where performance is described from how it could be used in a procurement process and PPI approach. A set of performance characteristics for the target action are presented below. The performance characteristics will be used only as examples and suggestions for measurements making sure the procurement specifications leave space and creativity to suppliers find solutions. Focus lies in the strategy of Mancomunidad del Sur: to reduce landfilling (costs) via maximized reuse/recycling.

The need for sorting in a specific batch of waste is strongly depending on the collection of waste. The quality standards of the packaging collected in municipal containers within Mancomunidad del Sur are still far from matching any of the autonomous communities of Madrid. Many municipalities still have open-top containers which lead to an increase in collected amounts but are detrimental to quality.

With the current installation, the treatment plant has an effectiveness of almost 89%, but future improvements are expected to improve the effectiveness and availability of the facility. An improvement of more than 4% of effectiveness is expected.

Aspects of improvements in treatment plants	Needs as a function	Performance characteristics
<i>Collection process</i>	<p>Stricter acceptance criteria adopted regarding quality of waste treated in the plant.</p> <p>Actions taken to push the municipalities to use collection systems resulting in higher quality of waste collected.</p>	Amount of waste from separate collection systems accepted into treatment plant.
<i>Sorting process</i>	<p>Maximum plastic sorting considering market demands for recovered plastics and minimising landfilling of residuals. This includes sorting of:</p> <ul style="list-style-type: none"> • LDPE (Low-density polyethylene) • HDPE (High-density polyethylene) 	<p>Sorting level in % for:</p> <ul style="list-style-type: none"> • LDPE (Low-density polyethylene) • HDPE (High-density polyethylene) • PP (Polypropen) • PET (Polyethylene terephthalate) • PE (Polyethylene)

	<p>polyethylene)</p> <ul style="list-style-type: none"> • PP (Polypropen) • PET (Polyethylene terephthalate) • PE (Polyethylene) 	
<i>User and maintenance</i>	<ul style="list-style-type: none"> • Level of user friendliness • Required competence and skills of the workforce • Guarantee on the system and technologies • Expected level of maintenance • Availability of spare parts for maintenance 	<ul style="list-style-type: none"> • Level of user friendliness • Required competence and skills of the workforce • Guarantee on the system and technologies • Expected level of maintenance • Availability of spare parts for maintenance
<i>System parameters</i>	<ul style="list-style-type: none"> • Energy consumption • Number of required workers to operate • Compatibility with current plant and control systems • Possibilities to expand the system 	<ul style="list-style-type: none"> • Energy consumption • Number of required workers to operate • Compatibility with current plant and control systems • Possibilities to expand the system

5. PERFORMANCE CHARACTERISTICS FOR ZAGREB CITY HOLDING

5.1 FUNCTIONAL MEASUREMENTS FOR ACTIONS

The “Roadmap for Progressive Improvement” listed a number of potential actions and future interventions for Zagreb City Holding related to the needs theme of “**develop sustainable management of biowaste**” and emphasising collections and logistics as a pathway to achieve targets. These actions are recapitulated in the table below.

Action	Description
A.1 Determination of the initial state	<p>Municipality and government</p> <ul style="list-style-type: none"> - Set legal targets for biowaste collection amounts, - Implement different awareness campaigns among citizens and other biowaste producers on separate collection, - Implement effectively the eco-design and work for the elimination of products with harmful impacts on the environment and health - Implement deterrents environmental taxes: payment for waste generation.
A.2. Implementation/adaptation waste collection scheme for appropriate biowaste management	<p>Municipality and Zagreb City Holding</p> <ul style="list-style-type: none"> - Increase the amount of separate waste collection through the implementation of door-to-door collection, - Develop the infrastructure for the collection of biowaste within the whole City area (bins, containers, vehicles, and other logistic requirements), - Improve selective separation and quality of the collected biowaste (analyse and monitor the quality of separated biowaste), - Introduce sustainable collection of biowaste with low environmental impact, - Build biowaste treatment plant for anaerobic digestion in order to utilize the biowaste as an energy source
A.3 Collection and transport	<p>Municipality and Zagreb City Holding</p> <ul style="list-style-type: none"> - Optimization of the collection routes (bin sizes and position depending on the biowaste producers), - Modernize the vehicle fleet and introduction of dedicated trucks for biowaste collection, - Implementation of Eco driving and other fuel-reduction methods, - Monitoring of air quality and noise in the urban areas, - Other actions that will lead to environmental-friendly biowaste collection
A.4 Treatment	<p>Municipality and Zagreb City Holding</p> <ul style="list-style-type: none"> - Build an up-to-date treatment facility for different biowaste types (kitchen and green waste, different industrial biowaste fractions, etc.) in order to diverse biowaste from landfilling, - To incorporate technological improvements in treatment plants in order to produce energy (e.g. purification of biogas in order to produce biofuel),
A.5 Recycling/Energy utilization	<p>Municipality and Zagreb City Holding</p> <ul style="list-style-type: none"> - Develop a market for biowaste in order to increase its amounts, - Implement the scheme for energy utilization of produced biofuel (e.g. CHP, inject in local gas grid, utilize as a transportation fuel), - Create a market for compost (outcome of the AD process),

The functional description for the desired actions can be measured through different dimensions. Some of these functional measurements are listed in the table below.

Action	Measurements of actions' impact on needs
A.1. Determination of the initial state	<p>Municipality and Government:</p> <ul style="list-style-type: none"> - Number of EU legislations and future plans (Circular economy package) implemented. - A national and local waste management plan with a concrete list of actions and measures, in order to decrease the amounts of the biodegradable waste being landfilled. - Number and quality of Educational and Awareness campaigns towards the different stakeholders: citizens, HORECA sector, FaB industry, etc.
A.2. Implementation/adaptation waste collection scheme for appropriate waste management.	<p>Municipality and Zagreb City Holding:</p> <ul style="list-style-type: none"> - Action plan for the increase of collected biodegradable waste amounts (locations, number of bins, etc.).
A.3. Transportation	<p>Municipality and Zagreb City Holding:</p> <ul style="list-style-type: none"> - Improvement of the current waste collection routes. - Implementation of the dedicated routes for biowaste.
A.4. Treatment (MS)	<p>Municipality and Zagreb City Holding:</p> <ul style="list-style-type: none"> - Construction of a biogas plant for the treatment of the collected biowaste.
A.5. Recycling	<p>Municipality and Zagreb City Holding:</p> <ul style="list-style-type: none"> - Usage of the digestate as a fertilizer.

5.2 SELECTION OF SPECIFIC ACTION

As determined in the “Roadmap for Progressive Improvement”, Zagreb City Holding has chosen to target the field of “**develop sustainable management of biowaste**”. When proceeding to the process of determining performance characteristics, a more narrow scope has been set to focus on the action “**improvements in biowaste collection**”.

Municipal waste mostly consists of organic waste, including kitchen waste, food residues, waste from food industry, grass, wood, paper and cardboard, etc. The “green waste”, as a part of municipal waste, mainly consists of garden waste and waste generated in the public parks. The collected biowaste is generally transported to composting units in the city area.

Separate collection of biowaste would significantly increase the total separately collected amounts of waste in Zagreb. Such a separate system for biowaste collection should involve different waste producers, such as: family houses, catering service, food and beverage industry, etc.

The innovation in collection is closely linked to the needs related to the treatment of biowaste described in action A2. Here is certainly a need for innovation as many projects where biowaste from municipal waste is used in anaerobic digestion fail because the digestion process is not effective: other sources of biowaste need to be added and after the anaerobic digestion there is still a need for an aerobic stabilization process for further use of the digestate. The collection should also take into account parallel streams and where the residue ends up. Biowaste from different sources should be treated to a level that the output is no longer bioactive and with a dry matter level that makes it possible to landfill without further treatment. Other uses such as garden compost can be added but that only works if the input is narrowly defined (only biowaste from separate collection meets to garden compost criteria).

The innovation in the procurement would be making a tender for the most sustainable collection of biowaste, where different parameters (economic and ecologic) will be taken into account. Some of them are presented in the next section.

5.3 PERFORMANCE CHARACTERISTICS – BIOWASTE MANAGEMENT

As determined in the “Roadmap for Progressive Improvement”, Zagreb City Holding has selected to target the field of **sustainable management of biowaste**, emphasizing collection and logistics as a one of the pathway to achieve the legally-binding targets.

The required performance and outcome of the targeted action is described by performance characteristics where performance is described from how it could be used in a procurement process. A set of performance characteristics for the target action are presented below.

Aspects of improvements in biowaste collection	Needs as a function	Performance characteristics
<i>Bins and litter</i>	<ul style="list-style-type: none"> • Size of litter bin/container (food waste) • Size of litter bin/container (recyclable waste) • Size of litter bin/container (other household waste) • Durability of bin/waste bags • Sustainability of bin/waste bags (recyclable food waste bags etc.) 	<ul style="list-style-type: none"> • Optimal Size of litter bin/container (food waste) • Optimal Size of litter bin/container (recyclable waste) • Optimal Size of litter bin/container (other household waste) • Tear resistance (wet/dry)of bin/waste bags • Water repellent factor • Carbon footprint/LCA impact/reusability of bin/waste bags (recyclable food waste bags etc.)
<i>Waste route planning system and waste collection trucks</i>	<ul style="list-style-type: none"> • Time for each waste collection tour • Required frequency for collection • Adaptability – • Adaptability - • LCC for garbage truck solution • Driving the trucks - implementation of the ECO drive 	<ul style="list-style-type: none"> • Needed time for each waste collection tour - optimization of the waste collection routes • Required frequency of collection • Adaptability - individual waste collection frequencies • Adaptability - Possibilities to expand the waste routes • LCC for waste collection truck solution • Needed labour
<i>User and maintenance</i>	<ul style="list-style-type: none"> • User satisfaction • Guarantee on the system and technologies • Level of maintenance • Impact on logistics / transport 	<ul style="list-style-type: none"> • Level of user satisfaction • Guarantee on the system and technologies • Offered level of maintenance, points and frequency • Availability of spare parts for maintenance • Optimization of collection frequency and routing
<i>Public awareness</i>	<ul style="list-style-type: none"> • Public awareness and information actions directed at citizens and at companies (HORECA, food packaging and producers etc.) 	<ul style="list-style-type: none"> • Intensity, frequency, duration

