

SCALIBUR

LEADING A REVOLUTION
IN BIOWASTE RECYCLING

Deliverable 2.1

Stakeholder engagement plan per
pilot municipality and identification
of current promising practices

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ABSTRACT

In the Horizon2020 SCALIBUR project leading research organisations, technology developers and waste management companies, as well as four European cities and regions – Lund (Sweden), Madrid (Spain), Albano Laziale (Italy) and Kozani (Greece) – join forces to develop and promote new circular economy approaches to recycle urban biowaste. Engaging all key actors along the value chain in the process, will be of vital importance to the project's success. As such, the focus of the following report is to illustrate SCALIBUR's understanding of and approach to stakeholder engagement and to give an overview of the findings and activities so far.

A first activity in SCALIBUR's WP2 was to conduct baseline analyses in the pilot cities, thereby gaining an overview of the status quo of each waste management system and understanding current main challenges and opportunities in each pilot. As a second step, and to further understand the needs of the pilots, a comprehensive stakeholder mapping was drawn for each pilot in order to identify the most relevant stakeholders and to understand their interests and motivations and the impact that they may have on the SCALIBUR project.

Lastly, in order to be able to learn from other European cities that have faced similar challenges as the three pilots and that have successfully involved all actors and changed their biowaste value chain, a first set of promising practices in terms of stakeholder engagement was collected. Next to the city of Lund (Sweden) – which is considered as SCALIBUR's "best performing territory" - also the cities Oslo (Norway), Milan (Italy), Besancon (France) and the region of Sardinia (Italy) are considered here.

As will be shown, the baseline analyses and stakeholder mappings – together with the first Biowaste Club meetings - help understand the main challenges in each pilot and the current expectations that the key stakeholders have towards SCALIBUR. Additionally, the analysis of the promising practices indicates the potential to transfer successful methods and tools to the pilots. Combining these three steps, it is possible to set the targets and decide on the first activities to be tested and implemented in the pilots. As the project is still at the beginning, it is natural that the process matching of local challenges and opportunities with the most fitting promising practices - that can eventually be adapted and implemented - is still on-going;

involving the local stakeholders from the beginning in the analyses and decision-making processes will be crucial for SCALIBUR's success in the three pilots.

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LIST OF ABBREVIATIONS

HORECA	Hotel/Restaurant/Catering
PAYT	Pay As You Throw
SCALIBUR	SCAlable technologies for Bio-Urban waste Recovery
TARIP	Tariffa Puntuale (Punctual Rate)
WP	Work Package

1 INTRODUCTION

In order for the SCALIBUR project to be successful and create its envisioned impact, it needs to integrate all actors along the biowaste value chain, from individual citizens at household level to waste collection, sorting, pre-treatment and valorisation, to the (future) consumers of the new biowaste-derived products. As such, work package 2 “stakeholder engagement and social innovation actions” plays a vital role in linking the different SCALIBUR activities and actors.

Having stakeholder engagement at its core, WP2 will identify and engage all key stakeholders (at the local, national and EU level), covering the whole value chain of organic waste. The focus will be on the stakeholders in the three SCALIBUR pilot cities/ regions – Kozani (Greece), Albano Laziale (Italy) and Madrid (Spain).

The deliverable at hand will start by defining the key concepts relevant for the WP2 activities and the main methodologies used and put these into the context of the SCALIBUR project (chapter 2).

As a first key step to stakeholder engagement, naturally stood the analysis of the current status quo in each of the three pilot cities. Thus, chapter 3 illustrates in detail the current situation in the pilot cities. It will give an overview both of the structure and management of the current biowaste value chains, as well as of the current key actors, their roles and interlinkages. Building on the status quo, chapter 3 also outlines the stakeholder engagement processes that have so far happened in the three pilots as well as the next steps planned with SCALIBUR’s WP2.

Having understood the key challenges and opportunities in each pilot city, it is helpful to consider promising examples and practices from other cities or regions in Europe that have faced similar challenges and have already successfully implemented changes to their biowaste management system. Chapter 4 will, thus, illustrate five selected promising practices, focusing in particular on their activities in terms of stakeholder engagement. Next to the city of Lund, Sweden – which is also a partner in the SCALIBUR project, being considered as best performing territory – also the cities Oslo (Norway), Milan (Italy), Besancon (France) and the region of Sardinia (Italy) are assessed here.

Finally, chapter 5 will bring together the key learnings both from the three pilot cities, as well as from the promising examples and outline the necessary next steps in terms of stakeholder engagement, both within the WP2-activities, as well as across SCALIBUR work packages.

2 CONCEPTS AND METHODOLOGY

Stakeholder engagement

Stakeholder engagement can be defined as a **guided process during which all relevant actors are included in frequent exchange and join forces to achieve a common goal**. As stakeholders within the SCALIBUR project are considered any representatives of certain societal groups or of specific organisations – such as companies, industry sectors or public bodies - that are directly affected by or can affect the biowaste value chain. Stakeholder engagement is, thus, for the SCALIBUR project understood, firstly, as an ongoing, inclusive dialogue among all actors that can contribute directly or indirectly to fostering a sustainable biowaste value chain, and secondly as a process of agenda-setting and collective implementation of pilot activities that are shaped according to the stakeholders' needs and expectations.

Changing – or, as the SCALIBUR slogan puts it, “revolutionizing” – an entire value chain is by its nature a complex challenge which will at one point or another affect the private and/or professional life of almost every individual of the pilot cities. For a long-lasting change/revolution of the biowaste value chain, it will thus be crucial to involve all key actors from the start in all local project activities and ensure that both the impact that the activities may have on the different actors as well as – the other way around - the influence that the actors will have on the success of the project activities is considered.

Biowaste Clubs

The key local dialogue platform for the stakeholder engagement in the 3 pilots to foster co-creation and local engagement will be the so-called urban Biowaste Clubs, which will include the key local stakeholders, such as representatives of the municipality, of waste collectors or of citizens' initiatives. These actors will decide upon and – together with the SCALIBUR partners – implement pilot actions that:

1. increase consumer awareness and acceptance of urban biowaste-derived products
2. change behaviour towards better recycling rates, in order to increase quality and quantity of the biowaste collected
3. implement best practices in biowaste collection, transport, sorting, pre-treatment and characterization (led by WP3)

4. promote new, circular business models and foster social innovation
5. initiate new local and national policies and initiatives and
6. set milestones for national action manuals

Ultimately, the members of the local Biowaste Clubs should – with the help of the SCALIBUR project - become national biowaste ambassadors and help spread the key SCALIBUR learnings and success stories across the three pilot countries and beyond.

Stakeholder mapping

SCALIBUR aims at bringing together stakeholders from all stages of the value chain. These include, for instance, the waste management companies, different public bodies and policy representatives, the local HORECA sector, households and neighbourhood initiatives as well as the (potential) customers of the new biowaste-derived products (such as farmers using fertiliser gained from biowaste).

Stakeholder mapping is a collaborative process of research, debate and discussion that draws from multiple perspectives to **determine a key list of stakeholders for a specific topic and assess their role and influence in a given situation or project**. The mapping can be broken down into five steps: 1. Identifying and listing relevant groups, organisations and people, 2. understanding each stakeholder's perspective and interests, 3. visualizing the relationships and interdependencies between actors and 4. ranking the stakeholders' relevance for and impact on the project and 5. (based on 4) defining each actor's role and type of involvement in the project¹.

For the stakeholder mapping of the 3 SCALIBUR pilots, CSCP and ITENE developed a template table that includes the following categories:

- Organisational details + contact person(s)
- Type of organisation + main working areas
- Previous exchange and experiences with the actor

¹ Also compare: <https://www.henricodolfing.com/2018/03/a-step-by-step-stakeholder-mapping-guide.html>. Retrieved 29 July, 2019

- Envisioned role in the project
- Ranking of the actor's influence on the success of the project + justifications for ranking
- Ranking of the actor's interest in the project + justifications of ranking

For the detailed template, see Annex I.

With the help of the template, a first set of key actors per pilot city has, thus, been identified by the local partners and ranked according to influence on and interest in the SCALIBUR project. Many of these actors are already in close cooperation with the local partners and have also already participated in and contributed to the first Biowaste Club meetings.

Naturally, **the mapping of the stakeholders will not be a one-time activity, but should rather be considered as an on-going process during the entire project lifetime.** Depending on the problems and opportunities that are identified in each pilot (thus linked to the baseline analysis) and the pilot activities that the project partners decide to pursue in each pilot city, additional actors may need to be identified and included in the mapping - and potentially become members of a growing Biowaste Club. Additionally, also the roles that specific actors should have in the project and/ or the influence and impact that they may have on the project's success, can change depending both on external events outside the project-control, as well as on the development of the different local activities and on the priorities that the Biowaste Clubs set themselves.

Thus, CSCP, ITENE and the local partners, will **review the mappings regularly to ensure that the right actors are always sufficiently involved** in the respective local activities and that the stakeholders' individual needs and interests are well understood and taken into consideration in each step of the local implementation of SCALIBUR.

Finally, the stakeholder mapping will also serve as a tool to, firstly, **monitor the participation of the different stakeholders in SCALIBUR** (e.g. who attended which meetings and participated in which pilot activities, how did actors' needs and interests shift) and, secondly, **identify the key success factors for engaging different stakeholder groups** (e.g. what motivated different target groups in each local case to join? How were they addressed? What triggered behaviour

change?). Both these assessments will bring valuable insights for the evaluation of the success of the stakeholder engagement and for a successful scale-up.

Baseline analysis

In order to understand the status quo, a baseline analysis of the current biowaste management scheme for each pilot city participating (Madrid [ES], Albano [IT] and Kozani [ELEL]) was carried out. This included barriers and opportunity areas, current consumption behaviour and the key steps and actors along the waste management chain. Assessing the key data on recycling rates, urban biowaste fractions separated, management routes, citizen engagement, etc. helped to **identify main barriers and opportunities in the current system** and, thus, will serve as a basis to **decide on the most fitting stakeholder engagement activities in each pilot**.

The baseline analysis – as the name indicates — will also serve as **a benchmark to assess and compare developments and improvements along the project's lifetime and, thereby, help evaluate SCALIBUR's successes and impacts in the three pilots**.

As a first step for the baseline analysis in the three pilots, a template questionnaire was developed by ITENE and CSCP and filled out by the three pilot cities. Congruent to the three pilot cities, Lund – as best performing territory – also completed the baseline analysis, in order to have a benchmark to compare the results of the three pilots to. Based on the filled templates, ITENE and the pilot cities carried out the baseline analyses, the results of which are illustrated in chapters 3.1 to 3.3. In the case of Kozani, the baseline analysis was presented to the local Biowaste Club members. This helped to detail the problems assessment and further detect possible solution-pathways. For Albano Laziale and Madrid, the baseline analyses will be presented and discussed in the upcoming Biowaste Club meetings in autumn 2019.

3 THE SCALIBUR PILOTS: STATUS QUO & ROAD AHEAD

In the following chapter, the baseline analyses and stakeholder mappings of the three pilot cities/ regions will be illustrated. The templates that have been developed to collect the data for these two exercises, can be found in Annexes I and II. The filled templates of both baseline analyses and stakeholder mappings of the three pilots are on purpose not attached to this public deliverable as they contain sensitive and confidential information (such as contact information of the key stakeholders or sensitive data on critical aspects along the respective value chains). These documents are, as such, shared and used only within the SCALIBUR consortium. The following chapter will, however, summarize the key insights, conclusions and current next steps planned for each pilot city.

As introduced above, the stakeholder engagement in the SCALIBUR project will focus on three pilot cities/ regions. As will be shown, the three pilots differ considerably in terms of how the respective biowaste management system is currently structured, which actors are involved and how and what activities towards a more sustainable biowaste recycling scheme have already been implemented. Also, the activities that have already been organised as part of the SCALIBUR project on local level vary considerably, depending on the local needs and availabilities of the different stakeholders. Nevertheless, many interesting linkages among the three pilots and Lund as best performing territory have already become visible. In the following months of SCALIBUR, it will therefore be crucial to also foster closer cooperation among stakeholders as well as across the pilots, in order to further foster exchange of knowledge and learnings in terms of experiences, successful activities, identify common problems and discuss possibilities to implement shared solutions.

3.1 Kozani, Greece

3.1.1 The baseline of biowaste collection and valorisation

KOZANI
71388 inhabitants
67/km ²
25000 households
Households involved:
2016: 100
2017: 285
2018: 530

Kozani is a city in Western Macedonia, Greece. It has 71,288 inhabitants, living in approximately 25,000 households. Since 2016, Kozani implemented a pilot system of selective biowaste management, which involves an increasing number of households. It started with 100 participating households, then increased to 285 in 2017, and finally to more than 500 in 2018.

This pilot program is promoted by the most recent legislation at the national and municipal level. The legislation focuses on implementing a separate collection of biowaste, minimizing the landfilled waste, implementing new biowaste treatments such as compost, anaerobic digestion or incineration. As a result of this legislation, the biowaste management system has significantly changed in Kozani. The current situation is depicted in the flow chart baseline analysis (Figure 1).

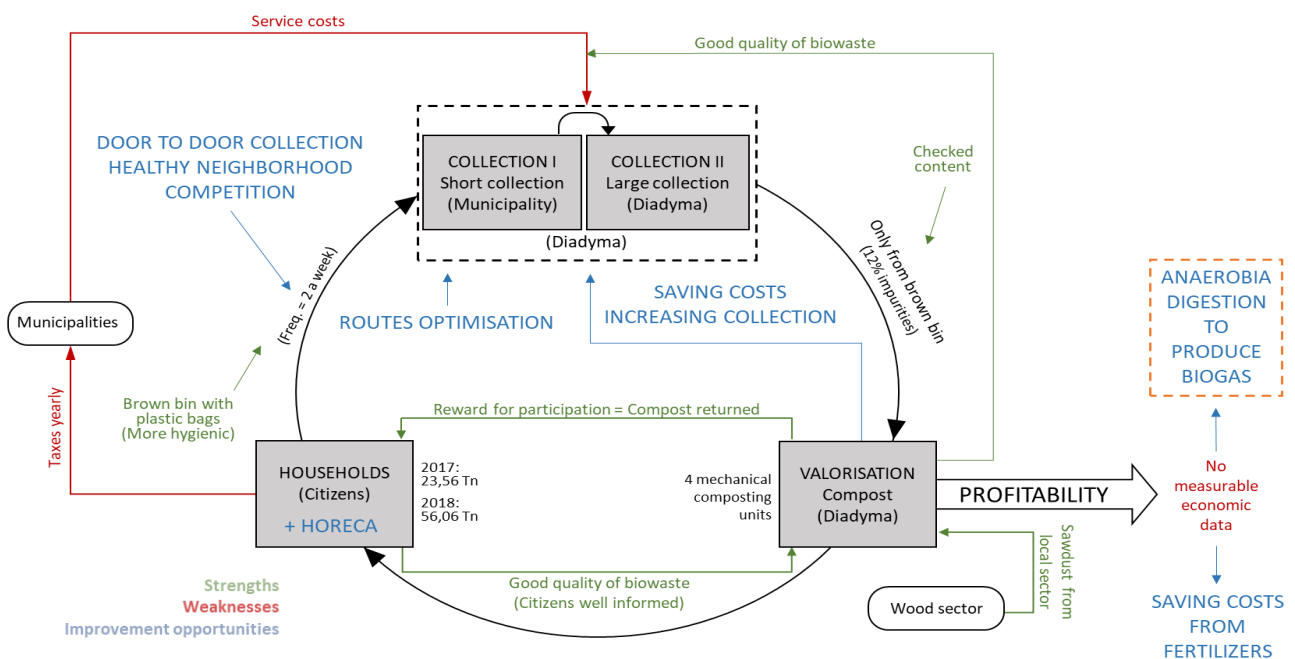


Figure 1 Flow chart baseline analysis of Kozani, Greece

The focus of the current pilot are households, from where an increasing quantity of waste has been collected since the start of the pilot: from 23.56 tonnes in 2017 to 56.06 tonnes in 2018, following the increase in the number of participating households.

Status quo in the pilot

Household waste is collected twice per week. There are two main categories for waste collection: short and large. While short collection refers to the logistics of small amounts of waste from the city to the Local Waste Management Units (LWMU), large collection is the collection and transference from LWMU to Mechanical and Biological Treatment plant (MBT). Initially, the municipal council manages the short collection, while large collections are managed by DIADYMA S.A. However, in some cases, short collections can be performed by DIADYMA as well. The biowaste is put in plastic bags and separate brown bins per house or block are provided.

When the biowaste is collected and transferred to the sorting plant it is checked in order to identify possible impurities and other wastes not related to biowaste (12%). Only the biowaste collected from the brown bins is used for valorisation.

The valorisation plant consists of a composting plant with four mechanical composting units. The valorisation plant uses sawdust from the local wood and forestry sector, in order to improve the ratio of carbon to nitrogen (C:N), and also to reduce the increased moisture. The compost produced as a result of the pilot project is returned to the participating households with plants as a reward for their collaboration.

The design and implementation of the project included public consultations and awareness raising campaigns. Among the different engagement actions performed in the pilot project, Kozani involved citizens, professionals and business representatives in various activities to inform them about waste prevention and correct recycling. Also, informative and environmental education workshops were performed in order to inform the participants about separation at source, recycling and composting.

Weaknesses & strengths

The first weakness noticed in Kozani's biowaste management system are the taxes that the citizens have to pay yearly to the municipality. **The taxes are paid based on m² of each household, regardless of how many people live in each house or how well they recycle.** Better processes of valorisation would allow the development of high-value products. These products would reduce service costs directly related to the collection process and thus the yearly taxes for the citizens.

As a result of good implementation of pilot tests in Kozani, a multitude of strengths have been found. At the beginning of the management chain, in the household, **citizens use plastic bags to dispose waste. This improves the hygiene of the collection process and prevents the generation of odours.**

Secondly, the addition of sawdust from the local wood sector to the composting process supports both a reduction of process costs as well as a decrease in wood waste generation.

In the biowaste collection process it is important to check the quality of the biowaste collected. This check allows for an early identification of possible impurities in the biowaste. The quality of biowaste collected, just 12% of impurities in the checking process performed in the sorting plant, will allow obtaining a high value product. This fact will have a direct repercussion on the cost of the biowaste collection system. Considering that in most checks, the quality of the biowaste appears to be high, it seems that the households are so far motivated and well-informed as to how to separate their waste properly.

Improvement opportunities

Despite the numerous strengths of the pilot project in Kozani, there are some opportunities for improvement. For example, a **door to door collection system** could be implemented. Also, implementing **reward mechanisms** for those areas of the city with the best biowaste separation could be implemented and would encourage healthy competition among neighbourhoods. Furthermore, by **optimizing the routes and involving the HORECA sector and local businesses in the biowaste collection system**, the amount of biowaste collected could be increased. This in turn would decrease costs in the collection system.

Additionally, the possible to adopt biodegradable and compostable bags for the biowaste collection might lead to: i) improve the quality of the collection, and consequently the quality of the compost obtained; and ii) improve and ease the collection process as often the use of an adequate product pushes citizen towards a correct collection of biowaste. Then, the use of a vented dustbin, together the above-mentioned compostable bags, would make it possible to reduce effluents and odors.

Finally, in order to increase profitability, the **integration of high technology processes, such as anaerobic digestion to produce biogas**, would additionally reduce service costs, as it would the selling of the compost produced as fertiliser to local farmers.

3.1.2 Stakeholder mapping of Kozani

Considering the stakeholder mapping of Kozani, it becomes evident that several of the key actors along Kozani's biowaste value chain have not only been identified, but are already in close cooperation and have already contributed to Kozani's Biowaste Club as it has developed so far. Firstly, clearly among the key actors in any city's biowaste value chain are the **public municipal and regional authorities that are in charge of running and supervising the entire chain** and as such their participation will have a major influence on the success of any SCALIBUR activities in the pilot cities. In the case of Kozani, luckily both representatives from the municipality, as well as representatives from the region of Western Macedonia and the Regional Union of Municipalities of Western Macedonia could already have been engaged and are members of the Biowaste Club actively participated in the club meetings.

While Kozani's Biowaste Club will – especially at the beginning – mostly focus on involving regional and municipal policy representatives, on a longer term it will also be crucial to involve national representatives. This exchange will not only be necessary in light of aforementioned legal boundaries that are currently hindering a circular biowaste value chain in Greece, but also with regard to the goal of WP2 to position the three SCALIBUR pilot cities as national forerunners and foster the scale-up of their learnings across cities and regions.

Secondly, as already illustrated in the baseline analysis above, in Kozani all activities from biowaste collection and transport to sorting and treatment are carried out by the publicly-run Waste Management Company of Western Macedonia (DIADYMA S.A.). One representative from

DIADYMA is not only active in the local Biowaste Club, but has also joined SCALIBUR's advisory board. The municipality of Kozani, DIADYMA and CluBE are already in close cooperation for many years and across various projects and have already run numerous activities to improve the biowaste value chain, such as stakeholder information and outreach campaigns.

At the very beginning of the biowaste value chain are the waste "producers". As outlined in the baseline analysis, **most biowaste currently being collected and treated in Kozani, originates from households. Thus, the citizens are naturally one major – and at the same time very diverse – stakeholder group that needs to be represented in the Biowaste Club and targeted with the Club's activities.** The SCALIBUR activities that will focus on citizen engagement in Kozani are currently being shaped, the fitting representatives for the Biowaste Club will thus be chosen and involved accordingly (see also below chapter 2.3.3).

Additionally, **another key stakeholder group on the "waste-producer" site is the HORECA sector and related local businesses, such as vendors at open markets.** While key actors in this group – such as the federation of Kozani hoteliers or the Hellenic federation of enterprises – have already been identified, their participation at the Biowaste Clubs has so far been limited and the upcoming engagement plan thus needs to consider their role and involvement further.

On the other end of the biowaste value chain are the (potential) consumers of the new bio-based products. A key group for Kozani, where currently all valorisation focuses on the production of fertiliser, are the **local farmers as well as representatives from the forestry and wood processing sectors.** Several cooperatives have already been identified. Understanding and tackling the farmers' concerns that have so far hindered them from using the fertilisers produced from biowaste will be particularly crucial to achieve a circular biowaste economy in Kozani.

Finally, also representatives from research and non-profit sector play a vital role in Kozani's stakeholder mapping, as these actors will bring valuable inputs, for instance on latest technological developments and trends in Greece, as well as on social and cultural aspects that may influence the interaction with citizens and the choice of tools and methods.

3.1.3 Preliminary stakeholder engagement plan for Kozani

As already indicated in chapter 2, similarly to the stakeholder mappings, also the following **engagement plans of the three pilot municipalities should be considered as on-going processes that need constant reviews across the project lifetime** to assess whether goals set and activities planned are well on track or need to be adjusted to new developments – be it project-internal developments e.g. in the technical WPs or external events such as new legislations or learnings from other cities or regions.

As such, the following stakeholder engagement plan will set out the most promising next steps for the Biowaste Club in Kozani as they were identified in the Biowaste Club meetings and project-internal meetings so far. Following the implementation of these steps as well as the activities that are simultaneously happening in other SCALIBUR-WPs, the stakeholder engagement plan shall consequently be altered and built upon.

The Biowaste Club in Kozani already met twice – on January 19th 2019 and July 5th 2019. Based on the discussions with the stakeholders in these first two meetings, Kozani's stakeholder engagement plan – and with it the focus of potential pilot activities in Kozani - currently has three main pillars.

The key objective of the SCALIBUR project - to **develop new high-value products from biowaste and to test their application** in the pilot municipalities - could not be more fitting for Kozani's stakeholders. As a representative from DIADYMA put it, **currently in Kozani "recycling doesn't make money"**. The costs of separate collection are considerably higher than the current gains from recycled products. Biowaste recycling can only be profitable in Kozani with a successful development of high-value products.

As shown in the baseline analysis in chapter 3.1, most biowaste collected in Kozani is turned into fertiliser, which however still implies rather high costs and is currently not profitable. Additionally, there are two local regulations that currently limit the use of biowaste to produce added value products such as fertilisers for farming or feed for animals. The current legislation does for instance not provide clear indications on how the added-value products may be used. As a consequence, farmers are reluctant to apply them. Also, as commercial fertilisers are

cheaper for farmers (both in purchase and application), the fertilisers from biowaste cannot compete with this.

For the stakeholder engagement in SCALIBUR this means, firstly, that **the project needs to engage with regional and national policy makers in order to better understand legislation that is hindering a circular biowaste chain and try to foster the necessary changes**. In a first step, a detailed assessment of promising, comparable examples in other cities and countries – e.g. with the best performing territory Lund – will be needed in order to identify which actors need to be targeted for the Kozani case and what are possible legal requirements needed to improve the biowaste management in Kozani. As WP8 focuses, among others, on assessing and comparing the legal opportunities and challenges along the value chain, a close cooperation between WP2+8 will be required here.

Secondly – and in line with SCALIBUR’s vision to foster innovative, high-value solutions – **the Biowaste Club of Kozani will focus on identifying innovations for the recycling and valorisation of biowaste that best fit the local context and on piloting the implementation of these new products and services**. The innovations are on the one hand developed in the SCALIBUR project itself (WPs 3-6). Since, for example, fur animal breeding is a large industry in Western Macedonia, participants of the Biowaste Club were interested in a cooperation with WP5 to explore the potential of using the larvae of the black soldier fly as animal feed.

On the other hand, in the second Biowaste Club meeting in Kozani, the participants agreed to foster social innovations and pilot new bottom-up approaches to process biowaste. Consequently, CSCP and CluBE are currently collecting best case examples of local social innovations across Europe in which specific organic waste residues have been used to produce high-quality added-value products. An interesting case here would, for instance, be the Dutch start-up Rotterzwam, which is collecting used ground coffee from HoReCa and using it to grow mushrooms in urban farms.² The mushrooms are then sold to high-end markets. The collection

² Source: De-uitdaging | <https://www.rotterzwam.nl>

of promising cases will be linked to Kozani's baseline analysis, thereby allowing the local stakeholders to assess for which solutions there is a local business case to follow a similar path.

A second key pillar of the Biowaste Club activities in Kozani, will focus on the citizens and households. Since currently all valorized biowaste in Kozani comes from households, ensuring proper waste separation at household level – and thus the right quality of biowaste to process it further – is of obvious importance. While the quality of the household biowaste is already relatively high and several information campaigns have already been carried out, there is still room for improvements and **the need for further interaction with households was identified as one main motivation for Kozani's actors to join the SCALIBUR Biowaste Club.**

There are different possible strategies to engage with citizens and households. A first idea (as also suggested in the baseline analysis) would be to work with fines and penalties for improper recycling. However, in Kozani, separate collection on household level is too complex to apply due to the infrastructure and setting of the city: households level collection requires individual bins and a tracking system (including sensors in the trucks) to enable DIADYMA to check who threw away what. However, most streets in Kozani are very small and narrow and both inside and in front of the houses, there is very limited space for the bins. Thus, according to the participants of the 2nd Biowaste Club meeting, it will be impossible to set in place an effective individual collection system. Accordingly, the idea to apply penalties in case citizens do not recycle properly is not doable (and on top also not compatible with the national law on municipal taxes).

As an alternative to penalties, **the participants of the Biowaste Club are keen to explore possible "reward mechanisms" for citizens** (such as discounts in commercial stores) to decrease the waste produced and increase the quality, either at the city or neighbourhood level. A similar system already exists in Kozani for plastic bottles.

A second and more participatory approach to engage and motivate the citizens, is to **develop interactive awareness raising and/ or dialogue formats for specific target-groups.** In cooperation with the municipality, DIADYMA has in the past years already engaged many schools and University students to increase the awareness level and understanding of recycling and proper separation of waste. So far approx. 12.000 students have been involved in these

tailored activities. As a helpful follow-up, the participants of the Biowaste Club discussed options on how to best evaluate whether these engagement activities have actually impacted local behaviour towards better recycling rates.

In case there is not sufficient data available to assess the success of the past activities, it will be interesting to repeat the same awareness raising campaigns in selected neighbourhoods and conduct an ex-ante & ex-post analysis in terms of behaviour change aspects.

Finally, as requested by the Biowaste Club members, CSCP - with support of CluBE – is currently preparing suggestions for further interactive formats and tools to engage with various local citizen groups. Gamification approaches were highlighted as having been particularly effective in Kozani. The suggestions will serve as a base for discussion in the next Biowaste Club meeting to identify possible pilot activities that are most promising to implement for the local stakeholders during the SCALIBUR project.

The third pillar of stakeholder engagement in Kozani will focus on the HORECA sector, as well as on local small- and medium-size businesses, such as shop owners or vendors at the two main open food markets. In particular at the latter food markets, currently a lot of food waste is produced that is not yet included in the biowaste recycling scheme. So far, these actors are neither engaged in the Biowaste Club, nor is biowaste systematically collected from them. On the contrary, according to the current Biowaste Club members, **the HORECA sector and local small shop and restaurant owners have been rather reluctant to change their waste systems so far.**

To start the dialogue with these actors and motivate them to engage further, CluBE has changed its strategy – from “merely” inviting them to the SCALIBUR Biowaste Club meetings, to addressing and visiting the key actors personally. During these visits, CluBE (with support of CSCP and the local Biowaste Club members) will **conduct interviews with the different stakeholders to better understand their needs, motivations and barriers and thus identify the best approaches to engage them in the SCALIBUR activities.**

Next to the survey, the local Biowaste Club members agreed to investigate further the amount of waste which is produced by the different actor groups, with a particular focus on restaurants

and open markets. Understanding which groups currently produce most biowaste and where most untapped potentials for improved recycling lie, is a crucial first step to select the most impactful and target-group specific engagement activities for the third pillar.

As a more long-term engagement idea, for institutions such as hospitals, hotels and restaurants, the Biowaste Club discussed the setting up of a green certification mechanism for proper separation of waste at the city-level. This could also be a starting point for a long-term green (public) procurement strategy in Kozani.

Finally - considering all three pillars of the stakeholder engagement plan and Biowaste Club activities in Kozani – **it is obvious that all of these current follow-ups and planned activities will constantly impact and change Kozani's stakeholder mapping.** Thus, as indicated in Section 2, the stakeholder mapping for Kozani will indeed be a **constant working document that will serve as a main tool to review the process and successes of the engagement activities in Kozani.**

3.2 Albano Laziale, Italy

3.2.1 The baseline of biowaste collection and valorisation

ALBANO
 41,715 inhabitants
 1,752.73/km²
 17,166 households

Albano Laziale is an Italian municipality in the Metropolitan area of Rome, located in the region Castelli Romani, central Italy. It is sometimes known simply as Albano and is bounded by other communes of Castel Gandolfo, Rocca di Papa, Ariccia, and Ardea. Albano has 41,715 inhabitants which corresponds to a total of 17,166 household in the city. Local waste management legislations aim at reducing landfilled waste through a ban on untreated waste. Those regulations also aim at improving skills, programming and waste material. The current state of the waste collection and management in Albano is further detailed in the status-quo section and graphically summarized in the flow chart baseline analysis, Figure 2.

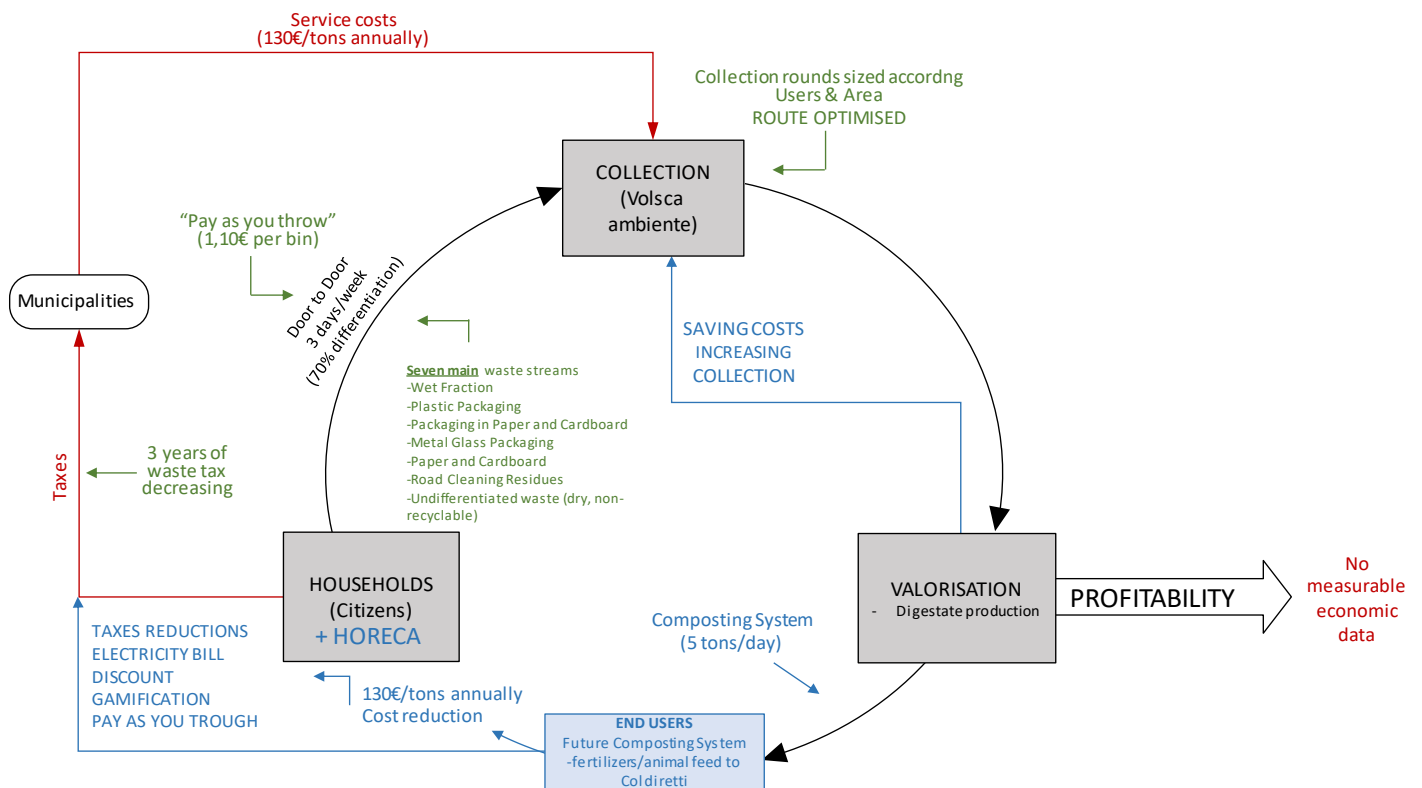


Figure 2 Flow chart baseline analysis of Albano Laziale, Italy

Status quo in the pilot

In the city of Albano, waste is separated and collected into different fractions, namely wet fraction, plastic, paper and cardboard, metal and glass packaging, paper and cardboard, road cleaning residues and undifferentiated waste (dry, non-recyclable). The collection system is managed by VOLSCA AMBIENTE. Specifically, biowaste is collected, sorted and pre-treated in an automated system, using magnets and screens. In Albano, the wet fraction of biowaste is also used to produce compost and for anaerobic digestion.

The municipality of Albano has recently changed the waste collection system, transitioning from a system based on different large bins located around the city to an individual household waste collection system. The new door-to-door system has been officially launched on 1st May 2019. Similar to the previous system, the new collection system is based on a specific schedule depending on residue typology and city area. However, with the door-to-door system, citizens have been engaged on a further level. They now have to display their waste bins outside of their houses/apartments at specific days during the week depending on the type of waste to be collected. **Complementary to the new waste collection system, the city of Albano has also introduced a relative new tax called TARIP, based on the concept "Pay as you throw".** To be able to measure the waste per household, each household has been provided with a so-called "mastello" in Italian or more simply a smaller bin with a chip concerning the non-recyclable waste.

The TARIP tax amount is based on the number of household members. Accordingly, a one-person household will, for instance, pay a TARIP tax fee that includes 16 times emptying the non-recyclable waste. Every additional time that the non-recyclable waste bin will need to be emptied the household will have to pay €1.10. Should the single person – in this case – manage to reduce the amount of emptying the non-recyclable waste bin to less than 13 times, he/she will get a discount of €1.10 for each time that the bin has not been emptied. For the one-person household 13 times is the minimum that s/he has to pay within the TARIP tax to guarantee the effectiveness of the service in Albano. This new system also considers households including kids up to 3 years/elderly people or sick persons, which for example produce additional non-recyclable waste like diapers. For these cases, it is possible to contact the town hall and arrange

the delivery of a specific bin targeted for this kind of waste which is then not counted in the TARIP as non-recyclable waste.

In addition to this new waste collection system, **the city of Albano also provided its citizens with the so called "eating plastic machines"**. These machines - located in two different areas of the city – significantly contributed to changing mindsets towards better recycling thanks to an award system. **Each citizen can accumulate points on their health card on the basis of the amount of plastic inserted in the machine. These points can be converted either to a discount on the TARIP tax or used in shops offering tailored discounts.** The first option provides €1.50 of discount for every 100 points collected. The system has also been extended to commercial activities which can benefit from a similar discount system.

Weaknesses & strengths

The Albano Baseline Analysis has brought to light existing weaknesses in the current waste management system. In particular, **Albano still has to set up a centre for the collection and treatment of bio-waste.** The municipality is, however, already working in this direction having identified a suitable spot and having started all the administrative procedures for the creation of such a centre. Albano aims to have it operating by beginning of 2020. Furthermore, the municipality has already considered the implicit costs of said system and has been in contact with local actors to set up an economic model which will enable the selling of the compost as animal feed and fertilisers.

However, **Albano has also proved how the switching to a more individual based system has not only improved the quality of the waste collected, but it has also resulted in economic advantages for the citizens:** the new TARIP tax is 5% lower in comparison to the previous one and if citizens (as per household members) reduce their overall production of non-recyclable waste the tax reduction can reach up to 10%.

The switching to the new system has required tailored awareness and knowledge sharing campaigns to guarantee the adequate involvement of citizens. The municipality of Albano organised a series of public meetings/events, and massively widespread knowledge about the new system via the social media. Furthermore, upon the starting of the new system with the actual delivery of the new bin, a door-to-door communication had been set up: upon the

delivery of the new bin a representative of the company explained to each household the functioning of the new system including the calculation of the TARIP tax. In addition, the municipality of Albano also set up a 24/7 information system for citizens to call for questions and concerns or to book the pick-up of bulky waste, thereby providing an incentive to reduce illegal dumping in view of the reduced size of the new bin.

Last but not least, the new system and the relative specific waste collecting schedule based on the kind of waste and city area represent a good approach to route optimization.

Improvement opportunities

Currently, the new door-to-door waste collection system and the relative TARIP tax have been implemented at the household level. **The up-take of the new system from other local waste producers, such as shops and HORECA channels is still under discussion.** It requires a slightly different approach – compared to the individual household system - due to different operational as well as socio-cultural challenges.

Therefore, the municipality of Albano aims to implement the collection of biowaste from HORECA by beginning of 2020, thereby being able to lead a step-by-step process, starting - in close cooperation with the Biowaste Club in Albano - with the identification of those actors' needs, expectations and socio-cultural barriers to change. The mainstreaming of the new waste collection system to other waste producers would allow a further reduction in costs for all citizens because of the increasing amount of biowaste collected.

The second central opportunity for improvement in Albano is represented by the setting up of the centre for the collection and treatment of biowaste, including a composting area. The construction of this type of installation would result in high-value end products. The municipality is working towards obtaining a regional funding of approx. €600,000 in order to be able to set up the mentioned centre and relative composting system. In the new centre, the city will be able to treat 5 tonnes/day of organic fraction with valorisation through compost production. This will create economic returns for the waste management company as well as for the municipality which will be able to further lower the TARIP tax. Currently, the waste has a cost of €130 per tonne for the municipality.

3.2.2 Stakeholder mapping of Albano Laziale

Due to the intrinsic differences between waste collection and management processes at the local level and the many challenges represented by national waste legislations in terms of biowaste treatment, the stakeholder mapping of Albano has highlighted **the importance of engaging with regional and national decision-makers operating and closely cooperating with administrators of neighbouring cities/towns in the Lazio region**, such as Ardea, Ariccia, Castel Gandolfo, and Rocca di Papa. Furthermore, the mapping exercise has also shown the **central role played by local shops and HORECA channels in Albano as large producers of biowaste**.

In terms of engagement of waste collection and management companies, the situation in Albano presents a rather straightforward two-actors system. The municipality has a contract with a subsidiary company "VOLSCA AMBIENTE", which as described above is responsible for the collection, management and disposal of waste, including organic waste. Nevertheless, following the efforts of the current Council of Albano to create a municipal biowaste treatment plant, the need to engage with additional private actors and networks, such as Coldiretti (leading organisation of Italian farmers at national and European level) and big retailers operating in the region, Carrefour, Auchan, became apparent.

Finally, as the recent introduction of the new tax and waste collection system significantly impacts Albano's households in their daily routines, naturally also the households will be a key stakeholder group for SCALIBUR. **So far, Albano's citizens appear to have adapted rapidly to the new system, which may be related to the possible tax reductions in the new waste collection and management system. Gaining a further understanding of the citizens' problems and needs in the new system and engaging them into the SCALIBUR activities, will be a crucial part of Albano's Biowaste Club.**

3.2.3 Preliminary stakeholder engagement plan for Albano Laziale

On the basis of the stakeholder mapping exercise, as well as by taking into account the challenges existing in Albano, the stakeholder engagement plan for the city is two-fold: firstly, the municipality has already started to **reach out to local and regional decision-makers, as well as to neighbouring cities' administrators** to discuss effective actions and strategies to overcome economic and legislative barriers; secondly, the municipality has also undertaken **wide-spread**

knowledge sharing and awareness raising campaigns with respect to the new door-to-door collection system.

The first two Biowaste Club meetings held in Albano, in November 2018 and in February 2019 respectively, have brought together a broad range of actors, including local and regional decision-makers, such as mayors of neighbouring cities/towns, and representatives of regional governmental bodies. At the same time, the second Biowaste Club meeting has also actively engaged Albano's citizens focusing on the adoption of the new door-to-door waste collection system and on the introduction of the new waste tax, TARIP.

Building upon these initial successful steps, the stakeholder engagement plan in Albano will be enlarged to also include the missing – though identified – stakeholders, namely local shops, retailers, key corporate actors, such as Coldiretti, and HORECA. In particular, **the upcoming third Biowaste Club meeting - planned for October 2019 - will engage these actors in a participatory roundtable, during which they will discuss and explore: 1) the possible barriers and opportunities for them to be included in the door-to-door system from beginning of 2020 onwards, 2) the collaborative set up, barriers and opportunities relative to the development of the new municipal biowaste treatment centre as well as the overall reduction of food waste and packaging.** Furthermore, several interlinked aspects will need to be discussed, such as a recycling centre for electronic products or the overall reduction of waste at household level.

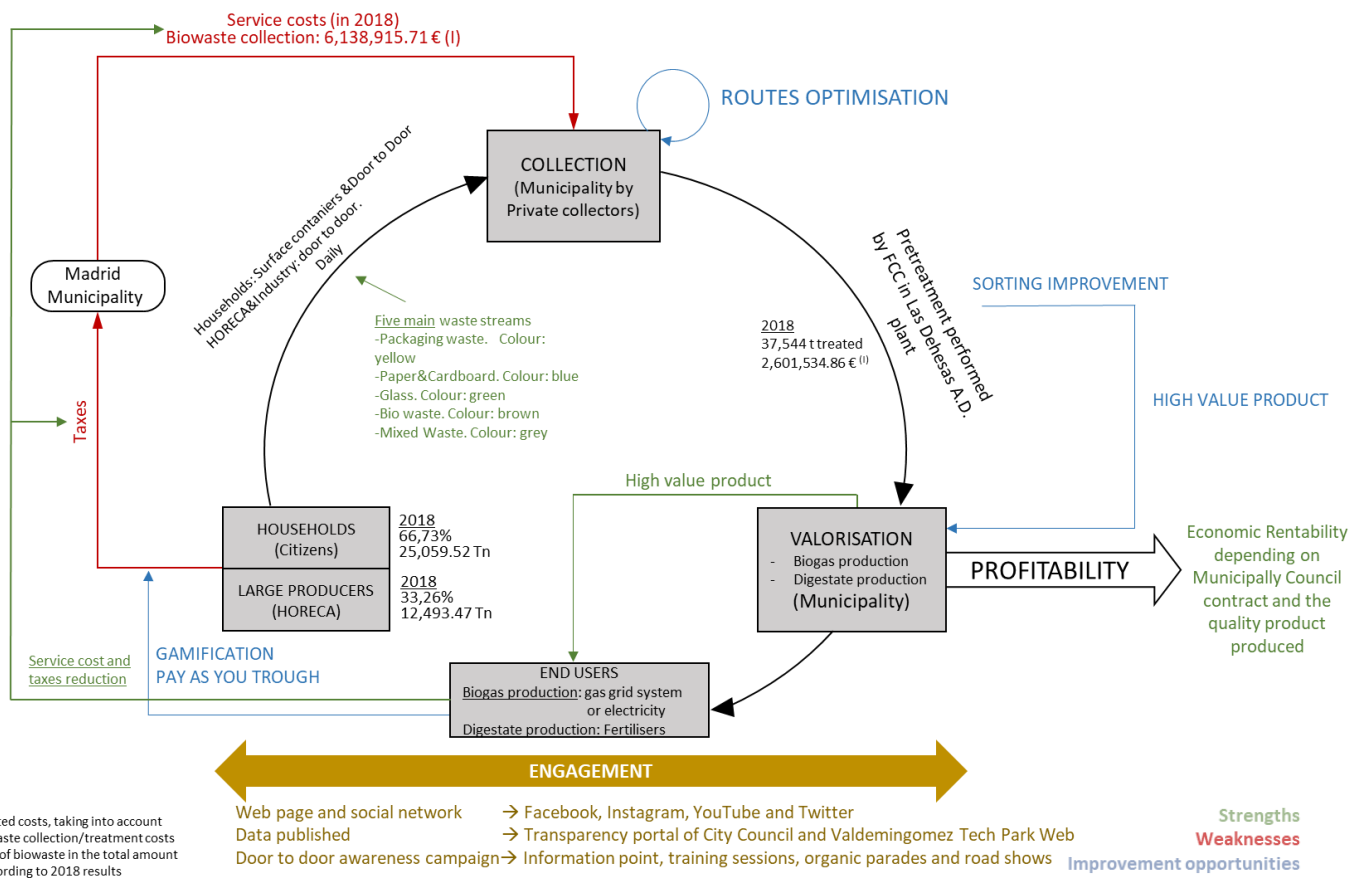
Complementary to these objectives, the municipality of Albano, with support of the local Biowaste Club, will also continue to bring forward its citizens' engagement initiatives and campaigns related to biowaste and more general to waste, such as promoting the reduction of single-use plastic bottles through the provision of water fountains in schools, raising awareness on how to effectively reduce food waste at the household level or fighting illegal dumping through informative actions and penalty schemes.

3.3 Madrid, Spain

3.3.1 The baseline of biowaste collection and valorisation

Madrid
 3,221,824 inhabitants
 604.3/km²
 Selective Collection is ongoing in all the city

Madrid, capital of Spain, is located in the center of the country and has 3,221,824 inhabitants, divided into 1,531,490 households. Based on the most recent local legislation a system for selective biowaste collection was implemented in large areas of the city. The process will finish in 2019, reaching 100% of the population in the 21 districts. Since then, five different fractions of waste are collected separately, both from private households as well as from large producers (mainly HORECA). The current waste management system is summarized in the Baseline Analysis on Figure 3.



(I) Estimated costs, taking into account complete waste collection/treatment costs and a 3,13% of biowaste in the total amount according to 2018 results

Figure 3 Flow chart baseline analysis of Madrid, Spain

Madrid's biowaste waste management collection is focused on both households and HORECA producers, from which a total of 25,059.52 and 12,493.47 tonnes respectively have been collected in 2018. Since October 2018, more and more districts were included in the new collection scheme. Currently, biowaste is recycled and collected separately from more than 1.5 million households.

Status quo in the pilot

Waste in Madrid is separated into five different fractions: packaging, glass, paper & cardboard, mixed waste and biowaste. They are sorted into different containers, following a colour code and mainly collected on a daily base. **The collection system is based on surface containers and a door-to-door system.** The collection and the transport are performed by private collectors hired by the City Council. In this case, one of the companies hired for the purpose is FCC. **All the waste collected in Madrid is treated in a waste treatment system**, Valdemingomez Technology Park. From there, all the biowaste fraction collected is treated in Las Dehesas Anaerobic Digestion Plant. The valorisation process is achieved in two different ways:

- Biogas production, to produce biomethane or power;
- Digestate production, to obtain fertiliser;

Even though biomethane is injected in the General Gas Grid System of Spain, and the biogas is used to produce electricity, it is still unclear who the end users of the currently produced compost are due to the lack of results on the quality analysis of the first composted tons of digestate (at the time of writing of this document the first tons were still in the composting tunnels).

All the information related to this selective waste collection program is communicated to citizens in order to engage them in the process. To inform them about the system, different communication channels have been used, such as: web pages, social networks, transparency portal and different campaigns and live workshops.

Weaknesses & strengths

In terms of weakness, the first one noticed in Madrid's concerning biowaste management is the taxes paid to the municipality: **taxes are paid regardless of how well citizens separate or recycle (the system is a voluntary system that relies on the citizen's confidence)**. Secondly, **end consumers for the compost produced in the composting plant are still unidentified due to the lack of information on the quality of the compost produced.**

Nevertheless, Madrid also already presents some interesting success factors: as a result of the good quality of biowaste collected and sorted, there is a high added valorisation. This valorisation allows Madrid to produce two high value-added products: biogas, to produce bioethanol or electricity and compost or fertilisers. Thanks to the profits resulting from valorisation, service costs and taxes could be reduced for the citizens.

Improvement opportunities

However, there still room for improvement in Madrid: currently the reduction resulting from the production of biogas or electricity and compost/fertilisers is not well connected to how a household or HORECA producer is separating. Consequently, there are no reward/compensation system in place on individual selective separation at source. Programs such as tax reduction, electricity bill discount or gamification could be introduced. This would allow citizens to be involved in the entire waste management chain and improve the quality of the biowaste collected.

Furthermore, being the new system in Madrid still in its early implementation phase, the quality of biowaste collected still includes a rather high amount of inert materials which is, however, common during this phase. Along the further uptake of the system across the whole city, Madrid municipality is also working towards strengthening the engagement of citizens through a diverse range of communication activities. In addition, the waste collection route could be optimised to reduce the cost of collection and to ensure the optimal state of the collected organic waste.

3.3.2 Preliminary stakeholder mapping of Madrid

While in Kozani and Albano Laziale most key stakeholders are already engaged or very motivated to be engaged in SCALIBUR and have understood the value for its municipality, **in Madrid - due mainly the size of the city and to the various elections, the process of stakeholder identification and engagement had to be delayed.**³ After the elections, the regional and municipal representatives in Madrid changed and with them also the administration is currently (as of July 2019) still being restructured. Therefore, the SCALIBUR partners are currently in the process of identifying those remaining and newly appointed representatives that still are or will in the future be responsible in the different for SCALIBUR relevant departments in order to inform and engage them in the Biowaste Club.

In the case of Madrid, starting the Biowaste Club with the municipality representatives as first key stakeholders is particularly relevant since – as illustrated in the baseline analysis above – **most stages of the biowaste value chain in Madrid, from the collection of the waste, to transport, sorting, pre-treatment and valorisation to the commercialisation of the new bio-based products is managed directly through different bodies of the city.** Thus, the municipal representatives of the different stages will be crucial to engage and motivate from the start of the SCALIBUR Biowaste Club in Madrid in order to be able to implement any new pilot activities.

Next to the different municipal public bodies, also representatives of the companies that are hired at the different stages of the value chain will need to be involved in the Biowaste Club. Additionally, similar to Kozani and Albano Laziale, naturally also representatives from the “biowaste-producing” side – thus households and HORECA sector – will need to be involved in the Biowaste clubs, e.g. through local neighbourhood initiatives and business associations. As the waste system in Madrid is centrally organised, there is also no intermediary between the city and its citizens. The city is currently working on developing and implementing communication and awareness raising campaigns and is, therefore, already in close contact with several key organisations from business and civil society side that will also need to be targeted for the SCALIBUR Biowaste Club.

³ National general elections on April 28th, 2019/ Elections to the European Parliament on May 26th, 2019/ Regional elections on May 26th, 2019

Finally, consumer representatives of the new bio-based products, such as farmer cooperatives, are also important stakeholders to be considered. The agriculture sector represents in the city only the 0.1% of the total economic activity, this makes Madrid mainly a Service Sector city (88.7%). For this reason, following the scheme of other smaller cities, trying to connect the production of the new bio-based products with the farmer cooperatives, will be a very hard task. Indeed, one of the challenges that Madrid is currently facing is the commercialization of the fertilizers produced from biowaste. By understanding the needs and hesitations of the farmers, commercialization of such products will be enabled and sales will be increased, making the new system more profitable for the city.

3.3.3 Preliminary stakeholder engagement plan for Madrid

The SCALIBUR partners are currently in the process of approaching the different new regional and municipal representatives and informing them about the role they could have in the Biowaste Club, including potential tasks and responsibilities but also the benefits for Madrid being part in the SCALIBUR project.

The official kick-off meeting of the Biowaste Club in Madrid is planned for late autumn 2019. In the meeting, the Madrid baseline analysis – as illustrated above - will be discussed with the stakeholders in order to agree on the key strengths and weaknesses in the biowaste management system in Madrid and to set priorities and targets for the local SCALIBUR pilot activities.

Additionally, as the target for Madrid in task 3.5 (led by ITENE, with support of Madrid and FCC) is the implementation of best practices, firstly on social awareness activities on the collection of OFMSW and, secondly, on sorting, pre-treatment and characterization of OFMSW, in the upcoming Biowaste Club meeting the partners will also present a selection of best practices, which will then be discussed among the Biowaste Club members in order to identify and choose those that are most fitting for pilot implementation in Madrid.

As indicated above, the city is currently engaged and further planning wide-spread information campaigns about the new sorting system. Citizens engagement will have to increase as the system is being adopted throughout the various city districts. Currently, the quality of the biowaste still varies widely across city districts. As a first step for the implementation of social

awareness activities (T3.5), it will, therefore, be relevant for the Madrid Biowaste Club to engage with representatives from the different districts (e.g. through surveys or focus groups) to understand why the information campaigns have better reached some actors than others, what problems some groups may face in separating properly and how the information and awareness raising activities can be enhanced and where necessary re-designed to address the needs of specific target groups.

4 SELECTED PROMISING PRACTICES

4.1 Rationale for the selection of practices

There are already several different (bio)waste management systems across Europe that have proven to be successful. SCALIBUR will use the knowledge and get inspiration from these different promising practices in order to develop solutions that best fit the pilot cities' needs on a local level. Due to the pilots' diverse background, different challenges and potentials are indicated.

Research on already existing practices showed that there is a good variety of methods (collection systems, treatment methods, by-products etc.) already being followed. Considering that the SCALIBUR's pilot cities differ in terms of technologies, culture, climate, city size and shape, target groups and current national legislation, the promising practices selected are equally diverse. The primary focus of the selection was to enable a comparison between the challenges and opportunities of the already implemented practices and those of the SCALIBUR pilot cities.

4.2 Best performing territory Lund

Lund is a town located in the South-West of Sweden with a population of 91,940 inhabitants. Lund's main economic activities include a highly developed service and a blooming tourism sector. Lund is also known for its advanced level on academia, being ranked as the best University in Sweden.

Waste collection & applied business model

In terms of waste collection and management the municipality of Lund - together with 13 other municipalities - co-owns SYSAV, the company responsible for the Regional Waste System. In the city of Lund, waste is separated into 8 fractions on household level.

In single-family houses (mostly in the suburbs), the current system is based on individual bins. Per household there are two bins, each of which is divided into 4-compartments: Bin 1: Household waste - Food waste - Colour Glass – Plastics; Bin 2: Paper - Cardboard - Clear glass – Metals.⁴ Waste collection is carried out with 4-compartment vehicles that empty all four fractions in each bin in one single cycle. To do so, the vehicle has four separated compartments, making a mixing of the fractions impossible. In apartment buildings (mostly in the city centre), eight separate underground containers are provided outside the buildings. Each of these eight fractions is collected by a separate vehicle.

With the current system, a high quality of waste collected is achieved: 91% purity in the packaging and paper fractions and 98% purity in the food waste fraction. The recyclable materials are delivered to the recycling companies, while the food waste and the residual waste is delivered to the co-owned company SYSAV. The food waste is pre-treated and then digested in a reactor to produce biogas and biofertilizer. In 2017 for instance, SYSAV collected 59,900 tonnes of food waste which generated 47,100 tonnes of slurry; slurry was then turned into biogas, replacing approximately 3.2 million litres of petrol.⁵

The produced biogas is, among others, used to optimise the energy consumption of Lund's waste collection fleet. As such, all waste collection vehicles run on biogas produced from local food waste. The residual household waste is incinerated to produce hot water for district heating and electricity.

Process and role for stakeholder & citizens' engagement

Lund's innovative waste collection and management system could not have been realized without the active contribution of its citizens separating waste at source. In order to guarantee

⁴ Bulky waste and electrical waste are collected at separate drop-off recycling centres.

⁵ Source: <https://www.sysav.se/en/>. Retrieved: 19 July, 2019

an active participation of all citizens, the municipality of Lund organised several events for different target-groups, developed different awareness raising campaigns (e.g. through advertisements on TV, blogs, flyers, calendars, visual campaigns in public spaces), hosted study visits to the waste treating facilities and moderated learning sessions and campaigns in schools.

Key lessons learnt & transferability potential

The implementation of the new waste collection system faced different challenges. At the beginning, citizens were mainly dissatisfied about the higher financial burden, consisting, for instance, of an additional fee of SEK 500 for single-family houses, resulting in a total sum of SEK 2850 per year. However, the new system was complementary to the introduction of the “Pay-As-You-Throw system” concept which provided households with a financial incentive, despite the higher fees; households choosing the 4-compartment vessels and smaller space for residual waste could benefit by paying a lower waste fee. Additionally, citizens faced some rather practical challenges, such as the amount of fly larvae that, especially during the summer season, started increasing rapidly in the separately collected biowaste.

Initially the municipality of Lund faced some resistance in persuading Lund’s citizens about switching to the new system. To face these challenges, the city of Lund invested resources in the development of innovative, **target-group specific information campaigns**, - as described in the previous section – and direct and on-going communication tools, such as the free hotline aiming not only to properly inform citizens about the functioning of the new waste collection system, but primarily to give room for direct dialogue and questions. **Giving the citizens the possibility for direct feedback and show them that their concerns were heard and considered, the city of Lund was able to build a long-term trust relationship.**

Additionally, to gain and keep the citizens’ trust and motivation, also **transparency** proved to be a key success factor in Lund. As such, the city of Lund not only provided information on how and why to separate waste, but also showed the citizens how the biowaste was successfully turned into new products and what benefits this would bring. **By making all steps in the value chain transparent, the city of Lund allowed citizens to see and experience the outcomes of their efforts and gave ownership of the successes to all stakeholders.**

A final aspect with regard to gaining citizens' trust in the new system was **reliability**. Introducing and communicating very clear processes – and most importantly then also ensuring that all actors comply with them - (e.g. when and how often which waste is collected), was crucial to maintain the citizens' motivation on a long-term base. Also, here the **constant possibility to interact** (e.g. through the hotline) supported in the city being perceived as reliable and in increasing the citizens' trust in the system.

Another key success in terms of stakeholder engagement in Lund can be seen in the **close cooperation with the different technology providers**. Cooperating, for instance, from the beginning of the process with the waste collectors and the vehicle providers, was crucial to design and introduce complementary bins and vehicles that fitted the needs of the different parts of the city. Also, the introduction of **underground containers** in highly populated areas that have limited outdoor space proved to be a successful innovation that can be valuable to transfer to cities facing similar challenges of limited public space.

4.3 Case study 1: Oslo

Oslo is Norway's capital and largest city. Its population in 2019 is estimated to be 681,071 people.⁶ Norway is widely considered as a European forerunner in terms of economic, social and environmental sustainability as well as social innovation and is thereby providing its inhabitants with a high quality of life.

Waste collection & applied business model

In the early 1990's the collection of household waste (organic waste, plastic packaging, residual waste) was done through public procurement and continues this way ever since with the hiring of different private companies⁷. In 2006, Oslo launched a new Waste Management Strategy (WMS) that aims to build a "recycle and reuse" society, so that Oslo can reach its target of 50% CO₂ emissions reduction by 2030 and become carbon neutral by 2050.⁸ In 2009, food waste and plastic packaging sorting at source was included in the already existing system, and since no

⁶ Source: [Statistik Sentralbyrå](#). Retrieved 31 July, 2019

⁷ Source: <https://www.oslo.kommune.no/english/waste-and-recycling/recycling-in-oslo/>. Retrieved 31 July, 2019

⁸ Source: *Ibid.*

logistical alterations were needed, its implementation was rapid. By 2012 all households in Oslo were included in the broader waste management scheme.

Nowadays, Oslo's waste management system is among the most advanced and well-functioning systems in Europe. Different streams of waste are separated at source and then collected, including clean plastic, food waste, residual waste, paper/cardboard, glass/metal packaging. Food waste, clean plastic and residual waste are placed into different coloured bags, green and blue for food waste and clean plastic respectively, while a normal shopping bag for the residual waste. The waste is then taken to an optical sorting plant where everything is sorted and treated. Optical sorting is advantageous in the sense that different waste types are placed in different bags but do not need to be placed in different bins or be transported in different vehicles, thus decreasing total CO₂ emissions.

In Oslo, by-products of the waste treatment include biogas, biofertilizers, electricity and new plastic products. Different fees based on a *"Pay As You Throw"* concept are implemented to finance the operation of the whole system. In this way, waste handling is fully financed by citizens as a non-profit service. The fees depend entirely on the bin size, beginning at €443/year for 140 litre-bins that are collected on a weekly basis.⁹ Paper door side collection and use of delivery facilities for separated waste is free. The regulation gives the City the right to sanction citizens who do not comply with the regulations of the waste management system. So far, no sanctions have been imposed.

Process and role for stakeholder & citizens' engagement

For Oslo's waste management strategy to be implemented, a number of stakeholders with different roles had to be engaged. The key stakeholders in Oslo include the City of Oslo and the Agency for Waste Management who are responsible for the operation of the system. The Agency for Waste Management ([Renovasjonsetaten](#)) was established in 1897 by the City of Oslo. The agency operates as an independent economic entity and its budget is decided by the City Council. The Waste-to-Energy Agency, that is subject to the Department of Transport and Environmental Affairs in the Municipality of Oslo, is responsible for waste treatment as well as energy and material recovery. Private companies participating in the public procurement

⁹ Source: [Application Form for the European Green Capital Award 2019](#). Retrieved July 31, 2019

process are later in charge of the waste collection. This procurement process has enabled companies to maximize their environmental performance as they are selected on the basis of their innovation potential and waste collection services.

For the engagement of citizens, the City of Oslo developed various promising communication and information strategies to raise interest. Indeed, a large part of the waste management system in Oslo is based on how citizens behave. This is because waste has to be sorted properly in order then to be efficiently converted into by-products such as bio-fertilisers and energy. Therefore, it is essential to understand what the key drivers behind consumer behaviour are, in order to better organise awareness raising campaigns and to tailor the new services to best meet the citizens' needs and increase e.g. the acceptance of products made out of waste.

To communicate the new system and encourage citizens' participation, the city of Oslo introduced different campaigns including distribution of brochures, advertising and also door-to-door campaigns. An important element of all these campaigns was the clear communication about the system's results and benefits for the citizens themselves. Once citizens were made aware of how the process is structured and how they benefit from it (e.g. energy produced from waste is returned into the grid), they were more receptive to the new system and paid more attention to properly separate their waste¹⁰.

Transferability potential

- Optical sorting enables an easier collection system from the citizens side - based on different colour bags. This reduces the amount of space required usually at the household level when different bins are in use.
- The waste collection and management system in place forces a close cooperation by the Agency for Waste Management, the municipality of Oslo and the Waste-to-Energy Agency. This system reinforces the dialogue among all the involved entities – including the private companies collecting waste - creating a positive loop;

¹⁰ Source "[Oslo takes an integrated approach to treat waste into circular bio-resources](#)". Eurocities, 2017. Retrieved July 31, 2019

- Citizens' engagement has been effectively conducted through the development and implementation of tailored communication, capacity-building (e.g. open day at the different sorting and treatment plants) and awareness campaigns. **These initiatives contribute to an effective behaviour change effect as people are more receptive once they are aware of how the process works, and what are its environmental and economic benefits.**

4.4 Case study 2: Sardinia

Sardinia is a Mediterranean island with a population of 1,651,793 (2017) inhabitants.¹¹ It is a very popular holiday destination and tourism is one of the key economic sectors together with agriculture, breeding (especially goats), fishing, and mining. In particular, the tourist sector has experienced a steady increase over the last decades and statistics show that in 2016, 2.9 million people visited Sardinia.¹²

Waste collection & applied business model

Even though tourism represents a key economic resource for the island, it is also a major challenge when looking at waste collection and management, especially when tourism rates are at their peak during spring and summer.

These increases upturn waste rates abruptly and significantly, and also often lead to improper collection; it is often the case that tourists either do not pay attention or are not properly informed about waste collection rules on the island - and illegal dumping. Furthermore, the island also faces some of the largest roadblocks and collected waste has to be transported from several smaller towns to large collection and treatment centres.

Notwithstanding, in 2004 Sardinia re-evaluated its waste strategy and (in compliance with the new targets set by European and national directives) developed a Regional Program for Biowaste. The new programs set out the following measures: i) compulsory separate collection of biowaste, including staged capture rates targets, aiming at collecting, at least 105 kg of biowaste per inhabitant by 2018; ii) an increase of the landfill tax from the minimum set up by

¹¹ Source: [Eurostat](#). Retrieved July 31, 2019

¹² Source: [Turismo: 2,9mln arrivi in Sardegna 2016](#). Retrieved July 31, 2019

the Italian law (10€/t) to the maximum (25.8€/t); iii) the introduction of a bonus/malus system on the cost of residual waste management, to reward or penalize municipalities on the basis of their individual performance; iv) the promotion of a door-to-door system as the preferred model for separate collection of waste, along with a pay-as you-throw concept and home composting.¹³

All these factors contribute to improving the quantity and quality of the biowaste. Since the adoption of the new strategy, separate collection rates in Sardinia have improved reaching 60% in 2016. At the same time, waste generation per capita has decreased consistently, moving from 520kg per inhabitant in 2003, to 443kg per inhabitant in 2016. These two figures combined result in a significant reduction of residual waste that has decreased from 500kg per inhabitant in 2003, to 176kg per inhabitant in 2016.

Process and role for stakeholder & citizens' engagement

The waste management processes in Italy is distributed between different authorities. Municipalities are in charge of separate collection of waste, supra-municipal authorities (provinces or districts) are in charge of waste treatment, and regions have to set up waste management plans and coordinate the provincial and local authorities. Therefore, a smooth coordination between these three levels is key to ensure an efficient waste collection and management system.¹⁴

From a citizens' perspective, the setting up of the new collection system has required tailored awareness raising campaigns and initiatives. In particular, many municipalities across Sardinia have conducted school campaigns and organised public meetings which have proved to increase citizens' knowledge and understanding of the importance of waste separation and waste generation including relative economic advantages. For example, the city of Tortoli (a town of approx. 11.000 inhabitants situated in province of Nuoro) conducted targeted communication activities addressing not only its residents but also its tourists. Visual signs for sorting including some translated versions in various languages were placed on the beaches demonstrating the correct way to separate the waste. This contributes to making, not only

¹³ Data from the European Project [UrbanWINS](#) on urban resource and product consumption. Retrieved July 31, 2019

¹⁴ Source: *Ibid.*

Tortoli's citizens, but also the so-called floating population of the city more conscious about the proper waste sorting and related environmental impacts.

Secondly, the city of Tortoli directly engaged with the HORECA sector to inform the key stakeholders about the importance of proper recycling and producing high-quality biowaste. These targeted campaigns have proved to effectively drive separate collection also by enhancing the pro-active cooperation among HORECA actors.¹⁵

Transferability potential

- Due to the intrinsic economic characteristic of the island largely dependent on tourism, Sardinia communication and engagement strategies constitute a good example on how to successfully address and sensitize tourists;
- Sardinia bonus/malus approach at the municipal level is a good case of how to address the challenge of managing the waste generated by all those actors, shops, restaurants and hotels active in the touristic sector;
- The PAYT concept combined with an individual household accountable waste collection system and complemented with targeted communication and awareness raising campaigns has proved to be effective in changing citizens habits.

4.5 Case study 3: Besançon

Besançon is a town situated in the east of France. Its population reached 116,466 inhabitants in 2016 according to the National Institute of Statistics and Economic Studies.¹⁶

Waste collection & applied business model

In 2008 Besançon along with some of its surrounding municipalities decided to switch from incinerating waste to using it in more sustainable ways. In order to avoid incineration, the city first had to re-evaluate its waste management strategy. The new adopted strategy builds upon two main components: a decentralized composting system along with a pay-as-you-throw fee.

¹⁵ Information adapted from the European [Zero Waste Europe groups](#)

¹⁶ Source: <https://www.insee.fr/fr/accueil>. Retrieved July 31, 2019

At the beginning of 2012, the greater Besançon became the first conurbation of over 100,000 inhabitants to switch to a pay-as-you-throw scheme to finance waste treatment and encourage the reduction of residual household waste. However, 80% of the population of Besançon live in collective housing, where the cost of waste management is not directly charged to individual households.¹⁷ Instrumental for the change in strategy was Besançon's participation at the EU project "*Waste on a Diet*" (2012-2016).

The aim of the Waste on a Diet project was to implement a pay-as-you-throw scheme in collective housings and rural areas, resulting in an expected reduction of the total volumes of waste and the adoption of good waste management practices, such as sorting, recycling and collective composting. It foresaw the installation of collective composting facilities, the upgrade of the 18 waste-disposal sites of the greater Besançon and the construction of a bulk waste-dismantling platform.¹⁸ The EU project provided all 18 sites managed by SYBERT - an authority composed of three groups of municipalities - with the necessary equipment to control access and to carry out the new recycling solutions. By 2016, citizens in Besançon and surrounding municipalities, all under the responsibility of SYBERT, were able to either compost at home or could visit smaller or larger community composting sites.

The new composting and PAYT systems have managed to reduce residual household waste by more than 30% from 217 kg/household/year in 2009 to 145kg/household/year in 2017;¹⁹ re-use and recycling rate increased from 39% in 2009, to 58% in 2017 above the 2011 French average of 37%. The overall action in Besançon achieved a waste recovery rate of around 97% in 2017, exceeding the EU's objective of 70% by 2030 and higher than the EU current average of 40%.²⁰ Thanks to the introduction of access control systems at waste disposal sites and local composting, it was possible to lower the amount of sorting errors and consequently decreasing

¹⁷ Information adapted from the project "[Waste on a diet](#)" (2012) under the aegis of the Association of Cities and Regions for sustainable Resource Management (ACR+). Retrieved July 31, 2019

¹⁸ Source: *Ibid.*

¹⁹ Source: Ferran R., 2017

²⁰ Source: Information adapted from the project "[Waste on a diet](#)" (2012) under the aegis of the Association of Cities and Regions for sustainable Resource Management (ACR+). Retrieved July 31, 2019

management costs. This in turn led to a decrease of costs for the citizens which reached €72 per year per household, way lower than the French average of €120.

Process and role for stakeholder & citizens' engagement

The main stakeholders who had to be engaged to realize this strategic transition from incineration to composting were the involved municipalities, local councils, waste treatment companies and of course households. Furthermore, due to the culturally diverse areas of Besançon, which also have a high rate of turnover of residents, the initiative had to go beyond traditional stakeholder communication and engagement tools. Accordingly, within the project's timeframe awareness-raising campaigns were conducted promoting good practices among the local population, as well as among public bodies, such as the city council and landlord associations. Additionally, targeted workshops for the citizens living in collective housings, were also organised. The workshops focused on shopping behavior, cooking and food waste reduction practices as well as on broader sustainability topics, e.g. on clothing recycling and organisation of second-hand markets for household furniture and equipment recycling.

These campaigns and initiatives were organised along the introduction of access control systems at waste disposal sites and local composting, which also resulted in fewer sorting errors and thus lower management costs. For example, SYBERT provides households with home composters at a lower cost regularly and is also responsible for setting up small community composting sites to accommodate the diversity of urban areas as well as for the installation of composters at the foot of buildings, which are later run by the residents of each building.

Transferability potential

- The initiative is a good example on how to tackle the challenges present in rural areas and implement an effective and economically viable waste collection and management system;
- From an environmental point of view the development of local treatment processes prevents waste being transported to remote locations and the associated carbon

footprint which consequently resulted in reduced journey times for dump trucks as well as in CO₂ savings of 41%;²¹

- Citizens and municipalities switching to the new system have experienced two-fold benefits: 1) local municipalities have had an economic advantage represented by decreased waste management infrastructural costs which in turn has made funds for other public activities and sectors available; 2) the scheme has led to the opening of regional job opportunities, thus providing stable economic conditions for citizens living in those rural areas.
- The greater Besançon area and its targeted communication and information strategies represent a good practice example of how to tackle challenges intrinsic to large urban residential areas (e.g. fluctuating residential populations; collective housing) which usually prevent the adoption of a PAYT scheme addressing individual households.

4.6 Case study 4: Milan

Milan is Italy's second biggest city with approximately 1.3 million inhabitants (2017). Due to its previously poor performance in matters of recycling, Milan decided to adopt new methods in waste management and set higher targets for separate collection of waste and recycling.

Waste collection & applied business model

In Milan, up until 2011 only food waste from commercial sources and not on household level was collected. A new plan for separation at source of residential biowaste was promoted by the city authorities with the view to produce biogas and high-quality compost. AMSA, Milan's waste collection and street cleaning company, organised the separate collection of biowaste through a door-to-door and curbside collection. To do so, the municipality of Milan provided each household with a new vented kitchen bin, designated for food waste along with compostable bags made of bioplastic (in compliance with European standards for biodegradable and compostable packaging). Full bags are to be placed in larger bins and exposed on the curbside

²¹ Source: *Ibid.*

to be collected by the company twice per week; waste is then collected in two transfer stations and redirected to anaerobic digestion and composting facilities.

The system is entirely funded by the municipality of Milan which had to invest upfront in it: increasing the number of collection vehicles (45 new vehicles to enforce the fleet); purchasing and distributing the necessary equipment and of course in enhancing its staff resources. The implementation of the new strategy was gradual and the city was divided in four collection parts to make the process less complicated. By 2014 every household in Milan was separating its food waste. Furthermore, thanks to the considerable reduction in waste sent to incineration, AMSA was able to reduce its disposal costs and this helped to cover a rather larger share of the additional upfront investment costs needed for the setting up of the in new collection infrastructure.

Process and role for stakeholder & citizens' engagement

For the successful implementation of the project, from the very beginning the municipality identified the need to engage not only the citizens, but also technical partners operating on the territory. More specifically the following key stakeholders: AMSA; the municipal company managing the waste collection system; CIC, the Italian Compost and Biogas Association whose contribution was valuable for treating the collected food waste and recovering resources; Novamont SpA, a company operating in the field of compostable polymers production and COMIECO, the National Consortium for the Recovery and Recycling of Cellulose-based Packaging.^{22 23}

Regarding citizens' engagement, the municipality has undertaken several tailored actions to inform and educate its citizens properly on matters of waste management and separation of different waste streams. Behaviour change aspects were one of the initiative's greatest challenges, and in response the municipality developed a thorough approach to effectively enhance citizen participation.

²² Source: <https://www.amsa.it/en/cittadini>. Retrieved July 31, 2019

²³ Source: Reference for the information added is: Global-Food-Waste-Management-Full-report-pdf: <https://www.dropbox.com/s/vnembdp91evmry3/Global-Food-Waste-Management-Full-report-pdf?dl=0>. Retrieved July 31, 2019

Before the pilot collection of food waste, the city together with AMSA and some external experts organised a communication campaign providing a comprehensive description of the new functions of the system along with highlighting the importance of effective waste management plans and recycling. Additional virtual tools were developed to accommodate the citizens' needs and doubts so as to facilitate the uptake of the newly deployed collection system: a free information hotline was set up to address questions and issues together with a new, free smartphone application.

In addition, more traditional information material, such as leaflets or posters, was also distributed. Importantly, to respond to the multicultural nature of the city, all material was made available in different languages. Households received letters with instructions and the distribution of the kitchen equipment (bins) was followed by face-to-face dialogues to explain how to properly use the equipment and separate the waste. Finally, the new approach has been incorporated into schools' curricula to teach students the importance and the benefits of a circular waste management system.

To advertise the results of the new implemented system, the city holds regular giveaway compost events so that citizens can get a deeper understanding of the concrete outcomes of the waste separation. Providing consumers with tangible products as the result of their efforts and participation has proved to be a significant incentive to further engage them. According to latest local surveys, citizens in Milan are satisfied with the new system and understand well how they have to separate their waste. The quality of the collected waste is high with low contamination levels (which translate to end products of higher quality).

Transferability potential

- The gradual implementation of the new system across four different city districts has proved to ease not only the shift to the new system for the citizens but also enabled the waste collection and management company to concentrate its efforts and relative challenges on a smaller portion of the city while at the same time increasing the quality of the service provided;

- The upfront engagement of key technical stakeholders operating on the Milan municipal territory enables a closer collaboration which consequently resulted in the development of a more efficient waste collection and management system in the city;
- The combination of digital and traditional information and communication tools has enabled a smooth transition into the new system. Citizens' needs and doubts have been more easily addressed and challenges caused by a lack of understanding of the new system were tackled in a prompt manner. Furthermore, in order to keep citizens engaged, the municipality has stretched these activities beyond the initial implementation phase by changing schools' curricula and introducing regular feedback mechanisms, such as online surveys.

5 CONCLUSION AND OUTLOOK

The key focus of the WP2 stakeholder engagement activities in the first quarter of SCALIBUR is to 1. analyse the status quo in the three pilot municipalities, 2. identify and involve all key stakeholders in the Biowaste Clubs and 3. based on promising practices identified, define the SCALIBUR targets and activities for each pilot municipality.

Regarding step 1., as discussed in the former sections, all three pilot municipalities have already implemented various measures to improve the biowaste management system. While the key strengths and weaknesses in each pilot have been analysed in the baseline analyses, in the coming SCALIBUR months, a more systematic comparison of these strengths and weaknesses across the three pilot cities will be needed in order to **identify shared problems and learn from each other's successful initiatives**. Interesting here would, for instance, be the reward mechanisms for households that Albano Laziale has already successfully implemented and that may also function in Kozani. Similarly, both Kozani and Madrid face problems in selling the biowaste-based fertilisers profitably and could learn from the successes in Albano Laziale.

When it comes to (2.) identifying and engaging the stakeholders in the Biowaste Clubs, Kozani and Albano Laziale have already successfully kicked off the discussions in starting groups of Biowaste Club key members. In Madrid, the process of involving the first key actors and inviting them to become active in SCALIBUR through the Biowaste Club is in due process, so that a first Biowaste Club meeting will happen in late autumn 2019.

In all three pilots, a regular review of the stakeholder mappings will be necessary in order to document and monitor the exchange with and roles of the different stakeholders and whether the right actors are sufficiently and successfully involved in the respective pilot activities of the Biowaste Clubs.

While the biowaste value chain currently varies significantly across the three pilots, partly different types of actors are involved and very different measures have already been implemented, the **three municipalities also share many challenges and opportunities**. All three pilots face, for instance, legal constraints at several levels, e.g. when it comes to how to

commercialise the new bio-based products. Here a cooperation between WPs2+8 will be needed in order to best support the three pilots in overcoming these legal barriers.

Similarly, all three pilots are - in the collection and valorisation processes - mainly focusing on biowaste generated on household-level and are facing similar challenges with regard to how to involve and motivate the HORECA sector and other local businesses.

Considering the promising practices that have been identified so far, there are many possibilities to transfer successful experiences to the pilots. **In particular many lessons can be learnt from Lund – as best performing territory –, e.g. how to motivate and engage all actors – especially the citizens - on a long-term basis, how to build trust through transparency and reliability or with regard to testing and implementing a new waste collection system, including the usage of new, tailor-made technologies** (such as the specifically developed vehicles).

In addition to that, the other promising practices show great potential for replication as well, in terms of how to implement new sorting and collection methods and technologies, how to make the new system profitable for the city (e.g. through changes in the tax system or through successfully commercializing the new bio-based products) and how to initiate and maintain a fruitful working relationship with all stakeholders, particularly the citizens.

Next to the promising practices identified so far in WPs 2 and 3 - and depending on the stakeholders' priorities and concerns as currently under discussion in the Biowaste Clubs - additional promising practices that best answer the local needs in terms of stakeholder engagement, will be considered.

The natural next step to (3.) define - and implement - the SCALIBUR targets and activities in each of the three pilots, will thus be a systematic matching of the challenges and opportunities of each pilot with the solution pathways provided both by the promising practices from other European cities as well as by the new solutions developed within the SCALIBUR project itself. As the latter solutions are not only focusing on stakeholder engagement tools and approaches (WP2+7), but also on new technical solutions in sorting, transport and characterization (WP3) as well as in valorisation (WPs4-6), a cross-WPs-cooperation is crucial here. In particular for the

implementation of the pilot activities in task 3.5, a close cooperation with the Biowaste Clubs will be of high importance.

While several of the potential “matches” have already been highlighted in this deliverable and the project-consortium is internally already in the process of further refining this match-making, it will be up to the members of the Biowaste Clubs to select and decide in their upcoming meetings upon the most burning local challenges and opportunities and the most fitting solutions to be implemented during the SCALIBUR project.

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7 ANNEXES

I. Template baseline analysis



Work Package 2: Stakeholder Engagement & social innovation actions

TASK 2.1.2 BASELINE ANALYSIS (lead ITENE)

(NAME PILOT CITY)

(DATE of last update to this document + NAME of who last worked in it)

This questionnaire aims at deepening our knowledge of the current waste management systems in each pilot city or region that are involved in the SCALIBUR project. From the main actors involved, through to the main management processes of bio-waste and to the final valorisation processes.

The questionnaire is divided in different sections, as follows:

1. Pitot city or region - general data
2. Legislation

3. Main actors involved in the (bio-) waste management chain
4. Current waste management system
5. Valorisation of bio-waste
6. Engagement activities
7. Other relevant data

Please fill this questionnaire to the best of your knowledge and send back as soon as possible (and latest by April 15th) to Licinio Díaz (licinio.diaz@itene.com), Carina Diedrich (carina.diedrich@scp-centre.org) and Rosa Strube (rosa.strube@scp-centre.org).

If you have any questions, comments or feedback on the questionnaire, please also get back to us anytime!

1. PILOT CITY OR REGION - GENERAL DATA

Name of the pilot city or region			
Population			
Demographic distribution		male	female
	0-17 years		
	18-64 years		
	65+		
Main economic activities (e.g. which industrial sectors, agriculture, tourism)			
Other relevant aspects			

2. LEGISLATION

In this section please include the information related to current relevant legislation that support or hinder the recycling and/ or (bio-) waste management system in the whole value chain, from collection to valorisation.

If you are aware of potential future legislation that is currently under discussion, please also mention this.

Please use the following template. Use 1 table per law or regulation (meaning: copy-paste the table if there is more than 1 relevant law or regulation per level)

(title of the legislation). Level: local/ municipal
(date that it came into force)
(Goals of the legislation)
(bullet points: what are the implications for your pilot city?)
(bullet points: has it already been efficiently implemented and enforced in your pilot city? If not, what are the barriers?)
(Other remarks)

(title of the legislation). Level: national
(date that it came into force)
(Goals of the legislation)
(bullet points: what are the implications for your pilot city?)
(bullet points: has it already been efficiently implemented and enforced in your pilot city? If not, what are the barriers?)
(Other remarks)

(title of the legislation). Level: EU (or other international regulation)
(date that it came into force)
(Goals of the legislation)

(bullet points: what are the implications for your pilot city?)
(bullet points: has it already been efficiently implemented and enforced in your pilot city? If not, what are the barriers?)
(Other remarks)

3. MAIN ACTORS INVOLVED IN THE (BIO-) WASTE MANAGEMENT CHAIN

In this part, we aim to get an overview of the main actors directly involved in the (bio-) waste value chain in your pilot city or region, from the waste disposal (by households, industry, HORECA etc.) to the final bio-based products (if already existing).

Please describe in bullet points the different stages of the current (bio-) waste management system in your city and the role of the respective actors. The provided stages and actors are just suggestions to help you. Feel free to change or add as it fits best for your pilot case.

Please always list the names of the actors. (Name of the organisation is sufficient here. The contact details and further information on the respective organisation, please add in the excel "stakeholder mapping template".)

Role(s) of the different actors along the (bio-) waste value chain
<p>1. Waste production</p> <p>(e.g. households, industry, HoReCa, others) <i>Please describe the role of each actor.</i></p> <p>E.g. "Households: produce X % of the bio-waste in our city."</p>
<p>2. Waste collection and transport</p> <p>(e.g. public or private waste collectors, transport companies, others) <i>Please describe the role of each actor.</i></p> <p>E.g. "Bio-waste of the households is collected by the public service provider XY once per week. XY relies on the vans of private Company YZ. The bio-waste is transported outside the city to ..."</p>
<p>3. Sorting and pre-treatment</p>

(e.g. sorting and pre-treatment plant(s))
Please describe the role of each actor.

E.g. "90% of the bio-waste of our city is transported to the sorting plant XY. It is privately owned by YZ. YZ is the biggest waste operator in our región..."

4. Valorisation processes and development of bio-based products

(e.g. industry, research, others)
Please describe the role of each actor.

5. Consumption and/or further processing of bio-based products

(who are the end-consumers of the bio-based products in your city?)
Please describe the role of each actor.

4. CURRENT WASTE MANAGEMENT SYSTEM

In this section, we want to take a closer look at the biowaste management system in your pilot city or region, focusing on the collection system, the sorting and pre-treatment processes and the main parameters regarding the recycling process.

COLLECTION SYSTEM
What is the collection system (Surface containers, door to door, buried containers)?
Household waste:
HoReCa waste:
Other (e.g. industry):
What fractions are collected separately?
How is the collection of bio-waste organised?
(E.g. is the bio-waste collected at the same time as other waste? Or by a different company/ in a different routine? Etc.)
How often is bio-waste collected?

What are the costs of the bio-waste collection for the households, HoReCa and other waste producers?
(E.g. are the households or HoReCa paying additional taxes for the bio-waste collection? Do they have to pay if they don't separate properly?)
What are in your view shortcomings in the current collection system and what are the main reasons for it?
(E.g. "The bio-waste collected from households is of bad quality because too small bins are provided to the households/ citizens are reluctant to separate properly because in summer there are too many flies in the bio-waste/ the company collecting the waste is not reliable, does not always collect on time/ ...")

SORTING and PRE-TREATMENT SYSTEM
When the bio-waste arrives in the sorting plants, which sorting and other processes does it undergo? (e.g. in case the waste was not separated collected, how is it separated?)
Effectiveness of the process (quality, % landfilling etc)
What pre-treatment processes are selected?
quantity of bio-waste treated: 1. In tonnes/year / 2. As % of total collected
What are in your view shortcomings in the current sort and pre-treatment system and what are the main reasons for it?

5. VALORISATION OF BIO-WASTE

VALORISATION PROCESSES
Main valorisation processes currently being carried out and by whom

Where are these processes being carried out?
How economically feasible is the valorisation process currently in your pilot city? What are barriers?
Please make an informed assumption, for which companies or other actors (local, national or also beyond) the bio-waste or valorised products may be of interest?
What are in your view shortcomings in the current valorisation processes and what are the main reasons for it?

6. ENGAGEMENT ACTIVITIES

ENGAGEMENT ACTIVITIES
What kind of engagement and awareness-raising activities have been carried out or are currently being executed in your pilot city or region? Who carries them out? Since when? Which are the target groups?
Main results
What influence did these activities have on the quality and quantity of the (bio-) waste
What are in your view shortcomings in the current engagement activities and what are the main reasons for it?
(e.g. which actors are not sufficiently involved. What information, tools, support do they need?)

7. OTHER RELEVANT DATA

Quantity + quality of bio-waste collected + recycled

1.1 Have there already been previous studies on the **quantity and quality of the bio-waste that is produced and collected in your pilot city**? If yes, how often is this measured?

1.2 Have there already been previous studies - **on national level - on the quantity and quality of bio-waste that is produced and collected** in the whole country? If yes, how often is this measured and how does your pilot city rank compared to other parts of the country?

2.1 Have there already been previous studies on the **quantity of bio-waste that was successfully recycled in your pilot city**? If yes, how often is this measured?

2.2 Have there already been previous studies - **on national level - on the quantity of bio-waste that was successfully recycled** in the whole country? If yes, how often is this measured and how does your pilot city rank, compared to other parts of the country?

For all 4 questions above: please send ITENE (Licinio) and CSCP (Carina and Rosa) ALL relevant studies of the past 3 years. (if possible in English; but Spanish, Italian or Greek are also fine)

Promising practises in your country

3. Are you aware of other cities or regions in your country which have already established **successful bio-waste recycling and valorisation schemes** (or are in a promising process of doing so)?

Please list all interesting cases, if possible including website links.

4. Are you aware of **promising engagement activities** (e.g. consumer campaigns, stakeholder platforms etc.) from other cities or regions in your country?

Please list all interesting cases, including website links. Please do not only consider activities focusing on bio-waste, but also more general successful activities, e.g. on waste separation, recycling or similar.

Open issues

5. Are there additional aspects on the (bio-) waste management system in your pilot city or region, that are not sufficiently covered above?

Please list any further aspects that you think should be taken up in SCALIBUR.

II. Template stakeholder mapping

STAKEHOLDER MAPPING: ALIBUR WP2, Task 2.1.1: NAME PILOT CITY (DATE of last update)					
Organisation name	website	Contact person(s)		Country	city
		<i>full name</i> <i>as contact person(s) preferably chose those people that</i> <i>- are highly motivated</i> <i>- you have already experienced as reliable partners</i> <i>- have influence in their organisation to implement SCALIBUR activities</i>	<i>his/her role in the organisation</i>	<i>contact details (e-mail + phone)</i>	
Type of organisation		Description of the organisation/ main fields of work			
<i>1. chose from list</i>		<i>2. if several apply or you can define the organisation type further, then please specify further</i>			



- consumer and citizens initiatives/ neighborhood initiative/ community leaders
- non-governmental organisations
- HoReCa sector (hotel, restaurant, catering)
- service providers, focus waste (e.g. waste collectors, treatment plants, waste management)
- other service providers (e.g. energy)
- industry (large-scale), e.g. corporations
- industry experts/ sector professionals
- business (medium- to small-scale): SMEs and/or local business owners
- business (small-scale): entrepreneurs/ start-ups
- investors
- research & development

Previous exchange with this organisation	
<p>If you have already been in touch, please give a few key words of the past cooperation</p>	<p>links to the most relevant previous shared projects etc. (website links can be in English, Spanish, Italian or Greek)</p>
Envisioned role in SCALIBUR project	INFLUENCE OF the stakeholder on the success of SCALIBUR
<p><i>please rank if we should involve this organisation</i> 1) in the local biowaste club OR 2) in other SCALIBUR activities (e.g. online stakeholder platform) OR 3) only relevant for outreach/ to keep them informed about SCALIBUR activities</p>	<p><i>INFLUENCE 1: please rank how much influence will this stakeholder have ON the success of SCALIBUR in your pilot city. Or in other words: how crucial is it to involve this stakeholder successfully in SCALIBUR activities?</i></p> <p><i>INFLUENCE 2: WHY is this stakeholder useful for SCALIBUR in general (and if applicable: for the biowaste clubs in particular)? WHAT can they contribute to the success of SCALIBUR (and the Biowaste Club) in your pilot city?</i></p>
INTEREST of the stakeholder in SCALIBUR	
<p>INTEREST 1: please rank how interesting the SCALIBUR project will be FOR the stakeholder. Or in other words: how high can be SCALIBUR's impact on the stakeholder?</p>	<p><i>INTEREST 2: How do we win them for SCALIBUR? Or in other words: why do you think the SCALIBUR project is relevant and beneficial TO THEM? (Also helpful to consider: What is the stakeholder's wish with regard to bio-waste)</i></p>

SCALIBUR (Scalable technologies for bio-urban waste recovery) brings together a unique blend of organisations and expertise, led by **ITENE Packaging, Transport & Logistics Research Center**. The project began in November 2018 and will run for four years.



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