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The Urban Lab of Europe !

The A2U Food project Journal N° 3

Project led by the City of Heraklion



**CIRCULAR
ECONOMY**



The A2U Food project

A2UFood aims to establish a holistic and coordinated management scheme to address food waste in the hospitality sector (hotels and restaurants) in the municipality of Heraklion. It wants to reduce avoidable food waste and use unavoidable food waste as raw materials through a broad range of innovative integrated tools and activities. For example project partners will develop a software to improve households' food management, making use of data stemming from supermarket loyalty cards. A second opportunity restaurant will use leftover food from the hospitality sector (collected through a pilot source separation scheme) to prepare meals for those in need. The project will also set up a pilot bio-plastic bio-refinery production system to produce compostable bags. A range of state-of-the-art autonomous composting units, using the aforementioned compostable bags, will be installed to maximize food waste valorization in the municipality. Citizens and local companies will be informed and engaged through a city-wide information campaign to ensure their large participation.

Partnership:

- City of Heraklion
- United Association of Solid Waste Management in Crete - regional waste authority
- ENVIROPLAN Consultants & Engineers S.A – waste management company
- University of Crete - higher education and research institutes
- Technological Educational Institute of Crete - higher education and research institute
- Harokopio University - higher education and research institute
- University of Stuttgart - higher education and research institute

Table of Contents

1. Executive Summary	4
2. Introduction	6
3. The A2U Food adventure continues with open questions: Act 3	7
3.1 Act 3: Suspense is building up	7
3.2 Challenges faced: The road continues uphill	13
4. Looming challenges	15
5. Some useful lessons	16
6. What next?	18

1. Executive Summary



The A2U project aspires to design and implement a holistic food system involving food waste prevention, optimal use and composting with the aim to divert food waste from the waste stream and to feed the circular economy (and society) of the city. In the first year, the partners focused on the selection of proper locations for the technical activities of the project – i.e. food waste prevention, optimal use of avoidable and unavoidable food waste and urban composting – as well as the identification of the individuals and the institutions that will participate in them; on preparatory activities regarding the design, tendering, purchasing and construction of the main technical actions; as well as the design of the information campaign and the establishment of basic communication channels.

This third period constituted a continuation of the first year, with the primary focus being on implementation of awareness raising tools for food waste prevention, and on licensing, tendering,

purchasing and design of the technical activities that relate with the optimal use of avoidable and unavoidable food waste and composting.

For food waste prevention, the Digital Food Waste Prevention Tool was prepared in a beta version and has been under testing by 10 users for needed enhancements, before it is made widely available by the end of 2019. The RESOURCEMANAGER-FOOD (RMF) tool was tried out in the daily operations of 5 hotels for one month in the period April – May 2019; three of them voluntarily extended the trial period of the tool by another month and two even to the whole summer tourist season. The results are now being analysed by USTUTT with the aim to inform the participating hotels and provide suggestions regarding ways they can limit their food waste generation. A catering service is interested in using the RMF tool in the coming period too. In the context of the Information Campaign Plan, the educational material that was prepared in

the previous period was used in 7 workshops for environmental educators.

For the 2nd Opportunity Restaurant, the permit from the Archaeological Service was obtained in July 2019; structural designs for the refurbishment of the building are now being finalised and next steps of the licensing procedure are expected to be done in the coming two to three months. The 2nd Opportunity Restaurant is anticipated to start operation in August 2020. An appropriate site for the bio-plastics unit was identified and the text of the programmatic agreement has been agreed upon; its signature is pending. Laboratory experiments regarding the transformation of food waste into bio-plastic were repeated under anaerobic conditions and the results were positive. Given this development, the designs for the bio-plastics unit had to be rethought and are expected to be completed by the end of October 2019. These delays lead to an anticipated 7 to 8 months long delay in the initiation of the bio-plastics facility operation. However, the partners consider it feasible to produce the foreseen number of bio-plastic bags in a period of 5-6 months full-time operation of the production unit.

The tendering of the 100 home composters has been finalised and the composters are expected the first days of November. However, the tendering procedure for the Autonomous Composting Units (ACUs) that will be installed in six neighborhoods and two institutions has been delayed due to intricacies in the procurement procedures and internal procedures of the

Municipality of Heraklion. The partners have discussed possible methods that can entangle this bind and hope that tendering will proceed in the coming months. All composting activities are anticipated to start in July 2020.

The challenges in this period have led to 5 to 8 months delays in the implementation of the technical actions, and a longer delay in the activities of the package on the optimal use of food waste (i.e. the 2nd Opportunity Restaurant) resulting to a serious concern regarding the feasibility of a meaningfully long demonstration of the bio-plastics unit.

The urban reality of the city – insufficient open spaces and illegal urban development – along with the prevailing culture regarding food waste are identified as important challenges the project has been facing. Bureaucratic procedures regarding tendering and licensing continued being major challenges our actors had to face in this period too. In some cases, licensing procedures proved a “simple hurdle” that got surpassed with patience and perseverance (e.g. the 2nd Opportunity Restaurant), and in other cases, they have led to serious delays that render some project actions (e.g. bio-plastics unit) precariously feasible within the time frame of this project. Learning from this project, political will, personal contacts and effort, good organization and effective follow up, as well as regular exchange of experience and know-how among the partners prove useful tools in the course of such innovative projects.

2. Introduction

“... life is a theater (Goffman, 1959), in which our lives unfold as different but intermingled plays. In this approach, people’s agency – ability to construct life, to change or maintain present practices or structures, and to interpret and then act upon life events – is highlighted, but within the boundaries / parameters of the stage. This is how we will present the A2U Food project – as a play; a play with a series of acts, and a play of which no one – including the actors – knows the end before experiencing the whole play.”

(Marouli, Journal 1, October 2018)

Once again, I visited the Heraklion life “stage” for the third act of the A2U Food initiative. The play is developing to a challenging adventure story, with increasing suspense and with tribulations that test the players’ – project partners’ perseverance and that prompt them to prove their level of commitment to the project goals as well as their ability to combine forces and think alternatively for effective problem solving.

The first two acts of the play – project focused on setting the ground internally and externally for the effective implementation of the A2U Food initiative, and it was dominated by background-foundational work (i.e. preparation of the Digital Food Waste Prevention tool, siting and licensing procedures) for the main parallel story-lines (project actions) of the play: the campaign for the reduction of food waste generation, the creation

of a second opportunity restaurant and a bio-plastics production unit for the optimal use of food waste, and home and neighborhood composting.

This third act – the period April to September 2019 – found our heroes continuing foundational work, with all three story-lines developing more slowly than foreseen or desired. Without desired results yet achieved or obstacles being effectively overcome, the need for continued and steady effort in the coming months weighs on them, but they persevere.

This journal is an account of this 3rd act and aims to share the project’s progress, achievements, challenges and obstacles of this period, as well as to discuss risks that remain and to identify useful lessons for other initiatives that aspire to go beyond the status quo and towards sustainable societies based on a circular economy logic.



Project team meeting

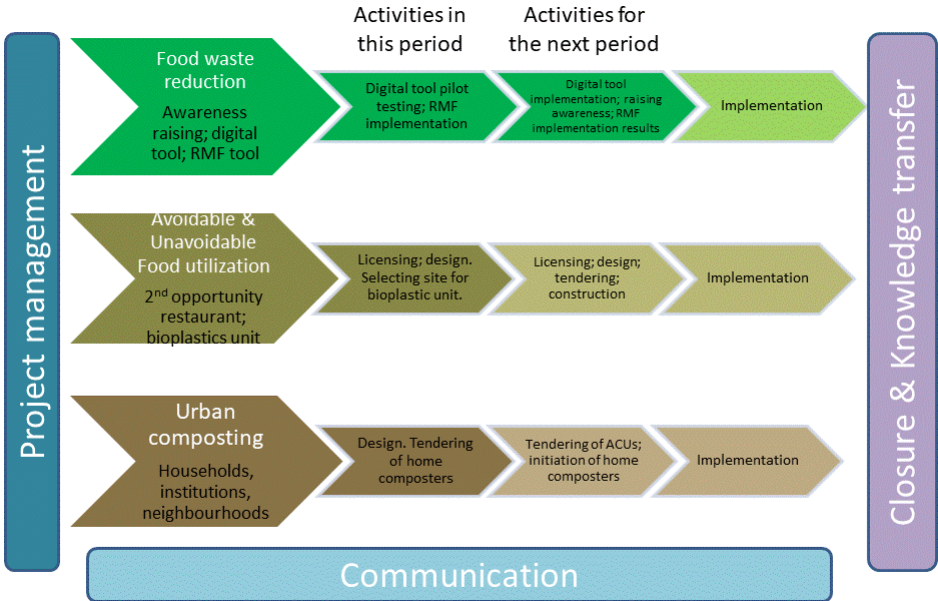
3. The A2U Food adventure continues with open questions: Act 3

3.1 Act 3: Suspense is building up

In this time period/act, the partners continued design work, licensing and tendering activities that are prerequisites for the actual implementation in the technical actions of the project – food waste prevention, utilisation of avoidable and unavoidable food waste, and composting –, as well as laboratory testing for the bio-plastics unit and some communication activities (e.g. workshops for educators on food waste reduction and a leaflet aiming to sensitise the public on food waste prevention, utilization

and composting possibilities). Food waste prevention activities progressed better than other technical actions, with the piloting of the digital tools done in this period too. Food waste utilization and urban composting activities experience significant delays.

The project management bodies met (face to face or electronically) to discuss issues. The hired consultant effectively supported the Municipality on project management and communication among partners.



Project workflow – Actions implemented this period & foreseen for the next period

3.1.A Food waste prevention

Preventing food waste generation is a challenging task and the project team had decided to use both an information campaign and a couple of tools (a digital tool for super

market customers and the RESOURCEMANAGER-FOOD (RMF) tool for hospitality units), targeting consumers and hospitality units. In this period, it was foreseen that the RMF tool would be

piloted in six hospitality units, the first version of the Digital Food Waste Prevention tool would be available, and information campaign activities would continue.

3.1.A.1 The Digital Food Waste Prevention tool for the general consumer



In this act, TEIC¹/HMU finalised the beta version of the foreseen digital tool that aims to raise awareness among consumers and help them minimise their generation of food waste. The digital tool includes the following functionalities: shopping lists that can be shared and collectively prepared by the members of a household; approximate expiration dates and an indication – with a color code – of which food stuffs need to be used to avoid rotting; suggested recipes based on available food stuffs. A significant challenge has been the expiration dates for the different consumer products that are sold by collaborating super markets and how these can be included in the tool, given that actual expiration dates are not automatically recorded based on a bar code. HUA – based on an extensive research – prepared a list of approximate expiration dates for each food product and this has been used in the app.

The digital tool will be implemented / deployed in collaboration with a major super market chain (i.e. Chalkiadakis) in Crete, which in this period

provided valuable data regarding consumer goods. The beta version of the tool is being tried out by ten volunteers. Based on the experience of these 10 users and the needs of Chalkiadakis' super market chain, some amendments have been made on the digital tool.



Two functionalities have been foreseen to be included in the digital tool but have not been implemented yet:

- automatic notifications to the users when a food stuff is close to its expiration date. Several issues puzzle the app developers of HMU (including customer comfort – how frequent should notifications be and what form should they have – and reliability of notifications given the approximate expiration dates). And,
- the connection of suggested recipes based on what food stuffs are available at the consumer's household. Recipes are available but they have not been connected with remaining or "aging" food stuffs in the consumer's kitchen.

The digital tool will be finalised – after further amendments – and will be made available as a mobile app to the wider public by the end of 2019.

¹ According to Greek Law 4610/2019 07/05/2019, TEIC is renamed Hellenic Mediterranean University. You see the world is fluid and unanticipated changes – good or bad – may take place and we must be flexible to readily adjust.

3.1.A.2 The RMF tool for the hospitality units



Hotels that participated in the RMF trial receive a certificate of participation

The RMF tool that USTUTT designed and adjusted for the case of Cretan hotels was tried out in five hotels for a period of one month (mid-April to mid May 2019). Although the plan was that the tool would be tried out in six hotels, two of the hotels that had originally expressed interest in trying out the RMF tool withdrew at the last minute due to internal constraints (i.e. lack of personnel). With the partners' efforts, one additional hotel was identified at that point. No catering service participated at this phase, but one wishes to try it out in its two restaurants at HMU in the future. A positive outcome was that three of the hotels that participated in the pilot voluntarily extended the trial period of the tool by another month and two even to the whole summer tourist season. The implementation of the RMF tool is considered successful as the hoteliers indicated during a ceremony MoH organised on 11 October 2019 to recognise their participation in the A2U Food initiative.

USTUTT presented their experience and preliminary results in two international scientific conferences and published scientific articles regarding the implementation of the RMF tool in the Cretan hospitality sector (<http://www.etaflorence.it/proceedings/?detail=16399>; <https://cisapublisher.com/product/proceedings-sardinia-2019/>).

3.1.A.3 The awareness raising campaign

The awareness raising campaign continues. After the selection of the contractor, the project websites (<https://a2ufood.gr>; <https://foodsaveshare.gr>) and social media are enriched with project news and useful products. The educational materials that were prepared in the previous act – period, with the aim to cultivate a new culture aiming to the reconceptualization of food waste as a valuable resource, have been uploaded as an e-book on the project website (foodsaveshare.gr). They were also used in seven workshops (out of 30 foreseen) targeting educators, for a multiplying effect. More workshops are planned for the next period and additional groups that will be targeted include chefs or future chefs and citizens' groups.

The leaflet for the public awareness raising campaign is ready. The partners are discussing the content of the other two foreseen leaflets (for source separation and composting units) in order to produce useful leaflets, fit to support the MoH waste reduction plan. The information campaign will fully unfold after the installation of the Autonomous Composting Units (ACUs) and the implementation of the composting plan of MoH.



Training workshops for educators

3.1.B Avoidable and unavoidable food waste utilisation

The second story focuses on utilization of food waste and diversion from landfilling and comprises three activities: the establishment of a 2nd opportunity restaurant for the avoidable food wastes and a bio-plastics production facility for the unavoidable ones, and the design of the optimal collection route for avoidable and unavoidable food waste from the participating hospitality units. In this period, it was expected that the technical description of the restaurant would have been finalised and the required licenses for the bio-plastics unit would have been obtained.

Challenges in the licensing procedure for the 2nd opportunity restaurant continue, although some have been overcome. The Archaeological Service gave its approval for the refurbishment of the

building in July 2019 (4 months later than expected), and now the structural designs are almost complete (now expected by the end of October 2019) but tendering documents will be finalised after all approvals. Given the age of the building (built in the late 19th century), there is a possibility that the structural designs may reveal the need for additional interventions. After the completion of the structural designs, further actions are needed by the Municipality of Heraklion for its legalisation, as well as the issuance of the building permit and the restaurant operation certificate. The Municipality needs to act efficiently and effectively. The partners expect that licensing will be finalised by the end of November 2019 if no further complications (e.g. results of the structural



Architectural design

assessment, Archaeological Service) arise. This plan will allow the full operation to start by August 2020, six months later than foreseen.

Food waste will probably be collected from three catering services. The food waste collection scheme can be finalised only after parameters like

vehicle size and food waste providers have been ascertained. The software for the optimization of the collection route is available. This is not anticipated to be a source of further delays.

Significant problems were also faced in all aspects of the preparation for the bio-plastics production unit, including siting, the laboratory testing of the scientific process and licensing. The laboratory tests for bioplastic production from food waste had to be redesigned to proceed via an anaerobic fermentation process, as previous experiments indicated that an aerobic process did not give the desired results. UOC performed additional experiments for monomer production anaerobically; now, it continues with experiments for the characterisation of the produced monomer – for standardisation purposes.



Laboratory experiments for bioplastic production

With this new reality, the design of the bio-plastics facility proved more challenging as budget and capacity concerns became limiting factors for it. The final design is expected by the end of October 2019 (with an approximate 5-month delay). Tendering documents will be prepared later. An Environmental Impact Assessment will be needed next.

It was conclusively decided that the bio-plastics production facility will be constructed in the property of the Municipal Enterprise for Water and Sanitation at Heraklion, but the programmatic agreement between ESDAK and the Municipal Enterprise has not been signed yet although the text has been finalised. ESDAK does not worry about getting the programmatic agreement signed in due time. However, given the observed delays in the designs and the licensing, the bio-

plastics unit will not be ready for operation in February 2020 as originally foreseen. Given the further needed licenses and works (e.g. connection with the electricity grid, etc.), not only the foreseen 1-year long operation is not possible; but even the feasibility of a 5-month long one is questionable. Our heroes – the partners were discussing that a 5 to 6-month long full-time operation of the unit is sufficient for the production of the foreseen number of bioplastic bags. However, the possibilities for the construction of the bio-plastics unit and a meaningfully long demonstration of its operation within the time frame of the project seem grim, requiring efficient and effective actions throughout and no additional delays. Some of the beneficiaries are particularly concerned, and others are more hopeful.

3.1.C Urban composting

The third story-line that unfolds in the A2U Food initiative relates with urban composting, with the foreseen installation of 100 home composters, 6 neighborhood Automatic Composting Units (ACUs) and 2 large ACUs in 2 big institutions. In this act, the tendering and purchase of the different composting units and the relevant monitoring equipment were expected to be finalised and the composters to be in operation by February 2020.

In this period, home composting actions have progressed well. The households that will use the home composters have been selected, the tendering for the composting units has been completed and the MoH expects their delivery in the first days of November 2019. The monitoring equipment parts have been purchased and await assembly, something that is not expected to delay the complete installation of the home composters, which is expected in November 2019.



Meeting with interested Heraklion inhabitants regarding home composters

For the 6 ACUs that will be installed at the selected neighborhoods and the 2 ACUs that will be installed at Venizeleio Hospital and the Heraklion campus restaurant of either the Hellenic Mediterranean University or the University of Crete, the technical description for the tendering process was finalised early in this period. However, the tendering procedure has not begun yet due to difficulties relating with the tendering requirements and practices and with the internal coordination between MoH

departments. Furthermore, connection with the electricity grid is also required. Possible alternatives to entangle the tendering procedures for the ACUs were discussed among the partners and they decided to adopt an international tendering procedure. Partners expect that the Automatic Composting Units will be purchased and installed in time for the full operation to begin in July 2020, with a 5-month delay in comparison to the original plan.

3.1.D Communication

In the previous act, the A2UFood website and social media were established and the tendering of the communication activities was completed. In this period, partners “fed” the social media & the website with news and other informative materials. A leaflet, aiming to raise awareness about food waste among the public, was developed and will be printed in the next period to support the demonstration of the technical actions. The team is preparing for additional communication activities (e.g. other leaflets) in the next months.



Project leaflets

3.2 Challenges faced: The road continues uphill

Although it was hoped that most obstacles would have been overcome by now and the tendering and licensing of technical activities would have been complete or almost complete, challenges persist, especially in the utilisation of avoidable and unavoidable food waste and to a lesser degree in urban composting. It appears that urban composting has the potential of proceeding without additional problems, but the feasibility of the bio-plastics unit is questionable and there are delays and risks in the refurbishment of the 2nd opportunity restaurant.

- **Licensing:** Licensing continued being a challenge. The additional 4-month delay to the anticipated date for the approval from the Archaeological Service for the 2nd opportunity restaurant has also postponed the completion of the structural designs for the refurbishment works at the building. This delay will also lead to more delays in further activities needed, in order for the licensing procedure for the restaurant to get completed. A 6-month delay is anticipated in the start date of the restaurant's operation, assuming no further complications arise.

- **Tendering**: The *tendering* procedures for the ACUs have not started yet, although the technical specifications have been ready for a while. This delay is mainly attributed to intricacies in the procurement requirements and procedures, and partly to the coordination between different municipal departments. Nevertheless, this challenge is expected to be overcome in the next months and ACUs to be in operation by July 2020 (5 month delay).
- **Bio-plastics unit**: The major challenge has proven to be the bio-plastics production unit. Selecting an appropriate location, which also minimised licensing requirements, was a challenge. But even the laboratory

verification of the chemical process that effectively turns food waste into useful bio-polymer proved to be more challenging than anticipated, affirming the initial concerns about possible delays due to the fact that the team had not foreseen the appropriate duration for the laboratory experiments in the original proposal. This also affected the design process for the bio-plastics unit, which is almost complete at this stage. The programmatic agreement has still not been signed either. The bio-plastic production unit – if no further obstacles arise – can begin in October 2020 (an approximate 7-month long delay).

4. Looming challenges

Unfortunately, significant challenges persist. Some continue from the previous act and need to be addressed, while new ones await ahead.

PROCUREMENT

Since licensing and tendering procedures have not been concluded, bureaucratic procedures, licensing and tendering requirements continue being noteworthy challenges for the upcoming period. Partners need to continue being creative and flexible in their approaches. Further delays can jeopardise the feasibility of different technical actions. Perhaps, use of targeted legal support at the first stages of the project would have helped.

LEADERSHIP

Municipal elections were conducted in spring 2019 and have led to a new composition of the Municipal Authority. New Vice Mayors – whose term started in September 2019 – have expressed a commitment to circular economy and interest in supporting the project, but they need to get informed. The project team makes a conscious effort to keep the Municipal leadership informed and involved with the project.

CROSS-DEPARTMENTAL WORKING

Project management structures, meeting frequently, have been established to effectively connect different departments of MoH. However, as no further delays should be incurred, an excellent coordination of all involved municipal departments should be ensured. Political will is fundamental in mobilizing and coordinating the Municipal administration towards the same goal (i.e. achievement of project objectives), resolving tendering and licensing binds.

PARTICIPATIVE APPROACH

The foreseen Project Management Team – which would include representatives of the project partners – appears to be inactive. Establishing appropriate fora for regular exchange of ideas, know-how and experience regarding experienced or anticipated risks or even specific tasks (e.g. bio-plastics production unit, or collaborative agenda-setting for meetings) can prove very useful.

SPECIFIC CONTEXT

Given that the building for the Second opportunity restaurant was built in the late 19th century, the structural capacity of the building may require additional interventions to ensure users' safety. In this case, the construction of the restaurant may entail an increased budget and additional delays in the finalization of the designs and the licensing procedure. Such a development may render the Second Opportunity Restaurant an impossible dream within the project's time frame.

Monitoring and evaluation and upscaling activities were not relevant in this phase given the delayed start of the implementation actions.

Project partners' communication efforts with target beneficiaries so far have been

effective; further efforts will be needed when implementation of activities in the different story lines will begin.

5. Some useful lessons

Any change attracts resistance from the system, bureaucracy, and habits. UIA projects that by design aim to introduce new ways of approaching urban problems are expected to experience a variety of obstacles in the design and implementation of their activities. Thus, it is good to have an idea of approaches that facilitate – but never guarantee – the success of innovative projects. Below, some lessons arising from the experience of the A2U Food project so far are identified.

- **1st lesson:** Innovative projects, already from their planning stage, should incorporate a significant “buffer” time in the case difficulties arise, especially with licensing and tendering procedures.
- **2nd lesson:** Project teams may consider taking 3-6 months preparation time before the project officially begins (if this is an option), in which they ardently pursue contacts and legal support that clarify required licensing, tendering and other bureaucratic procedures and attract support from administration for the project.
- **3rd lesson:** In the planning stage, the project team should consciously reflect on the urban planning and cultural context. In cities, where urban space has been anarchically built, with insufficient open – available spaces for new activities and often illegal construction, extra time should be planned for the siting and operation of facilities – even more if innovative or culturally unwanted ones – in case such activities are involved in the project. Similar caution should be adopted in historic cities, if buildings for the foreseen activities are not guaranteed and/or are not clear from legal issues from the very beginning of the project.
- **4th lesson:** Political will is fundamental. The Municipal (and other relevant) authorities should be positively-inclined towards the project, being willing to support it actively when necessary. Political will can minimise delays in public bureaucratic procedures and can coordinate alignment of different Municipal departments for the achievement of project objectives and for the sustenance of project results.
- **5th lesson:** It is essential to create appropriate fora (e.g. Steering Committee or thematic groups) for regular interaction and exchanges between project partners (involving especially experienced personnel) so that effective solutions to problems can be identified as obstacles arise. Fora (e.g. committees) involving stakeholders can also facilitate the project implementation given their diverse knowledge of relevant procedures, potential “shortcuts”, positions in relevant authorities, etc.
- **6th lesson:** Innovative initiatives require “out of the box” thinking, which is opposite to the bureaucratic logic of public administration. Flexibility for innovative (legal) approaches to public licensing and tendering (e.g. combining tendering procedures to avoid multiple delays; or dividing tendering procedures to allow a part of the task to proceed despite a possible stalemate in another task) is needed. Furthermore, identifying innovative individuals at key positions in public administration and involving them in the project can significantly benefit the implementation of such efforts.

And remember life is a theater with an unpredictable end. Good intentions, careful (and even more participatory) planning, passionate efforts, good organization, positive and productive alliances, sufficient resources, perseverance – all contribute significantly to the

success of a project. But no matter what we do, we can never guarantee the success at the end. Let's ensure that, no matter what the outcome in comparison to the desired one is, the effort – the trip itself – is a useful and enjoyable lesson.

6. What next?

In the next period, we expect training sessions regarding food waste reduction to continue, leaflets to be developed and distributed along with the implementation of the Digital Food Waste Prevention tool and the other technical actions. The results from the pilot testing of the RMF tool should be communicated to hoteliers.

The licensing of the 2nd Opportunity Restaurant and of the bio-plastics unit, the collection scheme of avoidable and unavoidable food waste, as well as tendering of food waste collection trucks and other equipment or related services, should have progressed significantly – without any additional delays – and all major hurdles should have been overcome in the next period. Home composters should be in operation too.

The next few months are crucial. Five to eight months long delays are already observed making some technical actions only precariously feasible. Any further delays should be avoided.

Will the A2U Food team manage to overcome the continuing challenges and effectively address the looming risks? Will they manage to implement all the foreseen project activities in a meaningful way and a sufficiently long time frame? Suspense is really building up. Will the project partners have the perseverance to succeed or will the inertia of the system win over their desire to successfully complete the project and innovate their beloved city? There is still hope as long as there is passion for a better world and desire to work for it.

Urban Innovative Actions (UIA) is an Initiative of the European Union that provides urban areas throughout Europe with resources to test new and unproven solutions to address urban challenges. Based on article 8 of ERDF, the Initiative has a total ERDF budget of EUR 372 million for 2014-2020.

UIA projects will produce a wealth of knowledge stemming from the implementation of the innovative solutions for sustainable urban development that are of interest for city practitioners and stakeholders across the EU. This journal is a paper written by a UIA Expert that captures and disseminates the lessons learnt from the project implementation and the good practices identified. The journals will be structured around the main challenges of implementation identified and faced at local level by UIA projects. They will be published on a regular basis on the UIA website.



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