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*SYMBIOSIS Project*

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**Symbiotic Networks of Bio-Waste Sustainable  
Management**

***1<sup>st</sup> Periodical report***

Date:

March 2019

### About the project

SYMBIOSIS promotes re-manufacturing, reuse and recycle, and transforms one industry's waste to another's raw material and/or fuel, to pave the way for a more circular economy for the regions, where waste is eliminated and resources are used in an efficient and sustainable way. The direct beneficiaries of Symbiosis project will be the 'producers' and 'users' of bio-wastes that include a large number of companies and agro-industries inside the cross-border area. The common platform of SYMBIOSIS project will meet the 'offer' with the 'demand' of bio waste creating synergies and business opportunities providing new solution for exploitation of bio-waste. Scope is the real matching of those companies and the sign of cooperation agreements among them. Moreover, the local authorities responsible for waste management will conduct pilot testing for the exploitation of urban and agro-waste and will develop their Action Plans for bio-waste management and separate treatment. Last but not least, experts will conduct studies on the environmental and economic impact of the project to the participated regions.

### Main target

The project main objective is to set up an integrated, sustainable, bio-waste management and trading scheme between the partner regions of Western Macedonia in Greece (former pref. of Florina) and the municipality areas of Bitola and Novatsi in Republic of North Macedonia following the Industrial Symbiosis concept. SYMBIOSIS will develop symbiotic networks bringing together companies and stakeholders from all business sectors, aiming to improve cross industry resource efficiency through material trading and sharing assets in an environmentally sustainable way.

### Specific objectives

- To set-up a cross industry resource efficiency through organic material trading and sharing assets;
- To create industrial sustainable networks especially in the agro-food industry;
- To achieve maximum efficiencies in energy and water use;
- To have a reference point where the demand will meet the offer of bio-waste materials in CBC area;
- To improve the local policies on the management of bio-waste streams and tackle this issue individually following the directions of the EU policy for less bio-waste to the landfills and better utilization for other uses;
- To improve the environmental benefits by reducing the bio-waste streams that were disposed into landfills;

- To generate tangible social benefits to local communities by better use of bio resources from the food industry in favor to social activities;
- To improve the cooperation among sectors and businesses in cross-border area thus improving the local economies and boosting entrepreneurship;
- To support the local economies by safeguarding raw materials or fuel coming from bio-waste;
- To promote job creation in the regions into question by exploring the trade opportunities and using the waste as a resource.

Project partners

PARTNERS	PARTNER TITLE	COUNTRY
<b>LB</b>	Public Enterprise KOMUNALEC Bitola	The former Yugoslav Republic of Macedonia
<b>PP2</b>	Waste Management of Western Macedonia DIADYMA SA	Greece
<b>PP3</b>	Public Enterprise for communal works KOMUNALNA HIGIENA Novaci	The former Yugoslav Republic of Macedonia
<b>PP4</b>	INNOPOLIS - Centre for Innovation and Culture	Greece
<b>PP5</b>	Movement for Environment MOLIKA DOM Bitola	The former Yugoslav Republic of Macedonia
<b>PP6</b>	NTUA (National Technical University in Athens)	Greece

Kick-off meeting

After the preparatory phase, the project was launched with a kick-off meeting held on 28th and 29th June 2018 in Bitola. On the first day, representatives of all project partners discussed and scheduled project implementation. The second day was a public promotion of the project, with a participation of high-level municipal representatives (mayors of Bitola, Novaci and Mogila) and country representatives (deputy minister for local self-government) from FYROM.

The project started with the kick-off meeting in June 2018 in which all the partners were present. The Director of PE Komunalec Bitola opened the meeting and every partner presented themselves. They pointed out the whole idea for synergy of the Symbiosis Project and they discussed and agreed about the tasks and future actions and the basic directions that everyone should follow.

Figure1 Invitation for kick-off meeting



Figures 2-3 Symbiosis project partners in kick-off meeting



Figure 4-7 kick-off meeting





## Actions

### *Greek area partners*

DIADYMA prepared the material for the first 2 trainings of the local stakeholders. The training material contains information about biowaste treatment and exploitation and is published at the dissemination hub of the official website of the project (link: <https://symbiosisproject.eu/training-material-for-participants/>). In the same time INNOPOLIS set up a database template of direct and indirect beneficiaries in order to find the local stakeholders. INNOPOLIS has also started a series of electronic newsletters to communicate info about the project to public. The first e-newsletter was published in September 2018 (link: [http://www.ipa-cbc-programme.eu/article/79\\_1st-Newsletter-of-SYMBIOSIS-released!](http://www.ipa-cbc-programme.eu/article/79_1st-Newsletter-of-SYMBIOSIS-released!)), the second one in January 2019 (link: [http://www.ipa-cbc-programme.eu/article/110\\_2nd--Newsletter-for-SYMBIOSIS-project](http://www.ipa-cbc-programme.eu/article/110_2nd--Newsletter-for-SYMBIOSIS-project)), and the third one in March 2019 (link: <https://us18.campaign-archive.com/?u=40f91692fb642e20fba644086&id=9a12612100>). Furthermore, INNOPOLIS has organized one sensitization event in Thessaloniki city, in December 2018, in order to communicate information about biowaste management and treatment to the local public and stakeholders (link: <http://www.innopolis.org/symbiosis-sensitization-event-in-thessaloniki/>) and another one in Florina city, in February 2019 (link: [http://www.ipa-cbc-programme.eu/event/84\\_2nd-sensitization-event-of-SYMBIOSIS-project](http://www.ipa-cbc-programme.eu/event/84_2nd-sensitization-event-of-SYMBIOSIS-project)). In January 2019, DIADYMA published the procurement of the Green Shredder. The Green Shredder is a machine that will be used for chipping branches, vegetable residues, etc. in order to reduce their volume. The engine will be towed and mounted on a new, single-axle wheel frame. The shredder will be mobile in order to cover the needs of the municipalities Amyntaio, Prespes & Florina (link: <http://diadyma.gr/Website/Prokyrikseis/2019/diakiriksi%208-1-19.pdf>). By February 2019, DIADYMA prepared the dissemination hub of the project in the official website in order to communicate project's updates (link: <https://symbiosisproject.eu/dissemination-hub/>). This communication package includes an Official Project Site, at least 3 links with social media, 4 articles in semester basis, newsroom, and link with Symbiosis platform. Also in the dissemination hub; helpful article were published in order to communicate information to local stakeholders and public (link: <https://symbiosisproject.eu/circular-economy-business-models-in-the-eu/>). In March 2019, DIADYMA developed a GIS tool so that the stakeholders will be digitized by its location in the map (<https://diadyma.circulabs.imsi.athenarc.gr/>).



Figure 8. Sensitization event in Florina city



### Second project meeting

The 2<sup>nd</sup> project meeting was held in Florina city. The partners discussed in detail the progress of the project so far and they have focused on the electronic platform (symbiosis platform) that will set up to support industrial symbiosis in the cross-border area.

Figure 9 Second project meeting



*The Former Yugoslav Republic of Macedonia area partners*

In the first period of time, we as P.E. Komunalna Higijena – Novaci were preparing for announcing tenders for tractor, mulcher and organic waste bins, tender for development report on the national policies on bio-waste and the current level of their implementation in regional level and Development of template for business agreements for different bio-waste streams and tender for office equipment. After completing the tenders, we purchased the whole equipment including office equipment, tractor, mulcher and organic waste bins, followed by purchase of the development report on the national policies on bio-waste and the current level of their implementation in regional level and Development of template for business agreements for different bio-waste streams. Purchased office equipment included the necessary office supplies for the overall operation of the project. The equipment was purchased in October 2018. The equipment as tractor, mulcher and the waste bins were purchased in December 2018 with the following specifications and uses:

- Tractor John Deere with Diesel motor, with 3 cylinders and working volume of 2900cm<sup>3</sup>, engine power min 55hp, all wheel drive with two-stage dry clutch. It has Open Center hydraulics system type with flow rate of 68 l/min and pressure of 195 bar. It has lifting capacity of 1800kg. The tractor is used for various purposes such as maintaining public greenery, mowing (joining the mulcher that is purchased together with the tractor), collecting organic waste etc.
- Mulcher Agrina with three-point attachment system and hydraulic lateral displacement and metal curtains. It has adjustable rear roller by height, cardan shaft and working width of 1.60 m. As mentioned above, it is used for maintaining public greenery, mowing and so on.
- 15 Organic waste bins Inter Eco, with capacity of 1.1 m<sup>3</sup> that can hold up to 440 kg of waste – used for collecting organic waste from the manufacturers that we will make contracts with, the households of Municipality of Novaci and the waste that we are also collecting from the mowing, pruning of trees...

Figures 10-14 Equipment of the project



After purchasing the equipment there were several technical presentations for practical use of all equipment hold by the seller. Development report on the national policies on bio-waste and the current level of their implementation in regional level and Development of template for business agreements for different bio-waste streams were made in December

2018. The reports are made to provide relevant data on general facts of waste management and overview of national legislation on waste management and treatment with special attention to bio-waste related regulations, waste management strategies and plans, responsible administration, recycling etc. Also the reports identify the level of implementation of national strategies and action plans and detecting the reasons in achieving foreseen targets on bio-waste treatment and recycling. The reports enclose best practices in waste management and circular economy implemented within the region and in European Union countries as well as further recommendations that will be used for the development of the action plan for integration of Symbiosis networks to the regional strategies and regional financial and support schemes.

The project pays great attention to visibility and communication, therefore the first version of project's Communication Plan has been developed. SYMBIOSIS Communication Plan which is considered as a live and dynamic instrument in the hands of SYMBIOSIS partnership aiming to the most effective and wide communication and publicity of the project itself as well as of its main objectives and goals.

Furthermore, MOLIKA designed and produced some of project's communication and campaign materials such as a general and target group flyers, roll-ups for general project events, fridge magnets and waste bin stickers.

Figures 15-22 Equipment of the project



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КУПУВАЈ ПАМЕНО,  
СОРИРАЈ ГО ОТПАДОТ И РЕЦИКЛИРАЈ

1. Навреме планирај ги сите твои купувања;
2. Купувај ги само производите кои навистина ти се потребни;
3. Пригответеј агому храна кому што ти е потребна;
4. После секвај оброк извади ги остатоците од храна од остатоците отпад;
5. Сметни го органичниот отпад во сакоцот за отпадоци со кафеаво боја;
6. Органичниот отпад ќе биде преработен во соодветна единица за компостирање;
7. Компостот ќе биде употребен во твојот град.

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БИДИ ВО ТЕК СО РАЗВОЈОТ НА  
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ПРОЕКТот СИМБИОЗА развива развојана која ќе биде дигитална во односот со општеството и ќе се фокусира на преработката на отпадот, со што ќе се создава работни места и ќе се воведат во употреба симбиотски мрежи.

ПРОЕКТот СИМБИОЗА ги искористува можностите за значително намалување на употребата на енергија и отпадот од храна на локалитетите, со што ќе се воведат во употреба симбиотски мрежи и ќе се воведат во употреба симбиотски мрежи.

ПРОЕКТот СИМБИОЗА ќе ги дава „информации“ со дигиталниот симбиотски мрежи, со што ќе се воведат во употреба симбиотски мрежи.

ВАЖНОСТЕ НА ИМАЖЕТО НА ПРОЕКТот СИМБИОЗА:

- Идентификација на идентитетот за развој на енергија и отпадот;
- Развој на нови иницијативи;
- Повлекување нови инвестиции во регионот.

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ЦИКЛУСНАТА ЕКОНОМИЈА е модел на производството и дистрибуцијата кој вклучува симбиотски мрежи, „зелени“ материјали, употребата, рециклирањето и рециклирањето на производите и производите.

КОМПАНИЈАТА на циркуларната економија вклучува материјали на соработничко соопштество на сите, нивна повторна употреба по пат на рециклирање и создавање на нов производ или енергија од стариот отпад.

ПРИНЦИПАТА на циркуларната економија се одредени со: рециклирање на материјали, енергија, соодветно на одржливиот развој, нивна повторна употреба, рециклирање, рециклирање и рециклирање на производите и производите.

Иницијативите на циркуларната економија ги искористуваат можностите на циркуларната економија и ги користат можностите на сите работници. Проектот ги вклучува работниците и бизнисите напредни на поддршка.

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The materials enclosed relevant information regarding the INTERREG Programme and SYMBIOSIS Project, instructions for bio waste separation at source, information regarding the industrial symbiosis and circular economy and key messages to raise public awareness on sustainable bio waste management and environmental issues.

In the first phase communication plan was prepared, and a database of stakeholders was created. Stakeholders (biowaste producers, potential biowaste users, environmental CSOs, authorities, etc.) were entered into the database.

At the beginning of the project, an external consultant prepared a study Record the needs of cross-sectoral industries in CBC area (inflow). Aim of the study was to record and analyze the needs of the cross-sectoral industries of raw materials and wood-based resources for

covering the biowaste needs of an industrial process or agricultural activity, e.g. greenhouses (inflow).

The following tasks were realized: identification of the current situation regarding the needs of the cross-sectoral industries for different types of bio-wastes supported with relevant data of different types of specific organic materials needed (moisture, density, gauge, production capacities/quantities, frequency, location, market value, etc.); data collection (questionnaires); recommendations for key priorities and potentials for fostering of a circular economy, development of the report.

In parallel with recording the needs of cross-sectoral industries in CBC area (inflow), the external consultant also worked on mapping bio-waste streams in CBC area (outflow). The aim of this study was mapping and measure all the bio-waste streams derived by the agro-food industrial sector and human made activities (outflow). Both studies were presented at the joint partners meeting in Florina, Greece.