

## LIFE B2E4SustWWTP (LIFE16 ENV/GR/000298)

*New concept for energy self-sustainable wastewater treatment process and biosolids management*

Deliverable: B.6.1

## REPLICABILITY AND TRANSFERABILITY PLAN



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## GENERAL INFORMATION

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<b>AUTHOR (S)</b>	Andrés Lara, Anahí Ginestá
<b>PARTNER (S) CONTRIBUTING</b>	DEVISE, DEYAR, ENGINNOV, GREENE, TUC

## Table of Contents

<b>1. OBJECTIVES .....</b>	<b>4</b>
<b>2. ACTION PLAN .....</b>	<b>4</b>
<b>Sub-action B6.1. Analysis of potential WWTP to replicate the new process .....</b>	<b>5</b>
<b>Sub-action B6.2. Analysis of potential sectors to transfer the new process .....</b>	<b>6</b>
<b>Sub-action B6.3. Market potential assessment and business model .....</b>	<b>7</b>

## 1. OBJECTIVES

In the context of LIFE projects, a strategy to ensure replication and transfer of project results to other contexts shall be included. This means going further than simply committing to project continuation through commercialization and industrialization. It entails a clear and sound plan supported by project activities that would allow market replication/transfer to other sectors, entities, regions or countries.

The aim of Action B6 is to provide a financial appraisal of the business scenarios emerging from the Life B2E4SusWWTP project (B2E4) (Business Plan), incorporating business model, cost-benefit analyses as well as a SWOT analyses and handbook of best practices and recommendations. Information obtained in action C1 (Life Cycle Assessment) will be incorporated into this task.

This deliverable seeks the organization of the Action B6 work. Thus, the goal of this report is to describe in detail the work plan of Action B6 and its corresponding deliverables, defining its structure and contents.

## 2. ACTION PLAN

Action B6 is divided in three sub-actions:

- B6.1. Analysis of potential WWTP to replicate the new process
- B6.2. Analysis of potential sectors to transfer the new process
- B6.3. Market potential assessment and business model

Figure 1 shows a scheme of these sub-actions and the sequence in which deliverables should be generated.

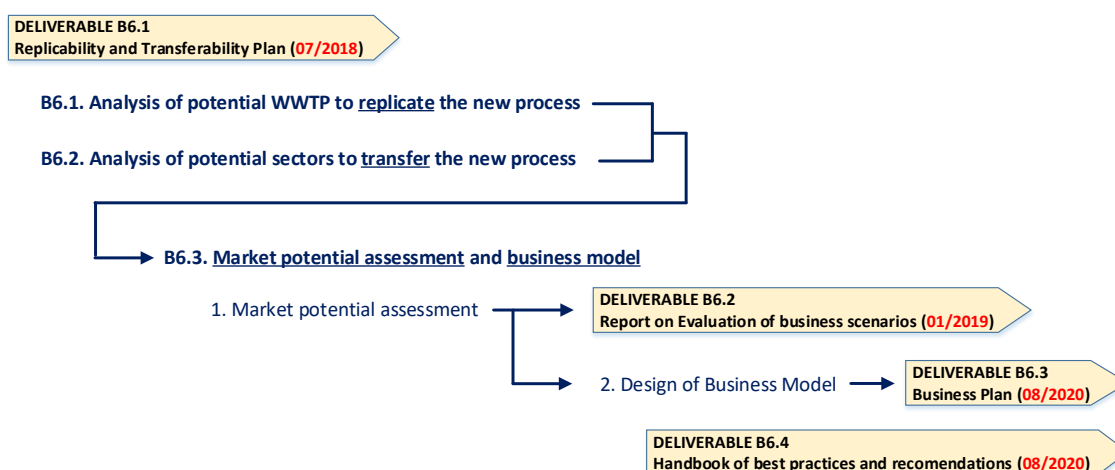


Figure 1. Action B6 work plan scheme

In the first two steps, the conditions that must be met to replicate the technology in other scenarios (WWTP of different types in Spain and Greece) and to transfer it to other sectors (industrial wastewater treatment) are defined.

With the information obtained in sub-actions B6.1 and B6.2, in sub-action B6.3., an assessment of the demand and studies of the different markets, in terms of the geographical areas (two key regions are chosen: Spain and Greece) as well as the different market segments would be undertaken. This material would be compiled in Deliverable B6.2.

The summary of these studies will result in a definition and preliminary evaluation of the different business scenarios, studying all different variables that make one scenario different from another. These results, gathered in Deliverable B6.3 will allow the design of new business models to be adapted to each new region and final customer, including the appropriate pricing strategies.

The business models will enable an industrially-relevant financial appraisal of investment decisions, including the business model, cost-benefit and SWOT analyses, and allowing “what-if?” questions to be answered by checking the final business scenario.

Finally, the partners will design innovative business models for other companies to build upon: A business plan will be created for the most relevant services applying innovative tools and methodologies through the value chain to improve effectiveness and better business management.

CETENMA will lead this sub-action and it will count with technical help of the rest of partners.

All these three sub-actions would be elaborated on the next lines.

### Sub-action B6.1. Analysis of potential WWTP to replicate the new process

The aim of this task is to carry out an analysis of the different urban wastewater treatment scenarios where the technology can be replicated. It is intended to know and describe all the particular conditions of these different scenarios. In summary, to define the **Baseline**.

It is pursued to define the technical-economic performance of WWTPs according to their location (Spain and Greece), their capacity (WWTP of small, medium or large capacity), their technologies (prolonged aeration, conventional, primary decantation, sludge digestion, etc.), the way that the sludge is valorized, etc.

The steps to follow in order to do this analysis are:

- 1) Gather of information about WWTPs in Spain and Greece. The information should gather the following aspects:
  - Location
  - Treatment capacity and / or equivalent inhabitants served

- Treatment process: presence or primary treatment, type of biological treatment, nutrients removal, sludge treatment line (presence or not of anaerobic digestion and cogeneration), etc.
  - Depuration performance
  - Energy performance. WWTP energy consumption assessment and its consumption ratios based on the degree of purification or volume treated
  - Economic performance. Estimate the economic performance in terms of energy consumption, WWTP technologies, how the sludge is valorized, etc., including amortization costs
- 2) Definition of several (4 or 5) categories of WWTP and classification of the installation studied in one of these. Examples of classification criteria are:
- Geographic location. Spain or Greece
  - Capacity of the plants: Small, medium and large capacity (or according to equivalent inhabitants served). This criterion defines both the technologies included in the WWTP and / or the consumption ratios.
- 3) Elaboration of a representative model of each type of WWTPs defined in the former point. In a spreadsheet, simulations could be made and the economic performance of each system can be determined based on variables such as cost of electricity and sludge disposal, possible grants for renewables energies, carbon footprint reduction benefits, etc.
- 4) Results analysis. Assessment of the types WWTP in which it is recommendable the implantation of the proposed system.

### Sub-action B6.2. Analysis of potential sectors to transfer the new process

A transferability study consist in the search of other sectors in which this technology could also be successfully applied.

Once located the potential sector for applying the B2E4 technology, the procedure for determining the feasibility of the new process is the same as the former sub-action. That is, in a first step, defining the baseline by the description of all the particular conditions of the different scenarios. Next, the assessment of the technical-economic performance of the different wastewater treatment options characteristic of each industrial sector based on its location, treatment technologies, recovery of waste produced, etc. would be completed.

For instance, a potential sector to transfer the project could be the mills of two phases: in this case, the baseline would be the different treatments that are currently made to olive pomace in Spain and Greece (biological treatment, composting, inertization, energy recovery, withdrawal by manager, etc.).

Thus, for the analysis of the potential sectors to transfer the proposed process, three main phases would be followed:

- 1) Performing a preliminary analysis of different sectors of wastewater/waste treatment where the technology could be applicable. In particular, processes where is obtained a waste with a high content of organic matter, low water content, and that can be classified as hazardous waste. It is a previous, theoretical analysis in which the study could be focused in three or four sectors.
- 2) Preparing a sheet for the simulation of the preselected alternatives, in which the economic performance is assessed according to aspects such as management costs, electricity price, amortization costs, etc.
- 3) Results analysis, determining the different sector into which the propose technology would find an interesting use.

### Sub-action B6.3. Market potential assessment and business model

#### Market potential assessment

In order to stablish the real feasibility of the project, a market assessment should be developed by the accomplishment the subsequent stages:

1. Identification and quantification of the target market  
It is necessary to spot the number and capability of the target WWTP, identified in the previous replicability analysis, as well as the alternative sectors to transfer the technology.
2. PEST analysis  
Describes a framework of macro-environmental factors used in the environmental scanning component of strategic management. Measures the project's impact from the Political, Economic, Social and Technological points of view.
3. SWOT analysis (strengths, weaknesses, opportunities and threats)  
This tool allows to diagnose the project environment, both internally and externally, and to make the right decisions according to the objectives of the project.
4. 4 P analysis (product, price, promotion, place)  
Product – It is imperative that to have a clear grasp of exactly what the product is and what makes it unique before successfully market it.

Price – Once a concrete understanding of the product offering is established, the pricing decisions could be taken. Price determinations would impact profit margins, supply, demand and marketing strategy.

Promotion – Promotion includes elements like: advertising, public relations, social media marketing, email marketing, search engine marketing, video marketing and more. Each touch point must be supported by a well-positioned brand to truly maximize return on investment.

Place – It is critical to evaluate what the ideal locations are to convert potential clients into actual clients.

5. Demand and supply analysis

6. Differentiation strategy.

A description of the whole market requirements should be assessed. With this, the benefits of the proposed technology's main features and innovations in comparison with alternative/competing technologies would establish its pertinence for the target market.

7. Promotion actions

8. Distribution channels

Finally, the needs for further R&D activity and implied risks, and for collaboration for exploitation (technology transfer activities) will be defined.

With all this, the 'strategic fit' of the proposed technology with the requirements as well as existing know how and capabilities of the target market will be assessed.

A key aspect of the Concept Validation will be to optimize this strategic fit, thus improving the potential for market entry. This concept is focused on specifying the requirements to be accomplished by these technologies in order to maximize the potential for market entry.

Following the scheme show in Figure 1, at the end of this step the **Deliverable B6.2 - Report on evaluation of business scenario**, will be completed. This document will gather all the information obtained so far, that is, the one corresponding to points B6.1, B6.2 and the market study of B6.3.

Therefore, the baseline for the replicability and transferability study will be presented, showing the economical yield for the different scenarios. The deliverable will also include the description of the target market in terms of volume and characteristics of the available offer, for which the previous mentioned tools will be used (PEST, SWOT, 4P's analysis, etc.).



## Business model

Just as the market study defined the target market to which addressing the action, as well as the study of its needs and the suitability of the proposed solution to these problems, the business model is the way of operating to reach this market in the optimal manner. At the same time, the Business Plan includes in a document the company's strategy and expected financial performance for the years to come. Actually, for the development of the Business plan, the market study is required, among several considerations.

The business model would be defined in the way that it best fits the target markets purchasing and operational practices. In this respect, a thorough insight in the needs, capacities, operational practices and their purchasing and decision making process of the target customers will be made such that a best fit sales proposition will be produced.

The structure of a Business plan is:

1. Legal viability (permits, licenses, trademark registration)
2. Market analysis
3. Operational analysis
4. Financial analysis
5. Project feasibility (conclusions)

The first steps include all the procedures to follow in order to obtain all the permits and licenses for the execution of the project. In addition, it is mandatory the review of the local, national and communitarians regulations in order to ensure that the products obtained with the project could be used afterwards.

The market analysis, as it was said above, would describe the strategy to follow for entering in the market.

The operational analysis comes from the replicability and transferability analysis (sub-actions B6.1 and B6.2), included in *Deliverable B6.2*, in which the following information would be provided:

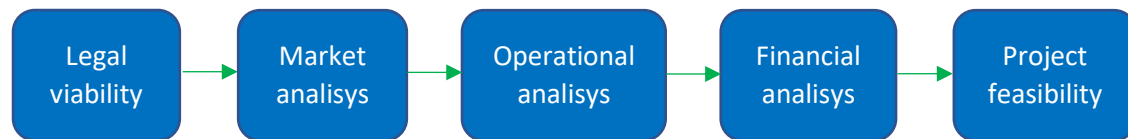
- Location and description of the facilities
- Production method
- Installed capacity
- Production yield with the use of the proposed technology
- Economic balance (cost vs. benefits)

The financial analysis would be projected at 5 years, and should summarize the projected income statements, the cash flow, the break-even analysis and a sensitive

analysis, considering an optimistic and a pessimist scenario. Finally, financial indicators would be estimated: Internal Rate of Return (IRR), Profitability Index (PI, or Profit Investment Ratio, PIR), Net Present Value (NPV) and Return of Investment (ROI).

As a final point, joining all this information, conclusions would be made about the project feasibility.

Figure 2 shows a scheme that summarize the Business plan structure.



**Figure 2.** Business plan structure

All this information would be presented in **Deliverable B6.3 - Business Plan**.

Finally, a last document would be generated, compiling the conclusions of Action B.6 and all the recommendations derived from the experimental phase, which can be used for the successful implementation of the technology. This document is **Deliverable B6.4 - Handbook of best practices and recommendations**.