



## ENABLING

Enhance New Approaches in Bio-based Local Innovation Networks for Growth

## Deliverable

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### D2.1 Information matrix for the provision of data on availability of resources and identification of industrial processes

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## DISCLAIMER

The sole responsibility for the content of this publication lies with the ENABLING project and in no way reflects the views of the European Union.

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## EXECUTIVE SUMMARY / ABSTRACT

This Deliverable is a matrix, with its associated instructions for compilation, provided to partners involved in T2.1 (Characterisation of biomass resources) and T2.2 (Identification of industrial processes) for the collection of information and data on biomass resources availability in the participating territories and on industrial processes and demand.

The Biomass Matrix Tool for BBPs has been developed as an Excel workbook file with a Cover Page, Maps Tool, Biomass Calculation Sheet and Industrial Processes Identification Sheet. It has been developed in conjunction with all ENABLING Project Partners involved in WP2. It is intended to be a “Living Document” that can be updated during the life of the ENABLING Project as new technologies and additional information on biomass resources become available.

## SCOPE

Enabling Deliverable D2.1 provides a template and guidance to assist in the collection of data to provide a detailed mapping and characterization of both:

- the biomass resources available in the participating regions or territories;
- biobased products (BBP) industrial processes operating either in those regions or territories, or within a range that is compatible with the development of sustainable supply chains.

## 1 Deliverable Description

This Deliverable is a matrix, with its associated instructions for compilation, provided to partners involved in T2.1 and T2.2 for the collection of information and data on biomass resources availability in the participating territories and on industrial processes and demand.

### D2.1 Information matrix for the provision of data on availability of resources and identification of industrial processes

The Biomass Matrix Tool for BBPs (BMT) is in the form of an Excel workbook file with a Cover Page, Maps Tool, Biomass Calculation Sheet and Industrial Processes Sheet. It is intended to be a living document that Enabling Partners can update during the lifetime of the ENABLING Project as new technologies and biomass resources become available.

The associated instructions for compilation of the matrix "How BMT Works" document are included in this report as Annex 1.

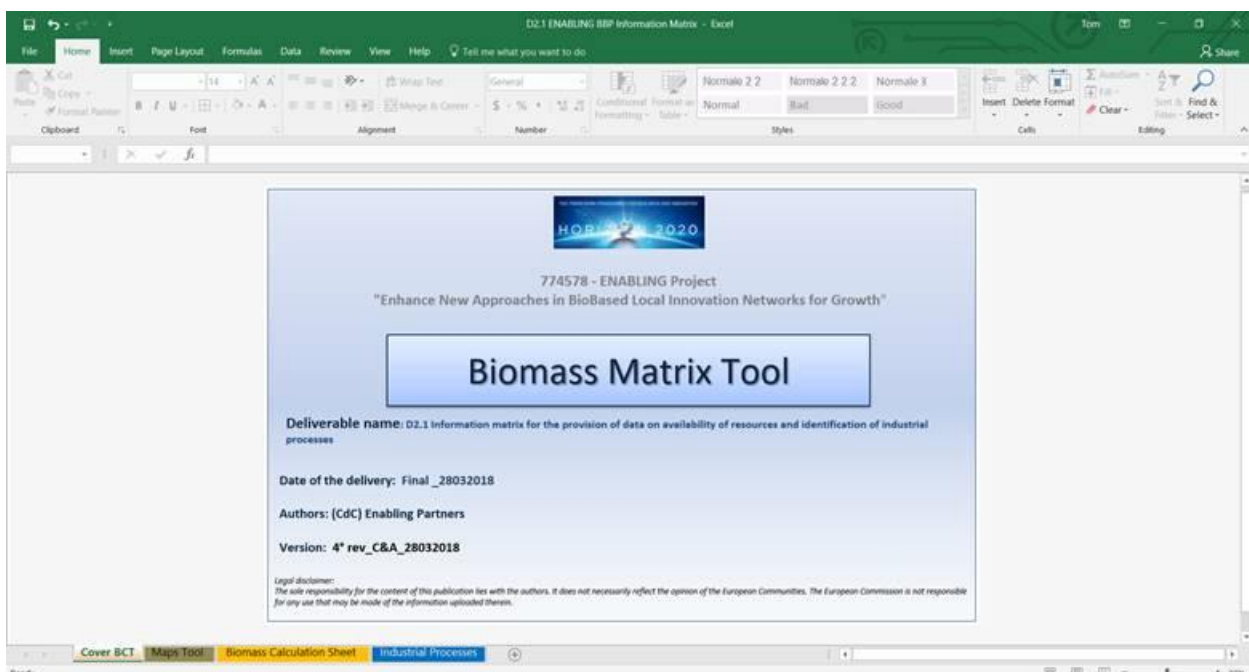
The aim of the Biomass Matrix Tool for BBPs is to give general indications on typologies and quantities of biomass that could stimulate the BBP industry sector to invest.

## 2 Design of the Biomass Matrix Tool for BBPs

The Biomass Matrix Tool has been designed by C&A, ITABIA and CELIGNIS, with input and feedback from all ENABLING Partners involved in WP2.

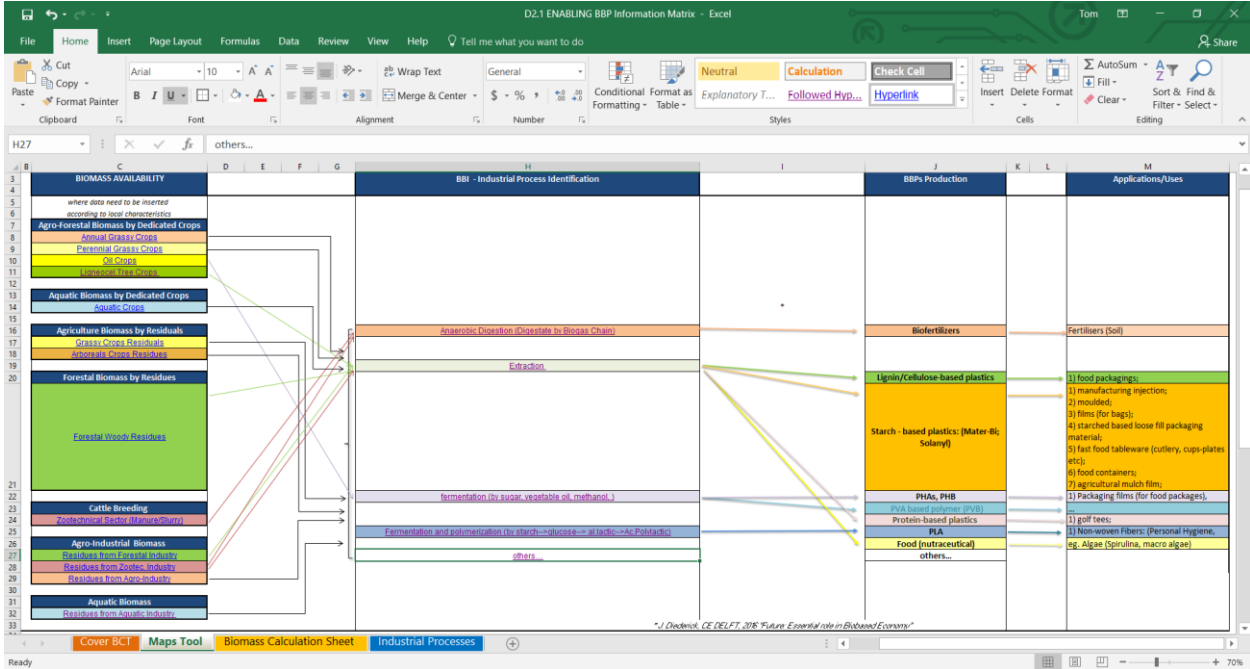
A draft was developed during December 2017 and January 2018 and refined within the core WP team before being circulated to all partners in January 2018 for feedback and comment. This led to the production of a final version which partners began to populate with data during February 2018. At the current time we have a good baseline of data available within the BMT, but we expect to continue to add to this during April 2018 and also during the lifetime of the project as new technologies and additional biomass resources are identified by partners.

### 2.1 Cover Sheet



## 2.2 Maps Tool

The Maps Tool Sheet represents a conceptual map where different biomass classes are connected to relevant BBP Industrial Processes and their BBPs potential uses / applications.



### 2.3 Biomass Calculation Sheet

The Biomass Calculation Sheet has been designed for each ENABLING Partner involved in WP2 to collect data on the most important biomass resources in selected Region(s), following the criteria:

- availability;
- identification of competition with other markets (feed and food);
- industrial interests;
- potential for higher valorisation (with or without future innovation).

The area selected by each partner takes into consideration the biomass data available. For this reason Partners have been advised not to consider an area that is smaller than a Region.

This is also important as decisions to kick off innovative pathways are taken at the national and regional level and innovative policy (e.g. BBP pathways) are often driven by using EU funding managed at regional level (e.g. EAFRD, ERDF).

The Biomass Calculation Sheet considers quantitative aspects of biomasses and their respective extractable components (i.e. starch, fibre for BBPs).

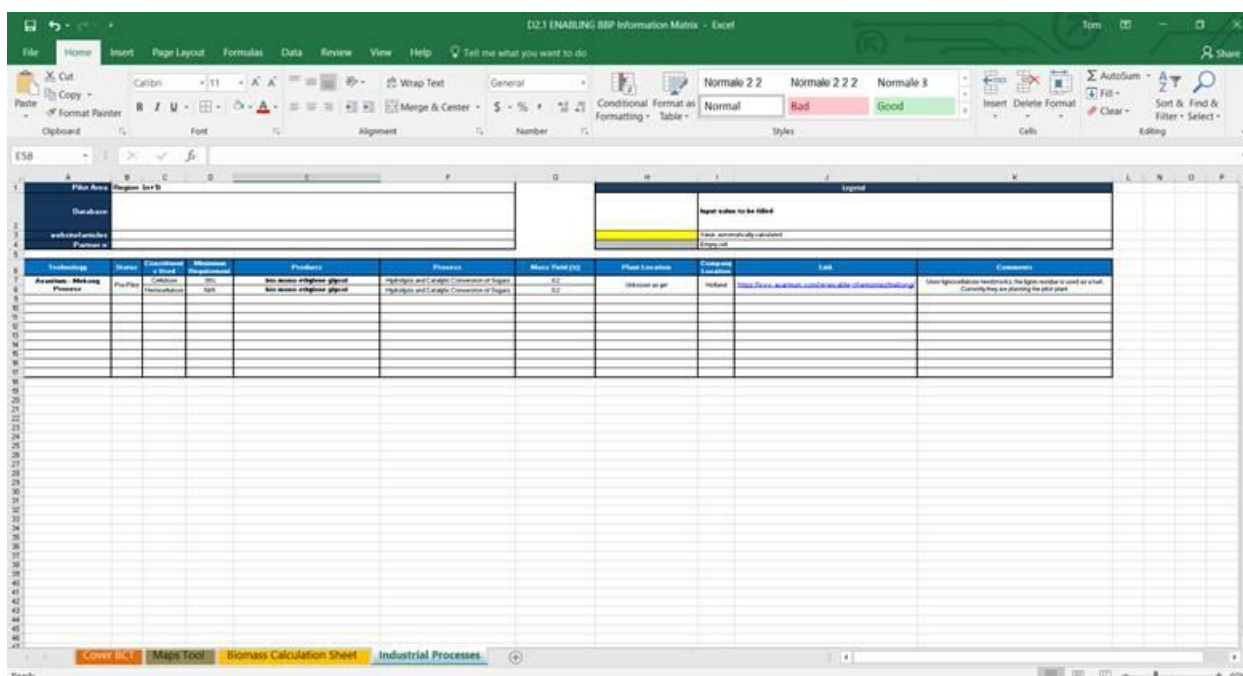


### 2.4 Industrial Processes Sheet

The Industrial Processes Sheet has been designed for each Enabling Partner involved in WP2 to identify BBP industries present either in the region, or within a sufficiently close reach, to allow the development of sustainable supply chains.

It is important to identify not only consolidated industrial players, but to also consider small and innovative young companies or entrepreneurs with the potential to stimulate innovation, knowledge transfer and the uptake of research.

This part of the BMT considers not only the technology but also the current status of the technology (e.g. pre-pilot), the products produced, the actual process involved, the constituents used in the technology (which can then be related to the available biomass residues identified in the Biomass Calculation Sheet) and the minimum requirement (as a percentage) of the constituent contained in a biomass source for the technology / process to be viable.



Technology	Status	Constituents in Feed	Minimum Requirement	Products	Process	Main Feed (kg)	Plant Location	Company Location	Link	Comments
Acetic Acid Production	Pre-Pilot	Cellobiose Hydrolysis	95%	95% acetic acid 95% acetic acid	High-Gravimetric Conversion of Sugars	100	Walsby in gov	Malton	<a href="https://www.acetate.com/news/industry-challenge">https://www.acetate.com/news/industry-challenge</a>	Other lignocellulosic feedstocks: the lignocellulosic feedstock is a feedstock. Currently they are planting the pilot plant.

### 3 Annex I. The Biomass Matrix Tool Instructions for Compilation: "How BMT Works"

## “Biomass Matrix Tool for BBPs”

### 3.1 How BMT works

The "Biomass Matrix Tool" has been developed to help the user in evaluating the potential and available biomass and industrial processes, considering the different bioproducts pathways.

The aim of this matrix is to get a general overview of the available biomass for BBPs Products of a selected area<sup>1</sup> and to evaluate which Bio-based products chains could be more suitable in relation to the several biomass categories by also using the innovative technology pathways.

The matrix is an Excel file formed by a set of sheets:

- 1) The Cover "**Biomass Matrix Tool**" which highlights the version, latest date of drafting, and the partner which is revising the matrix.
- 2) The "**Maps tool sheet**" represents a conceptual map where different biomass classes are connected to relevant BBP Industrial processes and their BBPs potential uses/applications.
- 3) The "**Biomass Calculation Sheet**".
- 4) The "**Industrial Processes Sheet**".

#### **The Biomass Calculation Sheet:**

At the top of the sheet, the general Information related to the selected Area<sup>1</sup>, database, articles and website used to collect the data is to be filled. Each partner can duplicate the sheet for each region selected/involved. **Please note that when you duplicate the Biomass Calculation Sheet that you must highlight to column Z in order that all drop down boxes are functional.**

**Each partner has to implement the calculation sheet selecting the types of biomass (cultivated or residual) relevant for their area**

A short legend about data filled and automatically calculated is shown next.

As follows, the **analysis of biomass and specific uses** are calculated on the basis of different parameters (column A-B):

#### 1. Agro-forestry and Aquatic dedicated crops and their biomass subcategories

- Biomass:
  - Woody crops (i.e. oak, willow, pine, fir, birch etc.)
  - Herbaceous crops (i.e. cardoon, sorghum, hemp, etc.)
  - Aquatic biomass (i.e. spirulina algae, macro algae (e.g. seaweed, kelp) etc.)
  - Other

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<sup>1</sup> The area should be selected by each partner taking into consideration the available data of biomass. It's suggested to consider the Region as a smaller selected area for several reasons: 1) data available and accessible to regional database.2) decisions to kick off innovative pathways are taken to the national and regional level. 3) the innovative policy (as BBPs pathways) are often driven by using EU funding managed at regional level (ERDF Fundings). 4) The Regions represent a territorial unit easy to manage.

## 2. Biomass residues

- Sectors:
  - Agriculture and Forestry (i.e. cereal straw, pruning residues, etc.)
  - Zootechnical sector (i.e. waste wool, others)
  - Agro-Industry sector (i.e. olive milling wastewater, wine dregs, fruit and berry residues etc..)
  - Aquatic biomass
  - Other.

The selected cells should be filled taking into consideration the available and most representative Biomass for each selected area/s (Region/regions) with respective values of production yield (t/ha) and cultivated area (ha/year).

**The Biomass Calculation Sheet is currently populated with examples and it is expected that partners may change these to reflect their own regions. It is possible to add sheet rows to include additional biomass crops and subcategories or biomass residues. Please note that if you insert additional sheet rows that you must copy the calculation formatting in the 2 yellow highlighted cells columns (click on right hand bottom corner of the cell above and drag it down to the new cell below).**

The mentioned parameters to be filled are (**Columns C - D**):

- Involved area (**Column C**),
- production yield (**Column D**).

The **theoretical amount of biomasses** will be automatically calculated (tons/year) (**Yellow Column E**).

The uses of them could be different on the basis of needs and local market conditions, thus not all biomass might be used for **traditional uses (Columns F - G)** but part of them could be used for:

- **BBPS sector (Column K)** in relation to respective **suitable fractions (Columns H, I, J)**
- **Alternative uses 1, 2, (n+1) (Columns L, M)**
- **Possible Innovative uses** still in research phase, but promising for marketplace during coming years (with TLR 5 - 8), (**Column N**).

**Column H** has drop down boxes to identify the suitable fraction.

Once the selected cells are filled, the **Available amount of Biomass for BBPs (t/year)** will be automatically calculated as well as the **biomass residues which will be not used** either for **traditional uses or BBPs productions (Column P)**, but destined for **other sectors (Column Q)**.

It would also be useful to know if potential biomass destined for BBPs production is supported by any **incentives mechanism** or specific **regional/national funding programmes** such as **ERDF (European Regional Development Funds) or Regional Policy Incentives**. **Column R** requires a yes / no answer. **Column S** allows for a short description of the incentive. **Column T** is dedicated to ERDF funds.

These mechanisms could make the difference for a strong promotion of BBPs among IFP - Industrial and Rural Partnership.

**Column U** allows for a short description of current and/or future factors affecting handling /disposal (where known).

Where there is no current utilization we are not asking for further explanations in the matrix. There will be a specific chapter explaining the reasons so that we have a bit more context on the challenges in a given region (technical barriers, logistic challenges, etc.)

### **The Industrial Processes Sheet:**

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**The Industrial Processes Sheet is currently populated with an example and it is expected that partners will add industrial processes to column A to reflect differing technologies in their own regions. It is possible to add sheet rows to include additional industrial processes and subcategories. Please note that if you insert additional sheet rows that you must copy the calculation formatting in Column B (click on right hand bottom corner of the cell above and drag it down to the new cell below).**

**Column C** is designed to list the constituent components of the biomass source eg cellulose. This links to **Column D** which indicates the minimum requirement % of constituent component of the biomass source for the industrial process to be viable.

**Column E** lists the products of the industrial process eg. Glycol

**Column F** lists the chemical process(s) used in the industrial processes to extract the constituent components in the biomass source. With **Column G** showing the Mass yield % from the industrial process.

Business information relating to the industrial processes including links to websites of the businesses / research institutions is found in **Columns H, I and J.**