

# S2BIOM –TOOLS AND DATABASES

Workshop on Sustainable supply of lignocellulosic biomass in Europe  
*First results and tools testing of the S2Biom project*  
Brussels, 16 June 2015

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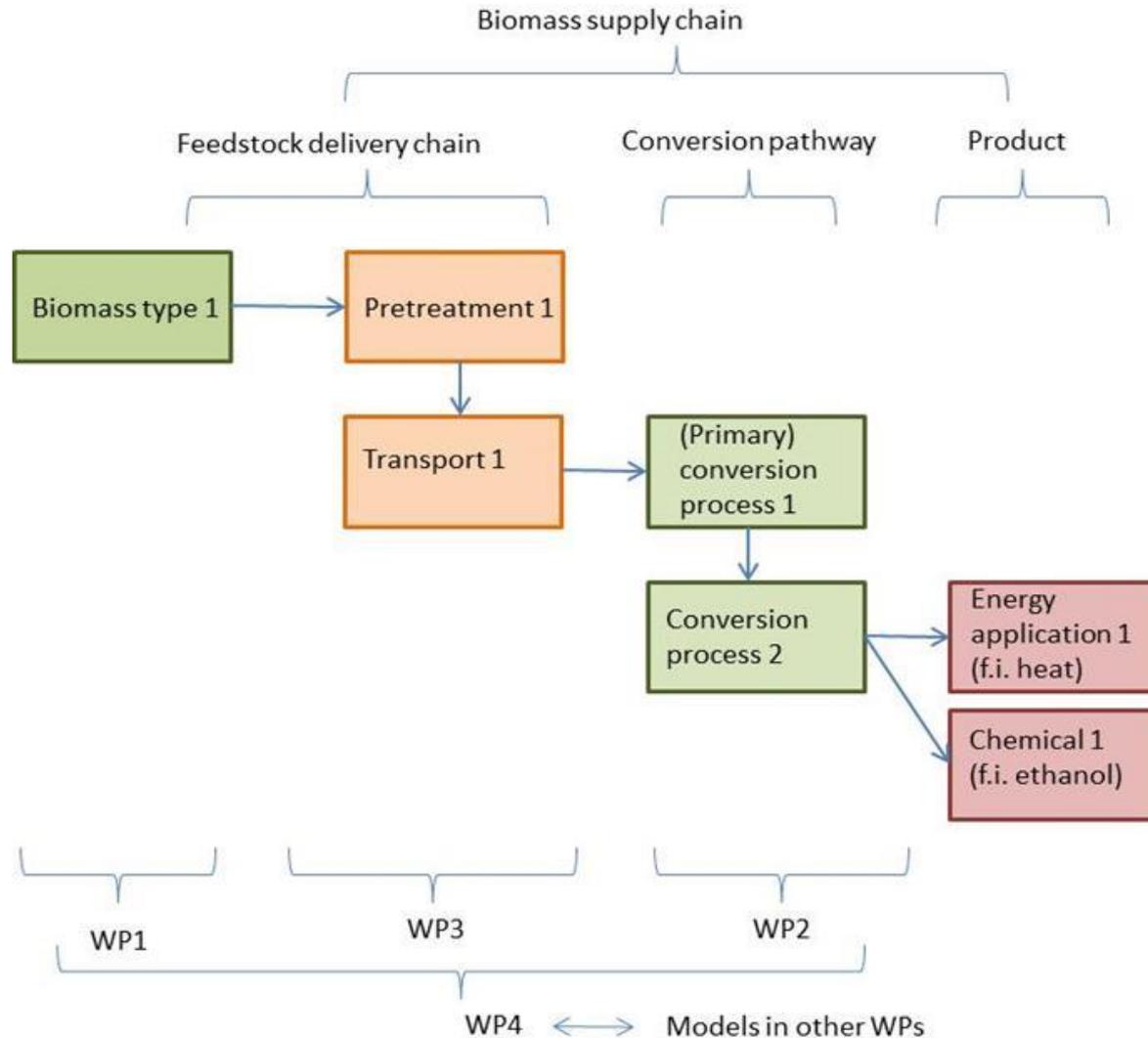
# Discussion questions

1. Now that you have seen an overview of the full toolset in S2BIOM, are there tools/data missing?
2. The cost-supply viewing tool is planned to incorporate a baseline biomass potential for lignocellulosic biomass. What are the four main criteria that need to be taken into account for quantifying the baseline potential for forest, agricultural and/or waste biomass?
3. What aspects are critical in setting up local/regional biomass delivery chains which need to be addressed in the full chain assessment tool supporting the design and environmental and economic evaluation of local biomass delivery chains?
4. What needs to be done to ensure that end-users have trust in the output of the S2BIOM toolset and start using it?

# Objectives & tasks WP4 (I)

- To develop a:
  - biomass cost supply tool
  - tool for viewing characteristics of conversion and pre-treatment technologies, biomass hubs and yards and matching biomass to technologies
  - tool for viewing market demand and policies for biomass for bioenergy and biobased products
  - tool for optimal design and evaluation of biomass delivery chains and networks at national and European scale
  - tool for optimal design and evaluation of biomass delivery chains and networks at regional and local scale (WP9)
  - central database (WP1, 2, 3, 5, 6)
  - user interface for entering the tools and databases and documents produced in the project

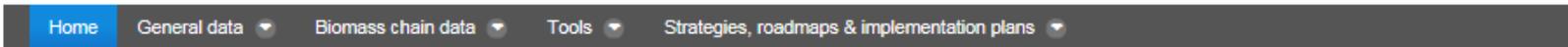
# Biomass supply chain



# General User Interface



## Tools for biomass chains



Home

### Introduction to S2BIOM GUI

**Home:** Here information on the S2BIOM project and on the S2BIOM tool box may be placed. It now provides short descriptions of the different items and tools (to be) included in the GUI.

**General data:** Under this item the following output will be included:

**Scenarios (WP7):** A short description will be placed of the central scenarios used in the project. For more detailed information on the scenarios and how they are used a link will be placed here to the final deliverable explaining the scenarios in detail.

**Regulatory & financial framework (WP6):** This is where the entry into the viewing tool will be for viewing all data on policies developed in WP6. At this moment the database is half-filled and will be included into the GUI and made accessible through a viewing and download tool expected to be available by Month 18.

**Biomass demand (WP7):** Under this item access will be provided to the demand analysis results assessed in WP7 with the ReSolve model taking account of scenario specifications and specific EU and national targets for renewable energy production by 2020/2030. Results for this task are to be included by month 24.

### Biomass chain data

In this part of the GUI the data and knowledge base is to be accessed that is generated in WP1 on biomass cost-supply, WP2 on biomass conversion technology characteristics, WP3 on the characteristics of main logistical chain components and indicators for sustainability and resource efficiency developed in WP5.

**Biomass cost-supply (WP1):** Biomass cost-supply data generated in the project is to be viewed in the biomass cost supply tool which enables easy viewing and further analysis capabilities for data on biomass supply at different spatial resolution levels (Nuts 0, 1, 2, 3). At this moment this tool includes draft cost-supply data for 2010 and a baseline scenario situation in 2020 and 2030.

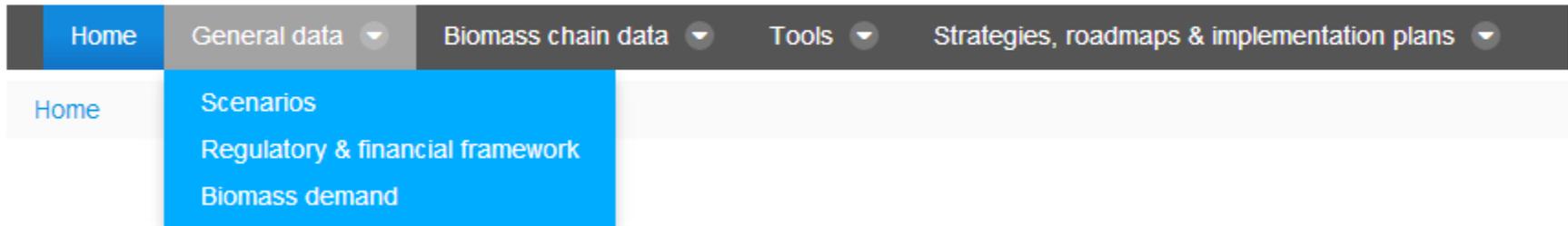
**Conversion technologies (WP2.1 & WP4.2):** This item in the GUI gives access to the database containing an extensive amount of characteristics on a large number of biomass conversion technologies collected in WP2.

# General user interface



# S2Biom

## Biomass chains



### General data

Scenarios (WP7)

Regulatory & financial framework (WP6)

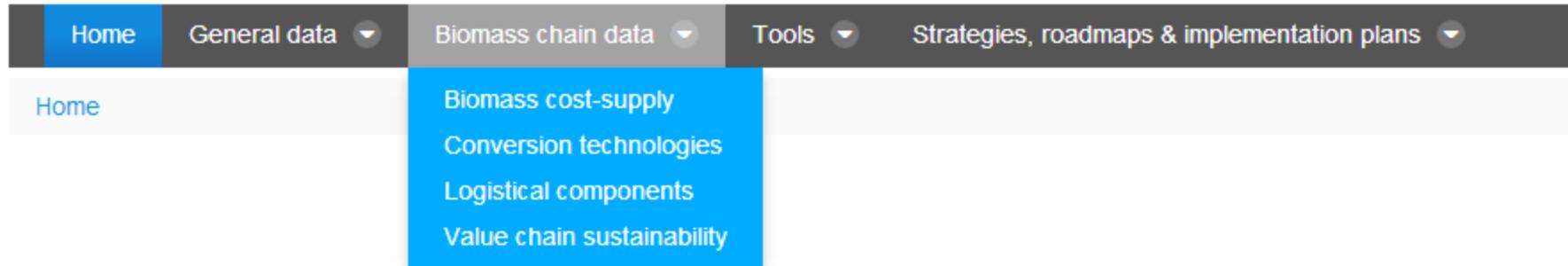
Biomass demand (WP7)

# General user interface



# S2Biom

## Biomass chains



### Biomass chain data

Biomass cost-supply (WP1)

Domestic biomass

Imported biomass

Conversion technologies (WP2.1 & WP4.2)

Thermal conversion processes

Chemical conversion processes

Bio-chemical conversion processes

(Biobased) products/building blocks

Logistical components (WP3.1 & WP4.2)

Value chain sustainability (WP5)

# S2Biom

# Cost-supply viewing tool

Biomass chain data / Biomass cost-supply

My Sites 0 Demo User

2020 Medium bioenergy - Primary production in agriculture - SRC on ag. land - Willow - amount - absolute

**NUTS level**

- nuts0
- nuts1
- nuts2
- nuts3

**Scenario**

- 2010 Reference
- 2020 Medium bioenergy
- 2030 Medium bioenergy
- 2040 Medium bioenergy

**Category**

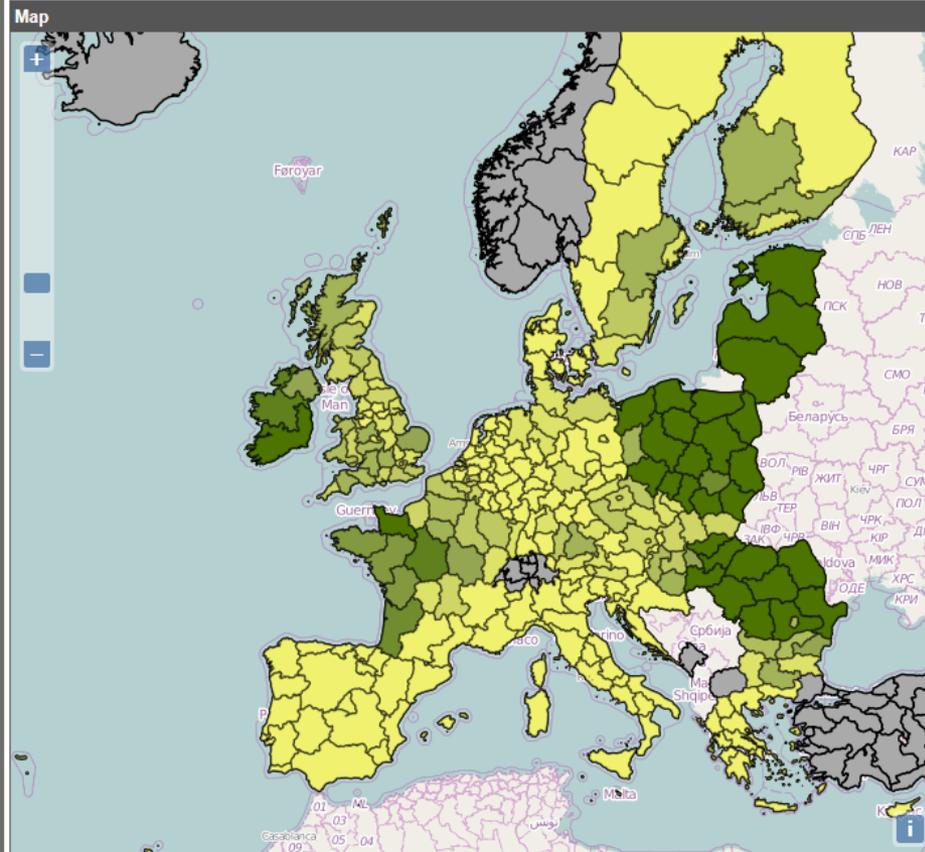
- Abandoned grassland
- Biomass from trees/hedges outside forests incl. La...
- Secondary residues (forest & wood industries)
- Secondary residues (industry util. Agricultural prod...

**Subcategory**

- Energy Grasses, Annual Crops, Perennial Crops
- SRC on ag. land

**Type**

- Willow
- Poplar
- Other



amount energy value costs

absolute area weighted

Unit: kton

0
0 - 20
20 - 40
40 - 60
60 - 80
80 - 100
100 - 120
120 - 140
140 - 160
160 - 180
180 - 200
more than 200

Current selection	Identify result
2010 Reference	0 kton
2020 Medium bioenergy	117 kton
2030 Medium bioenergy	127 kton
2040 Medium bioenergy	
2050 Medium bioenergy	

# Cost-supply viewing tool

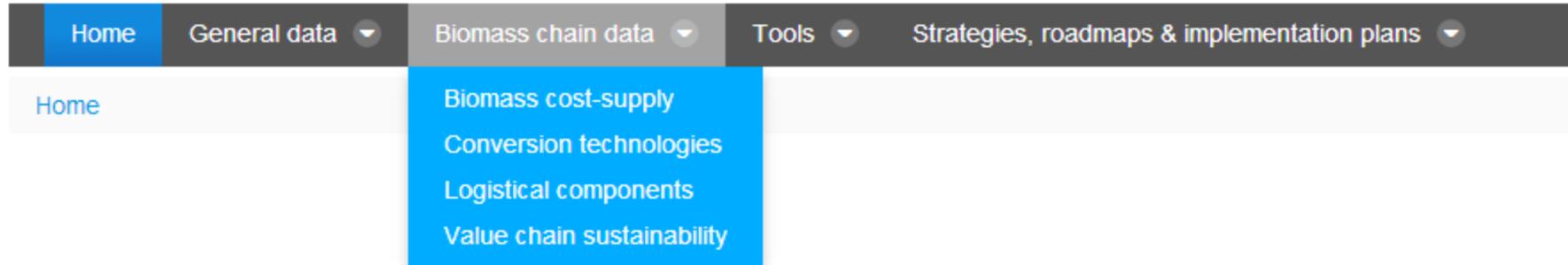
- Current up-dates:
  - Up-date with latest cost-supply data (WP1) Nuts 1-3.
  - Up-date the type of potentials ( baseline potential& user defined biomass potential constraints)
  - Add non-EU countries cost supply
  - Make selections according to cost levels
  - Cost supply relations

# General user interface



## S2Biom

## Biomass chains



### Biomass chain data

Biomass cost-supply (WP1)

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Thermal conversion processes

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(Biobased) products/building blocks

Logistical components (WP3.1 & WP4.2)

Value chain sustainability (WP5)

## S2Biom

# Database screen 1

## Edit Example with explanation (please do not change)

### GENERAL PROPERTIES

Commercial name	<input type="text" value="(required) Example with explanation (please"/>	Level of commercial application	<input type="text" value="mention general description of the status"/>
Main category	<input type="text" value="Communion (size reduction)"/>	Year of first implementation in practice	<input type="text" value="2005"/>
Subcategory	<input type="text" value="Chipping: disk chipper"/>	Estimated number of systems in operation since introduction	<input type="text" value="200"/>
Image url	<input type="text" value="www.producer.com/example_machine/picture.jpg"/>	Current Technology Readiness Level in 2014	<input type="text" value="Level 9, System ready for full scale"/>
Most common/suitable applications	<input type="text" value="processing wood residues after harvesting"/>	Expected Technology Readiness Level in 2030	<input type="text" value="Level 9, System ready for full scale"/>
Main operating principle	<input type="text" value="In this box may include any information about the operating principle of the logistical component, but also about relevant information that you cannot enter in the other data fields"/>	References	<input type="text" value="commercial: www.producer.com/description_machine_type&lt;br/&gt;scientific: authname(s), year (the full references of scientific papers will be stored in external reference word doc)&lt;br/&gt;other: websites, magazines, etc."/>

### TECHNICAL PROPERTIES

Energy demand	<input type="text" value="3.2"/>	<input type="text" value="MJ/t"/>	Number of full load hours per year	<input type="text" value="1600"/>
Type of energy needed	<input type="text" value="Diesel"/>		Maximum load volume of transport system	<input type="text" value=""/>
Other input demand	<input type="text" value="none"/>		Maximum load weight of transport system	<input type="text" value="0"/>
Pre-treatment efficiency	<input type="text" value="0.96"/>	<input type="text" value="(output/input)"/>	Typical lifetime of equipment	<input type="text" value="7"/>
Input processing capacity	<input type="text" value="150"/>	<input type="text" value="m3/h"/>	Labour requirements pre-treatment	<input type="text" value="0.0133"/>
Storage capacity for input	<input type="text" value=""/>	<input type="text" value="m3"/>	Labour requirements storage	<input type="text" value=""/>
Storage capacity for output	<input type="text" value="20"/>	<input type="text" value="m3"/>	Labour requirements transport	<input type="text" value=""/>
			Transportability	<input type="text" value="Mobile"/>

Save and proceed Cancel

# Database screen 2

**BIOMASS INPUT SPECIFICATIONS**

Acceptable biomass input groups: Wood

Received (intermediate) biomass type: Branches

Minimum particle size input: length (mm) 1000, width / diameter (mm) 50, height (mm) 50

Maximum particle size input: length (mm) 5000, width / diameter (mm) 300, height (mm) 300

Crop: straw

Moisture content input (% wet base): Minimum 20, Maximum 60

Bulk density input (kg/m<sup>3</sup> wet base): Minimum 100, Maximum 300

Maximum input level of contamination with exogenous material (% dry base):

Maximum ash content input (% dry base): 1.5

**BIOMASS OUTPUT SPECIFICATIONS**

Indication of follow up process(es): Transport

Delivered (intermediate) biomass type: Wood chips

Dimensions: P16S: 3,15 mm < P < 16 mm, Fine fraction F05: < 5 %

Moisture content output (% wet base): Minimum 20, Maximum 60

Bulk density output (kg/m<sup>3</sup> wet base): Minimum 200, Maximum 400

Maximum output level of contamination with exogenous material (% dry base):

Maximum ash content output (% dry base): 1.5

**FINANCIAL AND ECONOMIC PROPERTIES**

Specific investment costs of equipment, included auxiliaries: (€) 60000

Operation and maintenance costs: 1.25 €/t

- Calculation method: Effective operation time

Storage costs: €/t

Loading costs: €/t

Unloading costs: €/t

Transport costs per kilometer: (€/km)

Transport costs per tonne: (€/t)

Transport costs per load: (€)

Transport costs fixed: (€)

Infrastructure needed: Connection to road network

Save Cancel

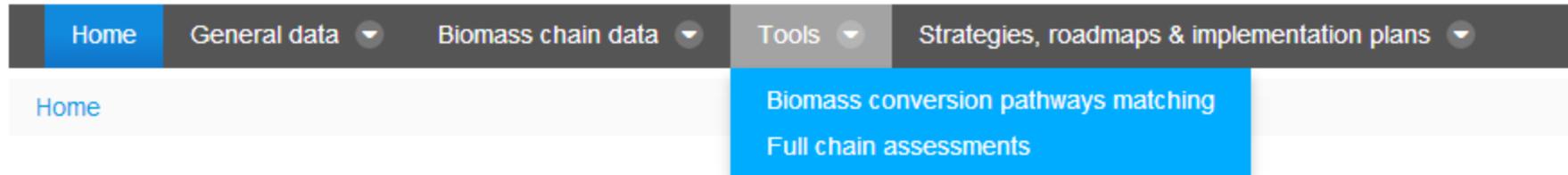
Edited by: Hugo de Groot, Bert Annevelink

# General user interface



## S2Biom

## Biomass chains



### Tools

Biomass conversion pathways matching (WP2 &3)

Full chain assessments( WP4.3&4.4)

EU wide-national and regional assessment tool (BeWhere)

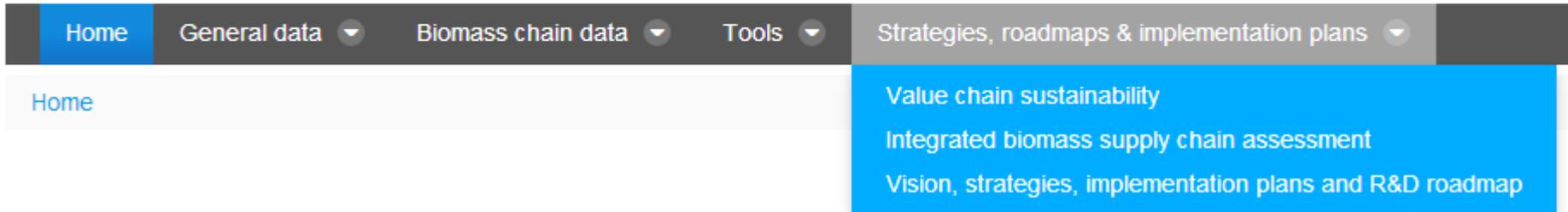
Local assessment tool (LOCAgistics)

# General user interface



# S2Biom

## Biomass chains



### Strategies, roadmaps & implementation plans

- Value chain sustainability (WP5)

- Integrated biomass supply chain assessment (WP7)

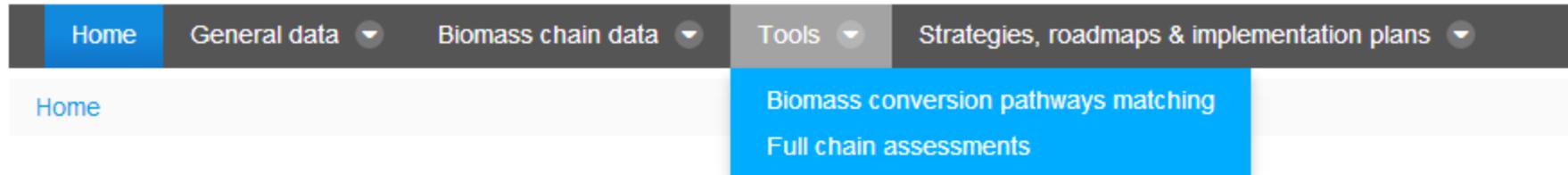
- Vision, strategies, implementation plans and R&D Roadmap (WP8)

# General user interface



## S2Biom

## Biomass chains



### Tools

**Biomass conversion pathways matching** (WP2 &3)

Full chain assessments ( WP4.3&4.4)

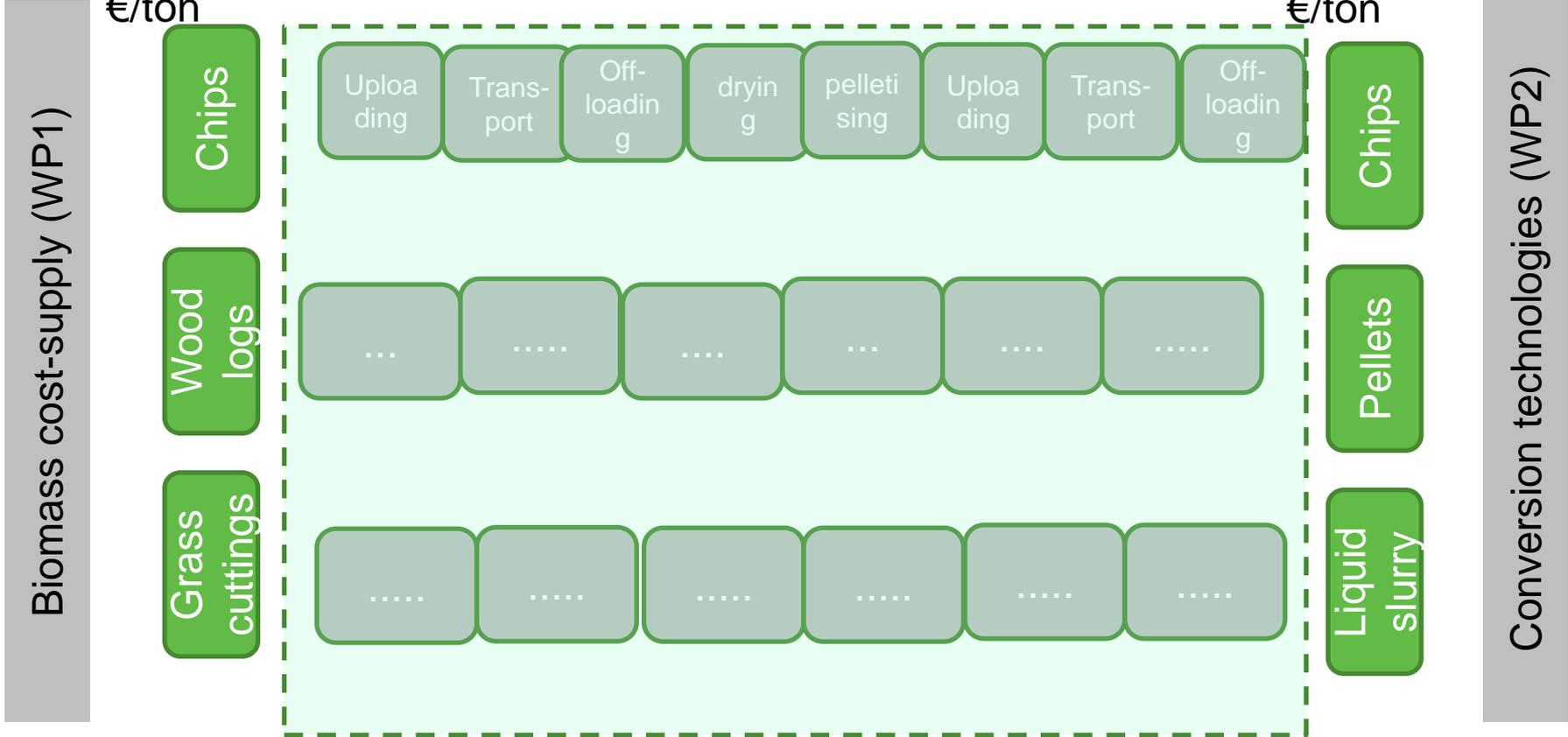
EU wide-national and regional assessment tool

Local assessment tool

# Biomass matching tool

Biomass as received at road side:  
Kton  
€/ton

Biomass as required at gate:  
Kton  
€/ton



Biomass cost-supply (WP1)

Conversion technologies (WP2)

Per biomass attributes (e.g. % water, volume, chlorine contents, ash content, particle size, etc.) **Logistics and pre-treatment to convert 'as received' to 'as required'**



Per biomass 10 attributes (e.g. % water, volume, chlorine contents, ash content, particle size, etc.)

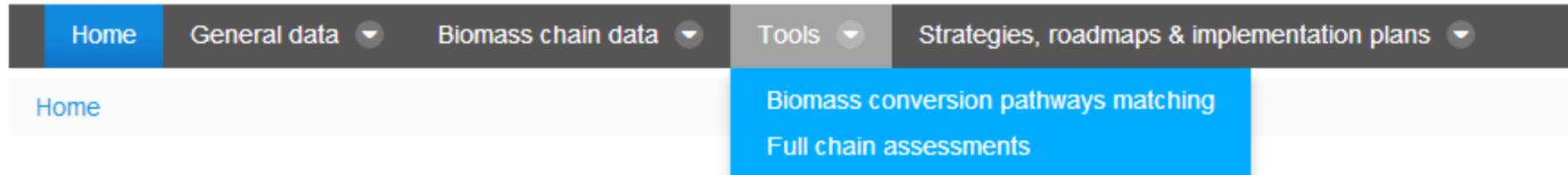


# General user interface



## S2Biom

## Biomass chains



### Tools

Biomass conversion pathways matching (WP2 &3)

Full chain assessments ( WP4.3&4.4)

**EU wide-national and regional assessment tool: BeWhere**

**Local assessment tool: LOCAgistics**

# BeWhere Model

- A model to optimize the supply chain from harvesting to production
- The model is commonly used to analyze:
  - **The cost-competitive location of new conversion facilities.**
  - Biomass collection sites and transport routes.
  - Technological combinations for reaching demand targets.

# Full chain assessment tools at EU and local level

## General User Interface

**User specifications:**

- *Scenarios*
- *Type of biomass*
- *Type of chain*
- *Focus region*

**BeWhere assessment:**

Best locations for starting biomass conversion installation

**Output BeWhere (EU & national level)**

**Selection local focus region:**

- *Scenarios*
- ***Type of biomass***
- ***Type of chain***

Design of local biomass delivery chains and calculation of performance for biomass needs, economic and environmental impacts

**Impacts of chain**

economic      GHG performance      Miterra land use impacts

LOCAgistics:  
regional assessment



# To BeWhere model

# Discussion questions

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THANKS FOR YOUR ATTENTION  
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QUESTIONS?