

# Delivery of sustainable supply of non-food biomass to support a resource-efficient Bioeconomy in Europe

S2Biom summer school, Athens, Greece, 17-20 May, 2016

## Session 5: Biomass logistics

*The main logistical components and logistic concepts (WP3)  
(demo of s2biom tools & hands on session)*

Presenter: Igor Staritsky, DLO - Alterra



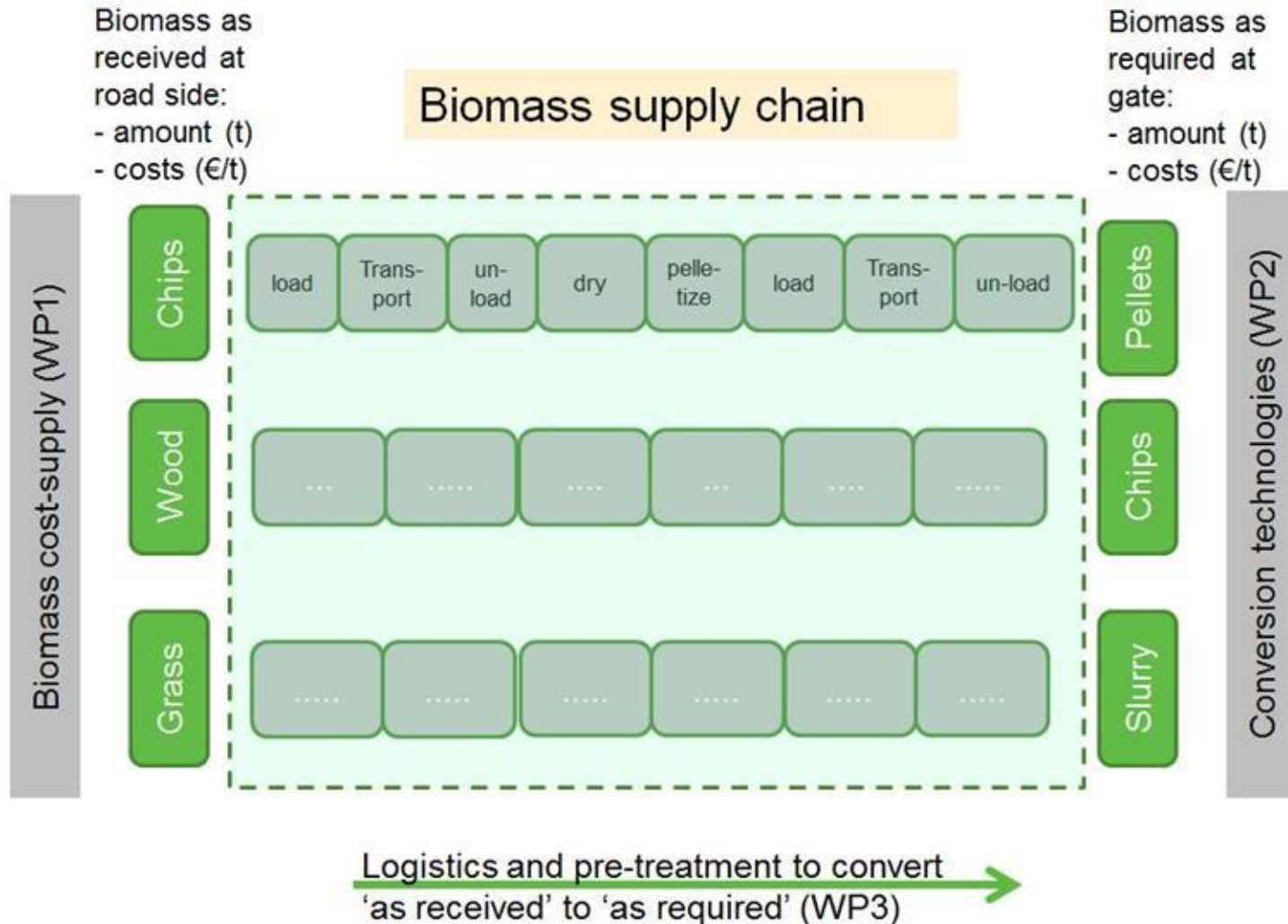
# Objectives & tasks

## WP3: Logistics

- to identify and characterise the main **logistical components** (such as storage, pre-treatment and transportation technologies) (Task 3.1)
- to identify and assess existing and develop new **logistical concepts** (e.g. biomass yards) to optimize sustainable non-food biomass feedstock delivery chains (Task 3.2)
- to **translate** theoretical logistical **concepts to specific cases**, and design the most promising logistic supply-chains for cases at local, regional and pan-European level (Task 3.3)

- **Biomass supply chains**
- **Bewhere v.s. LocaGIStics**
- **Walk through LocaGIStics**

# Biomass supply chains



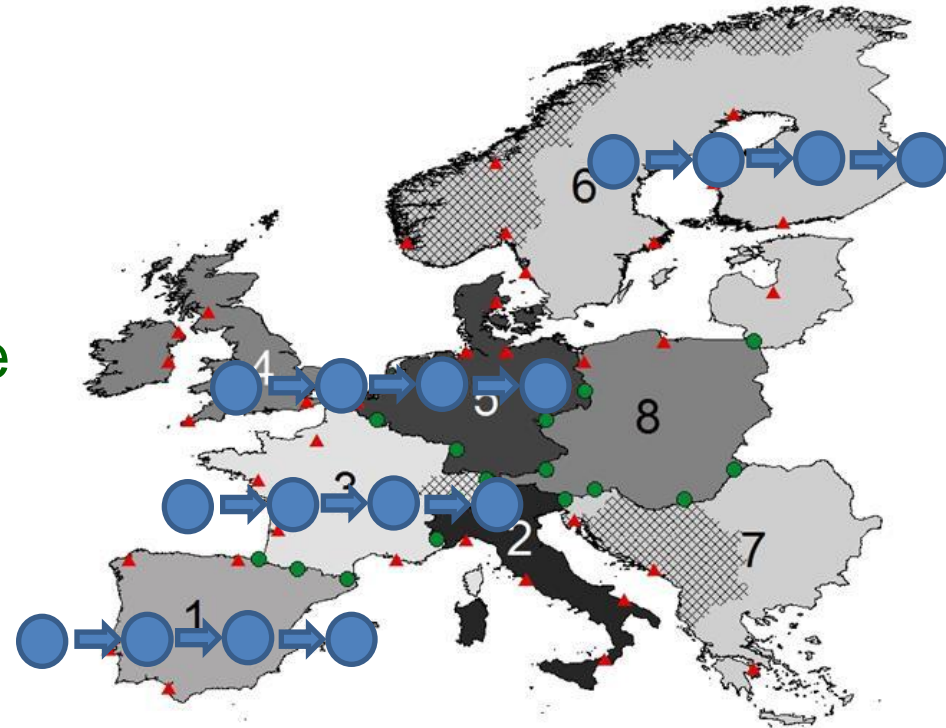
- **logistical component:** ●

- **logistical concept/chain:** ● → ● → ● → ●

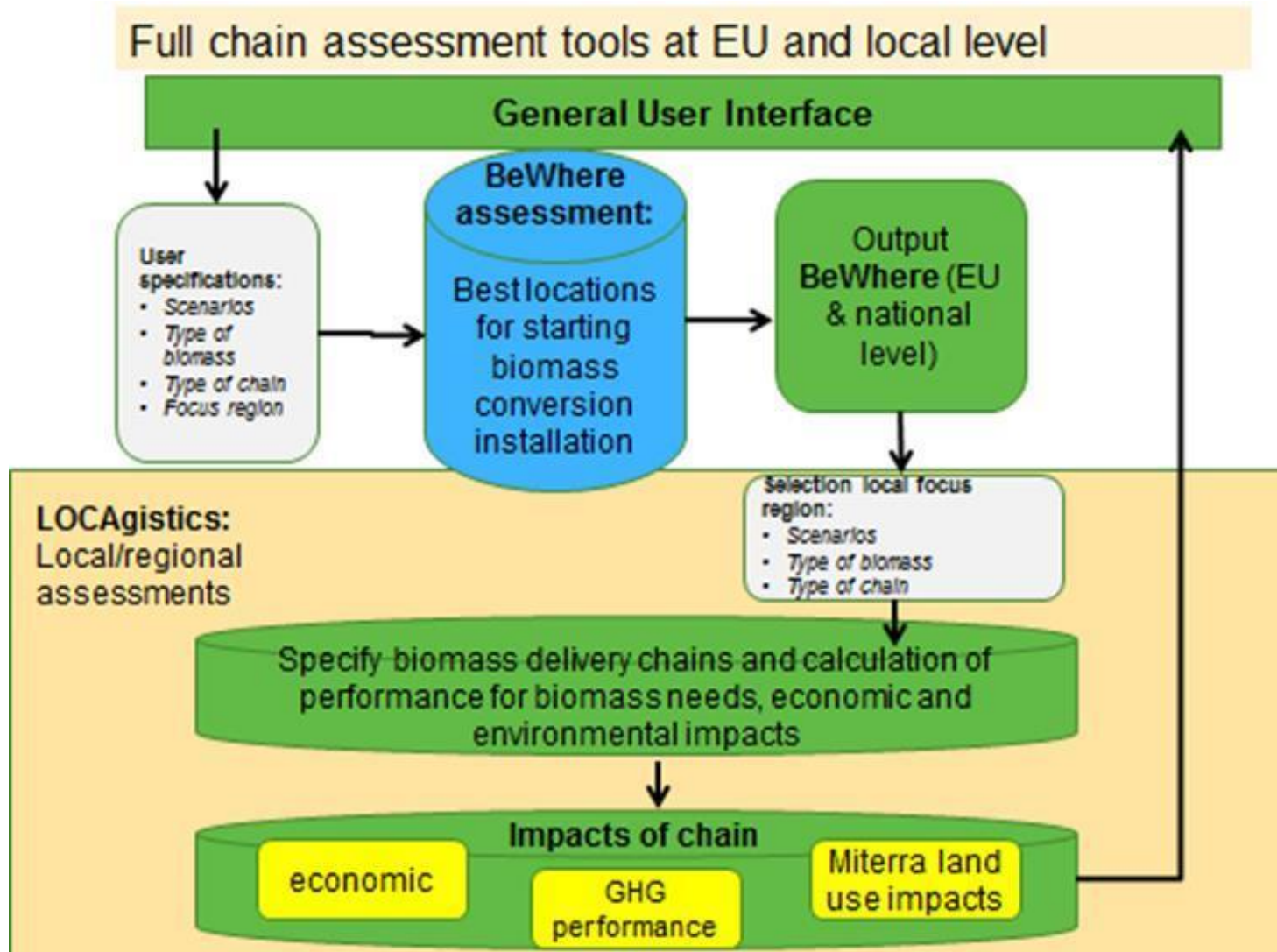
- **logistical concepts will be translated to**

1. EU level (BeWhere)
2. regional advanced case studies (LocaGISTics):

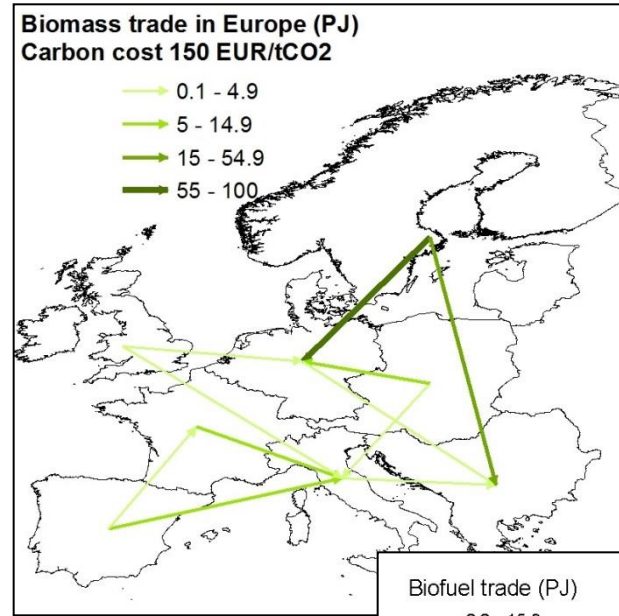
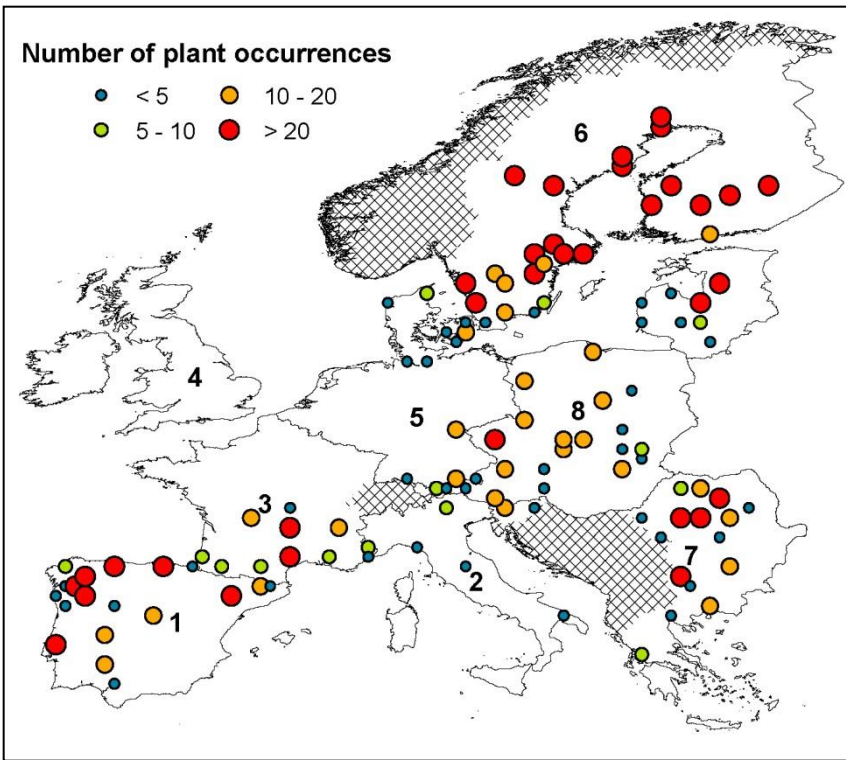
- Finland (Infres)
- France (LogistEC)
- Spain (Europruning)



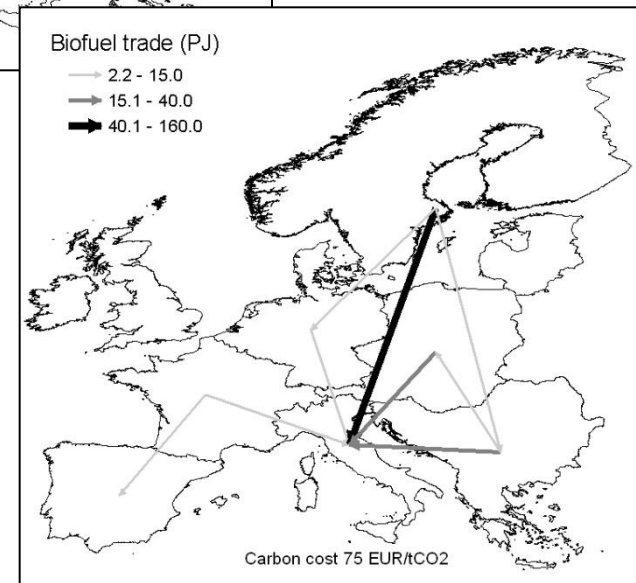
# Two tools for assessments: BeWhere & Locagistics



# Output BeWhere



Source: Leduc et al.,  
2013  
International Institute  
for Applied Systems  
Analysis (IIASA)





- **LocaGIStics is a visual, interactive tool for specification and assessment of biomass value chains**
- **it aims at regional level**
- **link with BeWhere model on an EU-/country level (output transferred to LocaGIStics)**
- **first developed in Dutch national 'ME4' project and now further developed for S2Biom**



# Specify configuration case study 1

- country, area of interest, case, variant

Countries		Areas of interest		
France	⌵	Burgundy	⌵	
Cases				
Burgundy straw and miscanthus				
Variants				
Name	Financial profit	Energy profit	Net GHG avoided	
empty	0	0	0	
1 pp, 1 icp	3,658,439	440,685	42,197	

# Specify configuration case study 2

- **biomass type**

Biomass types			
Name	Availability (%)	Field - ICP moisture content (%)	ICP - PP moisture content (%)
Straw	33	14	9
Miscanthus	100	15	10

# Specify configuration case study 3

- power plant
- intermediate collection point

Power plants					
Name	Size (ton DM)	Amount (ton DM)	Financial profit	Energy profit	Net GHG avoided
pp 1	30,000	30,481	3,658,439	440,685	42,197

Intermediate collection points		
Name	Amount (ton DM)	Distance (ton km.) ↓
icp 1.1	22,626	109,013
ipc 1.2	7,855	50,479

- **position the power plant on the map**
- **position one or two intermediate collection points on the map**
- **start calculation: GIS based ‘peeling heuristic’ determines biomass used (ton dm) and transport distances (ton.km) based on biomass availability maps**

# Suggested locations BeWhere

**Countries**  
France

**Areas of interest**  
Burgundy

**Cases**  
Burgundy straw and miscanthus

**Variants**

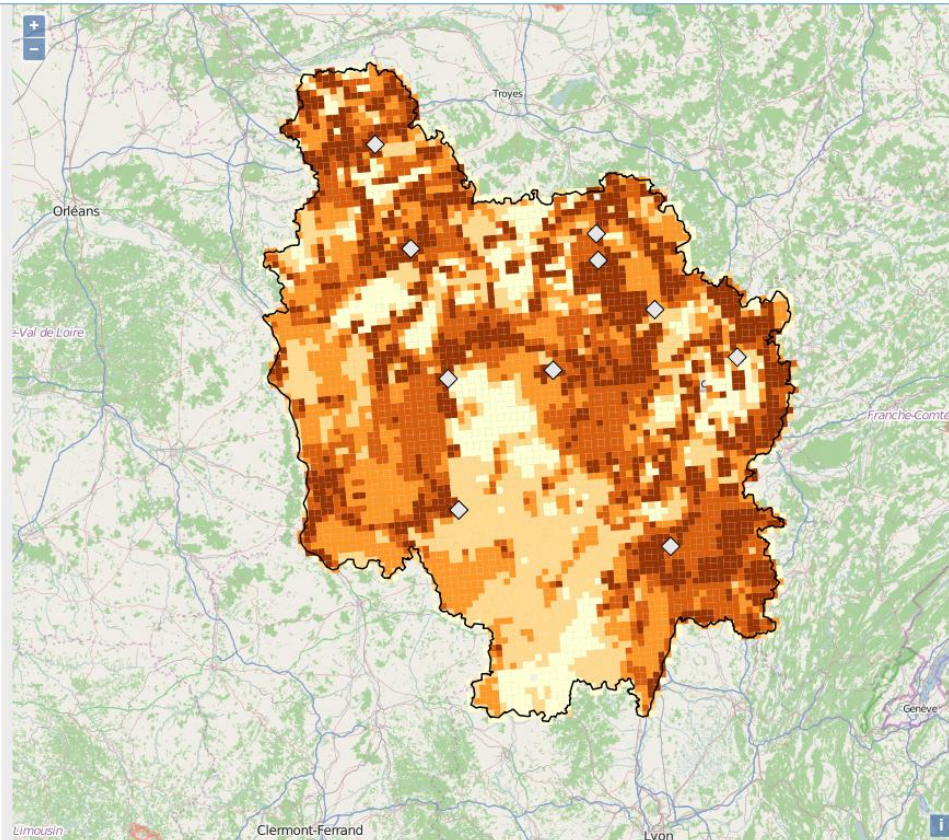
Name	Financial p...	Energy profit	Net GHG...
empty	0	0	0
1 pp, 1 icp	2,262,882	418,374	39,917
1 pp, 1 icp...	2,189,716	413,111	39,416
1 pp, 1 icp...	3,616,822	437,397	41,876
1 pp, 2 icp...	2,201,090	412,181	39,327

Create Save Delete Calculate

**Biomass types**

Name	Availa...	Field - ...	ICP - P...
Straw	33	14	9
Miscanthus	100	15	10

Save



**Power plants**

Name	Size (t...	Amou...	Fina...	Ene...	Net...
------	------------	---------	---------	--------	--------

Create Save Delete

**Intermediate collection points**

Name	Amou...	Distan...
------	---------	-----------

Create Save Delete CP = PP

- **powerplant & no biomass yard; only straw**
- **powerplant & no biomass yard; straw & Miscanthus**
- **powerplant & one biomass yard; straw & Miscanthus**
- **powerplant & two biomass yards; straw & Miscanthus**

# Variants 1

## powerplant & no biomass yard; only straw

LocaGISSticsViewer

localhost/extjs60/LocaGISSticsViewer/

geoserver sld triangle

Countries		Areas of interest	
France		Burgundy	

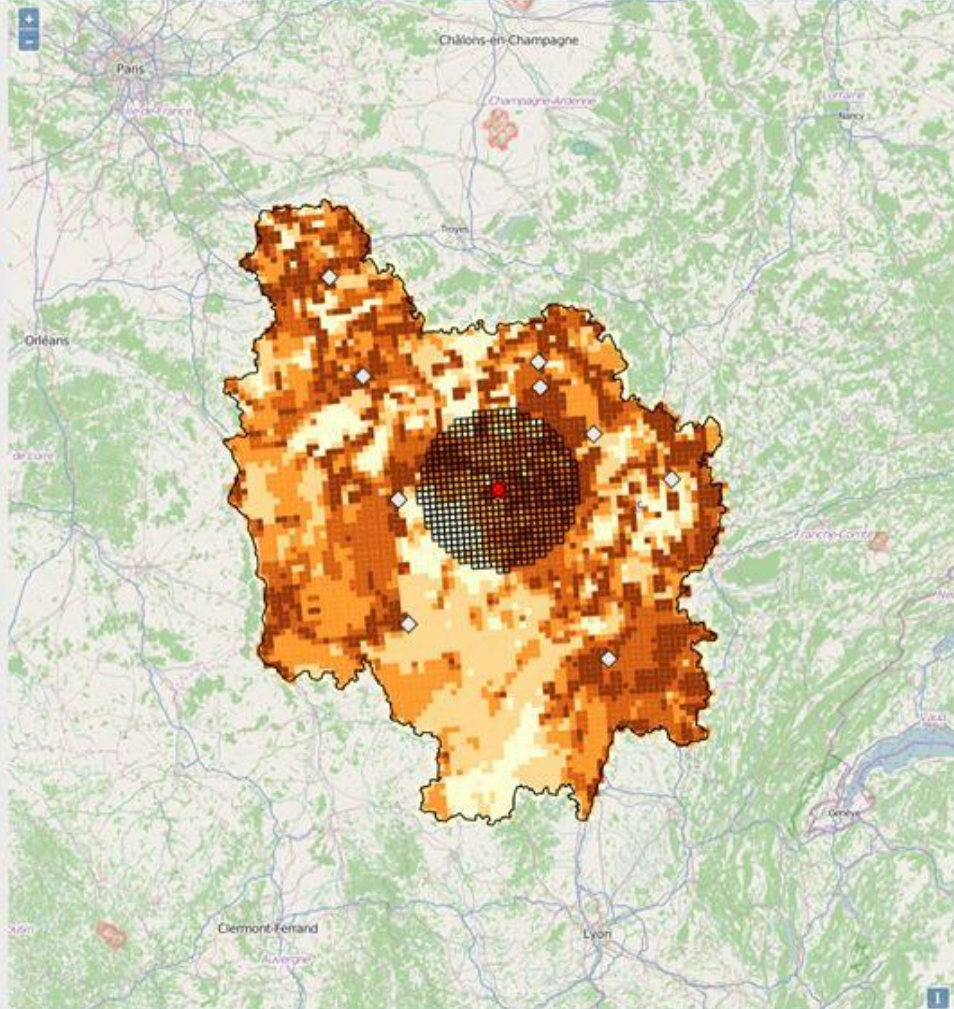
Cases			
Burgundy straw and miscanthus			

Variants			
Name	Financial pr...	Energy profit	Net GHG av...
1 PP = CP	2,852,251	412,044	39,313

Create Save Delete Calculate

Biomass types			
Name	Availab...	Field - I...	ICP - P...
Straw	33	14	9
Miscanthus	0	15	10

Save



Map showing biomass potential (heatmap) and a power plant location (red dot) in the Burgundy region of France. The heatmap is centered around a power plant location (red dot) and shows varying biomass potential across the region. The power plant location is marked with a red dot and a black grid pattern.

Power plants					
Name	Size (to...	Amoun...	Finan...	Energ...	Net G...
PP	30,000	30,011	2,852,...	412,044	39,313

Create Save Delete

Intermediate collection points			
Name	Amoun...	Distan...	
PP	30,011	707,438	

Create Save Delete CP = PP

- **yellow map is available straw**
- **only 33% straw was available**
- **more or less biomass available will influence the size of the collection circle**



# Variants 2

## powerplant & no biomass yard; straw & Miscanthus

LocaGISticsViewer

localhost/extjs60/LocaGISticsViewer/

geoserver sld triangle

**Countries**

France
--------

**Areas of interest**

Burgundy
----------

**Cases**

Burgundy straw and miscanthus

**Variants**

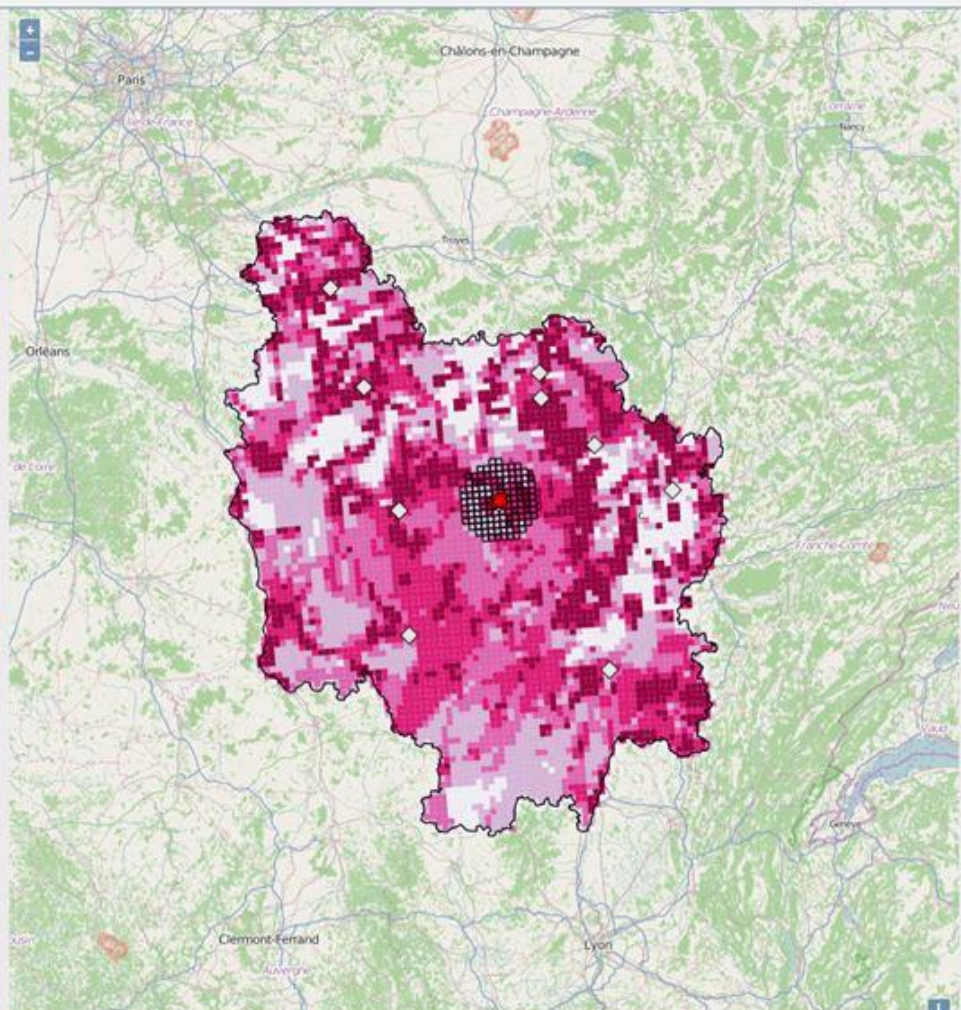
Name	Financial pr...	Energy profit	Net GHG av...
1 PP = CP	4,173,605	434,641	41,600

Create Save Delete Calculate

**Biomass types**

Name	Availab...	Field - I...	ICP - P...
Straw	33	14	9
Miscanthus	100	15	10

Save



**Power plants**

Name	Size (to...	Amoun...	Finan...	Energ...	Net G...
PP	30,000	30,224	4,173,...	434,641	41,600

Create Save Delete

**Intermediate collection points**

Name	Amoun...	Distanc...
PP	30,224	301,042

Create Save Delete CP = PP

- **different map is shown: purple for Miscanthus**
- **smaller supply circle, because Miscanthus now also available at closer distance**
- **notice that calculation results are different (e.g. profit)**

# Variants 3

## powerplant & one biomass yard; straw & Miscanthus

LocaGISTICSViewer

localhost/extjs60/LocaGISTICSViewer/

liferay menu items

Countries	Areas of interest
France	Burgundy

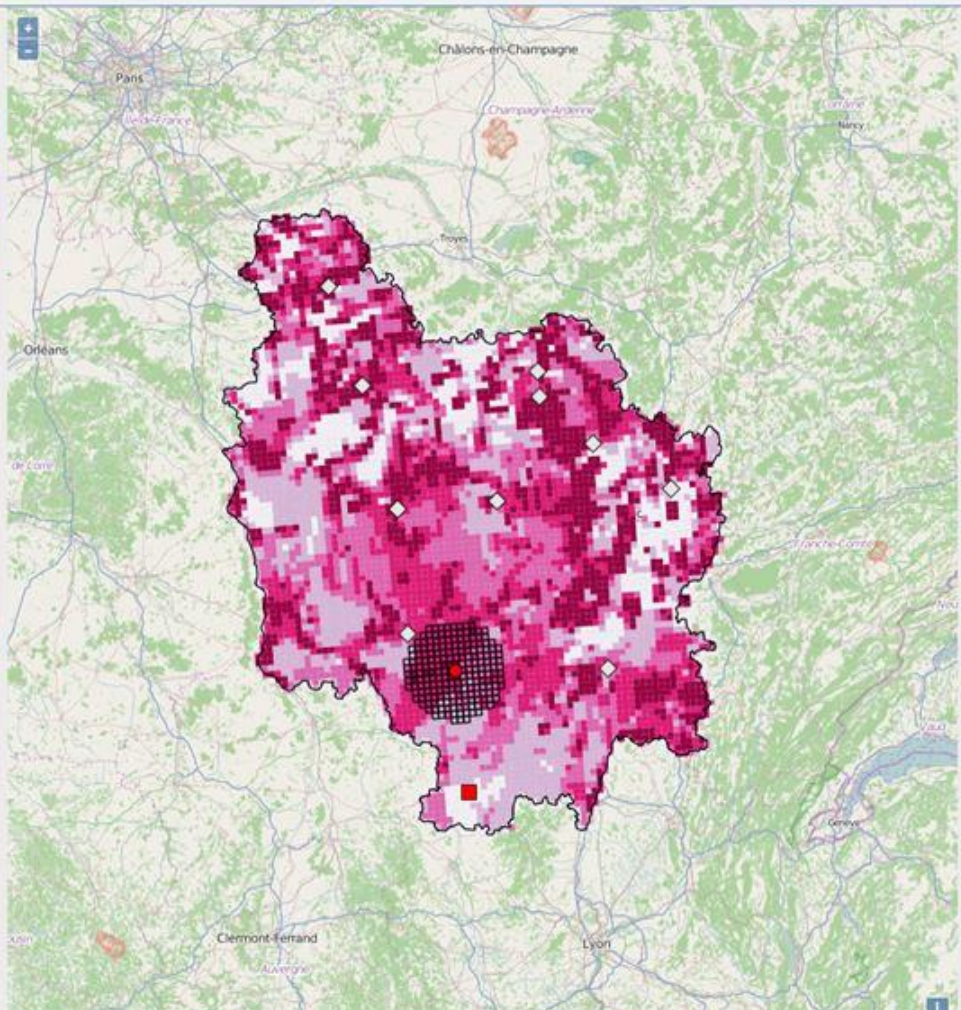
Cases
Burgundy straw and miscanthus

Variants			
Name	Financial pr...	Energy profit	Net GHG av...
1 PP, 1 ICP	4,347,243	437,084	41,867

Create Save Delete Calculate

Biomass types			
Name	Availab...	Field - I...	ICP - P...
Straw	33	14	9
Miscanthus	100	15	10

Save



Map showing biomass availability (red/pink) and a power plant location (black circle) in the Burgundy region of France. The map includes labels for cities like Paris, Châlons-en-Champagne, Troyes, Orleans, and Clermont-Ferrand.

Power plants					
Name	Size (to...	Amoun...	Finan...	Energ...	Net G...
PP	30,000	30,081	4,347,...	437,084	41,867

Create Save Delete

Intermediate collection points		
Name	Amoun...	Distanc...
ICP	30,081	446,439

Create Save Delete CP = PP

- **location powerplant and intermediate collection point separated**
- **intermediate collection point near to biomass sources**

# Variants 4

## powerplant & two biomass yards; straw & Miscanthus

LocaGisticsViewer

localhost/extjs60/LocaGisticsViewer/

geoserver sld triangle

Countries	Areas of interest
France	Burgundy

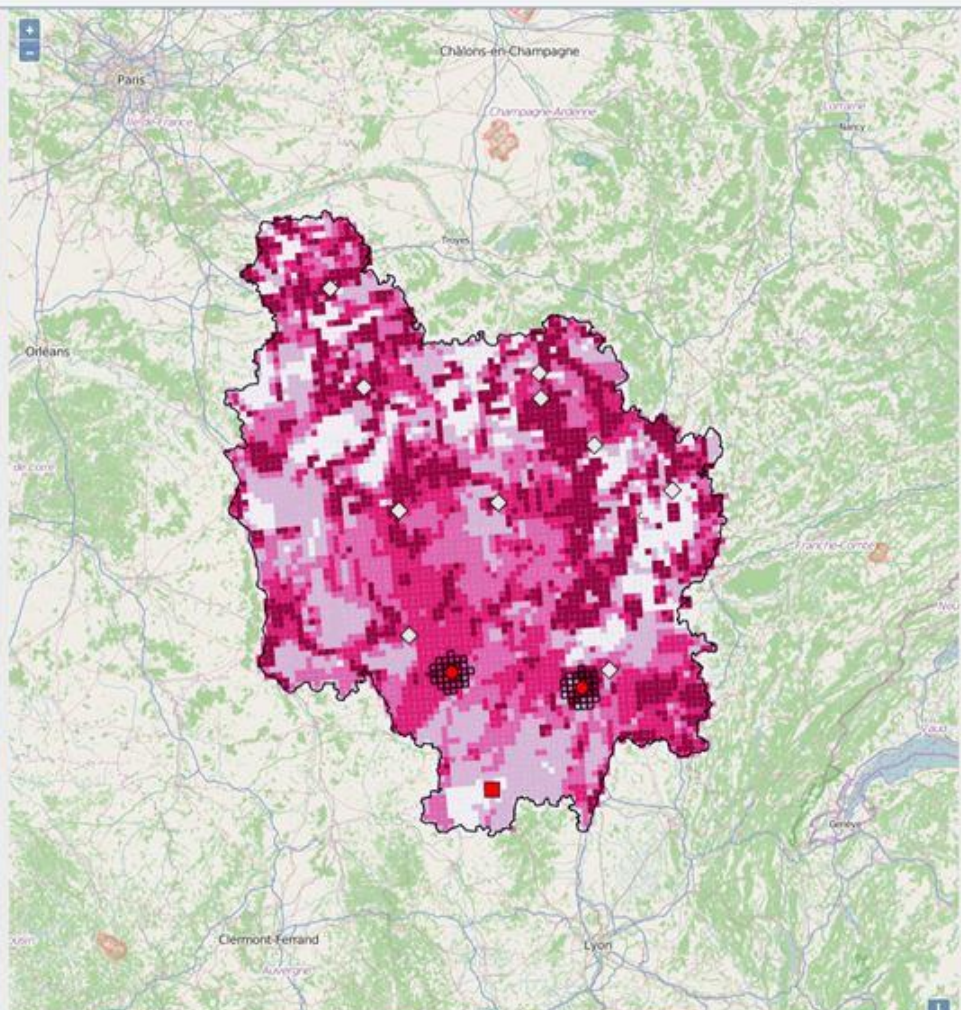
Cases
Burgundy straw and miscanthus

Variants			
Name	Financial pr...	Energy profit	Net GHG av...
1 PP = CP	3,482,165	439,865	42,099

Create Save Delete Calculate

Biomass types			
Name	Avallab...	Field - I...	ICP - P...
Straw	33	14	9
Miscanthus	100	15	10

Save



Power plants					
Name	Size (to...	Amoun...	Finan...	Energ...	Net G...
PP	30,000	30,638	3,482,...	439,865	42,099

Create Save Delete

Intermediate collection points		
Name	Amoun...	Distan...
PP	6,904	36,170
ICP	23,734	119,688

Create Save Delete CP = PP

- **two intermediate collection points**
- **for this size of the power plant two is probably too much (very small collection circle)**
- **however this can be compared on costs, energy production and avoided GHG emissions**

- excel sheet calculates economics, energy production and avoided GHG emissions

## Variants

Name	Financial profit	Energy profit	Net GHG avoided
empty	0	0	0
1 pp, 1 icp	2,262,882	418,374	39,917
1 pp, 1 icp sep	2,189,716	413,111	39,416
1 pp, 1 icp misc sep	3,616,822	437,397	41,876
1 pp, 2 icp sep	2,201,090	412,181	39,327

- **LOCAgistics current cost calculation method based on Bioloco (logistical optimization model): ‘simple chain calculation’ in excel:**
  - specify basic chain data (biomass, storage, transport, loading/unloading, pre-treatment and conversion)
  - weight/volume restrictions of transport means
  - total transport distance calculated by ‘biomass search procedure’
  - then overall revenues and costs are calculated



# LOCAgistics Basic chain data

Input basic	yellow = calculated	
<b>Biomass basic</b>	<b>B1</b>	<b>B2</b>
name	Straw	Miscanthus
Higher Heating value [GJ/ton dm]	17.00	18.50
initial moisture content [kg moisture/kg total]	16%	15%
biomass costs at roadside [euro/ton dm]	45.00	8.82
energy use biomass at roadside [GJ/ton dm]	0.50	0.84
<b>Form basic</b>	<b>F1</b>	<b>F2</b>
description form	bales	pellets
bulk density [kg dm/m3]	400	650
specific volume [m3/ton dm]	2.50	1.54
<b>Storage basic</b>	<b>S1</b>	<b>S2</b>
name	open air storage	covered storage
costs [euro/m3.month]	0.23	0.92
energy use [MJ/m3.month]	0.00	0.00
<b>Transport basic</b>	<b>FI to IC</b>	<b>IC to PP</b>
name	truck	walking floor
maximum volume [m3]	80	92.3
maximum weight [ton]	26.6	28
variable vehicle costs per driven km [euro/km]	3.26	3.10
fixed vehicle costs per load [euro]	0.00	0.00
transport energy [MJ/km]	4.48	4.48

# LOCAgistics Basic chain data

<b>Transport basic</b>	<b>FI to IC</b>	<b>IC to PP</b>
name	truck	walking floor
maximum volume [m3]	80	92.3
maximum weight [ton]	26.6	28
variable vehicle costs per driven km [euro/km]	3.26	3.10
fixed vehicle costs per load [euro]	0.00	0.00
transport energy [MJ/km]	4.48	4.48
<b>Loading/unloading basic</b>	<b>L1</b>	<b>L2</b>
transport type being (un)loaded	truck	walking floor
loading costs [euro/m3]	0.63	0.31
unloading costs [euro/m3]	0.50	0.25
loading energy [MJ/m3]	3.13	3.00
unloading energy [MJ/m3]	3.13	3.00
<b>Pretreatment</b>	<b>P1</b>	<b>P2</b>
name	pelletising	grinding
output form	pellets	powder
pretreatment costs [euro/m3]	22.80	9.74
pretreatment energy [MJ/m3]	4.00	6.00
drying costs [euro/ton moisture]	0.00	0.00
drying energy [MJ/ton moisture]	0.00	0.00

# LOCAgistics Basic chain data

<b>Conversion</b>	<b>C1</b>
name	combustion, grate boiler 5MWe, 10 MWth
net energy returns electricity [usable GJ/GJ input]	25.00%
net energy returns heat [usable GJ/GJ input]	60.00%
evaporation energy moisture [GJ/ton moisture]	2.256
capacity input [ton dm/month]	2,500
working hours [per month]	583
fixed costs plant + conversion [euro /year]	625,000.00
variable costs conversion [euro/ton dm input]	30.00
energy use [GJ/m3]	0.0002
emission CO2 [mg/Nm3]	0
emission NOx [mg/Nm3]	475
emission SO2 [mg/Nm3]	0
emission dust [mg/Nm3]	3,000
<b>Revenues</b>	<b>PP</b>
price electricity [euro/GJ]	53.61
price heat [euro/GJ]	3.17
<b>Legenda</b>	
B1 = biomass type 1; B2 = biomass type 2	
IC= intermediate collection point; PP = power plant	
FI=Field	

# LOCAgistics chain design

Input chain	yellow = calculated								
Chain	orange = fixed								
Chain									Formula
case description	Burgundy								
calculation number	1								
biomass chain name	bioenergy								
	<b>Chain design</b>	<b>B1 to IC1</b>	<b>B1(IC1) to PP</b>	<b>B2 to IC1</b>	<b>B2(IC1) to PP</b>				
	Straw to [default name] Straw ([default name] Miscanthus to [default name] Miscanthus ([default name]) to [default name])								
<b>Biomass</b>									
biomass type	Straw	Straw	Miscanthus	Miscanthus					taken from Input basic
origin location	Field	IC1	Field	IC1					fixed
destination location	IC1	PP	IC1	PP					fixed
description form	bales	pellets	bales	pellets					taken from Input basic
bulk density [kg dm/m3]	400	650	400	650					taken from Input basic
specific volume [m3/ton dm]	2.50	1.54	2.50	1.54					1000/bulk density
biomass shipped fresh [ton fresh]	4,285	4,049	31,054	29,329					biomass dry matter / (100 - initial moisture content) * 100
moisture content [kg moisture/kg total]	14%	9%	15%	10%					only original biomass moisture content inserted, other manual
biomass shipped dry [ton dm]	3,685	3,685	26,396	26,396					transfer from LOCAgistics
<b>Storage</b>									
name	open air storage	covered storage	open air storage	covered storage					taken from Input basic
costs [euro/m3.month]	0.23	0.92	0.23	0.92					taken from Input basic
energy use [MJ/m3.month]	0.00	0.00	0.00	0.00					taken from Input basic
average storage time [month]	4.5	4.5	4.5	4.5					default that can be changed
<b>Transport basic</b>									
name	truck	walking floor	truck	walking floor					taken from Input basic
maximum volume [m3]	80	92	80	92					taken from Input basic
maximum weight [ton]	27	28	27	28					taken from Input basic
variable vehicle costs per driven km [euro/km]	3.26	3.10	3.26	3.10					taken from Input basic
fixed vehicle costs per load [euro]	0.00	0.00	0.00	0.00					taken from Input basic
transport energy [MJ/ton.km]	4.48	4.48	4.48	4.48					taken from Input basic
total transport [ton.km]	54,403	211,847	392,036	1,535,414					transfer from LOCAgistics
transported weight per trip (if volume limited) [ton]	32.0	60.0	32.0	60.0					max volume/specific volume

# LOCAgistics chain design

<b>Loading/unloading basic</b>					
transport type being (un)loaded	truck	walking floor	truck	walking floor	taken from Input basic
loading costs [euro/m3]	0.63	0.31	0.63	0.31	taken from Input basic
unloading costs [euro/m3]	0.5	0.25	0.5	0.25	taken from Input basic
loading energy [MJ/m3]	3.13	3.00	3.13	3.00	taken from Input basic
unloading energy [MJ/m3]	3.13	3.00	3.13	3.00	taken from Input basic
<b>Pretreatment</b>					
name	pelletising	grinding	pelletising	grinding	
biomass output	pellets	powder	pellets	powder	
pretreatment costs [euro/m3]	22.80	9.74	22.80	9.74	
pretreatment energy [MJ/m3]	4.00	6.00	4.00	6.00	
drying costs [euro/ton moisture]	0.00	0.00	0.00	0.00	
drying energy [MJ/ton moisture]	0.00	0.00	0.00	0.00	
Percentage moisture content	14	9	15	10	

# LOCAgistics calculation

Costs and revenues value chain					
	orange = fixed				
Costs	B1 to IC1	B1(IC1) to PP	B2 to IC1	B2(IC1) to PP	Sum
purchase costs [euro]	165,818	0	232,815	0	398,632
storage costs [euro]	9,535	23,470	68,300	168,124	269,428
transport costs [euro]	5,542	10,946	39,939	79,336	135,764
number of transports	115	61	825	440	1,441
loading/ unloading costs [euro]	10,410	3,175	74,569	22,741	110,895
pretreatment costs [euro]	210,036	55,216	1,504,584	395,537	2,165,373
drying costs [euro]	0	0	0	0	0
variable conversion costs [euro]	0	110,545	0	791,886	902,432
fixed conversion costs [euro]	0	0	0	625,000	625,000
total conversion costs [euro]					1,527,432
<b>Revenues</b>					
electricity [euro]	7,294,567	electricity * payment	electricity		
heat [euro]	1,035,200	heat * payment	heat		

## Costs and revenues value chain

### Costs

purchase costs [euro]	biomass shipped dry [ton dm] * biomass costs at roadside [euro/ton dm]
storage costs [euro]	biomass shipped dry [ton dm] * specific volume [m3/ton dm] * storage costs [euro/m3.month] * average storage time [month]
transport costs [euro]	(total transport [ton.km] * variable vehicle costs per driven km [euro/km]) / transported weight per trip (if volume limited) [ton]
number of transports	biomass shipped dry [ton dm] / max volume or year consumed biomass / transported weight (in case of volume limited)
loading/ unloading costs [euro]	biomass shipped dry [ton dm] * specific volume [m3/ton dm] * (loading costs [euro/m3] + unloading costs [euro/m3])
pretreatment costs [euro]	biomass shipped dry [ton dm] * specific volume [m3/ton dm] * pretreatment costs [euro/m3]
drying costs [euro]	biomass shipped dry [ton dm] * specific volume [m3/ton dm] * drying costs [euro/ton moisture]
variable conversion costs [euro]	biomass shipped dry [ton dm] * variable costs conversion [euro/ton dm input]
fixed conversion costs [euro]	fixed costs plant + conversion [euro /year] ONLY ONCE!
total conversion costs [euro]	variable conversion costs + fixed conversion costs [euro]

## Output simple chain calculation

Case description	Burgundy		
Calculation number	1		
Biomass chain name	bioenergy		
<b>Total throughput:</b>			
<b>[ton dm]:</b>			
from sources	30,081		
<b>Revenues and costs:</b>			
<b>[euro]</b>			
electricity revenues	7,294,567		
heat revenues	1,035,200	total revenues	8,329,766
purchase costs	398,632		
storage costs	269,428		
transport costs	135,764		
loading/unloading costs	110,895		
pretreatment costs	2,165,373		
drying costs	0		
conversion costs	1,527,432	total costs	4,607,524
		profit	3,722,243

public site for s2biom tools:

<http://s2biom-test.alterra.wur.nl>

from main menu you can access:

- **Biomass chain data**
  - Supply viewer
  - Cost/supply viewer
- **Tools**
  - Matching tool (Bio2Match)
  - LocaGIStics



**Thank you for your attention!**

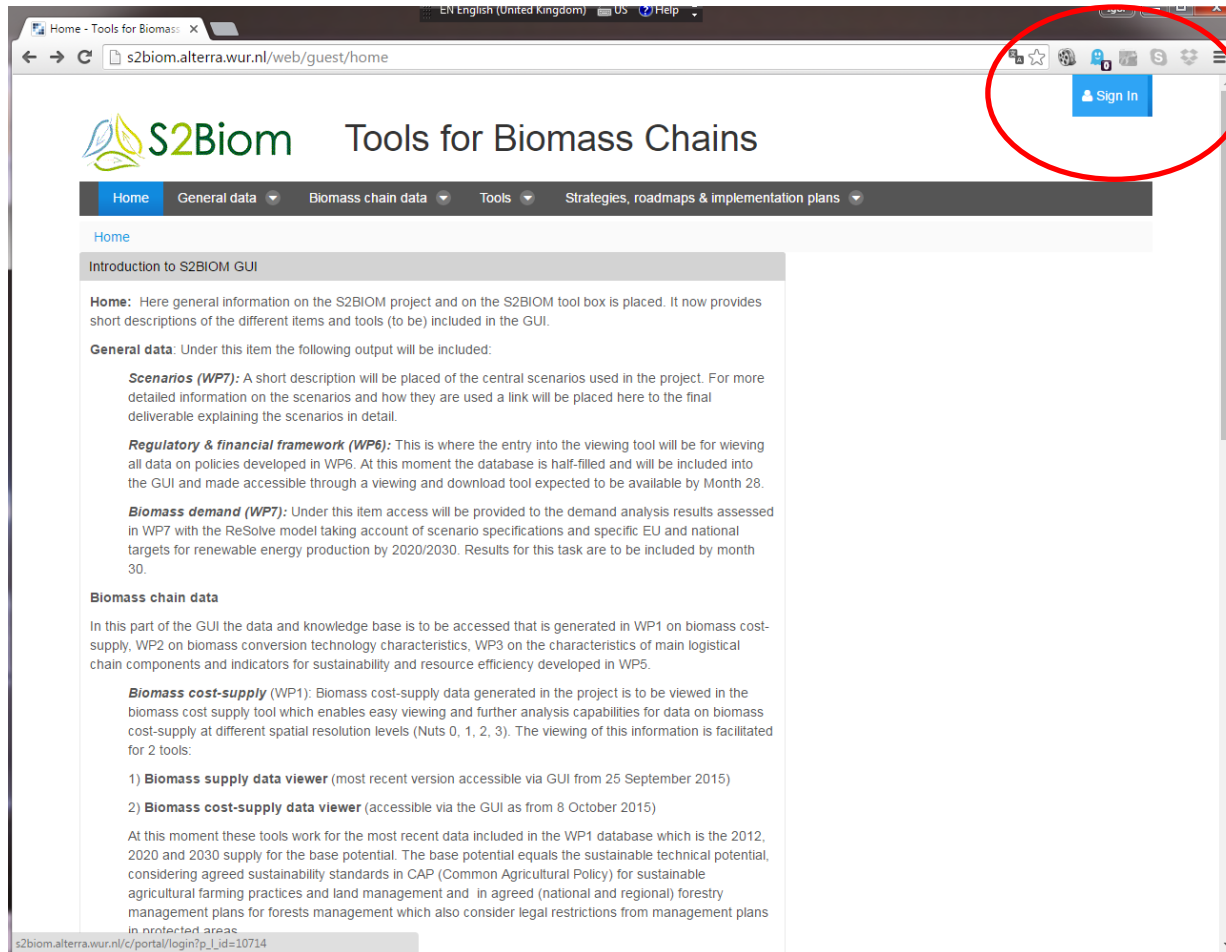
**[igor.staritsky@wur.nl](mailto:igor.staritsky@wur.nl)**

**Bert Annevelink, Bas Vanmeulebrouk, Berien  
Elbersen**

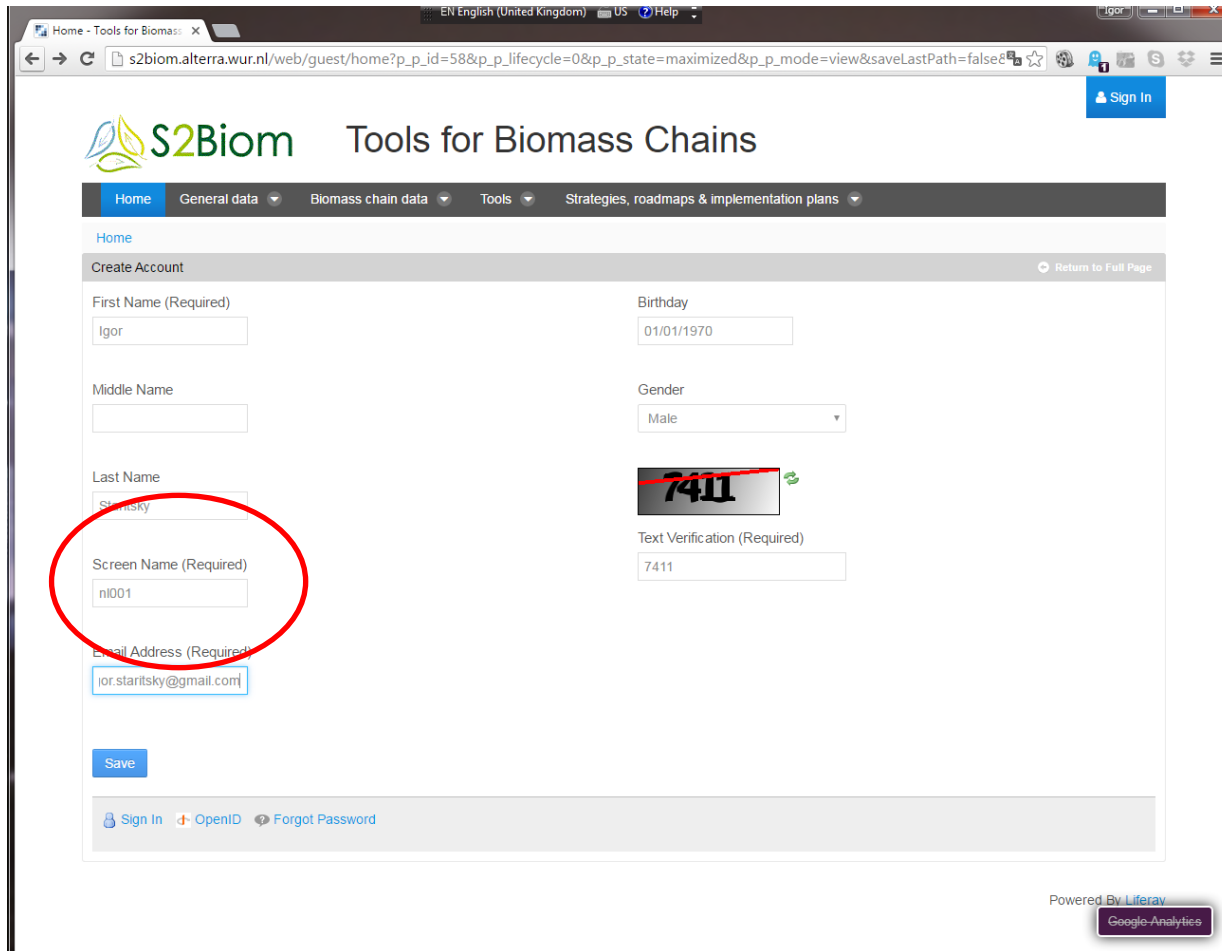


Now, go and find out for yourself

- Make your own login code
- Goto: <http://s2biom-test.alterra.wur.nl>
- Push **Sign In** button, top right
- Use **Create account** for new account (follow instructions on screen)
- Suggested username:
  - Find your student number on the list, say **25**
  - Create username GR\_00**25**

A screenshot of a web browser displaying the S2Biom website. The browser's address bar shows the URL "s2biom.alterra.wur.nl/web/guest/home". The website header includes the S2Biom logo and the title "Tools for Biomass Chains". A navigation menu contains links for "Home", "General data", "Biomass chain data", "Tools", and "Strategies, roadmaps & implementation plans". A "Sign In" button is highlighted with a red circle in the top right corner. The main content area is titled "Introduction to S2BIOM GUI" and contains several sections of text, including "Home", "General data", "Scenarios (WP7)", "Regulatory & financial framework (WP6)", "Biomass demand (WP7)", and "Biomass chain data". The footer of the page shows the URL "s2biom.alterra.wur.nl/c/portal/login?p\_l\_id=10714".

# Create new account



Home - Tools for Biomass Chains

Home | General data | Biomass chain data | Tools | Strategies, roadmaps & implementation plans

Home

Create Account [Return to Full Page](#)

First Name (Required)  
Igor

Birthday  
01/01/1970

Middle Name

Gender  
Male

Last Name  
Staritsky

Screen Name (Required)  
ni001

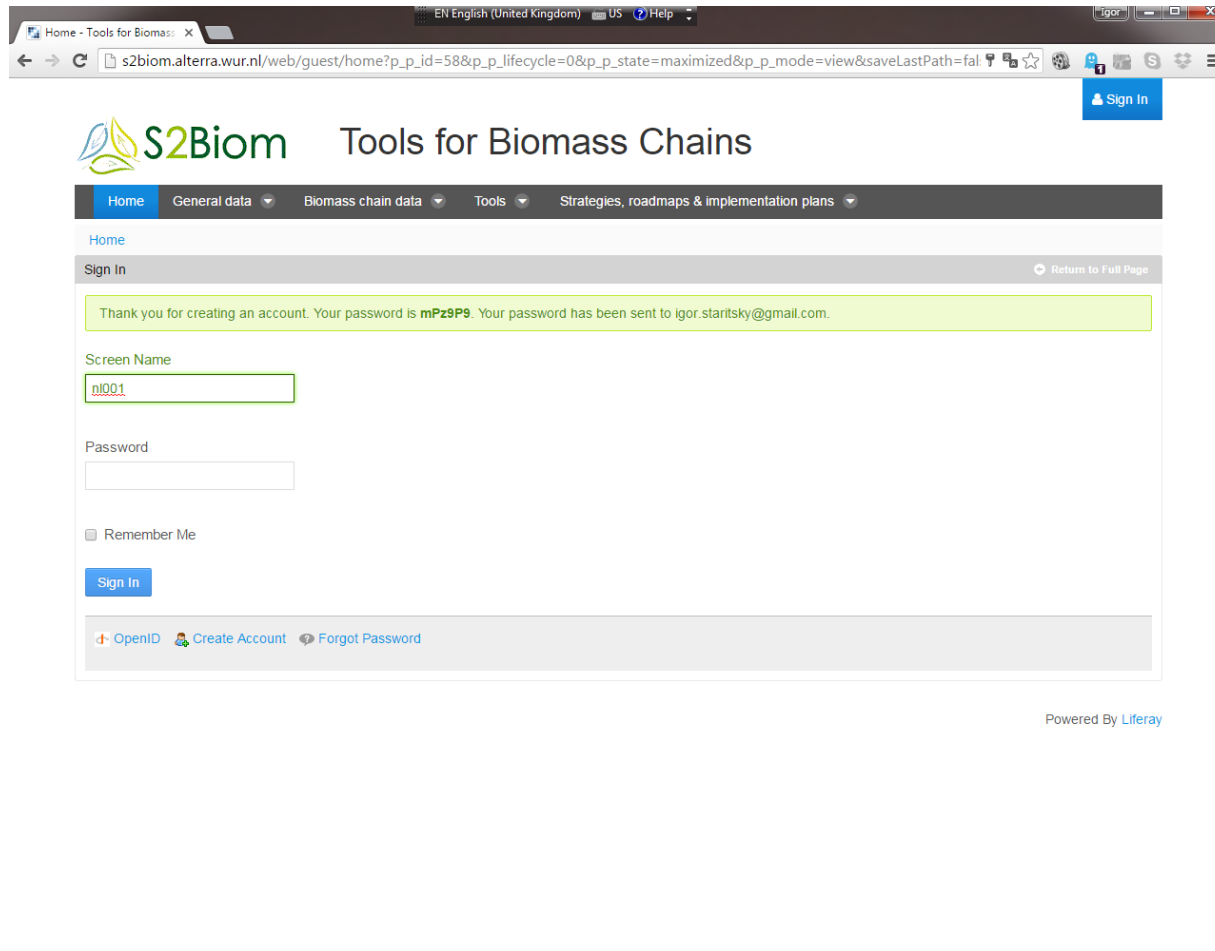
Email Address (Required)  
igor.staritsky@gmail.com

Text Verification (Required)  
7411

Save

[Sign In](#) [OpenID](#) [Forgot Password](#)

Powered By [Liferay](#)  
Google Analytics



Home - Tools for Biomass: X

EN English (United Kingdom) US Help

s2biom.alterra.wur.nl/web/guest/home?p\_p\_id=58&p\_p\_lifecycle=0&p\_p\_state=maximized&p\_p\_mode=view&saveLastPath=fal

Sign In

# S2Biom Tools for Biomass Chains

Home General data Biomass chain data Tools Strategies, roadmaps & implementation plans

Home

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Thank you for creating an account. Your password is **mPz9P9**. Your password has been sent to igor.staritsky@gmail.com.

Screen Name

Password

Remember Me

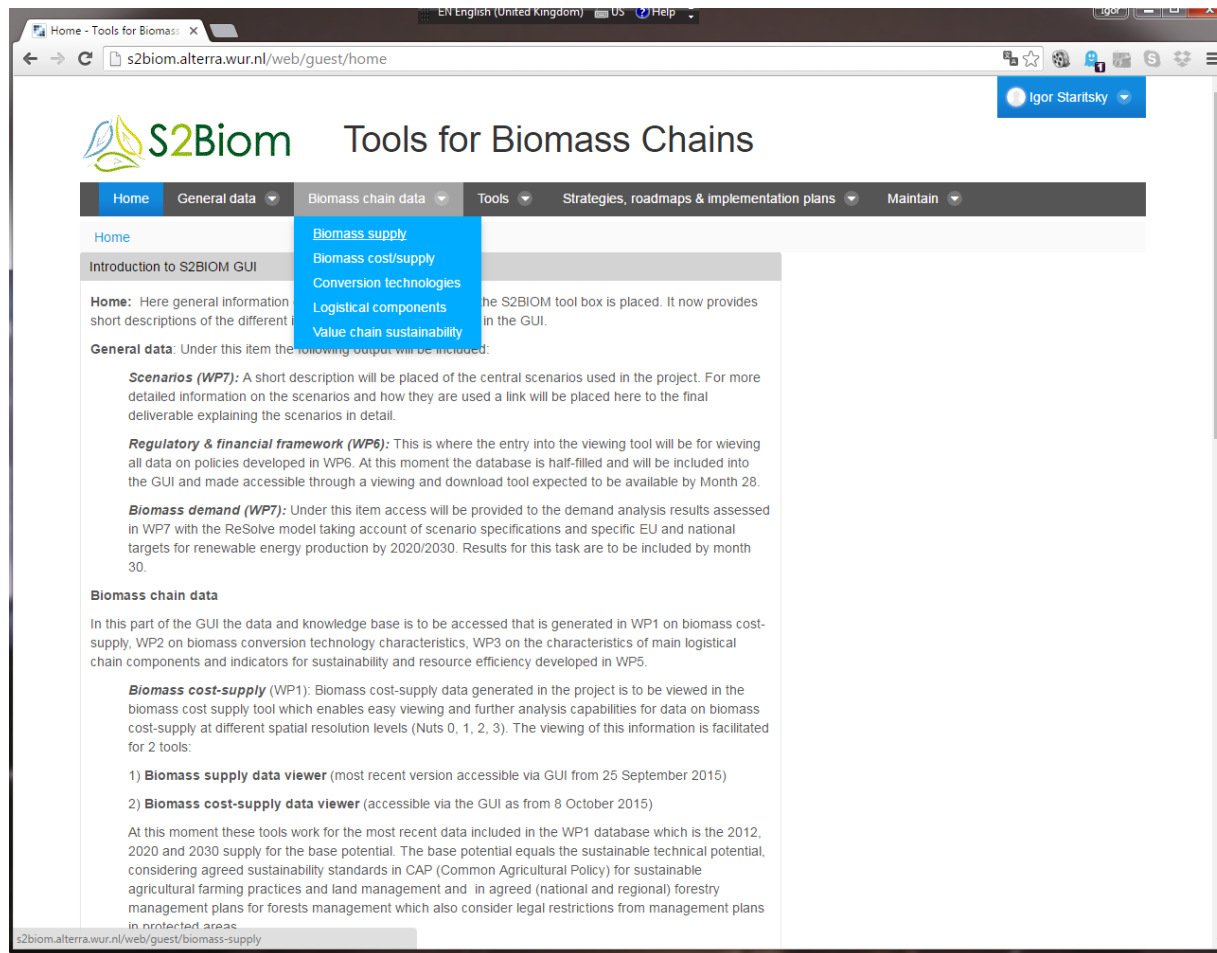
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# Accept and make nice password

A screenshot of a web browser displaying the 'New Password' page of the S2Biom website. The browser's address bar shows the URL 's2biom.alterra.wur.nl/web/guest/home'. The page header includes the S2Biom logo and the text 'Tools for Biomass Chains'. A navigation menu contains links for 'Home', 'General data', 'Biomass chain data', 'Tools', 'Strategies, roadmaps & Implementation plans', and 'Maintain'. A user profile dropdown for 'Igor Startsky' is visible in the top right. The main content area is titled 'New Password' and contains a light blue message box that says 'Please set a new password.'. Below this, there are two password input fields: 'Password' and 'Enter Again', both with masked characters (dots). A blue 'Save' button is located at the bottom left of the form. The footer of the page indicates 'Powered By Liferay'.



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s2biom.alterra.wur.nl/web/guest/home

Igor Staritsky

# S2Biom Tools for Biomass Chains

- Home
- General data
- Biomass chain data
  - Biomass supply
  - Biomass cost/supply
  - Conversion technologies
  - Logistical components
  - Value chain sustainability
- Tools
- Strategies, roadmaps & implementation plans
- Maintain

Home

Introduction to S2BIOM GUI

**Home:** Here general information on the S2BIOM tool box is placed. It now provides short descriptions of the different tools 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 28.
- 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 30.

**Biomass chain data**

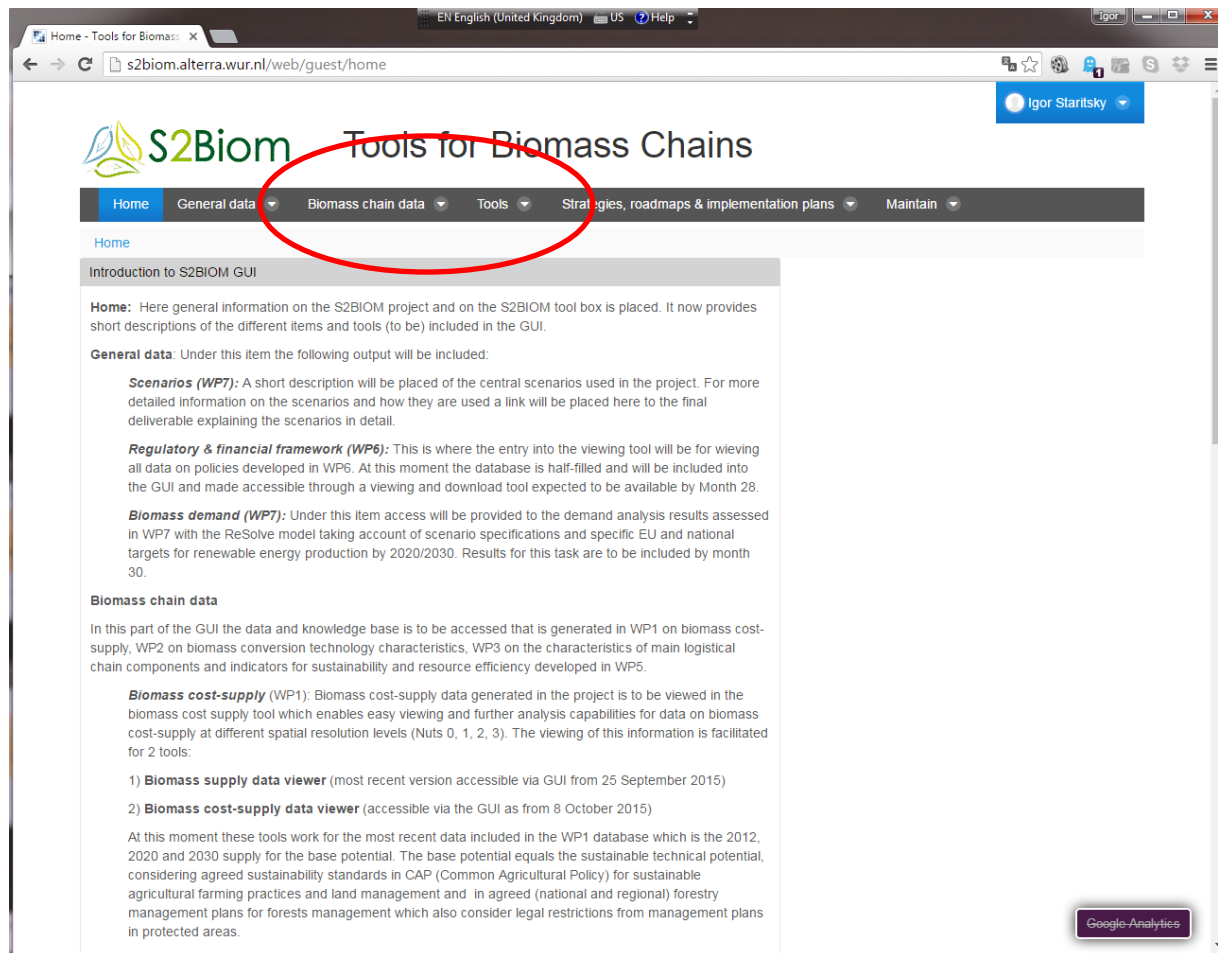
In this part of the GUI the data and knowledge base is to be accessed that is generated in WP1 on biomass cost-supply, WP2 on biomass conversion technology characteristics, WP3 on the characteristics of main logistical chain components and indicators for sustainability and resource efficiency developed 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 cost-supply at different spatial resolution levels (Nuts 0, 1, 2, 3). The viewing of this information is facilitated for 2 tools:

- 1) **Biomass supply data viewer** (most recent version accessible via GUI from 25 September 2015)
- 2) **Biomass cost-supply data viewer** (accessible via the GUI as from 8 October 2015)

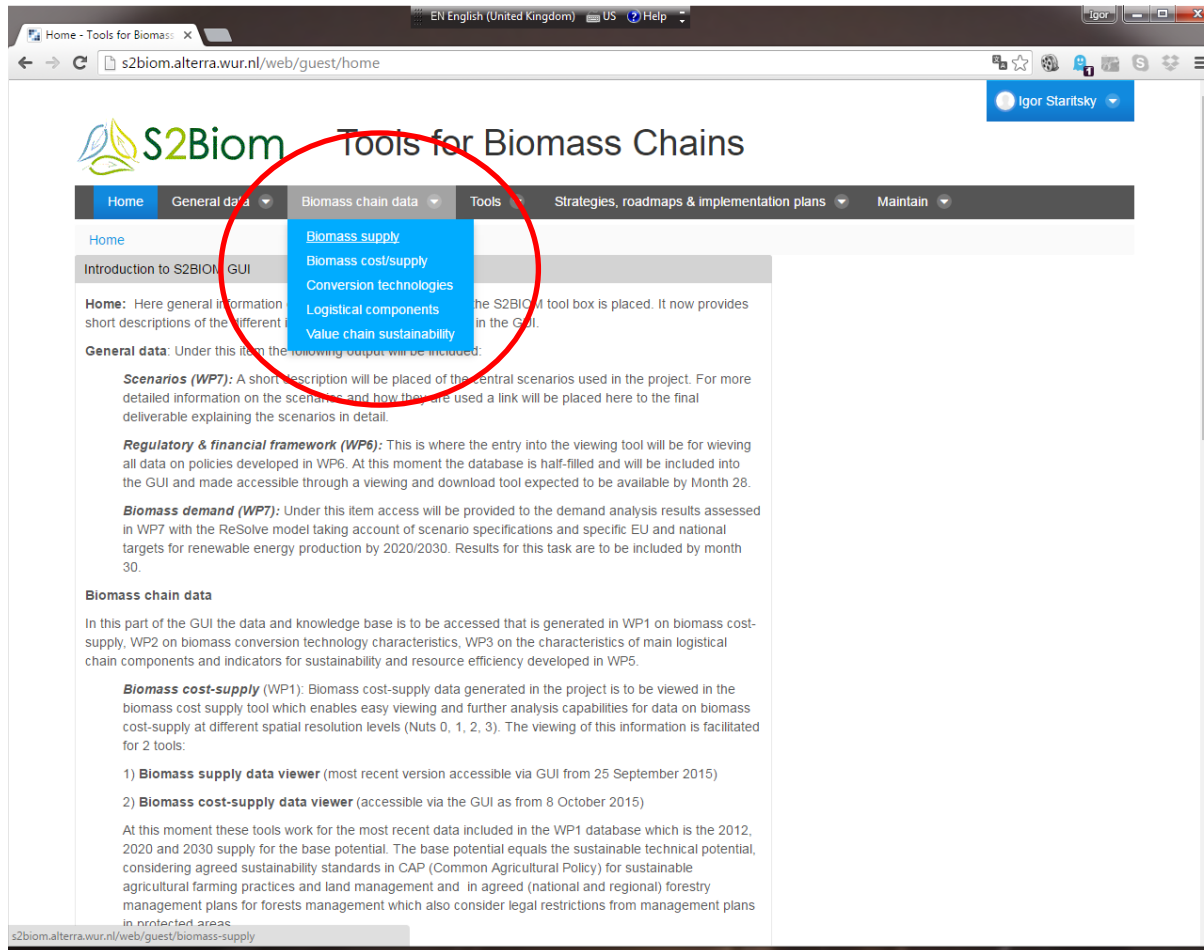
At this moment these tools work for the most recent data included in the WP1 database which is the 2012, 2020 and 2030 supply for the base potential. The base potential equals the sustainable technical potential, considering agreed sustainability standards in CAP (Common Agricultural Policy) for sustainable agricultural farming practices and land management and in agreed (national and regional) forestry management plans for forests management which also consider legal restrictions from management plans in protected areas

s2biom.alterra.wur.nl/web/guest/biomass-supply

A screenshot of a web browser displaying the S2Biom website. The browser's address bar shows "s2biom.alterra.wur.nl/web/guest/home". The website header includes the S2Biom logo and the title "Tools for Biomass Chains". A dark navigation bar contains several menu items: "Home", "General data", "Biomass chain data", "Tools", "Strategies, roadmaps & implementation plans", and "Maintain". The "Tools" menu item is circled in red. Below the navigation bar, the page content includes an "Introduction to S2BIOM GUI" section with a "Home" link. The main text describes the project and lists several data categories: "General data", "Scenarios (WP7)", "Regulatory & financial framework (WP6)", and "Biomass demand (WP7)". A "Biomass chain data" section follows, detailing the GUI's data and knowledge base, and listing two tools: "Biomass supply data viewer" and "Biomass cost-supply data viewer". A "Google-Analytics" tracking code is visible in the bottom right corner of the page content.



# Accessing the tools



The screenshot shows a web browser window displaying the S2Biom website. The browser's address bar shows the URL `s2biom.alterra.wur.nl/web/guest/home`. The website header includes the S2Biom logo and the text "Tools for Biomass Chains". A navigation menu is visible, with the "Tools" dropdown menu open. The "Tools" menu is circled in red, and the "Biomass supply" option is highlighted in blue. Other options in the menu include "Biomass cost/supply", "Conversion technologies", "Logistical components", and "Value chain sustainability". The main content area of the website contains text about the S2Biom tool box, including sections for "General data", "Scenarios (WP7)", "Regulatory & financial framework (WP6)", "Biomass demand (WP7)", and "Biomass chain data".

# Biomass Supply viewer



The screenshot shows the S2Biom Biomass supply viewer interface. The title bar indicates the browser window is 'Biomass supply - Tools for...'. The page title is 'S2Biom Tools for biomass chains'. The breadcrumb navigation shows 'Biomass chain data / Biomass supply'. The main title of the tool is '2020 - Production from forests - Stemwood from final fellings & thinnings - Final fellings from nonconifer trees - base potential - energy value - area weighted'.

**Administrative level:**

Administrative level	Scenario
nuts0	2012
nuts1	2020
nuts2	2030

**Category:**

- Production from forests
- Primary residues from forests
- Other land use

**Subcategory:**

- Stemwood from final fellings & thinnings

**Type:**

- Final fellings from nonconifer trees
- Final fellings from conifer trees
- Thinnings from nonconifer trees

**Potential:**

- base potential
- technical potential
- user defined 1

**Map:**

**Legend:**

energy value	weight	volume	costs
area weighted	absolute		
Unit: GJ/km2			
0			
0 - 50			
50 - 100			
100 - 150			
150 - 200			
200 - 250			
250 - 300			
300 - 350			
350 - 400			
400 - 450			

**Summary:**

Current selection	Identify result	Selected regions
NUTS level	nuts2	
Scenario	2020	
Category	Production from forests	
Subcategory	Stemwood from final fellings & thinnings	
Type	Final fellings from nonconifer trees	
Potential	base potential	

**Biomass supply (WP1)**



# Biomass cost/supply

