

LocaGIStics

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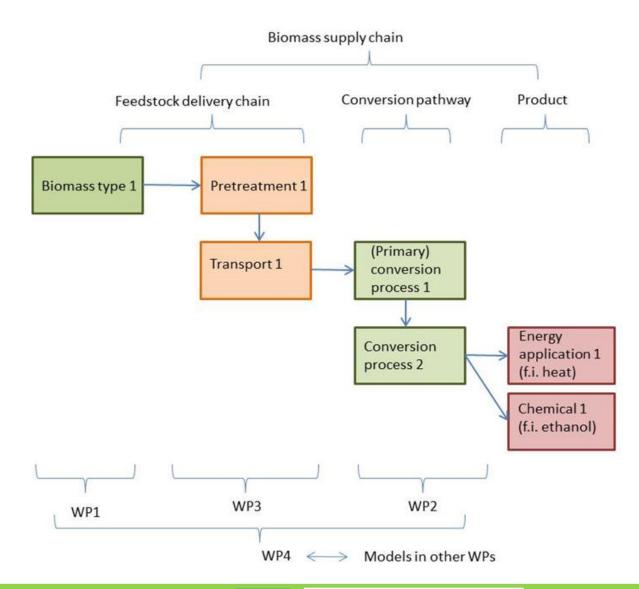




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Biomass supply chain









Objectives & tasks WP3: Logistics



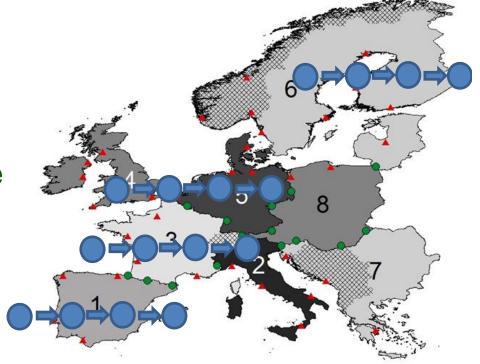
- to identify and characterise the main logistical components (such as storage, pre-treatment and transportation technologies) (Task 3.1)
- to identify and assess existing and develop new logistical concepts (e.g. biomass yards) to optimize sustainable non-food biomass feedstock delivery chains (Task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



From component to case study 28iom

- 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)

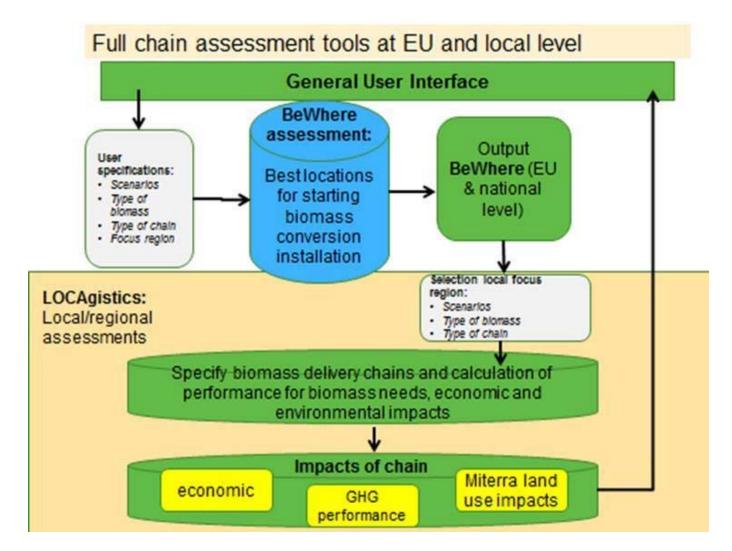






Two tools for assessments: BeWhere & Locagistics





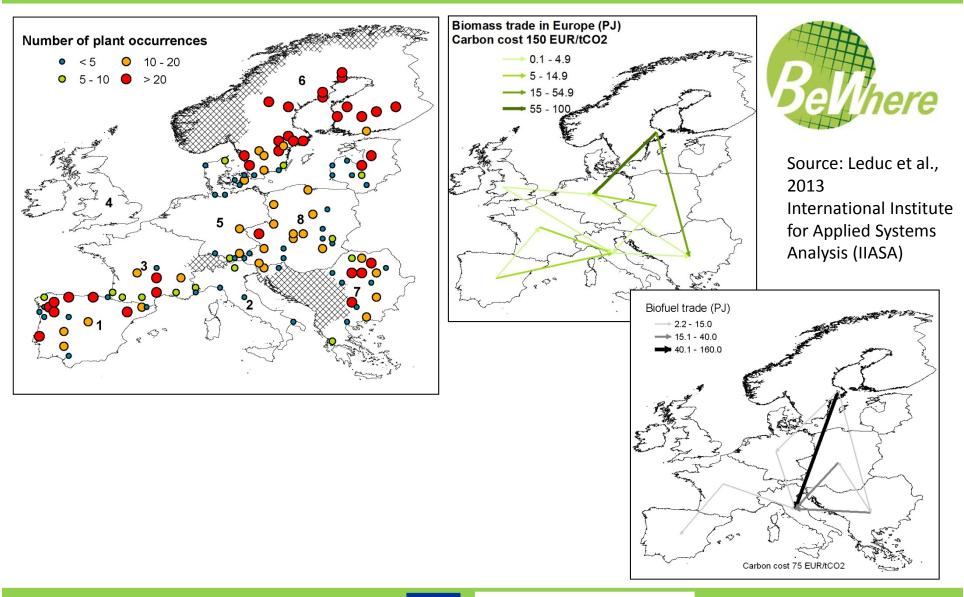
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Output BeWhere







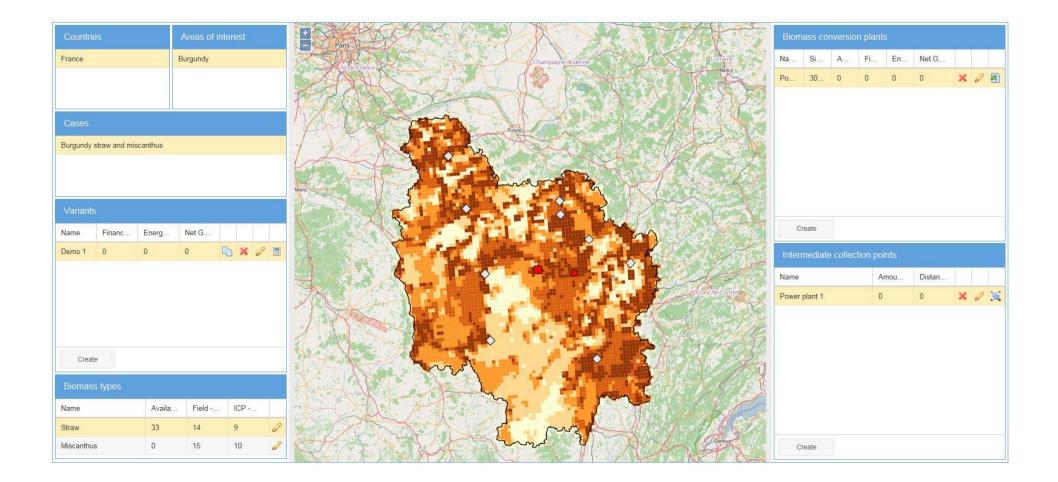
Regional level: LocaGIStics



- 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

User interface LocaGIStics





11/12/2015



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Specify a case study (1)



• country, area of interest, case, variant, biomass types

Countries	Areas of interest
France	Burgundy

Variants							
Name	Financial profit	Energy profit	Net GHG avoided				
Demo 1	2,192,796	411,899	39,301	9	×	0	

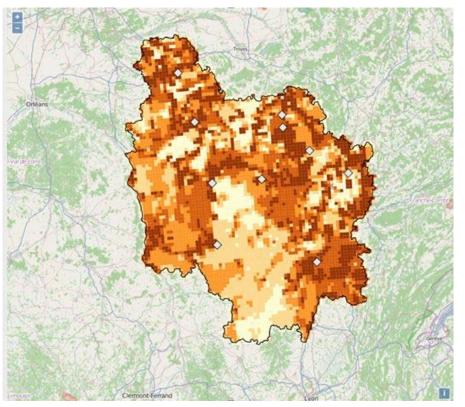
Biomass typ	es			
Name	Availability (%)	Field - ICP moisture content (%)	ICP - PP moisture content (%)	
Miscanthus	0	15	10	6
Straw	33	14	9	0



Specify a case study (2)



regional biomass availability



- 10 powerplant locations suggested for the whole Burgundy region based on calculations BeWhere (white points)
- LOCAgistics will further analyse one of them in more detail



Specify a case study (3)



- power plant
- intermediate collection point

Biomass conv	version plants							
Name	Size (ton DM)	Amount (ton DM)	Financial pr	Energy pr	Net GHG a			
Power plant 1	30,000	30,004	2,192,796	411,899	39,301	×	P	-

Intermediate co	ollection points				
Name	Amount (ton DM)	Distance (ton km.)			
IC_Point 1	11,551	112,018	×	a	36
IC_Point 2	18,645	185,738	×	0	X



Specify a case study (4)



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

Four variants as an example



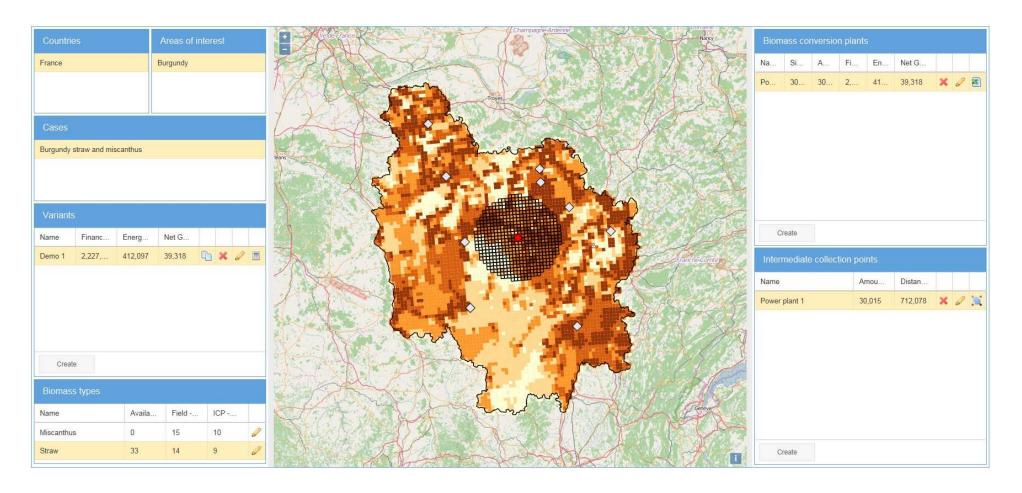
- powerplant & no biomass yard; only straw
- powerplant & no biomass yard; straw & Miscanthus
- powerplant & one biomass yard; straw & Miscanthus
- powerplant & two biomass yards; straw & Miscanthus



Variant 1



powerplant & no biomass yard; only straw







Discussion Variant 1



- map is shown for available straw (yellow)
- only 33% straw was available no Miscanthus
- the size of the collection circle can be influenced:
 - by assuming a higher or lower biomass availability % for a certain biomass type
 - but also by adding more biomass types (e.g. also include Miscanthus in variant 2)







powerplant & no biomass yard; straw & Miscanthus

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Discussion Variant 2



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





powerplant & one biomass yard; straw & Miscanthus

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Discussion variant 3



- separate location for power plant (red box) and intermediate collection point (red circle)
- intermediate collection point located near to area with a high biomass availability (e.g. rural area)
- power plant located near to area with a high energy demand (e.g. city)

Variant 4



powerplant & two biomass yards; straw & Miscanthus

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Discussion Variant 4



- two intermediate collection points with a much smaller biomass collection circle
- for this size of the power plant two intermediate collection points seems too much
- however, this can now be compared on costs, energy production and avoided GHG emissions

Regional level: LocaGIStics



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

Variants							
Name	Financial profit	Energy profit	Net GHG avoided				
Demo 3	3,713,960	437,421	41,896	Ð	×	0	
Demo 1	2,227,160	412,097	39,318	D	×	0	
Demo 2	3,5 <mark>4</mark> 5,369	433,998	41,539	-	×	0	
Demo 4	3,521,293	435,130	41,656	9	×	0	



LocaGIStics output



Output simple chain calculation	on		
Case description	Burgundy		
Calculation number	1		
Biomass chain name	bioenergy		
Total throughput:			
[ton dm]:			
from sources	30,081		
Revenues and costs:			
[euro]			
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





Thank you for your attention!







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