S2Biom

Workshop

"What instruments/tools to develop logistics for the agriculture and forestry biomass supply chain?"

16th November 2015 - Copa-Cogeca, Brussels

S2Biom - sustainable supply of non-food biomass feedstock

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S2Biom at a glance

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

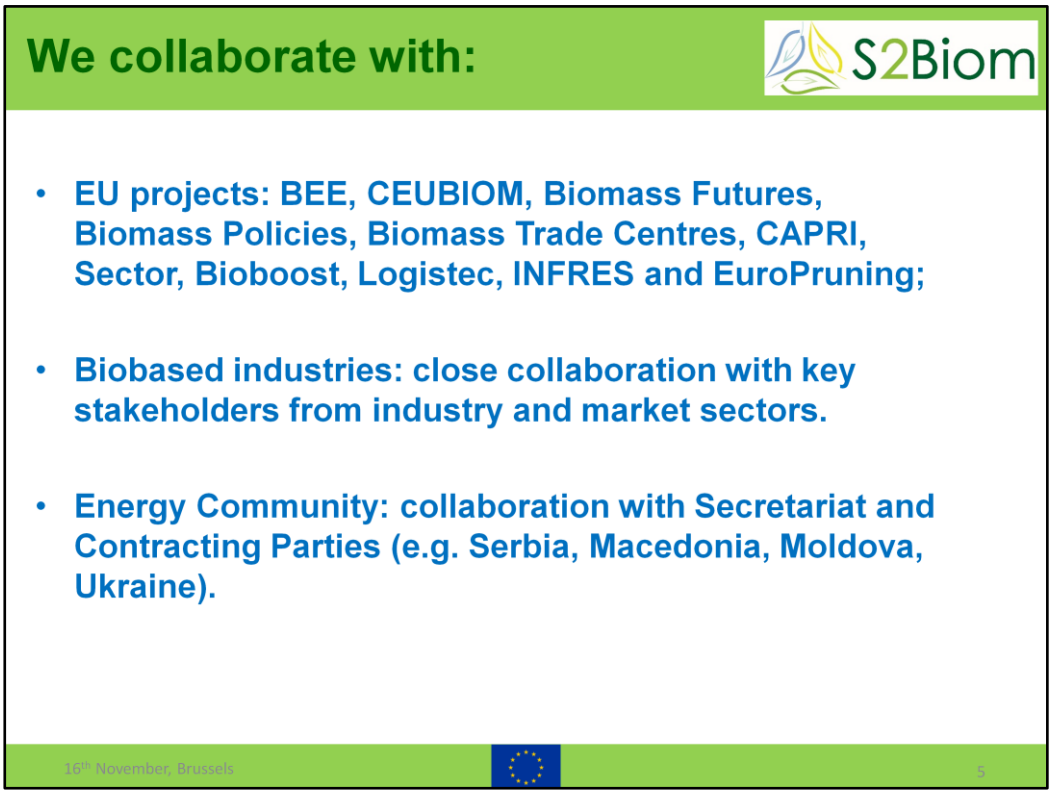
- **Funding programme: 7th Framework Programme (FP7)**
- **Funding volume: 4 Mio € (EC co-funding)**
- **Duration: 36 Month (09/2013 – 08/2016)**
- **Participation: 31 Partners from 16 countries (EU28, Western Balkans, Moldova, Ukraine, Turkey)**
- **Project website: www.s2biom.eu**

Our objectives

- *In support of the sustainable delivery of non-food lignocellulosic biomass at local, regional and pan-European level through developing Strategies, and Roadmaps that will be informed by a "computerized and easy to use" planning toolset (and respective databases) with up to date harmonized data for EU28, western Balkans, Turkey, Moldova and Ukraine.*

- Research *covers the whole biomass delivery chain from primary biomass to end-use of non-food products and from logistics, pre-treatment to conversion technologies.*

- *Spatial level is NUTS1 to NUTS3 for the toolset and the database*



Key to the success, cost efficiency and value for money of this project is the utilisation of up-to-date, relevant information and data, including the following:

Project Structure

Coordination & Management

Theme 1: Data & Tools (WPs 1-4)

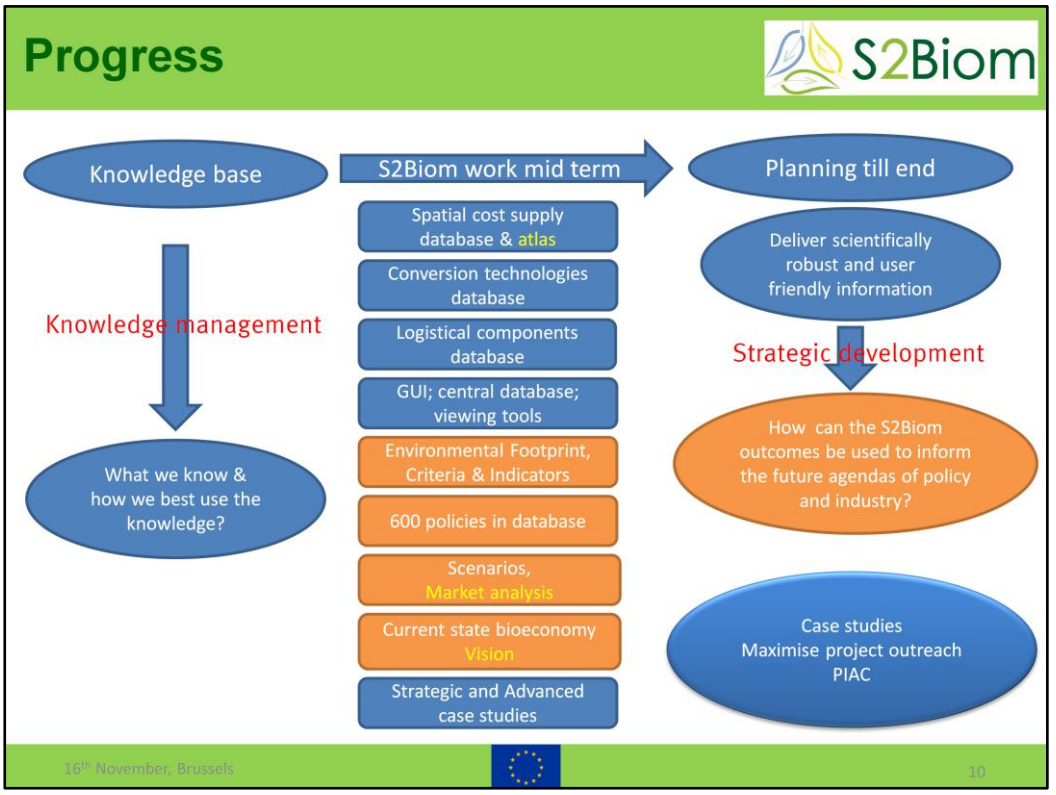
- Current and future sustainable lignocellulosic biomass costs and supply (domestic and from imports) in EU28; Western Balkans, Moldova, Ukraine and Turkey.
- Common operating data, models, and tools representing the entire biomass supply chain
- Incorporation of models and tools for technical, environmental, economic and social impact analysis

Theme 2: Strategies & Roadmaps (WPs 5-8)

- Policy and regulations for supplying the future bioeconomy
- Support for future industrial investments
- Clarity on cross sector sustainability
- Strategies & Roadmap
- Ex ante impact assessment

Theme 3: Validation & project outreach (WPs 9-10)

- Support for policymaking at local, national, regional and EU28 levels by visualizing the outcomes of proposed policies
- Case Studies
- Stakeholder engagement
- Information Campaign
- Improvement of public awareness, education, and outreach


Progress
S2Biom
Knowledge base
S2Biom work mid term
Planning till end
Knowledge management
Spatial cost supply database & atlas
Conversion technologies database
Logistical components database
GUI; central database; viewing tools
Environmental Footprint, Criteria & Indicators
600 policies in database
Scenarios, Market analysis
Current state bioeconomy Vision
Strategic and Advanced case studies
Deliver scientifically robust and user friendly information
Strategic development
How can the S2Biom outcomes be used to inform the future agendas of policy and industry?
What we know & how we best use the knowledge?
Case studies
Maximise project outreach
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Key S2Biom outputs

Database, method and atlas of sustainable non-food lignocellulosic biomass feedstocks at NUTS3 level for EU28, western Balkans, Turkey, Moldova and Ukraine.

Database, method and tool with indicators to assist decision makers in matching biomass types with the optimal conversion technologies.

Database, method and tool to evaluate promising logistics supply chains at local, regional level with sustainability and demand criteria

A computerised toolset integrating data and methodologies from biomass cost supply, conversion and logistics which will "facilitate the integrated design and evaluation of optimal biomass delivery chains at European, national, regional and local scale.

Key S2Biom outputs

Harmonized sustainability requirements for bioeconomy value chains, including guidelines for methodologies to determine sustainability performance.

A database on EU and national level, for all 37 counties analysed in this call, and policy guidelines in relation to the mobilization of sustainable non-food biomass for the biobased economy.

Strategies & implementation plans for lignocellulosic biomass supply tailored to a) different levels of governance (i.e. regional and specific local ones linked to case studies) and ii) industrial sectors

Case studies to validate the Strategies, Roadmaps and the Tool from the users' point of view (i.e. Member States, Associates and neighbouring countries, regional authorities, industries)

Case study outline

- Case Study: Burgundy
- Data as received
- Further data requirement

Input: biomass

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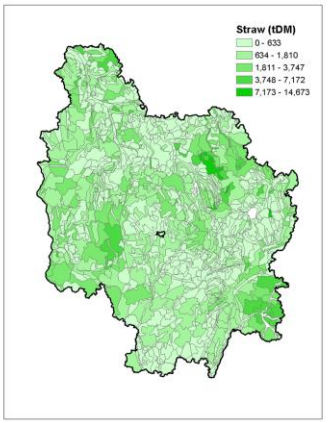
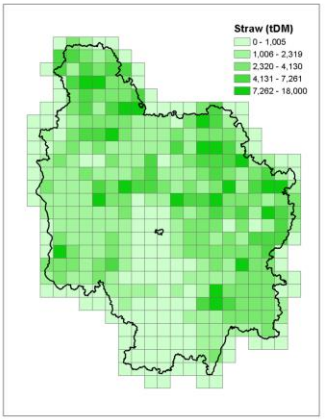
Straw availability



Aggregated straw availability



Input

- Biomass available
- Biomass cost
- Emissions

Other feedstock

- Crop residuals
- Woody biomass (IIASA/WP1)
- Woody by-products (IIASA/WP1)

- Wp 1 data

Input: technology

Key parameters	*Unit*	*Methanol [a, b]*	*Ethanol [c]*	*FT diesel [b]*	*CHP[d]*
Feedstock		Wood chips	Wood chips	Wood chips	Straw
Base plant capacity	$t_{biomass}$/hour	357	105	100	3.75
Cost					
Base investment	M€/a	505	143	67	0.63
O&M	M€/$PJ_{biofuel}$	1.2	2.5	2.9	1.75
Efficiencies					
Total	GJ_{in}/GJ_{out}	**0.66**	**0.81**	**0.57**	**0.85**
Biofuel	$GJ_{biofuel}/GJ_{biomass}$	**0.55**	0.30	0.45	-
Electrical	$GJ_{electricity}/GJ_{biomass}$	0	0.11	0.06	**0.25**
District heating	$GJ_{heat}/Gj_{biomass}$	0.11	**0.40**	0.06	**0.60**

[a] *Hamelinck , et al., 2002.*
[b] *Wahlund, et al., 2004.*
[c] *Barta, et al., 2010.*
[d] *S2Biom*

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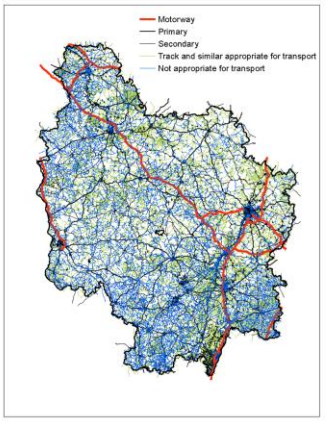
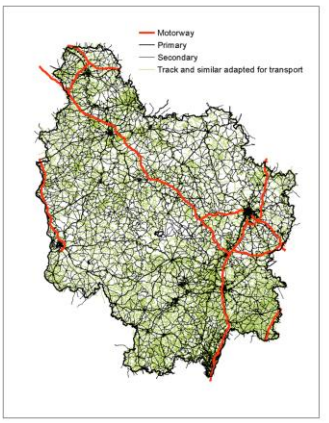
- decision, which technology is used based on the results of the matching tool
- 3 first of them were already in database
- CHP most suitable for Burgundy
    - High efficiency
    - Some biodiesel already

Input: logistics

Road Network



Used road network



Input

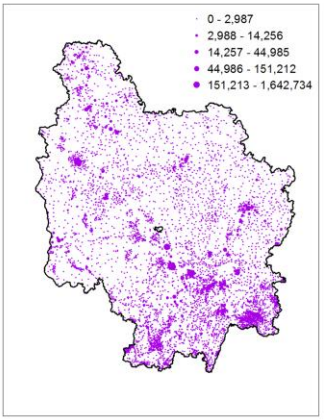
- Transport cost
- Emissions
- Terminals / pretreatment

- Distances from all points to all points based on Min(*t*) or Min(*d*)

Source: OpenStreetMap.org

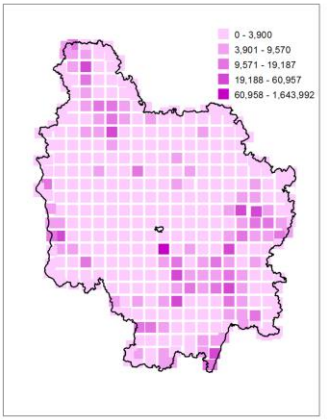
Input: demand

Population



Source: OpenStreetMap.org

Aggregated population



Additional Input needed

- **Heat** consumption
- **Power** consumption
- **Transport fuel** consumption

Based on statistics and weighted by number of inhabitants.

- **Price** of competing fossil fuel based heat / power / transport fuel

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- Population: heat consumption
- Price of competiting fossil fuel is aggregated into the map
- Higher the value, the higher the demand

Input data / Summary

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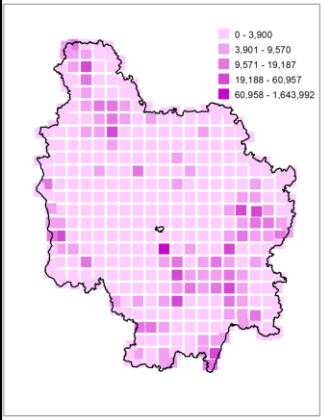
- **Biomass**
  - Location
  - Availability
  - Collecting cost
- **Existing industries**
  - Location
  - Feedstock demand
  - Power/heat output
- **Production plants**
  - Type of biomass
  - Biomass need
  - Economic parameters
  - Conversion efficiency
- **Transport**
  - Type of transport per feedstock
  - Costs
  - Emissions
- **Demand**
  - Location
  - Heat / power / transport fuel
  - Price of competing fossil fuel heat / power / transport fuel
- **Policy in place**
  - Carbon cost
  - Biofuel support
  - Subsidies

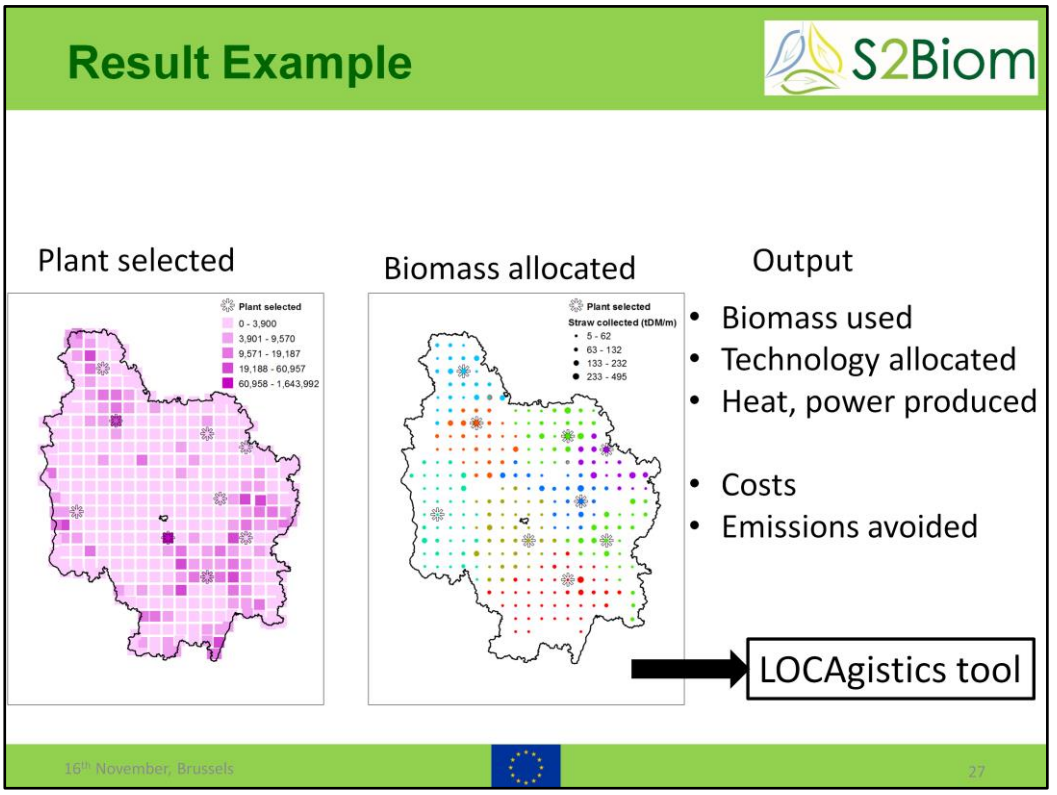
Results

- **Biomass**
  - Site used
  - To which plant
- **Production plants**
  - Number
  - Technologies
  - Capacities
- **Demand**
  - Demand met
  - Import and fossil fuel used
- **Additional information**
  - Quantities
  - Costs
  - Emission

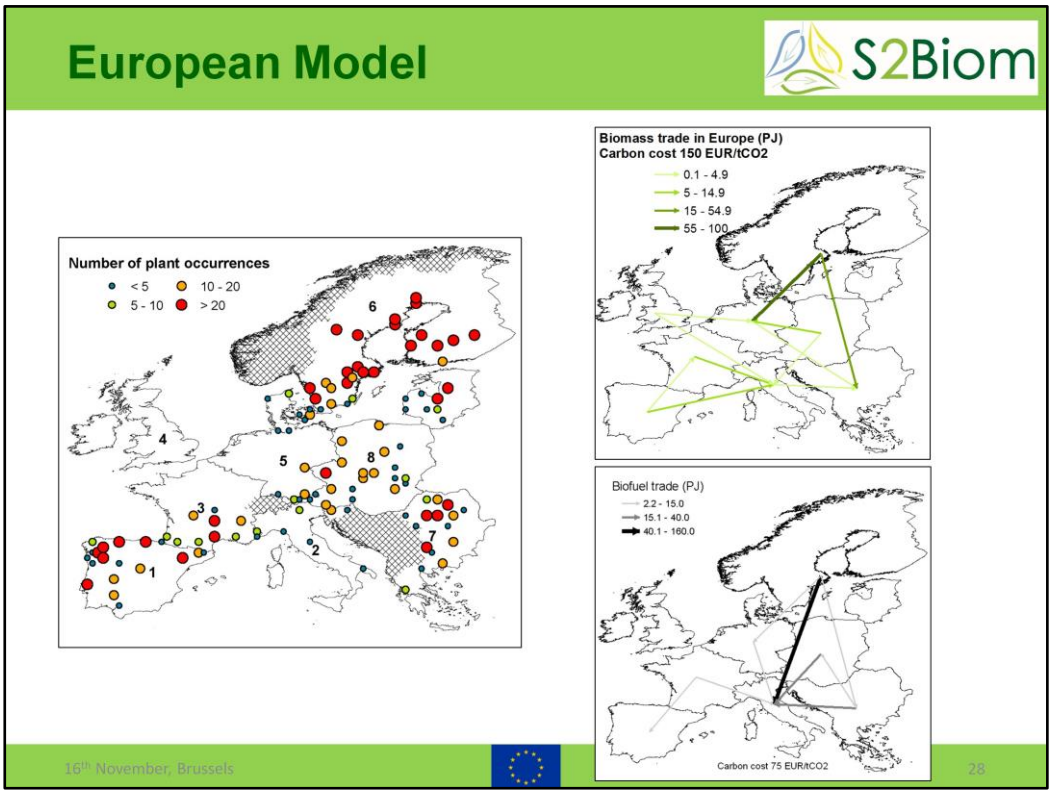
Result Example

Plant selected





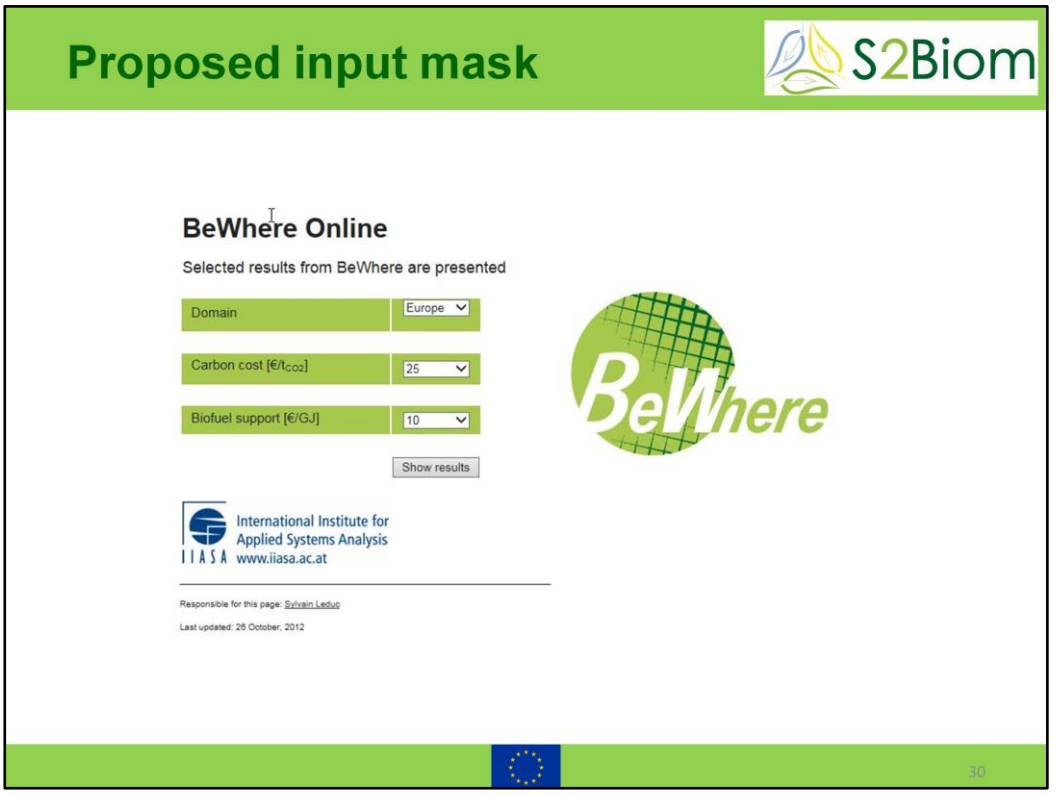
- Plant selection
- Where is the biomass
- Color is for the different plants
- Location of the plant, capacity
- Selection of different optimal logistic value chains
- Locagistic is not giving the optimal location of the plant



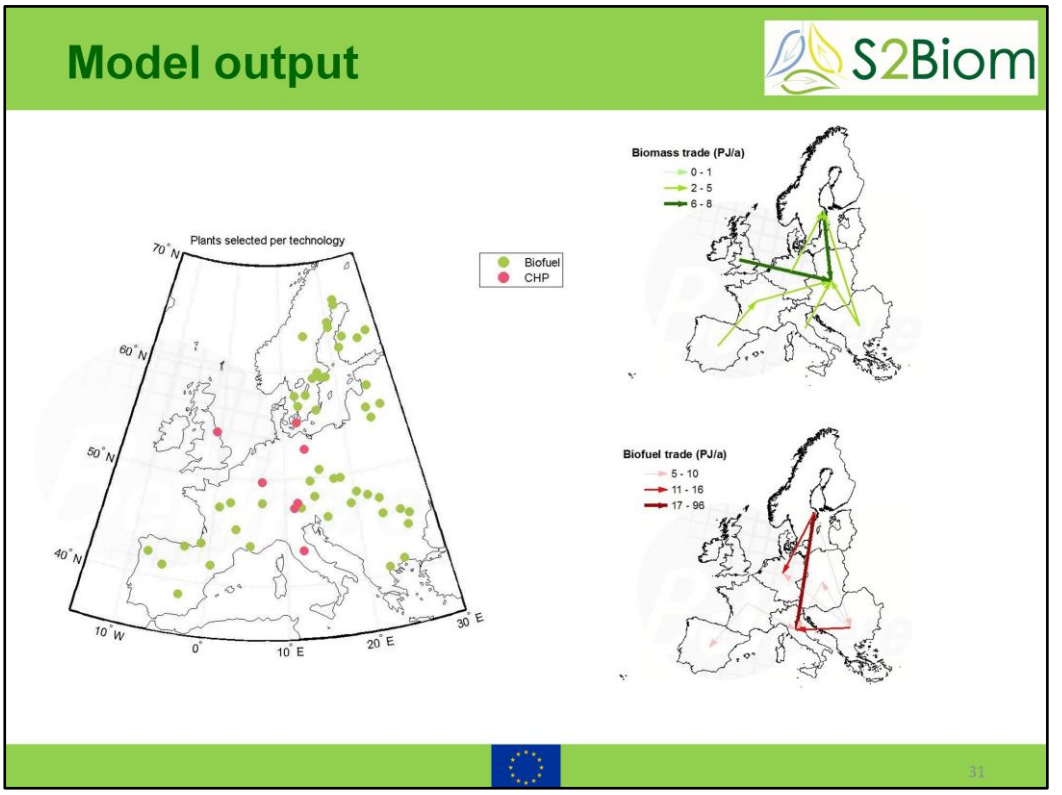
- trade routes and quantities are also modelled
- BeWhere output
- Trade is the output
- Amount of possible trade

BeWhere / Locagistic

- **BeWhere**
  - national level
  - geographic location of plant
  - based on techno-economic approach
- **LOCAgistics**
  - regional level
  - input from BeWHere
  - detailed allocation of biomass to selected plants



- online appearance of the tool
- will include more parameters for S2Biom



- example results of the online tool output
- will be tailored to S2Biom

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Thank you for your attention!

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