TRIGGERING THE CREATION OF BIOMASS LOGISTIC CENTRES BY THE AGRO-INDUSTRY

SUCELLOG project (IEE/13/638/SI2.675535)

April 2014 - March 2017

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Feria GENERA. 17de Junio 2016

This project is co-funded by the European Commission, contract N°: IEE/13/638/SI2.675535

Project Summary

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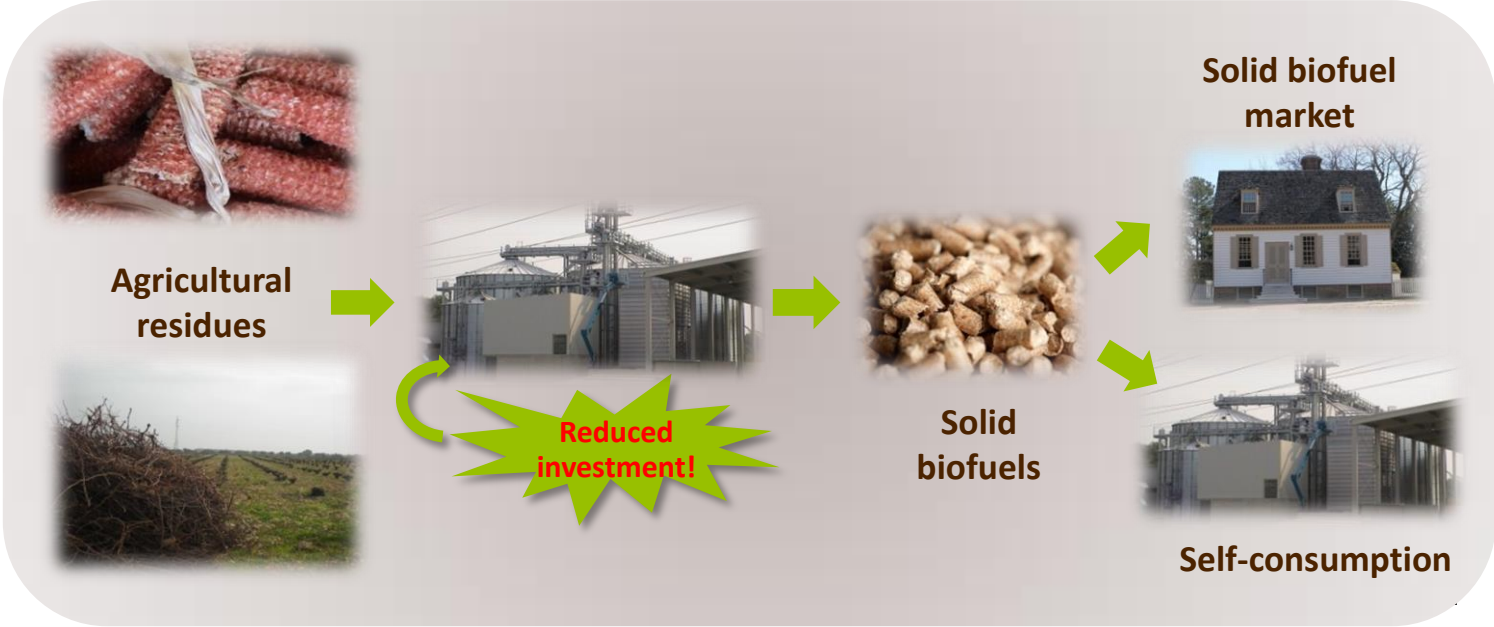
AGRO-INDUSTRIES as SEASONAL BIOMASS LOGISTIC CENTRE

Usual operation
(Nov-Feb)

Operation as biomass logistic centre
(Mar-Oct)



Partnership

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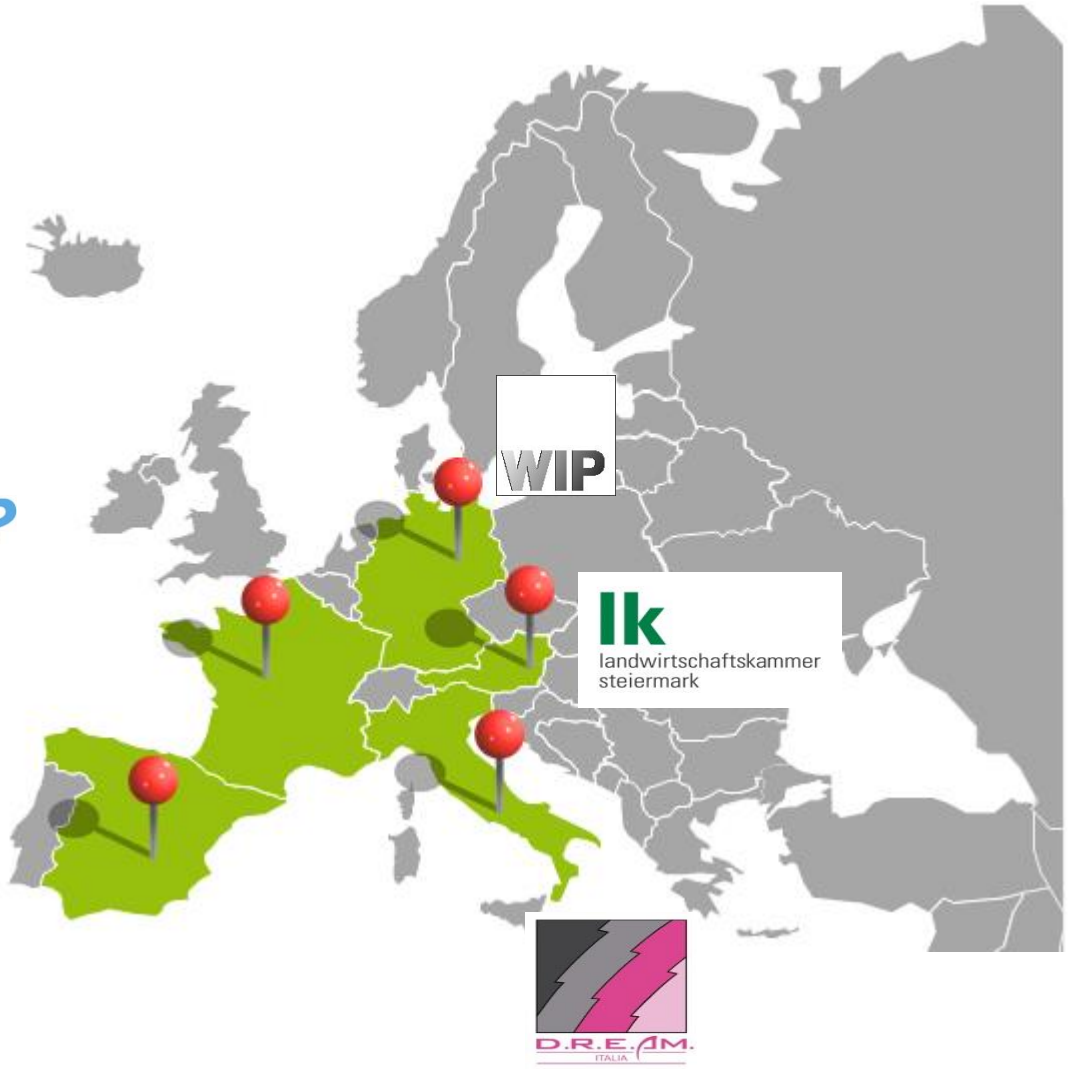

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agri-food cooperatives
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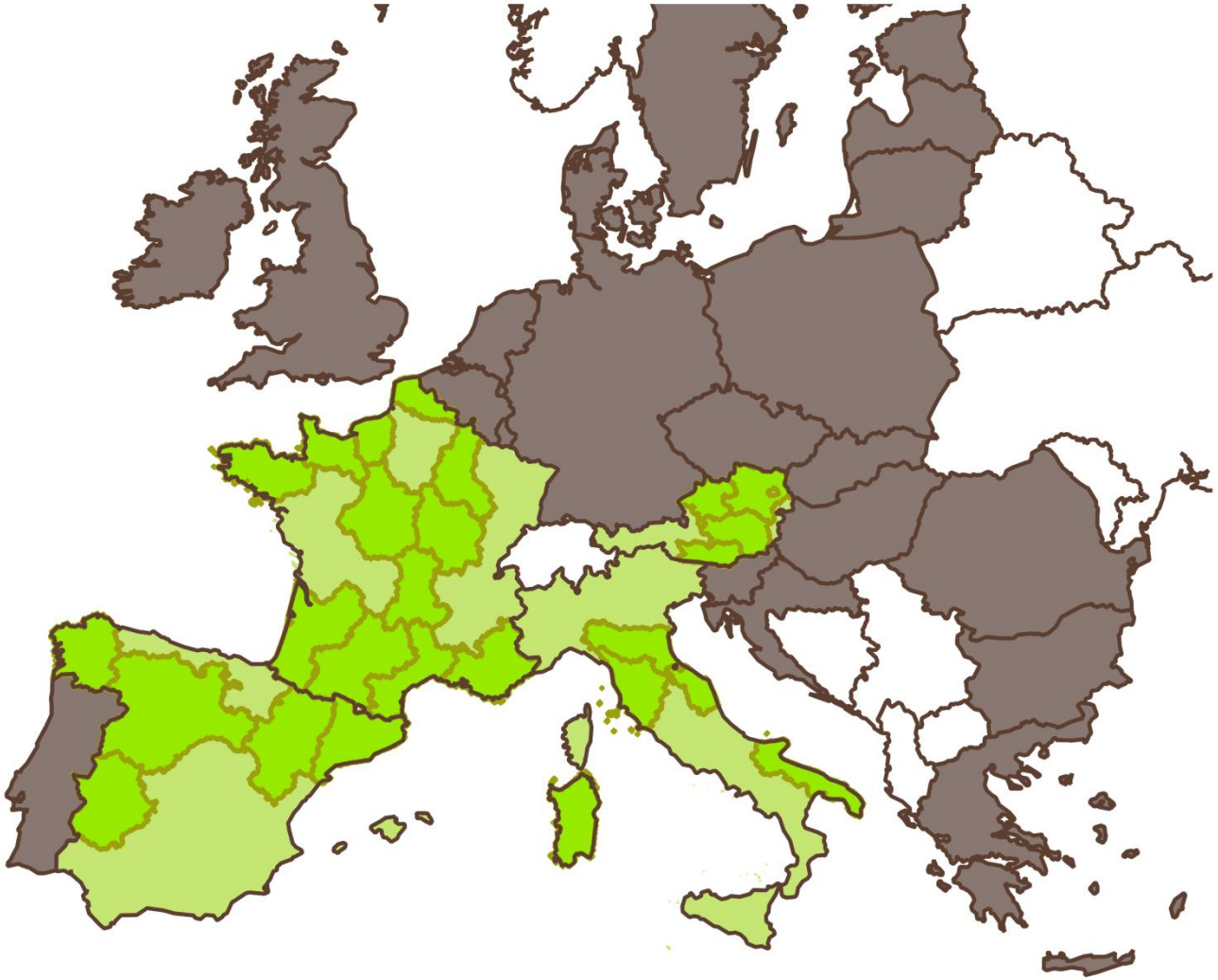
Technical support to agro-industries

The SUCELLOG project **supports 4 agro-industries in Europe to become biomass logistic centres using agricultural residues as raw material**. A feasibility study and a complete business model have been conducted for them.

The selected agro-industries are:

- **Cooperativa Agraria San Miguel** - Aragón region - Spain
- **Luzéal-Saint Rémy** – Champagne-Ardenne region - France
- **Società Cooperativa Agricola Le Rene s.r.l.** – Toscana region – Italy
- **Tschiggerl Agrar Gmbh** – Styria region – Austria

SUCELLOG Regions



Results up to now: Are you interested in?

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Knowing the potential of available biomass in your region and the existing agro-industries compatible with the production of solid biomass?

DOWNLOAD OUR REPORT ON REGIONAL SITUATION, BIOMASS RESOURCES AND PRIORITY AREAS

Understand the key messages to bear in mind when evaluating the possibility to become a biomass logistic centre?

DOWNLOAD OUR HANDBOOK WITH BASIC INFORMATION

ALREADY AVAILABLE AT

www.sucellog.eu

Available languages:
DE, EN, ES, FR, IT

Check your potential to become an agro-industry logistic centre?

DOWNLOAD OUR DIAGNOSIS GUIDE

Consult real feasibility studies made to 4 agro-industries that benefit from our services?

DOWNLOAD OUR FEASIBILITY STUDIES & BUSINESS MODELS

Main steps to make a techno-economic study on how to build a logistic centre in an agro-industry?

DOWNLOAD OUR HANDBOOK

Case study in Spain

Cooperativa Agraria San Miguel, Spain

Current activities	Existing equipment that can be used	Available agrarian residues	Outcomes of the feasibility study	Outcomes of the market assessment
Production of fodder pellets and bales from alfalfa Cereal drying (mainly maize) Production of fodder pellets from agro-industrial food residues	Two alfalfa production lines can be used for the pre-treatment of the solid biomass	Cereal straw >11,000 t/year Maize stalks >8,000 t/year	Straw is the most interesting raw material Blending with wood is required The most competitive product is a Class B agro-pellet with a maximum 70% share of straw	Price of the product: • 117 €/t • 0.027 €/kWh The price is positioned in the middle range local solid biomass market Secondary benefits should be offered to consumers: • ash as low-cost fertiliser, • reduction of Cl content of the soil

Recommended business strategy

Development of internal self-consumption chain targeted on the pig farmers (the members for cooperative) – being the suppliers of the straw and the consumers of the solid biomass. Biomass logistic centre should purchase the straw from pig farmers only under the condition that as well the annual or plurennial agro-pellet sale contracts are made.

Current activities in Spain

- Pelletizing tests have been performed using two different mixtures:
  - 70% straw/30% wood
  - 50% straw/50% wood

- Combustion tests have been performed in several surrounding pig farms using existing boilers (originally designed for combustion of wood pellets and olive pits) finding some performance problems.

- Current test are being carried out in different boiler models adapted to agrarian fuels in collaboration with boiler manufacturers.

Case study in Austria

Tchiggerl Agrar GmbH, Austria

Current activities	Existing equipment that can be used	Available agrarian residues	Outcomes of the feasibility study	Outcomes of the market assessment
Corn harvesting, treatment and trading Logistic operating of straw Pelletizing of corn cobs and straw for animal feeding and bedding	Drying facility that is currently used for drying the cobs (afterwards used in animal bedding)	Cereal straw 5,190 t/year Hay 200 t/year Corn cobs 15,249 t/year	Corn cobs are the most interesting raw material due to the lack of competitive uses	Only corn cob-derived products are feasible. Grits offer large potential market and chance of good profit. Price of the corn cob products: Loose cobs • 58 €/t • 0.017 €/kWh Grits • 144 €/t • 0.038 €/kWh Pellets • 192 €/t • 0.044 €/kWh

Recommended business strategy

The main consumers are expected to be farms and industries using wood chips and pellets. The market would be extended to households, but they are currently not allowed to use corn cobs by law in Styria. The best strategy for the company would be also to produce a small amount of corn cob pellets to be proposed to the consumers as test products in order to facilitate the transition to grits.

Current activities in Austria

- Biomass logistic centre started operation end of 2015
- Fuel production tests have been performed. In general it works well with some minor issues to be solved.
- Combustion tests have been performed in several surrounding farms using existing boilers (originally designed for combustion of wood pellets and wood chips).

Cooperative Luzéal-Saint Rémy, France

Current activities	Available agrarian residues	Existing equipment that can be used	Outcomes of the feasibility study	Outcomes of the market assessment
Production of fodder pellets and bales from alfalfa	In a radius of 30 km: Cereal straw 32,000 t/year Rape straw >40,000 t/year Miscanthus, sawdust and wood chips are available for blending	Two current alfalfa production lines can be used for the pre-treatment of the solid biomass with minor modifications	Only cereal straw is considered, since rape straw is mainly left on the field as fertiliser Blending is required The most competitive product is a Class A agro-pellet with 60% straw/40% sawdust	Minimum selling price: 163 €/t 0.037 €/kWh The production costs should be reduced in order to be competitive in the local industrial market dominated by wood chips

Recommended business strategy

Two scenarios are currently being assessed:

1) Reduction of production costs;

2) Extending the range of the services provided by the Cooperative – selling not only the biomass, but also heat, becoming an ESCO (energy service company).

Società Cooperativa Agricola Le Rene s.r.l., Italy

Current activities	Available agrarian residues	Existing equipment that can be used	Outcomes of the feasibility study	Outcomes of the market assessment
Sunflower harvesting, treatment and trading Cereal drying (maize and rarely wheat) Production of pine nuts Production of olive oil	Industrial residues from own activity In 30 km radius: Olive pomace 1,500 t/year Corn cobs 3,500 t/year Prunings of permanent crops 2,500 t/year Olive prunings 1,900 t/year	Vertical dryer used currently for corn and wheat drying is compatible with drying of olive pits Pelletiser 25,000 m2 (open area) and 2,000 m3 (warehouse) of storage capacity	Despite high availability, cereal straw are not considered in a first step because of their price The most competitive products are: Class A agro-pellets and mixed agro-prunings chips and hog fuel	Precise market prices of the products are not defined yet, since the exact quality of the produced fuel (ash and Cl content) is not known. Production costs are comparatively low. Thus an attractive price for consumers can be offered.

Recommended business strategy

The main consumers are expected to be households as well as medium to large consumers (industries, district heating plants, greenhouses). The manufacturing process of the agricultural prunings should be improved (diversifying the products obtained from them depending on the quality) and the residues from other processes (proper or connected with the agro-industry) should be re-used. The agro-pellets will represent the top product of the biomass logistic centre and the sub-products from agro-pellets production (chips and hog fuel from the agro-prunings treatment process) would be secondary products offered in the new business line.

Challenges and barriers

Example of barriers identified in the project:

- Technical
  - Properties of the raw material not appropriate to be used in existing equipment
  - Risk of contamination while switching production line from bioenergy to regular activities
  - Lack of appropriate combustion equipment at customers
- Regulatory
  - «waste» origin of the product prohibits using it as fuel for households
  - Different taxing rates (raw material, product, fuel)
  - Emission regulations
- Non-technical
  - Lack of funding
  - Complexity of new value chains (need for logistics, many actors involved, takes long time, purchase and sales contracts)
  - Customers acceptance of the new product (e.g. dark pellets vs light)
  - Market barriers- Prices of fossil fuels. Abundance of woody biomass. Comfort ability in gas use.
  - Competence with nutritional/fertilizing use
  - Agricultural residues burning in the field
  - Fight against fires