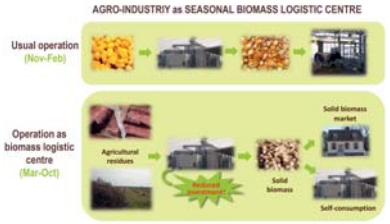
SUCELLOG CONCEPT

SUCELLOG concept is based on the exploitation of the excellent opportunities that agro-industries have to become solid biomass producers. Solid biomass production in addition to their main businesses allows agro-industries to diversify their activities and, thanks to the following synergy effects, initial investment is reduced.



Many agro-industries possess equipment and facilities (e.g. dryers, pelletisers, storages) that are compatible with solid biomass production process.

Agro-industries work seasonally; therefore diversification of their regular activities to be able to work in the idle period is much appreciated.

Agro-industries produce or are surrounded by agricultural residues. They can be used as raw material for solid biomass production.

Agro-industries are used to work with organic feedstocks and are aware of the importance of quality assurance.

SUCELLOG concept has been implemented at a regional scale in Austria, France, Italy and Spain. Synergies and partnerships among agro-industries and relevant local market actors have been supported to raise awareness and to create good practice examples in several regions. Biomass resources without competing uses were targeted and, in particular, the focus has been set on using industrial and field residues owned by agro-industries themselves. Experiences in SUCELLOG project regions showed that, thanks to the economic and environmental benefits of the new business line, agro-industries are able to make their main business more profitable. In addition to direct monetary benefits, saving of time, reducing energy costs, minimising risks and impact on the environment, and adding value to the field residues were important drivers for the implementation of the SUCELLOG concept.

During the SUCELLOG project 37 agro-industries in Europe have been directly supported. Among them are alfalfa dehydration facilities, feedstuff producers, distilleries, wineries, olive oil mills and pomace industries, cereal dryers, dairy farms, and grain and maize dryers.

SUCELLOG has triggered the use of various agricultural biomass resources, including cereal and lavender straw, silos dust, prunings from olive trees, orchards and vineyards, olive pits, grape stem and pomace, corn cobs and overlaid maize silage.

Produced solid biomass has been used as fuel by agro-industries themselves as well as sold in the local bioenergy markets. To increase the quality of the end-product, in some cases mixing agricultural residues with wood have been investigated.

MAIN LESSONS LEARNED

- → A clear and strong political commitment towards the use of agricultural biomass is essential for developing best practice examples in countries and regions. These 'first of a kind' initiatives are needed to demonstrate the feasibility of the innovative concepts and to trigger the new ones.
- → Consumers are not confident of agricultural biomass use. Lack of confidence is caused by low publicity of existing good practices and by bad experiences of using it in an equipment not compatible with the specifics of agricultural biomass. Raising awareness of the benefits generated in real cases is essential to promote investments in new projects.
- → Apart from economic incentives, clear regulatory framework conditions are important for private investors to decide to start-up investments. For instance, clear regulations regarding emission levels and classification of waste and by-products are needed.
- → A national entity (e.g., association, network, cluster) representing all involved sectors would help to shape more positive public opinion and to influence policy decisions. This entity could be the actor organising national communication, joining stakeholders, spreading the knowledge and supporting new initiatives.

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

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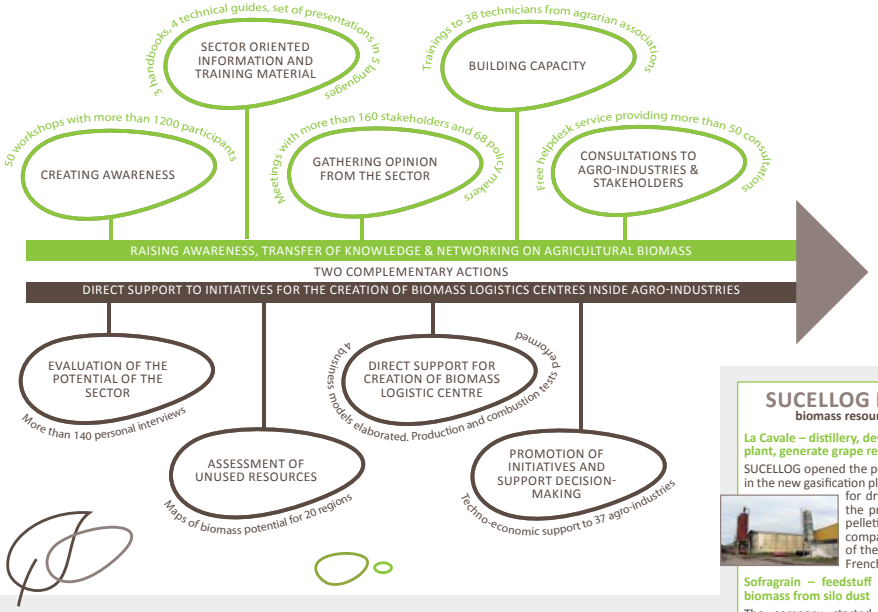
RESULTS AND LESSONS LEARNED

SUCELLOG aims to widespread the participation of the agrarian sector in the sustainable supply of solid biomass in Europe. **SUCELLOG** action focuses in an almost unexploited logistic concept which evidences the large synergy existing between the agro- economy and the bio-economy:

Agro-industry facilities can be utilised in their idle periods to handle and pre-treat agricultural residues to produce solid biomass for the local bioenergy market.

Through a combination of direct support actions to agro-industries and capacity building activities to the sector, **SUCELLOG** has planted a seed for the further development of local initiatives to valorise residues from agriculture and thus to increase the competitiveness and sustainable development of rural economy.

Co-funded by the Intelligent Energy Europe Programme of the European Union



France: Triggering national awareness about the use of agricultural residues for solid biomass production

In France, the project has opened a discussion on the role of agricultural biomass in covering the part of the heat demand in rural areas. Agro-industries have significant influence in rural territories and therefore are essential to trigger the development of this new market. Due to their size and commitment to sustainable development, rural municipalities and regional public institutions, are among the most interesting potential users of agricultural biomass. For this reason, SUCELLOG concept has been promoted among governmental entities and agencies, as well as among chambers, energy service providers, equipment producers, etc. motivating them to invest in the development of the solid agricultural biomass sector.

Spain: Awakening the interest on the valorisation of own agricultural residues in Spanish cooperatives

In Spain, the project has found that the best opportunity to implement biomass logistic centres inside the agro-industries is when this activity in strictly linked to their main business as food product producer. It is, when the agro-industry faces a problem linked to the disposal of a "residue" generated in their own process or from the activities of their members; and/or when there is a need to satisfy energy demand of their main activity. SUCELLOG has been focusing on demonstrating the feasibility of the concept, promoting the involvement of key actors in project activities and changing the attitude of the agriculture sector towards transforming the "residues" into a "product".

Italy: Promoting enterprise network and local supply chains for valorisation of agro-prunings

In Italy, SUCELLOG project worked on the promotion of currently unexploited synergies between the agricultural and energy sectors. The project focused on searching for solutions for the use of residual agro-prunings. Valorisation of this biomass is challenging and is a relevant problem in many Italian regions. Through promotion of enterprise networks and indicating possible sources of funding a new value chain has been established for using agro-prunings in energy production. Good practices developed in SUCELLOG project have opened opportunities for other local projects on similar topics, fostering cooperation among agro-industries, associations, academia, innovation holders, and manufacturers of boilers, and harvesting and biomass processing technologies.

Austria: Successful implementation of the SUCELLOG concept based on corn cobs

In Austria, SUCELLOG has successfully supported the creation of a biomass logistic centre based on agricultural resources (corn cobs). Experiences from SUCELLOG project in Austria show that one successful example is able to move forward other initiatives. On the other hand, one bad example at the initial phase of a new business activity may stop the progress for several years. A person, who initiates the development of biomass logistic centre, has to be innovative and open minded. Therefore the personality of the owner of an agro-industry is at least as important as the technical prerequisites. Additionally, from the technical point of view, it is essential to select raw materials for which the access can be guaranteed in a long-term. Antoher crucial factor is the existance of appropriate and approved technology at a reasonable price that can be used by potential consumers.

SUCELLOG IN SPAIN

In Spain, SUCELLOG has triggered the mobilisation of around **3.5 ktoe of biomass resources** for heat production and an expected **investment of more than 1.2 M€** in a short-term.

Troil Vegas Altas – cooperative for the transformation of oil mills by-products, have access to large amounts of olive prunings

The cooperative plans to double the capacity in the next years. Additional drying line will be installed and the demand for heat will increase. In the area, olive prunings are currently burnt and their collection would be beneficial from environmental and agronomic point of view.

SUCELLOG has joined these two necessities following the principles of circular economy, studying the annual mobilisation of more than 3000 t of prunings to be consumed in their facilities. A discussion with farmers and logistics operators has been started due to SUCELLOG. Existing storage facilities and personnel would be used. Leaves and the fine fraction of pruning would be delivered to a composting plant.

Cooperativa Agraria San Miguel de Tauste – forage dehydration industry, no market for the large excess of cereal straw

SUCELLOG supported the development of straw pellets production line due to their high potential to become a biomass logistics centre. Their pelletising facilities has long idle period (from November to March), the straw in the area is burned on the soil due to the lack of market and the pig farms owned by the members are intensive energy consumers. Production and combustion tests have been performed. Support from the Rural Development Programme was obtained to continue research activities on identification of better quality straw resources (less Chlorine content).

COCOPE Sociedad Cooperativa – wine producer and distillery of aromatic plants, has problem of residue management

SUCELLOG evaluated the viability of consuming the residues of their activities (grape stem and lavender straw) to supply their own demand and other nearby facilities creating a heating network. COCOPE would use their storage facilities and personnel in the new initiative and would contract the briquetting service to another company.

SUCELLOG IN FRANCE

In France, SUCELLOG has triggered the mobilisation of more than **16 ktoe of biomass resources** for heat production and an expected **investment of more than 3.8 M€** in a short-term.

La Cavale – distillery, developing a new biomass gasification plant, generate grape residues

SUCELLOG opened the possibility to use own residues as fuel in the new gasification plant. Existing facilities and equipment for drying and storage would be used for the production of solid biomass whereas pelletising would be done by a partner company. Further detailed study and part of the investment has been funded by the French Environmental and Energy Agency.

Sofragrain – feedstuff producer, already producing solid biomass from silo dust

The company started implementing SUCELLOG concept after attending one of the project workshops. They produce pellets from own residues (silo dust) and from residues of other agro-industries. In cooperation with an energy service company, pellets are delivered to several boilers. SUCELLOG helped to identify other potential consumers and explored the opportunity to use the produced biomass for self-consumption.

Luzeal – forage dehydration facility, investigates the use of herbaceous resources available in the area

SUCELLOG assessed the opportunity to use during their idle periods their pelletising line for production of straw pellets. Production costs have been calculated, combustion tests in real operating facilities have been carried out and detailed market study promoting partnership with energy service companies have been performed.

SUCELLOG IN ITALY

In Italy, SUCELLOG has triggered the mobilisation of around **2 ktoe of biomass resources** for energy production and an expected **investment of more than 3 M€** in a short-term.

Oleificio Cooperativo Produttori Agricoli Molfetta – oil mill, planning to build a cogeneration plant, have access to olive tree prunings

SUCELLOG evaluated the feasibility of using currently underutilised prunings (3500 t/year) as fuel in the cogeneration plant. This study initiated the development of a bigger project with participation of 3 other oil mills, the regional association of cooperatives, a logistic operator, engineers and researchers. Professionals, who have been brought together thanks to the SUCELLOG actions, will perform detailed technical and economic analysis for the different parts of the value chain and will form operational body for the management of the cogeneration plant. The project has been proposed for funding to the Rural Development Programme since it is strategically important for the territory and could trigger new initiatives.

Serragiumenta – wine producer, owns olive fields, vineyards and orchards, plans to build cogeneration plant, and has prunings

SUCELLOG has supported them with a feasibility study of the use of prunings from olive trees, vineyards and orchards (1500 t/year) currently burnt on-field. Project also helped them to establish contacts to the stakeholders required for the start-up. The company is convinced that valorising their agricultural activity by-products will enable the improvement of the primary production (wine).

Cooperativa Agricola Rinascita Oliena – dairy product producer, have access to prunings and grape processing residues

A feasibility study has been developed for covering own energy consumption and the one of oil mill aside. 300 t of pellets would be annually produced from olive tree and vineyards prunings, as well as from grape pomace and stems. Thanks to SUCELLOG, the cooperative became participant of another EU project that will continue to increase their energy self-sufficiency by using local biomass resources.

SUCELLOG IN AUSTRIA

In Austria, SUCELLOG has triggered the mobilisation of more than **1.7 ktoe** of biomass resources for heat production and an expected **investment of around 0.5 M€** in a short-term.

Tschiggerl Agrar GmbH – agro-industry harvesting and processing of maize grains and cereal straw for animal feed

Tschiggerl Agrar GmbH is located in the south-east of Styria. In 2007, the agro-industry decided to reduce their energy costs by looking for alternatives to replace fossil fuels (oil) in the energy intensive biomass drying process. From all available biomass resources in the area, corn cobs were identified as the most promising material since they had no market. However, before corn cobs could be used as fuel, several technical and organisational challenges had to be solved.

The first challenge was related to the logistic chain. The harvesting process had to be modified to be able to collect grains and corn cobs at the same time in separate containers. A regular CASE Axial-Flow 7088 corn harvester was adapted by installation of a sieve which separates corn cobs from the stalk and the shucks. After separation, the cobs are collected in a container. The additional fuel demand for harvesting the cobs is 4 litres per hectare compared to the regular activity for grain harvesting.

In the second step, in 2012, once the logistic step was solved, a boiler appropriate for the combustion of cobs was installed. This project provided 200 000 € annual savings of fuel costs and payback period of about 2 years.

As more corn cobs were generated every year, the company decided to use the surplus biomass for production of solid fuel to be sold in the market. **In 2015 with the support from SUCELLOG project, Tschiggerl Agrar GmbH started working as biomass logistic centre.** The new business concept has been developed based on the existing infrastructure and idle period of the equipment already available on site (dryer and chipper), and therefore it did not impose significant initial investment. The company is selling corn cobs in different formats (pellets, grits and loose corn cobs) directly to the consumers. Pellets are produced in another facility, which is owned by an association dealing with animal feed (being the owner of Tschiggerl Agrar GmbH a member of it).

From their initial production, they have mobilised around 4300 t of cobs. Their main product is currently grits, which are 40 % cheaper than wood pellets in the area thanks to the synergies with the agro-industry. Only 1.3 % of the total energy content of the fuel is consumed in their production (harvesting and chipping).