



Walloon case: Ecosystem built around the Haut Geer Biogas, HesbayeFrost and Apligeer cooperative

1. Title

Circular economy study case in Haut-Geer – Wallonia (Belgium)

2. Description of the case study

Biogas du Haut Geer is a biomethanisation unit operating in a short cycle located on the territory of Municipality of Geer located 70 km east of Brussels. From agricultural inputs and organic waste from the neighboring company HesbayeFrost, it produces electricity and heat using the biomethanisation process. Electricity is valued by HesbayeFrost for production and packaging plant of frozen vegetables and heat is valued by producing wood briquettes (FLAMECO © briquette), with an adapted work organization promoting the work of disabled people. HesbayeFrost company is itself supplied by the Apligeer cooperative which today collaborates with 500 farmers from Hesbaye and Condroz.

The municipality of Geer has favored the takeover by HesbayeFrost of the old beet-grater plant of Hologne-sur-Geer, thus recovering the old settling basins of the site to store irrigation water there. This acquisition is the meeting of the industrial world and the associative world active in the protection of biodiversity that allowed the creation of a birdwatch hotspot.

3. Innovation and key success factors in the circular economy

- a) Fermentable materials obtained from: Agricultural waste or crops trapping nitrates from neighboring fields; agro-food waste from HesbayeFrost - production and packaging plant of frozen vegetables (peelings, vegetable waste, waste obtained after purification of cleaning water); Dedicated crops: corn easy to store; Manure and slurry (in a minor part as the region is mainly oriented to cropping).
- b) Water from agro-industrial processes (HesbayeFrost): decantation and lagoon storage in basins (ornithological reserve managed by an environmental association), irrigation of vegetable crops.
- c) Supply of green electricity for HesbayeFrost (direct line).
- d) Digestate on neighboring crops: 43,000 m³ digestate / year (0.6% nitrogen = 258 tons of nitrogen not from the chemical industry). Certified organic digestate in the majority (depending on heavy metals composition). Gross digestate = fertiliser + structure. Phase separation Liquid digestate = fast fertiliser and solid digestate = structure + fertiliser.
- e) Heat: use in a wood energy sector; the wood is harvested as closely as possible (companies, municipal woods, private plantations), ground on site (energy from green electricity), drying of the wafers (green heat), screening ⇒ chips, pellets, compressed briquettes.
- f) Socio-economic aspects: creation of jobs for anaerobic digestion (direct: 4 FTEs and indirect: maintenance); agricultural cooperative (purchase of inputs, supply of digestate, mobilization of labor and agricultural equipment for transport); municipal partnership (use of mowing from dwellers, supervision by municipal worker); adapted work (handling of fuel wood by disable worker).

4. Constraints encountered

- a) The supply of raw materials for organic norms (quantities and prices) ⇒ recovery of local agricultural products ... but also local waste (mowing lawns).
- b) Digestate storage capacity (often underestimated) ⇒ managed by nearby spreading.
- c) The interest of the digestate in agriculture and the availability of land for spreading ⇒ contractualization, regular supply, improvement of the agronomic value of the digestate, development in organic farming. Attention to the quality of the inputs!
- d) The industrial risks of the company (a breakdown = loss of production) ⇒ prevention, maintenance – as far as possible by local technicians, professional network, in particular a nutritionist.
- e) The 24-hour operation of the company and the availability of staff.
- f) The capacities of personnel to carry out all tasks.
- g) Biological risks of the process analysis and monitoring of inputs and products.

- h) Control of environmental and waste legislation, training, advice.
- i) Political decisions in terms of supporting the production of renewable energy → information (and awareness of political decision-makers).
- j) Support for research to develop new sectors, particularly in the bio-economy: biomethanisation supporting the optimization of wind power surpluses (conversion of hydrogen into biomethane); algae development (recovery of CO₂, heat and digestate fractions) ...

5. Sustainability / perspective

Biogas du Haut Geer will soon install a CNG (gas for vehicle) service station and in particular supply the vehicles of HesbayeFrost and hopes to develop an extension of 1.500 kW (permit for land use management already introduced). For this purpose, the support for EAFRD (measure 8.6) had been introduced. The support from EAFRD had not been allowed for the first investment due to the major participation of HesbayeFrost in the partnership.

Currently, biomethanisation is an activity widely supported by the public authorities, a small part in investment (for which security standards are heavy) and especially for production (Green certificates linked to the GHG reduction, the calculation of which is based on carbon emissions from transportation). For his part, Gaëtan de Seny aspires that the Biogas sector can be profitable without any public help, which would be the surest way to make this sector sustainable, like any business. For this, he considers it essential to adapt the legislation to the different possibilities offered by this tool:

1. Encourage energy crops and develop second crops and recovery of agricultural organic matter (for example: agree to deduct material exports from the calculation of the "rate of soil linking" in nitrogen control).
2. Reduce the constraints on "waste" legislation, in order to reduce costs while maintaining control.
3. Authorize the management of voltage on the electrical network by authorizing production per period, and no more instantaneously, (which would make it possible to supply electricity on demand, during consumption peaks).
4. Reducing the constraints on environmental legislation (investment and control), it is a huge budget which is not justified in his eyes (partly due to the superimposition of the regulations of the different sectors: agriculture, public health, development of territory...).
5. Promote multi-production capacities (electricity, heat, fuel) by favoring access to the natural gas network. Biogas is an excellent complement to intermittent energies.
6. Reduce the administrative complexity of investment and development (we have planned an increase in power since 2008 and we still do not know if we would be entitled to CVs).
7. Set up local producer / consumer mini-networks via the existing network under acceptable conditions (It is not logical that the electricity producer receives 35 € / MWh and that the final consumer pays 200 € / MWh)
8. Reduce the constraints on the digestate and recognize it as a full-fledged fertilizer, this would allow it to be valued at its fair value (the price of chemical fertilizer).

6. Business model - Financial revenue (2018 figures) :

Sale of electricity (direct to HesbayeFrost)	23.61% (15,359 tons of fossil CO ₂ avoided = consumption of 228,199 inhabitants)
Sale of digestate: (contracts with neighboring farmers)	3.27%
Sale of heat: (internal valorisation: drying of wood chips and packaging in wood briquettes)	5.24%
Organic raw materials with positive value	1.17%
Green Certificates (public support for Renewable Energies)	66.69%

7. Contact(s)

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