SCRL Kessler (Attert, Belgium)

A short introduction to SCRL Kessler

Table 1. Technical information of the biogas plant

Date of construction	2003
Size (MWel)	0,905
Volume (m^3)	3000
Digester type	Mesophilic digestion

The biogas plant in Attert is located on the Faascht farm and built in 2003 by it's owners Jean and Nicolas Kessler. Back then, agriculture was in a crisis as a consequence of the dioxin crisis, mad cow and foot-and-mounth diseas outbreaks. As a result, farmers' incomes fell and the Kesslers saw energy production as an opportunity to escape this because of the stability of the electricity market.
Their project was supported by the non-profit organization Pays de l'Attert and several INTERREG research projects. Today the plant and farm is run by Mélody Kessler and Ludovic Peter.

Feedstocks

Manure from the farm's own dairy cows and meat cattle is digested (25% of the total input) and grass, biological waste from the supermarkets and from the food industry are imported (Table 2).

Table 2. Origin of feedstock

Type	Mass per year
Cattle manure	5 kt
Biological waste supermarket	10 kt
Waste from food industry	5 kt
Total	**20 kt**

Biogas production

Today, 20.000 MWh per year is produced. From the 6000 Mw_{el} produced per year, 20% is used on the Faascht farm and 80% goes to the grid.

The thermal energy (7.200 MW_{th}/year) from the CHP is used on the plant (10%), to heat the farm and houses (5%), for hygienisation of the digestate (5%) and for drying digestate and wood (25%).
Plans are being made to use more heat on site, by building a greenhouse for tomato cultivation, where also digestate and CO_2 can be locally used as as fertilizers.

Table 3. Yearly biogas production and average composition

Component	Estimation
CH_4 (%)	57-60
CO_2(%)	40
H_2S (ppm)	50 (max 350)
O_2 (%)	0,08
Total biogas production (Mm^3)	4
Biogas per tonne of feedstock (m^3/t)	200

Horizon 2020

*The H2020 EU-project SYSTEMIC (**Sy**stemic large **s**cale eco-innova**t**ion to advance circular **e**conomy and **mi**neral re**c**overy from organic waste in Europe) receives funding from the European Union's Horizon 2020 Framework Programme for Research and Innovation under Grant Agreement no. 730400*

SCRL Kessler (Attert, Belgium)

Current process and disposal routes for end products

The digestate is hygenized (1h 70°C) and stored in a covered digestate tank of 4000 m³. From there it is either directly dried on a band dryer or separated in a screw press in a solid and a liquid fraction. The liquid fraction of the digesate is used on grass land (20% of the 90 ha of the farm's own land). The solid fraction goes to fields as a fertilizer. The dried digestate pellets go to horticulture.

Table 4. Average composition of the recovered products

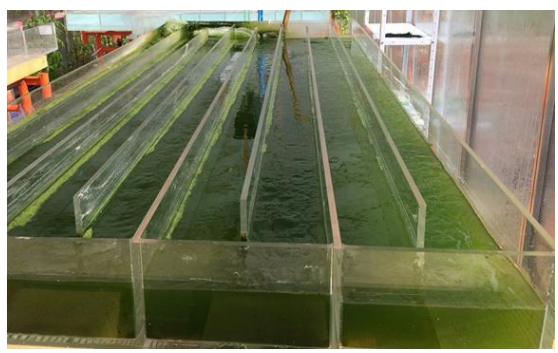
		Mass (kton/year)	Dry matter (%)	N- total (g/kg)	P_2O_5 (g/kg)	K_2O-total (g/kg)
Digestate	Raw digestate to dryer	1	7,2	7,6	1,87	3,9
	After drying	0,38	27,2	7,4	10,8	3,8
	Solid fraction after centrifuge	1				
	Liquid fraction after centrifuge	11				

Current drivers for interest in Nutrient Recovery and Reuse (NRR) Technologies

SCRL Kessler is currently participating in the Interreg Grande Région project PERSEPHONE with partners form France, Luxembourg, Germany and Wallonia. Like SYSTEMIC, the project intends to enhance the value of digestate. The site in Attert is testing the use of CO_2, heat and liquid fraction of digestate for algae cultivation, which could for example be used in the pharmaceutical, bio-plastic, biodiesel field cultivation or one day maybe animal feed.

The project also studies the recovery of H_2 and recirculating it to the digester for conversion to methane.

Because both SYSTEMIC and PERSEPHONE are working on bio-refinery of digestate and circular economy, SCRL Kessler hopes to establish an interaction between both.



They are particularly interested in the management and reduction/recovery of nitrogen in the digestate.

They are also keen to see organic nitrogen recognized as less polluting for soils and water than nitrogen from gas.

Horizon 2020

*The H2020 EU-project SYSTEMIC (**Sy**stemic large **s**cale eco-innova**t**ion to advance circular **e**conomy and **mi**neral re**c**overy from organic waste in Europe) receives funding from the European Union's Horizon 2020 Framework Programme for Research and Innovation under Grant Agreement no. 730400*