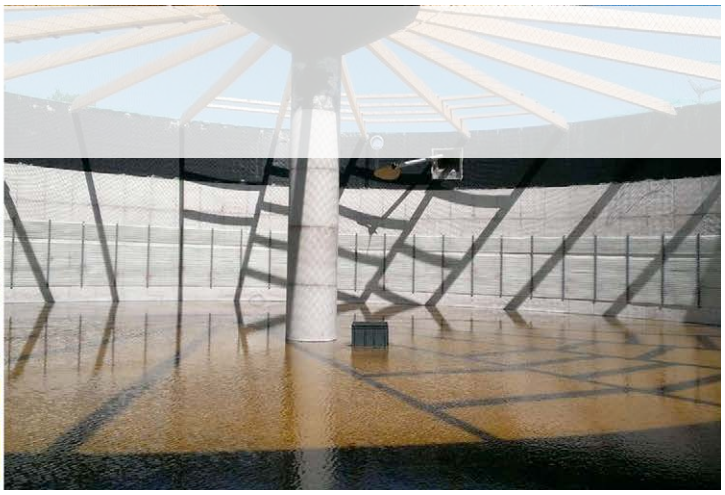
Polybutene
Piping Systems Association

Case Study

Moulin Guérin Farm, FR



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Moulin Guérin Farm, FR

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Located in the heart of the Normandie-Maine countryside, the small town of la Chapelle d'Andaine (1,500 inhabitants) hosts a very ingenious milk farm. Run by the Sidler family since 1986, the Moulin Guérin farm, with a herd of 100 cows, produces milk for the famous local production of Camembert cheese. Facing a significant reduction in the price of milk in the recent years, the Sidler family decided to strengthen the farm by diversifying its activities. With a view to becoming a sustainable and low cost supplier for local heat, a biogas plant project with Thermaflex followed.

Sustainability through recycling

La Chapelle d'Andaine – In France, the biogas market is rapidly expanding. Methanation, the process of recycling organic wastes, is widely recognized for its potential. Methanation projects like Moulin Guérin are subsidized by the French public entity ADEME, the region as well as the European Union. But what are the advantages of this process for the rural communities? A close review of the Moulin Guérin project indicates strong added value for the entire local community fulfilling important social, economic and ecological objectives.

Details

Local waste management
Annually, 10,500 tons of substrate (manure and organic matter) are required to keep the plant continuously in operation. That's just over 28 tons per day! The Moulin Guérin herd itself supplies

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5,500 tons of manure per year, in addition to the 5,000 tons supplied by local farmers. This means that Moulin Guérin and neighbouring farms can avoid long journeys to waste sites or costly facilities located on their own farms - saving time, money and also $C0_2$ emissions. On top of that, they are free to dispose of any organic matter to be used as substrate feedstocks they choose.

Benefits for all
By bringing manure to the biogas plant, the farmers are entitled to take an equivalent quantity of digestate – the residue left over from the methanation process. Thanks to the degradation of carbon during the digestion, minerals are formed making the digestate's fertilizing power highly superior. This means that the need for chemical fertilizers is reduced by half, enabling the farms to switch to biological production. The Sidler family can have its plant run non-stop, the local farmers add value to their business, while the consumer can enjoy wholesome products.

Intercrops to (re)serve the environment
The use of organic matter guarantees higher soil quality by preventing the need for constant ploughing and chemical fertilizers. This delivers 2 major benefits: Economically, mechanization costs can be cut by 20% to 40%, combined with an increase in crop production. Ecologically, the crops are grown in a much more sustainable way with respect to land and the environment, especially considering the lower need for herbicides, fungicides and pesticides.

So what are the specific benefits of the farm's biogas plant? Remember, organic waste does not have any direct added value for the consumer, or the cattle herd. It is therefore considered valueless waste, usually an expense for the farmer. However, when combined with manure, it offers the Moulin Guérin farm viable opportunities for energy production, while local farmers can add value by disposing of their otherwise worthless waste.

> "The farm-based biogas plant produces enough energy to power 138 households."

Goals
The primary goal of the biogas plant was to produce affordable electricity and heat in a CHP plant, at minimal maintenance to secure a stable supply for all users. The Sidler family's plant produces 250 kWh of electricity per day, which is sold directly to the grid. Annually, that comes down 2,190 mWh, enough to power 138 households.

From the 2,300 mWh of heat produced every year, 90% runs would run through a heating network, while the other 10% is used to heat up the digesters of the biogas plant. This heat was to supply both the dairy, the farm and the neighboring houses.

Calculated from the electric power only, the biomass plant will be paid back in 7 years. Combined with the heat, that can be reduced to 4. As the community hopes to benefit from this important asset for many years to come, securing a heat network with a high, stable and sustainable performances was key.

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Results

Flexalen provided the perfect answer to the challenge by securing affordable and headache-free energy for the Sidler farm and its neighbors now and for decades to come. For just 2 houses now powered by the biogas plant, there was an annual saving of 6,000 litres of fuel oil, slashing close to 30 tons of $C0^2$ emissions.

Calculated from the generated electric power only, the cost of the biomass plant will be amortized in 7 years. Combined with the heat component, that can be reduced to 4 years. In managing the plant and the new diversified activities, the farm has also secured employment for 2 local people.

Thanks to the flexibility of the Polybutene (also called Polybutylene) piping system and its high efficiency weldability using electrofusion, the complete installation, carried out by DTI, was realized in just 2.5 days. In no time, the Sidler farm and its community enjoyed sustainable, yet affordable comfort from a Cradle to Cradle Certified™ Silver solution, while securing ecological capital for generations to come.

Organisations

DTI – Certified Installer
Novatech – Biogas plant supplier

Project design and realization

Sub.: Thermaflex France

RESULTS

Volume of substrate to supply biogas plant annually
– 10,500 tons

Capacity for green, affordable energy supply
– 138 houses

Fossil fuels saved annually
– Equivalent to 6,000 L

CO_2 reduction
– 1,695 tons of CO_2

Electricity savings
– 250 kWh

Payback time
– 4 years

Project duration
– 2.5 days

July 2017