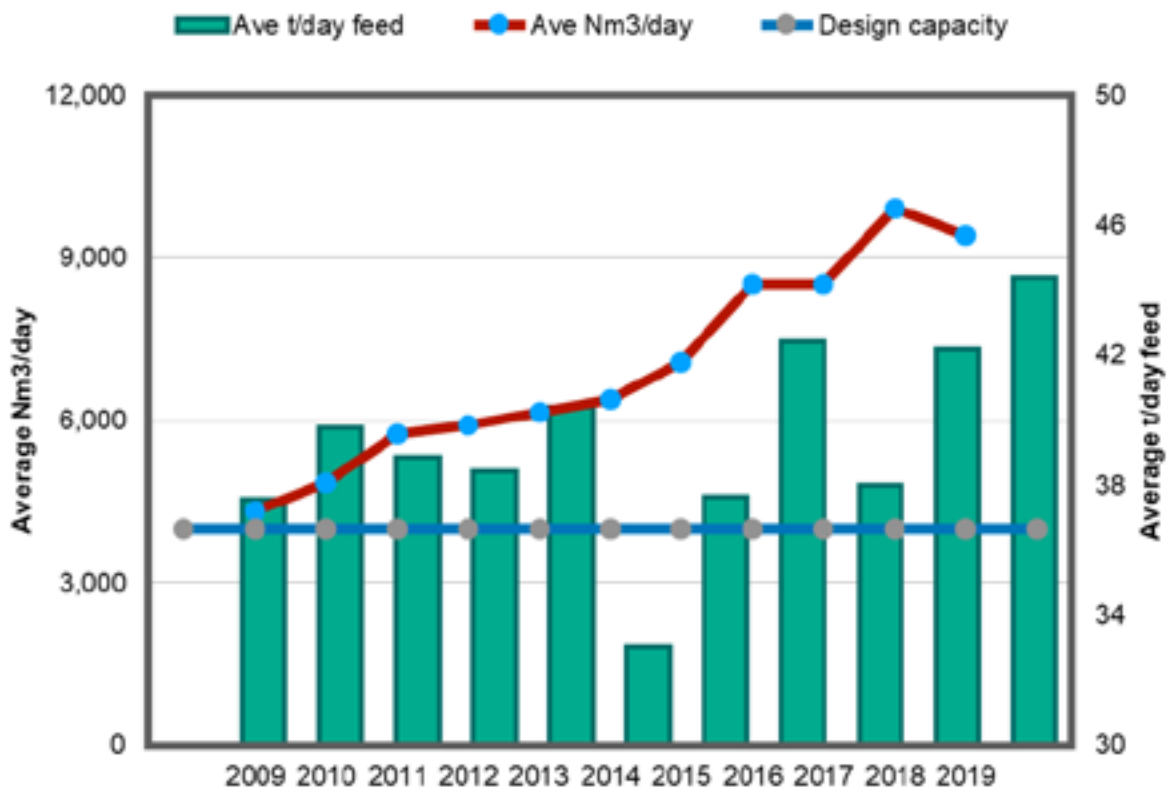




**10 YEARS APPLICATION OF XCEL BIO IN THE KOMPOGAS DIGESTER OF GERMANIER ECORECYCLAGE SA, LAVIGNY, SWITZERLAND.**

- Biogas yields increased from 115 to 235 Nm<sup>3</sup> per ton, over 200%.
- Offensive odours from site eliminated.
- Commercial sales into gas grid doubled.
- Electricity needs for the site fully supplied.
- High quality digestate produced with enhanced plant growth properties.



For sales and technical enquiries contact: [infoexcelbio@gmail.com](mailto:infoexcelbio@gmail.com)

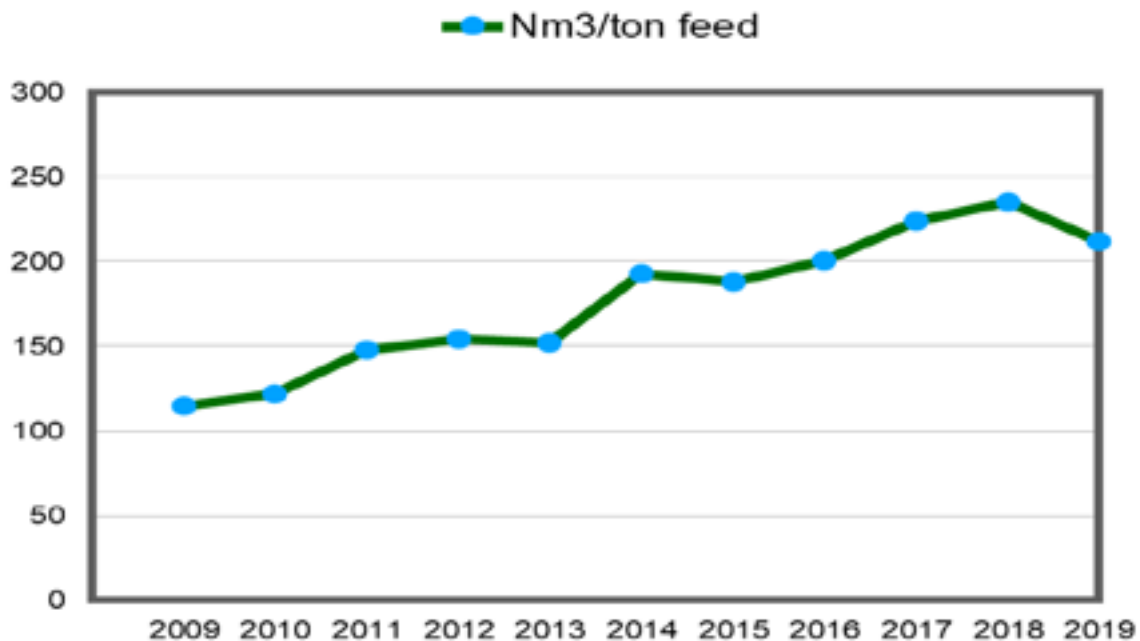


## 10 YEARS OF APPLICATION OF XCEL BIO IN THE KOMPOGAS DIGESTER OF GERMANIER ECORECYCLAGE SA, LAVIGNY, SWITZERLAND

### Introduction

Germanier Ecorecyclage SA is a composting site with a capacity of 25,000 tons per annum. To develop a better utilisation of green waste received, a Kompogas digester with a design capacity of 12,500 tons per annum was installed in 2008. According to the manufacturers, it was possible to feed, at an absolute maximum, up to 16,000 tons per annum with reduced efficiency of biogas yield.

The operational site is within 500 meters of the village of Lavigny on the shores of Lake Geneva. The odours emanating from the operations resulted in severe objections from the residents of Lavigny and surrounding neighbourhoods. Despite the installation of a system of composting control, the use of biofilters to treat the air from the preparation hall and composting piles as well as the use of masking perfumes, continuous complaints required a further solution. The arrival of Xcelbio on the market in Switzerland offered an inexpensive and different way to find a solution to these problems which threatened the continuation of the business.



### Odour

The initial objective for adding a continuous feed of Xcelbio to the digester was to reduce odours emanating from the digestate composting process post biogas production. An Xcelbio fermenter was installed on the roof of the digester and treatment commenced in May 2010. By September 2010 complaints from the community had decreased to an insignificant level and the use of masking fragrances was stopped.



## 10 YEARS OF APPLICATION OF XCEL BIO IN THE KOMPOGAS DIGESTER OF GERMANIER ECORECYCLAGE SA, LAVIGNY, SWITZERLAND

Increased production of gas and digester stability was noted to the extent that the capacity of the biogas concentration process was exceeded and continuous flaring of excess biogas was taking place. In Autumn 2012 a commercial decision to suspend Xcelbio addition was taken by financial management. Within a few months complaints were again received and as the summer of 2013 approached they became numerous again. Xcelbio addition was recommenced in July 2013 and complaints were eliminated within a few months.

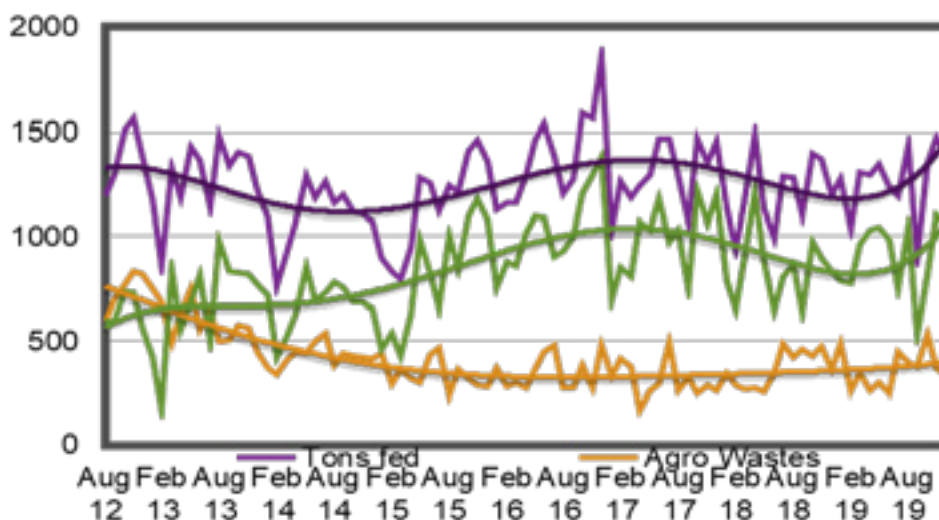
### Capacity and efficiency

As stated above increased gas production and digester stability was also seen as a consequence of adding Xcelbio to the digester. The effects of Xcelbio on the biology within the digester resulted in increased efficiency in the conversion of biomass. Although the nature quantity of higher potential feedstocks has reduced over the years and much more green waste from gardens and landscaping is fed the conversion efficiency continued to rise.

The increased volume of gas being made exceeded the capacity of the gas concentration and flaring capacity of the plant and it was necessary to restrict feed inputs in 2014 and 2015. The pressure drop in the gas pipe exiting the digester was also a limiting factor!. Additional gas cleaning and concentrating plant was commissioned in May 2015 along with an additional flare and a micro turbine to supply the sites electricity demand. This allowed feeding to be increased again and together with the continued increasing efficiency the average production of biogas increased to 10000 Nm<sup>3</sup> per day or 250% of the original digester design capacity.

This long term application of Xcelbio highlights a very important capability of Xcelbio technology - that it continues to optimise the treated biosystem over an extended period of time. At the same time the effects an interruption of Xcelbio addition can be noticed in a short period of time.

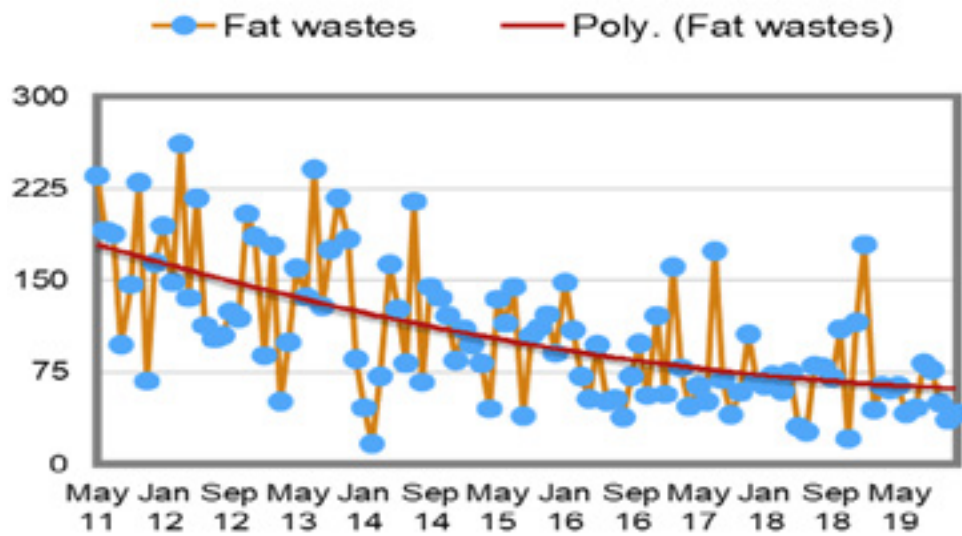
Germaniere changing feed mix (tons per month)



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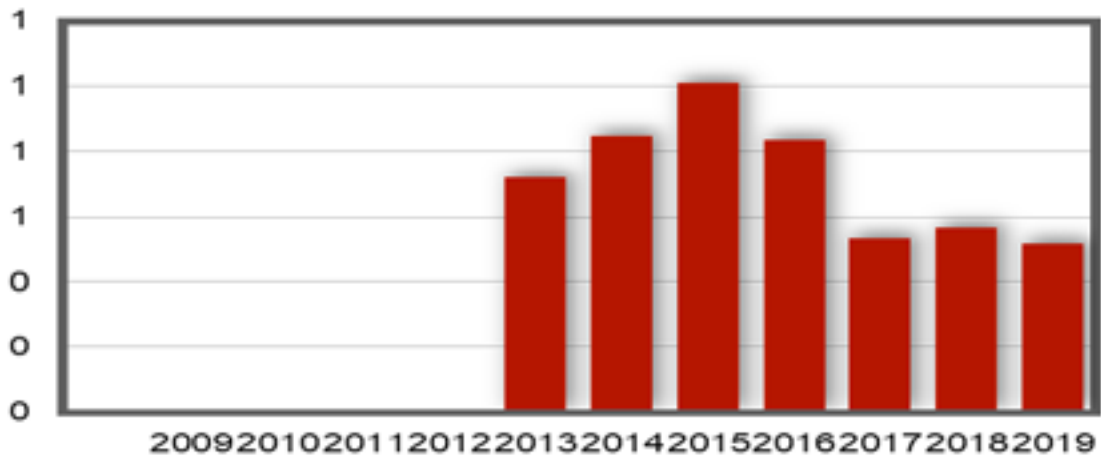
**10 YEARS OF APPLICATION OF XCEL BIO IN THE KOMPOGAS DIGESTER OF GERMANIER ECORECYCLAGE SA, LAVIGNY, SWITZERLAND**



**Stability**

The use of Xcelbio turns conventional biogas process control philosophy on its head and biogas plants are able to function well and stably with acidity levels of 15000 mg per litre and FOS-TAC ratios feel into ranges usually considered impossible

**Average FOS/TAC ratio yearly**



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**10 YEARS OF APPLICATION OF XCELBIO IN THE KOMPOGAS  
DIGESTER OF GERMANIER ECORECYCLAGE SA, LAVIGNY,  
SWITZERLAND**



**Owner's annual comments to Kompogas**

2015

I am pleased to pass on to you the result for the month of December, which allows us to pass the bar of 12,600,000 kWh produced over the year.

And to say that we haven't got the store returns yet. This lets us imagine records for 2016. In any case, thank you to all of you who contribute with your skills so that this result can be achieved for the great happiness of the commitments of COP 21.

2016

Good morning all ,

And here to start the year off right, we must finish the previous one well.

You will find attached the production statistics for December which are magnificent and which make us greatly exceed the annual production of the year 2015.

2017

Attached is the December statement; no flu for the digester for this last month of 2017.

I'm worried about how to do it better in 2018. In any case I wish us at least the same performances as 2017 for the production of Biogas.

2018

Attached is the December production which is a little lower than the average.

Some maintenance work, and a slightly too rich New Year's Eve menu have significantly shaken the intestinal flora (I'm talking about the digester)

Despite this, the year 2018 allows us to exceed 17,000,000 kWh hours.

2019

Attached are the production and supply tables for the month of December 2019.

I wish you a nice end of the day and my best wishes for the year 2020.