

# SUCCESS STORIES 2019



## Good Practices and Innovations in the Biogas Industry of the Members of the European Biogas Association

# Table of Contents

## Feedstock use

Name	Country	Company Name	Page
Co-Digestion of the Organic Fraction from Municipal Solid Waste with Manure and Chicken Dung at the Malta North Waste Treatment Facility	Malta	BTA	4
Wet pre-treatment of OF MSW at Glasgow Recycling and Renewable Energy Centre (GRREC)	United Kingdom	BTA	6
Wastewater and Waste-to-Energy Plant for Fish processing Industry	Ecuador	Fluence Italy SRL	8

## Plant construction

Name	Country	Company Name	Page
Willand AD plant	United Kingdom	BIOGEST	10
Construction, of a by-product AD plant in Japan	Japan	BTS—Biogas	12
Compact ETW SmartCycle® PSA	France	ETW Energietechnik GmbH	14





## Innovative tools and technologies

Name	Country	Company Name	Page
Selling green gas certificates directly from producer to consumer via an online platform	Netherlands	Vergroenjegas .nl	16
Biomethane feed into natural gas grid	Italy	GM-GreenMethane	18

# Co-Digestion of the Organic Fraction from Municipal Solid Waste with Manure and Chicken Dung at the Malta North Waste Treatment Facility



## Operator

BTA International GmbH

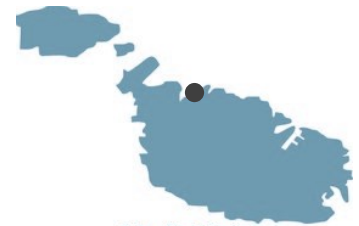
## Location of the project

Magthab, Malta

## Contact details

Jean Luc Zarb

[jean-luke.zarb@wasteservmalta.com](mailto:jean-luke.zarb@wasteservmalta.com)



## Project goals

### Process optimisation:

- Digestate

### Socio-environmental advantages:

- Renewable electricity/heat supply
- Waste reduction



## Project outline

The Malta North Waste Treatment Plant (MNWTP) is the second MBT Plant for the treatment of Municipal Solid Waste in Malta.

The facility is a key measure under Malta's Waste Management Plan and contributes significantly to the achievement of national goals by saving a landfill volume of over 58,000 m<sup>3</sup>/year while recovering material for recycling or RDF production, and producing biogas out of the organic fraction. With a power output of 10 gigawatt hours, the facility became one of the largest renewable energy sources in the country, while the digestate is used to produce landfill coverage substrate, highly valuable for an island such as Malta.

A further objective was to provide a solution for two livestock sector waste streams which have an increasing impact on the island – manure and chicken dung.

## Technical data

Year of plant construction	2013 – 2016
Year of performed service	2013 – 2018
Electric capacity:	1x 600 kW + 1x 1200 kW
Gas output:	5.4 million Nm <sup>3</sup> /year
Fertiliser:	Around 25,000 t/year stabilised dewatered digest
Volume of digester or gasifier	2 x 4500 m <sup>3</sup>
Type of digester or gasifier	Fully mixed reactor Mixing with gas lance system
Gas storage	1000 m <sup>3</sup>
HRT of digester	19 days
Process temperature	Mesophilic
Type of raw material	76,000 ton/year Municipal Solid Waste 47,000 ton/year Bulky Waste 35,000 ton/year Manure 4,000 ton/year Chicken Dung
Utilisation of (bio)gas/syngas	Valorization in CHP units
Heat utilization	Coverage of own heat consumption
Total investment costs (if published)	About 49 million € (incl. VAT)
Project partners	Consortium BEV: <ul style="list-style-type: none"> <li>• BTA International GmbH</li> <li>• EFACEC Engenharia e Sistemas S.A.</li> <li>• Vassallo Builders Ltd.</li> </ul>
Subsidy	Supported by EU funding (Cohesion Fund 2007-2013)

## Performed actions

The plant was designed and built by the BEV Consortium, on behalf of WasteServ Malta Ltd. The BEV Consortium comprises:

- BTA International GmbH
- EFACEC Engenharia e Sistemas S.A.
- Vassallo Builders Ltd.

The BEV Consortium was responsible for the design and construction of the MNWTF, which presents the following special features, among others:

- The MNWTF is split across two locations. The organic suspension produced from MSW at the Mechanical Treatment (MT) Plant is pumped over 400 m to the Anaerobic Digestion (AD) Plant.
- Receipt and co-digestion of residues from the livestock sector at the AD Plant.
- Two step dewatering concept to reduce the demand for flocculants.
- Stabilization of the dewatered digestate in the wet phase in three aeration tanks due to lack of available area for composting.

After the Provisional Approval in 2016, the Consortium has provided WasteServ with two years' operational support.

## Results

The results from the Approval Tests for the Provisional Approval of the MNWTF in 2016 showed that:

- The guarantees for the recovery rates and quality of the recyclable material and RDF were met or even exceeded.
- The requirement of a landfill diversion over 90% for Biodegradable Municipal Waste has been fulfilled.
- The specific biogas production per tonne VS input digester exceeded the design values, while methane contents were significantly higher than expected.
- The requirements regarding the physical impurities content and the degree of stabilization of the dewatered digestate were met.

The operation of the internal wastewater treatment plant was stable, achieving discharge loads distinctly below the corresponding guarantee values.

Management of the biogas proved to be quite feasible with a smaller than usual gas holder and with the installed 1.8MW split between a 1.2MW.

# Wet pre-treatment of OF MSW at Glasgow Recycling and Renewable Energy Centre (GRREC)



**Operator**  
BTA International GmbH  
**Location of the project**  
Glasgow,  
United Kingdom

**Contact details**  
Viridor  
Stephen Ivanec  
Sivanec@viridor.co.uk



## Project goals

### *Process optimisation:*

- Increased process stability
- Optimized feedstock usage

### *Economic advantages:*

- Lower operation costs
- Lower maintenance costs

### *Socio-environmental advantages:*

- Waste reduction



## Project outline

In 2016, 72% of the waste produced in Glasgow still went to landfill. Rising landfill taxes and the Scottish Government zero waste target were the drivers for Glasgow City Council to develop an ambitious programme for waste reduction, re-use, enhanced recycling rates, and energy recovery from residual waste.

With a treatment capacity of 200,000 tonne/year, the Glasgow Recycling and Renewable Energy Centre is central to this programme. Among other goals, it is designed to enable a landfill diversion of 90% of green bin residual waste and to produce enough energy to power and heat the equivalent of 22,000 and 8,000 households respectively.

The key to the successful valorization of the Organic Fraction from Municipal Solid Waste by anaerobic digestion is an efficient removal of the impurities and the recovery of a clean organic suspension. For this step, Viridor relied on the proven experience of BTA International GmbH.

## Technical data

Year of plant construction	2013 – 2017
Year of performed service	2013 – 2017
Wet Pre Treatment Capacity	90,000 tons per year
Volume of digester or gasifier	2 x 6000m <sup>3</sup>
Type of digester or gasifier	
HRT of digester	18—20 days
Process temperature	Mesophilic
Type of raw material	90,000 ton/year Municipal Solid Waste
Project partners	Viridor (DBO-Contractor for Glasgow City Council)



## Performed actions

For the Glasgow Recycling and Renewable Energy Centre, BTA International designed the wet pre-treatment step to remove the remaining contaminants from the Organic Fraction from Municipal Solid Waste obtained in the Material Recycling Facility (MRF) and produce a clean organic suspension for further treatment in the Anaerobic Digestion Plant.

In addition, BTA International supplied the key components of the BTA<sup>®</sup> Hydromechanical Pre-treatment (the Pulper, the Grit Removal System and the rejects handling equipment) as well as the control unit (PLC) for this process step.

Finally, BTA International supervised the commissioning of the pre-treatment step and provided operational support to Viridor during the first year of operation.



## Results

Equipment tests for the wet pre-treatment of OF MSW, with components supplied by BTA International for the Glasgow Recycling and Renewable Energy Centre, were completed in July 2017.

During these tests, the throughput and quality parameters for the heavy fraction, light fraction and grit fraction were successfully demonstrated even at critical design points, which simulated conditions far more demanding than the nominal throughput and waste composition parameters.

The equipment proved to be capable of operating at the critical design points with the heavy content more than two times higher and the grit more than four times higher than the nominal design waste composition.

Analysis by the University of Innsbruck showed that the level of impurities (> 2 mm) in the AD input was less than 2% of the total impurities share, demonstrating the efficiency of BTA<sup>®</sup> Hydromechanical Pre-treatment.

# Wastewater and Waste-to-Energy Plant for Fish Processing Industry



## Operator

Fluence Italy SRL

## Location of the project

Manabì, Ecuador

## Contact details

Eurofish

eurofish@eurofish.com.ec



## Project goals

### Process optimisation:

- Higher biogas output or methane content

### Process efficiency:

- Lower electricity consumption
- Higher efficiency
- Waste reduction

### Economic advantages:

- Lower operation costs
- Lower maintenance costs
- Waste disposal costs reduction

### Socio-environmental advantages:

- Renewable electricity or heat supply
- Waste reduction
- Reduced pollution
- New jobs
- Improved wastewater quality



## Project outline

The Eurofish Group is a leading firm in Ecuador's tuna industry as well as in the global market. Eurofish processes roughly 200 tonnes of tuna per day, predominantly for international export, including for brands such as Chicken of the Sea and Bumble Bee. Lately, the company has been moving into processing other types of fish, including sardines and mackerel.

Eurofish owns a processing factory in Manta, Ecuador, a large city on the Pacific Ocean that is a centre for fishing and seafood processing. To increase production and improve wastewater treatment quality, Eurofish contacted Fluence with a view to upgrading the facility and adding waste-to-energy to the plant's capabilities



## Technical data

Year of plant construction	2015 - 2016
Year of performed service	2016
Gas output:	60 Nm <sup>3</sup> /h, 480,000 Nm <sup>3</sup> /year
Volume of digester or gasifier	600 m <sup>3</sup>
Type of digester or gasifier	CSTR Digester
Gas storage	60 m <sup>3</sup>
HRT of digester	20
Process temperature	Thermophilic 50-55°C
Type of raw material	<ul style="list-style-type: none"> <li>• Primary DAF sludge from fish canning</li> <li>• Aerobic wastewater treatment sludge</li> </ul>
Utilisation of (bio) gas/syngas	Steam Boiler
Heat utilization	60 kW
Utilization of digestate/Ash	Fertilizer



## Performed actions

The renovation of the existing plant began with the addition of a new dissolved air flotation system (DAF) and other wastewater treatments. In addition to improving basic wastewater treatment, Fluence went on to add an anaerobic digester to treat sludge and produce biogas, which the facility uses as fuel for its boiler, generating steam used within the processing plant.

The process flow consists of:

- Separation of effluent in the DAF system.
- Treatment of clarified water in a double nitrification-denitrification stage.
- Anaerobic digestion of solids separated during the DAF process, which produces biogas and significantly reduces sludge volume.
- Final clarification to ensure the treated wastewater meets permit requirements before it is discharged.

Fish processing at the plant generates approximately 1,300 m<sup>3</sup>/d of wastewater, and its treatment generates 1,300 m<sup>3</sup>/d of methane. Before construction began, Fluence built a pilot plant on site to test the processes. A lab was built as well to monitor water quality.



## Results

The plant has been in operation since March 2016, making it the first complete industrial wastewater treatment plant in Ecuador. The facility can efficiently treat wastewater with very high levels of nitrogen and chemical oxygen demand.

Eurofish has reduced its sludge waste volume by 75% since the new facility went online. The improved quality of treated wastewater meets Ecuador's national standards for environmental compliance.

With the addition of waste-to-energy technology, Eurofish has reduced its wastewater treatment costs by 50% and its energy consumption by 35 – 40%. This highly efficient renewable energy source saves Eurofish more than \$120,000 a year.

This renovation gave Eurofish a chance to make other improvements benefitting the operation and the surrounding community.

# Willand AD plant



**Operator**  
Biogest Energie-  
und Wassertechnik GmbH  
**Location of the project**  
Willand, United Kingdom

**Contact details**  
Andronika Kirov  
andronika.kirov@biogest.at



## Project goals

### *Process optimisation:*

- Higher output or methane content
- Optimized feedstock usage
- Improved mixing
- Gas upgrading

### *Process efficiency:*

- Lower electricity consumption
- Lower heat energy consumption
- Higher efficiency

### *Economic advantages:*

- Lower operation costs
- Lower maintenance costs
- Lower investment costs

### *Socio-environmental advantages:*

- Renewable electricity or heat supply
- New jobs

## Project outline

After planning approval was granted in May 2015, the first stage of construction began on the project. This included the erection of a single 4,200 m<sup>3</sup> digester, a chemical wash biogas upgrade to convert biogas to clean biomethane and a Siemens grid entry unit to inject gas into the national grid. Subsequently, a CHP unit was added, which produces electricity and heat from biomethane and was successfully accredited in September 2016.

BIOGEST was contacted with a request to build an additional single process 4,200 m<sup>3</sup> digester, two PowerRing digesters and a new liquid feeding system consisting of two feeders. After successful negotiations, BIOGEST took over the full planning, construction, supply/installation of technology, commissioning and maintenance of the AD facility.

90% of the biogas produced is refined using a gas upgrading module, which separates methane from carbon dioxide. The result is pure biomethane, which is injected into the natural gas grid.

The remaining 10% of the biogas produced is burnt in a CHP/ gas boiler/stand by engine, producing electricity and heat. The electricity produced is used to power the plant itself, while the thermal heat generated is used to heat the digesters.

## Technical data

Year of plant construction	2017 -2018
Year of performed service	2018
Electric capacity:	1.8 MWel ( CHP 500 kWel + Diesel Generator 500 kWel + Backup CHP 800 kWel )
Gas output:	1,400 m <sup>3</sup> / h – 12,264,00 m <sup>3</sup> / year (max output)
Fertiliser:	59,495 m <sup>3</sup>
Thermal capacity:	1.2 MWth ( CHP 600 kWth + Gas Boiler 600 kWth)
Volume of digester or gasifier	PowerRing (Ring-in-ring) 2 x digester = 2 x 3,539 m <sup>3</sup> Single Process Fermenter 2 x SPF = 2 x 4,128 m <sup>3</sup> TOTAL = 15,334 m <sup>3</sup>
Type of digester or gasifier	2 x Power Ring Mesophilic, mixer mixed, insulated concrete tank, fixed insulated concrete roof with heat exchangers 2 x Single Process Fermenter Mesophilic, mixer mixed, insulated concrete tank, double membrane gas holder
Gas storage	Double membranes: 2 x 2,100 m <sup>3</sup>
HRT of digester	Power Ring : 76 days; Single Process Digesters : 89 days
Process temperature	40 °C Mesophilic / Gasifier 26 °C
Type of raw material	Grass silage
Utilisation of (bio) gas/syngas	Biomethane
Heat utilization	Gas upgrading + Digester heating + Pasteurisation
Utilization of digestate/Ash	Fertiliser

## Performed actions

**Planning:** BIOGEST started to work on the detailed planning, which included construction, technology installation and electrical control installation together with a software implementation tailored exactly to the client's needs.

**Construction & Installation:** BIOGEST built two PowerRing digesters with a diameter of 23 m and a height of 8 m. The PowerRing is a highly efficient, 2-stage biogas plant, which is suitable for operation with almost all substrates.

**Commissioning & Start-up phase:** In the start-up phase of the plant, active material was used to reach the full performance in the shortest possible time. In the very first month, a mix of grass silage and maize silage was used, eventually switching to a grass-only substrate.

**Biological Services:** BIOGEST's experienced biological service team provided support during commissioning and subsequent biogas plant operations, and continually monitors the biological process. BIOGEST has also successfully signed the service contract for the coming years.

## Results

**Operation:** The project was built and designed to process a mixture of energy crops and manures; due to the reduced availability of the proposed diet, however, it has been running on 100% wilted grass and grass silage, including during the ramp-up phase. The PowerRing system, with its outstanding mixing technology and the capacity to operate with almost all feedstocks, has proven its worth during long-term operation.

**Efficiency:** The plant has been fully operational since June 2018, with a consistent gas production of 1,000 m<sup>3</sup>/h. The plant has fulfilled the forecasted performance and is maintaining a stable operation. Scientific studies using simulations have determined the ideal positioning of the mixers in order to achieve the best possible level of mixing with minimum energy consumption. The plant is completely automated and controlled via a user-friendly operating system. The project concluded after the successful completion of the commissioning and performance test in August 2018.

# Construction, of a by-product AD plant in Japan



## Operator

BTS-Biogas

## Location of the project

Fukuoka, Japan

## Contact details

Gianluca Bisconti

G.Visconti@bts-biogas.com



## Project goals

### Process optimisation:

- Higher biogas output or methane content
- Increased process stability
- Optimized feedstock usage
- Reduced odours, noise
- Improved mixing
- Digestate

### Process efficiency:

- Lower electricity consumption
- Lower heat energy consumption
- Higher efficiency

### Economic advantages:

- Lower operation costs
- Feedstock flexibility

### Socio-environmental advantages:

- Renewable electricity or heat supply
- New jobs
- Raised public awareness/ acceptance on biogas/gasification and renewable energies



## Project outline

The plant location is only 8km from the city centre, and the odour produced by the pig farm was becoming a serious problem in the neighbouring area.

By installing a biogas plant, the owner can reduce the odour and generate income by selling the energy. In the very near future the pig farm owner will build a new pig farm to reduce further odour.



## Technical data

Year of plant construction	2018
Year of performed service	2018 and ongoing
Electric capacity: Gas output:	370 kW <sub>el</sub> 100 Nm <sup>3</sup> /h CH <sub>4</sub> / 876,000 Nm <sup>3</sup> /y CH <sub>4</sub>
Fertiliser: Installed thermal capacity: Ash:	14,270 t/y 430 kW <sub>th</sub> 500 t/y
Volume of digester or gasifier	3,874m <sup>3</sup> useable
Type of digester or gasifier	Concrete tank built in situ
Gas storage	1,040m <sup>3</sup>
HRT of digester	86 days
Process temperature	Mesophilic 40°C – 42°C
Type of raw material	- Pig slurry - Rice silage - Rice husk - Pig feedstock - Glycerin
Utilisation of (bio)gas/ syngas	Cogeneration
Heat utilization	Process internal, future external heat use planned
Utilization of digestate/ Ash	Fertilizer on agricultural land
Financial support: Obtained FIT / certificate	Japanese FIT programme



## Performed actions

- Design
- Delivery and installation of
  - \* Feeding system with feedstock pre-treatment
  - \* Biogas technology
  - \* Digestate separator
- Commissioning (in progress)
- Service & Maintenance (future)



## Results

- Construction completed
- Commissioning in progress

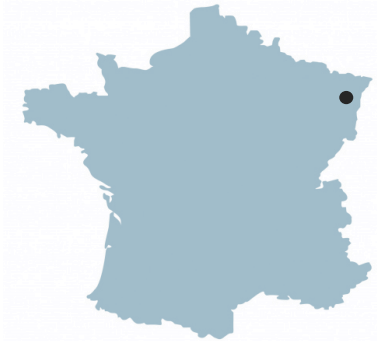


# Compact ETW SmartCycle® PSA



**Operator**  
ETW Energietechnik GmbH  
**Location of the project**  
Scherwiller, France

**Contact details**  
Oliver Jende  
jende@etw-energie.de



## Project goals

### *Process optimisation:*

- Gas upgrading
- Flexibility at changing inlet gas volumes and qualities

### *Process efficiency:*

- Lower electricity consumption
- Higher efficiency

### *Economic advantages:*

- Lower operation costs
- Lower maintenance costs
- Lower investment costs



## Project outline

France is currently one of the most important markets for biomethane plants in Europe. Energy experts estimate that by 2030 France will be able to cover one third of its gas requirements with biomethane. One challenge for upgrading plants in the French market are the less predictable biogas qualities and volume flows due to the use of diverse residues and waste streams.

That fluctuation, combined with the relatively reduced plant capacity demanded, makes the task of designing and building a plant far from simple. ETW Energietechnik, used to building larger industrial plants, had to develop a new concept to be competitive on the French market. The goal was to integrate all industrial features already approved at larger plants into a compact container-sized PSA upgrading unit with the capacity to produce 100 to 200 Nm<sup>3</sup>/h.

## Technical data

Year of plant construction	2018
Year of performed service	2018
Gas output:	350 Nm <sup>3</sup> /h (raw bio-gas)
Utilisation of (bio)gas/syngas	Biomethane production for grid injection



## Performed actions

ETW set up a team composed of experienced internal and external engineers from the PSA and biomethane industry, experts from the French biomethane market and the ETW process automation staff. The project team aimed to reduce components and simplify individual process steps, while also maintaining the ETW SmartCycle® technology that enables the plant to be self-adaptive and ensures stability on the production side without the need of additional homogenizing tanks or huge recycling steps.

During the development, valve skid was reduced, and compressor and vacuum pumps could be reduced in size and number due to recalculated process parameters. Some redundancies could be excluded in the small plant due to the closer operator presence. Adsorption vessels were completely redesigned to reduce footprint and fit into the same container. In addition, the pre-treatment step was improved in combination with a special design component in the PSA adsorption vessels to ensure higher VOC protection



## Results

The result is a complete upgrading unit that fits into one single container, including all same features known from large industrial plants. The ETW SmartCycle® PSA technology ensures process adaptability and production stability despite fluctuating inlet gas conditions. Energy consumption could be kept very low, less than 0.19 kWh/Nm<sup>3</sup>, the lowest energy demand on the market for this plant size. This feature in particular will make the new plant more competitive as energy costs in France are expected to rise during the plant's lifetime.

The easily accessible plant components allow the operator to perform daily visual inspections and carry out routine maintenance work unaided. The carbon molecular sieve (CMS) used in this upgrading unit is extremely cost effective in comparison with alternatives.

# Selling green gas certificates directly from producer to consumer via an online platform



**Operator**  
Vergroenjegas .nl  
**Location of the project**  
Groningen, Netherlands

**Contact details**  
info@vergroenjegas.nl



## Project goals

### *Economic advantages:*

- Lower investment costs

### *Socio-environmental advantages:*

- Renewable electricity or heat supply
- Reduced pollution
- Raised public awareness/ acceptance on biogas/gasification and renewable energies

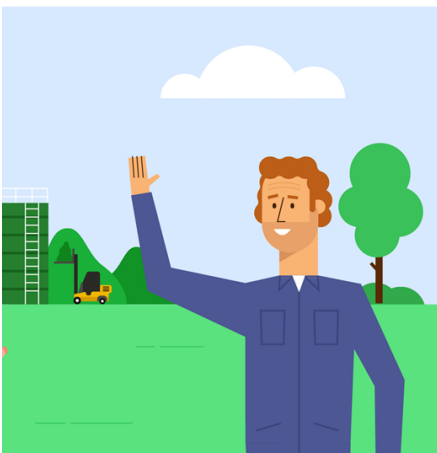
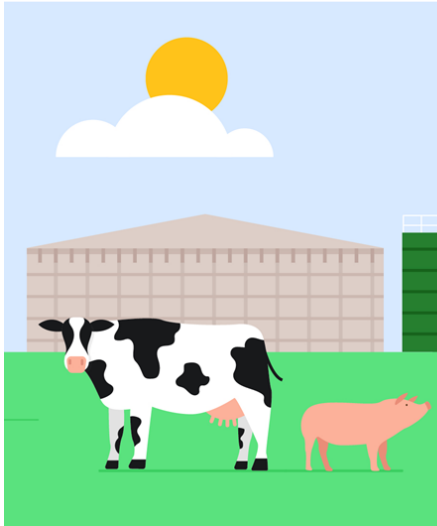


## Project outline

Consumers couldn't choose between fossil gas and sustainable green gas. The only choice they had was for either fossil or CO2-compensated gas, as real sustainable green gas was not available for households, only for other purposes. Vergroenjegas.nl decided to do something about that.

At Vergroenjegas.nl consumers finally have the option to buy real green gas certificates straight from the producers in three simple, different products: one year green cooking, one year green showering and one year green heating. There is also the option to purchase green gas certificates as a present for someone else. That way everyone can contribute to a more sustainable, cleaner and greener Netherlands even if the person doesn't use gas himself! !





## Performed actions

The online platform Vergroenjegas.nl was set up in association with Gasunie and GasTerra, with the help of one of the green gas producers. On Vergroenjegas.nl, the consumer can finally buy their own green gas certificates. Vergroenjegas.nl has made it as easy as possible for consumers to buy and for producers to sell green gas certificates on the platform.

Besides the platform, Vergroenjegas.nl also actively promotes green gas solutions on social media and at events where they explain everything people want to know about green gas. When they don't know the answer, they will always find someone who does! always find someone who does!



## Results

So far the results have been as follows: a fair price for green gas for consumers and producers; a relatively cheap and easy method for households to become more sustainable; awareness within households of the existence of green gas solutions; more consumer knowledge of green gas; and households actually using green gas at home.

But we're not done yet! We've just started, so there is a long way to go until our goals have been achieved. We want more households to think about sustainability, consider what the best solution available to them might be and, most importantly, to act upon that. We are there for the households who want to use green gas, now and in the future. and in the future.



# Biomethane feed into natural gas grid



**Operator**  
GM-GreenMethane  
**Location of the project**  
Anzio, Italy

**Contact details**  
Walter Giacomini  
walter.giacomini@gm-greenmethane.it



## Project goals

### *Process optimisation:*

- Gas upgrading
- Gas cleaning

### *Process efficiency:*

- Lower electricity consumption
- Lower heat energy consumption
- Higher efficiency

### *Economic advantages:*

- Lower operation costs
- Lower maintenance costs
- Lower investment costs
- Lower life cycle costs

### *Socio-environmental advantages:*

- Renewable electricity or heat supply
- Reduced pollution
- Lower carbon footprint



## Project outline

BioWaste decided to install a new plant for Biogas/Biomethane production from the anaerobic digestion of Organic Fraction Municipal Solid Waste.

GM-GreenMethane was selected as supplier for the Biogas upgrading plant.

Remit of GM-GreenMethane in the project was:

- cleaning the raw biogas coming from the anaerobic digester
- upgrading the biogas by removing CO<sub>2</sub> and minimizing CH<sub>4</sub> loss
- drying the Biomethane produced prior to compression and grid injection
- heating the anaerobic digester by recovering heat



## Technical data

Year of plant construction	2018
Year of performed service	2019
Gas output:	750 Nm <sup>3</sup> /h of raw biogas from OFMSW 480 Sm <sup>3</sup> /h of biomethane
Heat utilization	Heat output from the upgrading plant is recovered for digester heating



## Performed actions

The GM-GreenMethane timeline for the project was as follows:

- 2018-Q1
  - basic and detailed design of the plant
- 2018-Q2
  - procurement/manufacturing of all equipment/instrumentation/piping
- 2018-Q3
  - preassembly of the skid at the GM-GreenMethane factory
  - plant transport to the site
  - plant assembly at the site
  - plant ready to accept biogas within 9 months of the contract signing date.



## Results

The plant has already been delivered to the client. The commissioning/start-up is expected as soon as biogas is available (the digester is not yet complete).

This is the second GM-GreenMethane installation in Italy and other two plants are expected to be built soon.

GM-GreenMethane was awarded the “Premio per lo Sviluppo Sostenibile 2017” (Sustainable Development Award 2017) at the Ecomondo Exhibition. Indeed, the GM Biogas Upgrading System has proven to be the technology with the lowest carbon footprint (about -90% GHG reduction relative to fossil NG). This is mainly due to the negligible methane loss from the upgrading system and to the reduced power consumption.

Moreover, thanks to their robust design and low maintenance cost, GM plants have the lowest opex compared with competitors. Analysis of the Life Cycle Cost of the plants has shown that GM-GreenMethane technology is the best choice for biogas upgrading from an economical and environmental point of view.



# Associated Members of the EBA

- 3CEA
- AB Energy SPA
- Accord Ltd.
- Agraferm Technologies AG
- Aprovis Energy Systems GmbH
- AWITE Bioenergy GmbH
- Balmoral Tanks Ltd
- Biogest Energie- und Wassertechnik GmbH
- Bioprocess Control Sweden AB
- Biorefine Cluster Europe
- BRC, Biogas Research Center
- BTA International GmbH
- BTS Biogas Srl/GmbH
- China Agricultural University
- DESOTEC N.V. - S.A.
- DMT Environmental Technology
- DONG Energy
- DSM Biogas
- Ductor
- DuPont
- ECN
- ENGIE
- ETW Energietechnik GmbH
- Evonik Fibres GmbH
- Fluence Italy SRL (former RWL Water Italia S.r.l.)
- Franz Eisele u. Söhne GmbH u. Co.KG
- Fraunhofer IWES
- Future Biogas Ltd
- FWE GmbH
- Geotech UK
- GM Green Methane
- GrDF
- Greenlane Biogas Europe Ltd
- HABIO
- I.G.W. Srl
- IES BIOGAS SRL
- Institute for Biogas, Waste Management & Energy
- Jorgen Held
- Karlsruhe Institute of Technology (KIT), Engler Bunte Institut
- Kemira
- Kiefer Tek Ltd
- Landwärme GmbH
- Lars Salling
- Malmberg Water AB
- Miguel Smurawski
- N2 Applied
- Nature Energy
- Nederlandse GasUnie
- NEDGIA
- Nexsteppe Inc.
- Pales Muhendislik Yatirimlari Sanayi Ticaret Limited Sirketi
- Parker Hannifin GmbH
- Pentair Haffmans
- Peters Maschinenbau AG
- Prof. Dr. Mont. Michael Nelles, DBFZ Deutsches BiomasseForschungsZentrum GmbH
- Provincie Drenthe
- RISE
- Sattler Ceno Biogas GmbH
- Safe
- Schaumann BioEnergy Consult GmbH
- Schmack Biogas GmbH
- SebGas
- SHV Energy
- Streisal GmbH
- TAGUSGÁS - Empresa de Gás do Vale do Tejo
- Technische Universität Wien
- TNO
- UNICAMP
- Universität für Bodenkultur Wien
- University of South Wales
- Vaisala
- VSL B.V.
- Xylem Water Solution AB
- Yara International ASA



# Join us!

## Advantages for Associate Members

- **Broadcast** your successful stories in **Success Stories Catalogue**.
- **Get visibility** in brochures and events on biogas specific topics.
- **Promote your activities** within the EBA network.
- Attend EBA **events and conferences** or get discounts for other events on biogas.
- **Support EBA** position papers, research activities and public communications.
- Get information on **latest biogas developments**.
- Follow EBA initiatives and **collaborations with other stakeholders** at EU level.
- Cooperate with other EBA members by getting involved in **EBA bodies: SAC and CAC**.



**Address:** 63-67 Rue d'Arlon, 1040, Brussels, Belgium

**Phone:** +32 (0)2 400 1089

**Email:** [info@european-biogas.eu](mailto:info@european-biogas.eu)

**Website:** [www.european-biogas.eu](http://www.european-biogas.eu)



## About the EBA

EBA's strategy is based on reaching the full potential of biogas and biomethane production, that equals roughly 10% of EU's current natural gas consumption. Furthermore, EBA's work evolves around the major contributions of biogas and biomethane to the key EU policies such as climate targets, energy security, resource efficiency, circular economy and environmental legislation including air quality, prevention of contamination, bioeconomy and waste management.

EBA is the only European organisation that supports the entire biogas and biomethane industry and liaises with policy-makers in Brussels in order to steer the legal framework of biomethane.

EBA has an extended network across Europe. Our members are national biogas associations, international companies or research institutes, as well as private persons. As a company member you can participate and contribute to the EBA's work over the platform of the CAC Company Advisory Council.

EBA is also a partner in different EU projects and initiatives (e.g. Systemic project, Gas for Climate campaign). Our members can also be involved in our research activities and cooperate with EBA in removing existing barrier for the development of biogas.





**European Biogas Association**

Rue d'Arlon 63-67, B-1040,

Brussels, Belgium

[www.european-biogas.eu](http://www.european-biogas.eu)

[info@european-biogas.eu](mailto:info@european-biogas.eu)

+32 24 00 10 89

Join us on:

