



# Double benefit: Waste to energy plants.

Both problem solver and profitable investment.



# Economic benefits with circular waste management.

At PlanET we are convinced that biogas plants represent both a reliable energy supplier and the perfect solution for the utilisation of liquid and solid manure, and biogenic residuals.

## **For food producers and waste management companies.**

The digestion of waste could complete a cycle of raw materials based on food production or food waste management. Waste is used for the production of biogas and the biogas substitutes fossil fuels for the generation of electricity and heat – such a biogas concept provides double benefit for its plant owner.

PlanET anaerobic digestion (AD) plants can convert almost all biogenic waste materials into energy: slaughterhouse waste, fish processing residuals, animal carcasses, expired food or off-specification batches used in food production as well as agricultural residues, fats and oils. Especially in the food industry, anaerobic digestion offers significant cost advantages over traditional disposal methods – both to waste management companies and producers alike. The electricity and heat produced can be used in their own production facilities to make them independent of rising energy costs.





A wide variety of substrates can be used, i.e. vegetable waste.



Input material perfectly processed.

### A solid long-term investment.

There are many ways of making a successfully running business model with biogas production. Beside country specific governmental tax credits or special environmental waste programmes, the reduction of greenhouse gas emissions (GHG) is a popular motivation for strategic investments, because many governments offer carbon offset programmes by now in order to reach nationwide climate targets. Cogeneration facilities/AD plants are able to achieve proven effects to slow down impacts of climate change. Therefore economic benefits could be directly earned by operating a waste to energy plant.

Lethbridge Biogas LP, a Canadian AD plant with a capacity of 2,85 MWe located in Alberta, has saved 68,138 tonnes of CO<sub>2</sub> since it started commercial operation in December of 2013. Biogas is produced by two CHP units in order to generate the thermal energy and electricity which is sold to the Alberta

grid. Lethbridge Biogas LP is registered in the Alberta Offset System and we expect to save another 20,000 t CO<sub>2</sub> annually on a going forward basis. Carbon offsets are sold to large emitters in order to be in compliance with the climate change legislation.

### Many types of waste can be used in PlanET AD plants, including:

- Food waste
- Dairy products and whey
- Vegetable leftovers
- Fish and slaughterhouse waste
- Solid and liquid animal manure





# Premium technology and experience for maximum yield.

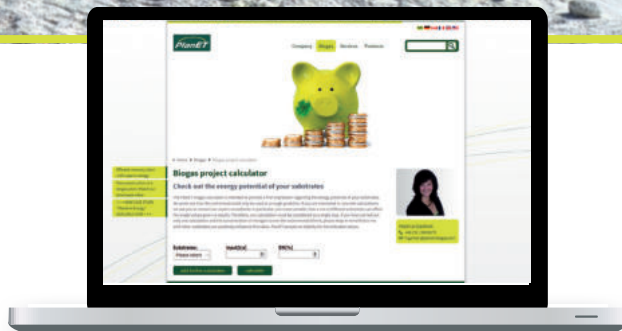
The PlanET Biogas Group is one of the leading providers of biogas solutions worldwide. Our portfolio covers the whole range of biogas technology and utilisation:

- **Feeding technology**
- **Safety technology**
- **Energy concepts**
- **Hygienisation**
- **Gas upgrading**

We understand ourselves as long-term partners for our customers. Therefore we provide all after-sale services including biological assistance as well as service and maintenance for all technical equipment.

## **Premium technology.**

Every waste to energy plant includes a huge number of high-tech components. The innovative crushing and feeding solutions are well suited to tackling the specific challenges associated with the different biogenic waste materials. For even biodegeneration of the input materials, correct agitation is fundamentally important. PlanET offers a wide range of agitators, adapted to your specific substrate mix. State-of-the-art biological desulphurisation and a highly efficient CHP unit for power and heat generation are further components to make sure that you get the most out of your waste to energy plant.



## Check out the energy potential of your substrates with the PlanET biogas calculator.

PlanET Biogas Group exclusively offers a brand new online tool, which enables potential clients to check out the energy potential of their substrates. The biogas project calculator is free of charge and provides its users a first impression regarding a suitable mix of substrates for an efficient biogas production. Everyone, who considers developing a biogas project, is now able to quickly check out, if and in which size a biogas production is possible for his facility. This biogas calculator is a rough guideline for our clients, certainly we carry out concrete feasibility calculations in a following step in which country-specific regulations such as feed in tariffs are being considered.



## PlanET: Success in figures.

- 450 AD plants worldwide
- More than 180 employees
- Winner of several benchmark and trademark awards
- 5 international locations
- Over 20 years of experience





Run your own trials & gain your experience with the PlanET mini digester.



The Netherlands | Beltrum  
1.25 MW | slaughterhouse waste, fish processing waste, flotote sludge, several food residuals



The Netherlands | Beilen | 2 MW  
liquid pig manure, cow manure, waste fat, crops, dry manure, vegetable fat



France | Littenheim  
250 kW | food waste

# Waste to energy. Best practice.

Our experience, your profit: To date PlanET has successfully completed 450 AD plants worldwide – from 40 kW liquid manure systems to 3 MW waste to energy plants. Among them are several successfully operating waste to energy plants in Canada, France, Germany, the Netherlands and Great Britain. Have a look at two examples.

## Case Study Germany. Biogas and waste treatment: 15 years of successful operation

As soon as 2001 it was clear to Hans-Gerd Buschhaus, a German businessman, that he would utilise food waste from canteens, restaurants and food markets to feed his biogas plant. A biogas production solely on the basis of secondary raw and residual materials –

with no energy crops whatsoever? Is this profitable? Today Hans-Gerd Buschhaus looks back at 15 years of successful operation. The cooperation with a local waste management company, established in 2013, was an initiative of his son Andre, now providing perfect conditions for a long-term economical success. The AD plant that started as a 160 kW plant for cow manure and energy crops, now has a total capacity of 1.5 MW and consists of a waste bin emptying and washing facility, a de-packaging plant, several hygienisation units, 3 digesters and 2 digestate storage tanks. The generated power is fed into the grid, the produced heat is used within the process and to heat green houses and nurseries within the vicinity of the AD plant - all driven by biogas from waste.





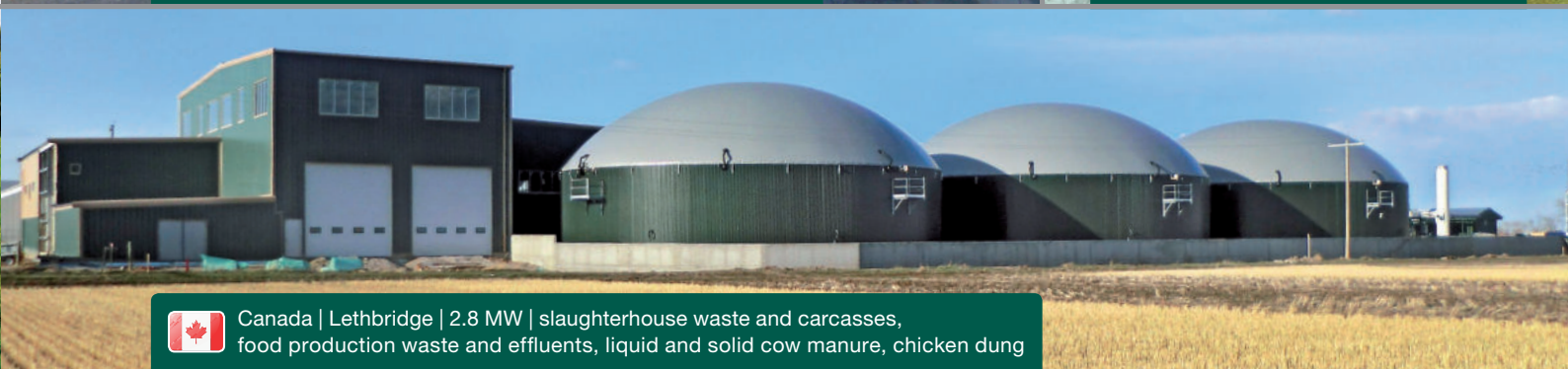
Germany | Grefrath | 1.4 MW  
flour dust, slaughterhouse waste, food residuals, vegetable waste, liquid cow manure, recirculated liquids



Canada | Ridgetown | 250 kW  
expired food, liquid cow manure



UK | Cardigan, Wales | 1 MW  
food waste, blood, stomach content, liquid manure, green waste



Canada | Lethbridge | 2.8 MW | slaughterhouse waste and carcasses, food production waste and effluents, liquid and solid cow manure, chicken dung

## Case Study Great Britain. A forward looking biogas concept including reception, depackaging and pre-treatment of food waste.

Asgard Renewables Limited was established to construct, own and operate AD and other renewable energy projects. It engaged Syrus Energy Limited, an AD consultancy, founded by two entrepreneurs Phil Gibb and Russel Ward, to provide project management and specialist AD delivery services. Asgard brought its biogas business model to life with the services of the PlanET Biogas Group. "Right from the beginning we focussed on two evident objectives: a solid profit and a sustainable utilisation of organic residues, especially food waste disposals", Gibb explains. The biogas concept is based on the idea of turning waste into

heat and power, taking additional waste at peak times, reducing landfill and using pasteurised digestate as quality certified fertiliser. The feedstock mainly consists of food waste, slaughterhouse waste (blood, stomach content), liquid manure and green waste. The total electrical output of the two CHP gas engines is 1 MWe. In order to guarantee a stable and long lasting process flow, Asgard decided to rely on an anaerobic digestion and pasteurisation solution, designed and realised by the PlanET Biogas Group. Two digesters and a storage tank will help turning the substrates into value. The forward looking biogas concept also includes reception, depackaging and pre-treatment of the waste in a separate reception building.



# Interested? Simply give us a call.

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