



BIOGAS IS READY, ARE YOU?

Why biogas
is essential for
a low-carbon
society

Green
Gas
Platform

Green Gas Platform



The Green Gas Platform is a joint initiative of Gas.be, ValBiom and Biogas-E. It was founded in 2019.



The mission of this collaboration is **to promote and to stimulate the production and use** of green gas in Belgium. The Green Gas Platform welcomes other green gas actors that endorse the same values and goals.

Green gas refers to gas from renewable resources such as biogas, biomethane, green hydrogen and syngas.

Gas.be

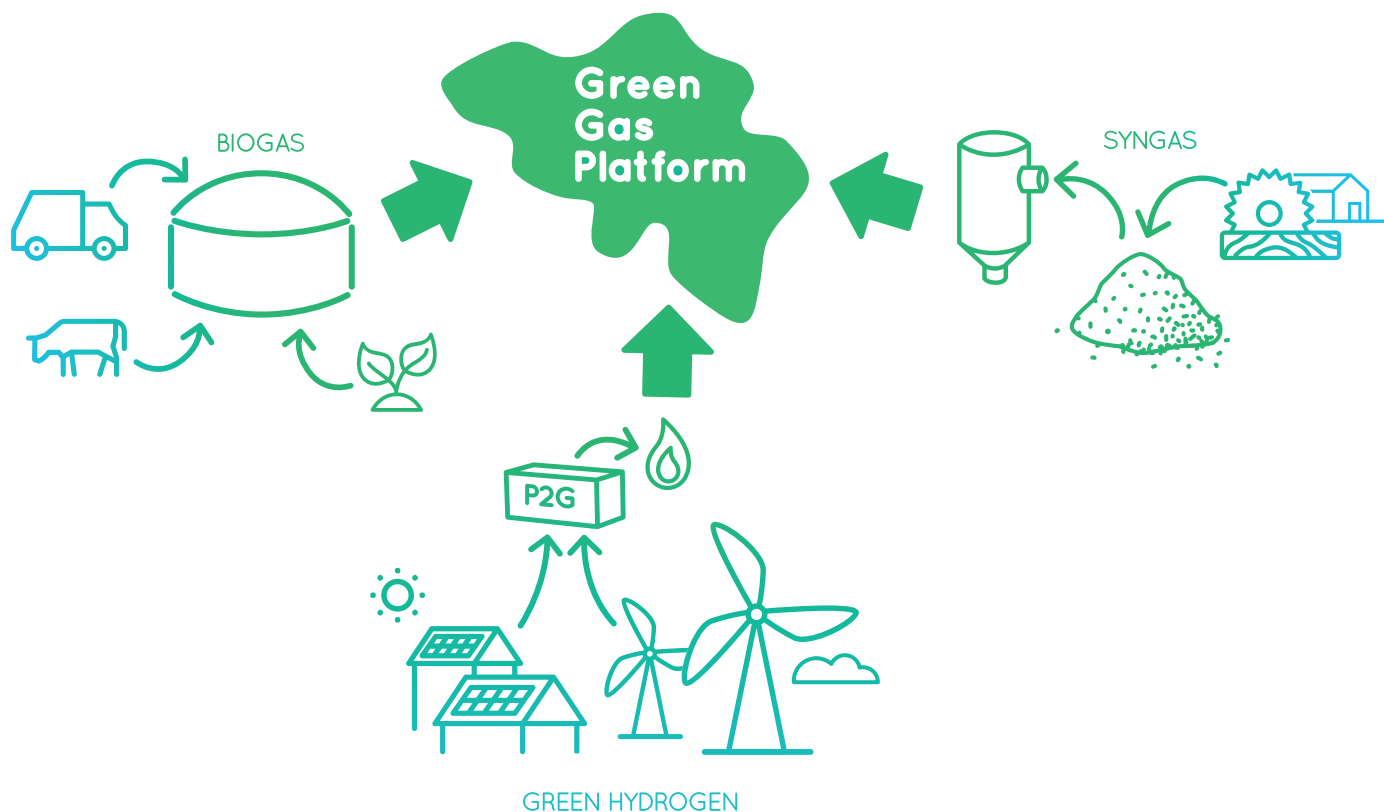
Gas.be represents the federation of Belgian transportation and distribution system operators of gas and promotes green gas as one of the key solutions for a low-carbon future.

ValBiom

ValBiom stimulates and facilitates the realisation of sustainable initiatives in Wallonia, integrating the production of biomass and its transformation into energy and materials.

Biogas-E

Biogas-E is the knowledge platform for anaerobic digestion in Flanders, striving for the sustainable development of the Flemish biogas and biomethane sector.



An aerial photograph of a rural landscape in Belgium. The scene is dominated by vibrant green fields and dense forests. A small village with several houses and buildings is visible in the middle ground. The terrain is slightly hilly, and the overall atmosphere is peaceful and scenic.

One of Belgium's main goals is to evolve towards a low-carbon society by 2050.

Green gas is essential in achieving this goal. Together with the different stakeholders, we want to collaborate on a joint strategy to ensure the role of green gas in the energy transition:

- Green gas contributes to the security of energy supply, compensating intermittency from wind and solar energy..
- Green gas offers a renewable alternative for fossil energy used in the industry and can serve as a carbon neutral fuel for the transport sector.
- Green gas connects several key sectors of our society like agriculture, environment and energy.

Our vision

100% green gas by 2050

In order to achieve this goal, the existing potential of the gas infrastructure should be acknowledged for what it is worth in the current climate strategy. This contribution should be central in a context where the gas grid plays an essential part in the valorisation of green gas.

To highlight its importance we promote a better understanding and recognition of green gas:

- By **promoting** green gas **and providing information** over its advantages;
- By starting an open **dialogue** with all concerned stakeholders about the role of green gas in our society;
- By developing **a common 2050 vision** for green gas, integrated in the regional as well as the national climate and energy visions;
- By elaborating **a fair support system**, taking into account the multiple advantages of green gas.

6 GOOD REASONS TO CHOOSE BIOGAS



Did you know?

1. We could compensate the CO₂ emissions from residential heating of 1 million Belgians, by using all the available manure in Belgium to produce biogas.

The agricultural sector is responsible for 10,8% of the Belgian greenhouse gas emissions. About 20% of this share is a result of natural emissions from manure. Using this manure to produce biogas would avoid up to 2 million tonnes of CO₂ eq/yr. At the same time 5,5 TWh of green gas would be produced, avoiding an additional 1,2 million tonnes of CO₂ eq/yr by replacing natural gas. In total we would avoid an equivalent amount of greenhouse gas emissions resulting from residential heating of 1 million Belgians.

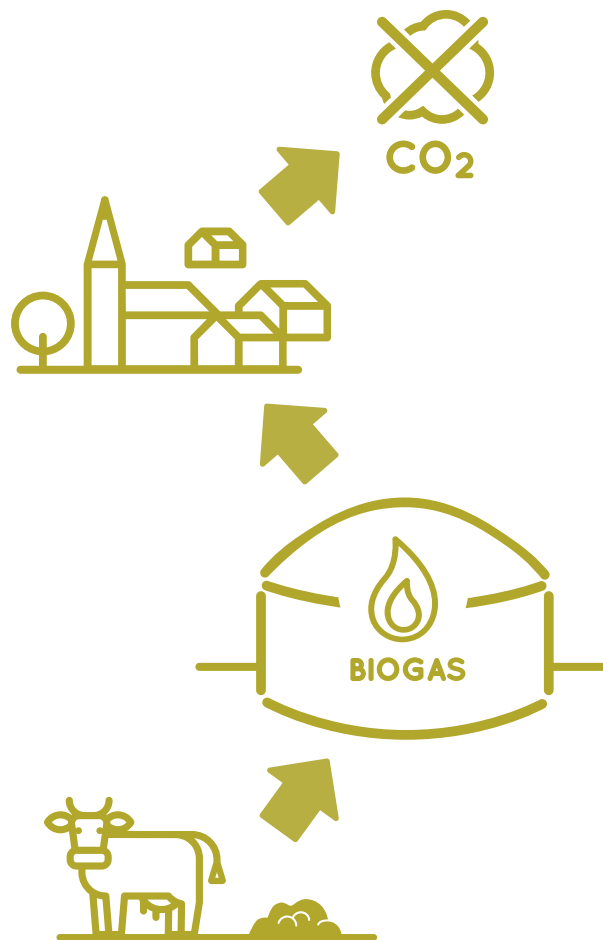
Sources and hypotheses :

Belgium's greenhouse gas inventory, 2018.

Average residential heating demand of 25 MWh/year.

288 kg CO₂/MWh natural gas.

An average of 2,4 persons per residence.



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Did you know?

2. The digestion of all the available organic residue streams can produce renewable fuel for a third of the private vehicles in Belgium (2 million cars) and at the same time replace 150.000 tonnes of chemical nitrogen fertilizer.

There is an estimated amount of 42,9 million tonnes of organic residue streams in Belgium. By producing biogas from these residue streams we could produce 18,5 TWh of biogas and 38,7 million tonnes of digestate. Digestate is an excellent biofertilizer, replacing 152.800 tonnes of nitrogen and other chemical fertilizers. Biogas (or biomethane) is a multifunctional renewable energy source: not only can it be used for the production of renewable heat and electricity, but it can also be used as a renewable and low carbon transport fuel for almost 2 million cars.

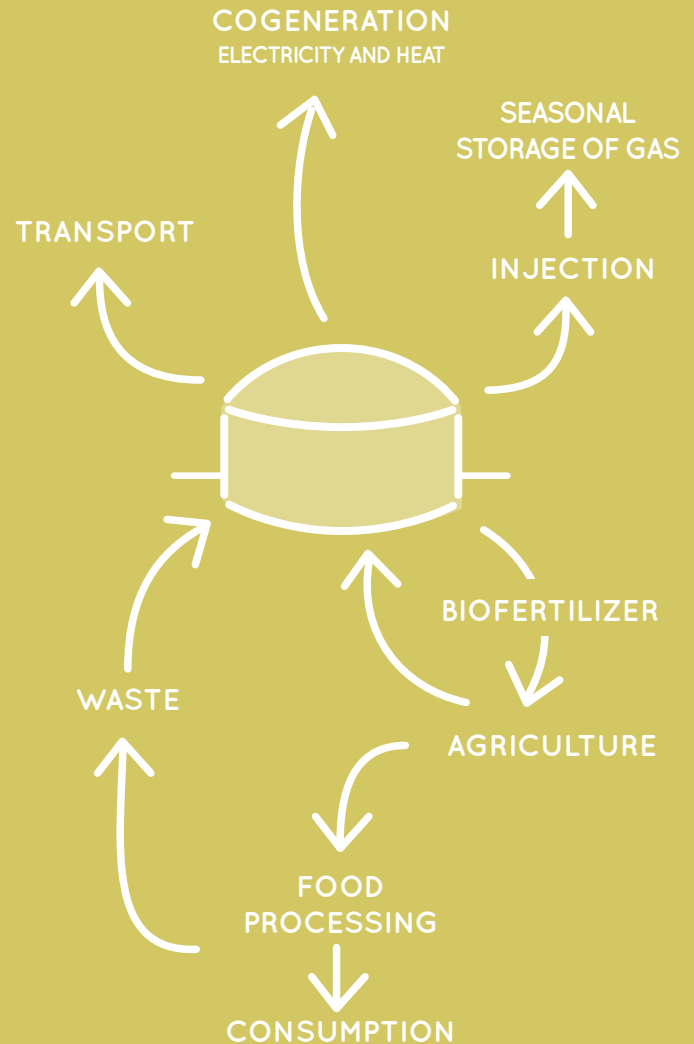
Sources and hypotheses:

The average number of driven kilometres per private vehicle: 14.770 km (FOD Mobility and Transport).

Average consumption of a private vehicle: 2,34 MJ/km (www.odyssee-mure.eu).

Average concentrations of raw digestate: 4,5 kg N/ton (87,8% plant-available nitrogen) (Vlaco).

Available waste streams in Belgium: "potentiel de biomethane injectable en Belgique" (Valbiom, 2018).



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Did you know?

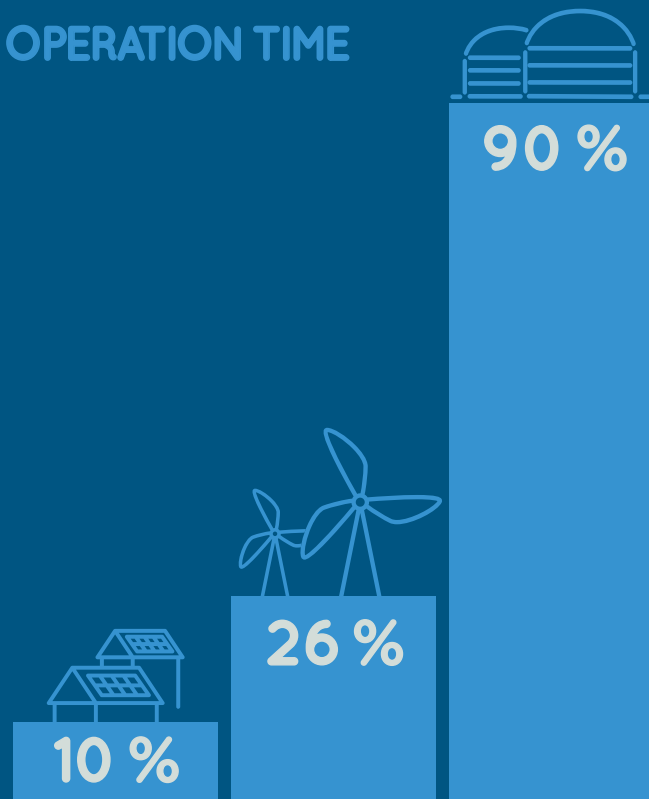
3. A biogas plant produces energy 90% of the time. It reinforces the grid and counter-balances the intermittent supply from other renewable energy sources.

Biogas is produced using biomass in a **continuous process**. A biogas plant provides **flexible energy supply, which can be stored long term**.

The **high-running hours make full use of the installed capacity** compensating the higher investment cost compared to a solar installation or wind turbine.

On top of that, the intermittency of wind and solar energy creates the need for grid reinforcement and large scale energy storage. Taking into account these hidden social costs further strengthens the case for biogas production.

OPERATION TIME



Sources and hypotheses :

Operation time renewable energy sources: 2018/2 Deel 1: Rapport OT/Bf voor projecten met een startdatum vanaf 1 januari 2019 (Flemish Energy Agency).

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Did you know?

- 4. The biogas sector could create 5.000 to 10.000 local jobs by 2030 and avoid the costly import of energy.

The biogas potential represents a nominal capacity of 900MW_{el}.

Based on the experience of the French and German biogas industry, this potential could result in 5.000 to 10.000 long term, local jobs.

The total investment would amount to 5 billion euros, but avoids the yearly import of natural gas amounting to 360 million euros.

Sources and hypotheses :

"potentiel de biométhane injectable en Belgique" (Valbiom, 2018).

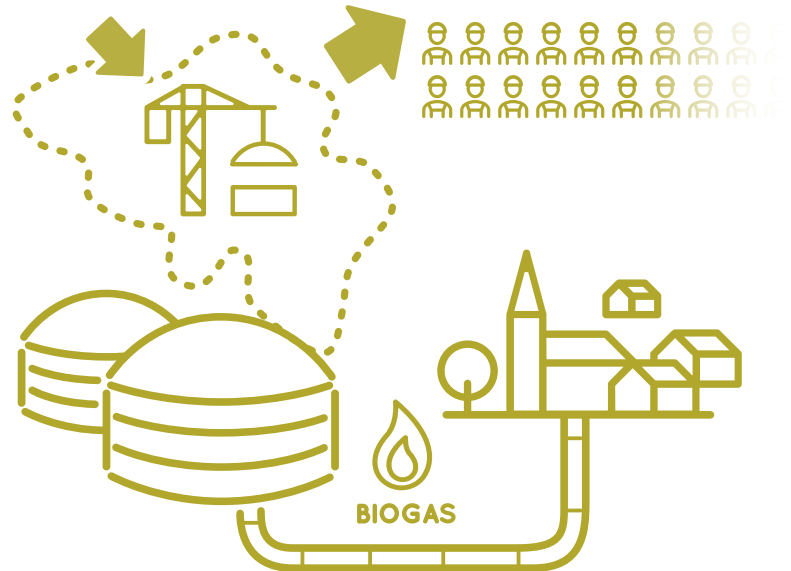
« L'emploi dans la filière biogaz de 2005 à 2020 – étude 2014 », (ATEE, 2014).

www.biosurf.eu

Internal information about the average cost per kW_{el} of a biogas plant (=6.000€/kW_{el}).

MARKET
€ 5 BILLION

CREATION OF 5.000
TO 10.000 JOBS



AVOIDED IMPORT
OF NATURAL GAS:
€360 MILLION

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Did you know?

5. Biogas saves more greenhouse gas emissions than other renewable energy sources.

On average, a biogas plant operates 90% of the time, reaching higher energy production than a wind or PV installation with identical installed capacity.

The biogas is typically valorised in a cogeneration unit, with the production of green electricity as well as green heat. A double win, replacing fossil electricity and natural gas.

Over the lifespan of an installation this results in greenhouse gas savings of 140.000 tonnes CO_{2,eq} per MW_{el}.

Sources and hypotheses :

Rapport 2018/2 Deell : Rapport OT/Bf voor projecten met een startdatum vanaf 1 januari 2019 (Flemish Energy Agency).

The greenhouse gas emissions are calculated with the Biograce II tool (<https://biograce.net/>).

Fossil fuel comparators: State of play on the sustainability of solid and gaseous biomass used for electricity, heating and cooling in the EU (European Commission).

Electricity: 186g CO_{2,eq}/MJ – Heat: 80g CO_{2,eq}/MJ.

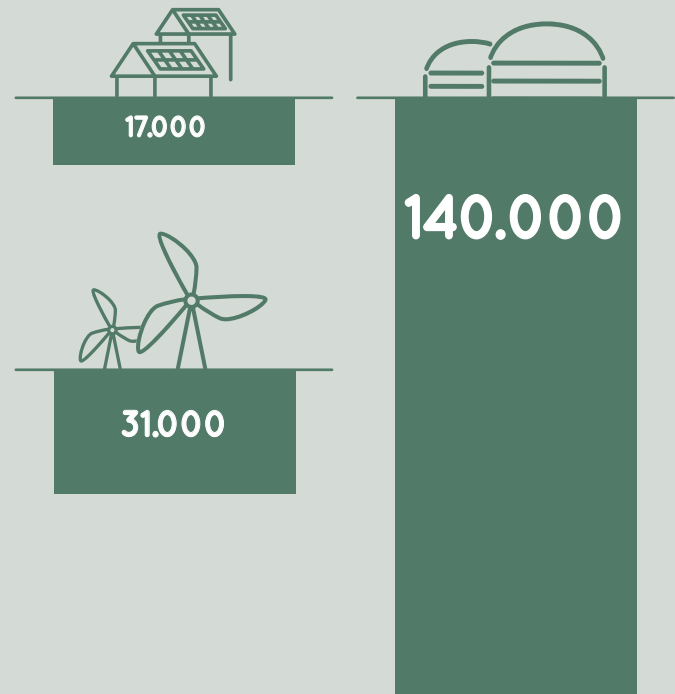
Lifespan per installation:

- Bioga: 20 years
- PV: 25 years (IRENA cost and competitiveness indicators - Rooftop solar PV, IRENA)
- Wind: 20 years (IEC 61400-1:2005 + AMD1:2010. Wind turbines – Part 1: Design requirements - Wind turbine classes, International Electrotechnical Commission)

Avoided greenhouse gas emissions



Tonnes CO_{2,eq}
For an installation of 1 MW_{el}



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Did you know?

6. The storage of green gas is **2.000 times cheaper than the storage of electricity.**

Green gas can be easily stored in gas storages. The existing Belgian gas infrastructure can store more green energy than 600 million domestic power wall batteries. The construction cost of new gas storages is minimal compared to the cost of a battery or pumped storage in hydropower plants.

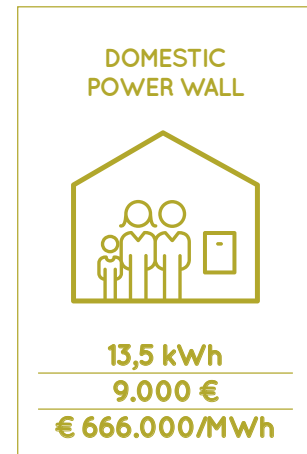
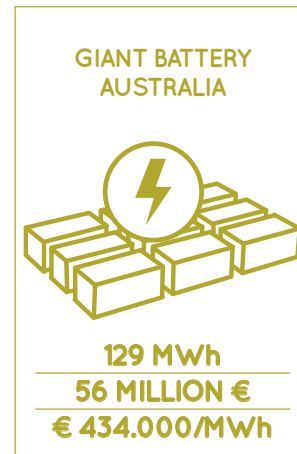
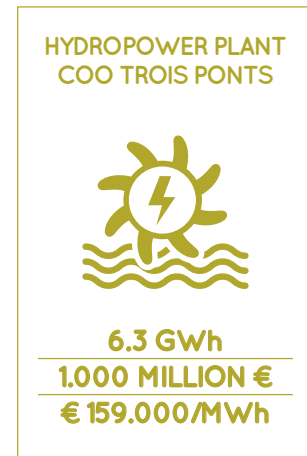
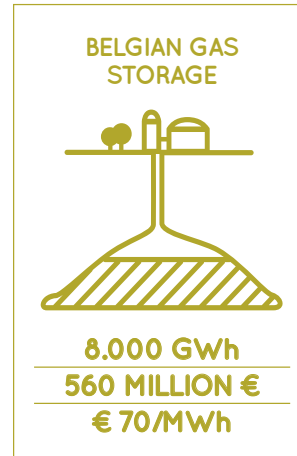
One of the major challenges in the energy transition is energy storage. This storage is not only required to compensate intermittent renewables, but also to cover peak energy demands during winter.

Sources and hypotheses :

Fluxus Belgium for the data on gas storage, Belgian gas storage based on underground gas storage in aquifer at Loenhout.

Cost pumped storage of the hydropower plant in Coo: Engie (<http://corporate.engie-electrabel.be>).

Information on Tesla Australia and Power wall 2: Tesla (https://www.tesla.com/nl_BE/powerwall).



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BIOGAS IS READY. ARE YOU?

The climate goals challenge us to think out-of-the-box and to widen our scope. The energy transition will only be possible if we link the different activities and sectors (agriculture, energy and environment) again. The concept of waste will progressively disappear as it will be used as a resource in the circular economy of tomorrow. A low carbon society creates jobs, significantly reduces the emissions of greenhouse gases, valorises waste streams and encourages farmers to switch towards organic agriculture.

For all those reasons, biogas is essential in the energy transition.

**AFFORDABLE
SOLUTION**

**VALUE
FOR MONEY**

**BIOGAS
AS ACTOR
IN THE
ENERGY
TRANSITION**

**CIRCULAR
ECONOMY**

**SUSTAINABLE
RECYCLING**

**CLIMATE
OBJECTIVES**

**CARBON NEUTRAL
BY 2050**

POTENTIAL

**10 TIMES HIGHER
THAN TODAY**

RECOMMENDATIONS

Develop a **long term strategy**,
by including green gas in the climate
and energy vision.

Identify and acknowledge all **economic and
social advantages** of biogas production.

Activate and develop the market for biogas
with **proper impulses and incentives**.

Create a **stable regulatory framework**
that facilitates **new green gas projects**.

Biogas production is the best available technology for upcycling our organic waste streams.

The operation time is 3 to 8 times higher, compared to wind or solar power.

Every biogas plant secures 5 to 10 local jobs per MW_{el} installed capacity.

Local biogas production lowers our dependency on energy imports.

Green gas is the cheapest option to store renewable energy.

Biogas avoids more greenhouse gas emissions than other renewable technologies.



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