Supply and utilisation of biogas and natural gas in Styria & Lower Austria; AUSTRIA

An overview of the present situation, norms & legislation and available vehicles

D2.2.3-4

Summary of the present situation – facts & figures

Supply

Biogas plants

- App. 100 waste water plants, app. 40 GWh per year
- App. 15 landfill gas plants, app. 130 GWh per year
- 340 biogas plants, 1.200 GWh per year

Wood Gasification

- 1 pilot plant

Natural gas

- More than 50 gas companies deliver or distribute natural gas
- Energy value of the gas is 11,11 kWh per Nm^3
- The total number of costumers in the region is 1,3 Mio
- The amount of sold/used gas in the region is 94.302 GWh/year

Treatment and distribution

Upgrading plants

- 6 upgrading plants
- Used techniques are membrane separation technology and absorption technology

Local (biogas) grid

- Several mini local gas grids
- No local biogas grid

National gas grid

- 1549 km Transit pipe line incl. loops
- 2589 km long distance pipe line
- 3583 km distribution pipe line > 6 bar
- 34522 km distribution pipe line < 6 bar

Non Grid Transportation

- minor important in Austria

Gas filling stations

- 111 filling stations
- 14 filling stations in the region (Styria)
- 12 filling stations in the region (Lower Austria)

Utilisation

Biogas & Natural gas in vehicles

- 235 personal cars in 2008 (Styria)
- 2.350 personal cars in 2008 (Austria)
- 50 - 70 buses (Austria)
- 1 heavy duty vehicle (Austria)

Biogas for non transport applications

- 340 biogas plants producing electricity
- 90,09 MW

LPG

Utilisation in vehicles

- Limited market for LPG in Austria
- 10 filling station for LPG in Austria
- > 50 passenger cars
- All 500 public transport buses in Vienna,

Available Vehicles

- 19 available models of personal cars
- 6 available models of light transport vehicles

Contents

Introduction

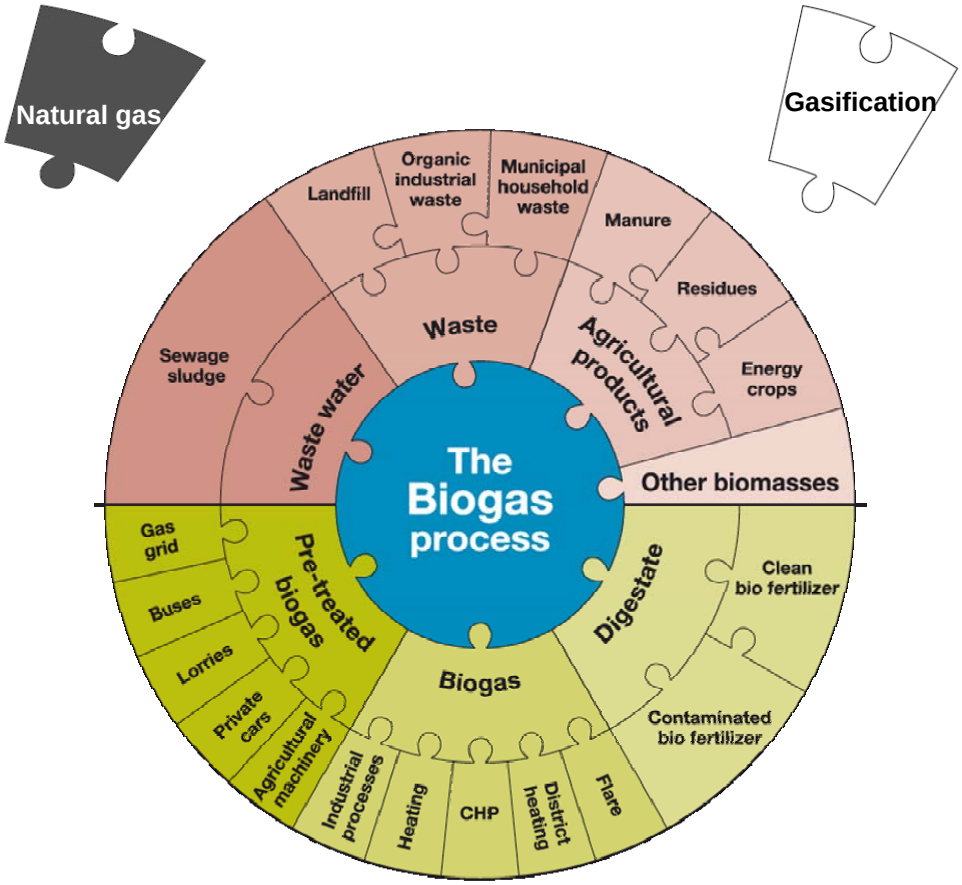
Biogas and natural gas are very clean energy sources, when combusted the amount of particles, NO_x, CO etc are lower than most other fuels. Biogas is also a renewable fuel. If petrol or diesel is replaced with biogas produced from manure, the CO_2 emissions can be reduced with up to 180 % . The MADEGASCAR project aims at improving the conditions for a growing market for gas driven cars and light transport vehicles (NGVs) and also increase the supply of biogas and natural gas for these vehicles.

To expand the market for supply and use of gas as a fuel for vehicles it is of high importance to understand the present situation of use and supply of gas. This text sums the present situation of supply, treatment & distribution and the final use of biogas and natural gas in the region.

One chapter deals with norms and legislation. This chapter concern laws around biogas production plants, distribution of biogas and natural gas, and the use of methane gas in vehicles. The current management control measures that are used in the region to support gas vehicles are also summed in this chapter.

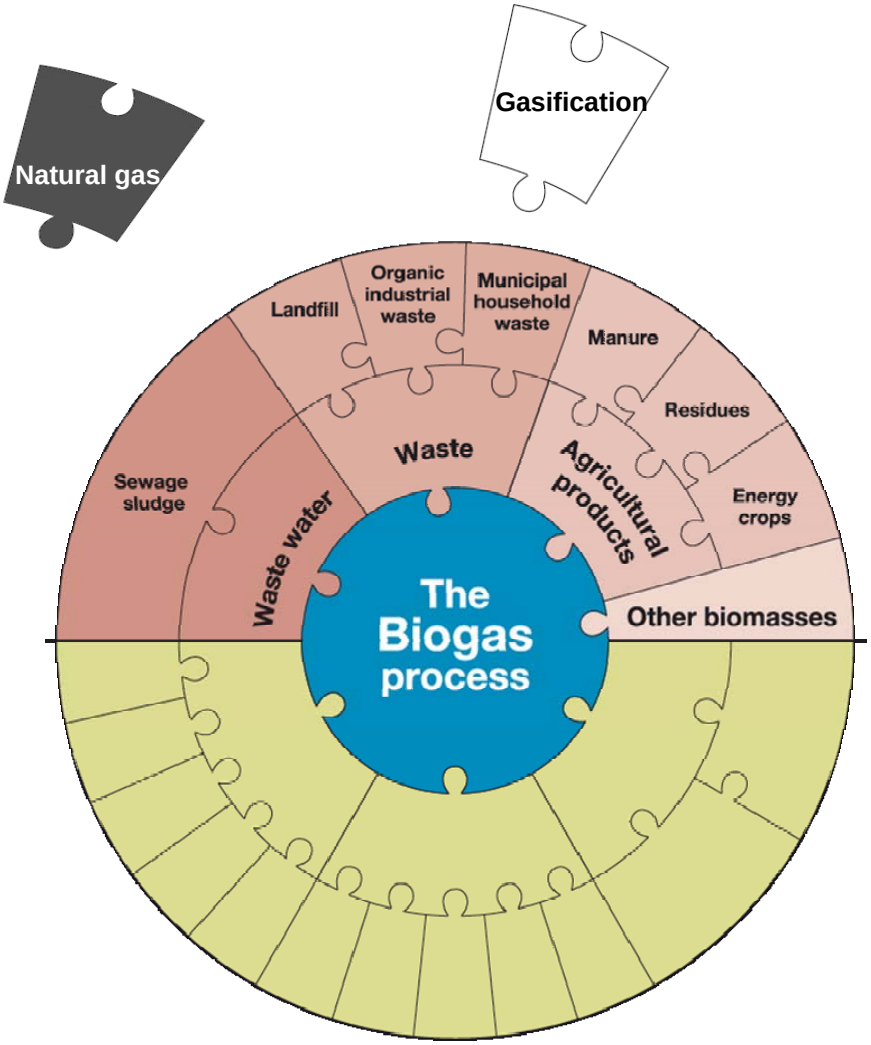
The use of LPG as vehicle fuel is also of interest for the MADEGASCAR project because of the possibility to convert these vehicles to propulsion with methane.

This text also contains an overview of the range of available NGVs in the region.



Supply

This section handles the present supply situation of biogas, natural gas and bio methane (gasification) in the region.



Biogas production plants

Background

In Austria biogas is used especially in combined heat and power (CHP) generation applications. Therefore a continuous and rather constant heat demand at the plant's location must be available to enable an economic plant operation. Thus biogas production and use are restricted to a rather small number of locations. On the other hand biogas could play a major role in a future energy system based on renewable sources. Biogas supply to public gas grids results in a broader use of this regenerative energy source with a high utilization factor, even without the demand for heat supply.

Around 157 million m^3 of biogas was produced in Austria in 2005 from 323 accredited green electricity plants. According to expert estimates additionally 94 biogas plants respectively co-fermentation plants produce between 65 and 132 million m^3 of biogas. Therefore more than 222 million m^3 of biogas are in total produced every year in Austria. Nearly 100% of the biogas is used for electricity production directly on site of the biogas plant. Nevertheless there is a growing interest of the producers to use biogas as a fuel.

The biogas produced from biomass is mostly used for the production of heat and electricity in Austria. On 31st of March 2006 in Austria 325 biogas plants with a bottleneck power of 81,06 MW were approved. In the year 2006 the amount of fed in electricity was 358 GWh electric power through biogas as well as 52 GWh through sewage and disposal gas. The actual amount of produced biogas is not easy to find out but experts estimate the amount to 265 to 414 million m^3.

Present situation

Waste Water

- App 100 waste water plants digests the sludge in biogas reactors
- 40 GWh in total production per year

Experts estimate that there are about 100 sewage gas plants with an electricity production of around 40 GWh a year. The existing plants are co-fermentation plants (with industrial waste being added) and produce relatively small quantities of sewage gas, which is mainly used to generate own electricity. Only a very small number of plants supply electricity to the power supply system.

Waste

- App. 15 landfill gas plants
- 130 GWh in total production per year

Approx. 10% of landfill gas is energetically used in Austria. According to expert estimates, 15 landfill gas plants with an installed load of 16 MWel are currently operated, producing about 130 GWh electricity annually. Besides some smaller plants, Vienna's largest landfill situated at Rautenweg energetically uses landfill gas. This plant – with an electrical power of about 8 MW – is the largest of its kind in Europe at present.

Agricultural products

- 340 biogas plants (accredited green electricity plants)
- 1,200 GWh per year

Austria ist the first European country which succeeded in realising standardised agricultural biogas plants. Biogas plants have been established all over the country since 1999.

Future perspectives

It is currently not permitted by law to supply sewage gas to the natural gas grid. At present, several parties try to achieve a legal amendment relating to this aspect.

A biogas plant has a life of about 20 years. Some plants receive subsidies for a limited period of 10 or 13 years and cannot cover their costs after the subsidies for green electricity have been discontinued. As a result, a growing number of agricultural biogas plants that is ready for operation is no longer covered by the tariff scheme and is closed down. Pucking serves as a first example for a biogas plant where the combined heat and power plant has been closed and where biomethane is supplied to the natural gas grid.

When it comes to selecting areas under crops, many runners of biogas plants are still bound to traditional ideas and rather use maize and cereal than catch crops. The latter do not compete with food; however, they are currently only used by biogas “pioneers” in Austria. In this context, it would be important to change the political framework conditions and no longer promote the overriding use of maize and the like in biogas plants to ensure that the operators of those plants also use liquid manure, dung and grass to a certain extent.

Furthermore, it has become apparent that quite a few plants were over-dimensioned in the past. Some large plants already use their over-capacities to build up a fuel supply chain as weitere Vermarktungsschiene. In the future there might be a trend for smaller plants with less than 100 kW power because of the increased crop prices and economically limited transport distances for liquid manure, dung and grass.

Gasification

Background

In Austria we use the English phrase “gasification” for producing synthesis gas out of wood, wood chips and similar biological fuels.

Present situation

Wood gasification in Güssing

An example for a pilot gasification plant using wood and wood chips as raw material is located in **Güssing**, Burgenland. The main advantage of wood is that it does not compete with the food industry. This is the only operating wood gasification plant in Europe using a technology developed by the Swiss Paul Scherrer Institut. Since there is no major natural gas grid in Güssing, biomethane is used for a CHP plant and – to a smaller extent – for a small local gas grid, a local filling station and for a BfL (Biomass to Liquid) production plant, which itself is leading in Europe. More information can be found at http://www.energiesystemederzukunft.at/results.html/id4286.

Natural gas

Background

Commercial use of natural gas in Austria reaches back 50 years. Approximately 19% of the gas used in Austria is produced in Austria; the remaining 79% are imported.
Most natural gas is imported from the Russian Federation (64% of the total amount imported and/or produced). From the large deposits located in West Siberia, this gas flows through thousands of kilometres of underground pipelines to reach Austria.
Austria also imports natural gas from Norway (7%), which is one of Western Europe's largest natural gas producers, and from Germany (10%).

Present situation

- More than 50 gas companies deliver or distribute natural gas within Austria. As the Austrian gas market is already liberalised theoretically each gas company are able to sell natural gas to the final customer.
- The Energy value of the gas is 11,11 kWh per Nm^3
- The total number of costumers in the region (Austria) are 1,3 Mio
- The amount of sold/used gas is 94.302 GWh/year

Customer structure for natural gas demand:

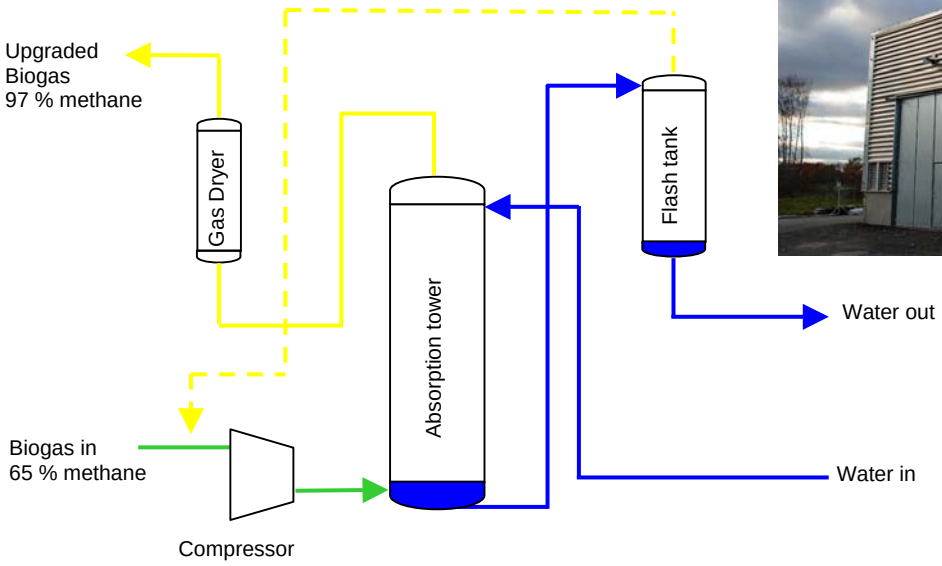
- Household 23%
- Small customer 10%
- Industry 37%
- Power plant 30%

Styrian region:

- Natural Gas sales 1447 Mio m^3
- Length of gas grid: approx. 3600 km
- Natural gas customers: approx. 37,000
- Served house holds: 43,000

Treatment and distribution

This section handles the present situation of biogas treatment plants and distribution systems for biogas and natural gas in the region. The number of gas fuelling stations will also be found in this section.



Treatment of biogas (upgrading)

Background

There are two different approaches:

- Supply to natural gas grids and use in the form of “virtual” biomethane
- Supply to filling stations next to biogas plants (“local application”) or transport to filling stations by tank lorries.

At the moment are six upgrading plants in operation:

- Pucking /Upper Austria (80.000 m³/Year – demonstration plant)
- Margarethen am Moos / Lower Austria (operation began in 2008, the aim is to reach 407.000 m^3)
- Bruck an der Leitha / Lower Austria (800.000 m³/Year)
- Eugendorf / Salzburg (140.000 m³ / Year)
- A plant at Leoben / Styria is in the building phase. It will start production by end of 2008. (1.000.000 m³/Year).
- Another plant in Utzenaich, Upper Austria is running as a demonstration plant.

Necessary cleaning and upgrading steps:

- Separation of dust particles
- Desulphurisation (max. Concentrationg H2S: <3ppm)
- Separation of oxigen
- Drying process
- Concentration of methane (CH4-conc. >96%, CO2 <2%))

Present situation

Technologies which are used include membrane separation technology (Bruck/Leitha and Margarethen/Moos) and absorption technology (Pucking, Eugendorf and Leoben)

Membrane separation technology

The only large plant operated in Austria is located in **Bruck/Leitha**, where 800,000 m^3 of pure biogas are upgraded per year (100 m^3 per hour). The quantity of biomethane upgraded in Bruck/Leitha corresponds to nearly half of the quantity used by NGVs in Austria (as of December 2007).

This is the first plant worldwide to use the dry membrane separation technology, which has been long used in the purification of natural gas, for biogas upgrading in an economic way. More information on this technology can be found at http://www.energiesystemederzukunft.at/results.html/id5183.

The lower costs compared to other upgrading technologies and the possibility to switch on and off the purification process according to the actual needs are considered the major advantages of the membrane separation technology. By-products of the food industry are used as raw materials.
The Bruck plant serves to recycle waste and produce electricity and long-distance energy as well as supply biomethane to the natural gas grid.

The aim of the project is to produce biomethane the cost of which is not higher than that of natural gas by 2012.

Ongoing research includes the testing of various types of membranes and the use of catch crops in order to minimise the methane losses and to further reduce costs.

Lower Austria, where Bruck/Leitha is located, is the only Austrian federal province to promote the use of virtual biogas by means of housing subsidies: End users who install gas stoves and undertake to buy virtual biogaswill receive similar investment subsidies as if they installed a wood pellets stove.

While the plant in Bruck/Leitha uses a two-step membrane technology, the plant in **St. Margarethen/Moos** in Lower Austria employs a similar but more simple one-step membrane technology. The plant supplies a neighbouring filling station which is the only one using pure biomethane (example for a local solution).

Absorption technology

Another example for a smaller upgrading plant can be found in **Pucking**, Upper Austria. It is the first plant in Austria to supply biomethane to the natural gas grid. Here a number of nearby households are using 100% biomethane.

A biogas plant in **Utzenaich**, Upper Austria, has a bio refinery preceding the upgrading plant, where chemical products like amino acids are produced as part of a pilot project. After this step, the upgraded biomethane is supplied to the natural gas grid.

Future perspectives

As a next step, it is necessary to identify those biogas plants which are located close to a suitable natural gas grid (through which a certain quantity of gas flows over the whole year).
It is the aim to have about 250 biogas plants supplying biomethane to the natural gas grid in Austria by 2015.

Gas grid

Background

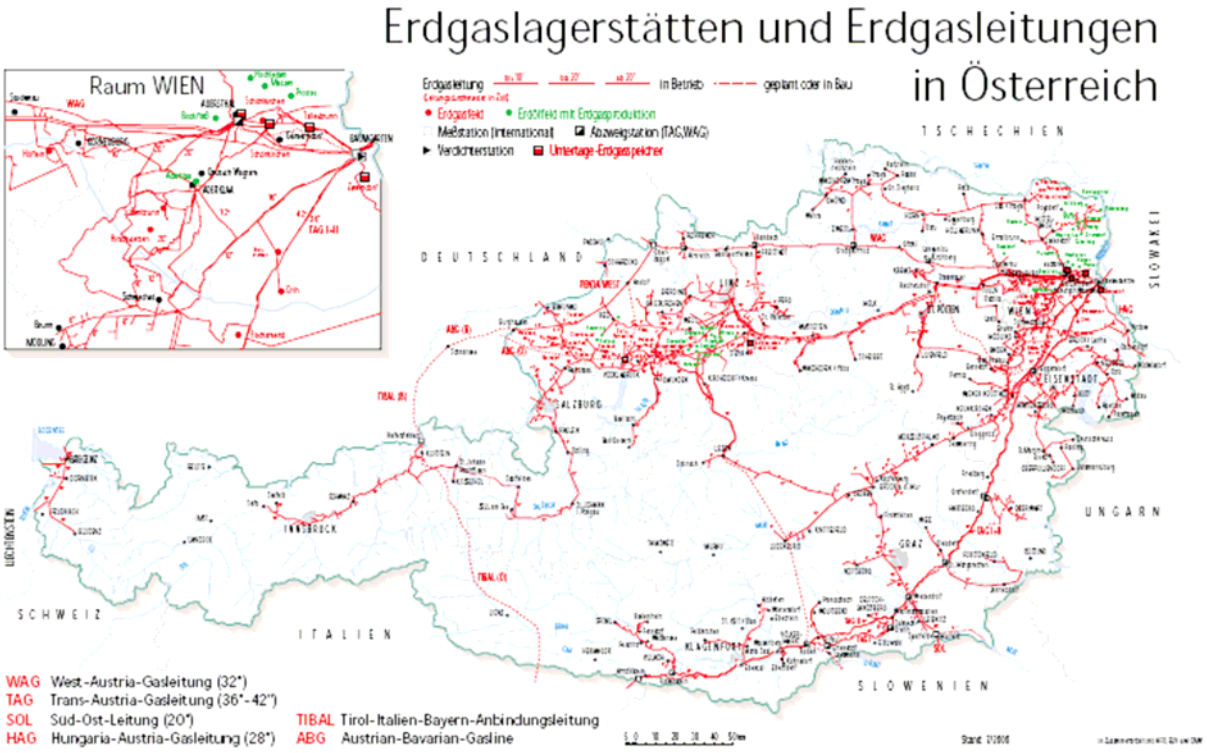
Approximately 20 gas grid operators are active in Austria.

Present situation

Local biogas grid:
There is no local biogas grid in operation or in planning. Bio-Methane is directly deliverd into the gas grid.

Large (regional) gas grid
The national gas grid is very well developed in Austria.

- 1549 km Transit pipe line incl. loops
- 2589 km long distance pipe line
- 3583 km distribution pipe line > 6 bar
- 34522 km distribution pipe line < 6 bar



Future perspectives

Nabucco pipeline project (international Project)
Südschiene (national project)

Non grid transportation

Background and present situation

Not available

The non grid transportation is not important up to now in Austria.

Gas filling stations

Background

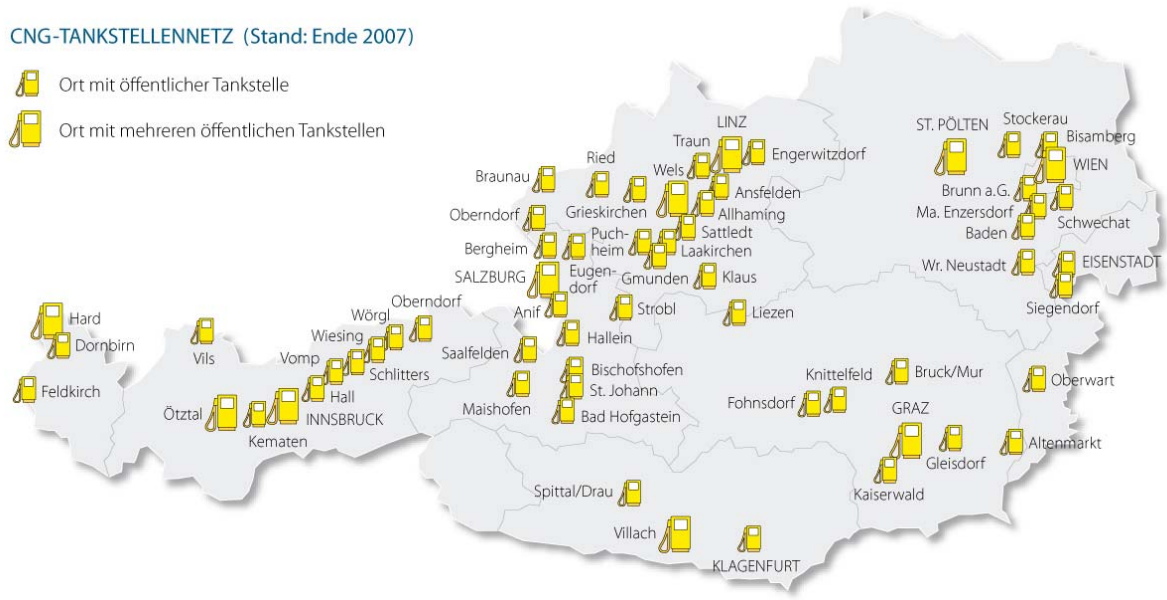
The first gas filling station was established in Graz in 1997. Today 109 gas filling stations are in operation. The following list shows the development steps:

- 1997: First gas filling station in Graz
- 2003: Area wide network established
- 12/2006: 36 public filling stations are in operation
- 05/2008: 109 public filling stations are in operation
- 2010: More than 240 to 280 filling stations should be in operation.

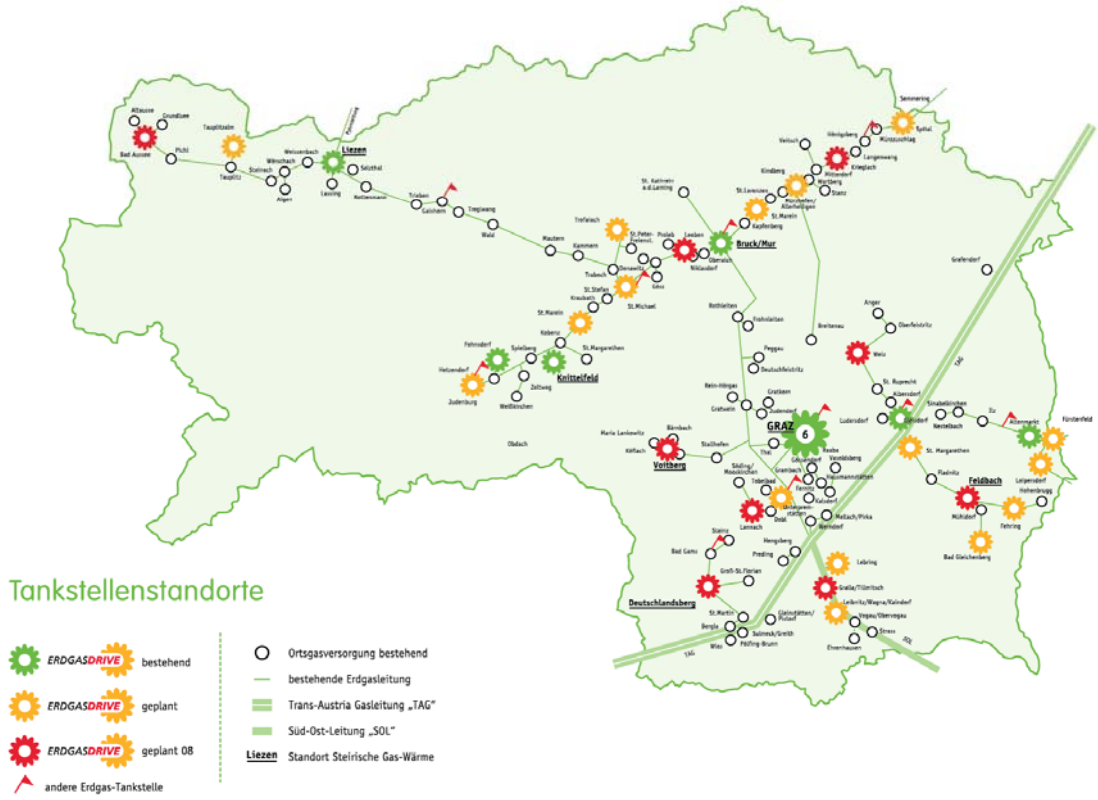
Present situation

- 111 filling stations in Austria (May 2008)
- 1 filling station (Margarethen am Moos / Lower Austria) is provided with 100 % biogas.
- 0 home filling stations (Home filling stations will not be promoted in Austria).
- 14 filling stations in the region (Styria)
- 12 filling stations in the region (Lower Austria)

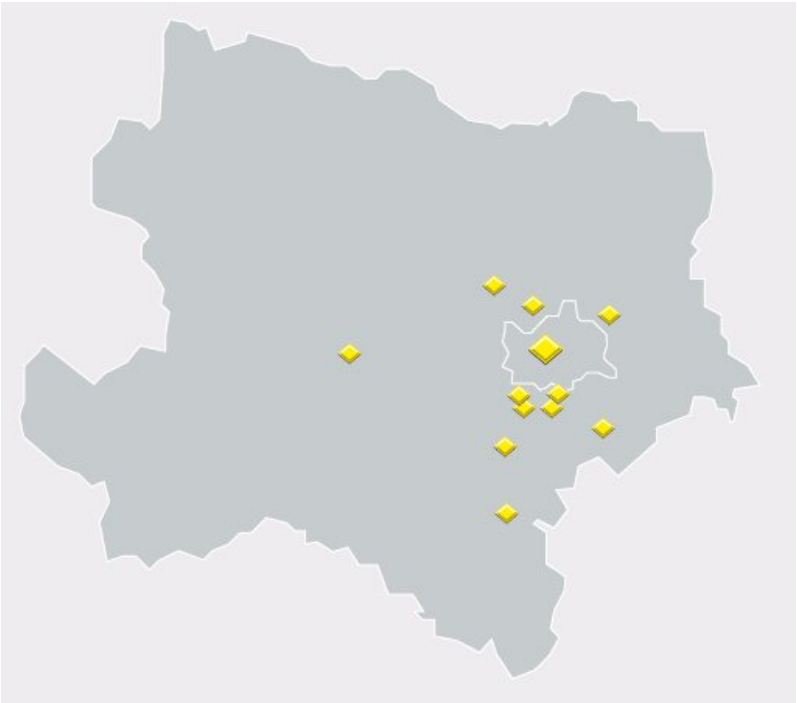
Network of natural gas filling stations in Austria



Network of natural gas filling stations in Styria



Network of natural gas filling stations in Lower Austria

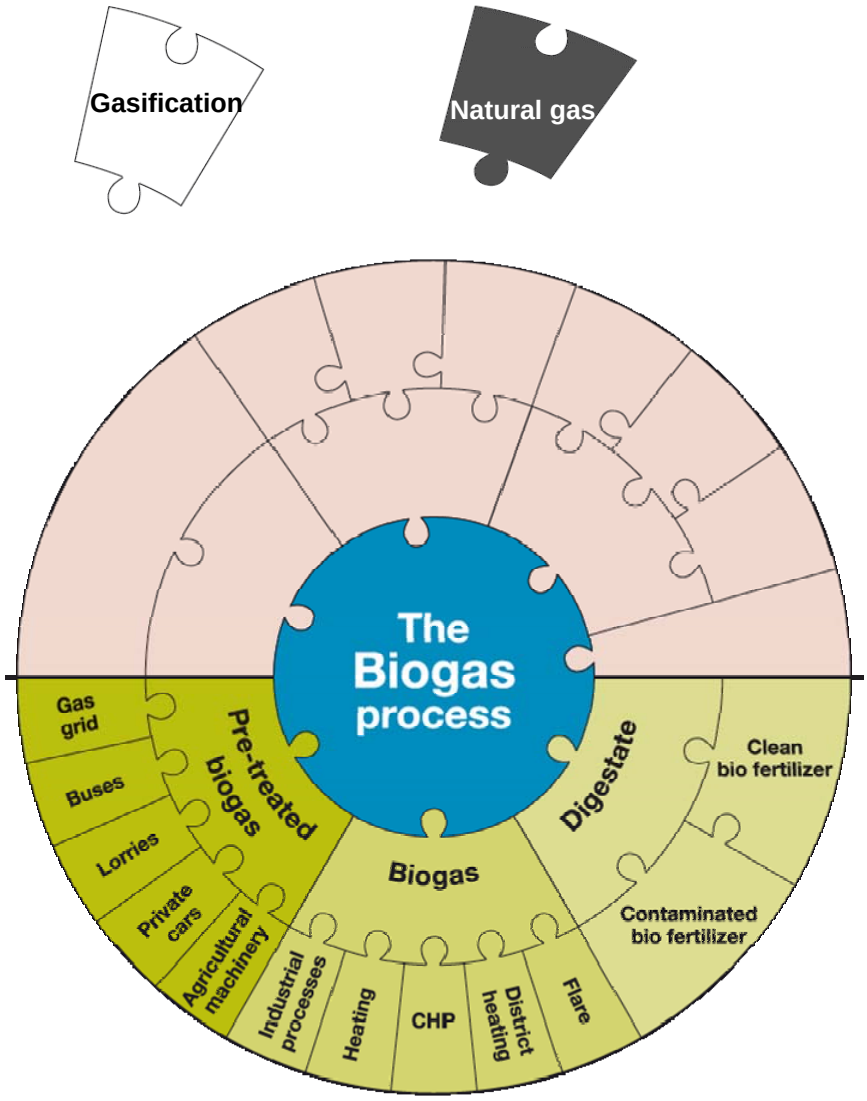


Future perspectives

Approximately 240 to 280 gas filling stations should be in operation by end of 2010

Utilisation of biogas and natural gas

This section sums the use of biogas and natural gas in the region. The focus lays on use of gas for vehicles, but the use in fixed applications as heating and CHP will also be ventilated to get a better overview of the entire gas market.



Utilisation of upgraded biogas and natural gas in vehicles

Present situation

- 235 personal cars in 2008 (Styria)
- 2.350 personal cars in 2008 (Austria)
- 50 - 70 buses (Austria)
- 1 heavy duty vehicle (Austria)

Natural gas

The amount of sold/used gas is 94.302 GWh/year

Biogas

Total produced biogas in Austria: The Estimated amount of biogas lies between 265 to 414 million m^3 per year. Taking the estimated amount of 414 mil. Nm^3 per year with an average consumption of 1.200 nm^3 per vehicle and year we would be able to run 345.000 vehicles in Austria.

One vehicle – 1.200 nm^3 = 15.000 km per year
Which means with 2.350 vehicles and the average consumption of 1.200 nm^3 per year we are actually consuming 2.820.000 nm^3.

With 50.000 vehicles in 2010 Austria would consume 60 mil. Nm^3.

Biogas for non transport applications

Background

Biogas plants:

In the Styrian region there are 44 biogas plants (November 2007) which are mostly used to produce electricity.
In Styria we have an electric production about 20 MW.
In Austria the total electric power by means of biogas plants is around 80 MW.

Natural gas for non transport applications

Background

Customer structure for natural gas demand:

- Household 23%
- Small customer 10%
- Industry 37%
- Power plant 30%

See also chapter “Natural gas”

LPG

Background

Due to the high tax (Mineralölsteuer) on LPG the market for LPG is very limited in Austria. The end customer price for LPG is higher than the price for petrol, diesel and natural gas(CNG).

Supply of LPG

- 10 filling stations for LPG are in operation in Austria. No plans for an expansion of the LPG filling station network are existing.

Utilisation of LPG

- Less than 50 vehicles are running on LPG in Austria. In addition all 500 public transport buses in Vienna are running on LPG.

Future perspectives

LPG will not receive high market shares in Austria.

Norms and Legislation

Die European directive 2003/55/EG assures that biogas may be supplied to gas grids throughout Europe.

Gas norms

The several gas norms in Austria can be found at the website of the ON Österreichisches Normungsinstitut (Austrian Standards Institute). Norms regarding natural gas include ÖNORM EN ISO 10101-x and the following codes.

Supply

The gas industry act (Gaswirtschaftsgesetz) obliges distribution network companies to connect producers of biogenous gases to their grids. However, the biogas to be supplied has to meet quality requirements defined by the below directives G 31 and G33.

ÖVGW Richtlinie G31 Regenerative Gases – Biogase; upgrading of biogas

This directive defines the quality requirements that are to guarantee the safe transport within the Austrian gas grid.

ÖVGW Richtlinie G33 Regenerative Gases – Biogase; feed in of biogas

This directive defines the quality of regenerative gases and quality monitoring as a prerequisite of the feed-in.

Supply to local gas grids

When it comes to establishing local biogas grids, the following provisions have to be observed:

Gaswirtschaftsgesetz (gas industry act)
Rohrleitungsgesetz (pipe act)
Gewerberecht (industrial law)
Umweltverträglichkeitsprüfungsgesetz (environmental assessment act)

Sewage Gas

It is currently not permitted by law to supply sewage gas to the natural gas grid. At present, several parties try to achieve a legal amendment relating to this aspect.

Utilisation of biogas and natural gas

Austria's *Kraftstoffverordnung* (fuel regulation) of 1999 comprises definitions of biofuels and other renewable fuels.

Quality requirements to be met:

- DIN 51624 " Automotive fuels - Compressed natural gas " issue of February 2008
- DIN EN ISO 15403-1 " Natural gas - Natural gas for use as a compressed fuel for vehicles", draft 2008

There are several norms regarding the planning, construction and operation of gas filling stations, including ÖVGW G 97 and ÖNORM EN 13638.

Control measures

Measures to promote the use of CNG and biomethane as a fuel

- CNG and biomethane are completely exempted from the mineral oil tax (Mineralölsteuer).

- Normverbrauchsabgabe (NOVA) (duty payable on standard consumption)
  A more favourable NOVA rate applies to natural gas driven vehicles due to their low consumption. As a result of the new regulation of the NOVA entering into force on 1 July 2008, the NOVA duty for CNGs and other low CO2 emission vehicles will be reduced by a maximum of EUR 500.

- Subsidies:
  While the federal government does not promote the purchase of a natural gas driven vehicles, a few individual Austrian federal provinces, towns and municipalities as well as natural gas companies offer different subsidy models. In most cases, these subsidies refer to the new purchase of natural gas driven vehicles and/or the conversion of vehicles to natural gas operation. An overview of the different subsidies can be found at http://www.oeamtc.at/index.php?type=article&menu_active=27&id=1119176.

- Fleets:
  Companies that plan to switch their fleets to natural gas may apply for subsidies with Kommunalkredit Austria AG (special-purpose bank entrusted with the management of the environmental support schemes of the Republic of Austria and the Environment and Water Management Fund). Up to 30% of the investments are subsidised.

Available vehicles in Austria

Passenger cars and light transport vehicles

CITROEN

Citroen Berlingo 1,4 Multispace

Cylinder capacity	1.360 ccm
Power	50 KW (68 PS)
Fuel capacity CNG	14 kg
Fuel capacity Petrol	55 l
Range CNG	220 km
Total range	930 km
CO2 Emissions	146 g/km

Citroen Berlingo Kastenwagen Bivalent

Cylinder capacity	1.360 ccm
Power	50 KW (68 PS)
Fuel capacity CNG	14 kg
Fuel capacity Petrol	55 l
Range CNG	200 km
Total range	910 km
CO2 Emissions	146 g/km

Citroen C3 SYYLE 1,4i bivalent

Cylinder capacity	1.360 ccm
Power	49 KW (67 PS)
Fuel capacity CNG	9 kg
Fuel capacity Petrol	45 l
Range CNG	180 km
Total range	872 km
CO2 Emissions	119 g/km

FIAT

Fiat Multipla Bipower

Cylinder capacity	1.596 ccm
Power	68 kW (92 PS)
Fuel capacity CNG	26,5 kg
Fuel capacity Petrol	38 l
Range CNG	420 km
Total range	840 km
CO2 Emissions	161 g/km

Fiat Doblo 1,6 16V Natural Power

Cylinder capacity	1.596 ccm
Power	68 kW (92 PS)
Fuel capacity CNG	22 kg
Fuel capacity Petrol	60 l
Range CNG	350 km
Total range	1.000 km
CO2 Emissions	161 g/km

Fiat Doblo Cargo Natural Power

Cylinder capacity	1.596 ccm
Power	68 kW (92 PS)
Fuel capacity CNG	22 kg
Fuel capacity Petrol	30 l
Range CNG	300 km
Total range	620 km
CO2 Emissions	161 g/km

Fiat Panda Natural Power

Cylinder capacity	1.242 ccm
Power	38 kW (52 PS)
Fuel capacity CNG	13 kg
Fuel capacity Petrol	30 l
Range CNG	300 km
Total range	780 km
CO2 Emissions	114 g/km

Fiat Punto Natural Power

Cylinder capacity	1.242 ccm
Power	38 kW (52 PS)
Fuel capacity CNG	11 kg
Fuel capacity Petrol	47 l
Range CNG	250 km
Total range	950 km
CO2 Emissions	119 g/km

FORD

Ford Focus C-MAX CNG

Cylinder capacity	1.999 ccm
Power	93 kW (126 PS)
Fuel capacity CNG	18 kg
Fuel capacity Petrol	55 l
Range CNG	270 km
Total range	1040 km
CO2 Emissions	158 g/km

Ford Focus CNG

Cylinder capacity	1.999 ccm
Power	93 kW (126 PS)
Fuel capacity CNG	18 kg
Fuel capacity Petrol	55 l
Range CNG	300 km
Total range	1.070 km
CO2 Emissions	151 g/km

Ford Transit CNG Kastenwagen

Cylinder capacity	2.261 ccm
Power	100 kW (136 PS)
Fuel capacity CNG	24,3 – 38,6 kg
Fuel capacity Petrol	80 l
Range CNG	250 - 400 km
Total range	1005 - 1355 km
CO2 Emissions	250 g/km

IVECO

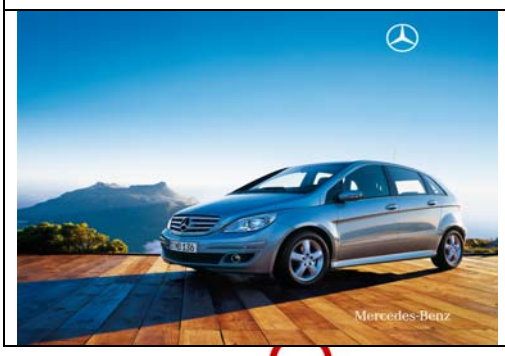
IVECO Daily CNG

Cylinder capacity	2.998 ccm
Power	100 kW (136 PS)
Fuel capacity CNG	36 – 48,6 kg
Fuel capacity Petrol	monovalent
Range CNG	269 – 362 km
Total range	269 – 362 km
CO2 Emissions	k.A. g/km

MERCEDES

Mercedes – Benz E 200 NGT

Cylinder capacity	1.796 ccm
Power	120 kW (163 PS)
Fuel capacity CNG	18 kg
Fuel capacity Petrol	62 l
Range CNG	300 km
Total range	1.000 km
CO2 Emissions	168 g/km



Mercedes B170 NGT (Herbst 2008)

Cylinder capacity	1.699 ccm
Power	85 kW (116 PS)
Fuel capacity CNG	17 kg
Fuel capacity Petrol	54 l
Range CNG	330 km
Total range	1.080 km
CO2 Emissions	135 g/km

Mercedes Sprinter 316 NGT (Herbst 2008)

Cylinder capacity	1.800 ccm
Power	115 kW (156 PS)
Fuel capacity CNG	39 - 46 kg
Fuel capacity Petrol	100 l
Range CNG	470 km
Total range	1.200 km
CO2 Emissions	254 g/km (316 NGT)
	263 g/km (516 NGT)

OPEL

Opel Combo 1,6 CNG monovalent plus

Cylinder capacity	1.598 ccm
Power	69 kW (94 PS)
Fuel capacity CNG	19 kg
Fuel capacity Petrol	14 l
Range CNG	350 km
Total range	515 km
CO2 Emissions	133 g/km

Opel Combo Kastenwagen 1,6 CNG

Cylinder capacity	1.598 ccm
Power	69 kW (94 PS)
Fuel capacity CNG	19 kg
Fuel capacity Petrol	14 l
Range CNG	350 km
Total range	515 km
CO2 Emissions	133 g/km

Opel Zafira 1,6 CNG monovalent plus

Cylinder capacity	1.598 ccm
Power	69 kW (94 PS)
Fuel capacity CNG	21 kg
Fuel capacity Petrol	14 l
Range CNG	380 km
Total range	530 km
CO2 Emissions	138 g/km

PEUGEOT

Peugeot Partner Epee 75 bivalent

Cylinder capacity	1.360 ccm
Power	50 kW (68 PS)
Fuel capacity CNG	13 kg
Fuel capacity Petrol	55 l
Range CNG	190 km
Total range	890 km
CO2 Emissions	146 g/km

Peugeot Partner Kastenwagen 190C

Cylinder capacity	1.360 ccm
Power	50 kW (68 PS)
Fuel capacity CNG	13 kg
Fuel capacity Petrol	55 l
Range CNG	190 km
Total range	890 km
CO2 Emissions	146 g/km

Peugeot Boxer Bivalent

Cylinder capacity	1.998 ccm
Power	71 kW (97 PS)
Fuel capacity CNG	26 kg
Fuel capacity Petrol	80 l
Range CNG	250 km
Total range	850 km
CO2 Emissions	g/km

VOLKSWAGEN

VW Caddy Life EcoFuel

Cylinder capacity	1.984 ccm
Power	80 kW (109 PS)
Fuel capacity CNG	26 kg
Fuel capacity Petrol	13 l
Range CNG	440 km
Total range	590 km
CO2 Emissions	157 g/km

VW Caddy Kastenwagen

Cylinder capacity	1.984 ccm
Power	80 kW (109 PS)
Fuel capacity CNG	26 kg
Fuel capacity Petrol	13 l
Range CNG	440 km
Total range	590 km
CO2 Emission	157 g/km

VW Touran EcoFuel

Cylinder capacity	1.984 ccm
Power	80 kW (109 PS)
Fuel capacity CNG	18 kg
Fuel capacity Petrol	13 l
Range CNG	310 km
Total range	440 km
CO2 Emission	155 g/km

VW Passat TSI Eco Fuel (Herbst 2008)

Cylinder capacity	1.400 ccm
Power	110 kW(150 PS)
Fuel capacity CNG	22 kg
Fuel capacity Petrol	31 l
Range CNG	420 km
Total range	820 km
CO2 Emission	k.A. g/km

MADEGASCAR

MADEGASCAR - market development of gas driven cars, is a project which aims at developing the market for gas driven vehicles – natural gas and biogas fuelled vehicles. Strengthening the supply and distribution infrastructure of biogas and natural gas to fuel vehicles is also a goal for the project.

Intelligent Energy - Europe

Intelligent Energy - Europe is the EU's tool for funding action to improve the conditions for energy saving and the use of renewable energy sources in Europe

Austrian Energy Agency

The Austrian Energy Agency is the national Energy Agency in Austria.

Graz Energy Agency

Graz Energy Agency is a regional Energy Agency in the city of Graz, Styria.

Steirische Gas Wärme

Steirische Gas Wärme is the regional gas utility in Styria.