

Supply and utilisation of biogas and natural gas in the Podkarpackie and Malopolska region, Poland

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

Summary of the present situation – facts & figures

Supply

Biogas plants

- 1 waste water plant
- 3 plants on waste dump

Gasification

- No plants in our regions

Natural gas

- One major company PGNiG deliver gas in region Malopolska and Podkarpackie. The company have a divisions in each region

Treatment and distribution

Upgrading plants

- No upgrading plants in our regions

Local (biogas) grid

- No biogas grid

Regional gas grid

- Gas grid in Podkarpackie contains 18 thousand km of pipes.
- Gas grid in Malopolskie contains 15 thousand km of pipes.

Non Grid Transportation

- No transport CNG or Biogas

Gas filling stations

- 9 filling stations in two regions Podkarpackie and Malopolskie

Utilisation

Biogas & Natural gas in vehicles

- A small number of NGV's
- No biogas vehicles

- 40 NG-Buses – the largest fleet of buses in country

Biogas for non transport applications

- Co-generation

Natural gas for non transport applications

- In Heat & Power company natural gas is used for electricity and heat production

LPG

Utilisation in vehicles

- Large number of LPG powered cars
- Large number of filling stations. Almost every gasoline station have a LPG distributor and there is many filling stations which refill only LPG cars.

Available Vehicles

- There is no available new LPG cars in dealer saloons made in factory
- In many new cars LPG installation is available without losing of car guarantee
- More than 30% of all used cars (gasoline and diesel) available on market already have LPG instalation

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Introduction

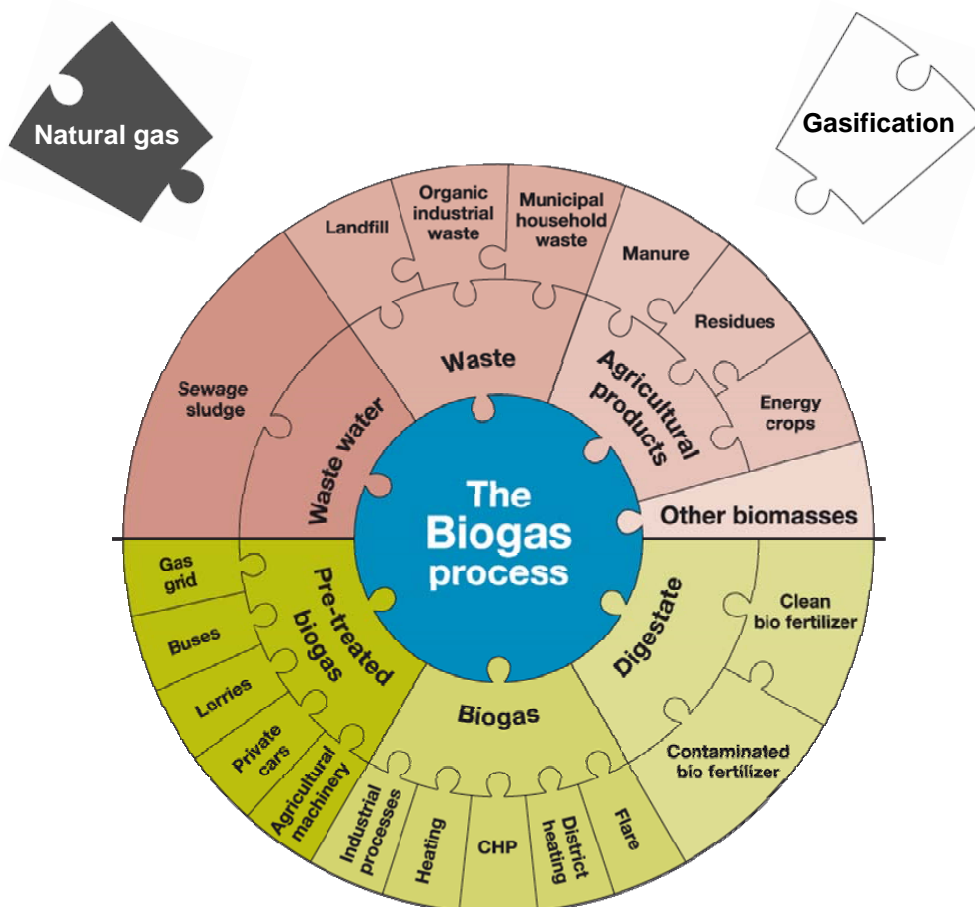
Biogas and natural gas are very clean energy sources, when combusted the amount of particles, NO_x, CO etc are lower than most other fuels. Biogas is also a renewable fuel. If petrol or diesel is replaced with biogas produced from manure, the CO₂ emissions can be reduced with up to 180 % . The MADEGASCAR project aims at improving the conditions for a growing market for gas driven cars and light transport vehicles 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 gas in vehicles. The current management control measures that are used in the region to support gas vehicles are also summed in this chapter.

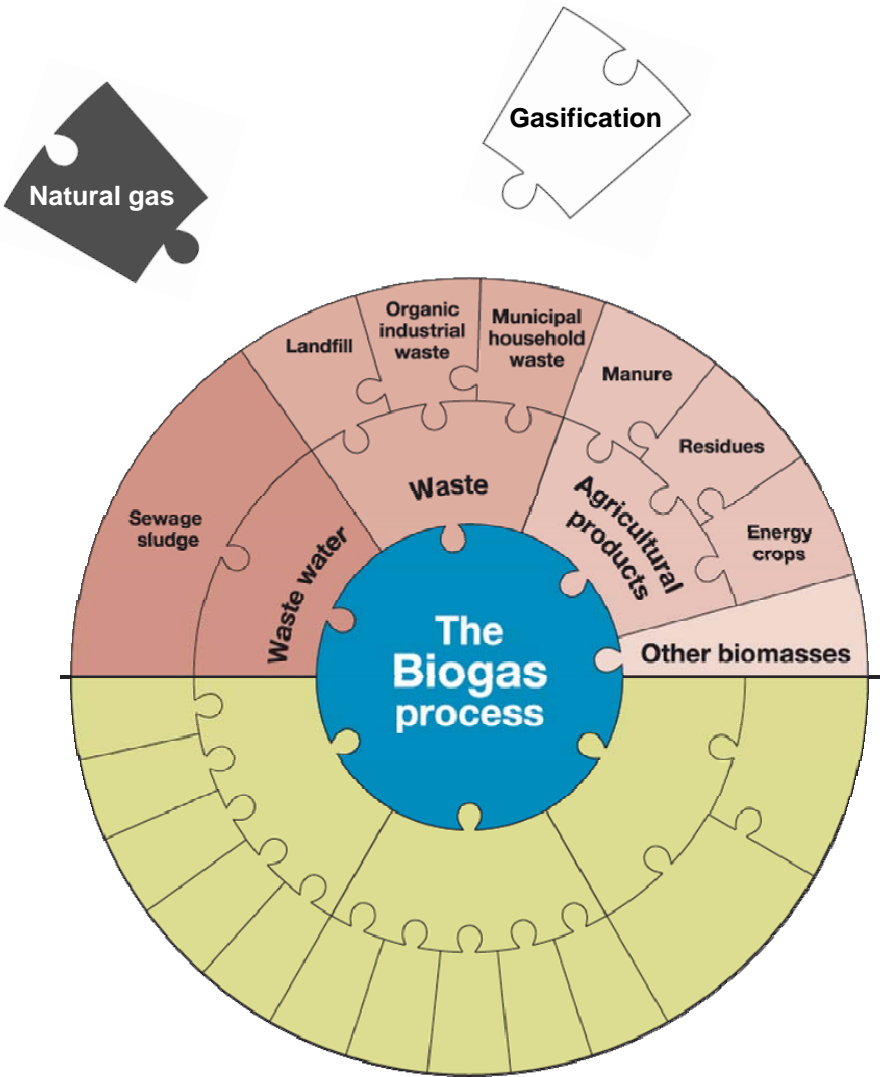
The use of LPG as vehicle fuel is also of interest for the MADEGASCAR project because of the possibility to convert these vehicles to propulsion with methane.

This text also contains an overview of the range of available gas driven personal cars and light transport vehicles 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

There is only few installations for biogas production. There is large potential for biogas production. There is more than 52 % people use waste water plants in whole Podkarpackie area. If there will be considered that Podkarpackie is mostly rural the biogas plants should be situated close to cities in direct neighbourhood of waste water plant. One biogas plant running nowadays in Krosno witch using waste water sludge and biomass fraction from waste separation plant. There are few installation on waste dumps with powers are 100 to 300 kW electric power. At this moment there is no facility witch collects agricultural wastes for biogas production. Most of the farms are small not bigger than 5ha.

Present situation

Waste Water

- 15 Waste water plant digests the sludge in biogas reactors
- Unknown total energy production per year
- Unknown GWh flared per year
-

Agricultural products

- 2 biogas plant

Future perspectives

Are there any activities planned in the near future? Is there anything that should be regarded in future?

Natural gas

Background

There is well developed grid of Natural Gas, there is a more than 74 % of total area is covered by gas grid. There are divisions of company in Tarnow, Krakow, Jaroslaw, Jaslo and Rzeszow.

Present situation

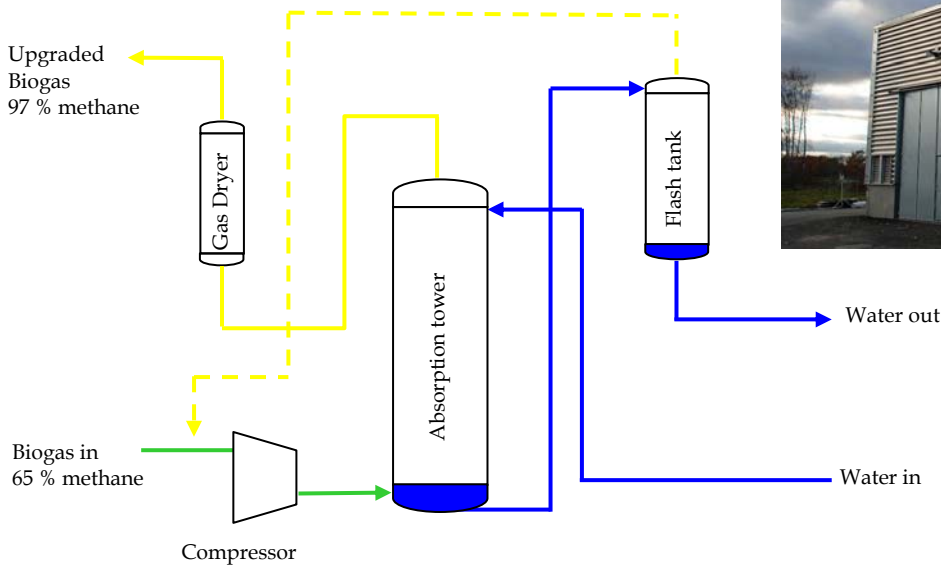
- Only one company with regional divisions. On the area Podkarpackie and Malopolskie natural gas is resealed by Karpacki Operator of Delivery System (Karpacki Operator Systemu dystrybucyjnego) covering whole area.

Future perspectives

Are there any activities planned in the near future? Is there anything that should be regarded in the future?

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.



Gas grid

Background

Present situation

Gas grid in Podkarpackie contains 18 thousand km of pipes.

Gas grid in Malopolskie contains 15 thousand km of pipes.

Future perspectives

Gas filling stations

Background

Present situation

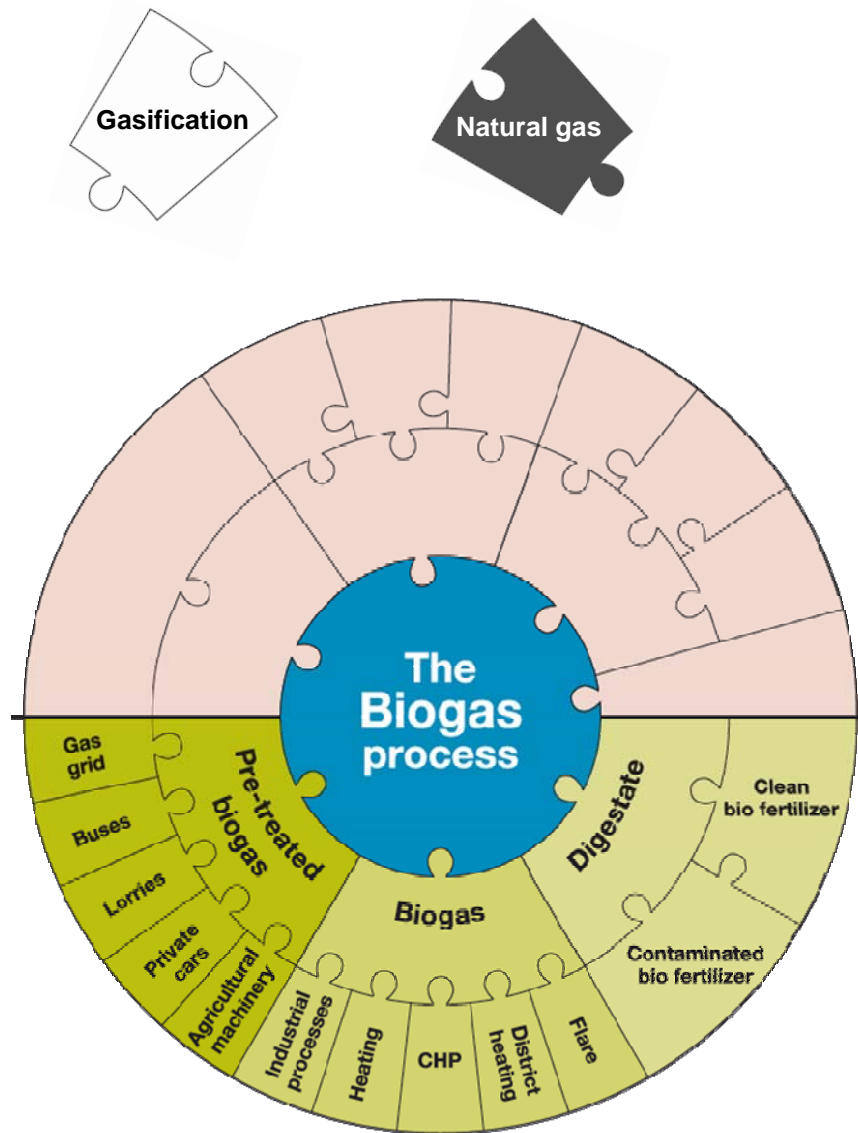
- 5 filling stations in the region Podkarpackie
- 4 filling stations in the region Małopolskie
- no filling stations are provided with 100% biogas.
- no home filling stations

Future perspectives

There are some ideas of local authorities for biogas installations. Most of it are on idea and resources recognition phase.

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

Background

Present situation

- no personal cars
- no buses
- no heavy duty vehicles

Future perspectives

Natural gas for non transport applications

Background

Rzeszow is a largest city in region Podkarpackie. With 180 thousand people have a continuously growing heat and power demands.

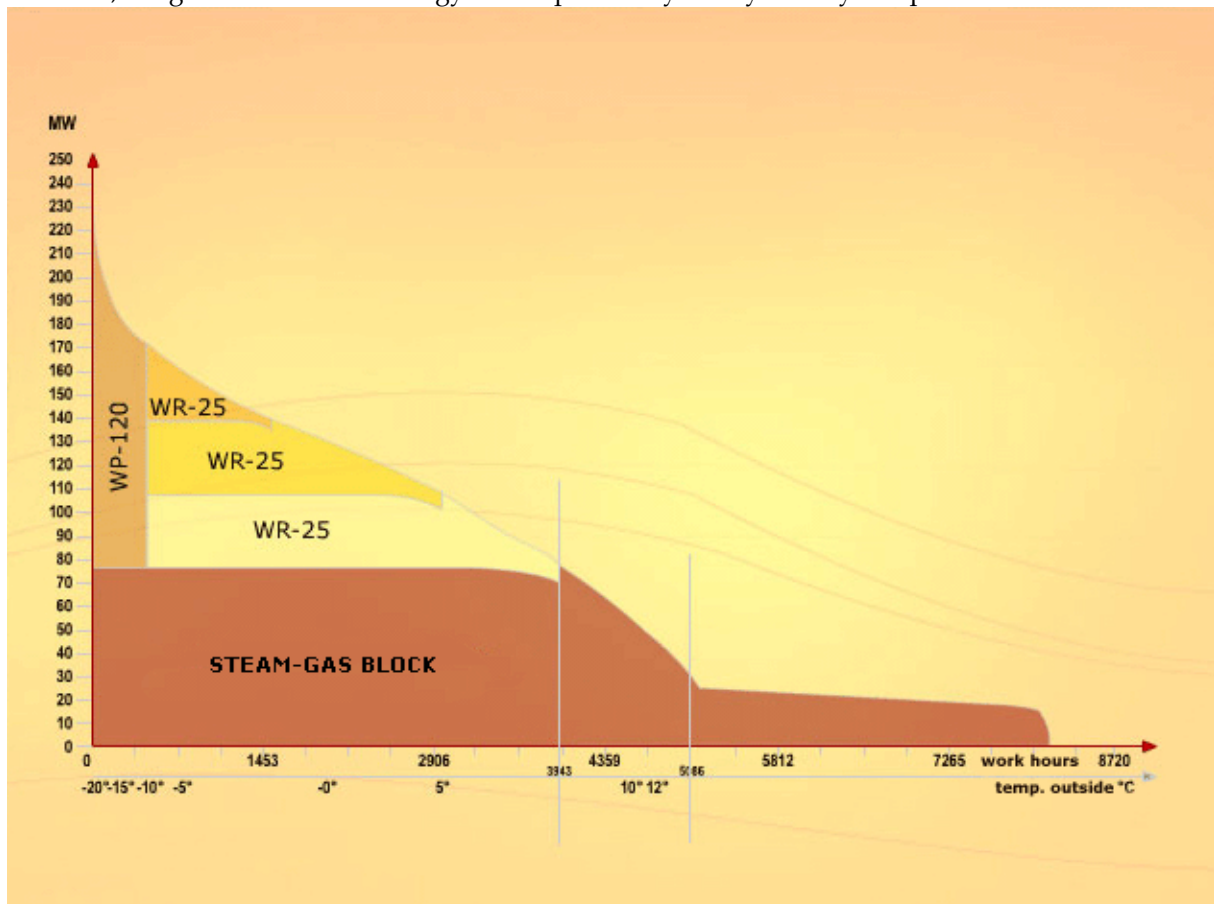
Present situation

Heating

Natural gas is used for heating and water

CHP

Thermal power plant in Rzeszów has built environment friendly gas-steam block. GSU (gas-steam unit) has been designed as a basic generation unit of the cogeneration power plant. In the heating season, water heaters are used to work at peak and off-peak times, which significantly reduces ecological noxiousness of the cogeneration power plant. In the summertime GSU covers completely consumers' requirement for warm service water, generating the additional amount of electric energy at the same time thanks to fuller utilization of a low-pressure turbine. In the sectional view of the whole year, over 65% of heat, transferred from the cogeneration power plant to the municipal heating system, comes from GSU-100, however, the generated electric energy covers practically totally the city's requirements.



Generation units share in the production of heat.

Gas and steam unit constitutes the combined system, which consists of:

- gas turbo set for electric energy generation,
- heat recovery steam generator, which utilizes the heat of flue gases from the gas turbine's outlet to the production of steam and the lattice water,
- steam turbine of heating and condensing type to the production of heat and electric energy in the combined-cycle energy management.

LPG

Background

Every LPG car is a bi-fuel car gasoline and LPG. The fuel that car is using might be switched manually or automatically (start on Gasoline)

Supply of LPG

- LARGE number filling stations for LPG in the region. Almost every gasoline station has a LPG distributor.(there is no useful information about number of stations)

Utilisation of LPG

- Large number vehicles running on LPG in the region. .(there is no useful information about number of LPG)

Future perspectives

Low price of LPG and quite cheap installation for LPG cause fluent development of this market.

Norms and Legislation

Gas norms

- PN-87/C-06400 Natural gas – identification of sulphur compounds – Identification the contents of hydrogen sulphide compound with analyzer WIT –AS
- PN-93/C-96011.01 Natural gas – identification of sulphur compounds – General conclusions
- PN-93/C-96011.02 Natural gas – identification of sulphur compounds – Method of gas chromatography with using electrochemical detector for identification sulphur compounds
- PN-C-04751:2002 Natural gas – Quality checking
- PN-C-04752:2002 Natural gas – Gas quality in transfer net
- PN-C-04753:2002 Natural gas - Gas quality at the final consumers connected to delivery net.
- PN-EN 1127-2:2002 Explosive atmospheres – Avoiding of explosions and explosion protection. Part 2 Basic concept and methods of gas mining
- PN-EN 1127-2:2004 Explosive atmospheres – Avoiding of explosions and explosion protection. Part 2 Basic concept and methods of gas mining

Supply

- PN-EN 12007-1:2004 Systems of gas delivery – pipes of maximal working pressure 16 bar – Part 1 General orders for working order
- PN-EN 12285-1:2003 Steel containers -- part 1: Underground cylindrical horizontal containers with single and double walls for storage flammable and not flammable water wastes ,
- PN-EN 12285-2 Steel containers - Part 2: Ground level horizontal mounted with single and double walls for storage flammable and not flammable water wastes
- PN-EN 12285-2:2005 Steel containers - Part 2: Ground level horizontal mounted with single and double walls for storage flammable and not flammable water wastes
- PN-EN 12673:2002 Water Quality - identification of chlorine phenol in water with tehnology in water with technology of gas chromatography
- PN-EN 12817:2003 Checking and testing of on –ground containers for liquid carbon hydrogen gases LPG up to 13 m³ including
- PN-EN 12817:2004 Checking and testing of on –ground containers for liquid carbon hydrogen gases LPG up to 13 m³ including
- PN-EN 12817:2004/ Checking and testing of on –ground containers for liquid carbon hydrogen gases LPG up to 13 m³ including
- PN-EN 12817:2004/A1:2006 Checking and testing of on –ground containers for liquid carbon hydrogen gases LPG up to 13 m³ including
- PN-EN 12817:2004/A1:2007 Checking and testing of on –ground containers for liquid carbon hydrogen gases LPG up to 13 m³ including

- PN-EN 12818 Checking and testing of underground containers for liquid carbon hydrogen gases LPG up to 13 m³ including
- PN-EN 12818:2003 Periodic checks and tests of underground containers for liquid carbon hydrogen gases LPG up to 13 m³ including
- PN-EN 12818:2005 Periodic checks and tests of underground containers for liquid carbon hydrogen gases (LPG) up to 13 m³ including
- PN-EN 12818:2005/A1 Periodic checks and tests of underground containers for liquid carbon hydrogen gases (LPG) up to 13 m³ including
- PN-EN 12818:2005/A1:2006 Period checks and tests of underground containers for liquid carbon hydrogen gases (LPG) up to 13 m³ including
- PN-EN 12818:2005/A1:2007 Periodic checks and tests of underground containers for liquid carbon hydrogen gases (LPG) up to 13 m³ including
- PN-EN 12819:2003 Period checks and tests on surface containers for liquid carbon hydrogen gases (LPG) bigger then 13 m³
- PN-EN 12819: Periodic checks and tests on surface containers for liquid carbon hydrogen gases (LPG) bigger then 13 m³
- PN-EN 12820:2003 : Periodic checks and tests underground containers for liquid carbon hydrogen gases (LPG) bigger then 13 m³
- PN-EN 12820:2005 Periodic checks and tests underground containers for liquid carbon hydrogen gases (LPG) bigger then 13 m³
- PN-EN 13121-1:2003 Surface containers made of plastic strengthen by fiberglass Part 1 – raw materials technical requirements, acceptance procedure
- PN-EN 13121-2:2004 2003 Surface containers made of plastic strengthen by fiberglass Part 2: Composite materials – Chemical resistance
- PN-EN 13280:2002 the Specification of tankers strengthened the glass fibre about the construction one- or multi- part, on ground, to cold water
- PN-EN 13341:2005 on ground thermoplastic stationary reservoirs to storing heat oil fuel light, the oil and heating oil of the home use -- execute the method blows away or the forming rotary polythene and anionic polymerization of the polyamide 6 -- Requirement and the method of investigations
- PN-EN 13423:2002 Use vehicles reinforced the compressed earth gas
- PN-EN 13575:2005 thermoplastic Reservoirs executes the method blows away or forming rotary – on ground reservoirs to the storing the substance chemical -- Requirement and the method of investigations
- PN-EN 14015:2005 the Requirement relates projects and the production steel on ground, perpendicular, cylindrical, flat-bottomed welded reservoirs to storing the liquid in the temperatures of surroundings and above
- PN-EN 14408-1:2005 the Systems of tubular lines from artificial materials to the renovation of underground nets of sending gauzes. The part 1: general Decisions
- PN-EN 14408-1:2006 the Systems of tubular lines from artificial materials to the renovation of underground nets of gas -- the Part 1: general Decisions
- PN-EN 14408-3:2005 the Systems of tubular lines from artificial materials to the renovation of underground nets of sending gauzes. The part 3: the Facing from pipes of fit closely
- PN-EN 14408-3:2006 the Systems of tubular lines from artificial materials to the renovation of underground nets of gas -- the Part 3: the Facing from pipes of fit closely

- PN-EN 14570 Equipment to the condensed hydrocarbonaceous gas (LPG) and equipment additional -- the Equipment of on ground and underground reservoirs of the condensed gas of hydrocarbonaceous (LPG)
- PN-EN 14570:2005 the Equipment of on ground and underground reservoirs to the condensed hydrocarbonaceous gas (LPG)
- PN-EN 14570:2005 / the A1 Equipment of on ground and underground reservoirs to the condensed hydrocarbonaceous gas (LPG) (Change A1)
- PN-EN 14570:2005 / A1:2006 Equipment to the condensed hydrocarbonaceous gas and equipment additional -- the Equipment of sground and underground reservoirs to the condensed hydrocarbonaceous gas (LPG)
- PN-EN 14570:2007 Equipment to the condensed hydrocarbonaceous gas (LPG) and equipment additional -- the Equipment of on ground and underground reservoirs of the condensed gas of hydrocarbonaceous (LPG)
- PN-EN 14591-2:2007 explosion - proof Protection in the underground excavations of institutions mining -- protective Systems -- the Part 2: the Explosion - proof dam
- PN-EN 14620-1:2006 Projects and the production steel sground, perpendicular, cylindrical, flat-bottomed reservoirs to storing gases chilled and condensed about the temperatures of the work among 0 ° C and -165 ° C -- the Part 1: general Decisions
- PN-EN 14620-2:2006 Projects and the production steel on ground, perpendicular, cylindrical, flat-bottomed reservoirs to storing gases chilled and condensed about the temperatures of the work among 0 ° C and -165 ° C -- the Part 2: metal Elements
- PN-EN 14620-3:2006 Projects and the production steel on ground, perpendicular, cylindrical, flat-bottomed reservoirs to storing gases chilled and condensed about the temperatures of the work among 0 ° C and -165 ° C -- the Part 3: concrete Elements
- PN-EN 14620-4:2006 Projects and the production steel on ground, perpendicular, cylindrical, flat-bottomed reservoirs to storing gases chilled and condensed about the temperatures of the work among 0 ° C and -165 ° C -- the Part 4: isolating Elements
- PN-EN 14620-5:2006 Projects and the production steel on ground, perpendicular, cylindrical, flat-bottomed reservoirs to storing gases chilled and condensed about the temperatures of the work among 0 ° C and -165 ° C -- the Part 5 the: the Investigation, drying, cleaning and cooling
- PN-EN 1473 Installations and devices to the condensed earth gas -- the Projecting the installation on ground

Control measures

There are no control measures

Supply

The working installations for cogeneration have no measurement of quantity of biogas production

Treatment and distribution

No control measures are used to increase the number of treatment facilities

Utilisation of biogas and natural gas

No support for using NGV's

No tax relief

NO legal support.

There is possibility of refunding RES installations including biogas installations from support programs.

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