



Cogeneration

TEDOM

Cogeneration – the perfect transformation of energy

TEDOM cogeneration units are equipment for the combined production of electricity and heat. The main characteristics of cogeneration technology is the high efficiency of energy production and the significant fuel savings as compared to separate production, and this has a considerable influence on both ecology and the economics of production.

Electricity and heat from a single source

Electricity generated in cogeneration units can be used for consumption by the building in which the machine is situated, or it can be supplied to the network. Heat from cogeneration units is used to heat the building, to prepare hot water or for technological heating.

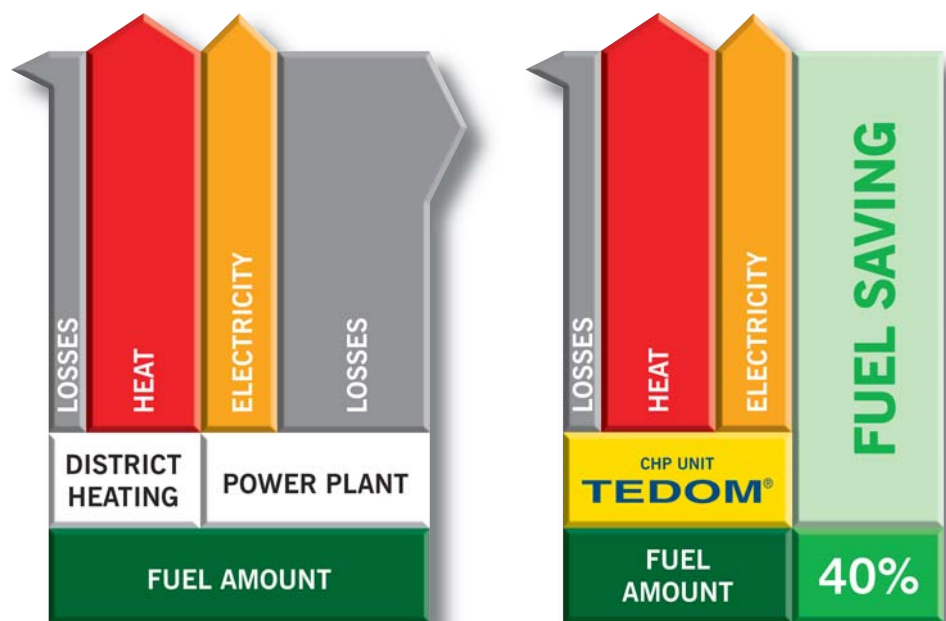
Energy in an emergency

Cogeneration units are also used as emergency sources of electricity in places where an uninterrupted supply is necessary.

Tri-generation

By means of absorptive coolers it is possible to use heat produced by cogeneration for the production of cooling for technological purposes or air conditioning. In such cases we are talking of tri-generation, the combined production of electricity, heat and cooling.

A comparison of the efficiency of the separate and combined production of electricity and heat



Why install cogeneration

The correctly chosen cogeneration technology is able to save a major part of energy purchase costs for its user, and in the event of the sale of electricity to the network it can earn money.

Areas using cogeneration technology

Cogeneration units can be used in all buildings with year-round demand for the consumption of electricity and heat, or cooling. These are, above all, hospitals, old people's homes, swimming pools, spas, ice rinks and stadiums, communal heating plants, hotels and bed and breakfast institutions, department stores or industrial plants; in cases using biogas, then they are suitable for water treatment plants, agricultural concerns and some communal landfill sites.



boiler room



hotel



swimming pool



landfill



hospital



agriculture



industrial company



sewage treatment plant

Possible versions

TEDOM cogeneration units are delivered as standard with:

- Compact block version with anti-noise hood
- Placed in a container
- In modular arrangement
- As a generator set

The hooded version

- is designed above all for installing in buildings. Their advantages are their simplicity and speed of installation and low noise level.



The container version

- is for external installation outside the domestic or industrial building. Their advantage is ease of installation and resistance to meteorological effects.



The modular version

- is used for cogeneration equipment with a higher output. There are separate heating and motor generator modules. The advantages of this version are the variety of versions available and their adaptability to individual customer requirements.



Generator set

- is a set consisting of an engine and a generator in a common steel frame, making up a basic functioning whole for constructing a cogeneration unit. The advantage of this version is its simple concept with the possibility of adding further technological elements of cogeneration.



Fuels used

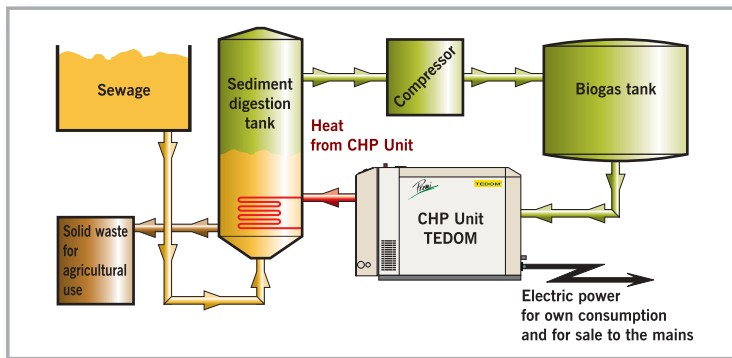
The major fuel for running cogeneration units is natural gas. In recent years, however, the number of units using biogas, landfill gas, gas from water treatment plants or another alternative fuel like mine gas for their operation has sharply increased.

Cogeneration in biogas stations

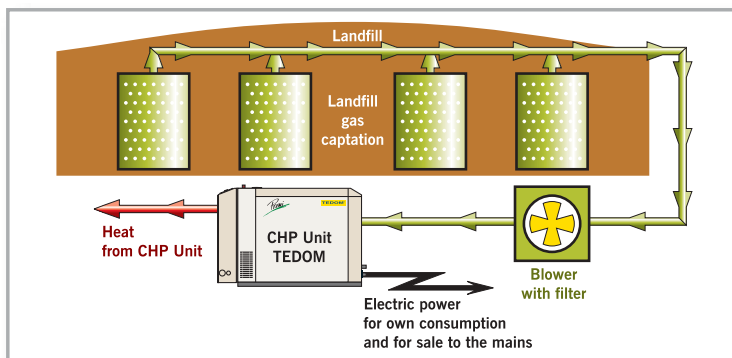
Biogas stations are mainly constructed in waste water treatment plants, communal landfill sites or in agricultural concerns concentrating on livestock rearing. Since biogas usually arises as a side product of the treating of organic waste, the operation of cogeneration units on this fuel is economically very advantageous. New energy legislation guarantees the operator of cogeneration technology using renewable energy resources a long-term stable purchase price for electricity at a very interesting rate.

If there is natural gas distribution available in the biogas station, it is possible to use a dual-fuel cogeneration unit for combined running on both natural gas and biogas (fuel switching). This is most advantageous in cases where the production of biogas is not uniform.

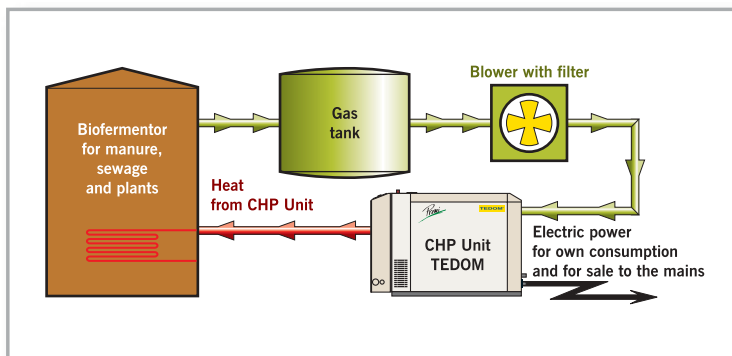
Sewage treatment plant



Landfill



Agriculture



TEDOM Service

The services offered by TEDOM and its service partners include the guarantee and after guarantee repair of cogeneration units, a non-stop emergency service, remote monitoring of the performance of cogeneration units, general repairs and other services according to agreement with the customer.

Remote monitoring can be actualized thus;

1. on-line connection to the TEDOM service monitoring centre (personnel at the monitoring centre can immediately react to whichever kind of non-standard situation in the cogeneration unit)
2. off-line connection (in the event of any non-standard situation in the cogeneration unit, a text message or e-mail is generated alerting selected people of the developing situation).

Basic technical parameters of TEDOM cogeneration units

Natural gas	Electrical output (kW)	Heat output (kW)	Natural gas consumption (m ³ /h)+
Micro S8 AP	8	19	3,15
Micro F25 AP	25	47	8,4
Cento T80 SP	81	121	25,2
Cento T100 SP	100	140	29,9
Cento T120 SP	125	163	35,7
Cento T150 SP	150	193	42,1
Cento T160 SP	160	199	44,0
Cento T180 SP	175	226	48,9
Cento T200 SP	200	247	54,4
Cento T300 SP	300	376	82,9
Cento D580 SP	580	674	150,6
Cento D770 SP	774	893	199,4
Cento D1200 SP	1169	1339	296
Cento D1600 SP	1558	1786	395
Cento D2000 SP	2014	2247	506
Quanto C400 SP	412	561	117
Quanto C500 SP	514	645	143
Quanto C770 SP	785	1010	219
Quanto C1000 SP	1050	1387	292
Quanto C1200 SP	1172	1519	318
Quanto C1600 SP	1608	1726	403
Quanto C2000 SP	2010	2166	504

+ The stated values are valid for natural gas with a lower calorific capacity of 34 MJ/m³.

Biogas	Electrical output (kW)	Heat output (kW)	Bio-gas consumption (Nm ³ /h)*
Micro F25 AP BIO	23	41,5	11,6
Cento T80 SP BIO	81	122	37,2
Cento T100 SP BIO	100	143	44,0
Cento T120 SP BIO	125	163	52,5
Cento T150 SP BIO	150	192	61,8
Cento T160 SP BIO	160	197	64,6
Cento T180 SP BIO	175	223	71,5
Cento T200 SP BIO	200	244	79,5
Cento T300 SP BIO	300	370	121,4
Cento D580 SP BIO	537	622	206,3
Cento D770 SP BIO	716	823	273,3
Cento D1200 SP BIO	1069	1198	389
Quanto C770 SP BIO	785	1118	374
Quanto C1100 SP BIO	1100	1187	459

* The stated values are valid for biogas with 65% methane content under standard conditions (0°C, 101,325 kPa). In case of other methane concentration the amounts may be different.

Abbreviations: A – asynchronous generator S – synchronous generator P – parallel operation with the grid



A selection of the more than 1 300 cogeneration units installed

Company	City	Country	Type	Year
Water treatment plant	Chrudim	Czech Republic	MT 140 SP BIO	1995
Swimming pool	Rožnov pod Radhoštěm	Czech Republic	MT 140 SP	1996
Block boiler room	Prakovce	Slovakia	3x CAT 400 SP	1996
Hospital	Prachatice	Czech Republic	3x MT 140 SP	1997
Berta's Spa	Třeboň	Czech Republic	2x Plus 22 AP+SPE	1998
Swimming pool	Eibar	Spain	Plus twin 88 AP	1998
Hotel Hubert	Gerlachov	Slovakia	2x MT 75 SPE	1998
Sport area	Pamplona	Spain	2x MT 100 AP	1998
Block boiler room	Norager	Denmark	CAT 1000 SP	1999
Hospital	Watreloos	France	CAT 500 AP	1999
Hospital	Žilina	Slovakia	2x CAT 190 SP	1999
Institut of social work	Slatiňany	Czech Republic	Cento M65 SPE	1999
Sport area	Madrid	Spain	2x CAT 190 AP + 2x Quanto C400 SP	1999 + 2005
Gasco	Santiago	Chile	Plus 22 AP - propan	2000
Water treatment plant	Komárno	Slovakia	2x Plus 22 AP BIO	2000
Block boiler room	Grobine	Lithuania	Cento 140 SP	2000
Hospital	Krnov	Czech Republic	2x MT 140 SP	2000
Block boiler room	Riga	Lithuania	CAT 500 SP CON	2000
Furniture production	Azpetia	Spain	CAT 770 SPI	2000
Aquapark	Jihlava	Czech Republic	Plus twin 88 AP	2001
Block boiler room	Winnica	Poland	2x Premi 22 AP	2001
Clinic	Seeschau	Switzerland	2x Premi 22 SPI	2001
Farm	Röhrnbach	Germany	Premi 22 AP BIO	2001
Hostel	Possenhofen	Germany	Premi 22 SPE	2001
Water treatment plant	Wartau	Switzerland	Premi 22 AP BIO	2001
BTK Telecom	Botevgrad	Bulgaria	Cento 100 SP + Cento 140 SPE	2001
EDF	Paříž	France	Cento 42 SPE	2001
Hospital	Turnov	Czech Republic	Cento 140 SPE	2001
Ice-ring	Třebíč	Czech Republic	Cento 140 SP	2001
Malt house	Wechingen	Germany	Centro 100 SP	2001
Water treatment plant	Zyrardow	Poland	Centro 140 SP + I BIO	2001
Block boiler room	Ogre	Lithuania	CAT 500 SP	2001
Block boiler room	Sárospatak	Hungary	CAT 1000 SP	2001
Block boiler room	Svitavy	Czech Republic	CAT 2000 SP	2001
Hospital	Repty	Poland	CAT 260 SPE	2001
Atlas Seis	Oeiras	Portugal	Premi 22 AP	2001
Pig farm	Velké Albrechtice	Czech Republic	6x Cento150 SP BIO	2001-4
Farm Gu AN	Hebei Province	China	Centro 100 SPE BIO	2002
Landfill Getlini	Riga	Lithuania	5x Quanto 1100 SP BIO	2002
Landfill	Praha	Czech Republic	2xQuanto 1100 SP BIO	2002
SES company	Tlmače	Slovakia	Cat 400 SP	2002
Hospital	Chamont en Vexin	France	4x Premi S22 AP	2003
Block boiler room	Győr	Hungary	2x Quanto C1000 SPE, 10,5 kV	2003
Textile factory	Vratitza	Bulgaria	Quanto C500 SPE	2003
Hotel Imperial	Karlovy Vary	Czech Republic	Cento L150 SP	2003
Swimming pool	Brno	Czech Republic	2x Cento T100 SP	2003
Gas from oil mining	Petchora	Rusko	2x Quanto C1000 SP	2003-4
Kompogas	Niederuzwil	Switzerland	2x Cento 150 SP BIO	2004
Skládka Asompo	Nový Jičín	Czech Republic	Cento T150 SP BIO KON	2004
OKD DPB company	Ostrava	Czech Republic	Quanto D500 SP	2004
Water treatment plant	Praha	Czech Republic	Quanto D1000 SP BIO KON	2004
Sportcentrum	Trebišov	Slovakia	Cento T150 SP	2004
Swimming pool	Jindřichův Hradec	Czech Republic	Cento M150 SPE	2004
Hospital	Belfast	Norhern Ireland	Cento T88 SP	2005
Chemical factory	Ankaleswar	India	Cento T150 SPI	2005





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