

N R G

N R G
G R O U P

HEAT- AND ELECTRIC POWER PRODUCTION





Dear Reader, dear Future Client of us!

We hope that our brochure meets your interests, and when reading it, you have several ideas regarding the realisation of your own CHP unit.

Please, do not hesitate to contact us either personally or by phone, so that we could give you an offer for the solution most suitable for you.

Imre Gönczi
manager



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CUSTOM MADE PRODUCTS • COMPLEX SERVICE

FLEXIBLE PAYMENT SCHEDULING • EXTREMELY SHORT DEADLINES

NRG-AGENT

ABOUT OUR COMPANY

Our company, **NRG-AGENT Service Providing and Trading of Energetics Ltd.** was established in year 2002 based in Kecskemét. The proprietors are Hungarian individuals. At the beginning our company's activities were the installation, operation, servicing and maintenance of combined heat and energy production units (Combined Heat and Power – CHP unit). However, high competition on the market required permanent improvement and the extension of the scope of our activities. For this impact we established a number of firms affiliated to NRG-AGENT Kft. creating the NRG GROUP.

Due to dynamic development, by now we operate and maintain nearly 80 CHP units (some 50 MWe electric power). We engineer and manufacture our own CHP units starting with systems with the power of 5 kWe up to 750 kWe, undertaking to obtain the required permissions, too. We carry out the maintenance and service providing tasks within the scope of long term partnership contracts.

- Our headcount is 40 persons; our workers regularly attend special professional training courses.
- Service provision and maintenance activities are implemented by 21 service technicians (countrywide coverage, stand-by system of 24 hours).
- High standard availability is ensured by 15 different kinds of service cars, special tools and the stock with the value more than 100 million HUF.
- The operation and servicing is supported by a modern IT background.





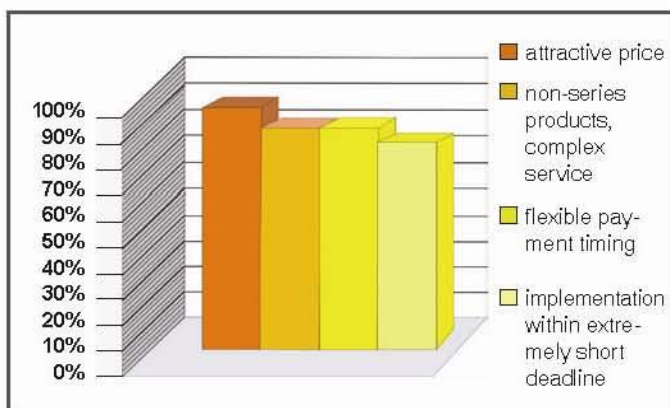
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Opinion of our investors



As you can see well on the diagram above, 90% of our contracting parties has chosen us because we offer our products at a more favourable price than our competitors. You can also see that most of our clients appealed to the fact that we have unique products and complex services. In comparison to our competitors two other factors can be highlighted: flexible payment terms and implementation within short deadline.



The success of our customer oriented business strategy is proved by ranking third in the Dynamic Businesses category of Enterprise Investors Pegazus Awards 2009. This award is to honour Hungarian enterprises that can provide extraordinary performance even within the actual economic environment.

In order to maintain high quality permanently we have introduced MSZ EN ISO 9001:2000 quality control system.





Combined or conjugated heat and power production (CHP – Combined Heat and Power) is when you produce electric power by means of burning fuel and you also utilise the heat and fume produced by the gas engine.

ABOUT CHP TECHNOLOGY

- Significant energy efficiency can be achieved by means of simultaneous utilisation of electric and thermal energy produced in the same phase of the technology. Due to this fact the total efficiency of CHP equipment is very high; it exceeds 85%.
- Taking the viewpoints of economy into account, the CHP power stations can principally cover local needs for heat: heating, cooling of buildings, technological heating, heating of water, district-heating etc.

Thus, the CHP unit supplies electricity according to the needs of the customer, delivers the produced surplus energy into the network, and makes use of the “waste-heat” generated during the production of electric power.

CHARACTERISTICS OF CHP UNITS

- **THE CHP UNIT'S** necessary renewals can be implemented outside the heating season,
- **USING THE CHP UNIT** the existing supply line from the service provider will remain in function as standby, so the power supply is continuous even in case of failure, too,
- **THE CHP UNIT** is an apparatus with low need for place, can be installed with the size according to the actual demand of energy, can be located either indoor or outdoor,
- **THE CHP UNIT** with appropriate noise absorption, produces moderate amount of noise, therefore it can be well utilised for even offices, schools, hospitals,
- **THE CHP UNIT** due to the up-to-date technology can be run clean, free of contaminations; its environment can be kept clean, too,
- **THE CHP UNIT** - regarding environment protection issues, - fully complies with the strictest regulations of the European Union. Due to the low level of emission, the components of the emitted fume are far below the stipulated limits,
- **THE CHP UNIT'S fuels are:** biogas, dump gas, byproduct gas, mine gas, natural gas.
- **THE CHP UNIT'S** operation is stable, its operation safety equals to that of conventional, big power stations,
- **THE CHP UNIT** does not need permanent operating staff,
- **THE CHP UNIT'S** control system can be operated by remote control,
- **THE CHP UNIT'S** need for maintenance is very little,



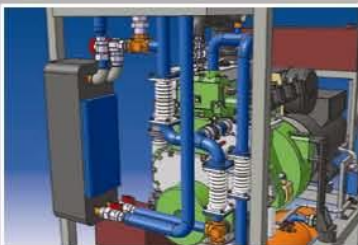
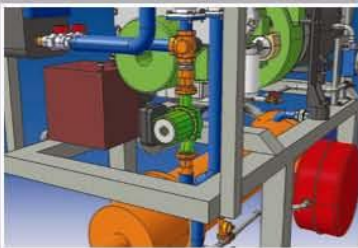
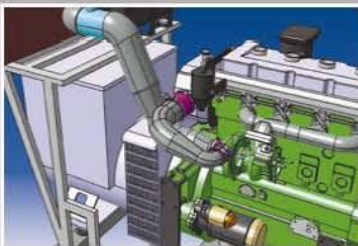
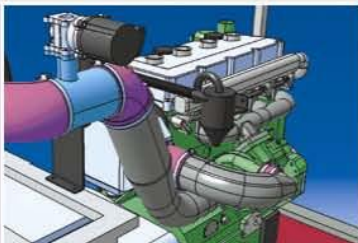
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MANUFACTURING OF NRG CHP UNITS



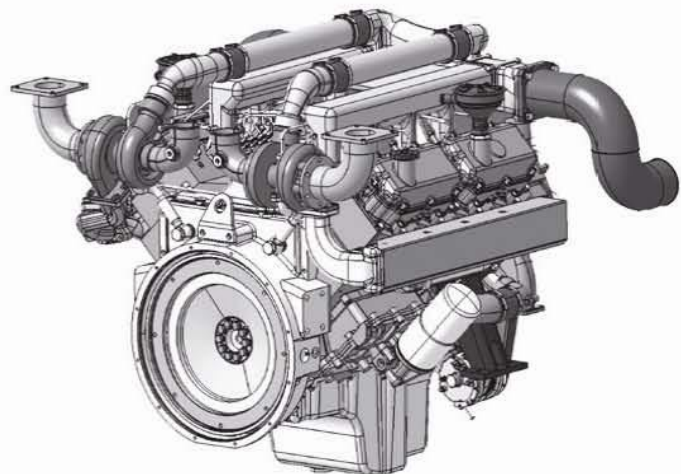
M I L E S T O N E S

By the end of year 2007, based on our service and maintenance experience, we began to produce our own CHP units (5 kWe – 750 kWe), designing them according to the demands of the clients, using the most recent technologies. In the range of our products you can find both indoor and outdoor units.

(In case of special demand, we undertake to produce CHP units with higher power, too.)

Simultaneously with the commencement of production we developed a special software, that makes it possible to test the motors without test-bench, by means of software. We can manipulate the parameters of the engine as well as the composition of the gas burnt in it.

HUNGARIAN INVESTMENT, HUNGARIAN GREY MATTER, OWN DEVELOPMENT IN ONE HAND.





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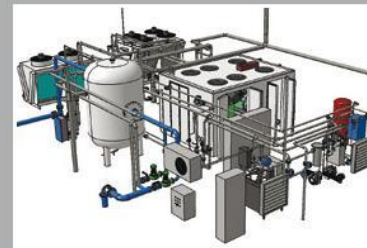
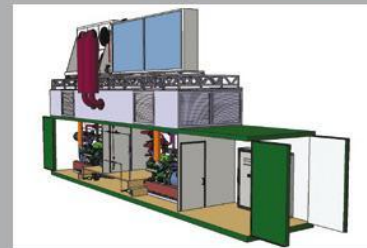


NRG CHP UNITS

MOST IMPORTANT CHARACTERISTICS

Turnkey system, energy centres fulfilling individual demands, from the some kWe micro co-generation system up to power stations with the power of several MWe, from the domestic mini power stations up to district heating systems.

- During engineering and manufacturing the **NRG CHP units** we apply the most up-to-date technologies.
- The engineering of the **NRG CHP units** is done with 3D technology.
- The **NRG CHP units** are equipped with a complex control system.
- The remote supervision of the **NRG CHP units'** control system is done through the internet (*the internet connection is provided by the client*).
- The control system of the **NRG CHP units** can be linked to the building supervisory system via MODBUS communication channel.
- The control system of the **NRG CHP units** is automatically updated with the new upgrades of the software.
- We optimise the gas-engines installed in the **NRG CHP units** by means of computer simulation.
- The **NRG CHP units** are easy to connect to the existing systems.
- The continuous operation of the **NRG CHP units** is ensured by the service background covering the whole country.





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TECHNICAL SPECIFICATIONS OF NRG CHP UNITS

FUEL: NATURAL GAS

Model of engine	NRG5 G2C	NRG10 G4Q	NRG30 G4L	NRG50 G4LTI	NRG70 G4LTI	NRG100 G6LTI	NRG150 GV6DTI	NRG170 GV6DTI	NRG200 GV8DTI	NRG250 GV8DTI	NRG310 GV12DTI	NRG380 GV12DTI
Arrangement of cylinders	V-engine	serial	serial	serial	serial	serial	serial	serial	V-engine	V-engine	V-engine	V-engine
Number of cylinders	2	4	4	4	4	6	6	6	8	8	12	12
Number of valves per cylinder	2	2	2	4	4	4	4	4	4	4	4	4
Bore (mm)	80	80	100	100	100	100	128	128	128	128	128	128
Stroke (mm)	79	90	127	127	127	127	142	142	142	142	142	142
Displacement (liter)	0.8	1.81	3.99	3.99	3.99	5.98	10.96	10.96	14.62	14.62	21.93	21.93
Rotational speed (1/min)	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
Operating voltage (V)	12	24	24	24	24	24	24	24	24	24	24	24
Entering energy content (kW)	18	35	99	144	198	263	397	460	520	652	805	975
Volume of gas (Nm ³ /h)	1.9	3.7	10.5	15.2	21.0	27.9	42.0	48.7	55.1	69.0	85.2	103.3
Mechanical power (kW)	5.5	12	33	53	74	100	150	175	208	260	324	392
Electric power (kWe)	5	10	30	50	70	96	143	167	200	250	310	375
Electric efficiency (%)	27.5	28.6	30.3	34.6	35.4	36.2	36.0	36.3	38.5	38.3	38.5	38.5
Charging air power 40/42 °C (kW)				6.2	8.5	11.6	14.4	20	25	28	32	38
Cooling water (kW)	5	11	28	33	46	56	87	101	110	138	175	205
Exhaust fume 120 °C (kW)	5	10	32	39	52	68	105	116	122	153	189	222
Useful heat output (kW)	10	20	60	72	98	124	192	217	233	291	364	427
Heat emission (kW)	2	3	6	8	11	16	24	25	27	32	39	44
Heat efficiency (%)	55.56	60.00	60.61	50.00	49.49	47.06	48.36	47.17	44.77	44.63	45.22	43.79
Total efficiency (%)	83.06	88.57	90.94	84.60	84.85	83.30	84.37	83.43	83.23	82.91	83.74	82.27



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TECHNICAL SPECIFICATIONS OF NRG CHP UNITS

FUEL: BIOGAS

Model of engine	NRG5 G2C	NRG10 G4C	NRG30 G4L	NRG50 G4LTI	NRG70 G4LTI	NRG100 G6LTI	NRG120 G6YTI	NRG150 G6YTI	NRG200 GV8DTI	NRG250 GV8DTI	NRG310 GV12DTI	NRG380 GV12DTI
Arrangement of cylinders	V-engine	serial	serial	serial	serial	serial	serial	serial	V-engine	V-engine	V-engine	V-engine
Number of cylinders	2	4	4	4	4	6	6	6	8	8	12	12
Number of valves per cylinder	2	2	2	4	4	4	4	4	4	4	4	4
Bore (mm)	80	80	100	100	100	100	120	120	128	128	128	128
Stroke (mm)	79	90	127	127	127	127	145	145	142	142	142	142
Displacement (liter)	0.8	1.8	4	4	4	6.0	9.8	9.8	14.6	14.6	21.9	21.9
Rotational speed (1/min)	1500	1500	1 500	1 500	1 500	1500	1500	1500	1500	1500	1500	1500
Operating voltage (V)	12	12	24	24	24	24	24	24	24	24	24	24
Entering energy content (kW)	18	35	104	144	185	263	334	395	520	652	805	975
Volume of gas (6,2kW/Nm ³) (Nm ³ /h)	2.9	5.6	17	23	30	42.5	53.9	63.7	83.9	105.2	129.8	157.3
Mechanical power (kW)	6.5	12	33	53	71	100	127	150	208	260	324	392
Electric power (kWe)	5	10	30	50	67	96	121	143	200	250	310	375
Electric efficiency (%)	27.8	28.6	29	35	36	36.2	36.2	36.2	38.5	38.3	38.5	38.5
Charging air power 40/42°C (kW)				6	8	11.2	12.3	13.9	25	28	32	38
Cooling water (kW)	5	10	29	33	41	56	76	92	111	139	175	205
Exhaust fume 120°C (kW)	5	11	31	39	47	68	84	99	126	157	189	222
Useful heat output (kW)	10	21	60	72	88	124	160	191	237	296	364	427
Heat emission (kW)	2	3	6	8	11	16	19	24	27	32	39	44
Heat efficiency (%)	55.56	60.00	58.00	50.00	48.00	47.06	47.90	48.35	45.54	45.40	45.22	43.79
Total efficiency (%)	83.33	88.57	87.00	85.00	84.00	83.30	84.14	84.54	84.00	83.68	83.74	82.27



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We offer complete, turnkey packages to our clients, which include obtaining the required permissions, the designing, delivery installation and commissioning of the CHP system. To ensure the optimal operation, we offer full range maintenance contracts for the lifetime of the system.

FINANCIAL POSSIBILITIES

FLEXIBLE FINANCIAL SOLUTIONS

The first and one of the most important questions is: how to finance the future investment? Our company can also give you help in this respect, as we also are experienced investors; we followed the rugged road of realisation, too.

Our company offers financial solutions that help fulfil special demands, too. Our flexible approach yields a measurable and evident decrease of risk on one hand, and makes real and traceable outcomes for our clients on the other hand.

CHP systems working with biogas are more and more popular, therefore the range of external investors is bigger. We collated with numerous banks, that can see opportunities in financing the projects

after having the calculations return seen. Several opportunities of tender are available, with which both our inventors and ourselves improve.

Furthermore it is also possible to apply full range energy management based on long term contracts, which means that the significant saving realised in the duration is shared between the contracting parties, so that the modernised equipment becomes the property of the contracting party in the duration of the contract.

PURCHASE OF ENERGY AT DISCOUNT PRICE

In case of choosing this construction our company installs, operates and finances the equipment free of charge, and merchandises the produced energy to its partners at a discount price.





LIST OF REFERENCE

FUEL: NATURAL GAS

Description	Type (Model)	Nominal electric power (kWe)	Proprietor	Description of the work
1 Debrecen Power Station 1	CAT 3520C CHP	2000	E.ON Energiatermelő Kft.	maintenance
2 Debrecen Power Station 2	CAT 3520C CHP	2000	E.ON Energiatermelő Kft.	maintenance
3 Debreceni Power Station 3	CAT 3520C CHP	2000	E.ON Energiatermelő Kft.	maintenance
4 Debrecen Power Station 4	CAT 3520C CHP	2000	E.ON Energiatermelő Kft.	maintenance
5 Debreceni Power Station 5	CAT 3520C CHP	2000	E.ON Energiatermelő Kft.	maintenance
6 Debrecen Power Station 6	CAT 3520C CHP	2000	E.ON Energiatermelő Kft.	maintenance
7 DEOEC 1	CAT G3412 CHP	375	Dotenergo Zrt.	maintenance
8 DEOEC 2	CAT G3412 CHP	395	Energo-Holding Kft.	maintenance
9 Eger EVAT heating centre 1	CAT 3516B CHP	1160	EBT ENERGIA Kft.	maintenance
10 Eger EVAT heating centre 2	CAT 3516B CHP	1160	EBT ENERGIA Kft.	maintenance
11 Eger EVAT heating centre 3	CAT 3516B CHP	1160	EBT ENERGIA Kft.	maintenance
12 Eger EVAT heating centre 4	CAT 3516B CHP	1160	EBT ENERGIA Kft.	maintenance
13 FŐTÁV Lakatos út 1	TCG 2020 V20 CHP	2000	FŐTÁV-KOMFORT Kft.	operation, maintenance
14 FŐTÁV Lakatos út 2	TCG 2020 V20 CHP	2000	FŐTÁV-KOMFORT Kft.	operation, maintenance
15 FŐTÁV Merényi Hospital	TCG 2020 V12 CHP	1160	FŐTÁV-KOMFORT Kft.	operation, maintenance
16 FŐTÁV Mogyoródi út	TBG 620 V16K CHP	1360	FŐTÁV-KOMFORT Kft.	operation, maintenance
17 FŐTÁV Tatai út 1	TCG 2020 V20 CHP	2000	FŐTÁV-KOMFORT Kft.	operation, maintenance
18 FŐTÁV Tatai út 2	TCG 2020 V20 CHP	2000	FŐTÁV-KOMFORT Kft.	operation, maintenance
19 Gherla Cluj	TEDOM Cento T160 SP CHP	160	B-Team SRL	maintenance
20 Győr Power Station 1	TEDOM Quanto C1000SPE CHP	1040	Győri Erőmű Kft.	maintenance
21 Győr Power Station 2	TEDOM Quanto C1000SPE CHP	1040	Győri Erőmű Kft.	maintenance
22 Hatvan 1	TEDOM Cento T160 SP	160	Mader Kft.	maintenance
23 Hatvan 2	TEDOM Cento T160 SP	160	Mader Kft.	maintenance
24 Kaposvár heating centre 1	CAT 3516B CHP	1160	E.ON Energiatermelő Kft.	maintenance
25 Kaposvár heating centre 2	CAT 3516B CHP	1160	E.ON Energiatermelő Kft.	maintenance



LIST OF REFERENCE

FUEL: NATURAL GAS

Description	Type (Model)	Nominal electric power (kWe)	Proprietor	Description of the work
26 Kaposvár heating centre 3	CAT 3516B CHP	1160	E.ON Energiatermelő Kft.	maintenance
27 Kaposvár heating centre 4	CAT 3516B CHP	1160	E.ON Energiatermelő Kft.	maintenance
28 Komádi	GM VORTEC	40	PETROLSZOLG Kft.	maintenance
29 Nyíregyháza	TEDOM Quanto 500 SP CHP	500	ENERGOCOOP Kft.	maintenance
30 Nyíregyháza	TEDOM Cento 150 SP CHP	150	ENERGOCOOP Kft.	maintenance
31 Nyíregyház Academy 1	TEDOM Quanto C1000 SP CHP	1040	NYÍREGYHÁZI FŐISKOLA	maintenance
32 Nyíregyház Academy 2	TEDOM Quanto C1000 SP CHP	1040	NYÍREGYHÁZI FŐISKOLA	maintenance
33 Pannonhalma	NRG MIDI L140 SP CHP	95	Magyar Bencés Kongregáció Pannonhalmi Főapátság	manufacturing, installation
34 Pécs Power Station	CAT 3516B CHP	1160	E.ON Energiatermelő Kft.	maintenance
35 Pharma-Press	TEDOM Cento T160 SP CHP	160	Pharma-Press Nyomdaipari Kft.	installation
36 Püspökladány	GM VORTEC	30	PETROLSZOLG Kft.	maintenance
37 Sárospatak Heating Power Station	TEDOM Quanto C1000 SP CHP	1040	SINERGY Kft.	maintenance
38 Székelyudvarhely 1	NRG MINI P30 SP CHP	30	S.C.LORIFOR S.R.L.	manufacturing, installation, maintenance
39 Székelyudvarhely 2	NRG MINI P30 SP CHP	30	S.C.LORIFOR S.R.L.	manufacturing, installation, maintenance
40 Szentes	TEDOM Quanto C1000 SP CHP	1160	Dalkia Energia Zrt.	maintenance
41 Szombathely Power Station	CAT 3516B CHP	1160	Szombathelyi Erőmű Zrt.	maintenance
42 Tapolca Power Station	CAT 3516B CHP	1160	Tapolcai Kogenerációs Erőmű Kft.	maintenance
43 Téglás	CAT G3412 CHP	395	HAJDU Infrastruktúra Szolgáltató Zrt.	maintenance
44 Budapest	NRG MIDI L300 SP Cont CHP	143	ZÁDOR-HÚS Kft.	manufacturing, installation
45 Valkó	NRG MINI P30 SP CHP	30	VALKÓ KÖZSÉG ÖNKORMÁNYZATA	manufacturing, installation, maintenance
46 Frolovo (Oroszország)	NRG MIDI D250 SP CHP	250	under manufacturing	manufacturing, installation, maintenance



LIST OF REFERENCE

FUEL: BIOGAS

Description	Type (Model)	Nominal electric power (kWe)	Proprietor	Description of the work
1 Hódmezővásárhely	TEDOM Cento T300 SP Cont CHP	320	ZÖLD NRG-AGENT Kft.	installation, maintenance
2 Nyíregyháza 1	Liebherr G926TI	143	NYÍRSÉGVÍZ Zrt.	changing of engine, maintenance
3 Nyíregyháza 2	Liebherr G926TI	143	NYÍRSÉGVÍZ Zrt.	changing of engine, maintenance
4 Szeged 1	JMS 208 GS-B	330	Szegedi Vízmű Zrt.	maintenance
5 Szeged 2	JMS 208 GS-B	330	Szegedi Vízmű Zrt.	maintenance
6 Gyál 1	NRG MIDI D500 SP Cont CHP	480	ZÖLD NRG-AGENT Kft.	manufacturing, installation, maintenance
7 Gyál 2	NRG MIDI D500 SP Cont CHP	540	ZÖLD NRG-AGENT Kft.	manufacturing, installation, maintenance
8 Kerepes	NRG MIDI L100 SP Cont CHP	95	KÖZGÉP Zrt.	manufacturing, installation
9 Kiskunfélegyháza	NRG MINI L50 SP Cont CHP	48	BÁCSVÍZ Zrt.	manufacturing, installation, maintenance
10 Körmen	NRG MINI P30 SP Cont CHP	30	Müllex-Körmen Kft.	manufacturing, installation, maintenance
11 Nagyvárad	NRG MIDI D500 SP Cont CHP	250	KEVIÉP Kft.	manufacturing, installation, maintenance



LIST OF REFERENCE

FUEL: THERMAL WATER BYPRODUCT GAS

Description	Type (Model)	Nominal electric power (kWe)	Proprietor	Description of the work
1 Hajdúszoboszló	TEDOM Quanto D1200 SP CHP	1160	HUNGAROSPA Zrt.	installation, maintenance
2 Püspökladány 1	NRG MINI P30 SP CHP	30	Püspökladányi Gyógyfürdő Egészségügyi Szolgáltató és Sportszervező Kft.	manufacturing, installation, maintenance
3 Püspökladány 2	NRG MINI P30 SP CHP	30	Püspökladányi Gyógyfürdő Egészségügyi Szolgáltató és Sportszervező Kft.	manufacturing, installation, maintenance
4 Hajdúböszörmény	NRG MIDI L150 SP Cont CHP	143	Hajdúböszörményi Városgazdálkodási Kft.	manufacturing, installation, maintenance
5 Berekfürdő	NRG MIDI D250 SP CHP	250	Berekfürdő Energia Termelő és Szolgáltató Kft.	manufacturing, installation, maintenance
6 Berekfürdő	NRG MINI L70 SP CHP	70	Berekfürdő Energia Termelő és Szolgáltató Kft.	manufacturing, installation, maintenance
7 Berekfürdő	NRG MINI P30 SP CHP	30	RHEU-MED Kft.	manufacturing, installation, maintenance
8 Túrkeve 1	NRG MINI P30 SP CHP	30	Túrkeve Város Önkormányzata	manufacturing, installation, maintenance
9 Túrkeve 2	NRG MINI P30 SP CHP	30	Túrkeve Város Önkormányzata	manufacturing, installation, maintenance

LIST OF REFERENCE

FUEL: PROPANE GAS

Description	Type (Model)	Nominal electric power (kWe)	Proprietor	Description of the work
1 Székesfehérvár 1	NRG MINI P30 SP CHP	30	Shell Gas Hungary Zrt.	manufacturing, installation
2 Székesfehérvár 2	NRG MINI P30 SP CHP	30	Shell Gas Hungary Zrt.	manufacturing, installation
3 Székesfehérvár 3	NRG MINI P30 SP CHP	30	Shell Gas Hungary Zrt.	manufacturing, installation



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ESTABLISHMENT OF ZÖLD NRG-AGENT

MILESTONES



Together with the production of CHP units we commenced the utilisation of renewable energies; in 2007 we established ZÖLD (green) NRG-AGENT Kft, a subsidiary of NRG-AGENT.

Our company's goal of high priority is: to realise investments of energetics based on the utilisation of gases obtained from dumps.

Utilisation of dump gas in energetics

OUR SERVICES

- engineering of dumps' gas extraction systems, obtaining of permissions, implementation
- installation of torch, biogas boiler and/or mini power station
- servicing and operation of the installed equipment

It is an additional opportunity, that ZÖLD NRG-AGENT Kft. is already able to deliver turnkey technical systems for the utilisation of biogas extracted from agricultural waste or sewage, undertaking all tasks from the engineering through approval up to operation.

The increasing trend of energy prices on the world market, the shortage in mineral oil and natural gas, the strict regulations of environment protection and policy of climate, the intention to save energy; - all these have the effect of increasing the portion of renewable energy used. The benefit of producing biogas is that you can obtain clean energy in an environment friendly way, which has more advantages than other energy sources of fossil origin, with CO₂ emission decreased, too.





OUR REFERENCES

OWN INVESTMENTS

- **A.S.A. Kft., Regional Dump, Hódmezővásárhely**
(gas extracting system, CHP unit (320 kW_e))
- **A.S.A. Kft., Regional Dump, Gyál**
(gas extracting system, stage I.: CHP unit (500 kW_e))

The equipment, which was made as our own construction, converts the bio-gas, obtained from the wells of gas set up on the dump, to electric energy.

- **A.S.A. Kft., Regional Dump, Gyál**
(stage II.: CHP unit (500 kW_e))

The equipment in Gyál is unique, too, made exclusively by our company. We also contracted for the maintenance and running of the systems for a period of 15 years.

- **Zala-Depo Kft., Regional Dump, Búslakpuszta**
(CHP unit (140 kW_e))

ORDERED INVESTMENTS

- **ZHK Kft., Regional Dump, Bodrogkeresztúr**
(gas extracting system)
- **KÖZGÉP Zrt., Regional Dump, Kerepes-Ökörítőfülpös**
(torch, CHP unit (100 kW_e))
- **Müllex Kft., Regional Dump, Körömend**
(gas extracting system, torch, CHP unit (30 kW_e))
- **KEVIÉP Kft. / ECOBIHOR, Regional Dump, Nagyvárad**
(gas extracting system, torch, CHP unit (500 kW_e))
- **Zala-Depo Kft., Regional Dump, Búslakpuszta**
(gas extracting system, torch)

UTILISATION OF RENEWABLE ENERGY





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EQUIPMENT TO PRODUCE ELECTRIC ENERGY FOR HOMES

MICRO CO-GENERATION

Micro co-generation refers to relatively very low power equipment producing electric current and heat at the same time.

According to the definition of electric current producing equipment for domestic use (under 50 kVA) in the Act of Electric Energy (VET) the installer of such equipment is still considered by the local energy supplier as consumer. The current supplier equips the location of the installation with supply-extract type counter at its own cost, by means of which it takes the quantity of "sold" and "bought" electric energy into consideration within the scope of 6-monthly or yearly balance setting contract. Ideally the electric energy generating equipment has to produce the consumer's total annual needs of electric energy by means of the possible highest number of running hours and permanent operation.

EUROPEAN ENVIRONMENT

The EU also pays high attention on the issue of co-generation: Directive 2004/8/EK. The application of Micro Co-generation on a decentralised mode is associated with significant savings of primary energy, energy efficiency and decreasing emission of CO₂. Numerous countries and European cities took measures to apply this method. (To supply electric energy and heat with the conventional methods to small customers – e.g. from centralised big power stations – is done with big loss on cables and primary energy utilisation. On the other hand, using the opportunities given by the legal regulations, and by means of applying Micro CHP units, the decentralised production of electric energy and heat is possible so that the total efficiency exceeds 85%.)

TARGET INSTITUTES

The use of Micro Co-generation is economical at any institutes and administration establishments, where the usage of heat is permanent nearly all through the year.

LOCAL GOVERNMENTS

The cost of energy supply has high importance in the budget of local governments. Micro CHP units designed to cover the annual needs for electric energy and the simultaneous application of biomass boiler to produce the increased quantity of heating energy demanded during the heating season the annual energy needs of local government institutes can be provided on an efficient and economical way.



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EQUIPMENT TO PRODUCE ELECTRIC ENERGY FOR HOMES

MICRO CO-GENERATION

If, by means of new legal regulation, it would be possible to combine the annual electric energy needs of all the institutes of a certain local government with 1 or 2 network connections, (applying Micro CHP units,) and using the "supply-extract" method balance accounting, further significant decrease of cost could be achieved, whilst the energy consumption and CO₂ emission balance of the country would definitely improve. In this case the Micro CHP unit should be installed at the institution of the local government where the demand for heat is the highest and most permanent at annual level. The CHP unit installed according to this high demand of heat (< 50 kW_e) – with minimum 8200-8300 operating hours per year, – the produced electric energy would probably be more than the demand of the institution, which could be taken into account in the total annual electric energy consumption of

the institutions of the local government. This way all the electric energy regarding the local government is redeemable, and simultaneously a portion of the necessary heating energy is also available.

ECONOMY

Calculations of economy at various institutions examined show, - in case of about 8,000 operating hours per year, with uninterrupted heat extraction and energy consumption with clearing, - that depending on the changes in the installation costs the time span of return of the investment is 2.5–3 years.

In the calculation we took only the application of micro co-generation equipment into account. If the application is done together with biomass boiler, even better economical output can be achieved.



By means of application of Micro CHP units there is a possibility to produce electric energy and heat on a decentralised way, so that the total efficiency exceeds 85%.



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SALE

NRG-AGENT Kft. prioritizes sales in order to facilitate an efficient and dynamic presence on the market. Our affiliated sales partner is **CHP Complex Kft.**



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HEAT- AND ELECTRIC POWER PRODUCTION



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