CO-GENERATION GAS POWER STATION BIOVET

ANNEXES

JI PROJECT DESIGN DOCUMENT

BIOVET JSC, PESHTERA, BULGARIA

Volume 2

ERUPT 4
Version 2
Sofia, May 2004

Annex No. 1

GEN PLAN BIOVET PESCHTERA FACTORY

АКТУАЛИЗИРАН ГЕНПЛАН НА ОСНОВНА ПЛОЩАДКА И ГЛС
БИОВЕТ АД Пещера

май 2002г.

Annex No. 2

Passages from the Energy Law

Article 33 (1) The Commission sets preferential costs for sale of electricity, generated by Renewable Energy Resources under article 159, paragraph 2 and from cogeneration by stations with combined generation of electric and heat energy under article 162, paragraph 2, item 1.
(2) Preferential costs under paragraph 1 are not set at less than 80 per cent of the average sale cost of the electric energy for the preceding calendar year for consumers, using electricity for household purposes.
(3) According to a proposal of the subsequent heat transmission company, the commission determines preferential cost for heat energy for the association under article 151, paragraph 1.

Chapter Four
LICENSES

Section I
Issuance of Licenses

Article 39
(1) Activities, subject to licensing under this Law, are:
1. Generation of electricity and/or heat energy;
2. Transmission of electricity, heat energy and natural gas;
3. Distribution of electricity or natural gas;
4. Storage of natural gas;
5. Trade in electricity;
6. Organizing an electricity market;
7. Public delivery of electricity or natural gas;
8. Public supply of electricity or natural gas;
9. Transit transmission of natural gas.

(2) The license authorizes performance of any of the activities under para. 1, subject to the conditions stated therein and constituting an integral part of the decision for its issuance.
(3) Where a license is issued for performance of any of the activities under para. 1 before building the energy facility required for it, the license contains conditions for building such facility and deadlines for start-up of the licensed activity.
(4) Issuance of a license is not required for:
1. Generation of electricity by persons who own an electricity plant of a total installed electric capacity of up to 5 MW;
2. Generation of heat energy by persons who own a heat energy plant of a total installed heating capacity of up to 5 MW;
3. Generation of heat energy for own use only.

Article 40
(1) A license is issued to a legal person registered under the Commercial Code that:
1. Has the technical and financial capabilities, material and human resources and organizational structure needed to meeting the regulatory requirements for performance of the licensed activity;
2. Has a property right to the energy facilities, by means of which the activity is to be performed, if these are built, except for the licenses under Article 39, para. 1, items 5, 6, 7 and 8;
3. Provides evidence that the energy facilities, by means of which the activity under the license is to be performed, meet the regulatory requirements for safe operation and environment protection.
(2) The terms under para. 1, items 1-3 shall be fulfilled by the time of start-up of the licensed activity, where the license is issued pursuant to Article 39, para. 3.
(3) Licenses are not issued to persons that:
1. Are subject to bankruptcy adjudication proceedings or are declared insolvent;
2. Are in the process of liquidation;
3. Have had a license for the same activity withdrawn or issuance thereof has been denied, and the period under Article 59 para. 3 or under Article 41, para. 4 have not yet expired.
(4) Licenses shall not be issued if there is a risk for the endangering the life and health of citizens, of damages to third parties' property and of the interests of consumers, of disturbing the reliable supply of electricity and heat energy and natural gas.
(5) In cases where one and the same person performs more than one of the activities subject to licensing separate licenses shall be issued for each of the activities. The Commission ensures that there are no conflicts in the regime for the performance of the individual licensed activities.

Article 41
(1) The procedure for issuance of a license is initiated upon a written application supported by all documents, required for issuance of a license.
(2) In the event that the licensed activity is performed at prices, subject to regulation under this Law, an application for their approval is attached to the application under para.
(3) Within three months of submission of the application under para. 1 and para. 2, the Commission issues a license or denies, in a reasoned manner, the issuance of a license and approves or determines the respective prices.
(4) In cases where the Commission denies the application, the applicant may submit a new request for issuance of a license not earlier than 3 months following the decision for refusal or, respectively, effectiveness of the court ruling, whereby any appeal is rejected for lack of merit.

Article 42
(1) Licenses are issued for a term not exceeding 35 years in accordance with the requirements of the ordinance under Article 60.
(2) The term of validity of a license may be extended for a period not exceeding the term stated in para. 1 above, provided that the licensee meets all requirements of this Law and all obligations and requirements under the license and has submitted a written request for an extension at least one year prior to the expiration of the term of the original license.

(3) In the decision to extend the term under para. 2, the Commission also determines the conditions for performance of the activity for the new license term.

Chapter eleven

Promotion of power generation from Renewable Energy Resources and combined generation.

Section II
Production of electric energy from Thermal Power Stations and combined generation

Article162 (1) The public provider and/or public suppliers are obliged to buy out the entire volume of the electricity from highly-efficient power plants for combined heat/power generation, registered with a certificate of origin, with the exception of volumes used by the producer to meet its own purposes and covered by contracts pursuant to Chapter Nine, Section VII, or those with which he participates in the balancing market.
(2) Electricity pursuant to Paragraph 1 shall be bought out as follows:
1. At preferential prices as provided for in the Ordinance pursuant to Article 36, Paragraph 3, for volumes generated by each plant of the producer up to 50 MWh per hour;
2. At negotiated prices and/or at balancing market prices for volumes generated by each plant of the producer over 50 MWh per hour.

(3) The method for metering the electricity generated by combined heat/power generation according to the type of the technological cycle, the requirements for technological devices for measurement and registering of the electricity from combined generation shall be defined in an Ordinance approved by the Minister of Energy and Energy Resources. The electric energy under article 1 is bought up as follows:

Article 163 (1) Mandatory buying out of electricity at preferential costs pursuant to article 162 is applied until the establishment of a system for issuing and trade in green certificates.

(2) The Minister of Energy and Energy Resources assesses the minimum volumes of electricity, produced out of highly-efficient combined production per each producer, as a per cent out of the general annual generation as a per cent of the total annual output by each producer for a period of ten years, reckoned as of the date of introduction of the system for issuing and trade in green certificates.

(3) Each producer shall be considered to have fulfilled his obligation under paragraph 2 at his presenting to the Commission of green certificate /green

certificates indicating the volume of electricity from highly-efficient combined generation, comprising a producer's obligation; such certificate(s) shall be:
1. Issued by the producer and\or;
2. Purchased from another electricity producer, the sale transaction considered effective on condition that it is entered into the register pursuant to Article 25, paragraph 1, item 4.
(4) The terms and conditions of issuing and trade in green certificates shall be settled in an ordinance pursuant to Article 161, paragraph 4.

Annex No. 3

PROGNOSTICATION OF BIOVET DEVELOPMENT

Years	Annual extension of the production [thous.EURO]	Average hour consumption of steam [tons /h]	Annual consumption of stem [tons]	Average hour consumption of electricity [MWh / h]	Annual consumption of electricity [MWh]
2003	24,967.8	20.29	177,775	9.9	86,980
2004	26,216.2	24.00	210,000	12	105,000
2005	28,837.8	29.90	262,000	15	131,000
2006	31,721.5	30.80	270,000	16	140,000
2007	33,307.6	31.39	275,000	17	149,000
2008	34,973.1	31.73	278,000	17.5	153,000
2009	36,721.7	31.90	280,000	18	157,000
2010	40,485.6	31.90	280,000	18.5	162,000
2011	42,509.9	31.90	280,000	18.8	164,000
2012	44,635.4	31.90	280,000	19	166,000
2013	46,867.2	31.90	280,000	19	166,000
2014	49,210.5	31.90	280,000	19	166,000
2015	51,671.1	31.90	280,000	19	166,000
2016	54,254.6	31.90	280,000	19	166,000

Estimated Average Engine Performance

GE Aero Energy
A GE Power Systems Business

Performance By: **Mahendra Singh Chauhan**
Project Info: **1xLM2000 SAC-SI @ 15degC.**

Engine: **LM2000**
Deck Info: **GE166A - 7t2.pip**
Generator: **M20 50Hz, 11.5kV, 0.85PF (8605)**
Fuel: **Site Gas Fuel#900-24T, 19000 Btu/lb,LHV**

Date: **01/03/2004**
Time: **9:38:07 PM**
Version: **3.0.4**

Ambient Conditions	
Dry Bulb, °C	15.0
Wet Bulb, °C	12.9
RH, %	80.0
Altitude, m	450.0
Ambient Pressure, kPa	96.036
Engine Inlet	
Temperature, °C	15.0
RH, %	80.0
Conditioning	NONE
Tons or kBtu	0
Pressure Losses	
Inlet Loss, mmH2O	101.60
Exhaust Loss, mmH2O	203.20

kW, Gen Terms	**16321**
Est. kJ/kWh, LHV	**10258**
Fuel Flow	
GJ/hr, LHV	167.4
kg/hr	3788
NOx Control	**Steam**
Steam Injection	
kg/hr	4508
Temperature, °C	**AS SPECIFIED IN GE AERO ENERGY'S PROPOSAL DOCUMENTATION.**
Exhaust Parameters	
Temperature, °C	460.4
kg/sec	61.2
kg/hr	220148
Emissions (NOT FOR USE IN ENVIRONMENTAL PERMITS)	
REF @ 15% O2	15
NOx mg/Nm3 Ref 15% O2	51
NOx as NO2, kg/hr	7
CO mg/Nm3 Ref 15% O2	249
CO, kg/hr	35.09
HC mg/Nm3 Ref 15% O2	50
HC, kg/hr	6.80
Exh Wght % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)	
AR	1.2285
N2	72.1826
O2	16.0588
CO2	4.3270
H20	6.1819
SO2	0.0000
CO	0.0159

HC	0.0031
NOX	0.0022

Exh Mole % Dry (NOT FOR USE IN ENVIRONMENTAL PERMITS)

AR	0.9585
N2	80.3089
O2	15.6421
CO2	3.0644
H20	0.0000
SO2	0.0000
CO	0.0177
HC	0.0061
NOX	0.0022

Exh Mole % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)

AR	0.8659
N2	72.5495
O2	14.1308
CO2	2.7683
H20	9.6620
SO2	0.0000
CO	0.0160
HC	0.0055
NOX	0.0020

Aero Energy Fuel Number	**900-24**	
	Volume %	**Weight %**
Hydrogen	0.0000	0.0000
Methane	84.5000	71.8447
Ethane	5.5800	8.8924
Ethylene	0.0000	0.0000
Propane	2.0500	4.7909
Propylene	0.0000	0.0000
Butane	0.7800	2.4027
Butylene	0.0000	0.0000

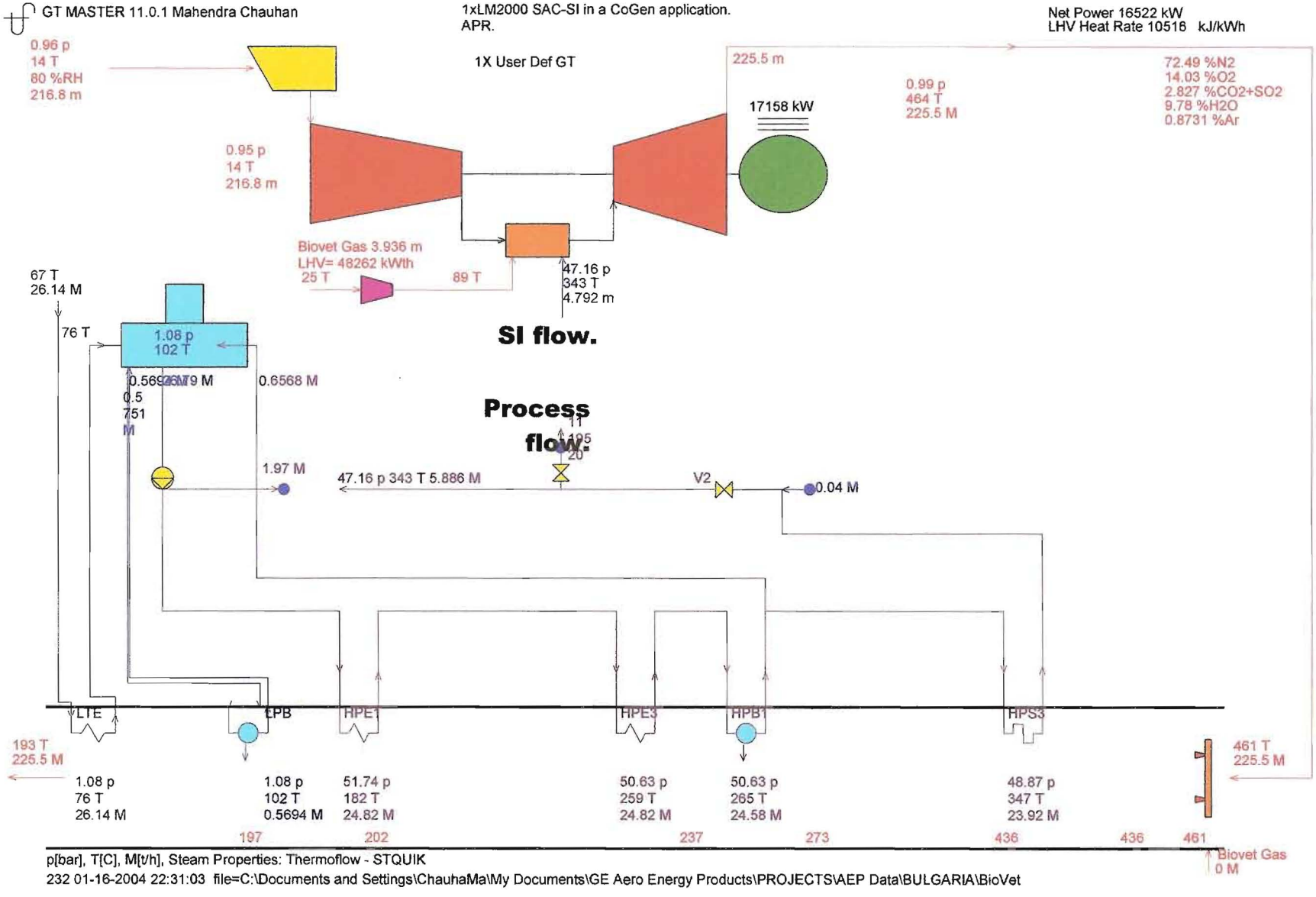
Butadiene	0.0000	0.0000
Pentane	0.1800	0.6883
Cyclopentane	0.0000	0.0000
Hexane	0.1700	0.7764
Heptane	0.0000	0.0000
Carbon Monoxide	0.0000	0.0000
Carbon Dioxide	0.6700	1.5628
Nitrogen	5.9300	8.8044
Water Vapor	0.0000	0.0000
Oxygen	0.1400	0.2374
Hydrogen Sulfide	0.0000	0.0000
Ammonia	0.0000	0.0000

kJ/kg, LHV	44194
kJ/Nm3, LHV	37197
kJ/Nm3, HHV	41131
kJ/kg, HHV	48861
Fuel Temp, °C	25.0
NOx Scalar	0.998
Specific Gravity	0.65

g

Annual heat balance diagram for one *"typical"* month.

Annex No. 5



Annex No. 6

Required thermal loads for Biovet Cogen Plant

Required thermal loads for BIOVET's CoGeneratrion power plant.

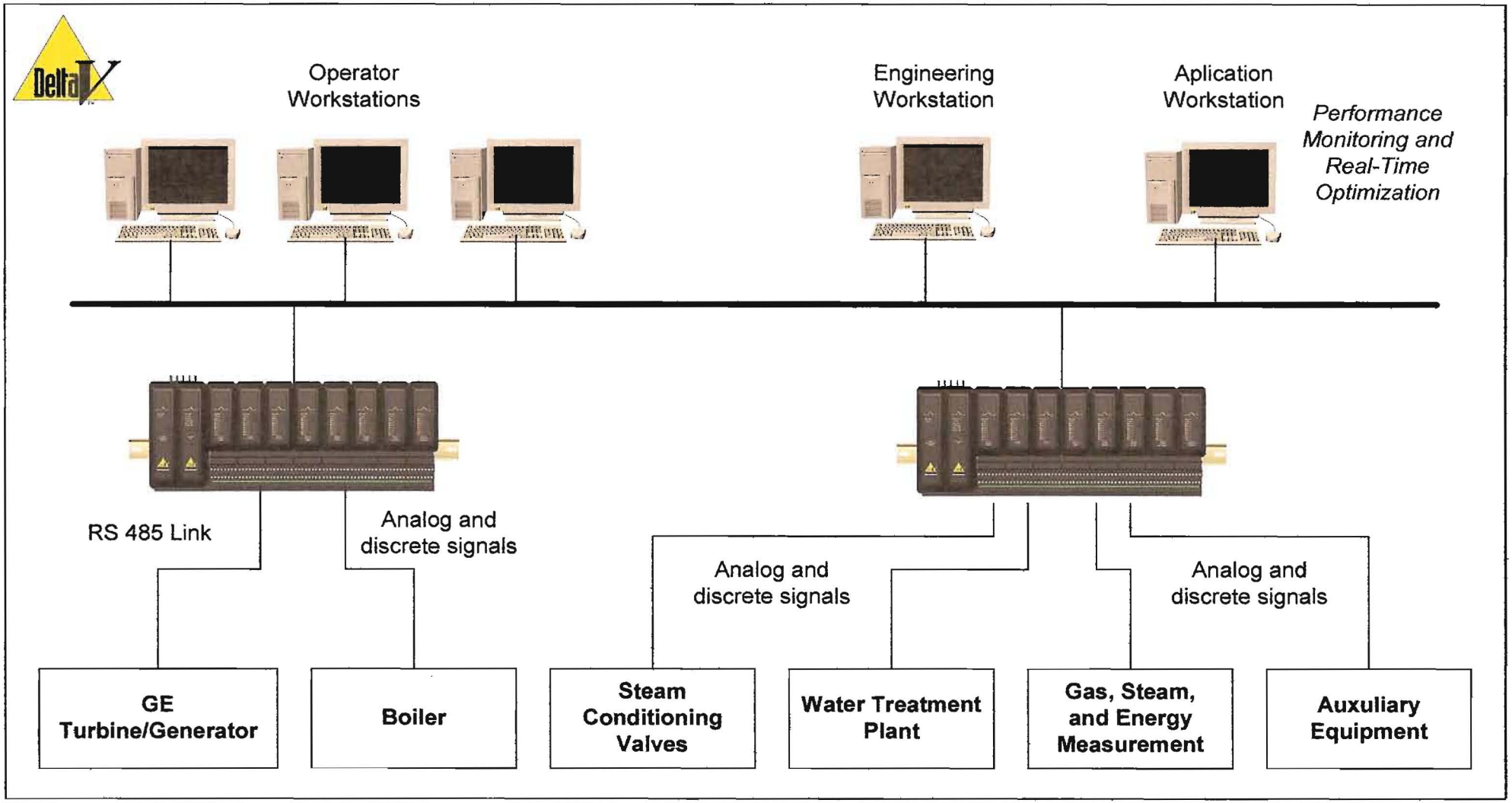
Month:	AIT	Process steam	Additional steam	TOTAL Steam requirement
	degC.	T/hr.	T/hr.	T/hr.
Jan	-4.5	21	7.2	28.2
Feb	4	21	3.5	24.5
Mar	7	21	2.2	23.2
Apr	14	21	1	22.0
May	17	21	1	22.0
Jun	22	21	1	22.0
July	25	21	1	22.0
Aug	24	21	1	22.0
Sep	18	21	1	22.0
Oct	12	21	1.1	22.1
Nov	9	21	1.3	22.3
Dec	3	21	4	25.0

Annual aveage thermal load (T/hr)	24.94

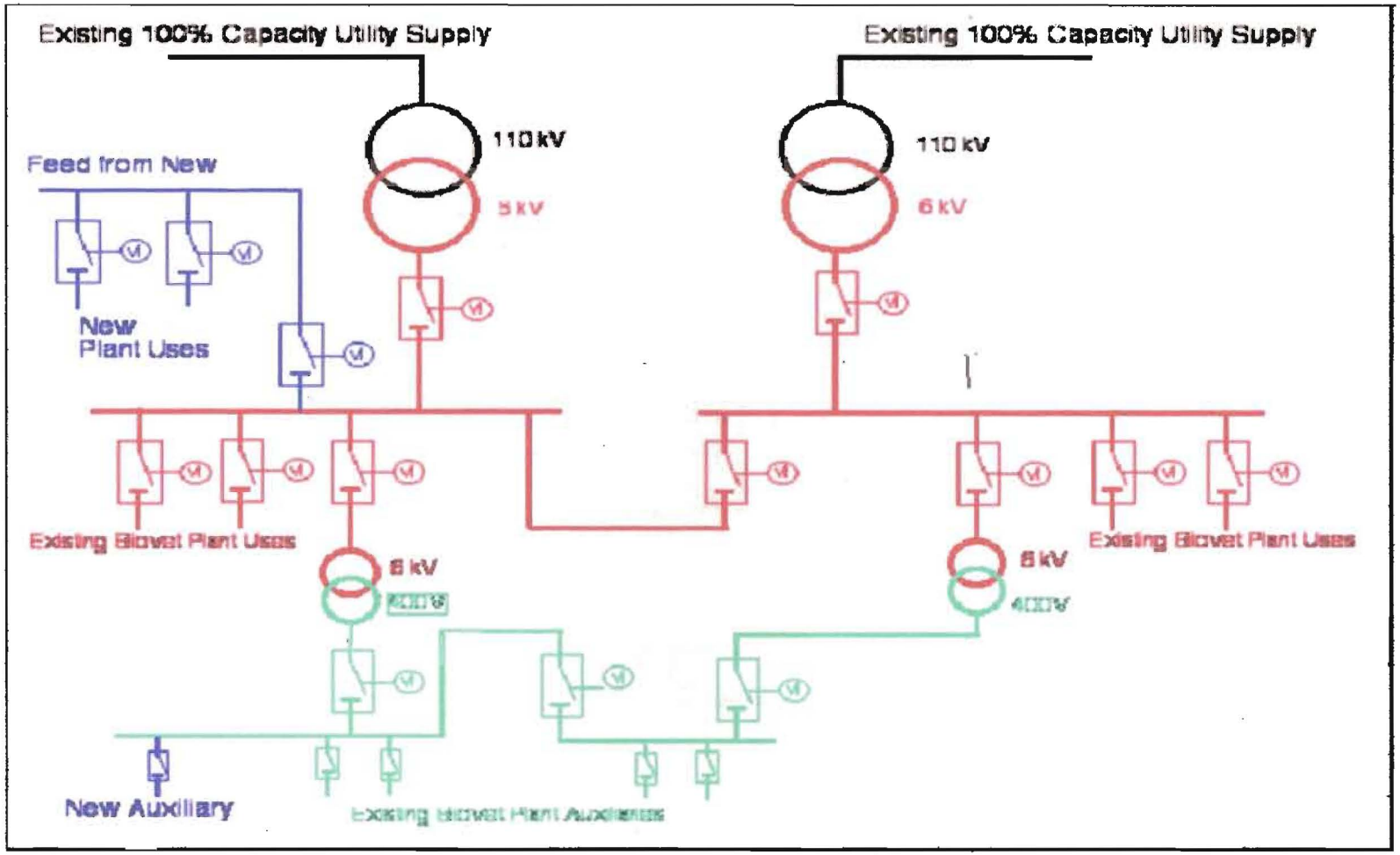
Above loads are as specified
by Biovet.
Steam conditions are 11Bar &
195degC.

Block scheme of the automation system Biovet Pestera Cogen Plant

Annex No. 7



Existing Single Line Diagram Electricity of Biovet Annex No. 8



Efficiency of Boiler No. 1 — Annex No. 9

Committee on Energy Efficiency
Ministry of Industry

2, Triaditsa Street, Sofia-1046, tel.: 87-49-72, 867-26-57
Fax: 980-00-19, e-mail: EECbg@geobiz.com
Website: http://geobiz.com/EECbg

PROTOCOL

ON THE RESULTS FROM THE ADJUSTMENTS OF THE BURNING PROCESS

Employer: Biovet AD of the town of Peshtera
Type of boiler: EKM 12 Boiler No. 1

No.	TYPE OF MEASUREMENT	DEGREE OF LOADING					
		3	4	5	6	7	8
1	t°C of exhaust gases	177	179	190	193	208	209
2	O_2 %	4.9	4.8	4.8	4.4	4.9	4.9
3	CO ppm	28	25	34	90	85	85
4	CO_2 %	9.1	9.2	9.4	9.7	9.5	9.3
5	Nox	85.0	84.8	86.6	87.0	85.0	85.6
6	α - coefficient of surplus air	1.32	1.31	1.31	1.26	1.22	1.23
7	Efficiency of burning process	89.0	89.0	89.0	90.5	89.0	89.0

The measurements were performed at an environmental temperature of 19°C.
(signed - illegible)
PERFORMED BY: *(signed - illegible)* EMPLOYER: *(signed - illegible)*
/D. Oreshkov/

Town of Peshtera,
23.10.1998

ЕЕС
ЕНЕРГИЙНА ЕФЕКТИВНОСТ
МИНИСТЕРСТВО НА ПРОМИШЛЕНОСТТА
ул."Триадица"№2, София -1046, Тел 87-49-72, 867-26-57
Факс 980-00-19, E-mail: EECbg @ geobiz.com
Интернет страница http://geobiz.com/EECbg

ПРОТОКОЛ

ЗА РЕЗУЛТАТИТЕ ОТ НАСТРОЙКАТА НА ГОРИВНИЯ ПРОЦЕС

Възложител: "Биовет" - АД, гр. Пещера

Тип на котела: ЕКМ 12 Котел № 1

Година: [illegible] 1969

№	ВИД ИЗМЕРВАНЕ	СТЕПЕН НА НАТОВАРВАНЕ					
		3	4	5	6	7	8
1	t °C на изходящите газове	177	179	190	193	208	209
2	O_2 %	4.9	4.8	4.8	4.4	4.9	4.9
3	CO ppm	28	25	34	90	85	85
4	CO_2 %	9.1	9.2	9.4	9.7	9.5	9.3
5	NOx	85.0	84.8	86.6	87.0	85.0	85.6
6	α - коефициент на излишък на въздуха	1.32	1.31	1.31	1.26	1.22	1.23
7	Ефективност на горивния процес %	89.0	89.0	89.0	90.5	89.0	89.0

Измерванията са извършени при температура на околната среда 19 °C.

ИЗПЪЛНИТЕЛ: /Д. Орешков/

ВЪЗЛОЖИТЕЛ:

гр. Пещера
23.10.1998г.

Annex No. 10

Excerpts from the price list approved by the State Committee on Energy Regulation as of 05.04.2004

Prices
approved by the State Committee on Energy Regulation as of 05.04.2004

IV. Price for transmission of electric energy over the transmission network – 11.80 BGN/MWh

Remark: The above price does not include value-added tax.

V. Prices for active electric energy, consumed for domestic needs by the population

Measurement method	Time zones	Monthly consumption	Price (BGN/kWh)	Applies to the following consumers
On two scales	Daytime	Up to 75 kWh	0.098	Everyone
		Over 75 kWh	0.153	Everyone
	Nighttime	Total consumption	0.082	- not connected to the thermal energy transmission network - not connected to the thermal energy transmission network during the April 1st – October 31st period
		Up to 50 kWh	0.053	- not connected to the thermal energy transmission network during the November 1st – March 31st period
		Over 50 kWh	0.082	- not connected to the thermal energy transmission network during the November 1st – March 31st period

Remark: The above prices do not include value-added tax.

VI. Prices for active electric energy, consumed for business and public activities by state and municipal entities, by real persons and legal entities

Measurement method	Time zones	Price (BGN/kWh) for voltage		
		HV	MV	LV
1. On three scales	Peak time	0.122	0.137	0.163
	Daytime	0.076	0.085	0.101
	Nighttime	0.046	0.052	0.062

Remark: The above prices do not include value-added tax.

VII. Prices for active electric energy, consumed for business and public activities by state and municipal entities, by real persons and legal entities on holidays and rest days, for consumers, who are connected to the transmission network, with an annual consumption of over 50 mln. kWh and regular payers to NEC EAD

Measurement method	Time zones	Price (BGN/kWh) HV
1. On three scales	Peak time	0.122
	Daytime	0.068
	Nighttime	0.038

Remark: The above prices do not include value-added tax.

X. Limit prices for thermal power supply

2. Plant Stations

No.	Plant Stations	Price of water steam (BGN/MWh)	Price of hot water (BGN/MWh)
1	TPS at "BRIKEL" EAD, town of Galabovo		32.92
2	TPS at "Sviloza" AD	22.75	24.53
3	TPS at "ZAHARNI ZAVODI" AD, town of Gorna Oryahovitsa	32.20	
4	TPS at "DEVEN" AD, town of Devnya	22.55	

Remark: The above prices do not include value-added tax.

XI. Prices for purchasing electric energy from stations with combined production of thermal and electric power

1. From the thermal power supply companies

No.	Company	Price of electric energy (BGN/MWh)
1	"Toplofikatsiya – Sofia" EAD	80
2	"Toplofikatsiya – Plovdiv" EAD	80
3	"Toplofikatsiya – Pleven" EAD	80
4	"Toplofikatsiya – Sliven" EAD	79
5	"Toplofikatsiya – Shumen" EAD	80
6	"Toplofikatsiya – Kazanlak" EAD	120
7	"Toplofikatsiya – Gabrovo" EAD	79
8	"Toplofikatsiya – Pernik" EAD	79
9	"Toplofikatsiya – Pravets" EAD	80
10	"Toplofikatsiya – Rousse" EAD	68
11	"TEGE 21" Ltd.	80

Remark: The above prices do not include value-added tax.

XVIII. Limit price of natural gas in case of sale by the transmission company to consumers, connected to the gas transmission network - 220.81 BGN/1000 m^3

Remark: The above price does not include value-added tax.

Interest Rates of Newly Credits by Non-Financial Corporations

Annex No. 11

Interest Rates on Newly Contracted Loans by Non-financial Corporations and Households and NPISHs

Year	Month	Period	Long-term loans											
			in BGN						in EUR			in USD		
			Total	Non-financial Corporations	Households and NPISHs [2]				Total	Non-financial Corporations	Households and NPISHs [2]	Total	Non-financial Corporations	Households and NPISHs [2]
					House purchase	Consumer [4]	Other							
annual effective interest rate														
1998	I	(1.I – 30.I)	15.75	16.58	17.2	15.5	nc	9.64	9.64	nc	13.98	13.98	nc	
1998	II	(31.I – 27.II)	15.18	12.27	17.2	15.5	nc	12.09	12.09	nc	14.93	14.93	nc	
1998	III	(28.II – 27.III)	15.21	13.34	17.22	15.53	nc	10.07	10.07	nc	10.76	10.76	nc	
1998	IV	(28.III – 30.IV)	15.59	15.04	17.21	15.56	nc	12.78	12.78	nc	15.86	15.86	nc	
1998	V	(1.V – 29.V)	15.48	14.42	17.18	15.57	nc	14.99	14.99	nc	15.93	15.93	nc	

1998	VI	(30.V – 26.VI)			15.4	14.5	17.22	15.52	nc	12.01	12.01	nc	15.92	15.92	nc
1998	VII	(27.VI – 31.VII)			16.32	15.24	17.47	16.44	nc	8.66	8.66	nc	11.41	11.41	nc
1998	VIII	(1.VIII – 28.VIII)			16.5	13.76	17.81	17.25	nc	12.84	12.84	nc	11.24	11.24	nc
1998	IX	(29.VIII – 26.IX)			16.22	12.92	17.77	17.22	nc	10.69	10.69	nc	14.42	14.42	nc
1998	X	(27.IX – 30.X)			15.95	14.47	17.79	17.19	nc	10.85	10.85	nc	12.42	12.42	nc
1998	XI	(31.X – 27.XI)			16.16	14.77	17.8	17.41	nc	13.86	13.86	nc	9.81	9.81	nc
1998	XII	(28.XI – 31.XII)			15.97	14.74	17.8	17.29	nc	13.96	13.96	nc	10.61	10.61	nc
1998 average					**15.811**	**14.3375**	**17.4725**	**16.3317**	**0**	**11.87**	**11.87**	**0**	**13.1075**	**13.1075**	**0**
1999	I	(1.I – 29.I)			16.7	15.73	17.75	17.2	nc	13.34	13.34	nc	15.17	15.17	nc
1999	II	(30.I – 26.II)			16.23	14.61	17.81	17.28	nc	14.32	14.32	nc	14.47	14.47	nc
1999	III	(27.II – 26.III)			16.92	15.57	17.8	17.21	nc	11.75	11.75	nc	14.91	14.91	nc
1999	IV	(27.III – 30.IV)			16.36	14.84	17.78	17.27	nc	10.49	10.49	nc	14.24	14.24	nc
1999	V	(1.V – 28.V)			16.36	13.98	17.71	17.18	nc	10.75	10.75	nc	14.65	14.65	nc
1999	VI	(29.V – 25.VI)			15.64	13.74	17.68	17.12	nc	12.01	12.01	nc	16.16	16.16	nc
1999	VII	(26.VI – 30.VII)			16.05	14.61	17.72	17.16	nc	10.41	10.41	nc	13.05	13.05	nc
1999	VIII	(31.VII – 27.VIII)			16.6	15.42	17.94	17.19	nc	9.17	9.17	nc	17.34	17.34	nc
1999	IX	(28.VIII – 24.IX)			16.86	15.77	17.74	17.19	nc	11.4	11.4	nc	10.55	10.55	nc
1999	X	(25.IX – 29.X)			15.74	13.35	17.5	17.1	nc	8.27	8.27	nc	14.76	14.76	nc
1999	XI	(30.X – 26.XI)			15.63	13.81	17.57	17.23	nc	9.57	9.57	nc	13.35	13.35	nc
1999	XII	(27.XI – 31.XII)			15.04	13.15	17.85	17.15	nc	10.6	10.6	nc	13.77	13.77	nc
1999 average					**16.178**	**14.54833**	**17.7375**	**17.19**	**0**	**11.0067**	**11.0067**	**0**	**14.3683**	**14.3683**	**0**
2000	I	(1.I – 28.I)			15.19	13.14	17.9	17.06	nc	10.79	10.79	nc	14.32	14.32	nc
2000	II	(29.I – 25.II)			14.75	12.48	17.23	17.07	nc	12.94	12.94	nc	17.4	17.4	nc
2000	III	(26.II – 31.III)			15.15	13.2	17.09	17.11	15.6	10.61	10.61	10.47	15.07	15.03	16.24
2000	IV	(1.IV – 28.IV)			16.28	14.68	17.49	17.17	16.83	13.07	13.08	10.89	13.99	13.89	16.72
2000	V	(29.IV – 26.V)			15.86	13.71	17.24	17.21	17.07	12.37	12.37	14.76	16.92	16.83	17.28

2000	VI	(27.V – 30.VI)			15.4	13.44	17.16	17.08	16.85	12.43	12.43	11.24	17.25	16.93	19.1
2000	VII	(1.VII – 28.VII)			12.88	10.69	16.34	17.07	16.64	12.71	12.71	12.92	12.69	12.62	19.25
2000	VIII	(29.VII – 25.VIII)			14.06	12.54	15.24	16.99	16.6	13.22	13.22	-	16.51	16.18	19.2
2000	IX	(26.VIII – 29.IX)			15.79	14.64	15.4	17.06	16.55	11.06	11.06	-	16.16	15.35	18.91
2000	X	(30.IX – 27.X)			15.86	14.6	15.83	17.09	16.63	10.65	10.65	12	13.4	13.27	19.82
2000	XI	(28.X – 24.XI)			16.07	15.08	15.48	17.11	16.59	13.52	13.52	13.72	21.4	21.86	19.53
2000	XII	(25.XI – 31.XII)			15.98	14.78	15.86	17.29	16.68	13.16	13.11	19.53	10.53	10.27	19.36
2000 average					**15.273**	**13.5816 7**	**16.5217**	**17.109 2**	**13.836 7**	**12.2108**	**12.2075**	**13.19**	**15.47**	**15.3292**	**18.541**
2001	I	(1.I – 26.I)			16.44	15.72	15.28	17.32	16.78	17.43	17.43	-	19.04	17.84	20.37
2001	II	(27.I – 23.II)			14.43	12.19	15.84	17.26	16.81	13.23	13.22	18.62	12.68	12.1	19.29
2001	III	(24.II – 30.III)			15.74	13.52	16.16	17.25	17.06	14.85	14.81	15.36	14.17	13.53	18.81
2001	IV	(31.III – 28.IV)			14.56	11.36	16.09	17.22	17.01	11.65	11.54	17.44	19.29	19.47	18.85
2001	V	(29.IV – 23.V)			15.5	13.19	16.46	17.25	17	15.26	15.21	19.52	18.23	19.58	16
2001	VI	(24.V – 29.VI)			15.94	14.32	16.09	17.23	17.03	12.71	12.76	11.84	17.3	16.95	18.4
2001	VII	(30.VI – 27.VII)			13.95	12.08	15.77	17.1	17.01	11.27	11.15	16.48	14.09	13.37	17.12
2001	VIII	(28.VII – 24.VIII)			14.13	11.91	15.69	17.05	17.01	12.45	12.36	17.26	14.6	13.73	17.27
2001	IX	(25.VIII – 28.IX)			14.75	12.91	15.75	17.03	16.24	11.79	11.58	17.44	14.49	14.14	16.24
2001	X	(29.IX – 26.X)			15.25	13.55	15.43	17.05	16.86	12.01	11.97	16.4	11.86	11.35	17.32
2001	XI	(27.X – 30.XI)			15.53	14.02	15.13	17.07	16.76	10.91	10.85	17.43	16.24	15.83	18.08
2001	XII	(1.XII – 31.XII)			14.49	13.07	15.14	17.01	15.61	10.72	10.66	15.11	11.39	11.08	16.68
2001 average					**15.059**	**13.1533 3**	**15.7358**	**17.153 3**	**16.765**	**12.8567**	**12.795**	**15.2417**	**15.2817**	**14.9142**	**17.8692**
2002	I	(1.I – 25.I)			15.73	14.98	14.95	16.93	15.31	11.72	11.69	13.19	14.38	13.73	18.4
2002	II	(26.I – 22.II)			15.65	14.57	15.18	16.91	15.1	11.53	11.33	15.89	12.79	11.91	16.87
2002	III	(23.II – 29.III)			14.04	12.2	15.15	16.88	14.54	12.63	12.56	16.07	13.23	13.13	15.26
2002	IV	(30.III – 30.IV)			14.33	12.53	13.72	16.72	14	11.64	11.55	14.07	12.58	12.42	16.64
2002	V	(1.V – 31.V)			13.87	12.19	13.66	16.05	13.23	10.7	10.66	13.11	14.74	14.57	16.98

2002	VI	(1.VI – 28.VI)			14.59	13.08	13.51	16.44	13.95	10.64	10.51	15.85	11.04	10.84	16.12
2002	VII	(29.VI – 26.VII)			14.48	13.03	13.47	16.38	13.52	12.79	12.74	13.67	10.86	10.7	16.7
2002	VIII	(1.VIII – 31.VIII)			13.24	10.47	13.21	16.26	14.79	12.03	11.9	13.95	10.26	10.02	15.32
2002	IX	(1.IX – 30.IX)			14.52	12.28	13.22	15.95	14.68	8.32	8.12	15.1	8.49	8.16	16.23
2002	X	(1.X – 31.X)			13.96	11.32	13.5	15.75	15.01	10.4	10.25	14.43	13.75	13.39	17.25
2002	XI	(1.XI – 30.XI)			14.19	11.85	13.03	16.09	14.79	10.16	10.02	14.23	10.46	10.27	16.56
2002	XII	(1.XII – 31.XII)			14.19	12.63	13.14	16.1	15.13	10.19	10.03	13.66	8.73	8.29	15.6
2002 average					**14.399**	**12.5941 7**	**13.8117**	**16.371 7**	**14.504 2**	**11.0625**	**10.9467**	**14.435**	**11.7758**	**11.4525**	**16.4942**
2003	I	(1.I – 31.I)			13.58	10.96	13.16	16.25	14.56	10.58	10.49	12.02	12.6	12.46	13.88
2003	II	(1.II – 28.II)			13.69	11.27	13.24	16.11	14.34	11.33	11.16	14.11	13.04	12.24	16.83
2003	III	(1.III – 31.III)			13.76	11.17	13.15	16.22	14.42	11.18	11.03	13.62	12.36	12.3	12.93
2003	IV	(1.IV – 30.IV)			14.3	11.87	12.98	16.04	14.46	9.45	9.3	13.1	9.06	8.75	15.37
2003	V	(1.V – 31.V)			13.62	11.24	12.98	16.02	14.62	10.83	10.65	13.76	12.25	12	16.02
2003	VI	(1.VI – 30.VI)			14.43	11.66	13.17	15.76	14.27	10.43	10.23	14.32	12.76	12.62	15.16
2003	VII	(1.VII – 31.VII)			13.08	10.06	12.98	15.59	14.38	10.1	9.87	13.51	11.04	10.44	17.22
2003	VIII	(1.VIII – 31.VIII)			13.92	11.53	13.16	15.43	13.59	9.85	9.56	12.71	9.49	9.31	14.48
2003	IX	(1.IX – 30.IX)			13.21	10.25	13.06	15.46	14.22	9.72	9.57	13.81	14.82	14.6	16.54
2003	X	(1.X – 31.X)			12.82	10.64	12.91	15.49	13.93	9.96	9.81	12.86	9.88	9.71	14.14
2003	XI	(1.XI – 30.XI)			12.92	10.44	12.88	15.32	14.36	9.85	9.65	12.71	7.54	7.5	9.85
2003	XII	(1.XII – 31.XII)			12.85	10.88	12.62	15.17	14.18	8.65	8.38	12.26	9.45	9.41	10.93
2003 average					**13.515**	**10.9975**	**13.0242**	**15.738 3**	**14.277 5**	**10.1608**	**9.975**	**13.2325**	**11.1908**	**10.945**	**14.4458**
2004	I	(1.I – 31.I)			12.99	10.95	13	14.4	14.36	8.32	8.15	12.49	9.68	9.58	14.61
2004	II	(1.II – 29.II)			12.6	10.14	12.44	14.3	14.36	9.69	9.5	12.47	7.2	7.19	11.53
2004	III	(1.III – 31.III)			12.76	10.19	12.36	13.99	14.35	9.74	9.6	11.97	10.07	9.88	15.77
2004 average					**12.783**	**10.4266 7**	**12.6**	**14.23**	**14.356 7**	**9.25**	**9.08333**	**12.31**	**8.98333**	**8.88333**	**13.97**

Comments

1) The interest rates and overdraft amounts start from March 2000. Until then it was included in the short-term loans.

2) NPISHs - Non-profit institutions serving households.
3) Until February 2000 the short-term lev-denominated consumer loans to Households and NPISHs included all short-term loans in the sector. After that date, difference is made between housing and other loans.
3) Until February 2000, the data on long-term lev-denominated consumer loans to Households and NPISHs include also other loans of Households and NPISHs
r - Revision of data for January and February 2003 because of change in the scope of interest rate statistics.

ANALYSIS OF THE POSSIBILITIES FOR ENERGY EFFICIENCY AND UTILIZATION OF RENEWABLE ENERGY SOURCES PROJECTS FUNDING BY BANKS, FUNDS AND OTHER SOURCES

The preparation of EE and RES projects includes the following four steps:
1. Step 1 – Project identification, embracing the technical and economical research;
2. Step 2 – Project funding;
3. Step 3 – Project implementation: designing, building/installation and putting into operation of the object;
4. Step 4 – Exploitation and maintenance of the new technology and/or equipment.

After the determination of the technical-economical aspects of the project, they have to be obtained the necessary financial means for its implementation. The aim is to be studied the different existing possibilities for funding and the most suitable to be chosen. The possibilities are the following:
1. Own means;
2. External financing.
- Credits by trade banks;
- Loans by international banks (European reconstruction and development bank, European investment bank, World bank); in that case usually the minimal credits are much higher, than an ordinary EE project requires, so an additional financial mechanisms must be available (for example credit lines);
- Donations, grants or loans with relived conditions by specialized state funds or programs of EC. Usually the funding in that way is more limited and harder to obtain;
- Leasing can be obtainedстави by supplier of equipment and is usually offered, when the supplier implement the project "to the key", the supplier as well can agree to fund the project by loan;
- Third party financing: Performance contractingp is given by ESCO companies (Energy Service Companies – ESCO): they offer services, in connection with identification, funding, construction and exploitation. That possibility is proven financial mean at the implementation of EE projects in the developed European countries.

The above possibilities could be combined as well.

TRADE FUNDING (bank loans)

Credit possibilities by local banks

Financial system efficiency of Bulgaria is still low (despite its stability) or with other words, so far the financial system does not fulfill effectively its main functions of mediator between the savings and investments in the real economy. The local banks are still doing cautious credit policy.

Because of the large dynamics of the bank system in the process of its establishment, it is possible to identify local banks, which are strongly specialized in investment banking in the energy sector. The companies, searching for credits should study and estimate the conditions, which are offered by almost all bank sector players.

As the necessary financing for efficient projects and for RES requires comparatively small capital investments, the credit loans by local banks for such projects will be easier, than for the larger energy projects. It is of big importance for the successful contracting of such credit is the giving of convincing financial proposal to the potential creditors.

Since the introduction of the currency board in Bulgaria the bank system is stable and slightly takes the main role to deliver capitals for the country economy. If the environment keep up to be so stable during the next years at given conditions the local trade banks could be important source for financing of EE and RES projects.

From other side the EE and RES projects have some specialties and usually require special experience from the side of the bank for their estimation and for determination of the credit scheme and the conditions.

To the present moment it is hard to name even one local trade bank with traditions for financing of energy projects. The bankers show favorable attitude and do not exclude directly that area of possibilities for crediting. So far with the view of the applying for funding from local trade banks, the energy object owner should implement the general conditions for giving of loans, which are posed for each area of funding. The main characteristics of the bank credits are:

- Lack of interest to investment crediting;
- Credit short term (more often up to two years, as the maximum term could be 5 years) at interest rate of 1—12 points higher than the basic interest rate (i.e. 13-16% annual credit interest rate);
- Minimum 100% guarantee coverage of the credit (in some cases even more), which for the Bulgarian companies and organizations is extremely hard requirement;
- Extremely cautious funding: usually the banks give credits to their regular customers, they know and for which they have information for the turnover and their financial results.

Each project is estimated separately by the bank experts for the credit conditions can be different, depending on that estimation.

An illustration of the conclusions above is placed below into comparative table for the credit conditions of three local banks, giving credits to small and medium enterprises:

Bank	Maximum credit ammount	Security	Gratis period	Credit deadline	Loan deadline	Credit interest rate
Union bank	250 000 lv. (for investments)	All allowed by the law securities	12 months	For investment projects from 2 to 60 months	From 5 to 20 working days depending on the credit	Depending the credit amount the period of usage and the kind of the security
Eurobank	Express Eurocredit - 15 000 USD or €	Real Estate Property,commodities, machines & equipment	Upon agreement	Up to 2 years	5 working days	13% annual interest
	Eurocredit - 100 000 USD or €	Real Estate Property,commodities, machines & equipment	Upon agreement	Up to 2 years	10 working days	14% annual interest
ProCredit-bank	Procredit Dynamo 100-20 000 lv.or equivalent in foreign currency	Real Estate Property, automobile, equipment - commercial and industrial, commodities; guarantee - legal or natural body, other security by the decision of the credit expert	Upon agreement	Up to 24 years	48 hours	1,65% monthly
	Procredit business – credit ammount of money upon agreement	The same	Upon agreement	Up to 3 years	1 week	Upon agreement
	Procredit business – credit ammount of money upon agreement	The same	Upon agreement	Up to 5 years	1 week	Upon agreement

United Bulgarian Bank (UBB) offers investment credits for small and medium enterprises for projects in the EE and environment protection area upon agreement with the USAID, as the agency offers guarantees in amount of 50% from the eventual net lost on the capital for the benefit of UBB on behalf of the credit applicant. The annual interest rate on the credit is about 14-16%.

Natural gas certificate for 2003 — Annex No. 13

BULGARGAS -EAD
NATURAL GAS SERTIFICATE FOR 2003

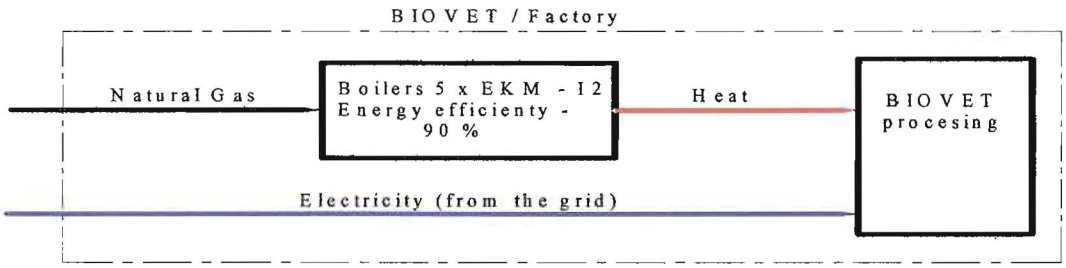
Components	Formula	Dimens.	VALUES PER MONTH									
			Feb	Jan	March	April	May	July	August	Sept.	October	Dec.
Methane	CH_4	vol. %	98,377	98,275	98,337	98,158	98,144	98,2	98,085	98,156	98,195	98,25
Ethane	C_2H_6	vol. %	0,539	0,603	0,562	0,676	0,681	0,651	0,731	0,692	0,672	0,642
Propane	C_3H_6	vol. %	0,175	0,2	0,186	0,229	0,237	0,222	0,249	0,231	0,221	0,209
i-Buthane	$I\text{-}C_4H_{10}$	vol. %	0,033	0,037	0,035	0,043	0,044	0,043	0,047	0,044	0,041	0,037
n-buthane	$N\text{-}C_4H_{10}$	vol. %	0,032	0,036	0,035	0,044	0,047	0,045	0,049	0,044	0,041	0,036
i-penthane	$I\text{-}C_5H_{12}$	vol. %	0,005	0,007	0,007	0,009	0,009	0,009	0,009	0,008	0,008	0,006
n-penthane	$I\text{-}C_5H_{12}$	vol. %	0,005	0,005	0,005	0,006	0,007	0,007	0,007	0,006	0,005	0,004
neo-penthane	$NEO\text{-}C_5H_{12}$	vol. %	-	-	-	-	-	-	-	-	-	-
i-xeksane	$I\text{-}C_6H_{14}$	vol. %	0,006	0,007	0,007	0,008	0,007	0,009	0,009	0,008	0,007	0,006
Nitrogen	N_2	vol. %	0,791	0,789	0,787	0,784	0,781	0,772	0,77	0,77	0,767	0,768
Carboneoxide	CO_2	vol. %	0,037	0,041	0,039	0,043	0,043	0,042	0,044	0,041	0,043	0,042
H_2S+mercap.	H_2S+m	g/nm^3	0,025	0,025	0,025	0,024	0,024	0,024	0,024	0,024	0,024	0,02
Dencity	R	kg/nm^3	0,6793	0,6802	0,06797	0,6813	0,6815	0,6811	0,6821	0,6813	0,681	0,6804
LHV	Q	$kcal/nm^3$	7987	7996	7992	8009	8011	8008	8019	8012	8007	8002
Dew point	T	° C	-16,1	-15,2	-13,7	-13,5	-13,1	-8,8	-13,3	-19,7	-21,3	-13,8

Calculations CO_2 emissions with other methodology Annex x No. 14

GREENHOUSE GAS SOURCES AND PROJECT BOUNDARIES

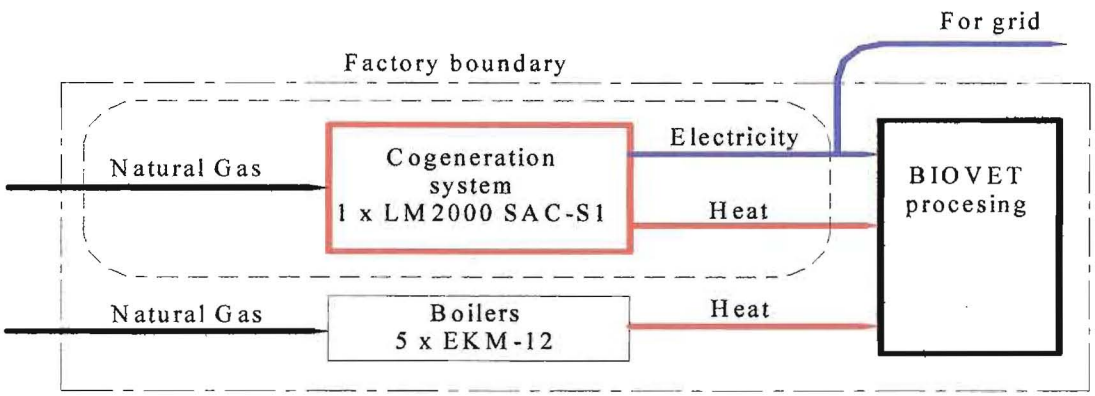
1.1 Flowchart of the current delivery system

Flowchart of current delivery system with it's the main components and their connections.



1.2 Flowchart of the project

Flowchart of the project with its main components and their connections



Project boundary

The project is the installation of CHP whose input is natural gas from gas pipeline, and whose outputs are electricity and heat supplied to an industry with demand for heat and electricity. Although the project would be installed at the industrial site, the project boundary is strictly the CHP

Project boundaries for natural gas fired in CHP are given in fig. 3.3.1.

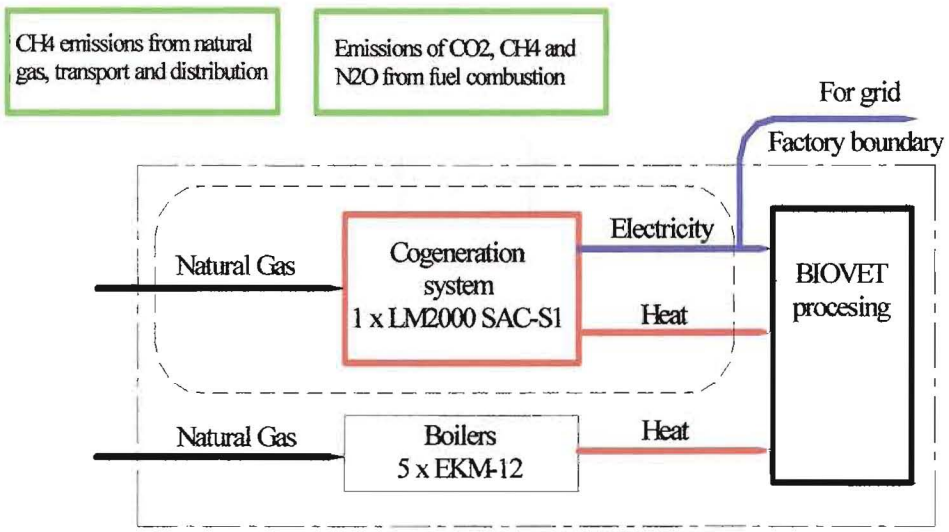


Fig. 1.3.1 Project boundary for natural gas fired in CHP

The cogeneration system is sized to provide base load heat to the industrial plant. According to baseline scenario the demand of electricity during the monitoring period is also related as a base load. Thus, the system does not meet all of the heat or electricity demand of the plant.
Prior to project installation the plant acquires all of electricity from the power grid and meets all of its heat requirements with natural gas acquired from the pipeline.
Once the project (CHP) is installed, the plant acquires heat and electricity from the system to meet some of its heat and electricity needs. The remaining electricity from the system is met by power grid. Similarly, the remaining heat demand is met by existing boilers

Thus the baseline is determined by the electricity and fuel purchases by the plant from the electricity grid and ng pipeline, that are avoided or offset as a result of electricity and heat supplied from CHP to the plan located at the project side, but outside the project boundary.
By defining the project boundary as we propose here, we are only concerned by the impact of the CHP on emissions.
This definition of the project boundary makes sense for several reasons:
The project emissions depend entirely on gas input to the CHP, while emissions avoided (baseline emissions) can be determined from heat and electricity produced by CHP and used in the factory. Thus we need only to estimate emission associated with natural gas consumption of the CHP, and emission avoided at the industrial plant, because of the heat and electricity output of the CHP. The associated monitoring determines both project and baseline emissions. Other fuels used at the factory and additional electricity used in the plant are irrelevant. Specifically, ng and electricity consumption at the factory prior to the installation of the CHP are irrelevant.

1.4. Direct and indirect emissions

With this definition of the project boundary, the Project and Baseline emissions, both *On-site and Off-site* are as shown in Table 3.4.1:

Table 3.4.1. Project and baseline emissions, direct and indirect, on and off-site		
Sources	Project	baseline
Direct on-site	• CO2 emissions from ng burnt by CHP • CH4 and N2O emissions from ng combustion by CHP	• None
Direct off-site	• "one step upstream" emission related to the transport of CHP to the project site. Considered negligible	• None
Indirect On-site	• None	• None
Indirect Off-site n	• CH4 emissions from ng production and pipeline leakage, associated with gas consumption of CHP	• CO2 emissions for ng consumption in heat producing equipment – boilers that is substitute by CHP
		• CH4 and N2O emissions for ng consumption in heat producing equipment that is substitute by CHP
		• CH4 emissions from ng production and pipeline leakage associated with gas consumption that is substituted by CHP
		• One step upstream: CO2 emissions for electricity generated that is substituted by CHP, including associated transmission and distributed losses

2. IDENTIFICATION OF THE MOST LIKELY BASELINE SCENARIO AND THE ASSOCIATED GREENHOUSE GAS EMISSIONS

2.1 Construction of the baseline scenario

Baseline GHG emissions correspond to those emissions that are offset by heat and electricity output from CHP, supplied to the plant.
Since the project boundary is the proposed CHP, there are no emissions within the project boundary in the baseline case. Baseline emissions can be collected in the "indirect off-site" category and comprise the following five components:

- **CO_2 combustion** corresponds to NG that would have been used in boilers if the CHP did not provide heat to the plant.
- **CH_4 combustion** from NG combustion in boilers to produce heat that is offset by heat supplied by CHP –negligible.
- **N_2O combustion** from NG combustion in boilers to produce heat that is offset by heat produced by CHP.

- **CH_4 leaks** in the pipeline supplying NG to the plant, associated with the NG consumption.
- **CO_2 electricity** – emission associated with the electricity that would have to be purchased from the power grid if the CHP did not provide electricity to the plant

The first four components of baseline emissions are proportional to natural gas consumption offset by the heat output of CHP

In order to estimate the importance of the project realization upon the GHG emissions, the following estimation are prepared:

- estimation of the baseline GHG emissions without realization of the Project;
- estimation of the baseline GHG emissions into the Project boundary;
- estimation of the GHG emissions from the Project;
- reduction of the GHG emissions as a result from the Project realization.

The quantity of GHG emissions may be expressed by multiplication of emission factor and energy consumption.

The following considerations are taken into account in these evaluations:

- GHG emissions from **CH_4 combustion; N_2O combustion; CH_4 leakages** were not estimated due to their small contribution into the total amount of GHG emissions (estimated approx. less than 1 to 2 %) and the lack of reliable data as corresponded emission factor and measurement problems during the monitoring period. Their contributions into the total GHG emissions are even less when emission reductions have to be evaluated;
- **CO_2 combustion** emission factor for natural gas is EFmg =56,1 kg/GJ – source: "Operational guidelines for Project Design Document of JIP" – Ministry of Economic Affairs of the Netherlands, June 2003;
- **CO_2 electricity** – the last component mentioned above, which is not proportional to natural gas consumption. These emission associated with the electricity from the power grid depend on annually estimated CO_2 emission factor in Bulgaria. The predicted values - BEF_{el} are presented in Table E 1. (source: "Operational guidelines for Project Design Document of JIP" – Ministry of Economic Affairs of the Netherlands, June 2003;

Table E 1 Annually CO_2 emission factors in Bulgaria at:

1) Generation of power;
2) Generation of power including distribution and transmission losses to the power grid

		YEAR							
BG	item	2005	2006	2007	2008	2009	2010	2011	2012
Generated	gCO_2/kWh	814	797	779	761	743	725	707	689
Generated with grid losses BEF_{el}	gCO_2/kWh	957	934	912	890	867	845	822	800

2.2 Estimation of the baseline emissions without realization of the Project

Predicted annual NG energy consumptions in BIOVET ECng [TJ] up to 2012 are presented in Tabl.B1. Heat produced by boilers – BECng in order to cover expected heat demand ECng is given by:

$$BECng = ECng / e_b, \ TJ$$

where: e_b – boiler efficiency
The estimations of yearly GHG emissions – E_{th} from boilers are given by:

$$E_{th} = BECng * EFmg, t\ CO_2/y$$

The estimations of yearly GHG indirect emissions from electricity supplied by power grid – BEl are given by:

$$BEl = El * BEF_{el,}\ t\ CO_2/y$$

where: El [MWh]– predicted yearly electricity consumption in BIOVET
The results are presented in Table. B1

2.3 Estimation of the heat and electricity rate in the Project boundary

In Table 5.3.1. and the relevant fig. 5.3.1. are shown the average monthly natural gas heat consumption and electricity and heat production in the chosen BIOVET Package Cogeneration Project – gas turbine LM 2000 with the corresponded HRSG as a function of the mean ambient monthly temperature in Pestera. The average values for mean yearly ambient temperature (12,5 °C) in the city of Pestera are also shown. The last values are chosen as heat and electricity rate for the project boundary. These values are estimated from the GE Company, which have to deliver the mentioned above CHP at a constant steam production, covering the base heat load.
The main characteristics in a base load operation of CHP, concerning GHG emissions, are

- Q_f - heat ng fuel input;
- Q_{el} - power capacity of the CHP;
- Q_{th} - thermal capacity of CHP

.

TABLE 5.3.1. MAIN CHARACTERISTICS OF BIOVET Package Cogeneration Project - gas turbine type LM2000 with HRSG

	Ta, °C	Qf, kWth	Qel, kWe	Qth,kWth
JAN	-5	54334	18124	14468
FEB	4	51525	18310	14959
MAR	7	50673	18220	15086
APR	14	48262	17158	15128
MAY	17	47111	16590	15137
JUN	22	45312	15703	15152
JUL	25	44082	15085	15164
AUG	24	44507	15299	15160
SEP	18	46744	16411	15140
OCT	12	48934	17485	15124
NOV	9	49876	17925	15117
DEC	3	52158	18291	14813
Average	**12,5**	**48627**	**17050**	**15037**
Power efficiency		**35**		
Heat efficiency		**33**		
Steam enthalpy		**2789 kJ/kg**		

NG hour consumption in CHP, recalculated at LHV 8000 kcal/m3 (BULGARGAS – NG sertificate for 2003 –mean value) is GH_{NG} = 5, 23 th.cub.m/h
If compare heat load characteristics in Chapter 1.5.3. with Dst, this value cover exactly base heat load for BIOVET
Annual average CHP characteristics for operational hours - 8200 h/y

Q_f^a, TJ/y	Q_{el}^a, MWh/y	Q_{th}^a, TJ/y
1435	139811	480

The following equations are used:

Q_f^a = Qf * 3,6 * 8200 / 10^6, TJ/y

Q_{el}^a = Qel * 8200 / 10^3, MWh

Q_{th}^a = Qth * 3,6 * 8200 / 10^6, TJ/y

GH_{NG} = Qf/1163/8, th.cub.m/h

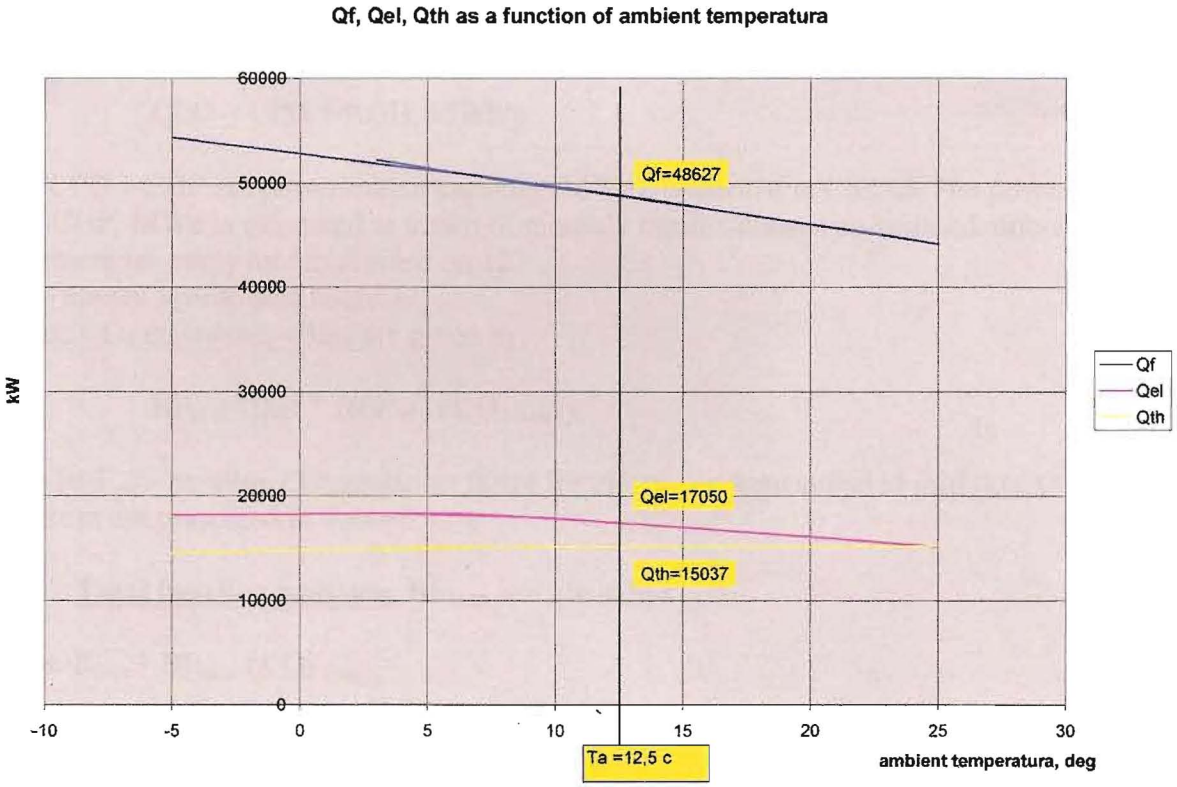


Fig. 5.3.1.

2.4 Estimation of GHG emissions in the project boundary

The main characteristics of CHP, presented in chapter 5.3, are used in the calculation of GHG base line emission, which correspond to those emissions that are offset by heat and electricity output from CHP, supplied to the plant. The following estimation procedure is used for estimation of GHG emission in the project boundary:
Annual baseline NG energy consumption offset by heat output from CHP, ABEC mg, is given by:

$$ABECmg = CHOR * AOH / e_b, \ t\ CO_2/y \quad -1$$

where CHOR is CHP heat output rate (GJ/h) and
AOH – annual operational hours (h/y)
e_b – boiler efficiency

CHOR is taken from the specification of the CHP. AOH is determined equipment and characteristics of the demand for heat and electricity at the plant. e_b is determined from engineer's analyses.

Baseline CO_2 emission from NG combustion, that are offset by heat supplied by CHP - BE_{th}

$$BE_{th} = ABEC\ mg * EFmg, \ t\ CO_2/y \quad -2$$

Baseline CO_2 emissions that are offset by electricity supplied by CHP,
Annual electricity generation from the CHP, CEO is estimated by:

$$CEO = CPO * AOH, \ MWh/y \quad -3$$

where CPO – CHP net power output capacity (MWe). presented in Ch. 5.3. Net power output rate of CHP, MWe is estimated as a sum of monthly mean values at co-respond ambient temperature for every month divided on 12.
AOH – annual operational hours, h/y...
Baseline CO_2 emissions - BE_{el}, are given by:

$$BE_{el} = CEO * BEF_{el}, \ t\ CO_{2-eq}/y \quad -4$$

Where BEF_{el} – baseline CO_2 emission factor for electricity from supplied grid ($kgCO_2/MWh$). The values are presented in Table E 1.

Total baseline emission, BE_{total}, are given by:

$$BE_{total} = BE_{th} + BE_{el}, \ t\ CO_{2-eq} \quad -5$$

GHG base line emissions are presented in Table B2

3. Estimation of GHG emissions from the project

The GHG emissions from the project implementation arise from NG combustion in CHP. Annual NG energy consumption from CHP, ABEC mg, is given by:

$$ABECmg = CHOR * AOH, \ t\ CO_2/y \quad -6$$

where CHOR is CHP heat output rate (GJ/h) and
AOH – annual operational hours (h/y)
CHOR is taken from the specification of the CHP. AOH is determined equipment and characteristics of the demand for heat and electricity at the plant.

Baseline CO_2 emission from NG combustion by CHP - BE_{th}

$$BE_{th} = ABEC\ mg * EFmg = E_{total},\ t\ CO_2/y \qquad -7$$

The project emissions results are presented in Table P

4. Estimation of GHG emission reductions

The difference between total baseline emissions and total project emissions (eq. 5– eq.7) represent the emission reduction from the project activity:

$$\mathbf{ER = BE_{total} - E_{total}},\ t\ CO_{2-eq}/y \qquad -8$$

GHG emission reductions from the project activity are presented in Table. R

Table B1. Calculation of the baseline emissions - case: wthout realization of the project

B1		Unit	2005	2006	2007	2008	2009	2010	2011	2012	average 2008-12	prec
	Emisson factors - ef											
B1	CO2 emission factor from gas combustion	Kton/TJ	0,0561	0,056	0,0561	0,056	0,056	0,056	0,056	0,056	0,0561	H
B3	CO2 from el. generation in Bulgaria	gCO2/kWh	814	797	779	761	743	725	707	689	725	H
B4	CO2 from el. generation including losses in grid	gCO2/kWh	957	934	912	890	867	845	822	800	844,8	H
	Additional data											
B5	Natural gas density at 20 C	kg/Nm3	0,68	0,68	0,68	0,68	0,68	0,68	0,68	0,68	0,68	
B6	Natural gas calorific value	kcal/Nm3	8002	8002	8002	8002	8002	8002	8002	8002	8002	
B7	Losses in grid	%	17,6	17,2	17,1	17,0	16,7	16,6	16,3	16,1	16,5	
B8	Efficiency of existed boilers		0,89	0,89	0,89	0,89	0,89	0,89	0,89	0,89	0,89	
B9	Annual average temperture in Pestera	° C	12,5	12,5	12,5	12,5	12,5	12,5	12,5	12,5	12,5	
B10	Annual steam production	t/y	262000	3E+05	275000	3E+05	3E+05	3E+05	3E+05	3E+05	279600	H
B11	steam enthalpy-H", P=8,5 bar,a	kJ/kg	2771	2771	2771	2771	2771	2771	2771	2771	2771	H
	On-site consumptions											
B16	On-site el. consumption	MWh	131000	1E+05	149000	2E+05	2E+05	2E+05	2E+05	2E+05	160400	H
B17	On-site heat consumption	TJ	726	748	762	770	776	776	776	776	775	H
	Heat production											
B18	Heat produced by sources on site	TJ	816	841	856	866	872	872	872	872	871	H
	Electricity production											
B19	Electricity produced by sources on site	MWh	0	0	0	0	0	0	0	0	0	
B20	CO2 eq. emission factor of electricity on site	Kton/MWh	0	0	0	0	0	0	0	0	0	
B21	Electricity coming from grid	MWh	131000	1E+05	149000	2E+05	2E+05	2E+05	2E+05	2E+05	160400	H
B22	CO2 eq. emission factor of electricity grid	Kton/MWh	0,001	0,001	0,001	0,001	0,001	0,001	0,001	0,001	0,001	H
	On-site Emissions without Project											
B23	CO2 combustion in boiler	Kton	46	47	48	49	49	49	49	49	49	H
	Off-site Emissions without Project											
B24	Emissions from electricity grid	Kton	125,4	130,8	135,9	136,2	136,1	136,9	134,8	132,8	135,4	H
B25	**Total eq-emission**	**Kton**	**171**	177	183	185	185	186	184	182	**184**	H
B26	**Total eq-emission- monitoring period**	**Kton**		360				922				H

Table B2. Calculation of the baseline emissions - case: into the project boundary

B2		Unit	2005	2006	2007	2008	2009	2010	2011	2012	average 2008-12	prec
	Heat and electricity consumption -project											
B1	On-site el. consumption	MWh	139811	139811	139811	139811	139811	139811	139811	139811	139811	H
B2	On-site heat consumption	TJ	480	480	480	480	480	480	480	480	480	H
B3	On-site fuel heat	TJ	540	540	540	540	540	540	540	540	540	H
B4	El. from grid for project boundary	MWh	139811	139811	139811	139811	139811	139811	139811	139811	139811	H
	Indirect off-site emissons -concerning project boundary											
B5	CO2 emissons (comb.in boilers)	Kton	30	30	30	30	30	30	30	30	30	H
B8	Emissions from electricity grid	Kton	134	131	128	124	121	118	115	112	118	H
B9	**Total CO2 emission**	**Kton**	**164**	**160,9**	**157,8**	**154,7**	**151,5**	**148,4**	**145,2**	**142,1**	148	H
B10	**Total CO2 emission-monitoring**	**Kton**		**319**				**742**				H

Table P. Estimation of the project emissions:											Average	
P		Unit	2005	2006	2007	2008	2009	2010	2011	2012	2008-12	prec.
	Fuel heat											
P1	On-site fuel heat - (from CHP)	TJ	1435	1435	1435	1435	1435	1435	1435	1435	1435	H
	Heat production											
P2	On-site heat consumption	TJ	726	748	762	770	776	776	776	776	775	H
P3	Heat produced by CHP	TJ	480	480	480	480	480	480	480	480	480	H
	Electricity production											
P4	On-site electricity consumption	MWh	131000	140000	149000	153000	157000	162000	164000	166000	160400	H
P5	Electricity produced by CHP	MWh	147600	147600	147600	147600	147600	147600	147600	147600	147600	H
	Direct on-site emissions											
P6	CO2 emissons (comb.in CHP)	Kton	81	81	81	81	81	81	81	81	81	H
P7	**TotaCO2 emission**	**Kton**	**81**	**81**	**81**	**81**	**81**	**81**	**81**	**81**	81	H
P8	**Total CO2 emission - monitoring period**	**Kton**		**161**				**403**				H

Table R. Estimation of emission reduction											average	
R		Unit	2005	2006	2007	2008	2009	2010	2011	2012	2008-12	prec
R1	Total Project CO2 emissions	Kton	81	81	81	81	81	81	81	81	81	H
R2	Total Baseline CO2 emissions	Kton	164	161	158	155	151	148	145	142	148	H
R3	**Anual emissions TOTAL reduction**	**Kton**	**84**	**80**	**77**	**74**	**71**	**68**	**65**	**62**	**68**	**H**
R4	**TOTAL CO2 reduction - monitoring period**	**Kton**	**42**	**158**				**339**				**H**

BIOVET CoGen Power Plant

Annual consumption

Natural gas for CHP x1000 Nm3

Month	2004	2005	2006	2007	2008	2009	2010	2011	2012
Jan									
Feb									
Mar									
Apr									
May									
Jun									
Jul									
Aug									
Sep									
Oct									
Nov									
Dec									
Total (1000 Nm3)	0	0	0	0	0	0	0	0	0

Generated electricity from CHP ;[MWh]									
Month	2004	2005	2006	2007	2008	2009	2010	2011	2012
Jan									
Feb									
Mar									
Apr									
May									
Jun									
Jul									
Aug									
Sep									
Oct									
Nov									
Dec									
Total (MWh)	0	0	0	0	0	0	0	0	0

Exchange electricity with power grid ;[MWh]									
Month	2004	2005	2006	2007	2008	2009	2010	2011	2012
Jan									
Feb									
Mar									
Apr									
May									
Jun									
Jul									
Aug									
Sep									
Oct									
Nov									
Dec									
Total (1000 Nm3)	0	0	0	0	0	0	0	0	0

Steam production from CHP; [tons]

Mont	2004	2005	2006	2007	2008	2009	2010	2011	2012
Jan									
Feb									
Mar									
Apr									
May									
Jun									
Jul									
Aug									
Sep									
Oct									
Nov									
Dec									
Total [tons]	0	0	0	0	0	0	0	0	0

Steam production from back up boilers; [tons]

Mont	2004	2005	2006	2007	2008	2009	2010	2011	2012
Jan									
Feb									
Mar									
Apr									
May									
Jun									
Jul									
Aug									
Sep									
Oct									
Nov									
Dec									
Total [tons]	0	0	0	0	0	0	0	0	0

Efficiency of back up boilers (month mean value); [%]

Mont	2004	2005	2006	2007	2008	2009	2010	2011	2012
Jan									
Feb									
Mar									
Apr									
May									
Jun									
Jul									
Aug									
Sep									
Oct									
Nov									
Dec									
Average ;%	0	0	0	0	0	0	0	0	0

Baseline sceanrio

Base line calculations

LHVNG	Lower heating walue	8000 kkal/Nm3 -		NG mean value from BULGARGAS for 2003
EFNG	CO2 emissions factor (combustion)	56.1	kg/GJ	Natural gas (dry): 15.3 t C/TJ LHV x 44/12 = 56.1 t CO2/TJ

Emissions from produced heat

Year	Year	CHP steam production	Back up boilers steam production	Total steam production	Back -up boiler Efficiency	Total heat NG input	CO2 emissions (combustion)
		t/year	t/year	t/year	%	GJ/year	t/year
1	2004	0	0	0	0	#DIV/0!	#DIV/0!
2	2005	0	0	0	0	#DIV/0!	#DIV/0!
3	2006	0	0	0	0	#DIV/0!	#DIV/0!
4	2007	0	0	0	0	#DIV/0!	#DIV/0!
5	2008	0	0	0	0	#DIV/0!	#DIV/0!
6	2009	0	0	0	0	#DIV/0!	#DIV/0!
7	2010	0	0	0	0	#DIV/0!	#DIV/0!
8	2011	0	0	0	0	#DIV/0!	#DIV/0!
9	2012	0	0	0	0	#DIV/0!	#DIV/0!

Emissions from electricity

Year	Year	Electricity from CHP	Electricity from / to grid	Total el.consumption in BIOVET	EF	CO2 emission (electricity grid)
		MWh	MWh	MWh	kgCO2/MWh	t/year
1	2004	0	0	0	979	0
2	2005	0	0	0	957	0
3	2006	0	0	0	934	0
4	2007	0	0	0	912	0
5	2008	0	0	0	890	0
6	2009	0	0	0	867	0
7	2010	0	0	0	845	0
8	2011	0	0	0	822	0
9	2012	0	0	0	800	0

Project emissions

CHP LM2000

LHVNG	Lower heating walue	8000 kkal/Nm3 -	NG mean value from BULGARGAS for 2003	
EFNG	CO2 emissions factor (combustion)	56.1 kg/GJ	Natural gas (dry): 15.3 t C/TJ LHV x 44/12 = 56.1 t CO2/TJ	

Year	Natural gas for CHP	CHP(NG-LHV) consumption	Back up boilers steam production	Back –up boiler Efficiency	NG-LHV cons. back up boilers	Total NG heat input	CO2 emissions (combustion)
	x1000 Nm3	GJ/year	t/year	%	GJ/year	GJ/year	t/year
2004	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!
2005	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!
2006	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!
2007	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!
2008	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!
2009	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!
2010	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!
2011	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!
2012	0	0	0	0	#DIV/0!	#DIV/0!	#DIV/0!

Natural gas for CHP x1000 Nm3

Emissions from electricity

Year	Electricity from CHP	Electricity from grid	EF	CO2 emission (el. from grid)	Electricity to grid(-)	EF	Avoided (-) CO2 emission (el. to grid)
	MWh	MWh	kgCO2/MWh	t/year	MWh	kgCO2/MWh	t/year
2004	0	0	979	0	0	832	0
2005	0	0	957	0	0	814	0
2006	0	0	934	0	0	797	0
2007	0	0	912	0	0	779	0
2008	0	0	890	0	0	761	0
2009	0	0	867	0	0	743	0
2010	0	0	845	0	0	725	0
2011	0	0	822	0	0	707	0
2012	0	0	800	0	0	689	0

Reduction CO_2 emision

		Base Line		Project Line			Reduction
Year	Year	CO2 emissions (combustion)	CO2 emission (electricity grid) electriciti	CO2 emissions (combustion)	CO2 emission (el. from grid)	CO2 emission (el. to grid) (-)	Total CO2 emission reduction
		t/year	t/year	t/year	t/year	t/year	t/year
1	2004	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!
2	2005	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!
3	2006	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!
4	2007	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!
5	2008	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!
6	2009	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!
7	2010	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!
8	2011	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!
9	2012	#DIV/0!	0	#DIV/0!	0	0	#DIV/0!

In assistance of Technical Univercity of Sofia
Thermal and Nuclear Energy Deprtament

Appendix No. 16

Calculation the Credit's Interest Rate

STATEMENT

on the due interest to Bulbank AD for the credit for the Co-Generation Station of Biovet

Initial data:	
January 1st, 2005	Starting date of the indebtedness
January 1st, 2011	Final date of the indebtedness
8 000 695.00	Value of principal
8.40%	Contracted interest rate
72	Months of reimbursement every
1	month
Final results:	
8 000 695.00	Initial value of principal in BGN
8 000 695.00	Reduction of the principal
2 380 206.68	Paid interest in BGN
Due interest in BGN	
-	Due principal in BGN
-	Due principal and interest
2 160	Number of days in the period

Date	(+)growth; (-)reduction of the principal	Paid interest	Due accumulated interest	Incl. for the periods	Principal	Principal + interest	Interest rate	Days
01.1.2005			-	-	8 000 695.00	8 000 695.00	8.40%	
01.2.2005		56 004.86	-	-	8 000 695.00	8 000 695.00	8.40%	30
01.3.2005		56 004.86	-	-	8 000 695.00	8 000 695.00	8.40%	30
01.4.2005		56 004.86	-	-	8 000 695.00	8 000 695.00	8.40%	30
01.5.2005		56 004.86	-	-	8 000 695.00	8 000 695.00	8.40%	30
01.6.2005		56 004.86	-	-	8 000 695.00	8 000 695.00	8.40%	30
01.7.2005		56 004.86	-	-	8 000 695.00	8 000 695.00	8.40%	30
01.8.2005		56 004.86	-	-	8 000 695.00	8 000 695.00	8.40%	30
01.9.2005		56 004.86	-	-	8 000 695.00	8 000 695.00	8.40%	30
01.10.2005		56 004.86	-	-	8 000 695.00	8 000 695.00	8.40%	30
01.11.2005		56 004.86	-	-	8 000 695.00	8 000 695.00	8.40%	30
01.12.2005		56 004.86	-	-	8 000 695.00	8 000 695.00	8.40%	30
01.1.2006		56 004.86	-	-	8 000 695.00	8 000 695.00	8.40%	30

01.2.2006	133344.92	56 004.86	-	-	7 867 350.08	7 867 350.08	8.40%	30
01.3.2006	133344.92	55 071.45	-	-	7 734 005.16	7 734 005.16	8.40%	30
01.4.2006	133 344.92	54 138.04	-	-	7 600 660.24	7 600 660.24	8.40%	30
01.5.2006	133344.92	53 204.62	-	-	7 467 315.32	7 467 315.32	8.40%	30
01.6.2006	133344.92	52 271.21	-	-	7 333 970.40	7 333 970.40	8.40%	30
01.7.2006	133344.92	51 337.79	-	-	7 200 625.48	7 200 625.48	8.40%	30
01.8.2006	133344.92	50 404.38	-	-	7 067 280.56	7 067 280.56	8.40%	30
01.9.2006	133344.92	49 470.96	-	-	6 933 935.64	6 933 935.64	8.40%	30
01.10.2006	133344.92	48 537.55	-	-	6 800 590.72	6 800 590.72	8.40%	30
01.11.2006	133344.92	47 604.14	-	-	6 667 245.80	6 667 245.80	8.40%	30
01.12.2006	133344.92	46 670.72	-	-	6 533 900.88	6 533 900.88	8.40%	30
01.1.2007	133344.92	45 737.31	-	-	6 400 555.96	6 400 555.96	8.40%	30
01.2.2007	133344.92	44 803.89	-	-	6 267 211.04	6 267 211.04	8.40%	30
01.3.2007	133344.92	43 870.48	-	-	6 133 866.12	6 133 866.12	8.40%	30
01.4.2007	133344.92	42 937.06	-	-	6 000 521.20	6 000 521.20	8.40%	30
01.5.2007	133 344.92	42 003.65	-	-	5 867 176.28	5 867 176.28	8.40%	30
01.6.2007	133 344.92	41 070.23	-	-	5 733 831.36	5 733 831.36	8.40%	30
01.7.2007	133344.92	40 136.82	-	-	5 600 486.44	5 600 486.44	8.40%	30
01.8.2007	133344.92	39 203.41	-	-	5 467 141.52	5 467 141.52	8.40%	30

Date	(+)growth; (-)reduction of the principal	Paid interest	Due accumulated interest	Incl. for the periods	Principal	Principal + interest	Interest rate	Days
01.9.2007	133344.92	38 269.99	-	-	5 333 796.60	5 333 796.60	8.40%	30
01.10.2007	133344.92	37 336.58	-	-	5 200 451.68	5 200 451.68	8.40%	30
01.11.2007	133344.92	36 403.16	-	-	5 067 106.76	5 067 106.76	8.40%	30
01.12.2007	133344.92	35 469.75	-	-	4 933 761.84	4 933 761.84	8.40%	30
01.1.2008	133344.92	34 536.33	-	-	4 800 416.92	4 800 416.92	8.40%	30
01.2.2008	133344.92	33 602.92	-	-	4 667 072.00	4 667 072.00	8.40%	30
01.3.2008	133344.92	32 669.50	-	-	4 533 727.08	4 533 727.08	8.40%	30
01.4.2008	133344.92	31 736.09	-	-	4 400 382.16	4 400 382.16	8.40%	30
01.5.2008	133344.92	30 802.68	-	-	4 267 037.24	4 267 037.24	8.40%	30
01.6.2008	133344.92	29 869.26	-	-	4133692.32	4 133 692.32	8.40%	30
01.7.2008	133344.92	28 935.85	-	-	4 000 347.40	4 000 347.40	8.40%	30
01.8.2008	133344.92	28 002.43	-	-	3 867 002.48	3 867 002.48	8.40%	30
01.9.2008	133344.92	27 069.02	-	-	3 733 657.56	3 733 657.56	8.40%	30
01.10.2008	133 344.92	26 135.60	-	-	3 600 312.64	3 600 312.64	8.40%	30
01.11.2008	133344.92	25 202.19	-	-	3 466 967.72	3 466 967.72	8.40%	30
01.12.2008	133344.92	24 268.77	-	-	3 333 622.80	3 333 622.80	8.40%	30
01.1.2009	133344.92	23 335.36	-	-	3 200 277.88	3 200 277.88	8.40%	30
01.2.2009	133344.92	22 401.95	-	-	3 066 932.96	3 066 932.96	8.40%	30
01.3.2009	133344.92	21 468.53	-	-	2 933 588.04	2 933 588.04	8.40%	30
01.4.2009	133344.92	20 535.12	-	-	2 800 243.12	2 800 243.12	8.40%	30
01.5.2009	133344.92	19 601.70	-	-	2 666 898.20	2 666 898.20	8.40%	30
01.6.2009	133 344.92	18 668.29	-	-	2 533 553.28	2 533 553.28	8.40%	30

01.7.2009	133344.92	17 734.87	-	-	2 400 208.36	2 400 208.36	8.40%	30
01.8.2009	133344.92	16 801.46	-	-	2 266 863.44	2 266 863.44	8.40%	30
01.9.2009	133344.92	15 868.04	-	-	2 133 518.52	2 133518.52	8.40%	30
01.10.2009	133344.92	14 934.63	-	-	2 000 173.60	2 000 173.60	8.40%	30
01.11.2009	133344.92	14 001.22	-	-	1 866 828.68	1 866 828.68	8.40%	30
01.12.2009	133344.92	13 067.80	-	-	1 733 483.76	1 733 483.76	8.40%	30
01.1.2010	133344.92	12 134.39	-	-	1 600 138.84	1 600 138.84	8.40%	30
01.2.2010	133344.92	11 200.97	-	-	1 466 793.92	1 466 793.92	8.40%	30
01.3.2010	133344.92	10 267.56	-	-	1 333 449.00	1 333 449.00	8.40%	30
01.4.2010	133344.92	9 334.14	-	-	1 200 104.08	1 200 104.08	8.40%	30
01.5.2010	133344.92	8 400.73	-	-	1 066 759.16	1 066 759.16	8.40%	30
01.6.2010	133344.92	7 467.31	-	-	933 414.24	933 414.24	8.40%	30
01.7.2010	133344.92	6 533.90	-	-	800 069.32	800 069.32	8.40%	30
01.8.2010	133 344.92	5 600.49	-	-	666 724.40	666 724.40	8.40%	30
01.9.2010	133344.92	4 667.07	-	-	533 379.48	533 379.48	8.40%	30
01.10.2010	133344.92	3 733.66	-	-	400 034.56	400 034.56	8.40%	30
01.11.2010	133344.92	2 800.24	-	-	266 689.64	266 689.64	8.40%	30
01.12.2010	133344.92	1 866.83	-	-	133 344.72	133 344.72	8.40%	30
01.1.2011	133344.72	933.41	-	-	-	-	8.40%	30
Всичко:	- 8 000 695.00	2 380 206.68	-	-	.	-		2160

The software has been elaborated by the Daik Company, tel.: (032) 44 30 60: GSM: 087 27 22 48; e-mail: michev@plovdiv.techno-link.com Web: www.daik.dir.bg

	8.4 %
2005	**672 058.32**
2006	**610 453.03**
2007	**476 041.35**
2008	**341 629.67**
2009	**207 218.00**
2010	**72 806.31**
Total:	**2 380 206.68**

Annex No. 17

LM2000SAC SI Estimated Scheduled Maintenance

Hours	Scheduled Maintenance Action	Outage
4,000	Inspection (Every 4000 Hours)	1 day
25,000	On-Site Combustor Exchange	2-3 days
50,000	Depot Refurbishment*	4-6 days
75,000	On-Site Combustor Exchange	2-3 days
100,000	Depot Refurbishment*	4-6 days
125,000	On-Site Combustor Exchange	2-3 days

* Spare or lease engine installed during refurbishment.

Gas Fuel

Actual Maintenance is "On-Condition".

Annex No. 18

Calculation IRR of the project excluding the revenue from the sale of ERUs and AAUs

CALCULATIONS INCOMES AND COSTS FOR CO-GENERATION BIOVET WITHOUT THE EFFECT FROM AAUs AND ERUs

Years	Average Annual Electricity Consumption	Average Annual Electriciy Costs (33,35 EURO MWh)	Average Annual Steam Consumption	Average Annual Steam Costs by (11 EURO ton)	Maintenance and Operation Costs	Investment Credit	Interest Costs for 8.4 % Interest Rate	Average Annual Co Gen Plant Gas Consumption by 5230 Nm^3/h	Annual Co Gen Plant Gas Costs for 17,05 MWe by (112,9 EURO/ $1000m^3$)	Total Annual Costs	Electricity Selling to Outside Grid of NEC (EUR 44,2 MWh)	Selling CO2 Incomes ERUS	Total Annual Revenues	Total Annual Costs without the Credit
	MWh	EUR	Tons	EUR	EUR	EUR	EUR	1000 Nm^3	EUR	EUR	EUR	EUR	EUR	EUR
2004	0	0	0	0	0	8,000,695	0	0	0	0	0	0	0	0
2005	69905	*2331332*	86100	*947100*	127,007	0	672,058	21,443	2,420,915	3219980	194,701	0	3473133	2547922
2006	139810	*4662664*	172200	*1894200*	245,271	1,600,139	610,453	42,886	4,841,829	7297692	0	0	6556864	5087100
2007	139810	*4662664*	172200	*1894200*	245,271	1,600,139	476,041	42,886	4,841,829	7163280	0	0	6556864	5087100
2008	139810	*4662664*	172200	*1894200*	245,271	1,600,139	341,629	42,886	4,841,829	7028868	0	0	6556864	5087100
2009	139810	*4662664*	172200	*1894200*	245,271	1,600,139	207,218	42,886	4,841,829	6894457	0	0	6556864	5087100
2010	139810	*4662664*	172200	*1894200*	245,271	1,600,139	72,806	42,886	4,841,829	6760045	0	0	6556864	5087100
2011	139810	*4662664*	172200	*1894200*	2,027,000	0	0	42,886	4,841,829	6868829	0	0	6556864	6868829
2012	139810	*4662664*	172200	*1894200*	245,271	0	0	42,886	4,841,829	5087100	0	0	6556864	5087100
2013	139810	*4662664*	172200	*1894200*	245,271	0	0	42,886	4,841,829	5087100	0	0	6556864	5087100
2014	139810	*4662664*	172200	*1894200*	245,271	0	0	42,886	4,841,829	5087100	0	0	6556864	5087100
Общо	**1328195**	**44295303**	**1635900**	**17994900**	**4116175**	**16001390**	**2380205**	**407417**	**45997379**	**60494455**	**194701**	**0**	**62484904**	**50113554**

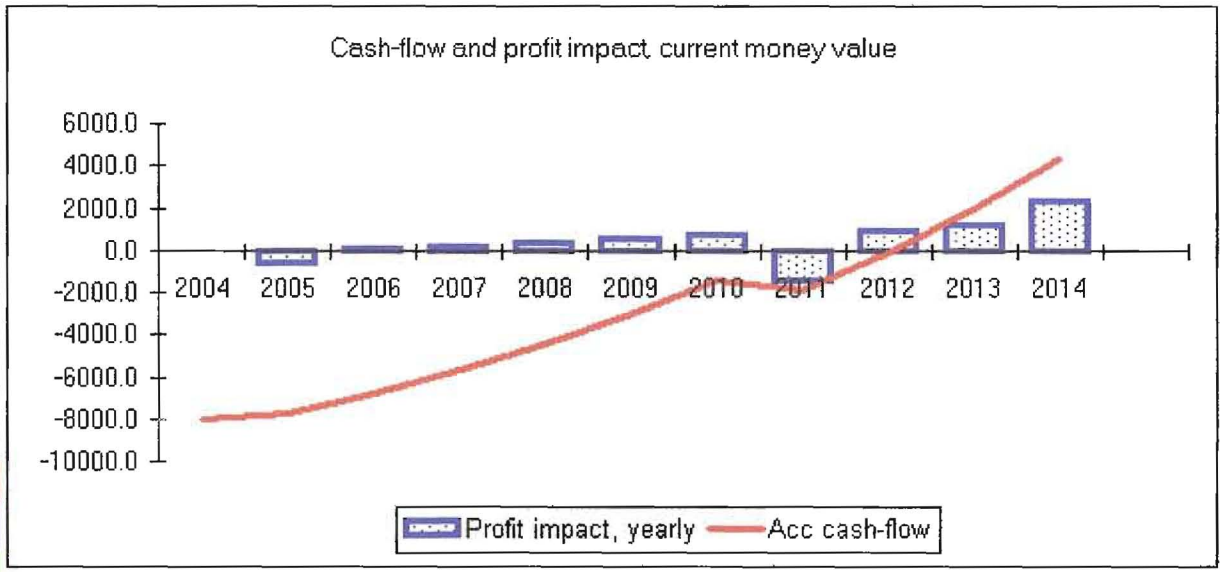
1. The capacity of the CoGen Plant is - 4100 h/year for 2005 and 8200 h/year for 2006 to 2012.
2. The maintenance and operation costs are average 10 EURO per hour and $ 100800 for membership in the club of GE in accordance with the signed Contract with GE.

ProCalc

Prerequisites	
	ths.
Unit:	EUR
Indata, FMV or CMV:	FMV
Nominell opp cost:	8.4%
>>Real opp cost:	4.2%
Inflation:	4.0%
Calc. time (Yrs):	11
Depreciation time:	9
Pmt/yr:end=0, succ=1	0

Output	
Pay-back-time:	9
Pos prof.impact, yrs:	8
Net present value:	1929.3
Int rate of return:	13.2%

Max. cash-fl short-fall:	-8000.7



Year:		2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
		0	1	2	3	4	5	6	7	8	9	10
INDATA SUM	FMV											
In-coming payments		-	3473.1	6556.9	6556.9	6556.9	6556.9	6556.9	6556.9	6556.9	6556.9	6556.9
Out-going payments		-	-2547.9	-5087.1	-5087.1	-5087.1	-5087.1	-5087.1	-6868.8	-5087.1	-5087.1	-5087.1
Investment		-8000.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net cash-flow		-8000.7	925.2	1469.8	1469.8	1469.8	1469.8	1469.8	-311.9	1469.8	1469.8	1469.8
Occ int to end year		-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net cash-flow at end of year		-8000.7	925.2	1469.8	1469.8	1469.8	1469.8	1469.8	-311.9	1469.8	1469.8	1469.8

CALCULATIONS, CM
V

CASH-FLOW/PAY-BACK											
Net cash-flow	-8000.7	962.2	1589.7	1653.3	1719.5	1788.2	1859.8	-410.4	2011.5	2092.0	2175.7
Interest	0.0	-672.1	-647.7	-568.6	-477.4	-373.1	-254.2	-119.4	-163.9	-8.7	166.3
Net after interest	-8000.7	290.1	942.0	1084.8	1242.0	1415.1	1605.5	-529.8	1847.7	2083.3	2342.0
Acc cash-flow	-8000.7	-7710.6	-6768.5	-5683.7	-4441.7	-3026.6	-1421.0	-1950.8	-103.2	1980.1	4322.1
*** * * PROFIT-IMPACT * ***											
Net cash-flow	-8000.7	962.2	1589.7	1653.3	1719.5	1788.2	1859.8	-410.4	2011.5	2092.0	2175.7
+ Investment	8000.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Depreciation:	0.0	-889.0	-889.0	-889.0	-889.0	-889.0	-889.0	-889.0	-889.0	-889.0	0.0
Interest	0.0	-672.1	-647.7	-568.6	-477.4	-373.1	-254.2	-119.4	-163.9	-8.7	166.3
Profit-impact:	0.0	-598.8	53.1	195.8	353.1	526.2	716.6	-1418.8	958.7	1194.3	2342.0
NET PRESENT VALUE											
Net cash-flow	-8000.7	962.2	1589.7	1653.3	1719.5	1788.2	1859.8	-410.4	2011.5	2092.0	2175.7
Annual pres value	-8000.7	887.6	1352.9	1298.0	1245.3	1194.8	1146.3	-233.4	1055.1	1012.3	971.2
Tot pres value	1929.3										
INTERNAL RATE OF RET.											
Net cash-flow	-8000.7	962.2	1589.7	1653.3	1719.5	1788.2	1859.8	-410.4	2011.5	2092.0	2175.7
Nom irr	13.2%										
Discounted net	-8000.7	849.8	1239.9	1138.7	1045.9	960.6	882.3	-172.0	744.2	683.5	627.8
Tot disc net	0.0										

Preparation for sensivityanalysis

	Pres val	Payback	Irr	Prof imp
Basecalculation:	1929.3	9	13.2%	8

Annex No. 19

Calculation IRR of the project including the revenue from the sale of ERUs

CALCULATIONS INCOMES AND COSTS FOR CO-GENERATION BIOVET WITH THE EFFECT FROM ERUs

Years	Average Annual Electricity Consumption	Average Annual Electricity Costs (33,35 EURO MWh)	Average Annual Steam Consumption	Average Annual Steam Costs by (11 EURO ton)	Maintenance and Operation Costs	Investment Credit	Interest Costs for 8.4 % Interest Rate	Average Annual Co Gen Plant Gas Consumption by 5230 Nm³/h	Annual Co Gen Plant Gas Costs for 17,05 MWe by (112,9 EURO/ 1000m³)	Total Annual Costs	Electricity Selling to Outside Grid of NEC (EUR 44,2 MWh)	Selling CO2 Incomes ERUS	Total Annual Revenues	Total Annual Costs without the Credit
	MWh	EUR	Tons	EUR	EUR	EUR	EUR	1000 Nm³	EUR	EUR	EUR	EUR	EUR	EUR
2004	0	0	0	0	0	8,000,695	0	0	0	0	0	0	0	0
2005	69905	*2331332*	86100	*947100*	127,007	0	672,058	21,443	2,420,915	3219980	194,701	905500	4378633	2547922
2006	139810	*4662664*	172200	*1894200*	245,271	1,600,139	610,453	42,886	4,841,829	7297692	0	0	6556864	5087100
2007	139810	*4662664*	172200	*1894200*	245,271	1,600,139	476,041	42,886	4,841,829	7163280	0	0	6556864	5087100
2008	139810	*4662664*	172200	*1894200*	245,271	1,600,139	341,629	42,886	4,841,829	7028868	0	0	6556864	5087100
2009	139810	*4662664*	172200	*1894200*	245,271	1,600,139	207,218	42,886	4,841,829	6894457	0	197700	6754564	5087100
2010	139810	*4662664*	172200	*1894200*	245,271	1,600,139	72,806	42,886	4,841,829	6760045	0	188800	6745664	5087100
2011	139810	*4662664*	172200	*1894200*	2,027,000	0	0	42,886	4,841,829	6868829	0	179800	6736664	6868829
2012	139810	*4662664*	172200	*1894200*	245,271	0	0	42,886	4,841,829	5087100	0	174100	6730964	5087100
2013	139810	*4662664*	172200	*1894200*	245,271	0	0	42,886	4,841,829	5087100	0	165200	6722064	5087100
2014	139810	*4662664*	172200	*1894200*	245,271	0	0	42,886	4,841,829	5087100	0	0	6556864	5087100
Общо	**1328195**	**44295303**	**1635900**	**17994900**	**4116175**	**16001390**	**2380205**	**407417**	**45997379**	**60494455**	**194701**	**1811100**	**64296004**	**50113554**

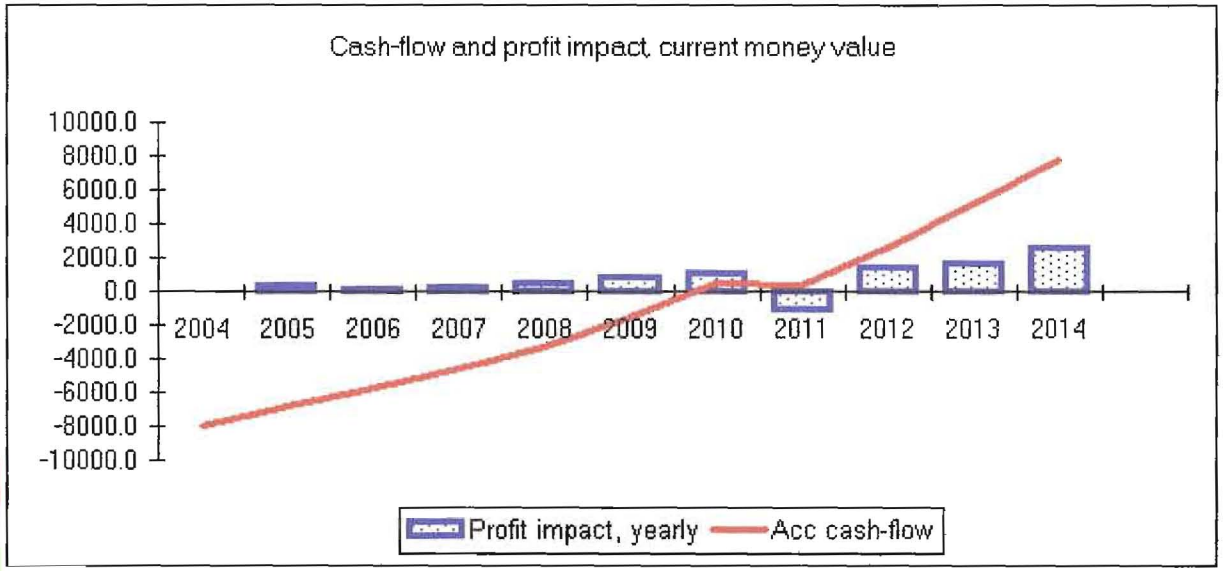
1. The capacity of the CoGen Plant is - 4100 h/year for 2005 and 8200 h/year for 2006 to 2012.
2. The maintenance and operation costs are average 10 EURO per hour and $ 100800 for membership in the club of GE in accordance with the signed Contract with GE.

ProCalc

Prerequisites	
	ths.
Unit:	EUR
Indata, FMV or CMV:	FMV
Nominell opp cost:	8.4%
>>Real opp cost:	4.2%
Inflation:	4.0%
Calc. time (Yrs):	11
Depreciation time:	9
Pmt/yr:end=0, succ=1	0

Output	
Pay-back-time:	6
Pos prof.impact, yrs:	8
Net present value:	3479.3
Int rate of return:	17.3%

Max. cash-fl short-fall:	-8000.7



Year:	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	0	1	2	3	4	5	6	7	8	9	10
I N D A T A FMV SUM											
In-coming payments	0.0	4378.6	6556.9	6556.9	6556.9	6754.6	6745.7	6736.7	6731.0	6722.1	6556.9
Out-going payments	-	-2547.9	-5087.1	-5087.1	-5087.1	-5087.1	-5087.1	-6868.8	-5087.1	-5087.1	-5087.1
Investment	-8000.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net cash-flow	-8000.7	1830.7	1469.8	1469.8	1469.8	1667.5	1658.6	-132.1	1643.9	1635.0	1469.8
Occ int to end year	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net cash-flow at end of year	-8000.7	1830.7	1469.8	1469.8	1469.8	1667.5	1658.6	-132.1	1643.9	1635.0	1469.8

CALCULATIONS, CM
V

CASH-FLOW/PAY-BACK											
Net cash-flow	-8000.7	1903.9	1589.7	1653.3	1719.5	2028.8	2098.7	-173.8	2249.8	2327.1	2175.7
Interest	0.0	-672.1	-568.6	-482.8	-384.5	-272.3	-124.8	41.0	29.8	221.3	435.4
Net after interest	-8000.7	1231.9	1021.2	1170.5	1335.0	1756.4	1973.9	-132.8	2279.6	2548.4	2611.1
Acc cash-flow	-8000.7	-6768.8	-5747.7	-4577.2	-3242.2	-1485.8	488.1	355.3	2634.9	5183.3	7794.4
*** * * PROFIT-IMPACT * ***											
Net cash-flow	-8000.7	1903.9	1589.7	1653.3	1719.5	2028.8	2098.7	-173.8	2249.8	2327.1	2175.7
+ Investment	8000.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Depreciation:	0.0	-889.0	-889.0	-889.0	-889.0	-889.0	-889.0	-889.0	-889.0	-889.0	0.0
Interest	0.0	-672.1	-568.6	-482.8	-384.5	-272.3	-124.8	41.0	29.8	221.3	435.4
Profit-impact:	0.0	342.9	132.2	281.6	446.0	867.5	1084.9	-1021.8	1390.7	1659.5	2611.1
NET PRESENT VALUE											
Net cash-flow	-8000.7	1903.9	1589.7	1653.3	1719.5	2028.8	2098.7	-173.8	2249.8	2327.1	2175.7
Annual pres value	-8000.7	1756.4	1352.9	1298.0	1245.3	1355.5	1293.5	-98.8	1180.1	1126.0	971.2
Tot pres value	3479.3										
INTERNAL RATE OF RET.											
Net cash-flow	-8000.7	1903.9	1589.7	1653.3	1719.5	2028.8	2098.7	-173.8	2249.8	2327.1	2175.7
Nom irr	17.3%										
Discounted net	-8000.7	1623.4	1155.7	1024.8	908.8	914.2	806.3	-56.9	628.4	554.2	441.8
Tot disc net	0.0										

Preparation for sensivityanalysis

	Pres val	Payback	Irr	Prof imp
Basecalculation:	3479.3	6	17.3%	8

Annex No. 20

Calculation IRR of the project including the revenue from the sale of ERUs and AAUs

Table for sales of emission reductions

	Unit	AAUs			ERUs					
	Years	2005	2006	2007	2008	2009	2010	2011	2012	2013
Price	EUR/ton	5.9								
Expected emissions	10^3tons	*42*	*80*	*78*	*74*	*71*	*68*	*65*	*61*	*0*
Total for period	10^3tons	*200*			*339*					0
Offered emissions	10^3tons	38	72	69	67	64	61	59	56	0
Total for period	10^3tons	179			307					0
Revenues	10^3EUR	224.2	424.8	407.1	395.3	377.6	359.6	348.1	330.4	0
Payments	**10^3EUR**	**905.5**	**0**	**0**	**1056.1**	**197.7**	**188.8**	**179.8**	**174.1**	**165.2**

CALCULATIONS REVENUES AND COSTS FOR CO-GENERATION BIOVET WITH THE EFFECT FROM AAUs AND ERUs

Years	Average Annual Electricity Consumption	Average Annual Electricity Costs (33,35 EURO MWh)	Average Annual Steam Consumption	Average Annual Steam Costs by (11 EURO ton)	Maintenance and Operation Costs	Investment Credit	Interest Costs for 8.4 % Interest Rate	Average Annual Co Gen Plant Gas Consumption by 5230 Nm^3/h	Annual Co Gen Plant Gas Costs for 17,05 MWe by (112,9 EURO/ $1000m^3$)	Total Annual Costs	Electricity Selling to Outside Grid of NEC (EUR 44,2 MWh)	Selling CO2 Incomes AAUs and ERUS	Total Annual Revenues	Total Annual Costs without the Credit
	MWh	EUR	Tons	EUR	EUR	EUR	EUR	1000 Nm^3	EUR	EUR	EUR	EUR	EUR	EUR
2004	0	0	0	0	0	8,000,695	0	0	0	0	0	0	0	0
2005	69905	*2331332*	86100	*947100*	127,007	0	672,058	21,443	2,420,915	3219980	194,701	905500	4378633	2547922
2006	139810	*4662664*	172200	*1894200*	245,271	1,600,139	610,453	42,886	4,841,829	7297692	0	0	6556864	5087100
2007	139810	*4662664*	172200	*1894200*	245,271	1,600,139	476,041	42,886	4,841,829	7163280	0	0	6556864	5087100
2008	139810	*4662664*	172200	*1894200*	245,271	1,600,139	341,629	42,886	4,841,829	7028868	0	1056100	7612964	5087100
2009	139810	*4662664*	172200	*1894200*	245,271	1,600,139	207,218	42,886	4,841,829	6894457	0	197700	6754564	5087100
2010	139810	*4662664*	172200	*1894200*	245,271	1,600,139	72,806	42,886	4,841,829	6760045	0	188800	6745664	5087100
2011	139810	*4662664*	172200	*1894200*	2,027,000	0	0	42,886	4,841,829	6868829	0	179800	6736664	6868829
2012	139810	*4662664*	172200	*1894200*	245,271	0	0	42,886	4,841,829	5087100	0	174100	6730964	5087100
2013	139810	*4662664*	172200	*1894200*	245,271	0	0	42,886	4,841,829	5087100	0	165200	6722064	5087100
2014	139810	*4662664*	172200	*1894200*	245,271	0	0	42,886	4,841,829	5087100	0	0	6556864	5087100
Общо	**1328195**	**44295303**	**1635900**	**17994900**	**4116175**	**16001390**	**2380205**	**407417**	**45997379**	**60494455**	**194701**	**2867200**	**65352104**	**50113554**

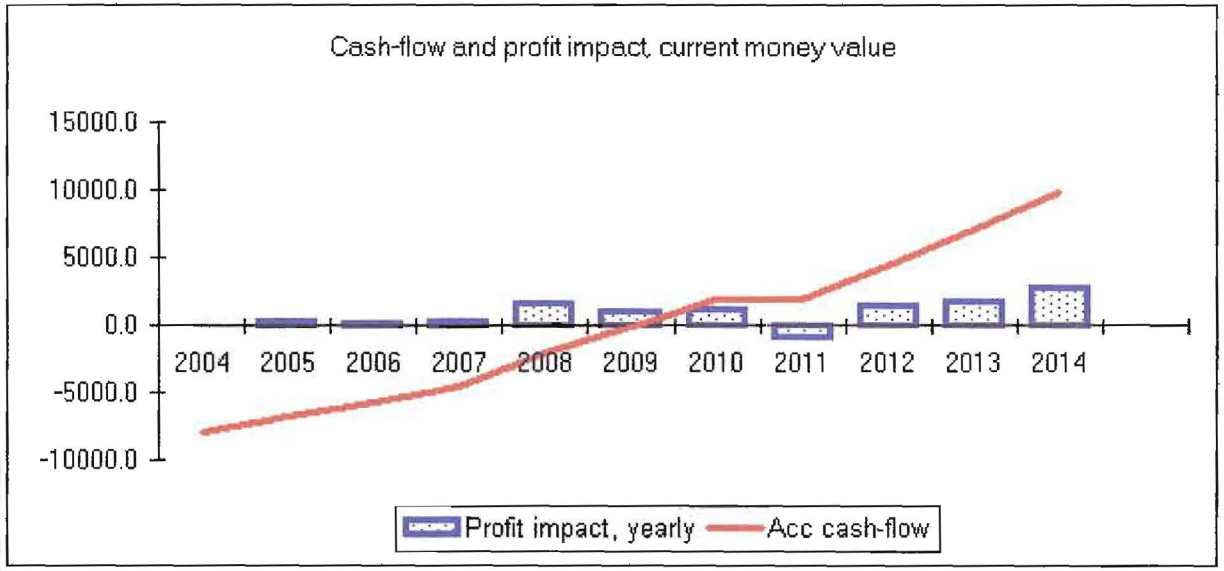
1. The capacity of the CoGen Plant is - 4100 h/year for 2005 and 8200 h/year for 2006 to 2012.
2. The maintenance and operation costs are average 10 EURO per hour and $ 100800 for membership in the club of GE in accordance with the signed Contract with GE.

ProCalc

Prerequisites	
	ths.
Unit:	EUR
Indata, FMV or CMV:	FMV
Nominell opp cost:	8.4%
>>Real opp cost:	4.2%
Inflation:	4.0%
Calc. time (Yrs):	11
Depreciation time:	9
Pmt/yr:end=0, succ=1	0

Output	
Pay-back-time:	6
Pos prof.impact, yrs:	8
Net present value:	4374.2
Int rate of return:	19.5%

Max. cash-fl short-fall:	-8000.7



Year:	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	0	1	2	3	4	5	6	7	8	9	10
INDATA FMV SUM											
In-coming payments	0.0	4378.6	6556.9	6556.9	7613.1	6754.6	6745.7	6736.7	6731.1	6722.1	6556.9
Out-going payments	-	-2547.9	-5087.1	-5087.1	-5087.1	-5087.1	-5087.1	-6868.8	-5087.1	-5087.1	-5087.1
Investment	-8000.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net cash-flow	-8000.7	1830.7	1469.8	1469.8	2526.0	1667.5	1658.6	-132.1	1644.0	1635.0	1469.8
Occ int to end year	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Net cash-flow at end of year	-8000.7	1830.7	1469.8	1469.8	2526.0	1667.5	1658.6	-132.1	1644.0	1635.0	1469.8

CALCULATIONS, CM
V

CASH-FLOW/PAY-BACK											
Net cash-flow	-8000.7	1903.9	1589.7	1653.3	2955.1	2028.8	2098.7	-173.8	2249.9	2327.1	2175.7
Interest	0.0	-672.1	-568.6	-482.8	-384.5	-168.6	-12.3	163.0	162.0	364.7	590.8
Net after interest	-8000.7	1231.9	1021.2	1170.5	2570.6	1860.2	2086.4	-10.9	2412.0	2691.8	2766.4
Acc cash-flow	-8000.7	-6768.8	-5747.7	-4577.2	-2006.6	-146.4	1940.0	1929.1	4341.1	7032.9	9799.3
*** * * PROFIT-IMPACT * ***											
Net cash-flow	-8000.7	1903.9	1589.7	1653.3	2955.1	2028.8	2098.7	-173.8	2249.9	2327.1	2175.7
+ Investment	8000.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Depreciation:	0.0	-889.0	-889.0	-889.0	-889.0	-889.0	-889.0	-889.0	-889.0	-889.0	0.0
Interest	0.0	-672.1	-568.6	-482.8	-384.5	-168.6	-12.3	163.0	162.0	364.7	590.8
Profit-impact:	0.0	342.9	132.2	281.6	1681.6	971.2	1197.4	-899.8	1523.0	1802.8	2766.4
NET PRESENT VALUE											
Net cash-flow	-8000.7	1903.9	1589.7	1653.3	2955.1	2028.8	2098.7	-173.8	2249.9	2327.1	2175.7
Annual pres value	-8000.7	1756.4	1352.9	1298.0	2140.2	1355.5	1293.5	-98.8	1180.1	1126.0	971.2
Tot pres value	4374.2										
INTERNAL RATE OF RET.											
Net cash-flow	-8000.7	1903.9	1589.7	1653.3	2955.1	2028.8	2098.7	-173.8	2249.9	2327.1	2175.7
Nom irr	19.5%										
Discounted net	-8000.7	1593.1	1113.1	968.6	1448.6	832.2	720.3	-49.9	540.7	467.9	366.1
Tot disc net	0.0										

Preparation for sensivityanalysis

	Pres val	Payback	Irr	Prof imp
Basecalculation:	4374.2	6	19.5%	8

Annex No. 21

STAKEHOLDERS ATTITUDE LETTERS

Attitude
Of Municipality of Peshtera, represented by Georgi Petarneichev

Regarding: Equipment Construction for Co-Generation

Dear Sirs Executive Directors

In reference to the letter above and your intentions to construct equipments for combinatory generation of electric energy and steam (co-generation), using natural gas, we pass the following position:

1. Reporting the circumstance that Biovet Joint Stock Company is the largest company on the territory of the Municipality, its steady development reflects optimum on the prosperity of the Municipality and its citizens. In that sense we support your decision for the construction of an ecological source of energy of the company that will stimulate your development by providing the necessary generation energy.
2. The construction of such source of energy will create an opportunity for a construction (when necessary) of an energy transfer network in the town.
3. An opportunity shall be created with the generated electric energy, which is over the one of your needs; one more source can generate account town objects in case of emergency.
4. We consider that the object construction will improve the ecologic circumstances, because thus the generation of old, non-efficient plants, which use coals for fuel will be substituted.

In conclusion we support your decision for the realization of the generation of matter as we pay attention that during its construction and exploitation The Law Regulations of the Republic of Bulgaria shall be abided.

Faithfully Yours:

/Mayor: G. Petarneichev/

„БИОВЕТ" - АД
№ 4558/22.04.04

ОБЩИНА ПЕЩЕРА

4550 гр. Пещера, ул. "Дойранска епопея" N•_ 17

Тел.: (0350) **22-03,22-08** факс: 41-65, mail: mavor(a!r)eshtera.b2 U R L : http~//wии-.p eshtera.bL

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ИЗПЪЛНИТЕЛНИТЕ ДИРЕКТОРИ **НА** "БИОВЕТ" АД
ГР. ПЕЩЕРА
На Ваш Ns4484/21.04.2004 г.

СТАНОВИЩЕ

На ОБЩИНА - ПЕЩЕРА, представлявана от
кмета ГЕОРГИ ПЕТЪРНЕЙЧЕВ
ОТНОСНО: Изграждане на съоръжения за КО-генерация

УВАЖАЕМИ Г-**АА** ИЗПЪЛНИТЕЛНИ ДИРЕКТОРИ,

ВІВ връзка с горното писмо и намеренията Ви за изграждане На съоръжения за комбинирано производство На електроенергия и пара (КО-генерация), използвайки природен газ, изразяваме следното становище:

1.Като отчитаме обстоятелството, че "Биовет"АД е най-голямото предприятие На територията На общината, неговото устойчиво развитие се отразява благоприятно На просперитета На Общината и нейните жители. В този смисъл ние подкрепяме Вашето намерение за изграждане На един екологичен източник На енергия за предприятието, който me gage **TRICK** На Вашето развитие с осигуряване На необкодимата енергия за производство.

2.Изграждането На такъв източник На енергия ме създаде възможност за изграждане На топлопреносна мрежа в града.

3.Ще се създаде възможност с произведената ел.енергия над необходимата за предприятието да бъдат захранени отговорни обекти в града от още един източник, в случай На аварийни ситуации.

4.Считаме, Ме изграждането на този обект ме бъде принос към подобряване На екологичното състояние, тъй като по този начин се замества производството от стари, неефективни централи, използващи за гориво въглища.

В заключение поддържаме Вашето намерение за реализация На въпросното производство като обръщаме внимание, че по време На неговото строителство и експлоатация следва стриктно да бъдат спазвани законовите разпоредби в Република България.

С УВАЖЕНИЕ
КМЕТ:
/Г.ПЕТЪРНЕЙЧЕВ/

Bulbank
UniCredit Group
13214 22.04.04

To Mr. Angel Jeliazkov
Managing Director
Biovet JSC
Peshtera

April 21, 2004

Subject: BULBANK's statement, concerning the construction of a gas-fired co-generation power plant at Biovet's production site in Peshtera.

Dear Mr. Jeliazkov,

Regarding to your intention to realize a project for the construction of a gas-fired power plant for the combined electricity and heat production at the production site of Biovet in Peshtera, we declare the following:

1. BULBANK intends to support the construction of an environmentally friendly power source of Biovet JSC, which will prevent the company from possible future production losses and will stimulate Biovet's development through its provision with the necessary electricity and heat for the manufacturing process at lower and more stable prices.

2. The construction of such kind of power station and the replacement of the conventional power sources is the right approach, moving to the improvement of our country's ecology.

3. We are sure that nowadays a project like this one, concerning the construction of substituting power sources in Bulgarian Energy sector is very appropriate, considering that some of the reactors of the nuclear power plant in Kozlodui, Bulgaria, have to be taken out of exploitation and the necessity for the reduction of the polluting gases, emitted from the coal power stations as well as in accordance with the EU legislation rules and laws.

4. The expectations for a future electricity and heat price increase seems to be pretty realistic, so we are sure that Biovet's project will be efficient and therefore appropriate to be financed.

5. With the ratification of Kyoto Protocol in 2002, Bulgaria is due to reduce the emissions of greenhouse gases by 8.0 % by 2008 in comparison to 1998.

In conclusion we would like to emphasize, that the development of Bulgarian industry is still very risky. That's why the support, which Biovet JSC would receive from selling greenhouse gas emission credits, will be very important for this project and will make its financing more flexible and less risky.

BULBANK AD * SOFIA * 03

Sincerely yours,

Levon Hampartzoumian
Chairman of the MB and Executive Director

Alessandro Decio
Deputy Chairman of the MB and Executive Director

Attitude — TRANSLATION

From the citizens of Peshtera, living near the plant
To the Management of Biovet Joint Stock Company

Regarding: Construction of equipments for combined generation of electric energy and steam for assuring Biovet's generation.
It is of great pleasure to us to keep up with the positive changes that are to come with Biovet's development, where we have worked for years and some of us still have.
We have not forgotten the dust coming from a steam plant's chimney, when bituminous coals used to be the main source of energy. WE have not forgotten the greasy soot and the suffocant stink of sulphur dioxide when black oil used to be burnt. We have not forgotten night-and-day work at fermentative and manufacturing workshops after failures due to a current rush or power supply shutting-down due to electric system failure. The news that Biovet is going to construct equipments for combined generation of electric energy and steam is the accurate decision about:

1) stabilizing of the fermentative processes of the company
2) The town of Peshtera to keep the environment and water clean in and in the surroundings of the town.
3) The town's preparations of joining to EU.

We suggest:
The specialists, working over that project should pay great attention to the noise coming from generators and by making the appropriate technical decisions not to allow for noise to exceed regular norms, set by EU. After improving the company's energy assurance Biovet's management should supply with steam the residence, we live in, through which we shall reduce pollution emissions from wood and bituminous coal burning, which we use for heating in winter.
We solute your major technical decision and we wish you luck!

/Jordanka Petkova/
/Liubomir Bonev/
/atanaska Fidanova/
/Atanas Fidanov/

April, 23rd, 2004
Peshtera

До
Ръководство го на Биовет - АД
Гр. Пещера

СТАНОВИЩЕ От жители на град Пещера живеещи в непосредствена близост до завода

Относно: **Изграждане на съоръжения за комбинирано производство на ел. енергия и пара за осигуряване на производството на Биовет-АД Пещера.**

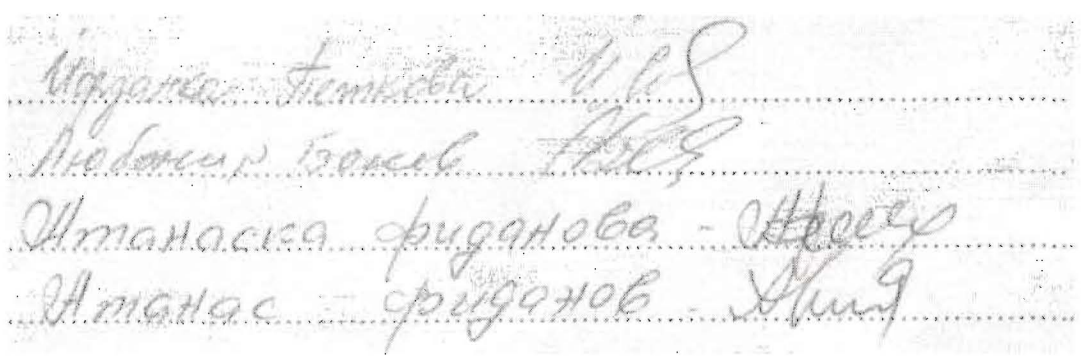
С радост следим положителните промени , които настъпват в развитието на Биовет - АД . където сме работили дълги години а някои от нас продължават да работят и сега.
Не сме забравили дима и праха . който се изсипваше от комина на парова централа когато енергетичен източник бяха каменните въглища , мазните сажди и задушаващата миризма на серен двуокис когато се гореше мазут. Не сме забравили денонощната работа във ферментационните и преработващи цехове след аварии . поради ...токов удар" или прекъсване на електрозахранването следствие на разпадане па енергийната система. Новината , че Биовет ще строи съоръжения за комбинирано производство на електроенергия и пара считаме . че е най- правилното решение за:

1) **стабилизиране на ферментационните процеси във фирмата.**
2) **Град Пещера да съхрани чистотата на въздуха и водата в и около града.**
3) **Подготовка на града за присъединяване към ЕС.**

Предлагаме:

Специалистите , работещи по този проект да обърнат особено внимание на шума , който се излъчва от генераторите и с подходящи технически решения да не позволят той да превишава нормите , приети от ЕС. Ръководството на Биовет , след подобряване на енергийното осигуряване на фирмата , да захрани с пара жилището в което живеем . с което ще намалим емисиите от дим , получавани от изгарянията на дървата и каменните въглища с които се отопляваме п реч зимата.

Като приветстваме вашето мащабно , техническо решение , Ви желаем успех !



Translation

Ref. No. 136 dated 29.04.2004 of Old River Sole-Owned Shareholding Company of the town of Peshtera, addressed to Biovet.

We have become acquainted with your project to construct your own station for thermal and electric energy generation.
As consumers of thermal energy from your facilities, we are interested in the improved reliability and quality of the supplied energy, as well as in the improved environment of the area.
Taking into consideration our long-term business relations, we hereby express our full support for the realization of the project and hope that the effects from its implementation will be mutually profitable for both our companies and will guarantee the future deliveries of thermal energy.

Dated 23.04.2004, town of Peshtera

Respectfully yours,
(signed - illegible)
(stamped with the seal of Old River Sole-Owned Shareholding Company of the town of Peshtera)
N. Sorgato – Executive Manager

"ОЛДРИВЪР 2000"ЕАД

ул. "Васил Петлешков"№ 1, 4550 Пещера, тел. 0350 / 61-84, факс: 0350 / 61-85, e-mail. info@oldriver2000.com

„ОЛДРИВЪР-2000"ЕАД
гр.ПЕЩЕРА,ул. „В.Петлешков"№1
№456/29.04.04

До
Изпълнителните директори
на "Биовет" АД
гр. Пещера, п. к. 4550
ул. "Петър Раков" № 39

Уважаеми господа Изпълнителни Директори,

Запознахме се с Вашия проект за изграждане на собствена централа за производство на топлинна и електрическа енергия, работеща на природен газ.

Като ползватели на произвежданата от Вас топлинна енергия, ние сме заинтересовани както от повишаване сигурността и качеството на доставките, така и от подобряване на екологичната обстановка в района.

Изхождайки от дългогодишните ни добри бизнесотношения, изразяваме пълната си подкрепа за реализацията на проекта, като се надяваме, че ефектът от внедряването му ще е взаимноизгоден за двете дружества и ще гарантира бъдещите доставки на топлинна енергия.

23.04.2004г.
гр. Пещера

С уважение:
(Н. Соргато – изпълнителен директор)

"ОЛДРИВЪР 2000" ЕАД гр.Пещера

Annex No. 22

TRANSLATION

ENVIRONMENTAL IMPACT LETTER

MINISTRY OF ENVIRONMENT AND WATERS
REGIONAL INSPECTORATE FOR THE ENVIRONMENT AND WATERS OF PAZARDZHIK

RESOLUTION No. 90 dated 2004
on the necessity to elaborate an Assessment of the Environmental Impact Report

On the basis of the provisions of Art. 93, clause 5 of the Environmental Protection Act and the submitted written documentation by the Investor BIOVET JSC of the town of Peshtera, 39, P. Raykov Street, BULSTAT registration No. 112029879, as per Annex No. 2 to Art. 6 of the Regulation on the Terms and Conditions for the Elaboration of Assessment of the Environmental Impact Reports for investment proposals with reference to construction, activities, and technologies, the undersigned hereby

RESOLVE

Not to elaborate an Assessment of the Environmental Impact Report for the investment proposal for the Design, Construction, and Operation of a Highly Effective Gas Plant of the Co-Generation Type with a Power Capacity of 22 MW for the Generation of Electric and Thermal Power (for technological and for heating purposes) to cover the needs of Biovet JSC and for Sale of the Surplus Generated Electric Energy to the NEC Project. The plant is foreseen to be fueled by natural gas and to be equipped with two co-generation installations of the UGT 10000 C type with an electric power capacity of 10 MW and UGT 10000 82 with electric power capacity of 16 MW.

MOTIVES:

1. The realization and operation of the investment project is not expected to significantly affect the population, its health, the flora and the fauna, the landscape, the hydrology and the quality of the waters and of the air;
2. The realization of the investment project will result in a reduction of the hazardous emissions due to the replacement of the fuel.
3. The site for the realization of the investment project is not located in an environmentally sensitive area and no protected sites, territories, or areas, which are populated by protected important or sensitive species of the flora and fauna, will be affected;
5. No written nor verbal objections on behalf of the public or the municipal administration of the town of Peshtera have been submitted.

The present resolution does not prejudice any obligations of the investor (owner) in accordance with the provisions of the Environmental Protection Act and other pertinent regulatory norms and standards and shall not serve as the basis for any deviation from his liabilities according to the current legislative norms.

Dated: 03.05.2004.

On behalf of the Director of the Regional Inspectorate for the Environment and Waters of Pazardzhik: *(signed - illegible)*
/G. Shishinyova/
(stamped with the seal of the Regional Inspectorate for the Environment and Waters of Pazardzhik)

Министерство на околната среда и водите
Регионална инспекция по околната среда и водите - Пазарджик

РЕШЕНИЕ № 90/2004 г.

за преценяване на необходимостта от извършване на оценка на въздействието върху околната среда

На основание чл. 93, ал. 5 от Закона за опазване на околната среда и представената писмена документация от **инвеститора** "БИОВЕТ"АД, гр. Пещера, ул. "П. Раков" № 39, Булстат 112029879 по приложение № 2 към чл. 6 от Наредбата за условията и реда за извършване на оценка на въздействието върху околната среда на инвестиционни предложения за строителство, дейност и технологии,

Р Е Ш И Х

да не се извършва оценка на въздействието върху околната среда за инвестиционно предложение "Проектиране, изграждане и експлоатация на високо ефективна Газова централа с мощност от порядъка на 22 MWe от ко-генерационен тип за производство на електрическа енергия и пара /технологична и за отопление/, за задоволяване нуждите на "Биовет" АД и продажба на излишната електрическа енергия на НЕК". Предвижда се централата да консумира като гориво природен газ и да бъде комплектована с две ко-генерационни инсталации от тип UGT 10000 C – с електрическа мощност 10 MWe и UGT 10000 S2 - с електрическа мощност 16 MWe

МОТИВИ:

1. При реализиране и експлоатацията на инвестиционното предложение не се очаква значително въздействието върху хората, здравето им, флората и фауната, ландшафта, хидрологията и качеството на водите и качеството на въздуха;

2. С реализирането на инвестиционното предложение ще се постигне редуциране вредните емисии, дължащо се на подмяната на горивната база.

3.Площадката на инвестиционното предложение не се намира в чувствителна екологична зона и няма да се засегнат защитени обекти и територии или площи, които се обитават от защитени важни или чувствителни видове на флората и фауната;

5. Няма постъпили писмени или устни възражения от страна на обществеността и Общинска администрация гр. Пещера.

Решението не отменя задълженията на инвеститора (собственика) по Закона за опазване на околната среда и други специални закони и подзаконови нормативни актове и неможе да служи като основание за отпадане на отговорността съгласно действащата нормативна уредба.

Дата: 03.05.2004 г.
ТА

Директор РИОСВ:
/ Г. Шишкинова/