JOINT IMPLEMETATION
PROJECT DESIGN DOCUMENT (JI-PDD)
Draft 13 - 21 April 2006

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Annexes

SECTION A. General description of project activity

A.1 Title of the project activity:

Bulgarian Renewable Energy Portfolio

A.2. Description of the project activity:

The purpose of the project is to generate electricity using renewable hydraulic energy sources in Bulgaria to meet the increasing regional and national energy demand. The project aims to install run-of river small-scale hydropower at two locations:

1. Tumrush (Trakija Gas)
2. Lesitchevo (Delektra Hydro)

Furthermore the project aims to generate steam using biomass source by installing two steam boilers for combustion of biomass (straw) located in:

3. Alfatar (Wiwa Agrotex)

The three subprojects reach an additional greenhouse gas reduction of 362,680 t CO_2eq in the period 2005-2012. In the Kyoto crediting period (2008-2012) the emissions reductions have been estimated on 233,698t CO_2eq.

The projects will strongly contribute to the sustainable socio-economic development of the region. The proposed projects will also reduce the dependency of the country on the imports of fossil fuels and will result into:

1. GHG mitigation with least costs;
2. Opportunity for technology and know-how transfer;
3. Support for the restructuring of economy;
4. Successful means for attracting foreign investments;
5. More sustainable economic development; and,
6. Support for the implementation of national environmental and energy policy and add to compliance with European Union directives.

The project will serve as a demonstrative model on how to produce renewable energy. Know-how derived from the implementation of the proposed project will result into multiplying similar projects in Bulgaria and will facilitate their implementation by reducing barriers and obstacles that have occurred in this project. The proposed project will strongly contribute to the growth of knowledge on environmentally sound technologies and on Kyoto Protocol mechanisms, such as Joint Implementation

1 Trakija Gas:

The construction of the run-of-river Small Hydro Power Plant (SHPP) Tumrush for the generation and sales of electric energy was finalized in August 2005. In addition to direct economic benefits the project provides carbon emissions reduction due to the replacement of electric power produced by conventional sources with such generated by the SHPP Tumrush. Table A.2.1indicates that the estimated CO_{2eq} emissions reduction amounts to 137,426 tons for the period 2005 – 2012.

Table A.2.1 Carbon Dioxide Emissions Reduction Trakija Gas (tons)

	Years	2004	2005	2006	2007	2008	2009	2010	2011	2012
Electricity production	MWh	0	8.812	15.115	15.115	15.115	15.115	15.115	15.115	15.115
CEF	tCO2eq/MWh	1,199	1,199	1,199	1,199	1,199	1,199	1,199	1,199	1,199
Emissions reduction	CO2eq/MWh/y	0	10.566	18.123	18.123	18.123	18.123	18.123	18.123	18.123
Total	Cum. CO2eq	0	10.566	28.688	46.811	64.934	83.057	101.180	119.303	137.426

The design for the SHPP Tumrush assumes the utilization of the hydro energy potential of the river Tumrushka in the section, situated between level 715 (the intake) and level 355 (the SHPP building), with

an approximate length of 4,400 m and average inclination of 8.2%. The river range is situated close to the road between villages of Bojkovo and Hrabrino, Plovdiv region, and about 20 km from the city of Plovdiv.

The SHPP Tumrush is constructed for the generation of 15,115 MWh/year depending on actual hydrological conditions in a mean-water year and installed capacity at the generator clamps of 5,140 kW. The average annual usage of the installed capacity is 2,941 hours/year.

2 Delektra:

The run-of-river SHPP Lesitchevo utilises the hydro energy potential of the waters of the last section of the main irrigation channel Momina Klisura – Lesitchevo, through which the water outflows to the river of Topolnitsa at Lesitchevo dam with elevation difference of approximately 60 meters.

The first unit of SHPP Lesitchevo was put in operation in January 2005 for the generation of 10,880 MWh in a mean-water year, with maximum generator capacity at the generators clamps of 1,527 kW and the average annual usage of 7,125 hours/year The unit was flooded on August 05, 2005 and put back in operation after refurbishment on November 04, 2005.
The second unit with the same capacity is under construction and will be put in operation on February 1, 2006 for the generation of 5,580 MWh in a mean-water year.
The total planed electricity production of the plant is 16,460 MWh in a mean-water year and the average annual usage of 5,390 hours/year. Table A.2.2 indicates that the estimated CO_{2eq} emissions reduction amounts to 147,558 tons for the period 2005 – 2012.

Table A.2.2 Carbon Dioxide Emissions Reduction Delektra

Unit	2004	2005	2006	2007	2008	2009	2010	2011	2012
MWh (unit 1)	0	8.394	10.880	10.880	10.880	10.880	10.880	10.880	10.880
MWh (unit 2)	0	0	5.022	5.580	5.580	5.580	5.580	5.580	5.580
CEF	1,199	1,199	1,199	1,199	1,199	1,199	1,199	1,199	1,199
CO2eq/MWh/y	0	10.065	19.068	19.737	19.737	19.737	19.737	19.737	19.737
Cum. CO2eq	0	10.065	29.134	48.871	68.608	88.346	108.083	127.821	147.558

3 Wiwa Agrotex:

A steam station for combustion of biomass (straw) will be build in Alfatar city. The steam station consists of two steam boilers with a total output of 8 t/h steam. Initially and according to the signed contracts, the steam will be sold to one consumer, namely the Bio-etil production plant owned by Evro-Etil Ltd in Silistra city. Thereafter, during the next heating periods and after the construction of the steam distribution network, it could be sold to two more consumers, i.e. the greenhouse and the fodder plant. All consumers are located close to the steam station. The steam distribution network is not build yet, therefore in the present calculations, the revenues from thermal energy sales to the greenhouse and the fodder plant are not included.

During the station operation, industrial waste water to the amount of 2.5 m^3/day and domestic waste water to the amount of 4.0 m^3/day will be generated.

The substitution of heavy fuel oil (3,962 t) with biomass (13,317 t of straw) shall reduce the CO_{2eq} emissions with 13,115 tons. The CO_{2eq} emissions reduction for the whole project lifetime is presented in Table A.2.4.

Table A.2.4 Carbon Dioxide Emissions Reduction Wiwa Agrotex (tons)

DATA:		Baseline		Project						
		2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Electricity consumption National Grid	MWh/y	768	768	768	768	768	768	768	768	768
Electricity consumption Biomass	MWh/y	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667	1.667
Heavy fuel consumption	t/y	3.962	3.962	0	0	0	0	0	0	0
Biomass consumption	t/y	0	0	13.317	13.317	13.317	13.317	13.317	13.317	13.317
Diesel per year	t/y	0	0	9.056	9.056	9.056	9.056	9.056	9.056	9.056
EMISSIONS:										
FACTORS:										
		2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
CEF Heavy Fuel	tCO2eq/t	3,081	3,081	3,081	3,081	3,081	3,081	3,081	3,081	3,081
CEF Electricity	tCO2/MWh	1,199	1,199	1,199	1,199	1,199	1,199	1,199	1,199	1,199
Transport Emission Losses	CO2eq kt/MW	0,120	0,120	0,120	0,120	0,120	0,120	0,120	0,120	0,120
CEF diesel	tCO2eq/t	3,071	3,071	3,071	3,071	3,071	3,071	3,071	3,071	3,071
CEF Biomass	tCO2eq/t	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000	0,000
BASELINE:										
Emissions Heavy Fuel	tCO2eq/y	12.207	12.207	12.207	12.207	12.207	12.207	12.207	12.207	12.207
Emissions Electricity	tCO2eq/y	921	921	921	921	921	921	921	921	921
Transport Emission Losses	CO2eq kt/MW	92	92	92	92	92	92	92	92	92
Emissions	**tCO2eq/y**	**13.220**	**13.220**	**13.220**	**13.220**	**13.220**	**13.220**	**13.220**	**13.220**	**13.220**
PROJECT:										
Emissions Heavy Fuel	tCO2eq/y	12.207	12.207	0	0	0	0	0	0	0
Emissions Electricity	tCO2eq/y	1.999	1.999	1.999	1.999	1.999	1.999	1.999	1.999	1.999
Emissions Biomass	tCO2eq/y	0	0	0	0	0	0	0	0	0
Transport Emission Losses	CO2eq kt/MW	0	0	92	92	92	92	92	92	92
Emission Diesel	tCO2eq/y	0	0	28	28	28	28	28	28	28
Emissions	**tCO2eq/y**	**0**	**0**	**2.119**	**2.119**	**2.119**	**2.119**	**2.119**	**2.119**	**2.119**
EMISSION REDUCTIONS:										
Emission reductions	tCO2eq/y	0	0	11.102	11.102	11.102	11.102	11.102	11.102	11.102
TOTAL	**tCO2eq**									**77.711**

The total effect from the renewable energy (biomass) usage will result in CO_{2eq} emissions reduction with 77,711 tons in 2005-2007 and 55,508 t CO_{2eq} for the period 2008 -2012.

Sulphur dioxide, nitrogen dioxide and a certain amount of dust are emitted during heat energy production from fossil fuels. The implementation of the Wiwa Agrotex Ltd Renewable Energy Project and decrease of conventional heat energy production will reduce these emissions. The carried out calculations show that as a result of the project implementation (substitution of heavy fuel oil with a renewable energy source – biomass), the SO_2 emissions shall decrease with 241 tons in 2006 and for the period 2006 -2012, their reduction amounts to 1,831 tons. In 2006 the NO_x emissions shall decrease with 0.2 tons and for the period 2006 - 2012 they shall decrease with 3.3 tons, as a result of the heavy fuel oil substitution with an alternative fuel – biomass. In 2006 the dust emissions shall decrease with 4.3 tones and for the period 2006 -2012 they shall decrease with a total of 33 tons, as a result of the project implementation.

Other benefits from the project implementation:

- The produced steam will provide the consumers with thermal energy at prices lower than that generated from light and heavy fuel oil

- The company's costs for taking away the straw from the rented field will decrease (otherwise it has to be burned on the field). The same applies for the other companies, providers of straw. The soil fertility will be preserved
- The humus and the biological diversity of the agricultural land, from which the straw is gathered, will be preserved
- The hazard of field and forest fires shall decrease too.

A.3. Project participants:

Host country:
Bulgaria

Projects' Sponsors:
All projects are financed by the EBRD Bulgaria Energy Efficiency and Renewable Energy Credit Line Support Facility (BEERECL)[1]. The facility is a credit line for small and medium sized projects in the field of renewable energy and energy efficiency, established by the EBRD. UBB is one of the banks in Bulgaria that operates this facility. In the past companies in Bulgaria could not borrow on the capital market for these kinds of projects. With BEERECL, UBB is able to provide their clients a credit for investments of this kind. UBB also grants a grace period for each loan. The role of UBB is one of a lender and intermediary. UBB will obtain the credits from the individual project operators, and will be the contracting party for selling the credits to the EBRD Carbon Fund (established by the Dutch Government). From this responsibility, it will also take a leading role in making agreements with the individual project operators on registration and monitoring of emissions reductions and other relevant data.

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[1] For more information refer to "www.beerecl.com"

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A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

Bulgaria

A.4.1.2. Region/State/Province etc.:

The subprojects are located throughout Bulgaria (see section A.4.1.3).

A.4.1.3. City/Town/Community etc:

Table A.4.1.3.1 Project Locations

No	Name of the subproject	Location
1	Trakija Gas	Plovdiv region (between Bojkovo and Hrabino)
2	Delektra Hydro	Pazardjik region (near Lesitchevo)
3	Wiwa Agrotex	Alfatar City

The projects are located throughout Bulgaria. The specific projects are numbered and spotted in the map (Figure 1).

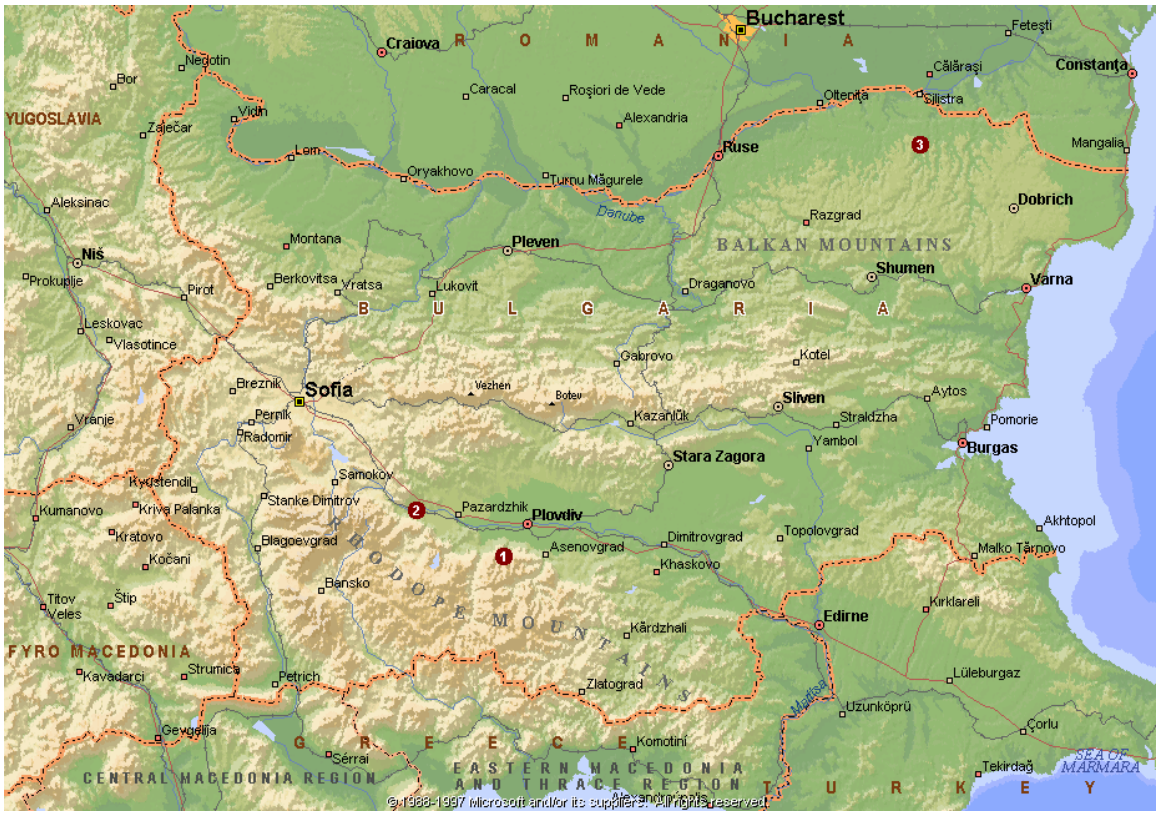


Figure 1: Map Bulgaria

1. Trakija Gas, Tumrush
2. Delektra Hydro, Lesitchevo
3. Wiwa Agrotex, Alfatar

A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

1 Trakija Gas:

The Tumrushka river is a left tributary to the Purvenetcka river, which is being formed by merging Tumrushka and Dormushka rivers. The river basin is located at the North slopes of the Rhodopes mountains, South-South-West from the town of Plovdiv. The hydrological station 303/72420 located on the Purvenetzka river above the Purvenetz village is in use since 1952. The flow of Tumrushka and Parvenetzka rivers has not been influenced by anthropogenic activities.

Results of the hydrological study for the SHHP Tumrush project development are given in the tables below:

Table A.4.1.4.1 Characteristics of River Discharge for a Mean-Water Year

Monthly distribution of river discharge:

Month	1	2	3	4	5	6	7	8	9	10	11	12	Q_{av}
Q_{mav}	0.674	0.800	1.694	2.680	3.124	1.545	0.740	0.386	0.279	0.290	0.353	0.611	1.100

Average duration curve:

T(Days)	1	2	3	10	20	30	40	60	90	120	150	180	210
Q_{ttam}	12.263	8.243	6.311	5.017	3.416	2.753	2.350	1.678	1.031	0.619	0.434	0.367	0.330

T(Days)	240	270	300	330	365	Q_{av}
Q_{ttam}	0.322	0.321	0.321	0.321	0.321	1.100

2 Delektra Hydro:

The SHPP Lesitchevo project is based on the utilization of the larger part of the water resource of the Belmeken-Sestrimo cascade, formed in the water-collecting areas of the rivers Struma, Mesta, Maritza and partly of Iskar river and which after the last stage of the cascade – the HPP Momina Klisura is transferred for irrigation needs to the Pjasacnik dam and the Pazardjik irrigation system. The system is one of the most complex ones built on the territory of the country. The small hydro power plant Lesitchevo will benefit from the used water potential of the cascade Belmeken-Sestrimo. The water is fed to the irrigation systems Karabunar, Varvara and Toplonitsa. The waters from HPP Momina Klisura are fed to the water collection basin of river Topolnitsa. This is done through a complex system, according to the government's priority.

- Water consumption for ecological needs – feeding the rivers Maritza and Topolnitsa;
- Water supply of Belovo and Pazardjik towns (household and industrial);
- Water supply of the irrigation system cited above ensures arable lands (river Topolnitsa 112,000 dca, Pjasacnik dam – 148,000 dca.

The larger part of the waters used by the HPP Momina Klisura are fed to the Pjasacnik dam from where the waters are regulated the different consumers of the Plovdiv-Pazarjik region.

3 Wiwa Agrotex:

The steam station burning biomass (straw) is property of Wiwa Agrotex Ltd, Dulovo city. The two new steam generating boilers are situated within a new industrial area of the newly constructed Bioetanol production plant. The area is situated on about 3 km from Alfatar town at the road from Alfatar to the town of Dobrich.
The steam station is built on an uncultivated and unusable land. The site of the station is located at about 50 m from a building, which 10 years ago has been a warehouse for straw and seed-corn processing. The steam station consists of two steam boilers with capacity of 2.8 MW_{th} each, 5.6 MW_{th} in total.

A.4.2. Category(ies) of project activity:

The methodology addresses to the renewable energy generation for a grid applicable for the two run-of-river hydro power plants Trakija and Delektra and thermal energy supply to the user directly in case of the Wiwa Agrotex project.

A.4.3. Technology to be implemented by the project activity:

1 Trakija Gas:

The scheme provides for the construction of the plant without a reservoir for levelling of the river flow fluctuations. For the full usage of the available flow the plant is going to operate continuously at river flows not less than 0,200 m^3/s.

The scheme for the construction SHPP Tumrush includes the following main components:

- Water intake (with a settling chamber and pressure basin) – to collect and mechanically water (see picture);

- Pressure pipeline – facility for taking the water from the water intake to the SHPP turbines, ensuring the necessary pressure for their operation;
- The building of the SHPP with mechanical and electrical equipment, necessary for energy production and lower channel for outflow the used water back to the river.

The water intake is constructed at the elevation of 715.00 m. It consists of the following construction elements:

- Overflow dam with a total length 16.00 m, including an overflall 10.50 m in length, flush passage 1.20 m wide, through which the minimum ecological water discharge is channelled, water intake trench, covered with a grid 3.60 m in length and distribution wall with total width of 0.70 m;
- Settling chamber for mechanical cleaning of the water from the intake trench;
- The water flows from the settling chamber into the pressure basin (chamber) and into the pressure pipeline. A water level indicator connected with the turbine controls is installed in the pressure chamber.

The water intake structure allows the processing of river flows up to 1.80¸2.00 m^3/s. During flood period, when there is significant amount of suspended solids, this particular design of intake will need frequent flushing.

The pressure pipeline is steewith diameter of 1,000 mm, laid in a trench 4,500 m in length. It starts from the pressure basin of the water intake and ends at the valve before the turbine in the SHPP building. The pipeline route consists of the following parts:

- First (from km 0+00 to km 1+978) 1,978 m long, starting from the pressure basin at the water intake, following the steep right river slope and going to the road between the villages Bojkovo - Hrabrino, with an inclination of about 0.9%
- The second (from km 1+978 to km 3 + 426) 1,448 m long follows exactly the road between the villages Bojkovo - Hrabrino, the pipe being laid to the right of the road (on the side of the trench). The average slope of is 6.58%
- The third (from km 3+426 to km 4+500) 1,074 m long starts from the road, passes a hilly terrain, in its large part with an insignificant cross inclination, crosses the ravine with an open piece and goes to the building of the SHPP. The average inclination is 22.42%.

The gross head of the pressure pipeline is 355 m. The pipeline can accommodate different flows with varying hydraulic losses. Within the optimum water velocity, the pipeline can provide a flow of 1,80 m^3/s with 23.76 m hydraulic losses resulting a net head at the turbine of 331.24 m.

One vertical axis turbine is delivered with a nominal generator capacity 5,300 kW, which fully covers the energy capacity of the project. The main equipment, installed in the turbine hall (see picture), is:

- Turbine type Pelton with 5 nozzles, design head 335 m and design flow 1.80 m^3/s;
- Synchronous generator with nominal capacity 5,300 kW at 1,000 min-1;
- Automatic turbine controls;
- Control board of the turbine;
- Spherical valve DN 500 before the turbine;
- Transformer HYUNDAI 6 MVA.

The turbine efficiency is relatively high based on the following:

- Allows for a high percentage of usage of the available river flow;
- The turbine operate with relatively high efficiency (82%) even at flows under 5% of the design flow (Qmin = 0.090 m^3/s, at Qdesign = 1.80 m3/s);
- A high total efficiency is being maintained (registered at the high voltage outlet of the transformer)in a wide range of flows:

Table A.4.3.1 Hydro Power Plant Efficiency

River Flow (m^3/s)	Efficiency (%)
0.100 ÷ 0.300	70 ÷ 80
0.300 ÷ 0.600	80 ÷ 85
0.600 ÷ 0.750	85 ÷ 86
0.750 ÷ 1.800	86 ÷ 87

The technology applied has been proven in other projects. However, the realisation of such projects in Bulgaria only takes place on a limited scale, mainly due to financial barriers. VA TECH Hydro is the supplier of equipment and responsible for on-site supervision of equipment installation and is bound by a performance bond. The installed hydropower equipment has to reach the maximum guarantee output value based on the technical specification in order to pay the supplier the full sum. The supplier is also financially restricted to complete the delivery within the deadline.

VA TECH has trained staff of Trakia on operational issues. Further training needs are annually reviewed by Mr. Nasko Stoianof of Trakia. Maintenance is also performed by VA TECH.

2 Delektra Hydro:

The SHPP Lesitchevo is constructed as a by-pass spillway from the end of the main irrigation channel Momina Klisura – Lesitchevo at the Lesitchevo village on the Topolnitsa river with elevation difference of approximately 60 meters. The project for SHPP Lesitchevo includes the following main facilities:

- Pressure basin (water chamber);
- Two-parallel pressure pipelines;
- The building of the SHPP with mechanical and electrical equipment, necessary for the power production and two lower channels for taking the outflow water to the Topolnitsa river;
- Existing spillway.

The pressure basin is constructed on the border between the end of the main irrigation channel and the spillway, as an extension at the left side of the channel. It provides maintaining of the upper operational water elevation 338.42 meters. From the intake section of the pressure basin begin two-parallel pressure pipeline, which end in the SHPP building. Longitudinal wall, shaped as overfall, and the right half of the channel, outline an overfall trench, which outflows at the beginning of the spillway. The main water outlet of the pressure basin also outflows in it. The pressure basin provides the necessary supply of water quantity to the SHPP.

The pressure pipeline of SHPP Lesitchevo is two-parallel .The pressure pipeline is laid along the left side of the spillway and follows parallel with its course. The pipeline is burrowed, and the first (basic) section with length 784 meters is constructed with pipes of fiberglass produced by the company HOBAS with diameter of 1,400 mm and stiffness SN 5000, and the second section with length approximately 20 meters, just next to the building of the SHPP – is constructed with steel pipes with diameter – 1,000 mm. The average longitudinal inclination of the pipeline is approximately 7,5%. The conditions for the pipeline construction are considered favourable, although there is missing data forthe size of the hydraulic water hammer in the pipeline at transitional working regime of the turbine of the SHPP when the generator trips off the grid.

One turbine on horizontal axis is installed and the second is going to be installed in the SHPP building of including the following equipment:

- Francis-type turbine F 23 with diameter of the working wheel 650 mm and 750 min-1, produced by “MAVEL” company
- Synchronic generator type 1FC4 711-8 with nominal capacity 1,700 kVA, cos = 0,9 and 750 min^{-1}, produced by “SIEMENS”.

The turbine of the SHPP is coupled to the grid through a transformer with nominal capacity 1,600 kVA at 6/20 kV. The energy indexes of the equipment – efficiency and capacity of the three elements – turbine, generator and transformer, as well as the total efficiency of the system, at different values of the water quantity, are presented in the table hereunder:

Table A.4.3.2 Energy Characteristics of Equipment

Water	Turbine		Generator		Transformer		Total
Quantity	Efficiency	Capacity	Efficiency	Capacity	Efficiency	Capacity	Efficiency
m^3/s	%	kW	%	kW	%	kW	%
3.20	87.9	1,593	95.9	1,527	98.5	1,505	83.0
3.00	88.9	1,510	95.9	1,448	98.5	1,427	84.0
2.73	89.2	1,379	95.9	1,322	98.5	1,303	84.3
2.50	78.0	662	94.8	628	98.5	619	72.8

The machine building of the SHPP is located on the right side of the river of Topolnitsa. The bottom elevation of the machine building is 278.00 m (the bottom elevation of the mounting site – 280.60 m).

The intake pipes of the two turbines outflow in independent outflow shafts, with water levelling of 278.77 meters, located outside the outlines of the building of the SHPP. The water outflows to the Topolnitsa river through short channels.

The energy potential of the project are estimated by the following elements:

- Water resource – water quantity and water volume, with which the turbine of the SHPP work and its internal annual distribution (energy usable volume)
- Topographic (geodesic) resource – gross (geodesic) head and net head of the SHPP
- Energy indexes of the equipment – efficiency of the turbine, generator and transformer, in dependence of the working regime of the turbine of the SHPP (loading).

The SHPP Lesitchevo project is based on the utilization of the bigger part of the water resource of the Belmeken-Sestrimo cascade, formed in the water-collecting areas of the Struma river, Mesta river, Maritza river and partly of Iskar river, which after the last stage of the cascade – the HPP Momina Klisura is transferred for irrigation needs to the Pjasachnik dam and Pazardjik irrigation system through the following scheme:

The used waters from the HPP Momina Klisura, which works at peak load with maximum water quantity 56,6 m^3/s, through a siphon under Maritza river and tunnel No.1, are fed for levelling to Momina Klisura.

The usable levelling volume – 500,000 m^3 – allows full daily levelling (regulating) of the outfall waters from HPP Momina Klisura. The levelling water flow through the main irrigation channel Momina Klisura – Lesitchevo (which includes tunnel sections (tunnel No.2 and tunnel No.3) and open channel sections, including spillway with elevation difference approximately 60 meters) to the Topolnitsa river above the Lesitchevo dam. From there, the water combines with the water from the Topolnitsa dam, through main irrigation channel Lesitchevo-Strjama. They flow to the Pjasachnik dam and finally into the Pazardjic irrigation system.

The used waters from Belmeken-Sestrimo cascade could be calculated through the power production of the HPP Momina Klisura and the specific water consumption of 1,72 m^3/ kWh for the production of 1kWh electric energy (). At the outflow of the HPP Momina Klisura, also along the length of the main irrigation channel Momina Klisura – Lesitchevo, there is deviation of waters for irrigation, as well as for

industrial water supply of the town of Belmeken. By an expert estimation their consumption is amounting to approximately 15% from the total volume, which is fed by the HPP Momina Klisura. The rest of 85% is considered as available water volume for the power production at the SHPP Lesitchevo.

The gross (geodesic) head of the HPP is estimated as elevation difference between the water level in the pressure basin – 338.45 m and water level in the outflow shaft (the outflow) of the HPP – 278.77 m and amounts to 59.65 m.

The hydraulic losses in the pipeline are estimated, considering the fact that it is two-parallel. As a design net head (at Qmax = 3.20 m^3/s for the turbine) is estimated the value 58.70 m. The average quantitative value of the annual available volume and its monthly distribution is based on the data for the power production of HPP Momina Klisura for a 29-year period (from 1974 to 2002). The estimation of the expected power production of the SHPP Lesitchevo for mean-water year is based on the following:

- Energy usable volumes are equal to the volumes available up to the maximum flow capacity of the turbine of 3.20 m^3/s;
- The volumes, which exceed the maximum flow speed of the turbine flow through the overfall and the spillway of the pressure basin;
- The calculations are conducted monthly for the whole 29-year period, after which they are averaged.

Staff of Delektra Hydro was trained by the supplier. Training needs are annually reviewed by the management of Delektra Hydro. Maintenance is performed by the company itself on a regular basis, at least once a year.

3 Wiwa Agrotex:

The steam production based on biomass is proven technology, but the use of straw as biomass source has not yet often been applied in Bulgaria.

The new steam station, which mainly burns biomass, is built on an uncultivated land, which is not usable for agricultural purposes. The site for the station is located 50 m from a building, which 10 years ago has been a warehouse for straw and seed-corn processing. At present, this complex is not in use due to the wrecked facility. Only the bearing columns and the laminated iron ceiling of the warehouse are usable. After its rehabilitation, the warehouse will fulfil its function as main straw warehouse. Galvanized corrugated sheet will be used for replacement of the existing ceiling. A belt conveyor will be installed lengthwise to the warehouse. The site of the steam station is situated between the steam consumers– the fodder plant, the plant for bio ethanol production and the warehouse - and is equally far from them. Part of the steam line connecting the consumers with the steam station will be placed under the ground, and the remaining part will be laid above the ground. In the vicinity of the steam station, two warehouses for daily straw storage and the ion-exchange facility shall be built. The ion-exchange facility is used for water softening.

The constructed steam boilers will work with lower output and higher excess of air – 1.5 when they will burn biomass in comparison with the heavy fuel oil/ light fuel oil case. Hence, their efficiency will be lower – about 0.7 instead of 0.85.(the heavy fuel oil/light fuel oil case). Periodical blow-down of the dust accumulated on the tubes of the inner wet-back reserving chamber is necessary. The dust results from the straw combustion. The capacity of the warehouse for seasonal storage is sufficient to ensure an all-year round storage of straw for the needs of the boiler. Fire protection measures are provided and the electric cables are protected against rodents. The output of the ion exchange facility is high enough and can work in an automatic regime. The generated thermal energy amounts to 128,478 GJ/year, and the consumed electric energy by the boiler house is estimated to the 1,667.040 kWh/year.

Personnel is trained on the job. Mr. Radoslav Shynk is responsible for training and knowledge of personnel. Operation and maintenance is performed by shift personnel of Wiwa on a regular basis. Mr. Ivan Taskov is responsible for operation and maintenance of the boilers and straw conditioning.

A.4.4. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed JI project activity, including why the emission reductions would not occur in the absence of the proposed project activity, taking into account national and/or sectoral policies and circumstances:

Baseline scenario

National energy market[2]

The final energy consumption in the country in the period 1987-1989 was almost constant, approximately 891,000 TJ. However sins 1990 it is constantly decreasing. Bulgaria depends largely on imports to meet its energy needs. The country has virtually no oil reserves and extremely low amounts of natural gas deposits. Its energy import account for more that 70% of the primary energy resources. GDP is highly energy intensive, which energy use per unit of output estimated to be up to two times higher than comparable market economies.

Bulgaria balances its dependence on international sources of energy with its strategic location, which allows Bulgaria to serve as an integral transporter of energy from Russia to South-eastern Europe and Turkey. In the Figure 2 the final energy demand in Bulgaria in 1999 has been presented.

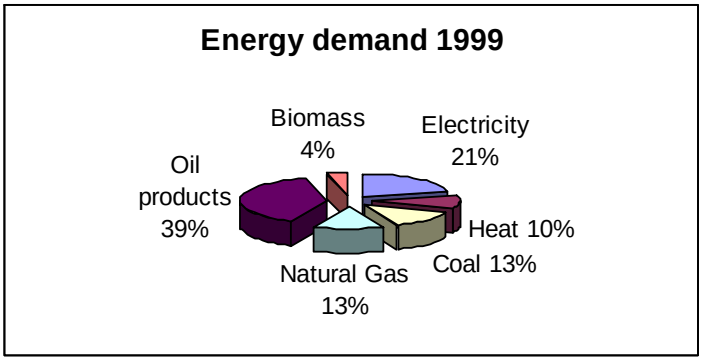


Figure 2: Final energy demand in Bulgaria, 1999 [3]

An historical summary of Bulgaria's Total Primary Energy Production (TPEP) and Consumption (TPEC) is shown in the table hereunder.

Table A.4.4.1 Bulgaria's TPEP and TPEC, 1990-2002 (in Quads) [4]

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
TPEP	0.41	0.35	0.33	0.35	0.36	0.40	0.43	0.42	0.42	0.37	0.41	0.41	0.43
TPEC	1.18	0.92	0.90	0.85	0.84	0.92	0.95	0.92	0.85	0.77	0.88	0.91	0.85

note: 1 Quad = 1 quadrillion Btu

[2] U.S. Department of Energy Office of Fossil Energy, An Energy Overview of the Republic of Bulgaria, 2005

[3] Source: Third National Communication on Climate Change, Sofia 2002

[4] Source: DOE/EIA

The energy consumption per capita in Bulgaria is approximately two times less in comparison with other Eastern European countries, because of the severe economic slowdown in the 90s. The economic growth is rising again and therefore it is expected that energy demand will keep increasing for the next decade.

Installed power generation units in the country have a capacity of 12,283 MW (actual 9,735 MW) distributed as follows:

Table A.4.4.2 Distribution of the installed power generation units (2003)[5]

Power plants	Installed capacity		Available capacity	
	MW	%	MW	%
Thermal Power Plants	6,564	53,4	4,915	50,5
Nuclear Power Plants	2,880	23,4	2,600	26,7
Hydro and CH Power Plants	2,839	23,1	2,220	22,8

From Thermal Power Plants:

(i) on lignite – 50.2%;
(ii) on imported coal – 28.3%;
(iii) on natural gas and oil – 21.5%.

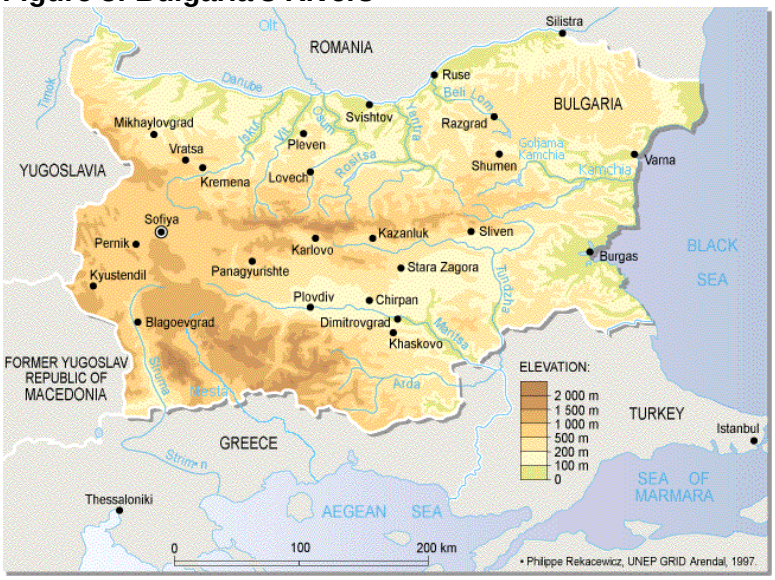
Bulgaria's most plentiful resource is low quality, brown lignite coal. However, domestic consumption still exceeds production, requiring large amounts of coal imports from the international market, particularly from the Ukraine. The Bulgarian Energy Strategy calls for US$437 million investment in the coal sector to increase production through refurbishing facilities and incorporating newer technologies.

Hydroelectric power

There are three drainage basins in Bulgaria. The Danube River basin occupies most of the northern half of the country and includes two major tributaries, the Iskur and the Yantra, each of which flows north through Bulgaria to the Danube. The Danube itself forms much of Bulgaria's northern border with Romania as it flows eastward toward the Black Sea. Most of the southern half of Bulgaria is part of the Aegean Sea drainage basin, and includes rivers that flow south and southeast toward the Aegean. The most important of these is the Maritsa River, the deepest river in the Aegean basin, which rises in south-western Bulgaria and flows east and then southeast before it leaves Bulgaria and forms the border between Greece and Turkey before it empties into the Aegean. Other important Bulgarian rivers in the Aegean basin are the Struma and the Mesta, both of which flow southward into Greece before emptying directly into the Aegean, the Arda, which flows into Greece before merging with the Maritza, and the Tundzha, which flows into Turkey before merging with the Maritza. Wedged between these two basins, in the eastern section of the country, is a separate Black Sea basin with rivers that flow into the Black Sea without first merging with the Danube. The largest and most important of these is the Kamchia River, which enters the Black Sea south of Varna. A map of Bulgaria's major rivers is shown in Figure 3.

[5] Austrian Energy Agency: Energy Profile Bulgaria, 2005

Figure 3: Bulgaria's Rivers[6]



There are six large complexes of cascading dams. Each one consists of at least three hydroelectric power plants, totaling 18 stations. The Belmeken-Sestrimo-Chaira cascade, Batak cascade, and Arda cascade are in the Rodopi mountains; the Vacha cascade and Iskar cascade are in the Rila mountains; and the Sandanska Bistritsa cascade is in the Pirin mountains. A summary of Bulgaria's major hydroelectric generating facilities is shown in Table F.1.1.

Table F.1.1 Hydroelectric Generating Facilities in Bulgaria

Power Station	River	Capacity (MWe)	Cascade
Belmeken	Cherna Mesta	375	Belmeken-Sestrimo-Chiara
Sestrimo	Cherna Mesta	240	
Momina Klisura	n/a	120	
Chaira (pumped storage)[7]	Cherna Mesta	720	
Teshel	Vacha	60	Vacha
Devin	Vacha	80	
Tsankov Kamak	*Vacha*	*80*	
Anton Ivanovtsi	Vacha	160	
Vacha II	Vacha	14	
Krichim	Vacha	80	
Vacha I	Vacha	7	
Batak	Batak	40	Batak
n/a	Batak	125	
n/a	Batak	66	
n/a	Arda	106	Arda
n/a	Arda	60	
n/a	Arda	108	
Beli Iskar	Beli Iskar	17	Iskar
Mala Tsarkva	Levi Iskar	8	
Simeonovo	Iskar	6	
Pasarel	Iskar	32	
Kokaliane	Iskar	22	
Popina Laka	Sandanska Bistritsa	21	Sandanska Bistritsa
Lilianovo	Sandanska Bistritsa	20	

[6] Source: UNEP GRID-Arendel

[7] Utilizes water from Belmeken reservoir; when operating in pumping mode, power input requirement is 540 MWe
Sources: NEK, Bulgarian Energy Agency

Sandanski	Sandanska Bistritsa	14	
Pirin	Pirinska Bistritsa	21	Pirinska Bistritsa
Spanchevo	Pirinska Bistritsa	28	
Other hydroelectric	n/a	147	n/a

n/a - not available or not applicable
note: Tsankov Kamak facility still in design/construction phase

Bulgaria has modest hydroelectric resources. Water accumulates in approximately 50 large reservoirs, with capacities ranging from 15 million to more than 2,100 million cubic feet. The uses range from drinking and industrial water supply to irrigation and electricity generation. Due to decreased rainfall and the slowdown of the Bulgarian economy in recent years, hydroelectric power generation has only operated at about half of the nameplate capacity.

Small and micro hydro sector[8]

The studies indicate possibilities for construction of 156 new HPPs with total capacity of 2,800 MW, as well as - about 800 new micro-HPPs with a capacity of below 2,000 kW each. Four river valleys (Sreden Iskar, Gorna Arda, Sredna Vacha and Danube) defined to have top priority in construction of big and small HPPs with better technical and economic indices are explored.

Total hydro-energy potential of the country:

Hydro energy is the main and currently almost the only renewable energy source in use for electricity production.

Bulgaria has scarce water resources (2,380 m^3 per capita annually). Due to the high elevation of some country areas the theoretical hydro-energy potential accounts to 24.6 TWh in an average flow year. The technical potential is about 57% of the theoretical potential. It is estimated to be 15 TWh. These figures are achieved on a base of feasibility studies about future construction of HPPs allover the country territory.

Utilized hydro-energy potential:

Up to 2002 there exist 99 HPPs. Ten of them are decommissioned, i.e. 89 HPPs are currently operating efficiently in the national power grid. Compared to the total installed capacity the HPPs' share is 16.6% and 5-7% of the country electricity production. According to design data the installed capacity in HPPs reaches up to 1,996 MW and the electricity generation in average year should equal to 4.6 TWh. Due to rain decrease (cycle and global) and the significant water recourses used for water supply, irrigation and ecological purposes which haven't been taken into account in the projects the average electricity generation during the last 25 years was only about 60% of the designed.

Actually the existing HPPs use 30% of the national technical potential.

Small HPPs:

- "Sreden Iskar" cascade

Fourty dam sites with reservoirs and power plants with total capacity of 93 MW and annual electricity production of 520 GWh could be constructed here. The average annual utilization of the installed capacities will be 5,590 hours.

- "Gorna Arda" cascade

The Arda River is the third largest river with regard to the high water next to Maritza and Struma rivers. But at the same time it exceeds them by high waters volume, volume of constant outflow, specific high water with regard to time distribution and the impact of Mediterranean climate along the river.

The three river's steps already constructed are of great importance as far as they can be used as an example in case of further investments. New water catchments with plants are considered for

[8] Study on Standard Multi Project Baseline for Joint Implementation Projects in the Bulgarian Power Sector, National Electricity Company (NEK), Bulgaria, 09.05.2005

construction. As a whole the cascade could provide total capacity of 174 MW and annual electricity production of 487 GWh.

- "Sredna Vacha" cascade

The "Vacha" cascade as a whole is planned as combined cascade construction with down-lake plans (Tzankov kamak, Mihalkovo, Antonivanovtzi, Vacha II) as well as derivation plants (Teshel, Devin, Krichim and Vach I).

Six HPPs in the cascade with total capacity of 400 MW are operating and a new HPP "Tzankov kamak" is under construction as Joint Implementation project.

Micro-HPPs

Theoretical and technically feasible micro-HPP potential in Bulgaria:

Recently a great attention is paid to the micro-hydro-energy potential. This potential is represented by the micro-HPPs (without international recognition). In the counties with high hydro potential the upper limit is identified at 10,000 kW. The 1982-88 study on the micro-HPPs over the whole country territory proves these potential to be a significant one. Within the range of 30-2,000 kW plant capacity 779 power plants data are systematized with total capacity of 237 MW and 921 million kWh electricity generation. These numbers include 730 micro-HPPs to be constructed with 210 MW capacity and 795 million electricity production. The rest 49 plants already exist. The above figures include the so called technical potential. It includes water sources with winter flow above 100 l/sec situated in areas suitable for construction and exploitation. The theoretical potential is considerably higher but unspecified yet.

Data on the constructed micro-HPPs:

The construction of micro-HPPs is not a new direction in the Bulgarian hydro-energy construction. At the beginning of our century some HPPs were constructed for the needs of some communities and especially as energy sources for lots of private industrial enterprises. Now these HPPs are considered micro-HPPs. The existing HPP with capacity to 2,000 kW are 49 but only 41 of them are in operation. The remaining 8 are decommissioned because of different reasons. Their total capacity is 25.25 MW and the planned electricity generation is 121.4 kWh.

A characteristic feature of the existing micro-HPPs is their situation at the West highlands of the country. Predominantly these micro-HPPs have low water pressure, small water quantities and low capacity. Most of these devices are still in operation after exploitation of 50-60 years already.

The planned electricity production of the micro-HPPs is considerably different from the real one within the range of 60-65%. The key reason is the lower efficiency coefficient of the old devices.

<u>Renewable Energy from Biomass</u>

Only small amounts of non-hydroelectric renewable energy are presently being produced in Bulgaria. The most significant contributor is biomass-fuelled thermal-electric power generation. In 2001, about 0.03 billion kWh (about 0.1% of the total electricity generation) was from biomass-fuelled power plants. Bulgaria's National Program on Renewable Energy Sources has a goal of significantly increasing the share of non-hydroelectric renewables in Bulgaria's energy mix. The share of biomass in energy production raised to 2.84% in 2004. Certain biomass opportunities are envisaged in the industry sector (switch from coal and/or oil to wood chips) and district heating. In the medium term use of straw and other agricultural by-products can be used in appropriate biomass boilers for heat supply of farms and small villages.

<u>Wiwa Agrotex</u>

In the city of Alfatar, a bio fuel plant (bioethanol, used as a supplement to petroleum) is being built, which process requires saturated steam with pressure - 8 bar and temperature – 194^{o}C.
According to the project for plants' boiler house, the heat load will be provided by the installed 2 steam boilers (type PKM-4 with main fuel –heavy fuel oil) at the plant site. The annual energy costs for steam generation are assessed to about 3,962 tones of heavy fuel oil and to 768 MWh of electricity. Table

below presents the technical-economical parameters of the bio fuel plants' boiler house according to the design data. The boilers burring heavy fuel oil, will be used as a supplement to the boilers burring biomass. Therefore, their characteristics are assumed as a reference.

Design technical-economical parameters of the plants' bio fuel boiler station

1. Present state	Value	Dimension
Working hours of steam boiler (PKM-4)	7,248	h/y
Heavy fuel oil consumption	3,962	ton/y
Released energy from the heavy fuel oil combustion	138,756	GJ/y
Steam for the heavy fuel oil heater	11,101	GJ/y
Steam boiler efficiency	88%	
Installed electric power	106	kW
Electricity consumptino for the boiler house needs	768,288	kWh/y
Electricity consumptino for the boiler house needs	2,766	GJ/y
Water consumption	0	m^3/год
Heavy fuel oil expenditures	**824,424**	**EUR/y**
Salaries and social securities costs	**5,915**	**EUR/y**
General production expenditures	**858,818**	**EUR/y**

Forecast of the monthly steam load distribution for process steam and steam for heating purposes of the plant for bioethanol

Month	For 2006					
	Consumed Thermal Energy					
	%	Process	Heating	Total	Working hours	Steam production
		GJ	GJ	GJ		t пара
January	10.27%	13,187	1.08	13,189	744	5,208
Februray	9.27%	11,911	1.08	11,912	672	4,704
March	10.27%	13,187	0.97	13,188	744	5,208
April	9.93%	12,762	0.86	12,763	720	5,040
May	10.26%	13,187	0	13,187	744	5,208
June	4.97%	6,381	0	6,381	360	2,520
July	4.97%	6,381	0	6,381	360	2,520
August	4.97%	6,381	0	6,381	360	2,520
September	9.93%	12,762	0	12,762	720	5,040
October	10.27%	13,187	0.86	13,188	744	5,208
November	9.93%	12,762	0.97	12,763	720	5,040
December	4.97%	6,381	1.08	6,382	360	2,520
Total:	100%	128,471	6.9	128,478	7248	50,739

It can be observed from the presented data in table here above that the bio fuel plant in Alfatar necessitates steam to the amount of 128,478 GJ (50,739 tones steam), 128,471 GJ of which are for process needs and 6.9 GJ for heating purposes. The total production costs of the built steam station, which burns heavy fuel oil, are assessed to EUR 858,818 annually. Reduction of the steam cost, and of the emissions noxious substances, for the bioethanol plant can be achieved through the implementation of the Wiwa Agrotex Ltd. Rational Energy Utilisation Project.

Project scenario

Hydropower plants

The existence of the proposed Hydroelectric Projects increases the amount of renewable energy supplied to the grid, diversifying the energy production sector. The fact that hydroelectric plants have a

low cost for energy production and are managed to optimize the use of water means that hydro facilities have a higher dispatch priority than thermal coal-based generators. Thus, the increase of low-cost hydro energy availability will reduce the use of higher-cost energy produced by fossil fuel fired power plants. As a result without the hydropower upgrade and expansion projects, an increase in demand would result in first the low cost hydropower units coming online and then residual fuel oil and then diesel generation. Net GHG emissions will therefore be reduced by the reduction using the combined build and operating margin.

Wiwa Agrotex

The steam station, burning biomass and subject to the present report, at installed capacity of the steam boilers - 5.6 MW will generate thermal energy to the amount of 128,478 GJ/year. According to the published energy balance, the gross inland energy consumption in the country in 2002 is 19,205 K tons of oil equivalent, 639K tons (3.3%)of which are owed to biomass. The biomass consumption at Wiwa Agrotex Ltd would be 0,7% of the total consumption of biomass energy resources in the country. The estimated steam generation from the steam station is 3,962 tons of oil equivalent, i.e. 0.037%of the total final consumption of energy resources.

Determination of why the emissions in the baseline scenario would likely exceed emissions in the project scenario:

The financial investment climate in Bulgaria is not facilitating major investments in the energy sector. The required payback times are far too short for these types of enormous investments. Generally, the energy sector makes investments for a lifetime of 20 years. Bulgarian banks require lower payback times up to 7 years. In general companies in Bulgaria have limited capital to invest because of the poor economic development in the past years. Especially companies in the energy sector that do not export and fully depend on the domestic situation, have very limited cash possibilities. The state-of-the-art technology from mostly western technology suppliers makes these investments even more expensive. The additional revenue coming from the sales of emission reductions will help these projects to become economically viable.

A.4.4.1. Estimated amount of emission reductions over the chosen crediting period:

The total estimate of anticipated CO_2 reductions over the crediting period is 378,524 t CO_{2eq}. For emissions' reductions calculations please refer to Section E.

A.4.5. Public funding of the project activity:

The BEERECL facility foresees the payment of a bonus, if the project is completed successfully. This bonus, the so called KIDSF grant, is paid or by the Kozloduy fund (public fund).

SECTION B. Application of a baseline methodology

B.1. Title and reference of the approved baseline methodology applied to the project activity:

The HHP project use the approved baseline methodology AMS-I.D "Renewable electricity generation for a grid".
The Wiwa project uses the approved ASM-I.C "Thermal Energy for the user".

B.1.1. Justification of the choice of the methodology and why it is applicable to the project activity:

The chosen methodology AMS-I.D is designed for grid-connected renewable power generation project activities. The conditions for the methodology to be applicable are respected:

- the proposed two project activities apply to electricity capacity additions from run-of-river hydro power plants
- generated electricity is supplied to an electricity national distribution system that is supplied by diverse fossil fuels (see Section A.4.4)
- the eligibility limit of 15 MW/y per project is respected.

ASM-I.C comprises renewable energy technologies that supply individual households and users with thermal energy that displaces fossil fuels. No upgrading of existing equipment is planned at the Wiwa plant. The project aims to install two new straw fired steam boilers.

B.2. Description of how the methodology is applied in the context of the project activity:

A. *The baselines of the three proposed projects have been defined*
The chosen methodology has been applied in the context of the project through determining the emissions factor for the Bulgarian grid. The Study on Standard Multi Project Baseline for Joint Implementation Projects in the Bulgarian Power Sector (see reference 9), performed by the National Electricity Company and approved by the Ministry of Energy and Energy Resources and the national focal point for climate change of Bulgaria, has been used.

B. *The additionality test for small scale projects has been applied, where the analysis of the barriers to the project have been made*
The additionality questions have been answered, and the answers substantiated with documented evidence, in such a way as to clarify why the project would not occur in the absence of the JI.
There were the following barriers identified: investment barriers - regarding economical market development in the host country and financial unattractiveness of small scale HPP and Biomass projects, prevailing barriers – where political situation has been analysed and situation in the energy sector in a view of common practice in Bulgaria, other barriers – where political and administrative situation in the country has been analysed and where uncertainness of the provided data for the carbon credits calculations has been identified. It has been concluded that the approval and implementation of the project activity as a JI activity will alleviate the financial hurdles and other identified barriers and thus enable the project to be undertaken.

C. *The boundaries of the projects have been identified*
For each project boundaries systems have been defined, where all relevant installations have been listed and their emissions.

D. Crediting period

According to JI restrictions, crediting period is 5 years, 2008-2012. The projects will, however, generate credits before 2008, so-called AAUs. These have been taken in the emission reductions calculations and in the total amount of the proposed credits.

E. Monitoring Plan

A simplified monitoring methodology has been applied in the three projects in accordance with paragraph 28 of the simplified modalities and procedures for small-scale CDM (JI) project activities.

F. Calculations of the emission factor

The calculations have been based on historical data. Simple Operational Margin and Build Margin have been calculated. Emission factor for electricity is presented by Combined Margin.

Dispatch Data Analysis could be applied because:

- No dispatch order is available to determine the top 10% of grid system dispatch order
- The grid system dispatch order of operation for each power plant of the system is not available
- The amount of power (MWh) that is dispatched from all plants in the system during each hour that the project activity is operating is not available.

Average OM could not be used because:

- Low cost/must run resources constitute less than 50% of the total grid generation
- Detailed data to apply option c is not available

Simple adjusted OM could not be used because:

- Chronological load data for each hour of the year is not available
- Low cost must run resources in Bulgaria are estimated on 8% of the total generation. We consider this as a too small amount to significantly impact the lambda factor on the margin.

Method a (Simple OM) is applicable because:

- We define low cost must run resources as follows: low cost must run resources typically include hydro, geothermal, wind, low-cost biomass, nuclear, and solar generation. As shown in table below, these resources are not expected to constitute more than 50% of the total grid generation between now and 2010.[9]

Operating and Build Margins were used to calculate the emission factor for the electric grid. Considering that Bulgaria has a substantial share of its total produced electricity being provided by hydropower – a low-cost source – the Operating Margin was calculated using data from the National Electricity Company and adjusted to include the biggest hydropower plants. Then, using both of these derived "margins" to determine the Combined Margin, it was possible to estimate the emission factor of the grid and therefore know "what would happen otherwise", in terms of GHG emissions.

Furthermore, IPCC factors for fossil fuels have been applied (for natural gas, heavy oils and coal)[10].

G. Calculations of the emission reductions

Emission reductions are presented by the difference between project scenario and baseline scenario:

- In case of HPP it's amount of MW delivered to the grid.

The emission reductions for the Wiwa project has been calculated as follows:

- Electricity consumption from the National Network in the baseline scenario multiplied with emission factor calculated accordingly to the method described above;
- Plus Heavy oil consumption in the baseline scenario multiplied with IPCC emission factor[11];

[9] Source: Review of Status of Emissions Trading Activities in CG11 Countries, 2002

[10] Country-Specific Net Calorific Values, n the Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories

- Plus Transport Emission Losses in the baseline scenario that are 10% of the Combined Margin factor;
- Minus electricity consumption from the National Network in the project scenario multiplied with electricity emission factor;
- Minus straw consumption multiplied with diesel fuel consumption for unit straw collection and transportation, multiplied with diesel IPCC emission factor[12];
- Minus Transport Emission Losses (for electricity purchased from the National Grid) in the project scenario that are 10% of the Combined Margin factor.

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered JI project activity:

The emission reductions generated by the proposed projects meet the CDM Executive Boards definition of additionality by (i) having taken JI into account at the earliest stages of project development, (ii) using technology that would otherwise not be used to meet new capacity needs in Bulgaria, (thus the GHG emission reductions would not otherwise have occurred in the business as usual scenario), and (iii) carbon financing was integral in arranging the long-term financing for the project.

The salient point for the proposed projects is that JI has been a long-standing component of the project and contributed to the decision to move forward with the investment.

According to the Attachment A to Appendix B of the simplified modalities and procedures for CDM (JI) small scale project activities evidence to why the proposed project is additional is offered under the following categories of barriers: (a) investment barrier, (b) technological barrier, (c) prevailing practice and (d) other barriers such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher.

(a) Bulgaria is an economy in transition. In Bulgaria project developers for small scale renewable energy projects are faced with poor access to commercial long term financing. Normally a project investment is financed with own means and commercial loans. For this type of projects, commercial loans have hardly been accessible before the EBRD's BEERECL facility was introduced. E.g. UBB has not financed any small scale renewable energy projects before BEERECL was introduced. Partly because of the relatively high overhead for banks associated with these small scale projects and partly because of unfavourable terms and conditions of the loans for the project developers. The BEERECL facility solves the main problems, without causing interference in the market conditions. E.g. BEERECL's interest rates are in line with market interest rates. Because the subprojects will receive a bonus, if implemented successfully, and can receive additional cash flow from selling carbon credits (ERUs), tenures can be longer (including a grace period) and a lower share of securities is requested (100% instead of > 150% of loan amount), leading to better terms and conditions for the project developer of this type of projects than "regular" commercial loans. BEERECL also provides incentives to the participating banks to overcome the relatively high overhead costs for small scale projects.

(b) Currently the green electricity is sold at a premium price, but the preferential treatment will most probably disappear since the Energy Law will allow a system of Green Certificates. The system was initially likely to be changed in 2006, but it is not clear if the "new" government strives for this change in the near future too. By the introduction of green certificates, it is likely that the generation of renewable energy will receive a market price. Prediction of the market price is unsafe, so any cash flow resulting from the sale of green certificates is uncertain. For

[11] In the Revised 1996 IPCC Guidelines, fuel type is specified as "Light Fuel Oil/Diesel"

[12] In the Revised 1996 IPCC Guidelines, fuel type is specified as "Oil"

development of new renewable energy projects, this is an important barrier. For small scale biomass projects the situation might even worsen, when utilities are starting their own biomass operations (in order to generate the required amount of Green Certificates). Presumably such projects will be large scale, to benefit from economies of scale, and may lead to higher biomass market prices.

(c) Overall, the predominant and known technology is thermal plants and all experience is oriented to that technology. The lack of available knowledge and confidence in the technologies involved in small, privately built hydroelectric projects makes this type of development non-existent and difficult to establish, despite the good potential in Bulgaria. Straw as fuel for boilers on a small scale has not been established before in Bulgaria. As a result, the government and Banks see thermal plants as less risky. This risk is reflected in the fact that well under very little percentage of the current hydro capacity represents small hydro plants (below 15 MW capacity). Other small hydro plants that are under construction in Bulgaria, are often JI projects too. Europe studies show high potential for biomass projects. Fuel switch projects cover mainly coal or oil to wood on a large scale. This project is among the first movers from fossil fuel to straw.

(d) The incomes of small HPP from electricity sale are at average 19% of the investment and are therefore insufficient to secure the operation and maintenance costs (OMC) and the bay-back of the investment.

The micro HPPs income is even worse than that of small HPPs. The incomes from electricity sale are 11% of the investment at average and the operation and maintenance costs can hardly be covered, let alone servicing of the eventual construction loan. Therefore the construction of micro hydro is not developed. The only exceptions are some extreme cases of construction of HPPs on existing water-supply systems of big and medium settlements.

The basic reasons for small and micro HPPs being unviable can be determined as:

– high specific investment;
– low loading factor;
– low price of electricity from renewables.

The low loading factor is determined by the climatic conditions and could be changed only through reduction of the HPPs' capacities.
Privately financed, built and operated small hydro plants are not common practice in Bulgaria. The primary barriers within the institutional and regulatory framework are the unclear process, sudden and unsubstantiated changes to the legal process, and timing for completing licenses and permits. The existing feed-in tariff structure will be replaced by a system of green certificates. All of these issues amount to enough (financial) uncertainty to deter many project developers from starting small-scale energy projects and financial institutions from supporting project that choose to do so.

The time frame for the legal documentation required to develop small renewable energy projects has proven to be more than two years for each project.

(e) Other barriers for the realisation of such projects in Bulgaria is lack of awareness on technologies for generation of renewable energy and lack of successful example projects, demonstrating for both possible investors and businesses that these types of projects can be implemented successfully in the country. This is especially true for Wiwa Agrotex, because it is the first of its kind in Bulgaria.

Because of danger of flooding during the summer and autumn times, the small HHP installation can be easily flooded and damaged. The necessary repairs take usually several months and are expensive. The water intake can be blocked with soil, transported by the floods, but can also be freed. Environmental risks associated with the construction of SHPPs and SBPP could be related to biodiversity, water management and affecting of the forest during the construction phase. Because the projects are relatively small-scale, the effects are limited. Furthermore, the

risks are minimised by adhering to all environmental requirements and contacting the responsible authorities at an early stage, as well as by taking technical measures.

(f) The baseline calculations for the HPP projects can be influenced by changing the course of development in the nuclear power sector in Bulgaria. The economy and therefore energy demand in the country is dynamically growing. There are plans to build new nuclear power plant(s), however these plans are not confirmed yet.

The build margin has been calculated on basis of current political decisions and predictions where old nuclear installations will partly be closed and there will be no new one implemented. The emission factor for the baseline scenario could thus strongly decrease in case the Government of Bulgaria will decide to build a new nuclear power plant however the probability of this scenario is very low.

(g) Articles 12, 13 of decision 17/CP.7 and article 1(c) of decision 18/CP.9, allow a starting date of CDM projects before their registration. This means that project activities that have already started to operate, can still be considered additional if they meet the additionality criteria. The emission reductions generated by this project meet the CDM/JI Executive Boards definition of additionality by (i) having taken CDM/JI into account at the earliest stages of project development, (ii) using technology that would otherwise not be used to meet new capacity needs in Bulgaria (thus the GHG emission reductions would not otherwise have occurred in the business as usual scenario), and (iii) carbon financing was integral in arranging the long-term financing for the projects.

Conclusions

The current and expected practice of energy production is predominantly relying on thermal sources and some large hydro in expanding the generation capacity. The combination of lack of access to finance, institutional and regulatory barriers, and perceived risks of the selected technology, clearly demonstrate that the proposed Hydro and Biomass projects are additional and therefore not the baseline scenario.

The approval and registration of the project activity as a JI activity, and the benefits and incentives derived from the project activity, will alleviate the financial hurdles and other identified barriers and thus enable the projects to be undertaken.

Registering the project as a JI project will attract foreign investors that bring capacity to operate successfully on the Bulgarian electricity power market. This will enable Bulgaria to make its energy production system more sustainable by duplicating this kind of projects.

JI registration results in reducing inflation/exchange rate risk affecting expected revenues and attractiveness for investors. Transaction risk is the risk that the value of a cash flow in foreign currency, measured in the company's functional currency, will change due to a change in exchange rate. This definition indicates that this involves cash flow in a foreign currency, where the value of this cash flow in the functional currency can fluctuate between the moment the cash flow is announced and the moment the transaction actually takes place. This is especially important since most of the equipment used is imported.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the project activity:

The project boundary is defined as the notional margin around a project within which the project's impact (in terms of carbon emission reductions) will be assessed.

Hydropower plants

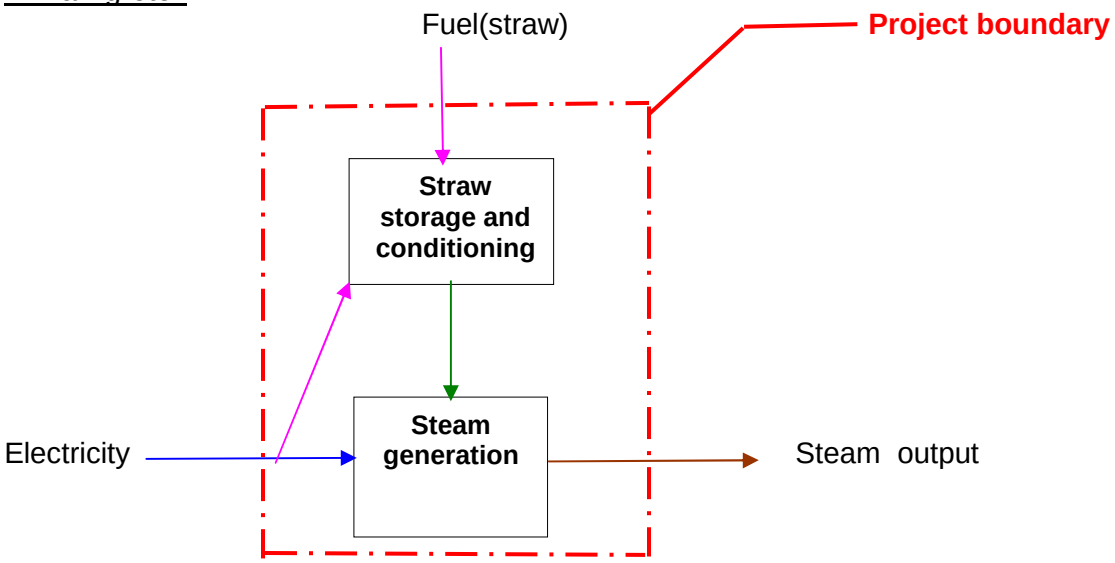
As referred to in Appendix B for small-scale project activities, the project boundary for a small scale hydropower project that provides electricity to a grid encompasses the physical, geographical site of the renewable generation source. For the proposed projects this includes emissions from activities that occur at the project locations. The system boundary for the proposed projects is defined as the national grid in Bulgaria. The project boundary for the baseline will include all the direct emissions, being the emissions related to the electricity produced by the facilities and power plants to be replaced by each power plant. This involves emissions from displaced fossil fuel use at power plants.

Conforming to the guidance and rules for small scale project activities, the emissions related to production, transport and distribution of the fuel used for the power plants in the baseline are not included in the project boundary as these do not occur at the physical and geographical site of the project. For the same reason the emissions related to the transport are also excluded from the project boundary, except for the biomass project.
Furthermore the boundary is applied to the project activity by considering:

- reduction of emissions from thermal plants supplying the national electric grid
- methane emissions from flooding to create the reservoir.

In this project, the emissions from flooding and transportation are determined to be zero (see section E.1). Any effect of transmission and distribution (T&D) losses from the lines, transformers, and other downstream components in the boundaries of the baseline and the project activity are excluded.

Wiwa Agrotex



The project boundaries are formed by the:

- Weighbridge of the straw storage;
- Electric meter for the electricity consumption of the boilers and straw storage and conditioning site;
- Location where biomass is transported from to the site;
- Measurement device for the energy of the steam exported from the boiler house.

B.5. Details of baseline information, including the date of completion of the baseline study and the name of person (s)/entity (ies) determining the baseline:

DHV
Laan 1914 no.35
3818 EX Amersfoort
The Netherlands
Mr. H.J. Wijnants
Tel. +31 33 468 2917
Fax +31 33 468 2801

SECTION C. Duration of the project activity / Crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

Project name	Project activity starting date
Trakija Gas	August 2005
Delektra Hydro	January 2005
Wiwa Agrotex	February 2006

C.1.2. Expected operational lifetime of the project activity[13] :

Project name	Operational lifetime
Trakija Gas	Thirty (30) years
Delektra Hydro	Thirty (30) years
Wiwa Agrotex	Twelve (12) years

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

>>Not applicable.

C.2.1.2. Length of the first crediting period:

>>Not applicable.

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

AAUs:

Trakija Gas : August 2005 - 31st December 2007
Delektra Hydro : January 2005 - 31st December 2007
Wiwa Agrotex : February 2006 - 31st December 2007

ERUs:

1st January 2008 – 31st December 2012

C.2.2.2. Length:

Kyoto period: five (5) years.

[13] At least till end of the Kyoto period

SECTION D. Application of a monitoring methodology and plan

D.1. Name and reference of approved monitoring methodology applied to the project activity:

The project uses the approved monitoring methodology ASM-I.D “Renewable electricity generation for a grid” and ASM-I.C “Thermal energy for the user”.

D.2. Justification of the choice of the methodology and why it is applicable to the project activity:

The chosen methodology ASM-I.D is designed for grid-connected renewable power generation project activities and applies to all proposed HP Projects. Monitoring consists of metering the electricity generated by the renewable technology.

ASM-I.C applied for Wiwa Agrotex project comprises renewable energy technologies that supply individual households and users with thermal energy that displaces fossil fuels. Monitoring consists of metering the energy produced by a sample of the systems where the simplified baseline is based on the energy produced multiplied by an emission coefficient.

D.3. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:									
ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data type	Data variable	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	For how long is the archived data kept?	Comment
HPP Trakija and Delektra :									
$E_{pEXPORT}$	Energy	Electric energy exported to the grid	MWh	m	Yearly	100%	Electronic, paper	During the crediting period	
A	Area	Area of Flooded Land	m^2	e	At the validation	100%	Electronic	During the crediting period	No flooded areas
Biomass Wiwa:									
ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data type	Data variable	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	For how long is the archived data kept?	Comment
$E_{pIMPORT}$	Energy	Electric energy imported from the grid in project case	MWh	m	Yearly	100%	Electronic, paper	During the crediting period	To be measured and used for estimation of project emissions from electricity used for straw conditioning and steam production
Q_i	Quantitative	Volume of the straw fuel used by project activity	tonnes or m^3	m	Continuously	100%	Paper	During the crediting period	To be measured and used for estimation of project emissions from collection and delivery .

S_{export}	Energy	Volume of steam exported by the project activity	MWh	m	Yearly	100%	Electronic, paper	During the crediting period	To be measured and used for estimation of the base line of steam production from oil
Eff	Efficiency of Oil boiler	Constant, 0.85		m	Once, Boiler passport		Data obtained from the PKM 6.5 oil fired boiler documentation	Once	Used to estimate the quantity of fuel oil replaced by straw.
Ef_oil	Emission factor	CO_2 emission factor of oil	tCO_2/MWh	c	Yearly	100%		During the crediting period and two years after	National annual GHG inventory Ef Calculation of avoided emissions
Ef_diesel	Emission factor	CO_2 emission factor of diesel	tCO_2/MWh	c	Yearly	100%		During the crediting period and two years after	National annual GHG inventory Ef Calculation of emissions for collection and delivery of straw

D.4. Relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHG within the project boundary and identification if and how such data will be collected and archived:

ID number *(Please use numbers to ease cross-referencing to table D.3)*	Data type	Data variable	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	For how long is the archived data kept?	Comment
EF_y	Emission factor	CO_2 emission factor of the grid	tCO_2/MWh	c	Yearly	100%	Electronic	During the crediting period and two years after	Calculated as a weighted sum of emission factors of OM BM in the PDD. It is not to be monitored during the project ctivities

EM_OM_y	Emission factor	CO_2 operating margin emission factor of the grid	tCO_2/MWh	c	Yearly	100%	Electronic	During the crediting period and two years after	Calculated as indicated in the relevant OM baseline method above
EM_BM_y	Emission factor	CO_2 build margin emission factor of the gird	tCO_2/MWh	c	Yearly	100%	Electronic	During the crediting period and two years after	Calculated as $[\sum_i F_{i,y}*COEF_i/\sum_m GEN_{m,y}]$ over recently built power plants defined in the baseline methodology
Eff	Efficiency of Oil boiler	Constant, 0.85		m	Once, Boiler passport		Data obtained from the PKM 6.5 oil fired boiler documentation	Once	
Ef_oil	Emission factor	CO_2 emission factor of oil	tCO_2/MWh	c	Yearly	100%		During the crediting period and two years after	National annual GHG inventory Ef

D.5. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO_2 equ.)

The baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in kg CO_{2eq}/kWh) calculated in a transparent and conservative manner as the average of the "approximate operating margin" and the "build margin", where:

i. The "approximate operating margin" is the weighted average emissions (in kg CO_{2eq}/kWh) of all generating sources serving the system, excluding hydro, geothermal, wind, low-cost biomass, nuclear and solar generation
ii. The "build margin" is the weighted average emissions (in kg CO_{2eq}/kWh) of recent capacity additions to the system, which capacity additions are defined as the greater (in MWh) of most recent 20% of existing plants or the 5 most recent plants."

For historical data and projections for the electricity generation, CO_{2eq} emissions from electricity generation and the emission factors, please look at attached Annex 4.

Calculations to determine the emission factors for one year are attached in Annex 5.

Furthermore, for the Wiwa Agrotex the emission factor values for reduction of the CO_2 emissions were calculated, as a result of the generated heat energy from renewables and heavy oil savings for the period 2008 – 2012. Determination of the annual emissions of CO_2 and of other noxious gases is according to Commission decision of 21.01.2004 establishing guidelines for the monitoring and reporting of Greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council. The emissions factors elaborated by the MOEW (Methodology for calculation of emissions of noxious substances (pollutants) released into the environment based on balance methods) have been used for the CO_2 emissions assessment.

The calculation of the emissions of CO_2 and other noxious substances are made at the following premises:

- The emissions from biomass combustion are zero
- The decrease of harmful gases emissions equals the emissions form, obtained from the combustion of an alternative (substituting) fuel
- The increase of harmful gases emissions is due to transportation, which emit these gases when heavy fuel oil, petroleum, etc. are used

The consumption of fuel related to transport of straw are based on:

- Straw collection will be in a circle of around 20 –25 km's;
- For 250 kg of straw, the following amounts of diesel are used: collection 0.6 kg, transportation 0.8 kg and loading and unloading 0.3 kg.

This leads to a total of 1.7 kg per 250 kg of straw, or 6.8 kg diesel per ton of straw delivered to the boiler house. A carbon emission factor for diesel of 3.0713 kg CO_2/t [14] is used.
The burned annually 13,317 tons of straw will replace the usage of 3,962 tons of heavy fuel oil.

[14] The Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories, fuel type is specified as "Light Fuel Oil/Diesel"

D.6. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored

Data *(Indicate table and ID number e.g. 3.-1.; 3.2.)*	Uncertainty level of data (High/Medium/Low)	Are QA/QC procedures planned for these data?	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
$E_{pEXPORT}$,	Low	Yes	QA/QC procedures shall be considered for monitoring the energy production as accurately as possible, for it is the main variable to quantify the total emissions reduction of the project
A	Medium	No	Area of Flooded Land must be estimated
Q_i, NCV_f, EF_f	Low	Yes	This data will be required for the calculation of project emissions
EF_y /EM_OM_y / EM_BM_y / $COEF_{i,j,yIMPORTS}$	Low	Yes	All factors are calculated by the Bulgarian National Electric Company (NEK)
$GEN_{j/k/ll,yIMPORTS}$	Low	Yes	The monitoring systems used at all hydro projects are monitored by the local electricity distribution companies: based on this, the plants receive their revenues. For Wiwa, a protocol has to be established.

D.7. Please describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects, generated by the project activity

The two small hydro power plants will have a similar structure to monitor the generated electricity. A meter will monitor every kWh produced and delivered to the grid. The technical staff of the HHP and the responsible person of the local distribution company will both check the electricity produced. Monthly they will read the meter (day, night and peak kWhs), and sign the monthly produced amount off in a special monthly monitoring protocol paper. A copy of this paper is held by the technical staff of the HHP. Payments by the distribution company to the HHP are calculated on the basis of this protocol paper. The electricity consumption of Wiwa Agrotex will also be monitored by a commercial electricity meter in the boiler house, written down by the operational staff. All electricity will be measured by a commercial meter owned by the local distribution company in the supply sub station. The steam production will be monitored by a commercial trade flow meter. The straw delivery is weighted an recorded in a log book. The CO_2 emissions will be estimated by use of the baseline emission factor.
Responsible for monitoring the meters are the operational staff. Responsible for checking the monitored data, supervising the monitoring and checking the calculations of emissions reductions are:

- Director Mr. Stoianoy of Trakija Gas;
- Chief engineer Mr. Krilchev of Delektra Hydro;
- Head of operarion Mr. Taskov of Wiwa.

All operational staff have annual training schemes, that include training on monitoring issues. The schemes are updated and reviewed each year. The 3 persons above are responsible for adequate knowledge of the staff for monitoring and updating their knowledge through training. Annually, the staff's knowledge is tested. Procedures for testing and training are laid down in a Training Protocol.

A protocol is prepared in case the meter fails. In case of technical failures an agreement is reached in each project plant that historic data will be used to calculate the produced electricity.

All “commercial” meters at Wiwa are subject to Law of Standardisation and Meteorology and are regularly checked by the Regional Offices of the State Meteorological Services.

The data will be recorded in a log book on a daily, weekly, monthly and yearly basis. The data from the electricity and heat meter will be taken, as well as the sum of the measurements of the weight of the delivered straw. The delivery and sales documentation copies will be stored for documentation too.

D.8.	**Name of person/entity determining the monitoring methodology:**

DHV
Laan 1914 no.35
3818 EX Amersfoort
The Netherlands
Mr. H.J. Wijnants
Tel. +31 33 468 2917
Fax +31 33 468 2801

SECTION E. Estimation of GHG emissions by sources

E.1. Estimate of GHG emissions by sources:

GHG Emissions related to flooded area
The project does not involve any expansion to the existing reservoir and no additional methane emissions will arise as a result of the project. In fact, it could be argued that the methane emissions per unit of electricity generated will go down as a result of the project, since more water will be used to generate electricity rather than spilled.

Emissions related to transport of equipment to the project location
Transport emissions due to civil works are considered to be negligible.

Emissions related to electricity consumption
Emissions by sources from Wiwa Agrotex project are related to electricity consumption from the National Grid and its transport losses **= 14,637 t CO_{2eq}.**

E.2. Estimated leakage:

Transport emissions for delivery of straw to Wiwa Agrotex are calculated to be **195 t CO_{2eq}.**

E.3. The sum of E.1 and E.2 representing the project activity emissions:

The sum of E1 and E2 equals to **14,832tCO_{2eq}**.

E.4. Estimated anthropogenic emissions by sources of greenhouse gases of the baseline:

377,512tCO_{2eq}

E.5. Difference between E.4 and E.3 representing the emission reductions of the project activity:

362,680 t CO_{2eq}

E.6. Table providing values obtained when applying formulae above:

Emissions reduction Renewable Energy Portfolio, Bulgaria [CO2eq/MWh/y]

	Tarkija	Delektra	Wiwa	Total
2004	0	0	0	**0**
2005	10.566	10.064	0	**20.630**
2006	18.123	19.066	11.102	**48.291**
2007	18.123	19.736	11.102	**48.960**
AAUs	46.811	48.866	22.203	**117.881**
2008	18.123	19.736	11.102	**48.960**
2009	18.123	19.736	11.102	**48.960**
2010	18.123	19.736	11.102	**48.960**
2011	18.123	19.736	11.102	**48.960**
2012	18.123	19.736	11.102	**48.960**
ERUs	90.614	98.678	55.508	**244.800**
TOTAL	**137.426**	**147.544**	**77.711**	**362.680**

Emission for Energy Consumption [tCO2/y]						
Year	**Project Scenario**	**Baseline Scenario**	**Project Scenario**	**Baseline Scenario**	**Project Scenario**	**Baseline Scenario**
	Tarkija		**Delektra**		**Wiwa**	
2005	0	10.566	0	10.064	0	0
2006	0	18.123	0	19.066	2.119	13.220
2007	0	18.123	0	19.736	2.119	13.220
2008	0	18.123	0	19.736	2.119	13.220
2009	0	18.123	0	19.736	2.119	13.220
2010	0	18.123	0	19.736	2.119	13.220
2011	0	18.123	0	19.736	2.119	13.220
2012	0	18.123	0	19.736	2.119	13.220
TOTAL	**0**	**137.426**	**0**	**147.544**	**14.832**	**92.542**

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

1 Trakija

The Regional EPA has issued ruling 115/2003, that is subject to an EIA and permission for water usage N1413/22.01.2003 was issued by the Ministry of Environmental Protection and Water – Basin Division East White Sea basin – Plovdiv.

Environmental NGO's can participate through public participation procedures during the EIA procedures during the permitting process. The investor Trakia Gas Ltd. has sent to the Regional Inspection of Environment Protection and Water (RIEPW) – Plovdiv branch information for evaluation of the necessity for working out of an EIA for the SHPP Tumrush (Art. 93, Para 1 of EPA and Art. 6 of the Regulation for the conditions and order for doing an EIA on investment projects for construction works, activities and technologies). The EIA is approved.

The decision on the EIA and permission for water usage have been approved by the following entities:

- Ministry of Agriculture and Forestry, Regional Forestry Management – Plovdiv, approves the project for the placement of the water intake and the trace of the pressure pipeline to SHPP Tumrush No. 1895/31.07.2003
- Ministry of Agriculture and Forestry, Regional Division Agriculture and Forestry - Plovdiv, Municipal division for agriculture and forestry – Plovdiv – Parvenetz
- List of the owners, affected by the pipeline construction for the SHPP Tumrush - 743/03.07.2003
- Notification for returned property to the Municipality – the village of Hrabrino – 1221/27.11.2003
- Ministry of Agriculture and Forestry, National Forestry Management, Regional Forestry Management – positive statement for the concession of the project Mountain Water Intake and Trace of the Pressure Derivation from the Water Intake to the SHPP – UPF 07.67/16.10.2003
- Ministry of Agriculture and Forestry, Regional Division Agriculture and Forestry - Plovdiv – replacement of the designation of the arable lands for other uses and accepting of sites and traces for designing – Decision No. 12/18.09.2003
- Regional Road Division – Plovdiv – approval of the pressure pipeline trace – 1099/09.09.2003
- Elektrorazpredelenie Plovdiv plc – conditions and the technical requirements, necessary for connecting SHPP Tumrush Patax = 4.8 MW to the regional electric energy 20 kV system – 2694/04.04.2003
- Elektrorazpredelenie Plovdiv plc – approved Electrical Part of the design for the SHPP Tumrush - 36853/31.10.2003
- Approval procedure with the Rhodopes Regional Management, on which territory is the site.

The ecological assessment has been carried out in compliance with the requirements of the current regulatory acts:

- Waters Act (State Gazette No. 67/99; revised and supplemented No. 81/2000, No. 84/23.09.03
- Nature Protection Act (State Gazette No. 47/67, revised and supplemented No.3/77, No.13, 85,86/97, supplemented No. 62/98; revised and supplemented No.133/98, No.29/2000,No. • 91/25.09.2002
- Forests Act (State Gazette No.125/97, revised and supplemented No.79/1998, No.133/1998, supplemented No.25/1999, amended and supplemented No.29/2000, No.78/2000)
- Territorial Development Act (State Gazette No.01/2001, 2003)
- Air Purity Act (State Gazette No.45/28.05.96; revised No.49/96; revised No.85/97; revised and supplemented No.27/2000)
- And expect that all current acts, norms have been observed.

During the implementation of the investment project for the SHPP Tumrush the investor has declared to fulfil the following recommendations for:

- Increasing of the ecological water quantity, necessary for the ecosystem preservation from the design 70 l/sec to the required 110 l/sec;
- Designing of a fish passage according to the present ichtiofauna and passing the compulsory 110 l/sec;
- Prohibition of carrying out of explosion works in the period 15.03 to 31.07 due to a presence of a preserved variety;
- Recultivation of the used terrains;
- Installation of a monitoring system of the waters.

Key project agreements:

i. The project of the SHPP Tumrush corresponds to the present regulatory base for environmental protection of the Republic of Bulgaria. The project sponsor has signed a preliminary contract with the National Electric Company – Elektrorazpredelenie – Plovdiv Plc. in January 2004.
ii. The parties have signed a contract for connecting the small hydropower plant Tumrush to the grid of Electrorazpredelenie – Plovdiv Plc., after preparing the project and obtaining the construction permission. This preliminary contract has signed on the authority of a permit N2694/04.04.2003 for conditions and the technical requirements, necessary for connecting SHPP Tumrush to the regional electric 20-UV system. The parties have also signed a Power Purchasing Agreement.
iii. According to the Bulgarian law, Para 160, Art.1 the National Electric Company guarantees full electric energy purchase, generated from renewable energy sources by Trakija Gaz.

Environmental impact of the project:

Due to the replacement of electric energy produced by conventional sources with such generated by the SHPP Tumrush CO_2 emissions shall be reduced by 100,070 tons for the period 2005 - 2012.

Implementation of the SHPP Tumrush project and decrease of the conventional electric energy production will reduce emissions of sulphur, nitrogen oxides and a certain amount of dust. Estimated annual reductions of SO_2, NO_x and dust emissions are presented in the table F1.1.

Table F.1.1 Emissions reductions (tons)

Reduction	2005	2006	2007	2008	2009	2010	2011	2012	Total
SO_2	25	236	213	246	252	221	173	173	1,539
NO_2	2	12	15	11	11	11	11	15	86
Dust	1	9	11	8	8	8	8	11	62

2 Delektra

The procedure on the Environmental Impact Assessment of the project (EIA) for SHPP Lesitchevo has been done according to the requirements of the Environment Protection Act (EPA). The project sponsor Delectra-Hydro has sent to the Regional Inspection of Environment Protection and Water (RIEPW) – Pazardjik branch information for the evaluation of the necessity for the EIA for the SHPP Lesitchevo (Art. 93, Para 1 of EPA and Art. 6 of the Regulation for the conditions and order for doing an EIA on investment projects for construction works, activities and technologies).

The Ministry of Environment and Water – RIEPW – Pazardjik with Minutes No.34/2003 has decided the SHPP Lesitchevo project is not subject to the EIA and all requirements of the Environmental Protection Law are met.

The Ministry of Environment and Water issued a permit for water usage No. 3087/16.09.2003 for Q_{built}=6.0 m^3/sec, water limit V=158 million m^3/year. The Irrigation Systems Ltd. issued a permit for agreement No 22-00-17/12.02.2004 for designs for hydro technical, architecture-construction and mechanical part of SHPP Lesitchevo.

Key permits:

- The decision of Ministry of Agriculture and Forestry – Pazardjik for the change of the function of farm lands for non – farm needs concerning SHPP Lesitchevo construction No. K-1/24.02.2004
- Elektrorazpredelenie Plovdiv plc – Pazardjik branch - conditions and the technical requirements, necessary for connecting SHPP Lesitchevo P_A^{TAX} = 3,000 kW to the regional electric energy 20 $_K$V system – No 02 IP50-2/01.03.2004
- The approval of the Lesitchevo Municipality Management, on which territory the site is located.

The ecological assessment has been carried out in compliance with the requirements of the current regulatory acts:

- Waters Act (State Gazette No. 67/99; revised and supplemented No. 81/2000, No. 84/23.09.03)
- Nature Protection Act (State Gazette No. 91/25.09.2002)
- Forests Act (State Gazette No.125/97, revised and supplemented No.79/1998, No.133/1998, supplemented No.25/1999, amended and supplemented No.29/2000, No.78/2000)
- Territorial Development Act (State Gazette No.01/2001, 2003)
- Air Purity Act (State Gazette No.45/28.05.96; revised No.49/96; revised No.85/97; revised and supplemented No.27/2000)
- Except that all current acts, norms have been observed.

During the implementation of the investment project for the SHPP Lesitchevo the project sponsors have declared to fulfill the following recommendations for:

- Dependence of the water permit regimes of SHPP Lesitchevo on the water resource and the operation of the Belmeken-Sestrimo cascade and irrigation needs
- Processing water through the SHPP's outflow run out on Topolnitsa river
- Recultivation of the used terrains
- Installation of a water monitoring system.

The project of the SHPP Lesitchevo corresponds to the present regulatory base for environmental protection of the Republic of Bulgaria.

Key project agreements:

i. The project sponsor has signed a preliminary contract with the National Electric Company – Elektrorazpredelenie – Plovdiv Plc.- Pazardjik branch in March 2004. The parties to the present preliminary contract have agreed after preparing of the work project and construction permission to sign a contract for connecting of a small hydropower plant Lesitchovo to the electric energy system of Electrorazpredelenie – Plovdiv Plc – Pazardjik branch.
ii. According to the Bulgarian law, Para 160, Art.1 the National Electric Company guarantees full electric energy purchase, generated from renewable energy sources by Delectra Hydro. PPA is signed with Plovdiv Electricity Distribution Enterprise.

Environmental impact of the project:

Due to the replacement of electric energy produced by conventional sources with such generated by the SHPP Lesitchevo CO_2 emissions shall be reduced by 114,367 tons for the period 2005 - 2012.

Estimated annual reductions of SO_2, NO_x and dust emissions are presented in the table F1.2.

Table F.1.2 Emissions reductions (tons)

Reduction	2005	2006	2007	2008	2009	2010	2011	2012
SO_2	141	201	201	201	201	201	201	201
NO_2	11	15	15	15	15	15	15	15
Dust	8	12	12	12	12	12	12	12

3 Wiwa

According to Minutes No. 2787/10.10.2003 of the Regional Inspection of Environment Protection and Water (RIEPW) – Rousse, the investment proposal for the construction, and the steam station operation respectively, does not come under article 81, para 1, section 2 of this act. This means that implementation of an EIA is not necessary. Besides, the investment project does not affect protected territories, habitats, wetlands, superficial water and monuments of culture by law.

According to the current legislation, the construction, operation and location of every manufacturing company and its site should conform to the laws and ordinance in the field of environmental protection. The laws and ordinances to which Wiwa Agrotex Ltd. Should conform are:
1. Environment Protection Act (State Gazette, No. 91/25.09.2002)
2. The Waters Act (State Gazette, No. 67/27.07.1999)
3. Forest Act (State Gazette No. 125/1997 r.)
4. Protected Territories Act (State Gazette No.133/1996, supplement No. 78/2000.)
5. Biodiversity Act (State Gazette, No. 77/09.08.2002 r.)
6. Waste Management Act (State Gazette, No. 86/30.09.2003 r.)
7. Air Purity Act (State Gazette, No. 45/28.05.1996r.)
8. Soil Protection From Pollution Act (State Gazette, No. 84/1963r. revised and amended in State Gazette, No. 113/99)
9. Ordinance No. 62/ 12.03.2003 for Issuance of Complex Permits for construction and operation of new and operation of existing installations and facilities (State Gazette, No. 26/21.03.2003, amend. No 29/ 31.03.2003)

Environment Protection Act
According to Minutes No. 2787/10.10.2003 of the Regional Inspection of Environment Protection and Water (RIEPW) – Rousse, the investment proposal for the construction, and the steam station operation respectively, does not come under article 81, para 1, section 2 of this act. This means that implementation of an EIA is not necessary. Besides, the investment project does not affect protected territories, habitats, wetlands, superficial water and monuments of culture by law.

The Waters Act
The steam station operation generates industrial waste water to the amount of 2.5 m3/day and domestic waste water to the amount of 4.0 m3/day. The articles of this law, which concern its operation are art. 56 and art. 61. In addition the requirements of art, 14 of Ordinance Nº 10 “Issuing of permits for waste water channeling in water sites and determination of individual emissions limits for source point pollutions” (State Gazette, Nº. 66/17.07.1999). Wiwa Agrotex Ltd has assumed the responsibility to build a waste water treatment plant as well as to develop operation manuals for them, According to Minutes No. 2787/10.10.2004 of the RIEPW – Rousse. Besides, the company will build a shaft for probe taking and control of the channel water. Thus, pollution of the environmental will be avoided and the requirements of this act met.

Forest Act

The location of the steam station, property of Wiwa Agrotex Ltd, does not affect forest territories and lands in the forest fund. Hence, it does not come under the articles of this Act.

Protected Territories Act
The location of the steam station does not affect protected by law territories and habitats. Hence, it does not come under the articles of this Act.

Biodiversity Act
The operation and location of the steam station does not affect protected by law territories and habitats. Hence, it does not come under the articles of this act.

Waste Management Act
The operation of the steam station, property of Wiwa Agrotex Ltd, generates ashes from the biomass combustion process. In their treatment, the company shall observe the requirements of this law, as it is written in Minutes No. 2787/10.10.2004 of the RIEPW – Rousse. This is necessary, since the ashes may contain compounds, which at given atmospheric conditions can cause soil contamination.

Air Purity Act
The operation of the steam station emits certain amount of harmful gases, such as dust, NO_x and others, but their concentration is within the limits, set by Ordinance No. 2 "Norms for emission limits (concentration in the flue gases) of noxious gases from stationary sources" (State Gazette, No. 51/06.05.1998 revised and supplemented State Gazette, No. 93/21.10.2003). On the other hand, emissions of harmful gasses such as CO_2, SO_2 and other will be saved due to implementation of the Wiwa Agrotex Ltd Energy Efficiency Projects, since biomass will be burned. The emissions from biomass combustion are zero, since the emitted in the atmosphere gases from the combustion process are assimilated from the plant. Therefore, the operation of the steam station not only does not come under this Act, but also contributes to the decrease of ozone depletion gases.

Soil Protection From Pollution Act
The operation of the steam station and the generated wastes is such, that there is no risk from soil pollution. Therefore, it does not come under the articles of this act.

Ordinance No. 62 from. 12.03.2003 from 12.03.2003 for Issuance of Complex
Permits for construction and operation of new and operation of existing installations and facilities.
This ordinance does not require the submission of a Complex Permit for the steam station. On the basis of the review in compliance with the environmental laws and ordinances, the Minutes from RIEPW - Silistra, presented to EnCon Services Ltd. by Wiwa Agrotex Ltd., it is concluded that the investment project for the steam station conforms to the requirements of the above mentioned laws and ordinance. In conclusion, it could be stated that on the ground of the standpoint of the hygiene epidemiology inspectorate, Regional Department of the Ministry of Internal Affairs and the Fire-precaution Department, the operation of steam station (property of Wiwa Agrotex Ltd.) meets the requirements of the current regulations regarding healthy and safe conditions for work.

Key project agreements:

A contract with one consumer, namely Evro-Etil Ltc, Silistra city has been concluded already. During the next heating period and after the construction of the steam distribution network, steam could be sold to two more consumers. This is not included in the calculation of project emissions and do not influence them.

Environmental impact of the project:

Due to the replacement of heat energy produced by conventional source (oil fired boilers) with such generated by the straw fired boilers in Alfatar CO_2 emissions shall be reduced by 76,756 tons for the period 2006 - 2012.

Sulphur dioxide, nitrogen dioxide and a certain amount of dust are emitted during energy production from fossil fuels. The implementation of the Wiwa Agrotex project and decrease of conventional energy production will reduce these emissions. The carried out calculations show that as a result of the project implementation (substitution of heavy fuel oil with a renewable energy source – biomass), the SO_2 emissions shall decrease for the period 2006 -2012, their reduction amounts to 1,831 tons. The SO_2 emissions reduction for the period 2006 -2012 is presented in Table F.1.3.

Table F.1.3 SO_2 emissions reductions (tons)

Emission characteristics		2006	2007	2008	2009	2010	2011	2012
Heavy fuel oil savings	t/yr	3,632	3,962	3,962	3,962	3,962	3,962	3,962
SO_2emission factor	t SO_2/t	0.068	0.068	0.068	0.068	0.068	0.068	0.068
Electricity savings	MWh/yr	-824	-899	-899	-899	-899	-899	-899
SO_2emission factor	t SO_2/MWh	0.007	0.003	0.002	0.002	0.002	0.002	0.002
Total	t SO_2/yr	241	265	265	265	265	265	265

The NOx emissions reduction for the period 2006 -2012 is presented in Table F.1.4. In 2006 the NO_x emissions shall decrease with 0.2 tons and for the period 2006 - 2012 they shall decrease with 3.3 tons, as a result of the heavy fuel oil substitution with an alternative fuel – biomass.

Table F.1.4 NO_x emissions reductions (tons)

Emission characteristics		2006	2007	2008	2009	2010	2011	2012
Heavy fuel oil savings	t/yr	3,632	3,962	3,962	3,962	3,962	3,962	3,962
NO_x emission factor	t NO_x /t	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
Electricity savings	MWh/yr	-824	-899	-899	-899	-899	-899	-899
Total	t NO_x /yr	0.2	0.3	0.5	0.6	0.6	0.6	0.6

The dust emissions reduction for the period 2006 -2012 is presented in table F.1.5. In 2006 the dust emissions shall decrease with 4.3 tones and for the period 2006 -2012 they shall decrease with a total of 33 tons, as a result of the project implementation.

Table F.1.5 Dust emissions reductions (tons)

Emission characteristics		2006	2007	2008	2009	2010	2011	2012
Heavy fuel oil savings	t/yr	3,632	3,962	3,962	3,962	3,962	3,962	3,962
Dust emission factor	t NO_x /t	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012	0.0012
Dust emission reduction	t NO_x /yr	4.3	4.8	4.8	4.8	4.8	4.8	4.8

Other benefits:

- The produced steam will provide the consumers with thermal energy at prices lower than that generated from light and heavy fuel oil and natural gas
- The company's costs for taking away the straw from the rented field will decrease (otherwise it has to be burned on the field). The same applies for the other companies, providers of straw. The soil fertility will be preserved
- The humus and the biological diversity of the agricultural land, from which the straw is gathered, will be preserved
- The hazard of field and forest fires shall decrease too.

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

Given that three plants are already under construction or constructed and in operation (Tarkia, Delektra and Wiwa), the environmental impact assessment identifies three impacts and mitigation measures to be addressed during the construction phase, as follows:

Environmental Impact	Mitigation Measures
Impact on vehicular traffic	Movement of heavy loads have been done under appropriate permits and escorts
Water turbidity	Work of preparing river crossings (fords) has been done to minimize the movement of the river bed materials
Contamination by Solid Waste	Wastes were properly disposed of in a nearby sanitary landfill and where possible recycled

Furthermore, producing renewable energy SHPPs are contributing to the reduction of the greenhouse effect, while also reducing other emissions related to conventional energy production. Environmental risks associated with the construction of SHPPs could be related to biodiversity, water management and affecting of the forest during the construction phase. Because the projects are relatively small-scale, the effects are limited. Furthermore, the risks are minimised by adhering to all environmental requirements and contacting the responsible authorities at an early stage, as well as by taking technical measures.

The above aspects are specified in the permits and Environmental Impact Assessments released for each project. The documents can be available on request of the validator and/or verificator.

SECTION G. Stakeholders' comments

G.1. Brief description how comments by local stakeholders have been invited and compiled:

For the BEERECL facility, two public conferences were organised. The first one in Sofia, Hotel Rodina on June 24, 2004 and the second in Varna, Sveti Konstantin and Elena Resort, International Scholars' House on September, 24, 2004. Advertisements were made in national and local newspapers, weekly business magazines, internet and radio. Staff of UBB has presented the three projects during these two workshops. See annex 6.

All projects were submitted in the Project Identification Note to the Ministry of Environment and Water. A Letter of Endorsement was provided by the Ministry, after all the projects of the PIN were thoroughly reviewed by MoEW's staff regarding their environmental impacts and compliance with the official procedures.

G.2. Summary of the comments received:

There were no comments received.

G.3. Report on how due account was taken of any comments received:

Because there were no comments received, no action has been undertaken.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	United Bulgarian Bank
Street/P.O.Box:	5 Sveta Sofia Street
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Represented by:	
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Represented by:	
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The BEERECL facility foresees the payment of a bonus, if the project is completed successfully. This bonus, the so called KIDSF grant, is paid or by the Kozloduy fund (public fund).

Annex 3

BASELINE INFORMATION

(1) The Central and Eastern Europe Business Information Centre, March 2003

(2) Appendix B of the simplified modalities and procedures for small-scale CDM project activities Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories

(3) Third National Communication on Climate Change, Sofia 2002

(4) South-eastern Europe Country Analysis Brief, March 2005

(5) U.S. Department of Energy Office of Fossil Energy, An Energy Overview of the Republic of Bulgaria, 2005

(6) Rational Energy Utilisation and Financing Plan for Trakija Gas Ltd. Renewable Energy Project, June 2004

(7) Rational Energy Utilisation and Financing Plan for Delectra-Hydro Gas Ltd. Renewable Energy Project, August 2004

(8) Small Hydro Power Plant Devin, October 2005

(9) Study on Standard Multi Project Baseline for Joint Implementation Projects in the Bulgarian Power Sector, National Electricity Company (NEK), Bulgaria, 09.05.2005

Annex 4

HISTORICAL DATA AND PROJECTIONS FOR THE ELECTRICITY GENERATION, CO_2 EMISSIONS FROM ELECTRICITY GENERATION AND THE EMISSION FACTORS

Tables will be provided

Annex 5

CALCULATIONS TO DETERMINE THE EMISSION FACTORS FOR ONE YEAR

INFORMATION OF THE STUDY PERFORMED BY THE NATIONAL ELECTRIC COMPANY (NEK), BULGARIA
DATED 09.05.2005

STUDY ON STANDARD MULTI PROJECT BASE LINE FOR JOINT IMPLEMENTATION PROJECTS IN THE BULGARIA POWER SECTOR

The study was performed at the request from the Ministry of Environment and Water of Bulgaria. It aims reduction of transaction costs of the JI projects that influence the electricity production and electricity demand in the country. This study is approved by the Ministry of Energy and Energy Resources and the national focal point for climate change in Bulgaria.

The applied methodology explores the document of the UNFCCC CDM Executive board ACM0002 “Consolidated Baseline Methodology for Grid-connected electricity generation from renewable sources”.

The results are reported for the historical period 2000 – 2004 and for the future period 2005 – 2012.

The historical data are taken from the records of the National Dispatching Center of the Power Grid and from the annual reports of the electricity producers.

The data for the future period are based on the official Least Cost Development Plan of the Bulgaria Power Sector, reported in 2004. The NEK uses the computer code IRP Manager (Integrated resource planning Manager) that was developed in the United States of America for the purposes of the optimal planning of the power sector and the analysis of the demand side management. The sophisticated software tool allows to model long term period with hourly load diagrams. This allows to get forecast for the annual loading curve by every hour (8760) hours a year) for every of the plants as well as fuel spent.

The table on the next page is a calculation of the Build Margin en Operational Margin based on the data provided by the study.

Combined Margin Calculation Carbon Emission Factor for the Bulgarian Gird (source NEK study: Baseline Study of Joint Implementation Projects in the Bulgarian Energy Sector (Sofia 05.05.2005) reference year 2004

Parameter	Fuel	Available Capacity	Thermal Output	Energy Output		Gross Heat Rate		Energy Input		Net Caorific Value	Fuel Carbon	Carbon Emission	Fraction of Carbon
Power Plant				Electricity	Heat	Electricity	Heat	Electricity	Total	GJ/Mg	Content	Factor	Unoxidized
Unit		MWel	MWth	GWelh	MWthh	kJ/kWh	MJ/MWh	GJ/a	GJ/a	MJ/Nm3	%	kgC/GJ	%
Operating Margin Power Plants													
TPP Bobov dol	brown coal	555	1.716	2.169,164	0	11.068,00	0,00	24.008.307,15	24.008.307,15	9,58	28,72	29,98	1,93
TPP Varna	antracite	1.200	2.781	2.405,800	0	10.757,00	0,00	25.879.190,60	25.879.190,60	24,10	64,90	26,93	4,70
TPP Rousse East (Unit #4)	antracite	100	284	310,194	0	11.017,00	0,00	3.417.407,30	3.417.407,30	24,18	67,80	28,04	3,83
TPP Maritsa #3	lignite	95	290	251,637	0	12.739,00	0,00	3.205.603,74	3.205.603,74	10,38	23,77	22,89	2,64
Total		**1.950**		**5.136,795**				**56.510.508,79**	**56.510.508,79**				
Build Margin Power Plants													
Most resent power units													
NPP Kozloduy	nuclear	950		5.918,348	0	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
PSHPP Chaira	hydro	420		152,097	0	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
DHP Sofia East (Units #5, #6, #7)	natural gas	66	456	381,877	1.000.000	6.781,78	3.886,19	2.589.805,80	6.475.995,80	33,36	50,00	14,99	0,50
TPP Maritsa East 2 (Units #7-#8, 200MW)											3,89	29,50	2,69
Total fossil fuels													
Total included hydro and excluded nuclear													
Future Build Margin Power Plants													
NPP Belene											0,00	0,00	0,00
HPP Tsankov kamuk											0,00	0,00	0,00
GTCC in DHS's Zemliane and Lyulin											0,00	15,02	0,50
GTCC in DHS Sofia											0,00	15,02	0,50
TPP Maritsa East 1 (replacing capacity)											3,40	28,36	2,00
TPP Rousse East (Unit #3)											5,90	25,53	2,20
Total fossil fuels													
Total included hydro and excluded nuclear													
Least Cost Power Plants													
NPP Kozloduy											0,00	0,00	0,00
TPP Maritsa East 2 (Units #1-#4, 150MW)											3,76	30,54	2,39
TPP Maritsa East 2 (Units #5-#6, 200MW)											3,76	30,54	2,49
TPP Maritsa East 3											3,61	29,88	2,92
Total fossil fuels													
Total excluded nuclear													
"Must Run" Power Plants													
Hydro Power Plants											0,00	0,00	0,00
TPP Brikel	lignite	180	865	1.134,100	702.568	11.280,14	5.950,00	12.792.806,77	16.973.086,37	9,650	20,00	20,73	1,86
TPP Rousse East (cogeneration part)	antracite	60	785	186,116	443.187	11.584,66	4.209,00	2.156.090,58	4.021.464,66	25,17	67,80	26,94	2,58
Industrial TPP Lukoil	heavy oil	257	2.040,00	980,000	2.237.858	8.804,05	4.406,11	8.627.969,00	18.488.217,51	40,40	85,00	21,04	1,00
Industrial TPP Deven	antracite	219	1.425,00	416,000	2.987.448	6.757,00	4.346,00	2.810.912,00	15.794.361,01	25,55	66,00	25,83	4,00
Industrial TPP Kremikovtsi	blast gas	112	1.070	350,792	1.148.399	7.578,26	5.676,79	2.658.392,98	9.177.612,94	4,07	12,00	29,49	0,50
Industrial TPP Sviloza	antracite	120	660	369,986	478.440	12.234,00	4.269,00	4.526.408,72	6.568.869,08	23,46	64,00	27,28	1,83
Industrial TPP Vidahim	antracite	50	471	328,467	1.229.057	12.857,98	4.394,17	4.223.422,12	9.624.107,51	22,24	61,10	27,47	3,46
Industrial TPP Himenergo	natural gas	50	324,00	0,000	0	8.092,41	3.377,55	0,00	0,00	33,36	50,00	14,99	0,50
Industrial TPP Nova Plama	natural gas	60	468	0,000	0	10.783,73	3.924,14	0,00	0,00	34,08	50,00	14,67	0,50
DHP Sofia East (Units #1, #2, #3, #4)	natural gas	120	1.558	284,071	1.837.186	6.781,78	3.886,19	1.926.507,03	9.066.160,89	33,36	50,00	14,99	0,50
DHP Sofia	natural gas	100	1.622	130,720	1.710.214	7.323,97	4.015,14	957.389,36	7.824.138,00	33,54	50,00	14,91	0,50
DHP Pleven	natural gas	24	661	71,915	443.903	7.465,00	5.411,00	536.845,48	2.938.804,61	33,49	50,00	14,93	0,50
DHP Plovdiv North	natural gas	85	628	136,071	612.873	6.857,97	3.830,50	933.170,84	3.280.780,86	33,40	50,00	14,97	0,50
DHP Republika	lignite	105	502	516,125	375.684	15.047,00	4.877,00	7.766.132,88	9.598.343,74	8,02	23,00	28,68	3,88
DHP Sliven	subbit. coal	30	220	176,184	108.039	15.298,56	6.389,00	2.695.361,50	3.385.622,67	14,47	30,70	21,22	3,60
DHP Shoumen	natural gas	18	175	12,259	123.492	5.275,37	4.232,02	64.670,76	587.291,37	33,53	50,00	14,91	0,50
DHP Gabrovo	subbit. coal	18	196	8,852	71.259	6.592,00	6.100,00	58.352,38	493.032,28	26,50	63,00	23,77	8,40
DHP Kazanluk	heavy oil	12	114	3,168	112.500	5.290,00	4.090,00	16.758,72	476.883,72	39,80	87,50	21,98	1,00
Total fossil fuels		**1.620**		**5.104,826**	**15.622.107**			**52.751.191,11**	**118.298.777,24**				
Total included hydro		3.420		8.247,451				52.751.191,11	118.298.777,24				
System Total		**14.261**		**43.823,527**				**259.681.143**	**329.114.919**				
Simple Operating Margin_EF				5.136,795				56.510.508,79	56.510.508,79				
Build Margin Emission Factor		**1.446**		**2.811,877**				**28.692.865,80**	**32.579.055,80**				

		Fossil Fuels
Baseline Emission Factor - BEF		
Combined Margin	ktCO2/MWh	**1,199**
T&D Losses (10%)	ktCO2/MWh	**0,120**

Annex 6

STAKEHOLDERS CONSULTATIONS

On the next pages workshop announcements and the agenda are presented.

ANNEX 6-A

Articles and announcements about the second BEERECL Workshop – 24.09.2004

Web site dir.bg
www.news.dir.bg

Икономика

10 млн. евро безвъзмездно дава ЕБВР за енергийна ефективност

10 милиона евро безвъзмездно ще даде Европейската банка за възстановяване и развитие (ЕБВР) по проекти за енергийна ефективност и използване на възобновяеми енергийни източници.

25 септември 2004, събота, 00:00
Източник: СЕГА

10 милиона евро безвъзмездно ще даде Европейската банка за възстановяване и развитие (ЕБВР) по проекти за енергийна ефективност и използване на възобновяеми енергийни източници. Това стана ясно вчера на започналия край Варна семинар по темата. С тези средства ще оперират"HVB Biochim"и Банка ДСК.ЕБВР вече отпусна кредитна линия от 50 млн. евро на няколко банки за финансиране на проекти за енергийна ефективност и възобновяеми енергийни източници - вятърни, водни или слънчеви централи и мощности, използващи геотермална енергия или биогаз.Стойността на проектите, които са финансирани до момента, е 3,5 млн.евро. Ако те бъдат изпълнени успешно, получателите на кредитите ще имат право да получат от ЕБВР и безвъзмездна помощ до 490 000 евро.
[още]

www.banks.dir.bg

Новини

ЕБВР отпуска 50 милиона евро кредитна линия за енергийна ефективност

24 Септември 2004, Петък, 15:57
Източник : Радио България

50 милиона евро отпуска Европейската банка за възстановяване и развитие /ЕБВР/ чрез кредитна линия за проекти за енергийна ефективност и използване на възобновяеми източници на енергия". Това съобщи днес в курорта "Св.Св. Константин и Елена", край Варна Ян-Вилем ван де Вен от дирекцията за енергийна ефективност на банката. Той участва във втория семинар за използване на възобновяеми източници на енергия и енергийна ефективност, който беше открит днес край Варна.
На форума има и представители на шестте банки в страната, чрез които ще се осъществява кредитирането на фирмите, кандидатстващи с проекти. 50-те милиона евро ще бъдат разпределени между - Пощенска банка, ОББ, Юнионбанк, Булбанк, HVB Bank Biochim и Банка ДСК. Допълнително ЕБВР предоставя 10 милиона евро под формата на безвъзмездна помощ. Проектите за енергийна ефективност могат да включват малки мощности за комбинирано производство на топло и електроенергия, проекти за реконструкция на енергийна инфраструктура, за оползотворяване на отпадна топлина. Изграждане на малки водноелектрически централи, слънчеви инсталации, вятърни централи, геотермални инсталации и инсталации с биогаз са сред проектите от частта за използването на възобновяеми енергийни източници. По време на семинара ще бъде представена Националната ни програма за енергийна ефективност, както и самата кредитна линия на ЕБВР.

Още новини »

Newspaper Dnevnik online edition
www.dnevnik.bg

ДНЕВНИК online
Европейски перспективи

Вторник, 28 септември, 2004

ЕБВР отпуска 50 милиона евро за енергийни проекти

DNEVNIK.BG24/9 - 15:49 ч.

50 милиона евро отпуска Европейската банка за възстановяване и развитие /ЕБВР/ чрез кредитна линия за проекти за енергийна ефективност и използване на възобновяеми източници на енергия". Това съобщи в петък в курорта "Св.Св. Константин и Елена" Ян-Вилем ван де Вен от дирекцията за енергийна ефективност на банката. Той участва във втория семинар за използване на възобновяеми източници на енергия и енергийна ефективност, който беше открит край Варна. На форума има и представители на шестте банки в страната, чрез които ще се осъществява кредитирането на фирмите, кандидатстващи с проекти.

50-те милиона евро ще бъдат разпределени между - Пощенска банка, ОББ, Юнионбанк, Булбанк, HVB Bank Biochim и Банка ДСК.

Допълнително ЕБВР предоставя 10 милиона евро под формата на безвъзмездна помощ. В момента се изпълняват няколко проекта за енергийна ефективност и използване на възобновяеми източници. Отпуснатата досега сума е 3,5 милиона евро. Ван де Вен подчерта, че това са кредити, а не субсидии от банката. Става въпрос за проект за водно-електрически централи и проект за геотермална инсталация. При успешно изпълнение кредитоискателите ще получат от ЕБВР безвъзмездни помощи с общ размер 490 000 евро от Международния фонд "Козлодуй". Фондът е създаден, за да компенсира затварянето на част от блоковете на АЕЦ "Козлодуй".

Компенсацията става по два начина - чрез подобряване на енергийната ефективност, или чрез използване на нови източници, обясни Ван де Вен. Според него използването на възобновяемите източници е по-сполучлив подход. За да кандидатстват за пари фирмите трябва да представят реални проекти и бизнес-план. Фондът на банката подпомага успешно реализираните проекти чрез безвъзмездна помощ в размер на 7,5 процента за проекти за енергийна ефективност и 20 процента за проектите за възобновяеми източници.

Проектите за енергийна ефективност могат да включват малки мощности за комбинирано производство на топло и електроенергия, проекти за реконструкция на енергийна инфраструктура, за оползотворяване на отпадна топлина.

Изграждане на малки водноелектрически централи, слънчеви инсталации, вятърни централи, геотермални инсталации и инсталации с биогаз са сред проектите от частта за използването на възобновяеми енергийни източници.
По време на семинара ще бъде представена Националната програма за енергийна ефективност, както и самата кредитна линия на ЕБВР.

Bulgarian Economic portal
www.econ.bg

17:19, 24.09.2004

Допълнително ЕБВР предоставя 10 милиона евро под формата на безвъзмездна помощ

50 милиона евро отпуска Европейската банка за възстановяване и развитие /ЕБВР/ чрез кредитна линия за проекти за енергийна ефективност и използване на възобновяеми източници на енергия". Това съобщи днес в курорта "Св.Св. Константин и Елена", край Варна Ян-Вилем ван де Вен от дирекцията за енергийна ефективност на банката. Той участва във втория семинар за използване на възобновяеми източници на енергия и енергийна ефективност, който беше открит днес край Варна.

На форума има и представители на шестте банки в страната, чрез които ще се осъществява кредитирането на фирмите, кандидатстващи с проекти. 50-те милиона евро ще бъдат разпределени между - Пощенска банка, ОББ, Юнионбанк, Булбанк, HVB Bank Biochim и Банка ДСК. Допълнително ЕБВР предоставя 10 милиона евро под формата на безвъзмездна помощ.

Проектите за енергийна ефективност могат да включват малки мощности за комбинирано производство на топло и електроенергия, проекти за реконструкция на енергийна инфраструктура, за оползотворяване на отпадна топлина. Изграждане на малки водноелектрически централи, слънчеви инсталации, вятърни централи, геотермални инсталации и инсталации с биогаз са сред проектите от частта за използването на възобновяеми енергийни източници. По време на семинара ще бъде представена Националната ни програма за енергийна ефективност, както и самата кредитна линия на ЕБВР./БНР

ECON.BG

Bulgarian National Radio
Radio Varna
www.radiovarna.com

50 млн евро предоставя Европеската банка за възстановяване и развитие на шест български банки

Радио Варна 24.09.2004 13:53

50 млн евро предоставя Европеската банка за възстановяване и развитие на шест български банки чрез кредитната си линия за енергийна ефективност и възобновяеми енергийни източници, съобщи представителят на банката Ян Вилен Вандевен. Обявените нови четири заема, финасирани по тази линия са с общ размер от 3 млн. и 73 хил. евро и са предоставени от ОББ. Те са за изпълнение на проекта за енергийна ефективност, за два проекта за малки ВЕЦ и проект за геотермална инсталация. В допълнение към преките икономически ползи се очаква проектите да осигурят намаляване на емисиите на въглероден двуокис в размер на 224 хил. тона за периода 2005-12 година . Допълнително ЕБВР предоставя 10 млн евро под формата на гранд или безвъзмездна помощ за извеждане от експолатация на реакторите на АЕЦ Козлодуй и за компенсиране на загубите на енергия в следствие затваряне на блоковете

Electronic newspaper Varnapool
www.varnapool.net

24 09 2004

ЕБВР отпуска 50 млн. евро кредитна линия за енергийна ефективност
Източник: varnapool.net

Европейската банка за възстановяване и развитие /ЕБВР/ финансира чрез кредитна линия от 50 млн. евро проекти за енергийна ефективност и използване на възобновяеми източници на енергия, съобщи днес в курорта "Св. Константин" Ян-Вилем ван де Вен от банката. Той е във Варна за участие във втория семинар за използване на възобновяеми източници на енергия и енергийна ефективност. В него участват представители на шестте банки в страната, чрез които ще се осъществява кредитирането на фирмите, кандидатстващи с проекти.

50-те млн. евро ще бъдат разпределени между шестте банки – БПБ, ОББ, Юнионбанк, Булбанк, HVB-Биохим и банка ДСК. Допълнително ЕБВР предоставя 10 млн. евро под формата на безвъзмездна помощ, обясни представителят на банката. Най-голямата част от кредитната линия – 15 млн. евро, ще се осъществява от ОББ.

В момента се изпълняват няколко проекта за енергийна ефективност и използване на възобновяеми източници, като отпуснатата сума до момента е 3.5 млн. евро. Ван де Вен подчерта, че това са кредити, а не субсидии от банката. Сред изпълняваните проекти са два за водно-електрически централи и проект за геотермална инсталация. При успешно изпълнение кредитоискателите ще получат от ЕБВР безвъзмездни помощи с общ размер 490 000 евро от Международния фонд «Козлодуй».

Фондът е създаден, за да компенсира затварянето на част от блоковете на АЕЦ, а компенсацията става по два начина - или чрез подобряване на енергийната ефективност, или чрез използване на нови източници, обясни Ван де Вен. Според него използването на възобновяемите източници се явява удачен подход.

За да кандидатстват за заем, фирмите трябава да представят реални проекти и бизнес-план, обясни представителят на ЕБВР. Кредитите се отпускат на изпълнителите на проектите. Фондът на банката подпомага успешно реализираните проекти чрез безвъзмездна помощ в размер на 7.5 процента за проекти за енергийна ефективност и 20 процента за проектите за възобновяеми източници.

Проектите за енергийна ефективност могат да включват малки мощности за комбинирано производство на топло и електроенергия, проекти за реконструкция на енергийна инфраструктура, за оползотворяване на отпадна топлина.

Изграждане на малки водноелектрически централи, слънчеви инсталации, вятърни централи, геотермални инсталации и инсталации с биогаз са сред проектите от частта за използването на възобновяеми енергийни източници.

По време на семинара ще бъде представена Националната програма за енергийна ефективност, както и самата кредитна линия на ЕБВР. В проявата освен представители на банките участват зам.председателят на Държавната комисия за енергийно регулиране Игнат Томанов и Кольо Колев, който е директор по енергийна ефективност и възобновяеми енергийни източници в Агенцията за енергийна ефективност.

Bulgarian National Radio Chain Darik Radio
www.darik.net

Бизнес

[<<] [6 от 41] [>>]

ЕБВР - кредитна линия за енергийна ефективност
24-09-2004 18:14

50 милиона евро за проекти
Кредитна линия от 50 милиона евро за проекти за енергийна ефективност и използване на възобновяеми източници на енергия отпуска на страната ни ЕБВР. Това съобщи днес в курорта Свети Константин край Варна Ян-Вилем ван де Вен от банката. Той е в морския град за участие във втория семинар за използване на възобновяеми източници на енергия и енергийна ефективност.

Коментирай Николай Христов

Bulgarian National Radio
Radio Bulgaria
www.bnr.bg

Новини

Публикувано на 24 Септември 2004 в 15:57 BG

Евробанката за възстановяване и развитие отпуска 50 милиона евро кредитна линия за енергийна ефективност
50 милиона евро отпуска Европейската банка за възстановяване и развитие /ЕБВР/ чрез кредитна линия за проекти за енергийна ефективност и използване на възобновяеми източници на енергия". Това съобщи днес в курорта "Св.Св. Константин и Елена", край Варна Ян-Вилем ван де Вен от дирекцията за енергийна ефективност на банката. Той участва във втория семинар за използване на възобновяеми източници на енергия и енергийна ефективност, който беше открит днес край Варна. На форума има и представители на шестте банки в страната, чрез които ще се осъществява кредитирането на фирмите, кандидатстващи с проекти. 50-те милиона евро ще бъдат разпределени между - Пощенска банка, ОББ, Юнионбанк, Булбанк, HVB Bank Biochim и Банка ДСК. Допълнително ЕБВР предоставя 10 милиона евро под формата на безвъзмездна помощ. Проектите за енергийна ефективност могат да включват малки мощности за комбинирано производство на топло и електроенергия, проекти за реконструкция на енергийна инфраструктура, за оползотворяване на отпадна топлина. Изграждане на малки водноелектрически централи, слънчеви инсталации, вятърни централи, геотермални инсталации и инсталации с биогаз са сред проектите от частта за използването на възобновяеми енергийни източници. По време на семинара ще бъде представена Националната ни програма за енергийна ефективност, както и самата кредитна линия на ЕБВР.

Web site dnes +
www.dnesplus.com

50 млн. евро предоставя Европейката банка за възстановяване и развитие на шест български банки

24/9/2004 15:56

50 млн. евро предоставя Европейката банка за възстановяване и развитие на шест български банки чрез кредитната си линия за енергийна ефективност и възобновяеми енергийни източници, съобщи представителят на банката Ян Вилен Вандевен.

Обявените нови четири заема, финансирани по тази линия са с общ размер от 3 млн. и 73 хил. евро и са предоставени от ОББ. Те са за изпълнение на проекта за енергийна ефективност, за два проекта за малки ВЕЦ и проект за геотермална инсталация. В допълнение към преките икономически ползи се очаква проектите да осигурят намаляване на емисиите на въглероден двуокис в размер на 224 хил. тона за периода 2005-12 година .

Допълнително ЕБВР предоставя 10 млн. евро под формата на гранд или безвъзмездна помощ за извеждане от експлоатация на реакторите на АЕЦ Козлодуй и за компенсиране на загубите на енергия в следствие затваряне на блоковете. Информацията е на Радио Варна.

Bulgarian telegraphic agency – BTA
www.bta.bg

Варна - ЕБВР - кредитиране

ЕБВР отпуска 50 милиона евро кредитна линия за енергийна ефективност
Варна, 24 септември /БТА/

50 милиона евро отпуска Европейската банка за възстановяване и развитие /ЕБВР/ чрез кредитна линия за проекти за енергийна ефективност и използване на възобновяеми източници на енергия". Това съобщи днес в курорта "Св.Св. Константин и Елена" Ян-Вилем ван де Вен от дирекцията за енергийна ефективност на банката.

Той участва във втория семинар за използване на възобновяеми източници на енергия и енергийна ефективност, който беше открит днес край Варна. На форума има и представители на шестте банки в страната, чрез които ще се осъществява кредитирането на фирмите, кандидатстващи с проекти.
50-те милиона евро ще бъдат разпределени между - Пощенска банка, ОББ, Юнионбанк, Булбанк, HVB Bank Biochim и Банка ДСК. Допълнително ЕБВР предоставя 10 милиона евро под формата на безвъзмездна помощ.

В момента се изпълняват няколко проекта за енергийна ефективност и използване на възобновяеми източници. Отпуснатата досега сума е 3,5 милиона евро. Ван де Вен подчерта, че това са кредити, а не субсидии от банката.
Става въпрос за проект за водно-електрически централи и проект за геотермална инсталация. При успешно изпълнение кредитоискателите ще получат от ЕБВР безвъзмездни помощи с общ размер 490 000 евро от Международния фонд "Козлодуй".
Фондът е създаден, за да компенсира затварянето на част от блоковете на АЕЦ "Козлодуй". Компенсацията става по два начина - чрез подобряване на енергийната ефективност, или чрез използване на нови източници, обясни Ван де Вен. Според него използването на възобновяемите източници е по- сполучлив подход.

За да кандидатстват за пари фирмите трябва да представят реални проекти и бизнес-план. Фондът на банката подпомага успешно реализираните проекти чрез безвъзмездна помощ в размер на 7,5 процента за проекти за енергийна ефективност и 20 процента за проектите за възобновяеми източници.

Проектите за енергийна ефективност могат да включват малки мощности за комбинирано производство на топло и електроенергия, проекти за реконструкция на енергийна инфраструктура, за оползотворяване на отпадна топлина.
Изграждане на малки водноелектрически централи, слънчеви инсталации, вятърни централи, геотермални инсталации и инсталации с биогаз са сред проектите от частта за използването на възобновяеми енергийни източници.
По време на семинара ще бъде представена Националната програма за енергийна ефективност, както и самата кредитна линия на ЕБВР. /ДР/

/СВ/

Newspaper Sega – electronic edition
www.segabg.com

Икономика

24.09.2004 г.

10 млн. евро безвъзмездно дава ЕБВР за енергийна ефективност

НАТАЛИЯ ВУЧКОВА

10 милиона евро безвъзмездно ще даде Европейската банка за възстановяване и развитие (ЕБВР) по проекти за енергийна ефективност и използване на възобновяеми енергийни източници. Това стана ясно вчера на започналия край Варна семинар по темата. С тези средства ще оперират "HVB Biochim" и Банка ДСК.
ЕБВР вече отпусна кредитна линия от 50 млн. евро на няколко банки за финансиране на проекти за енергийна ефективност и възобновяеми енергийни източници - вятърни, водни или слънчеви централи и мощности, използващи геотермална енергия или биогаз.
Стойността на проектите, които са финансирани до момента, е 3,5 млн. евро. Ако те бъдат изпълнени успешно, получателите на кредитите ще имат право да получат от ЕБВР и безвъзмездна помощ до 490 000 евро. Парите ще дойдат от Международния фонд "Козлодуй", който се управлява от ЕБВР, каза във Варна Ян-Вилем ван де Вен от дирекцията за енергийна ефективност на банката. Фондът бе създаден за усвояване на средствата, които Евросъюзът отпусна за предсрочното затваряне на реактори в АЕЦ "Козлодуй".
При действащи проекти за енергийна ефективност фондът отпуска помощ в размер на 7,5% от стойността им, а за възобновяемите източници този процент достига 20.

Newspaper Sega, daily
Print media

ЕБВР безвъзмездно кредитира енергийни проекти

НАТАЛИЯ ВУЧКОВА

10 милиона евро безвъзмездно ще даде Европейската банка за възстановяване и развитие (ЕБВР) по проекти за енергийна ефективност и използване на възобновяеми енергийни източници. Това стана ясно вчера на започналия край Варна семинар по темата. С тези средства ще оперират „HVB Biochim“ и Банка ДСК.

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ANNEX 6-B

WORKSHOP ADVERTISEMENT

Advertisements for the second BEERECL Workshop

Advertisements for the second BEERECL workshop were published in the following newspapers:

- The weekly newspaper Capital. Published in issue No. 35 of the newspaper, dated September 4, 2004, Saturday.
- The daily newspaper Pari. Published in issue No. 168, dated September 1, 2004 – Wednesday.
- The daily newspaper 24 Hours Varna. The advertisement is published in issue No.174, dated September 2, 2004 – Thursday
- The daily newspaper Sea Trud Varna. Published in issue No.172 of the newspaper, dated September 2, 2004, Thursday.
- The daily newspaper 24 Hours Bourgas. The advertisement is published in issue No.174, dated September 2, 2004, Thursday
- The daily newspaper Sea Trud Bourgas. Published in issue No.174 of the newspaper, dated September 2, 2004, Thursday

Advertisement in the Newspaper Capital

Европейска банка за възстановяване и развитие
Кредитна линия за енергийна ефективност и възобновяеми енергийни източници
Семинар

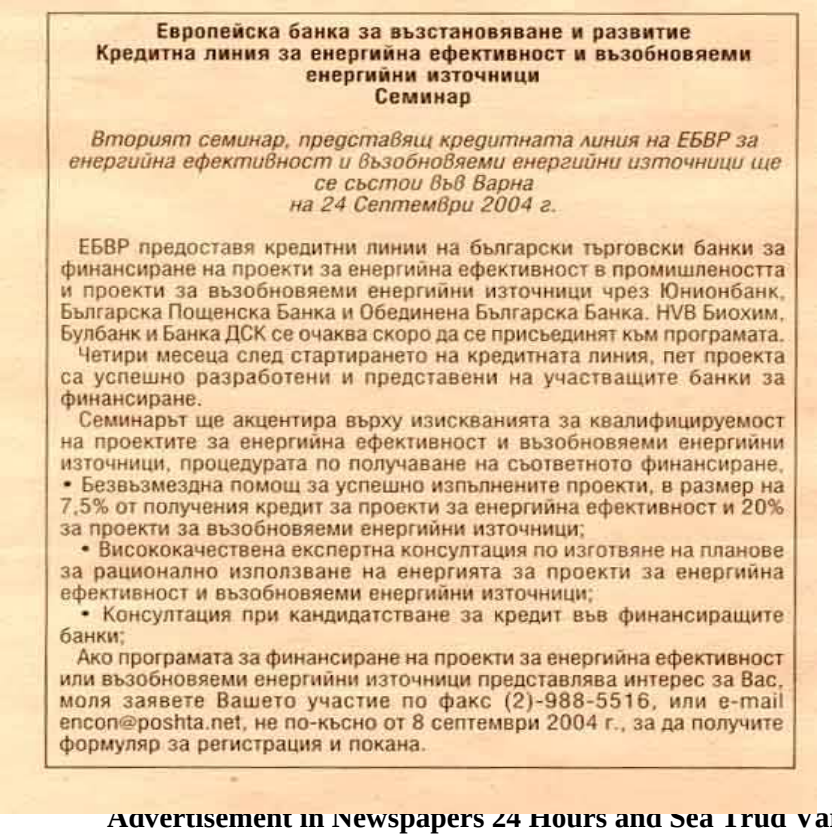
Вторият семинар, представящ кредитната линия на ЕБВР за енергийна ефективност и възобновяеми енергийни източници ще се състои във Варна
на 24 Септември 2004 г.

ЕБВР предоставя кредитни линии на български търговски банки за финансиране на проекти за енергийна ефективност в промишлеността и проекти за възобновяеми енергийни източници чрез Юнионбанк, Българска Пощенска Банка и Обединена Българска Банка. HVB Биохим, Булбанк и Банка ДСК се очаква скоро да се присъединят към програмата.
Четири месеца след стартирането на кредитната линия, пет проекта са успешно разработени и представени на участващите банки за финансиране.
Семинарът ще акцентира върху изискванията за квалифицируемост на проектите за енергийна ефективност и възобновяеми енергийни източници, процедурата по получаване на съответното финансиране, както и следните инициативи за потенциалните кредитоискатели:

- Безвъзмездна помощ за успешно изпълнените проекти, в размер на 7,5% от получения кредит за проекти за енергийна ефективност и 20% за проекти за възобновяеми енергийни източници;
- Висококачествена експертна консултация по изготвяне на планове за рационално използване на енергията за проекти за енергийна ефективност и възобновяеми енергийни източници;
- Консултация при кандидатстване за кредит във финансиращите банки;

Ако програмата за финансиране на проекти за енергийна ефективност или възобновяеми енергийни източници представлява интерес за Вас, моля заявете Вашето участие по факс (2)-988-5516, или e-mail encon@poshta.net, не по-късно от 8 септември 2004 г., за да получите формуляр за регистрация и покана.

Advertisement in the Newspaper Pari



Европейска банка за възстановяване и развитие
Кредитна линия за енергийна ефективност и възобновяеми енергийни източници
Семинар

Вторият семинар, представящ кредитната линия на ЕБВР за енергийна ефективност и възобновяеми енергийни източници ще се състои във Варна на 24 Септември 2004 г.

ЕБВР предоставя кредитни линии на български търговски банки за финансиране на проекти за енергийна ефективност в промишлеността и проекти за възобновяеми енергийни източници чрез Юнионбанк, Българска Пощенска Банка и Обединена Българска Банка. HVB Биохим, Булбанк и Банка ДСК се очаква скоро да се присъединят към програмата.

Четири месеца след стартирането на кредитната линия, пет проекта са успешно разработени и представени на участващите банки за финансиране.

Семинарът ще акцентира върху изискванията за квалифицируемост на проектите за енергийна ефективност и възобновяеми енергийни източници, процедурата по получаване на съответното финансиране.

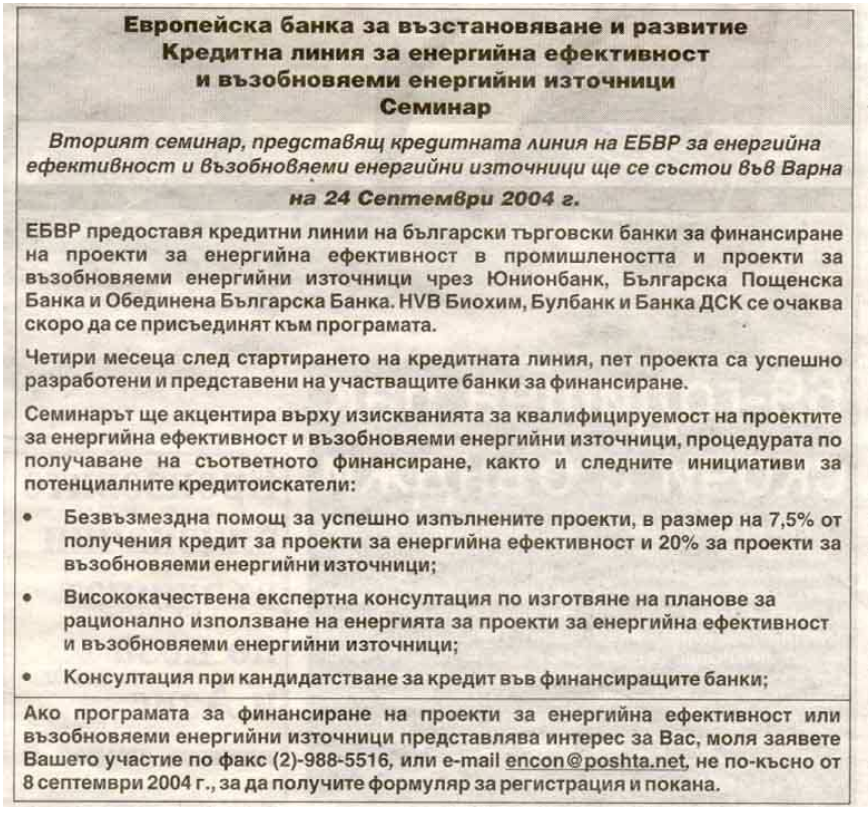
• Безвъзмездна помощ за успешно изпълнените проекти, в размер на 7,5% от получения кредит за проекти за енергийна ефективност и 20% за проекти за възобновяеми енергийни източници;

• Висококачествена експертна консултация по изготвяне на планове за рационално използване на енергията за проекти за енергийна ефективност и възобновяеми енергийни източници;

• Консултация при кандидатстване за кредит във финансиращите банки;

Ако програмата за финансиране на проекти за енергийна ефективност или възобновяеми енергийни източници представлява интерес за Вас, моля заявете Вашето участие по факс (2)-988-5516, или e-mail encon@poshta.net, не по-късно от 8 септември 2004 г., за да получите формуляр за регистрация и покана.

Advertisement in Newspapers 24 Hours and Sea Trud Varna



Европейска банка за възстановяване и развитие
Кредитна линия за енергийна ефективност
и възобновяеми енергийни източници
Семинар

Вторият семинар, представящ кредитната линия на ЕБВР за енергийна ефективност и възобновяеми енергийни източници ще се състои във Варна на 24 Септември 2004 г.

ЕБВР предоставя кредитни линии на български търговски банки за финансиране на проекти за енергийна ефективност в промишлеността и проекти за възобновяеми енергийни източници чрез Юнионбанк, Българска Пощенска Банка и Обединена Българска Банка. HVB Биохим, Булбанк и Банка ДСК се очаква скоро да се присъединят към програмата.

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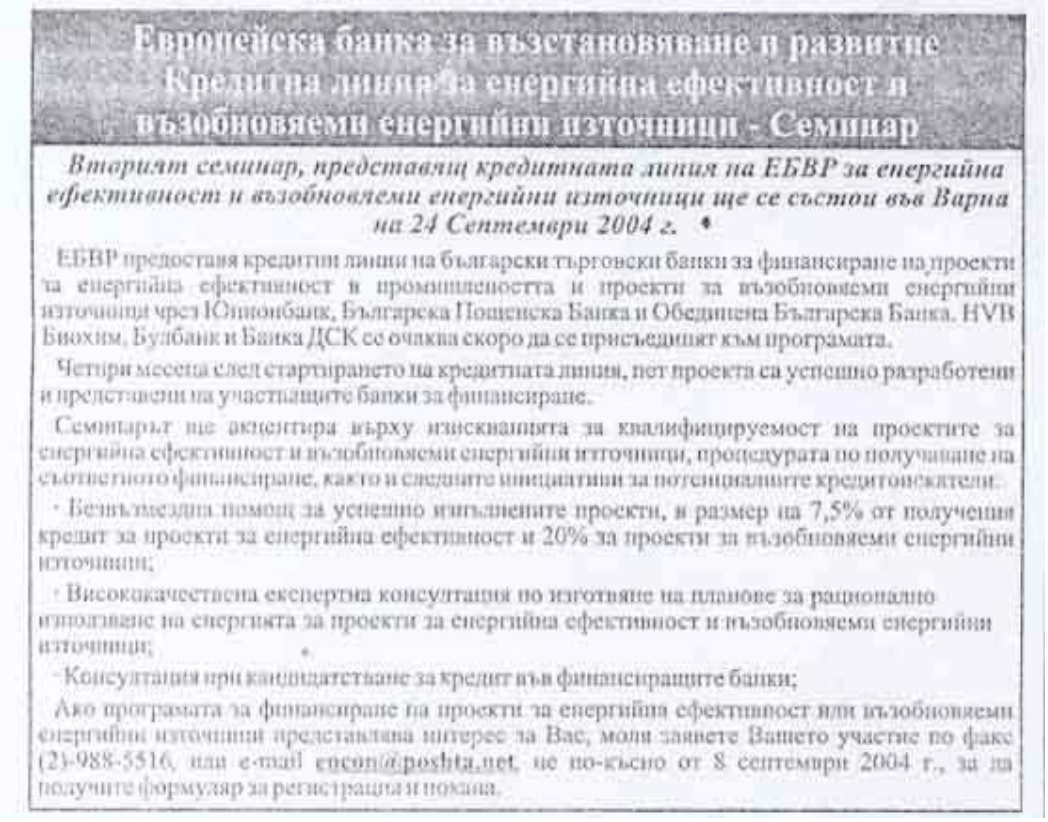
Семинарът ще акцентира върху изискванията за квалифицируемост на проектите за енергийна ефективност и възобновяеми енергийни източници, процедурата по получаване на съответното финансиране, както и следните инициативи за потенциалните кредитоискатели:

- Безвъзмездна помощ за успешно изпълнените проекти, в размер на 7,5% от получения кредит за проекти за енергийна ефективност и 20% за проекти за възобновяеми енергийни източници;
- Висококачествена експертна консултация по изготвяне на планове за рационално използване на енергията за проекти за енергийна ефективност и възобновяеми енергийни източници;
- Консултация при кандидатстване за кредит във финансиращите банки;

Ако програмата за финансиране на проекти за енергийна ефективност или възобновяеми енергийни източници представлява интерес за Вас, моля заявете Вашето участие по факс (2)-988-5516, или e-mail encon@poshta.net, не по-късно от 8 септември 2004 г., за да получите формуляр за регистрация и покана.

Advertisement in newspapers 24 Hours and Sea Trud Bourgas



Европейска банка за възстановяване и развитие Кредитна линия за енергийна ефективност и възобновяеми енергийни източници - Семинар

Вторият семинар, представящ кредитната линия на ЕБВР за енергийна ефективност и възобновяеми енергийни източници ще се състои във Варна на 24 Септември 2004 г.

ЕБВР предоставя кредитни линии на български търговски банки за финансиране на проекти за енергийна ефективност в промишлеността и проекти за възобновяеми енергийни източници чрез Юнионбанк, Българска Пощенска Банка и Обединена Българска Банка. HVB Биохим, Булбанк и Банка ДСК се очаква скоро да се присъединят към програмата.

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Семинарът ще акцентира върху изискванията за квалифицируемост на проектите за енергийна ефективност и възобновяеми енергийни източници, процедурата по получаване на съответното финансиране, както и следните инициативи за потенциалните кредитополучатели:

- Безвъзмездна помощ за успешно изпълнените проекти, в размер на 7,5% от получения кредит за проекти за енергийна ефективност и 20% за проекти за възобновяеми енергийни източници;
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Ако програмата за финансиране на проекти за енергийна ефективност или възобновяеми енергийни източници представлява интерес за Вас, моля заявете Вашето участие по факс (2)-988-5516, или e-mail encon@poshta.net, не по-късно от 8 септември 2004 г., за да получите формуляр за регистрация и покана.

Annex 6-C

AGENDA

European Bank for Reconstruction and Development

Bulgaria Energy Efficiency and Renewable Energy Credit Line Workshop

September 24, 2004

International Home of Science "Fr. Joliot-Curie", St. Constantine and Elena resort, Varna, Bulgaria

11:00 to 11:45 Press Conference *(Conference Hall 3, International Home of Science "Fr. Joliot-Curie")*
With the participation of :
Koljo Kolev, Director Energy Efficiency & Renewable Energy, Energy Efficiency Agency
Terry McCallion, Principal Banker, Energy Efficiency, EBRD
Jan-Willem van de Ven, Operation Leader Technical Cooperation, EBRD
Representatives of :Participating Banks
Ignat Tomanov, Deputy Chairman of the State Energy Regulatory Commission
Bannock Consulting and EnCon Services
Independent Energy Expert

11:30 to 12:00 Workshop Registration *(Conference Hall 5, International Home of Science "Fr. Joliot-Curie")*

12:00 to 12:20 ***Opening***
National Energy Efficiency Program, Energy efficiency and Renewable Energy Projects financing
Koljo Kolev, Director Energy Efficiency & Renewable Energy, Energy Efficiency Agency
Key-note by EBRD
Jan-Willem van de Ven, Operation Leader Technical Cooperation, EBRD

12:20 to 12:40 ***Bulgarian Energy Efficiency and Renewable Energy Credit Line Facility***
Michael Velikanov, Project Manager, the Bannock Consulting and EnCon Services Project Team

12:40 to 13:40 ***Introduction by Participating Banks***
Martin Petrov, Head Project Unit, Postbank
Stefan Vassilev, Manager, SME and International Lending Programs, UBB
Kiril Chaltakov, Coordinator of Lending Division, Unionbank
Anton Kobakov, Project and structured finance, Bulbank
Kiril Hristov, Head of Products for Business Clients, HVB~BankBiochim
Kostadin Karadjov, Head of Sales and Product Management Department, Bank DSK

13:40 to 14:10 Coffee Break

14:10 to 14:30 ***Regulatory support for renewable energy and co-generation***
Ignat Tomanov, Deputy Chairman of the State Energy Regulatory Commission

14:30 to 14:45 ***rational Energy Utilisation Plan***
Renata Natan, Financial Expert, EnCon Services

14:45 to 15:00 ***Energy Audit***
Iliya Iliev, Senior Engineer, EnCon Services

15:00 to 15:30 Questions and Answers Session
Koljo Kolev, Director Energy Efficiency & Renewable Energy, Energy Efficiency Agency
Jan-Willem van de Ven, Operation Leader Technical Cooperation, EBRD
Representatives of the Participating Banks
Ignat Tomanov, Deputy Chairman of the State Energy Regulatory Commission
Bannock Consulting and EnCon Services
Independent Energy Expert

15:30 Refreshments with Booths for the Participating Banks

Annex 7

DETAILED TECHNICAL SPECIFICATIONS AND CHARTS FOR THE MAIN ENERGY EQUIPMENT AND AUXILIARY FACILITY

Refer to main text