Industrie Service

Determination Report

Determination of the ”Bulgarian Renewable Energy Portfolio”

Report No. 733 895-2, Rev. 01

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Summary:

The Certification Body "Climate and Energy" of TÜV Industrie Service GmbH TÜV SÜD Group, has been ordered by the European Bank for Reconstruction and Development (EBRD) in London, UK to determine the above mentioned project.

The determination of this project has been performed by document reviews, interviews by e-mail and on-site inspections, audits at the locations of the project and interviews at the offices of the project owner.

As the result of this procedure, it can not be confirmed that the submitted project documentation is in line with all requirements set by the Marrakech Accords and the Kyoto Protocol and relevant guidelines of Bulgarian Designated National Authority. This opinion is caused by the sole remaining outstanding issues regarding the Letter of Approvals of the involved Annex-I-Parties.

Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reductions of 244 800 tons CO_{2e} (to be issued as ERUs) in the intended crediting period from 2008 – 2012 represents a reasonable estimation using the assumptions given by the project documents.

Work carried out by:	Klaus Nürnberger (Project manager) Peicho Peev (GHG trainee, ISO 14001 lead auditor)	Internal Quality Control by: Werner Betzenbichler

Abbreviations

BREP	Bulgarian Renewable Energy Portfolio
CAR	Corrective action request
CR	Clarification request
DOE	Designated Operational Entity
DP	Determination Protocol
EIA / EA	Environmental Impact Assessment / Environmental Assessment
BEF	Baseline Emission Factor for the Bulgarian Grid
ER	Emission reduction
ERU	Emission Reduction Unit
GHG	Greenhouse gas(es)
IRR	Internal Rate of Return
JI	Joint Implementation
KP	Kyoto Protocol
MoEW	Bulgaria Ministry of Environment and Water
MP	Monitoring Plan
MS	Management System
NGO	Non Governmental Organisation
NPV	Net Present Value
PDD	Project Design Document
RIEPW	Regional Inspection of Environment Protection and Water
SHPP	Small Hydro Power Plant
VVM	Validation and Verification Manual

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1 INTRODUCTION

1.1 Objective

The EBRD, London in United Kingdom has commissioned TÜV Industrie Service GmbH TÜV SÜD Group to conduct a determination of the "Bulgarian Renewable Energy Portfolio" (BREP-Project) with regard to the relevant requirements for JI project activities. The determination serves as a conformity test of the project design and is a requirement for all JI projects. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria. Determination is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reductions (in particular ERUs - in the first commitment period under the Kyoto Protocol).

UNFCCC criteria refer to the Kyoto Protocol Article 6 criteria and the Guidelines for the implementation of Article 6 of the Kyoto Protocol as agreed in the Marrakech Accords.

1.2 Scope

The determination scope is defined as an independent and objective review of the project design document (PDD), the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. TÜV SÜD has, based on the recommendations in the Validation and Verification Manual (see www.vvmanual.info), employed a risk-based approach in the determination, focusing on the identification of significant risks for project implementation and the generation of emission reductions.

This report is based on the PDD which has been issued November, 2005. The version from November, 2005 was published on the website of www.netinform.de. Potential stakeholders have been invited for commenting by using the Climate-L announcement list service. According to CARs and CRs indicated in the audit process the client decided to revise the PDD. The final version submitted in April 2006 serves as the basis for the final conclusions presented herewith.

The determination is not meant to provide any consulting towards the Dutch company DHV and the United Bulgarian Bank. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 GHG Project Description

The project foresees the installation of 2 small hydro power plants (Tumrush; Trakija Gas and Lesitchevo; Delektra Hydro) and biomass fired steam boilers (Alfatar; Wiwa Agrotex). The purpose of the project is

- to generate electricity in Bulgaria to meet the increasing energy demand and replacing part of the electricity production in Bulgaria produced from fossil fuel, and

- to generate steam by installing two steam boilers using combustion of straw.

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 hydro power plant Tumrush, Trakija Gas is located on the Purvenetzka river above the Purvenetz village.

The small hydro power plant (SHPP) Lesitchevo is located close to the village Lesitchevo on the Topolnitsa River.

The area of Alfatar Project 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 baseline scenario for the SHPP is reflected in the indirect off-site emissions by electricity production and for the biomass project it is reflected in the substitution of heavy fuel oil with biomass.

The installation of SHPP Tumrush has started in May 2005. The start of operation began in August 2005. The construction of SHPP Lesitchevo took place in 2004 and the commissioning was in January 2005. The Alfatar project is still under construction since November 2004 and the starting date of the boilers is foreseen in February 2006.

The Project Participants of the Host Country are

- Trakija Gas, Stara Zagora
- Delektra Hydro, Sofia and
- Wiwa Agrotex, Silstra

which are the operators of the subprojects and the owner of permits and licenses. These project owners will supply the Emission Reduction Units ERUs. The project documentation has been developed by United Bulgarian Bank, Sofia and DHV, Amersfoort from The Netherlands.

2 METHODOLOGY

In order to ensure transparency, a determination protocol was customised for the project, according to the Validation and Verification Manual (VVM). The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The determination protocol serves the following purposes:

- It organises, details and clarifies the requirements a JI project is expected to meet;
- It ensures a transparent determination process where TÜV SÜD has documented how a particular requirement has been validated and the result of the determination.

The determination protocol consists for this project of three tables. The different columns in these tables are described in Figure 1.

The completed determination protocol is enclosed in Annex 1 to this report.

Determination Protocol Table 1: Mandatory Requirements			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the determination report. **O** is used in case of an outstanding, currently not solvable issue, **AI** means Additional Information is required.*	*Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent determination process.*

Determination Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in six different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **Clarification** or **Additional Information** is used when the independent entity has identified a need for further clarification or more information.*

Determination Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Draft report clarifications and corrective action and additional Information requests	***Ref. to checklist question in table 2***	***Summary of project owner response***	***Determination conclusion***
If the conclusions from the draft determination are either a Corrective Action Request or a Clarification or Additional Information Request, these should be listed in this section.	*Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification or Additional Information Request is explained.*	*The responses given by the Client or other project participants during the communications with the independent entity should be summarised in this section.*	*This section should summarise the independent entity's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".*

2.1 Review of Documents

The project participants submitted a PDD and additional background documents related to the project design and baseline. A review for all these documents has been performed in order to identify all issues for discussion during the follow-up interviews on-site and by phone or email.

2.2 Follow-up Interviews

On November 14th, 2005 TÜV SÜD performed meeting with the project documentation developer and on November 31st and December 1st, 2005 TÜV SÜD conducted the on-site-mission to confirm selected information and to resolve issues identified in the document review. Representatives of the project owners have been interviewed.

The main topics of the interviews are summarised in Table 1. The complete and detailed list of all persons interviewed is enclosed in Appendix 2 to this report.

Table 1: Interview topics

Interviewed organisation	Interview topics
DHV	Project design, baseline, monitoring plan, environmental impacts, permits and licenses, stakeholder comments, additionality, monitoring procedures, Energy Sector, Approval of the project, JI-Guidelines
Project owner Trakija Gas and Delektra Hydro	Project design, monitoring plan, environmental impacts, permits and licenses, stakeholder comments, monitoring procedures, calibration of the measurement equipment, documentation, archiving of data, Energy Sector
United Bulgarian Bank	Baseline, Additonality, evaluation of the projects by external experts, Approval
National Electricity Company NEK	Baseline

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the determination is to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified in order to achieve a positive conclusion during the assessment process. Clarification and Corrective Action Requests raised by TÜV SÜD have been resolved in most parts by the revised PDD submitted January 4, 2006 and the remaining ones with final PDD version April 21, 2006. Furthermore additional documents have been submitted separately in order to provide the required evidences. To guarantee the transparency of the determination process, the concerns raised are and the response given are summarised in chapter 3 below. The whole process is documented in more detail in the final determination protocol in Annex 1.

3 DETERMINATION FINDINGS

In the following sections the findings of the final determination are stated. The determination findings for each determination subject are presented as follows:

1) The findings from the desk review of the project design document and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the Determination Protocol in Annex 1.

2) Where TÜV SÜD has identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively, has been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Determination Protocol in Annex 1.

3) Where Clarification and Corrective Action Requests have been issued, the response by the project participants to resolve these requests is summarized in the final determination report.

4) The final conclusions of the determination are presented consecutively.

3.1 Project Design

3.1.1 General Findings

There is no official form to be used in the context of the PDD development of JI projects besides the guidance given under the CDM. However the submitted PDD as well as its revision use an official form for CDM projects. The PDD are considered to cover all aspects necessary to describe the project and to assess its conformity with the underlying regulations.

Nevertheless a preliminary official form for description of JI-Project is now available and in case of "Track 2" its use would certain the approval of the JI Project by the JI Supervisory Committee.

The foreseen technology does reflect current good practice for generating electricity by hydropower and biomass. The project uses technology that goes beyond the state of the art in the host country. Moreover it is unlikely that the foreseen project technology will be substituted during the crediting period by a still more efficient technology.

Bulgaria has ratified the Kyoto Protocol on August 15th 2002. The Ministry for Environment and Water MoEW was appointed as national focal point of Bulgaria and has issued National JI-Guidelines "How to develop a climate change project and leverage the carbon benefits" (http://www.moew.government.bg/recent_doc/international/climate/Brochure_JI_eng.pdf).

The project starting date is clearly defined as well as the crediting period which will cover the years 2008-2012 in accordance with the first commitment period (generation of ERUs).

Under regular conditions the operational lifetime of the project will exceed this indicated time frame.

The Bulgarian National Focal Point has issued Letters of Endorsement which show in principle the support of the project.

3.1.2 Issued CARs/CRs

Corrective Action Request (CAR1):

It is envisaged that the project has to be approved by both countries (Netherlands and Bulgaria) at the end of the validation process. Written letters of approval were not available at the time of this determination.

Response:

The Approvals will be provided at the end of the validation.

Clarification Request (CR1):

It should be clarified before end of the validation, whether such guidelines are officially available.

Response:

No response received, but it is known that the Ministry for Environment and Water MoEW was appointed as national focal point of Bulgaria and has issued National JI-Guidelines "How to develop a climate change project and leverage the carbon benefits"

Corrective Action Request (CAR2):

The Technical Description (1.7 Results and activities of the project) presented in the PDD, shows a complete description of the project's system. Nevertheless there are some inconsistencies within the PDD. Inconsistencies in terms of technical data, respectively Astra Project, should be identified and corrected.

Response:

> The PDD revised does not contain anymore the subproject Astra, because this SHPP is in a very early stage. Other inconsistencies in terms of technical data were corrected.

Corrective Action Request (CAR3):

The aspects regarding future responsibilities are not mentioned in the PDD. The PDD should give a short overview about the aspects training and maintenance needs of the project. Table

Response:

Staff of Trakia and Delektra was trained on operational issues by the main supplier. Further training needs are annually reviewed by the manager of the operator.

Maintenance is performed by the company itself or by the supplier on a regular basis, at least once a year.

Mr. Radoslav Shynk is responsible for training and knowledge of personnel of Wiwa Agrotex. Personnel are trained on the job. 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.

3.1.3 Conclusion

The project status is partly in a comparative early stage; therefore the project does not yet fulfil formally all belonging criteria set for the approval of JI-projects. The Letter of Approvals by both parties, investor and host country, shall be submitted to TÜV SÜD at time of its availability. In case the issuance of ERUs will be done under the “First Track JI”- regime, there is no requirement to provide the validator such a LoA in order to forward it to the Supervisory Committee. Under that circumstance the issue can be considered to be resolved otherwise it will be considered as an outstanding issue requiring a final revision of this validation report.

The foreseen technology does reflect current good practice for generation of electricity using hydropower and biomass. The project uses technology that goes beyond the state of the art in the host country. It is moreover very unlikely that the foreseseen project technology will be substituted during the crediting period by a still more efficient technology .

The PDD contains information how training, operating, controlling, maintenance will be organized and managed. The aspects regarding future responsibilities and quality assurance are fixed.

3.2 Baseline

3.2.1 Findings

The baseline of the Bulgarian “Bulgarian Renewable Energy Portfolio” Project is established according the CDM Small Scale Methodologies ASM I.C. and ASM I.D. The emission reductions result from the replacement of electricity generation by the Bulgarian grid and the replacement of heat generation by oil-fired boilers.

The baseline does take into account the Bulgarian JI-Guidelines, NEK-Baseline Study and the IPCC Good Practice Guidance in National Greenhouse Gas Inventories and the major national and/or sectoral policies, macro-economic trends and political developments. Relevant key factors are described and their impact on the baseline and the project risk is evaluated.

The used approach for electricity production and heat generation is transparent, reproducible and conservative and is according the methodologies. It delivers emission factors for this baseline, which are considered to be appropriate.

The additionality of the project is proven by using barrier test according Attachment A to Appendix B of the simplified modalities and procedures for small–scale CDM project activities.

The PDD demonstrates additionality in particular with the combination of the following barriers:

- prevailing practice and lack of local technical expertise in terms of operating and maintaining SHPPs
- risk of to gain provisioned electricity generation due weather risk
- lack of access to finance because of high investment and unsecured income for electricity sales of green electricity due to the foreseen national quota system

Further on the subprojects will receive a bonus if implemented successfully. This bonus, the so called KIDSF grant, is paid by the Kozloduy fund (public fund).

3.2.2 Issued CARs/CRs

Corrective Action Request (CAR4):

For the biomass project Alfatar the baseline description and additionality discussion (B.2. and B.3.) is missing. The PDD should describe in detail how the methodology is applied and how the emissions will be reduced by the project. Further the additionality discussion for Alfatar must be described in detail, too.

Response:

The PDD revised describes the baseline for the biomass project Alfatar.

Clarification Request (CR2):

The PDD refers to the Study on Baseline for JI-Projects in the Bulgarian Power Sector from National Electricity Company, May 2005. The determination of the Baseline emission factor is not strictly according the CDM-Methodology of ACM002. It should be clarified, if this determination of grid-factor is supported by the national focal point. The calculation of grid-factor by using Operating Margin emission factor and Build Margin Emission Factor is not shown in the PDD. Hence it is not clarified, wether the BEF is combined once more with the Build Margin Factor.

Response:

The NEK – Baseline Study is approved by Bulgarian National Focal Point.

Clarification Request (CR3):

The additionality of the project is proven by using the Attachment A to CDM small-scale-methodology, an often applied tool in CDM, which is a multi barrier approach to demonstrate that the project is additional.

The financing plans for the projects in the REUP-studies show high rates of IRR and short pay back periods. The given loans have also short pay back periods. That information contradicts the explained financial barrier in the PDD. The financial barrier should be checked and explained in more detail.

Response:

The PDD revised explain the financial barrier in more detail:

United Bulgarian Bank has not financed any small scale renewable energy projects before EBRD's Bulgaria Energy Efficiency and Renewable Energy Credit Line 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.

Corrective Action Request (CAR5):

The PDD should be checked regarding references and added as necessary. (i.E. Emission factor for heavy fuel oil; hydroelectric generating facilities in Bulgaria; studies on possibilities of new HPPs)

Response:

The PDD revised was reviewed regarding references. Emission factors, calculations and tables are now referenced.

3.2.3 Conclusion

The baseline methodologies are in principle applicable for the emissions of electricity sector and heating of steam. The NEK – Baseline Study is approved by Bulgarian National Focal Point. This study determines combined margin Emission Factor (BEF).

The determination/calculation of the used emission factor of the grid (see PDD table A.2.1, A.2.2, A2.3) is now demonstrated in the PDD and its annexes. Hence it is clarified, that the Carbon Emission Factor for the Bulgarian Grid of the reference year 2004 calculated as Combined Margin is applied.

Nevertheless the NEK – Baseline Study, does not correspond exactly to CDM-Methodology because

- "Operating Margin EF" is calculated without consideration of the power plants, which are covered by the build margin.

- "Build Margin EF" is calculated without consideration of the "build" nuclear power plant units.

If the project should be validated as "Track 2 –project", it might be necessary to use exactly the CDM-methodologies.

The emission factor for heavy oil and diesel are referenced in the PDD. The determination and calculation of diesel fuel related to transport of straw and the determination of baseline emissions and project emissions are reasonable and now sufficiently described.

The additionality discussion for Alfatar is now demonstrated in more detail, it is shown that straw as fuel for boilers on a small scale is definitely no common practice in Bulgaria.

The expected carbon credits allow lower share of securities and a grace period. The BEERECL also provides incentives to the participating banks to overcome the relatively high overhead costs for small scale projects. The given figures regarding financial additionality are confirmed by respective proofs.

All given responses to the indicated CARs and CRs are resolving the belonging issues. The project does fulfil all the criteria on baselines as set for the approval of JI-projects.

3.3 Duration of the Project

The crediting period for the emission reduction units ERUS is defined as being from 2008 – 2012 in accordance with the first commitment period defined in the Kyoto Protocol.

The project starting dates are exactly defined. The PDD defines the starting date as the beginning of the respective construction. The operational lifetime of the project is announced to last at minimum by the end of 2012. This timeframe is very conservative.

3.3.1 Findings

Corrective Action request: (CAR6):

The starting date of the crediting period for the biomass project Wiwa agrotex will start later than indicated. The starting dates of the crediting periods should be checked and revised according the current status of the projects.

Response:

> The starting dates of the crediting periods have been revised in the PDD according the current status of the projects.

3.3.2 Conclusions

The commissioning dates of the sub-projects are exactly defined. The start of overall crediting period of the project is exactly defined; it has begun at January 1, 2005. It is distinguished in the PDD between the Kyoto period 2008-2012, when ERUs and the period before 2008, when only AAUs can be generated.

The Kyoto period is explicit defined as being from 2008 – 2012 in accordance with the first commitment period defined in the Kyoto Protocol.

The revised PDD is resolving the belonging issues The project is in compliance with the requirements.

3.4 Monitoring Plan

3.4.1 Findings

The monitoring methodology for the hydropower project does reflect current good practice and is supported by the monitored and recorded data. The monitoring provisions are in line with the project boundaries.

No indicators for project emissions have been defined and no leakage emissions are monitored according to the monitoring plan as there are no emissions to be expected.

Transport emissions and emissions related to flooded areea are discussed. These emissions are not considered to be monitored or to negligible.

3.4.2 Issued CARs/CRs

Corrective Action Request (CAR7):

The monitoring methodology for the biomass project Wiwa Agrotex is not included. The monitoring methodology and the selected monitoring parameters/devices for the biomass project Wiwa Agrotex shall be added.

Response:

> The PDD revised does include monitoring methodology and the selected monitoring parameters/devices for the biomass project Alfatar are added.

Clarification Request (CR4):

No indicators have been defined and no leakage emissions are monitored according to the monitoring plan as there are no emissions to be expected.

Nevertheless it should be regarded, that due reduced electricity production for the grid, the electricity sector would indirectly need less allowances to emit within the EU Emissions Trading System. Hence by preparing the national allocation plan the Bulgarian JI projects must be taken into consideration.

Response:

> The PDD revised does not contain any comment on this issue.

Corrective Action Request (CAR8):

Besides reporting all aspects regarding future responsibilities for registration, monitoring, measurement are already fixed in advance. The authority and responsibility for reporting should be fixed and clearly described in the PDD.

Response:

> The PDD revised is stating that 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 has 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.

Corrective Action request (CAR9):

No procedures are described for training of monitoring personnel. The procedures for training of monitoring personnel should be fixed and clearly described in the PDD.

Response:

See response above CAR8.

Corrective Action request (CAR10):

For the metering of the electricity, which will fed into the grid, the distribution company will be responsible for the technical quality of the collected data. It should be clarified how the calibration for the rest of monitoring devices will be managed..

Response:

The PDD revised is stating that 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 Alfatar project, a protocol has to be established.

3.4.3 Conclusion

The missing monitoring parameters are added in the revised monitoring plan. Exported electricity to the grid ($E_{pEXPORT}$) does mean the net-electricity (own consumption supplied from the is already subtracted).

The monitoring methodology for Alfatar project is reasonable chosen and the monitoring parameters are applicable.

All aspects regarding future responsibilities for registration, monitoring, measurement are already fixed in advance. Procedures for training of monitoring personnel are described, too.

For the metering of electricity, which will be fed into the grid, the distribution company will be responsible for the technical quality of the collected data. The Bulgarian authority for metering devices is responsible for calibration.

The MoEW is aware about the issue of double-issueing of ERUs and Allowances. Bulgaria is planning to set aside a reserve for electricity producing JI projects (deducted from the allowances of the electricity sector) in order to avoid indirect double counting. This reserve will include the ERUs in the PDDs of the approved projects, the endorsed projects, and some new projects.

The discussed issues are considered to be resolved. The project does fulfil all the prescribed requirements completely.

3.5 Calculation of GHG Emissions

3.5.1 Findings

The project's spatial boundaries are clearly described. Uncertainties in the GHG emissions estimates are addressed in the documentation.

Project emissions related to flooded area and to transport during construction are considered negligible. Baseline emissions and project emissions due electricity demand of conditioning of straw transport of straw are considered and comprehensible calculated.

Leakage emissions due transport of straw are considered and comprehensible calculated. No further aspects of leakage have been identified; hence further leakage calculation is not requested.

Despite some leakage emissions and project emissions the project will definitely result in fewer GHG emissions than the baseline scenario.

3.5.2 Issued CARs/CRs

Corrective Action Request (CAR11):

The calculations for the transportation emissions should be indicated in the PDD..

Response:

The PDD revised contains data regarding transportation emissions.

Corrective Action Request (CAR12):

Uncertainties in the GHG emission estimates should be addressed in the documentation.

Response:

The PDD revised is stating information about uncertainties of monitored parameters.

3.5.3 Conclusion

Determination of transport emissions are now demonstrated within chapter D.5 and calculated in section A2. The calculation is now sufficiently comprehensible.

The PDD revised is stating information about uncertainties of monitored parameters. The given information is sufficient.

The discussed issues are considered to be resolved. The project does fulfil all the prescribed requirements completely.

3.6 Environmental Impacts

3.6.1 Findings

The analysis of the environmental impacts is sufficient. There are few significant environmental impacts recognised and mitigation measures has been addressed during construction phase. For the SHPPs EIAs have been conducted and approved by Ministry of Agriculture and Forestry and the local authorities of the municipality. Construction permits were issued, which take environmental issues into account.

For Alfatar Project the Minutes No. 2787/10.10.2003 of the Regional Inspection of Environment Protection and Water (RIEPW) shows that the requirements of the current regulations regarding healthy and safe conditions for work will be met.

3.6.2 Issued CARs/CRs

Clarification Request (CR8):

The EIA Approval for Astra Project and the construction permits for Astra Project and Alfatar Project should be delivered to the audit team.

Response:

The Astra Project is cancelled within this PDD.

3.6.3 Conclusion

According to the PDD the necessary permits at this stage of the projects are available.

The project fulfils all prescribed requirements completely.

3.7 Local stakeholder process

3.7.1 Findings

Authorities and stakeholders have been consulted during the process of approval of the project. The project participants applied for an approval of the local mayor, who announced the regarding project. There have been no comments, which would have required any further action. With issuing the construction permits stakeholder comments are regarded.

Further for the BEERECL facility, two public conferences were organised. Advertisements were made in national and local newspapers, internet and radio. There were no comments received. Because of this, no further action has been undertaken.

3.7.2 Issued CARs/CRs

No such requests have been issued.

3.7.3 Conclusion

The project fulfils all the prescribed requirements completely.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

TÜV SÜD published the project design document on its website for 30 days from November 24 to December 23, 2005.

No comments have been received in this period.

Industrie Service

5 DETERMINATION OPINION

TÜV SÜD has performed a determination of the "Bulgarian Renewable Energy Portfolio"-Project. The determination was performed on the basis of relevant JI criteria.

The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria.

There is a remaining issue concerning the required letters of approval. Under the condition that this issue will be rectified sufficiently it is our opinion, that the project meets all relevant UNFCCC requirements for JI.

Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amounts of emission reductions of 244 800 t CO2e in the crediting period from 2008 – 2012 (to be issued as ERUs) represent a realistic estimation using the assumptions given by the project documents. As these figures will depend on the future performance of the project, this confirmation gives no guarantee on the realisation.

The determination is based on the information made available to us and the engagement conditions detailed in this report. The determination has been performed using a risk-based approach as described above. The only purpose of the report is its use during the registration process as JI project. Hence, TÜV SÜD can not be held liable by any party for decisions made or not made based on the determination opinion, which will go beyond that purpose.

Munich, 2006-05-03

Werner Betzenbichler

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Determination Protocol

Table 1 Mandatory Requirements for Joint Implementation (JI) Project Activities

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
1. The project shall have the approval of the Parties involved	Kyoto Protocol Article 6.1 (a)	**CAR 1** <u>Corrective Action Request:</u> The Approvals should be provided at the end of the validation.	It is envisaged that the project will be approved by both countries (investor country and Bulgaria) at the end of the validation process. The Bulgarian National Focal Point has issued a Letter of Endorsement which shows in principle the support of the project. It is foreseen to sell the emission reduction units to the EBRD Carbon Fund (established by Dutch Government). The Project Participants envisaged submitting the Letters of Approval to the validator.
2. Emission reductions, or an enhancement of removal by sinks, shall be additional to any that would otherwise occur	Kyoto Protocol Article 6.1 (b)	☑	Table 2, Section B.2
3. The sponsor Party shall not aquire emission reduction units if it is not in compliance with its obligations under Articles 5 & 7	Kyoto Protocol Article 6.1 (c)	☑	The Netherlands fulfil the obligations as requested.
4. The acquisition of emission reduction units shall be supplemental to domestic actions for the purpose of meeting	Kyoto Protocol Article 6.1 (d)	☑	The project is additional to domestic actions.

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
commitments under Article 3			
5. Parties participating in JI shall designate national focal points for approving JI projects and have in place national guidelines and procedures for the approval of JI projects	Marrakech Accords, JI Modalities, §20	**CR 1** Clarification Request : It should be clarified before end of the validation, whether such guidelines are officially available.	Both Parties have designated national focal points. National guidelines and procedures (G&P) are currently available for the Dutch tender but no specific guidelines are presented to the audit team regarding Bulgaria. The Bulgarian designated national focal point is the Ministry of Environment and Water and has issued National JI-Guidelines.
6. The host Party shall be a Party to the Kyoto Protocol	Marrakech Accords, JI Modalities, §21(a)/24	☑	Verified at UNFCCC website
7. The host Party's assigned amount shall have been calculated and recorded in accordance with the modalities for the accounting of assigned amounts	Marrakech Accords, JI Modalities, §21(b)/24	☑	Third National Communication is available
8. The host Party shall have in place a national registry in accordance with Article 7, paragraph 4	Marrakech Accords, JI Modalities, §21(d)/24	☑	This issue can not be answered by now as such as the JI system is not installed yet.
9. Project participants shall submit to the independent entity a project design document that contains all information needed for the determination	Marrakech Accords, JI Modalities, §31	☑	A PDD has been submitted in November 2005, which contains the most relevant infor-

REQUIREMENT	REFERENCE	CONCLUSION	Cross Reference / Comment
			mation.
10. The project design document shall be made publicly available and Parties, stakeholders and UNFCCC accredited observers shall be invited to, within 30 days, provide comments	Marrakech Accords, JI Modalities, §32	☑	The project design document was made publicly available from November 24 to December 23. Within the comment period no comments have been received.
11. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, in accordance with procedures as determined by the host Party shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out	Marrakech Accords, JI Modalities, §33(d)	☑	Table 2, Section F
12. The baseline for a JI project shall be the scenario that reasonably represents the GHG emissions or removal by sources that would occur in absence of the proposed project	Marrakech Accords, JI Modalities, Appendix B	☑	Table 2, Section B.2
13. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	Marrakech Accords, JI Modalities, Appendix B	☑	Table 2, Section B.2
14. The baseline methodology shall exclude to earn ERUs for decreases in activity levels outside the project activity or due to force majeure	Marrakech Accords, JI Modalities, Appendix B	☑	Table 2, Section B.2
15. The project shall have an appropriate monitoring plan	Marrakech Accords, JI Modalities, §33(c)	☑	Table 2, Section D

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A. General Description of Project Activity					
A.1. Project Boundaries					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	1, 2, 3, 6, 7, 8	DR, I	The project's spatial boundaries are clearly described for the project installation and respective emissions reduction through electricity generation by renewable energy.	☑	☑
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	1, 2, 3, 6, 7, 8, 16	DR, I	Yes, the Technical Description (1.7 Results and activities of the project) presented in the PDD, shows a complete description of the project's system. Nevertheless there are some inconsistencies within the PDD <u>Corrective Action Request:</u> Inconsistencies in terms of technical data should be identified and corrected. Respectively the Project Astra (i.E. Trakjia: 15,115 MWh/y; Delektra: 2nd turbine; Wiwa: 3,071 tons of crude oil equ.)	**CAR2**	☑
A.2. Technology to be employed					
A.2.1. Does the project design engineering reflect current good practices?	1, 2, 3, 6, 7, 8, 9,	DR, I	Yes, the employed technology does reflect current good practice concerning the installation and operation of hydro power plants	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	10, 11		and biomass heating system.		
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	1, 2, 3, 6, 7, 8, 9, 10, 11	DR, I	The foreseen technology does reflect current good practice for generation of electricity and heating using hydro and biomass. The project uses technology that goes beyond the state of the art in the host country. It is, moreover, not likely that the project technology will be substituted by a more efficient technology.	☑	☑
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	1, 2, 3, 6, 7, 8, 9, 10, 11	DR, I	It is not likely that the project technology will be substituted by a more efficient technology.	☑	☑
A.2.4. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	1, 2, 3, 6, 7, 8	DR, I	The turbine suppliers will be obliged to organize training for responsible operating and maintenance staff.	☑	☑
A.2.5. Does the project make provisions for meeting training and maintenance needs?	1, 2, 3, 6, 7, 8	DR, I	The aspects regarding future responsibilities are not mentioned. Corrective action request: The PDD should give a short overview about the aspects training and maintenance needs of the project.	**CAR3**	☑

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B. Project Baseline					
B.1. Baseline Methodology					
B.1.1. Is the discussion and selection of the baseline methodology transparent?	1, 2, 3, 4, 6, 7, 8, 21	DR, I	The discussion and selection in the Baseline Study is transparent. CDM-Methodologies for small-scale-projects are used.	☑	☑
B.1.2. Does the baseline methodology specify data sources and assumptions?	1, 2, 3, 4, 6, 7, 8, 21	DR, I	Yes, all data used are specified and documented. For the biomass project Alfatar the baseline description (B.2. and B.3.) is missing. <u>Corrective Action Request:</u> The PDD should describe in detail how the methodology is applied and how the emissions will be reduced by the project.	**CAR4**	☑
B.1.3. Does the baseline methodology sufficiently describe the underlying rationale for the algorithm/formulae used to determine baseline emissions (e.g. marginal vs. average, etc.)	1, 2, 3, 4, 6, 7, 8, 21	DR, I	The PDD refers to the Study on Baseline for JI-Projects in the Bulgarian Power Sector from National Electricity Company, May 2005. This study does not regard build margin power plants by calculating the operating margin. Further by calculating the build margin the recent build Hydro Power Plants and Nuclear Power Plant units are neglected. This study fixes the emission factors for the future ex-ante and does not foresee ex-post determination.		☑

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			Clarification request: It should be clarified, if this determination of grid-factor is supported by the national focal point. If the project should be validated as "Track 2 –project", it would be necessary to use exactly the CDM-methodologies. The calculation of grid-factor by using Operating Margin emission factor and Build Margin Emission Factor is not shown in the PDD.	**CR2**	
B.1.4. Does the baseline methodology specify types of variables used (e.g. fuels used, fuel consumption rates, etc)?	1, 2, 3, 4, 6, 7, 8, 21	DR, I	See comments above: Mainly all types of variables are clearly and completely specified.	See CAR4 and CR2	☑
B.1.5. Does the baseline methodology specify the spatial level of data (local, regional, national)?	1, 2, 3, 4, 6, 7, 8, 21	DR, I	All spatial levels are considered to be appropriate.	☑	☑
B.2. Baseline Determination					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	1, 2, 3, 4, 6, 7, 8, 21	DR, I	The discussion and determination of the chosen baseline is transparent and reflect the situation as required due to altered legislation and the resulting need for changes.	☑	☑

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B.2.2. Has the baseline been determined using conservative assumptions where possible?	1, 2, 3, 4, 6, 7, 8, 21	DR, I	See comments above; CAR4 and CR2		☑
B.2.3. Has the baseline been established on a project-specific basis?	1, 2, 3, 6, 7, 8	DR, I	Yes, the baseline is established in a project specific manner.	☑	☑
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	1, 2, 3, 4, 6, 7, 8, 21	DR, I	Yes, the baseline does take into account the major national and/or sectoral policies, macro-economic trends and political developments. Relevant key factors are described and their impact on the baseline and the project risk is evaluated.	☑	☑
B.2.5. Is the baseline determination compatible with the available data?	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 21	DR, I	See comments above; CAR4 and CR2	See CAR4 and CR2	☑
B.2.6. Does the selected baseline represent a likely scenario in the absence of the project?	1, 2, 3, 4, 6, 7, 8, 9, 10, 11,	DR, I	Yes, the baseline does represent a likely scenario in the non project case as it conforms to all legal requirements and the prevailing practice in the Bulgarian energy sector.	☑	☑

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	21				
B.2.7. Is it demonstrated that the project activity itself is not a likely baseline scenario?	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 21	DR, I	The additionality of the project is proven by using the Attachment A to CDM small-scale-methodology . which is the applied tool applied in CDM which is a multi barrier approach to demonstrate that the project is additional. Clarification request: The financing plans for the projects in the REUP-studies show high rates of IRR and short pay back periods. The given loans have also short pay back periods. That information contradicts the explained financial barrier in the PDD. The financial barrier should be checked and explained in more detail.	**CR3**	☑
B.2.8. Have the major risks to the baseline been identified?	1, 2, 3, 6, 7, 8	DR, I	Most important risks to the baseline are the weather risks because of droughts and floods. See comments above CR2 and CAR2	See CR2 and CAR2	☑
B.2.9. Is all literature and sources clearly referenced?	1, 2, 3, 6, 7, 8	DR, I	Yes, mainly. Corrective Action Request: The PDD should be checked regarding references and added as necessary. (i.E. Emission factor for heavy fuel oil; hydroelectric generating facilities in Bulgaria; stud-	**CAR5**	☑

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			ies on possibilities of new HPPs)		
C. Duration of the Project/ Crediting Period					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	1, 2, 3, 6, 7, 8	DR, I	The project starting dates are exactly defined. The PDD defines the starting date as the beginning of the respective construction. The operational lifetime of the project is announced to last at minimum by the end of 2012. This timeframe is very conservative.	☑	☑
C.1.2. Is the project's crediting time clearly defined?	1, 2, 3, 6, 7, 8	DR, I	Yes, the crediting period for the emission reduction units ERUS is defined as being from 2008 – 2012 in accordance with the first commitment period defined in the Kyoto Protocol. The starting date of the crediting period for the biomass project Alfatar will start later than indicated. <u>Corrective Action Request</u> The starting dates of the crediting periods should be checked and revised according the current status of the projects.	**CAR6**	☑
D. Monitoring Plan					
D.1. Monitoring Methodology					
D.1.1. Does the monitoring methodology reflect good	1, 2,	DR,	The monitoring methodology for the hydro-		☑

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monitoring and reporting practices?	3, 6, 7, 8	I	power project does reflect current good practice. The monitoring methodology for the biomass project Alfatar is not included. Corrective Action Request The monitoring methodology and the selected monitoring parameters/devices for the biomass project Alfatar shall be added.	**CAR7**	
D.1.2. Is the selected monitoring methodology supported by the monitored and recorded data?	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 16, 21	DR, I	The monitoring methodology for hydropower projects is supported by the monitored and recorded data. The internal demand of electricity is normally smaller than 1% of generation, and therefore it can be neglected. Anyway, there should be a check during operation, that this behaviour is suitable. The visited power plants have metering devices to monitor the internal demand. Currently it cannot be evaluated if the monitoring methodology for biomass project is supported by the monitored and recorded data. See CAR7	☑	☑
D.1.3. Are the monitoring provisions in the monitoring methodology consistent with the project boundaries in the baseline study?	1, 2, 3, 6, 7, 8	DR, I	See CAR7	☑	☑

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D.1.4. Have any needs for monitoring outside the project boundaries been evaluated and if so, included as applicable?	1, 2, 3, 6, 7, 8	DR, I	It has been evaluated, but there is no such need.	☑	☑
D.1.5. Does the monitoring methodology allow for conservative, transparent, accurate and complete calculation of the ex post GHG emissions?	1, 2, 3, 6, 7, 8	DR, I	Yes.	☑	☑
D.1.6. Is the monitoring methodology clear and user friendly?		DR, I	See CAR7	☑	☑
D.1.7. Does the methodology mitigate possible monitoring errors or uncertainties addressed?		DR, I	See CAR7	☑	☑
D.2. Monitoring of Project Emissions					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	1, 2, 3, 6, 7, 8	DR, I	For the hydro power projects two indicators for project emissions have been defined but no project emissions are monitored according to the monitoring plan as such emissions are negligible. For the biomass project the monitoring plan does not exist yet. However it is foreseen to monitor the internal demand of electricity and the emissions by transportation of straw. See CAR7.	☑	☑
D.2.2. Are the choices of project GHG indicators reasonable?		DR, I	See above	☑	☑
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?		DR, I	See above	☑	☑

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D.2.4. Will the indicators enable comparison of project data and performance over time?		DR, I	This is more relevant for the baseline indicators (energy generation), which will offer a proof of the project's performance.	☑	☑
D.3. Monitoring of Leakage					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	1, 2, 3, 6, 7, 8	DR, I	No indicators have been defined and no leakage emissions are monitored according to the monitoring plan as there are no emissions to be expected. Clarification Request: Nevertheless it should be regarded, that due generated electricity fed into the grid the electricity sector would indirectly need less allowances within the EU Emissions Trading System. Hence by preparing the national allocation plan the Bulgarian JI projects must be taken into consideration.	**CR4**	☑
D.3.2. Have relevant indicators for GHG leakage been included?		DR, I	See comment above.	☑	☑
D.3.3. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?		DR, I	See comment above.	☑	☑
D.3.4. Will it be possible to monitor the specified GHG leakage indicators?		DR, I	See comment above.	☑	☑
D.4. Monitoring of Baseline Emissions					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary	1, 2,	DR,	For the hydro-power projects there is one	☑	☑

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for determining the baseline emissions during the crediting period?	3, 6, 7, 8	I	key factor which is required in order to determine the baseline emissions - electricity production of the project – which is properly monitored. For the biomass project see CAR7		
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	1, 2, 3, 6, 7, 8	DR, I	The choice is reasonable.	☑	☑
D.4.3. Will it be possible to monitor the specified baseline indicators?	1, 2, 3, 6, 7, 8	DR, I	Yes.	☑	☑
D.5. Monitoring of Social and Environmental Impacts					
D.5.1. Does the monitoring plan provide for the collection and archiving of relevant data on social and environmental impacts?	1, 2, 3, 6, 7, 8	DR, I	No, the monitoring plan does not provide the collection of environmental impacts. The approvals of EIA or the construction permits show that there are not any relevant environmental impacts. The construction permit for Alfatar should foresee to monitor the exhaust gases regarding harmful gases.	☑	☑
D.5.2. Will it be possible to monitor the specified impact indicators?		DR, I	See comment above	☑	☑
D.6. Project Management Planning					
D.6.1. Is the authority and responsibility of project management clearly described?	1, 2, 3, 6,	DR, I	The aspects regarding future responsibilities and quality assurance are fixed in ad-	☑	☑

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	7, 8		vance.		
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	1, 2, 3, 6, 7, 8	DR, I	Yes, all aspects regarding future responsibilities for registration, monitoring, measurement are already fixed in advance. <u>Corrective Action Request:</u> The authority and responsibility for reporting should be fixed and clearly described in the PDD.	**CAR8**	☑
D.6.3. Are procedures identified for training of monitoring personnel?	1, 2, 3, 6, 7, 8	DR, I	No procedures are described for training of monitoring personnel. <u>Corrective Action Request:</u> The procedures for training of monitoring personnel be fixed and clearly described in the PDD.	**CAR9**	☑
D.6.4. Are procedures identified for emergency preparedness where emergencies can result in unintended emissions?	1, 2, 3, 6, 7, 8	DR, I	There is no need for this; emergencies can not result in unintended emissions. The internal demand will be measured.	☑	☑
D.6.5. Are procedures identified for calibration of monitoring equipment?	1, 2, 3, 6, 7, 8	DR, I	For the metering of electricity, which will fed into the grid, the distribution company will be responsible for the technical quality of the collected data. <u>Corrective Action Request:</u> It should be clarified how the calibration for the rest of monitoring devices will be managed.	**CAR10**	☑

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D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	1, 2, 3, 6, 7, 8	DR, I	Data uncertainties of directly monitored data (i.e. electricity) are deemed to be low. An independent National agency is in charge of checking the meters and guaranteeing their operation within close, officially set parameters.	☑	☑
D.6.7. Are procedures identified for monitoring, measurements and reporting?	1, 2, 3, 6, 7, 8	DR, I	Yes, the procedures regarding monitoring, measurements and reporting are already fixed in advance.	☑	☑
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	1, 2, 3, 6, 7, 8	DR, I	Yes, the procedures regarding day-to-day records handling are already fixed in advance.	☑	☑
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	1, 2, 3, 6, 7, 8	DR, I	Yes, procedures are identified for dealing with possible monitoring data adjustments and uncertainties. Historical data will be used in such cases.	☑	☑
D.6.10. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	1, 2, 3, 6, 7, 8	DR, I	The responsibility for monitoring supervision is not fixed. See comment above CAR7	☑	☑
D.6.11. Are procedures identified for project performance reviews?	1, 2, 3, 6, 7, 8	DR, I	With the monitored data there are enough indicators to check the performance of the project. These indicators are strong connected to generated emission reduction.	☑	☑

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			Therefore no further procedures for project performance are necessary.		
D.6.12. Are procedures identified for corrective actions?	1, 2, 3, 6, 7, 8	DR, I	The responsibility for monitoring supervision is not fixed yet. See comment above CAR7		☑
E. Calculation of GHG Emissions by Source					
E.1. Predicted Project GHG Emissions					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	1, 2, 3, 6, 7, 8	DR, I	Yes, all necessary parameters have been defined.	☑	☑
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	1, 2, 3, 6, 7, 8, 21, 22	DR, I	No, the calculations for the transportation emissions are not mentioned. Corrective Action Request: The calculations for the transportation emissions should be indicated in the PDD.	**CAR11**	☑
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	1, 2, 3, 6, 7, 8, 21, 22	DR, I	See comment above.	☑	☑
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	1, 2, 3, 6, 7, 8	DR, I	See comment above.	☑	☑

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E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	1, 2, 3, 6, 7, 8	DR, I	Yes.	☑	☑
E.2. Leakage Effect Emissions					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	1, 2, 3, 6, 7, 8	DR, I	Yes, leakage effects are identified due to transport emissions of straw for Biomass project.	☑	☑
E.2.2. Have these leakage effects been properly accounted for in calculations?	1, 2, 3, 6, 7, 8	DR, I	Yes.	☑	☑
E.2.3. Does the methodology for calculating leakage comply with existing good practice?	1, 2, 3, 6, 7, 8	DR, I	Yes.	☑	☑
E.2.4. Are the calculations documented in a complete and transparent manner?	1, 2, 3, 6, 7, 8	DR, I	Yes	☑	☑
E.2.5. Have conservative assumptions been used when calculating leakage?	1, 2, 3, 6, 7, 8	DR, I	Yes.	☑	☑
E.2.6. Are uncertainties in the leakage estimates properly addressed?	1, 2, 3, 6, 7, 8	DR, I	There are uncertainties regarding real distances which the straw camions have to drive. The conservative assumptions do cover the possible uncertainties.	☑	☑
E.3. Baseline Emissions					
E.3.1. Have the most relevant and likely operational	1, 2,	DR,	Yes, besides the grid-factor, all data are	☑	☑

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characteristics and baseline indicators been chosen as reference for baseline emissions?	3, 6, 7, 8	I	based on historic values, which have been verified during the validation process.		
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	1, 2, 3, 6, 7, 8	DR, I	Yes.	☑	☑
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	1, 2, 3, 6, 7, 8	DR, I	Yes.	☑	☑
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	1, 2, 3, 6, 7, 8	DR, I	Yes.	☑	☑
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	1, 2, 3, 6, 7, 8	DR, I	Uncertainties in the GHG emission estimates are not addressed yet in the documentation. Corrective Action Request: Uncertainties in the GHG emission estimates should be addressed in the documentation.	**CAR12**	☑
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	1, 2, 3, 6, 7, 8	DR, I	Yes.	☑	☑
E.4. Emission Reductions					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	1, 2, 3, 6, 7, 8,	DR, I	Yes.	☑	☑

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
	9, 10, 11 1, 2, 3, 6, 7, 8				
F. Environmental Impacts					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	1, 2, 3, 6, 7, 8	DR, I	Yes, the description of the environmental impacts is sufficient.	☑	☑
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	1, 2, 3, 6, 7, 8, 12, 13, 14, 15, 17, 18, 20	DR, I	Requirements for EIAs exist in the host country and have already been fulfilled, besides Astra project. Construction permits, besides Astra project were issued, which take the results of EIA into account. Clarification request: The EIA Approval for Astra Project and the construction permits for Astra Project and Alfatar should be delivered to the audit team.	**CR5**	☑
F.1.3. Will the project create any adverse environmental effects?	1, 2, 3, 6, 7, 8, 9, 10,	DR, I	No, the project will create only low and very local adverse environmental effects, regarding local increase of exhaust gases. In a regional view there is not any adverse environmental effect.	☑	☑

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	11				
F.1.4. Are transboundary environmental impacts considered in the analysis?		DR, I	It can be confirmed that no transboundary impacts are existing.	☑	☑
F.1.5. Have identified environmental impacts been addressed in the project design?		DR, I	See comment F1.3.	☑	☑
F.1.6. Does the project comply with environmental legislation in the host country?	1, 2, 3, 6, 7, 8, 12, 13, 14, 17, 18, 20	DR, I	Yes the project complies with the environmental legislation in Bulgaria and the EU.	☑	☑
***G.* Stakeholder Comments**					
G.1.1. Have relevant stakeholders been consulted?	1, 2, 3, 6, 7, 8, 12, 13, 14, 17, 18, 20	DR	Yes, the project participants, besides Astra project, applied for an approval of the local mayor, who has announced the respective project. With issuing the construction permits stakeholder comments are regarded. Further for the BEERECL facility, two public conferences were organised. Advertisements were made in national and local newspapers, internet and radio. There were no comments received. Because of this, no further action has been undertaken.	☑	☑

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G.1.2. Have appropriate media been used to invite comments by local stakeholders?	1, 2, 3, 6, 7, 8	DR	Yes	☑	☑
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	1, 2, 3, 6, 7, 8, 12, 13, 14, 17, 18, 20	DR	Yes	☑	☑
G.1.4. Is a summary of the stakeholder comments received provided?	1, 2, 3, 6, 7, 8	DR	Yes	☑	☑
G.1.5. Has due account been taken of any stakeholder comments received?	1, 2, 3, 6, 7, 8	DR	There have been no comments, which would have required any further action.	☑	☑

Table 3 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Determination conclusion
CAR 1 Corrective Action Request: The Approvals should be provided at the end of the validation	Table 1, 1.		The project status is in a comparative early stage; therefore the project does not yet fulfil formally all belonging criteria set for the approval of JI-projects. The Letter of Approvals by both parties, investor and host country, shall be submitted to TÜV SÜD at time of its availability. In case the issuance of ERUs will be done under the "First Track JI"- regime, there is no requirement to provide the validator such a LoA in order to forward it to the Supervisory Committee. Under that circumstance the issue can be considered to be resolved otherwise it will be considered as an outstanding issue requiring a final revision of this validation report.
CR 1 Clarification Request : It should be clarified before end of the validation, whether such guidelines are officially available	Table 1, 5.		The Ministry for Environment and Water MoEW was appointed as national focal point of Bulgaria and has issued National JI-Guidelines "How to develop a climate change project and leverage the carbon benefits" (http://www.moew.government.bg/recent_doc/international/climate/Brochure_JI_eng.pdf
CAR2 The Technical Description (1.7 Results and activities of	Table 2, A.1.2.	The PDD revised does not contain anymore the subproject Astra, because this SHPP is in a very early stage. Other inconsistencies in	The PDD revised has cancelled the subproject Astra. The given technical data are reliable and do correspond to each other.

Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Determination conclusion
the project) presented in the PDD, shows a complete description of the project's system. Nevertheless there are some inconsistencies within the PDD Corrective Action Request: Inconsistencies in terms of technical datas should be identified and corrected. Respectively the Project Astra (i.E. Trakjia: 15,115 MWh/y; Delektra: 2nd turbine; Wiwa: 3,071 tons of crude oil equ.)		terms of technical data were corrected.	This issue is considered to be resolved.
CAR3 The aspects regarding future responsibilities are not mentioned. Corrective action request: The PDD should give a short overview about the aspects training and maintenance needs of the project.	Table 2, A.2.5.	Staff of Trakia and Delektra was trained on operational issues by the main supplier. Further training needs are annually reviewed by the manager of the operator. Maintenance is performed by the company itself or by the supplier on a regular basis, at least once a year. Mr. Radoslav Shynk is responsible for training and knowledge of personnel of Alfatar. Personnel are trained on the job. 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 PDD revised gives a short overview about the aspects training and maintenance needs of the project. The responsibilities are fixed. This issue is considered to be resolved.

Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Determination conclusion
		the boilers and straw conditioning.	
CAR4 All data used are specified and documented. For the biomass project Alfatar the baseline description and additionality discussion (B.2. and B.3.) is missing. <u>Corrective Action Request:</u> The PDD should describe in detail how the methodology for Alfatar is applied and how the emissions will be reduced by the project. Further the additionality discussion for Alfatar must be described in detail, too.	Table 2, B.1.2.	The PDD revised describes for the biomass project Alfatar the baseline.	The additionality discussion for Alfatar is described in more detail. It is shown that straw on that scale is definitely not common practice in Bulgaria. This issue is considered to be resolved.
CR2 The PDD refers to the Study on Baseline for JI-Projects in the Bulgarian Power Sector from National Electricity Company, May 2005. This study does not regard build margin power plants by calculating the operating margin.	Table 2, B.1.3.	The NEK – Baseline Study is approved by Bulgarian National Focal Point.	The baseline methodology is in principle applicable for the emissions of electricity sector. The NEK – Baseline Study is approved by Bulgarian National Focal Point. This study determines combined margin EF (BEF). The determination/calculation of the used grid-factor (see PDD table A.2.1, A.2.2, A2.3) is now

Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Determination conclusion
Further by calculating the build margin the recent build Hydro Power Plants and Nuclear Power Plant units are neglected. This study fixes the emission factors for the future ex-ante and does not foresee ex-post determination. Hence the determination of the grid-factor is not strictly according the CDM-Methodology of ACM002. Clarification request: It should be clarified, if this determination of grid-factor is supported by the national focal point. If the project should be validated as "Track 2 – project", it would be necessary to use exactly the CDM-methodologies. The calculation of grid-factor by using Operating Margin emission factor and Build Margin Emission Factor is not shown in the PDD. Further it is not clarified, why these			shown in the PDD ant it is not clarified where this value is derived from. Remark: The NEK – Baseline Study, does not correspond to CDM-Methodology because - "Operating Margin EF" is calculated without consideration of the power plants, which are covered by the build margin. - "Build Margin EF" is calculated without consideration of the "build" nuclear power plant units and the pumped storage HPP This issue is resolved in case that this project will be a "Track1"-JI-Project, and will not require further approval by the JI Supervisory Committee.

Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Determination conclusion
BEF are combined once more with a Build Margin Factor.			
CR3 The additionality of the project is proven by using the Attachment A to CDM small-scale-methodology . which is the applied tool applied in CDM which is a multi barrier approach to demonstrate that the project is additional. <u>Clarification request:</u> The financing plans for the projects in the REUP-studies show high rates of IRR and short pay back periods. The given loans have also short pay back periods. That information contradicts the explained financial barrier in the PDD. The financial barrier should be checked and explained in more detail.	Table 2, B.2.7.	The PDD revised explain the financial barrier in more detail: United Bulgarian Bank has not financed any small scale renewable energy projects before EBRD's Bulgaria Energy Efficiency and Renewable Energy Credit Line 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	The expected carbon credits allow lower share of securities and a grace period. The BEERECL also provides incentives to the participating banks to overcome the relatively high overhead costs for small scale projects. This issue is considered to be resolved.

Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Determination conclusion
		to the participating banks to overcome the relatively high overhead costs for small scale projects.	
CAR5 Almost all literature and sources are clearly referenced. <u>Corrective Action Request:</u> The PDD should be checked regarding references and added as necessary. (i.E. Emission factor for heavy fuel oil; hydroelectric generating facilities in Bulgaria; studies on possibilities of new HPPs)	Table 2, B.2.9.	The PDD revised was reviewed regarding references. Some Emission factors and calculateions are now referenced to IPCC National annual GHG inventory.	The used emission factors are now referenced in the PDD. This issue is considered to be resolved.
CAR6 The crediting period for the emission reduction units ERUS is defined as being from 2008 – 2012 in accordance with the first commitment period in the Kyoto Protocol. The starting date of the crediting period for the biomass project Alfatar will start later	Table 2, C.1.2.	The starting dates of the crediting periods have been revised in the PDD according the current status of the projects.	The commissioning dates of the sub-projects are exactly defined. The start of overall crediting period of the project is exactly defined; it has begun at January 1, 2005. It is distinguished in the PDD between the Kyoto period 2008-2012, when ERUs and the period before 2008, when only AAUs can be generated. The Kyoto period is explicitly defined as being

Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Determination conclusion
than indicated. Corrective Action Request The starting dates of the crediting periods should be checked and revised according the current status of the projects.			from 2008 – 2012 in accordance with the first commitment period defined in the Kyoto Protocol. This issue is considered to be resolved.
CAR7 The monitoring methodology for the hydropower project does reflect current good practice. The monitoring methodology for the biomass project Alfatar is not included. Corrective Action Request The monitoring methodology and the selected monitoring parameters/devices for the biomass project Alfatar shall be added.	Table 2, D.1.1.	The PDD revised does include monitoring methodology and the selected monitoring parameters/devices for the biomass project Alfatar are added.	The monitoring methodology for Alfatar is reasonable chosen and the monitoring parameters are applicable. This issue is considered to be resolved.
CR4 No indicators have been defined and no leakage emissions are monitored accord-	Table 2, D.3.1.		The MoEW is aware about the issue of double-issuing of ERUs and Allowances. Bulgaria is planning to set aside a reserve for electricity producing JI projects (deducted from the allow-

Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Determination conclusion
ing to the monitoring plan as there are no emissions to be expected. Clarification Request: Nevertheless it should be regarded, that due generated electricity fed into the grid the electricity sector would indirectly need less allowances within the EU Emissions Trading System. Hence by preparing the national allocation plan the Bulgarian JI projects must be taken into consideration.			ances of the electricity sector) in order to avoid indirect double counting. This reserve will include the ERUs in the PDDs of the approved projects, the endorsed projects, and some new projects. This issue is considered to be resolved.
CAR8 All aspects regarding future responsibilities for registration, monitoring, measurement are already fixed in advance. Corrective Action Request: The authority and responsibility for reporting should be fixed and clearly described in the PDD.	Table 2, D.6.2.	The PDD revised is stating that 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 has annual training schemes, that include training on monitoring	All aspects regarding future responsibilities for registration, monitoring, measurement are already fixed in advance. This issue is considered to be resolved.

Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Determination conclusion
		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.	
CAR9 No procedures are described for training of monitoring personnel. <u>Corrective Action Request:</u> The procedures for training of monitoring personnel should be fixed and clearly described in the PDD.	Table 2, D.6.3.	See Response above CAR8	Procedures for training of monitoring personnel are described. This issue is considered to be resolved.
CAR10 For the metering of electricity, which will be fed into the grid, the distribution company will be responsible for the technical quality of the collected data. <u>Corrective Action Request:</u>	Table 2, D.6.5.	The PDD revised is stating that 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 Alfatar a protocol has to be established.	For the metering of electricity, which will be fed into the grid, the distribution company will be responsible for the technical quality of the collected data. The Bulgarion authority for metering devices is responsible for calibration. This issue is considered to be resolved.

Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Determination conclusion
It should be clarified how the calibration for the rest of monitoring devices will be managed.			
CAR11 The calculations for the transportation emissions are not mentioned. <u>Corrective Action Request:</u> The calculations for the transportation emissions should be indicated in the PDD.	Table 2, E.1.2.	The PDD revised contains data regarding transportation emissions.	The assumptions regarding transport emissions are comprehensible and conservative. This issue is considered to be resolved.
CAR12 Uncertainties in the GHG emission estimates are not addressed yet in the documentation. <u>Corrective Action Request:</u> Uncertainties in the GHG emission estimates should be addressed in the documentation.	Table 2, E.3.5.	The PDD revised is stating information about uncertainties of monitored parameters.	The PDD revised is stating information about uncertainties of monitored parameters. The given information is sufficient. This issue is considered to be resolved.
CR5	Table 2,	Astra Project is cancelled as JI-Project.	According PDD the necessary permits are avail-

Draft report clarifications and corrective action requests	Ref. to checklist question in table 2	Summary of project owner response	Determination conclusion
Requirements for EIAs exist in the host country and have already been fulfilled, besides Astra project. Construction permits, besides Astra project were issued, which take the results of EIA into account. <u>Clarification request:</u> The EIA Approval for Astra Project and the construction permits for Astra Project and Alfatar should be delivered to the audit team.	F.1.2.	Minutes No. 2787/10.10.2003 of the Regional Inspection of Environment Protection and Water (RIEPW) shows that the requirements of the current regulations regarding healthy and safe conditions for work will be met.	able. This issue is considered to be resolved.

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Determination Reference List

Reference No.	Document or Type of Information
1.	Interviews at the offices of TÜV SÜD conducted on November 14th, 2005 by auditing team of TÜV SÜD **Validation team:** Klaus Nürnberger (Project manager) — TÜV SÜD Industrie Service GmbH, TÜV SÜD Group **Interviewed persons:** Ir. Malgorzata Sienuc, (Managing Director) — DUNIN Environmental Consultancy Herman J. Wijnants, (Project manager) — DHV Environment and Transportation
2.	On-site interview at the power plant site of Delectra Hydro in Lesitchevo conducted on November 31, 2005 by auditing team of TÜV SÜD **Validation team on-site:** Klaus Nürnberger (Project manager) — TÜV SÜD Industrie Service GmbH Peicho Peev (GHG trainee, ISO 9001 Auditor) — TÜV SÜD Industrie Service GmbH, Office Bulgaria **Interviewed persons:** Georgi Denkov (Executive Director) — Delektra Hydro A.S., Sofia Christo K. Christov (Executive Director, Consultant) — Energy Institute JS Co.; Sofia
3.	On-site interview at the power plant site of Trakija Gas nearby Purvenetz village conducted on November 31, 2005 by auditing team of TÜV SÜD **Validation team on-site:** Klaus Nürnberger (Project manager) — TÜV SÜD Industrie Service GmbH Peicho Peev (GHG trainee, ISO 9001 Auditor) — TÜV SÜD Industrie Service GmbH, Office Bulgaria **Interviewed persons:** Nasko Dimitrov Stoyanov (Manager) — Trakija Gas., Stara Zagora Ivan Jeliazkov Jeliazkov (responsible for operation) — Trakija Gas., Stara Zagora Christo K. Christov (Executive Director, Consultant) — Energy Institute JS Co.; Sofia

Reference No.	Document or Type of Information
4.	On-site interview at the Ministry of Economy and Energy in Sofia conducted on December 1, 2005 by auditing team of TÜV SÜD **Validation team on-site:** Klaus Nürnberger (Project manager) — TÜV SÜD Industrie Service GmbH **Interviewed persons:** Valentina Ilieva (Chief Environmental Expert) — Ministry of Economy and Energy, Environmental Protection Directorat Christo Schwabski — National Electric Company (NEK) Christo K. Christov (Executive Director, Consultant) — Energy Institute JS Co.; Sofia
5.	On-site interview at the United Bulgarian Bank in Sofia conducted on December 1, 2005 by auditing team of TÜV SÜD **Validation team on-site:** Klaus Nürnberger (Project manager) — TÜV SÜD Industrie Service GmbH **Interviewed persons:** Hrisimira Malcheva (Project Developer, Sector Manager) — United Bulgarian Bank, International Lending Program Stefan Vassilev — United Bulgarian Bank Christo K. Christov (Executive Director, Consultant) — Energy Institute JS Co.; Sofia
6.	Project Design Document for JI project “Bulgaria Renewable Energy Portfolio”, submitted November 9, 2005
7.	Project Design Document for JI project “Bulgaria Renewable Energy Portfolio”, submitted November 24, 2005 (published version)
8.	Project Design Document for JI project “Bulgaria Renewable Energy Portfolio”, submitted April 2006
9.	Rational Energy Utilisation and Financing Plan for Wiwa Agrotex Ltd. Energy Efficiency Plan, EnCon Services, November 2004
10.	Rational Energy Utilisation and Financing Plan for Trakia Gas Ltd. Renewable Energy Project, EnCon Services, June 2004
11.	Rational Energy Utilisation and Financing Plan for Delectra Hydro Renewable Energy Project, EnCon Services, August 2004 and March 2005
12.	Construction Permit SHPP Lesitchevo, Municipality of Lesitchevo, Nr. 0037023; February 05, 2004
13.	Operation Permit SHPP Lesitchevo, Ministry of Economy and Energy, Nr. AK-07-05 /11-02-2005

Reference No.	Document or Type of Information
14.	Approval of Env. Impact Assessment SHPP Lesitchevo; Ministry of Environment and Water, Nr. 3087 /16.09.2003
15.	Validation Report following Completion Validation Review for SHPP Lesitchevo, ESBI Engineering, February 09, 2005
16.	Hydrological Scheme of SHPP Lesitchevo, Delektra Hydro, November 31, 2005
17.	Construction Permit SHPP Tumrush, Municipality of Rodopia, Nr. 287/06.11.2003
18.	Approval of Env. Impact Assessment SHPP Tumrush; Ministry of Environment and Water, Nr. 1413 /22.012003
19.	Validation Report following Completion Validation Review for SHPP Tumrush, ESBI Engineering, September15, 2005
20.	Construction Permit Biomass Alfatar, Municipality of Alfatar, Nr. 7/20.04.2004
21.	National JI-Guidelines, National Focal Point, Ministry of Environment and Water, http://www.moew.government.bg/recent_doc/international/climate/Brochure_JI_eng.pdf
22.	Excel-spreadsheet “CO2eq_EE_en_RE_29_03_06.xls”, DUNIN Environmental Consultancy, April 4, 2006