ASSESSMENT REPORT

OF

New Baseline and Monitoring Methodology:
”NEW COGENERATION FACILITES SUPPLYING LESS CARBON INTENSIVE ELECTRICITY TO GRID AND STEAM AND/OR HOT WATER TO ONE OR MORE GRID CUSTOMERS”

Voluntary Carbon Standard 2007.1
(VCS 2007.1)

REPORT NO. BULGARIA-ASS/0002/2009

REVISION NO. 02

BUREAU VERITAS CERTIFICATION

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ASSESSMENT REPORT

Date of first issue: 26/10/2009	Organizational unit: Bureau Veritas Certification Holding SAS
Client: Camco International	Client ref.: Maxim Khamaza

Summary:

Bureau Veritas Certification has made the validation and assessment of the new methodology "New cogeneration facilities supplying less carbon intensive electricity to grid and steam and/or hot water to one or more grid customers" on the basis of Voluntary Carbon Standard Program (VCS Program) which includes the Voluntary Carbon Standard (VCS 2007.1) and the Program Guidelines 2007.1. The VCS 2007.1 is design for project proponents, validators and verifiers and provides a global standard for voluntary GHG emission reduction and removal projects and their validation and verification. The core of this standard are the requirements in ISO 14064-2:2006, ISO 14064-3:2006 and ISO 14065:2007.

The first output of the evaluation process is a checklist of Clarification and Corrective Actions Requests (CL and CAR), presented in Annex A. Taking into account this output, the methodology proponent revised the new methodology document.

The validation is an independent third party assessment of the new methodology. In particular the validation has to confirm that the baseline, the monitoring plan, and the entire methodology are in compliance with relevant VCS rules and procedures. The validation of the new methodology done through a double approval process, according to VCS standard, is required as necessary to provide assurance to stakeholders of the quality of the new methodology.

In summary, it is Bureau Veritas Certification's opinion that the new methodology correctly meets the relevant Voluntary Carbon Standard (VCS 2007.01) requirements. Therefore the new methodology is recommend to be approved under VCS 2007.1

Report No.: BULGARIA-Ass/0002/2009	Subject Group: VCS
Project title: "New cogeneration facilities supplying less carbon intensive electricity to grid and steam and/or hot water to one or more grid customers"	
Work carried out by: Mr. Hristo Schwabski	
Work verified by: Mr. Flavio Gomes	

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Abbreviations

AM	Approved Methodology
AR	Assessment Report
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CH_4	Methane
CL	Clarification Request
CO_2	Carbon Dioxide
ER	Emission Reductions
GHG	Greenhouse Gases
IPCC	Intergovernmental Panel on Climate Change
LNG	Liquefied Natural Gas
MP	Monitoring Plan
N_2O	Nitrous Dioxide
PD	Project Description
PE	Project Emissions
VCS	Voluntary Carbon Standard

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1 INTRODUCTION

Camco International has commissioned Bureau Veritas Certification to perform an assessment of the proposed new baseline and monitoring methodology "New cogeneration facilities supplying less carbon intensive electricity to grid and steam and/or hot water to one or more grid customers" (revised from previous proposed methodology with the title "New waste heat recovery facilities supplying steam and/or hot water to multiple customers and displacing grid/off grid steam and grid hot water generation from natural gas"), work out by Camco International.

This report summarizes the findings of assessment of the new methodology, performed on the basis of the criteria proposed to provide consistent Voluntary Carbon Standard 2007.1 application, monitoring and reporting.

Bureau Veritas Certification operated in the capacity of second validator.

This assessment is prepared based on the following documented methodology: "New cogeneration facilities supplying less carbon intensive electricity to grid and steam and/or hot water to one or more grid customers", Version: 2, September 30, 2009.

2 OBJECTIVE

The purpose of this report is to review the new methodology documentation and to assess whether the following issues are found appropriate and adequate:

- methodology's applicability criteria;
- project baseline;
- additionality;
- definition of the project's physical boundary;
- sources and types of gases included;
- estimation of baseline emissions;
- estimation of project emissions, and emission reductions;
- approach for calculating leakage;
- monitoring approach;
- monitored and not monitored data and parameters used in emissions calculations.

The new methodology has to comply with the following VCS 2007.1 requirements:

- All methodologies applying for approval under the VCS Program shall be approved via the double approval process (VCS 2007.1, Section 6.1);
- VCS Program methodologies shall comply with all requirements in the VCS 2007.1 clause 6.1 to 6.4.4 (VCS 2007.1, Section 6.1);
- VCS Program methodologies shall include (VCS 2007.1,Section 6.1):
  - applicability criteria that defines the area of project eligibility;
  - a process that determines whether the project is additional or not (based on criteria laid down in VCS 2007.1, Section 6.4);
  - determination criteria for the most likely baseline scenario; and
  - all necessary monitoring aspects related to monitoring and reporting of accurate and reliable GHG emission reductions or removals;

- Methodologies shall be informed by a comparative assessment of the project and its alternatives in order to identify the baseline scenario (VCS 2007.1, Section 6.1);
- The project proponent shall select the most conservative baseline scenario for the methodology. This shall reflect what most likely would have occurred in the absence of the project (VCS 2007.1, Section 6.3);
- In developing the baseline scenario, the project proponent shall select the assumptions, values and procedures that help ensure that GHG emission reductions or removal enhancements are not overestimated (VCS 2007.1, Section 6.3);
- Based on selected or established criteria and procedures, the project proponent shall quantify GHG emissions and/or removals separately for:
  - each relevant GHG, for each GHG source, sink and/or reservoir relevant for the project; and each GHG source, sink and/or reservoir relevant for the baseline scenario;
  - when highly uncertain data and information are relied upon, the project proponent shall select assumptions and values that ensure that the quantification does not lead to an overestimation of GHG emission reductions or removal enhancements (VCS 2007.1, Section 6.5.2).

3 ASSESSMENT SCOPE

The assessment scope is defined as an independent and objective review of the new baseline and monitoring methodology document. The information in this document is reviewed against the Voluntary Carbon Standard 2007.1 (VCS 2007.1).

The evaluation is not meant to provide any consulting towards the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the methodology design.

4 EVALUATION PROCESS

The evaluation process consisted of the following three phases:

- desk review of the new methodology document;
- follow-up interviews with project stakeholders;
- resolution of outstanding issues and the issuance of the final assessment report and opinion.

The overall validation, from Contract Review to Assessment Report and Opinion, was conducted using Bureau Veritas Certification internal procedures.

5 CONFLICT OF INTEREST REVIEW

Prior to beginning of the independent assessment work on the methodology, Bureau Veritas Certification has conducted an evaluation to identify any potential conflicts of interest associated with the task. No potential conflicts were found for this project.

6 ASSESSMENT TEAM

Bureau Veritas Certification assessment team consisted of the following individual who was selected based on his GHG validation experience, as well as familiarity with the sectoral scopes 1 (Energy industries {renewable - / non-renewable sources}.) 2 (Energy distribution) and 3 (Energy demand):

- Hristo Schwabski – CDM/JI/VER Auditor and Sector expert
- Flavio Gomes – Internal Technical Reviewer

7 CORRECTIVE, CLARIFICATIONS, FOWARD ACTIONS REQUESTS AND SUPPLEMENTAL INFORMATION

The team requested clarification and supplemental information as well as several corrective actions during the validation. The corrective action, clarifications, forward actions requests, supplemental information and the responses provided are summarized in the following sections and in the attached Annex, for transparency reasons.

8 ASSESSMENT RESULTS: EVALUATION OF THE PROPOSED NEW METHODOLOGY BY THE DESK REVIEWER

The validation process focused on assessing the appropriateness and adequacy of the new methodology's applicability criteria, baseline approach, additionality, project boundary, emissions, leakage, monitoring, data and parameters, and compliance in the application of the new methodology with the Voluntary Carbon Standard 2007.1 (VCS 2007.1). The assessment results are summarized below, which are further substantiated with details in the following sections and in the attached annex.

Coverage of the Voluntary Carbon standard 2007.1 new methodology sections as outlined in the applicable guidelines.

The language is sufficiently transparent, precise and unambiguous to undertake a full assessment.

The proposed methodology reflects methodology-specific information and not project specific information.

The baseline methodology is internally consistent i.e., the applicability conditions, project boundary, baseline emissions estimation procedure, project emission estimation procedure, leakage, and monitoring.

The baseline scenario identification has a clear and concise presentation of methodological steps to identify baseline scenario and applicable.

The additionality section has clear and concise presentation of methodological steps to assess additionality.

The emission reductions calculation section has relevant formula provided and all variables used are adequately explained.

All the issues raised in the methodology desk review are addressed and are sufficiently and properly explained.

The baseline methodology is internally consistent with the monitoring methodology, which is clearly documented in accordance with applicable guidelines.

9 OUTLINE CHANGES NEEDED TO IMPORVE THE METHODOLOGY

9.1 Major changes

No major changes are needed to improve the methodology.

9.2 Minor changes

The applicability condition #4 in second sentence on page # 2 of methodology document seems not reasonable. If the option with supplying steam and/or hot water from the grid is more economically feasible and rational than the self generation, it could accept as applicability condition in the VCS methodology.

Table #2 mention on page 36 with default emission factors values for fugitive CH_4 upstream emission have to be included into methodology after the wording describing leakage emissions.

It is more reasonable and appropriate if common practice analysis is determined as separate step 3 in the demonstration of additionality.

Analysis of the impact of VCS registration could be used as a last step 4 in assessing of additionality.

Continuous measurement with hourly and monthly recording" will be preferable option for these key parameters:

- Net electricity supplied;
- Specific enthalpy of the steam;
- Natural gas consumed;
- Specific enthalpy of the hot water;
- Return condensate and water temperature.

QA/QC project activity procedures have to be briefly described in general and set up in separate table for each of the monitored key parameters.

7.) There is no guidance on the approaches to assessing the uncertainty of key parameters and input data used in the calculations of emission reductions.

10 GENERAL INFORMATION ON THE SUBMITED PROPOSED NEW METHODOLOGY

10.1 One sentence describing the purpose of the methodology

The methodology is applicable for project activity implementation which consists of a new gas cogeneration plant supplying less carbon intensive electricity power to the grid,

steam and/or hot water to customers in aim to cover costumer's energy demand and to reduce GHG emissions in the baseline scenario.

10.2 Summary description of the methodology

Baseline scenario – Establishing the most likely baseline scenario is identifying of baseline alternative scenarios for project developer and project customers to cover the demand of electricity power, steam and/or hot water. The most probable baseline scenario will be the one that includes the most likely energy facilities of producing electricity power, steam and/or hot water in the absence of the proposed VCS project activity.

Additionality - The project developer will demonstrate that the proposed project activity is not the best attractive option to undertake unless the project activity could be registered under VCS.

Baseline emissions are determined by estimating emissions that would occur in the project costumer's sites by consuming of steam and/or hot water generated of combustion of fossil fuel and consuming of electricity power from the grid in absence of the project activities.

Project emissions are resulting from combustion of natural gas within the project boundary.

Leakage emission sources considered in the methodology are as follows:

- Fugitive CH_4 emissions associated with fuel extraction, processing, liquefaction, transportation and distribution of natural gas used in the project activities and subtracts the emissions occurring from fossil fuels used in the absence of the project activity;
- In the case of LNG is used in the project activities, CO_2 emissions from fuel combustion or electricity consumption associated with the liquefaction, transportation, re-gasification and compression of natural gas feed in transmission or distribution system.

Calculation and monitoring of emission reductions:

- Emission reductions are calculated as the difference between total baseline emissions and total project activity emissions and total project leakage;
- The monitoring methodology determines emission reductions based on the baseline emissions rate of each generation source (electricity, steam and hot water) within the project boundary that is displaced by the proposed project activity and compares it to the emissions rate of the new co-generation plant;
- Monitoring of emission reductions would be done according to the prescription for determination of baseline and project emissions, and leakage in the proposed methodology.

10.3 Relationship with approved or pending methodologies

The emissions calculations approaches use elements from CDM methodologies AM0029 and AM0048. Therefore, the proposed new Methodology is based on elements of the following CDM methodologies:

- AM0029 “Baseline Methodology for Grid Connected Electricity Generation Plants Using Natural Gas”;
- AM0048 “New Cogeneration facilities supplying electricity and/or steam to multiple customers and displacing grid/off grid electricity generation with more carbon intensive fuels”.

Conclusions comparing the new methodology and the approved similar methodologies:

- The proposed new methodology could not be considered as amendment or extension of the above mentioned existing methodologies;
- Methodologies AM0029 and AM0048 could be extended and combined to be used to calculate emission reductions from the project activity associated with the proposed new methodology but the necessary revisions should be considerable.
- They are enough different to be considered that above mention methodologies are not comparable.

11 DETAILS OF THE EVALUATIONS OF THE PROPOSED NEW METHODOLOGY

11.1 Applicability conditions

The methodology is applicable under the following conditions:

- The project activity is the construction and operation of a new gas fired cogeneration plant which is connected to the electrical grid and where all the electricity produced other than that required to operate the cogeneration facility is exported to the grid;
- The geographical/physical boundaries of the baseline power grid can be clearly identified and information is publicly available to establish the grid emissions factor;
- Natural gas is sufficiently available in the region or country, for future natural gas power capacity additions of similar size so that of the project activity is not constrained by the use of natural gas in the project activity;
- This methodology is only applicable to cases in which the steam and/or hot water that is to be displaced by the project activity is either produced for export to a steam/hot water grid or is drawn from a steam/hot water grid. It shall not be applied to situations in which it would lead to the displacement of steam and/or hot water that is generated at a project customer’s installations to meet its heating/process requirements;
- Where the project activity results in the substitution of imported steam and/or hot water, the project proponent shall provide evidence to prove that the thermal energy which is displaced is that which the project customer(s) would

have otherwise imported from the grid and not that which is self-generated, assuming that such option exists for the project customer(s);
- The methodology is applicable only to project customers that do not co-generate electricity, steam and/or hot water in the baseline scenario;
- Only applicable to project customers that ensure that the equipment displaced by the project activity will not be sold for other purposes.

11.2 Definition of the project boundary

The project boundary is defined in terms of:

- Gases and sources - the GHG and emission sources included in the project boundary are the GHG - CO2, CH_4 and N_2O. The main emission source in combustion of fossil fuels is carbon dioxide. Methane and Nitrous Oxide are excluded for simplification from the project boundary;
- Physical delineation - the project boundary includes the site of the project facilities and the sites of the project customers;

The project boundary defined in terms of gases, emission sources and physical delineation is appropriate and rational. There are not required any additional changes.

11.3 Determining the baseline scenario and demonstrating additionality

The most plausible baseline scenario will be the one that includes the most likely scenario in result of the combination of the most likely baseline scenarios for both the project developer and the project customers of producing electricity, steam and hot water in the absence of the proposed VCS project activity.

The application of the methodology could result in a baseline scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity.

The application of the methodology provides a generally rational way to determine the baseline scenario. It addresses the baseline largely from the perspective of the project developer, whereas many of the key baseline issues (lifetime of equipment, fuel choice, use of grid and off-grid generation and boilers) and anthropogenic emissions by sources that would occur in the absence of the proposed project activity are determined.

Additionality shall be demonstrated by using the latest version of the CDM “Tool for demonstration and assessment of additionality”. Project participants can use either investment analysis step or barrier analysis step. They may use both, the investment and barrier analysis steps, if they wish so.

The basis for assessing additionality is appropriate and adequate.

The common practice analysis is included as step 3 of barrier analysis. It is more reasonable and appropriate if common practice analysis is determined as separate step 3 in the demonstration of additionality.

Analysis of the impact of VCS registration could be used as a last step 4 in assessing the additionality.

11.4 Methodological basis for calculating baseline emissions and emission reductions

Baseline emissions are estimated as a sum of emissions resulting from generation of electricity power, steam and/or hot water as follows:

- Baseline emissions of electricity power generation are estimated by the net electricity generated at the project plant times the CO_2 baseline electricity grid emission factor;
- Baseline emissions of steam generation are estimated by the amount of energy consumed with the steam by the project customer times the steam generating facilities CO_2 baseline emission factor;
- Baseline emissions of hot water production are estimated by the amount of energy in the hot water purchased by project customer times the CO_2 baseline emission factor corresponding to the hot water produced by the hot water production plant which the project consumer utilize.

The basis for estimating of baseline emissions is appropriate and adequate.

Project emissions are estimated from natural gas consumed within project plant facilities times lower heating value of the combusted natural gas, times CO_2 emission factor for natural gas combustion.

11.5 Leakage

Leakage are determined as a sum of leakages due to fugitive upstream CH_4 emissions and leakage due to fossil fuel combustion or electricity consumption associate with the liquefaction, transportation, re-gasification and compression of LNG into a natural gas transmission or distribution system.

The treatment of leakage is appropriate and adequate. There are no required changes.

11.6 Key assumptions

Reliable and accurate data are available for the establishment of key factors within the baseline years. This includes recorded and estimated output and consumption data and when appropriate metering of electricity, steam and hot water has taken place during the baseline years and the crediting period.

An appropriate CO_2 power grid emission factor is made available, or inputs to the calculation of the combined margin are available and transparent.

The input data for the calculation of the amount of steam and hot water energy content are available or those measurements are recorded and are easily monitored.

Three baseline years are representative for describing of the existing and recent situation with respect to emissions factors of the grid power and heat generators which are replaced within the project boundary.

The project boundary can be clearly and consistently defined to include those customers and sources affected by the output of electricity and/or steam and hot water from the new cogeneration facility.

Project participants are needed to ensure that the fuel consumption data are available and used in the calculations reflects all consumers' combustion processes over the period, rather than invoices or sales receipts.

The existing generating plants are not going to naturally improve there performance based on maintenance activities. This is an assumption driven by the natural tendency of generation plant to degrade over time with respect to efficiency and emissions rates.

The probability to obtain reliable power grid dispatch data from the authorities in aim to calculate conservative combined CO_2 baseline emission factor seems problematic. In this case if reliable country and regional statistic data for calculation of CO_2 baseline emission factor available for the recent 3 years seems appropriate and adequate.

11.7 Data and parameters NOT monitored

These data that is determined only once and remains fixed throughout the crediting period.

Key data and parameters which data sources or default values used and how the data or the measurements are obtained:

- The data for carbon content of fuel source could be obtained by IPCC. If more accurate country specific or regional data are approved these data will be used;
- Actual performance data about estimation of the CO_2 baseline emission factor for the production of steam and hot water will be used if there are publicly available;
- The amount of energy content of steam and hot water generated with burning fossil fuel by costumers will be obtain if actual data are public available;
- The quantity of fossil fuel consumed for steam and hot water generation by the customers will be obtain if actual data are public available.
- The highest measured value of project customers boiler efficiency obtain from tests, manufacture's information or default boiler efficiency of 100% will be use in the further calculations.

The vintage of the data recommended by the project developer and require in the baseline methodology is three years of data prior to project implementation. If three years of data is not available, then the project developer must use at least one complete year or two when they exists and must demonstrate using evidence from credible sources to the validator that additional data does not exist.

The provided data has to be adequate, accurate, consistent and reliable. Thus the project developer will perform cross checking of all data not monitored and of there measuring procedures aiming to verify them.

The proposed methodology requires data on the physical characteristics of fuel used, steam and hot water of the project baseline. These data are directly used in the calculations and will be critical in providing that the calculations are consistent across the baseline determination and crediting periods.

11.8 Key data and parameters monitored

These data are determined throughout the crediting period.

Key data and parameters which sources or measurement procedures are used:

- Official electricity generation and transmission company statistics is used to determine the grid electricity coefficient. This data is collect from the utilities on national, regional or local level, as appropriate;
- The data provided for the electricity grid and from individual facilities have to be available and transparent, in order to calculate the carbon coefficient of the electricity and steam and/or hot water being displaced from project customers by the project activity;
- The data for steam and/or hot water consumption and characteristics from project costumers during crediting period are available and could be collected on a national or a regional power grid level.

The data sources and measurement procedures are proposed in the tables with data for parameters monitored. They are adequate, consistent, accurate and reliable.

The monitoring frequency for the data and parameters is chosen appropriate and do not require additional changes. However, “Continuous measurement with hourly and monthly recording” will be preferable option for these key parameters:

- Net electricity supplied;
- Specific enthalpy of the steam;
- Natural gas consumed;
- Specific enthalpy of the hot water;
- Return condensate and water temperature.

Quality Assurance and Quality Control (QA/QC) procedures are proposed for certain parameters in the table with data parameters monitored.

However, QA/QC project activity procedures have to be briefly described in general and set up in separate row in the tables for each of the monitored key parameters.

The proposed baseline and monitoring methodologies should require data on the monitored data and parameters during crediting period. These data are directly used in the calculations, and will be critical in providing that the calculations are consistent across the project years and crediting periods.

11.9 Assessment of uncertainties

The proposed methodology recommends that metering of relevant parameters to be performed at an accuracy of 95% or higher, if the appropriate quality control procedures are in place. This is a reasonable level of accuracy given to the approach calculating emissions reductions.

In despite of the above statement, there is no guidance on the approaches to assessing the uncertainty of key parameters and input data used in the calculations of emission reductions.

11.10 Transparency, conservativeness and consistency

The baseline methodology is presented in a generally adequate and transparent manner; after some minor changes improvements were made.

Whether the methodology is conservative or not will depend on the integrity of the data used for determination of baseline emissions factors and monitoring of reliable performance data at the project plant and at the project customers.

The validator considers that the new baseline and monitoring methodology is internally consistent.

11.11 Proposed changes required for the methodology implementation on 2nd and 3rd crediting periods are appropriate.

Estimation of CO_2 combined baseline power emission factor is deemed appropriate at the end of the 2nd and 3rd crediting period, because of inevitable changes in the determination of build margin emission factor.

Estimation of CO_2 baseline power emission factor for steam and/or for hot water is deemed appropriate at the end of the 2nd and 3rd crediting period due to reduction of the life time of the main equipment in the project boundaries.

11.12 Appropriateness of the selected baseline approach

The baseline approach selected is internally consistent and appropriate. The baseline approach is comprehensive and present the steps to achieve consistency of the baseline methodology are presented in details.

11.13 Appropriateness of the proposed methodology for the referred proposed project activity and the referred project context

The response of this question is still pending. Project proponents are in stage of preparation of the PD for project activity which will refer to the proposed methodology as appropriate.

11.14 Any other comments

The following CDM methodological tools have been used for evaluating of the proposed methodology:

- "Tool for the demonstration and assessment of additionality" (Version 05.2)
- "Tool to calculate the emission factor for an electricity system" (Version 01.1)

12 FINAL RECOMMENDATIONS FOR THE PROPOSED NEW VCS BASELINE AND MONITORING METHODOLOGY

The assessed and evaluated methodology with the title "New cogeneration facilities supplying less carbon intensive electricity to grid and steam and/or hot water to one or more grid customers", Version 2nd of October 2009 (revised from previous proposed methodology with the title "New waste heat recovery facilities supplying steam and/or hot water to multiple customers and displacing grid /off grid steam and grid hot water generation from natural gas", dated 5th of August 2008), meets the requirements of the Voluntary Carbon Standard 2007.1 (VCS 2007.1).

The evaluated methodology is consistent with its objectives and meets the requirements of VCS Program which includes the Voluntary Carbon Standard (VCS 2007.1) and the Program Guidelines 2007.1.

The assessment team therefore recommends the methodology to be approved under the Voluntary Carbon Standard 2007.1 (VCS 2007.1).

13 CURRICULA VITAE OF THE ASSESSMENT TEAM MEMEBERS

Mr. Flavio Gomes is a Chemical and Safety Engineer graduated from «UNICAMP – Universidade Estadual de Campinas», with a MSc title in Civil Engineer (Sanitation). He spent four years at RIPASA Pulp and Paper as Environmental Process Engineer. He is, since 2006 the Global Manager for Climate Change in Bureau Veritas Certification. Previously and since 1997, he was senior consultant for Bureau Veritas Consulting in fields of Environment, Health, Safety, Social Accountability and Sustainability audit and management systems. He also acted as Clean Development Mechanism verifier, and Social/Environmental Report auditor, in the name of Bureau Veritas Certification. Flavio is pursuing this PhD on Energy Management at the Imperial College – London.

Mr. Hristo Schwabski has 30 years of experience in energy and environment field. He has been involved in GHG reduction projects since 2002. Since that time he has extensive experience in establishing PD, baselines setting, monitoring plans, GHG estimations and investment and financial analysis's of GHG projects. He participates as a consultant in 7 JI projects and develops estimation of Bulgarian CO2 emission factor for the Electricity Power System. Mr. Schwabski participated as auditor and verifier trainee in 7 CDM/VCS projects since 2008.

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ANNEX A

Final List of Corrective Action Requests (CARs) Table

- proposed new VCS Methodology "New cogeneration facilities supplying less carbon intensive electricity to grid and steam and/or hot water to one or more grid/off-grid customers"
- Date: 26/10/2009
- Person in charge: Hristo Schwabski

Corrective Action Requests	Reference	Summary of project owner response	Validation team conclusion
CAR 01 The applicability condition #4 in second sentence on page # 2 of methodology document seems not reasonable. If the option with supplying steam and/or hot water from the grid is more economically feasible and rational than the self generation, it could accept as applicability condition in the VCS methodology.	Page #2 of AR document	Even though the project activity could produce steam and/or hot water at a lower cost than that generated by a project customer to meet his own process and heating demand, we felt that it was best to exclude this case because of the added complexity which we feel would be associated to it. More specifically, such a case would require that the baseline scenario for the production of steam and/or hot water by such a project customer be determined. This would require the identification of a number of additional baseline alternatives. However, perhaps the most important issue that would have to be addressed arises from the fact that such an end user would be also connected to a steam and/or hot water grid. Hence, the project customer's thermal energy needs could be met both by his own steam and/or hot water generating facilities as well as by imported steam and/or hot water from the grid. In order to determine what the CO_2 emissions would have been in the absence of the project activity, a procedure would be required to determine which of the two sources of heat is being displaced. This could require a comparison of the steam	OK. CAR01 has been resolved and closed.

		and/or hot water generating costs between the two baseline heat sources: the grid and the project customer's steam and/or hot water generating facilities, or in the absence of such, the determination of historical emissions per unit energy output for both of these sources of heat and the selection of the least carbon intensive one as the baseline scenario for the purpose of determining the baseline emissions. Depending on the options available and chosen to determine the baseline scenario for steam and/or hot water generation in this case, the baseline equations may or may not have to be revised or additional equations added. As noted in the discussion above, removing the applicability condition would require that the above issues are addressed. We are confident however that the proposed new methodology can house such a case, and thus encourage any developer interested in applying this methodology to such a case to proceed to its revision in order to accommodate it.	
CAR 02 Table 2 mention on page 36 with default emission factors values for fugitive CH4 upstream emission have to be include into methodology after the wording describing leakage emissions	Page #36 of NM document	Agreed. The following table has been pasted into the text of the new VCS Methodology at the end of the leakage emissions section of the methodology.	OK. The table has been inserted at page 37 of the methodology
CAR 03 It is more reasonable and appropriate common practice analysis to be determine as separate step 3 in the demonstration of additionality.	Page #13 of NM document	Agreed, the common practice analysis section has been included as Step 2.2. in the Identification of the Baseline Scenario and Demonstration of Additionality part of the proposed new VCS meth as suggested.	OK. CAR03 has been included as Step 2.2 Common Practice Analysis of item "Determination of additionality

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CAR 04 Analysis of the impact of VCS registration could be use as a last step 4 in assessing of additionality	Page 11 of AR document	From what we have observed after reviewing the Voluntary Carbon Standard program documentation, namely: - Voluntary Carbon Standard 2007.1; - VCS Guidelines; - VCS Project Description Template; - VCS Validation Template, it appears that the impact of VCS registration should only addressed as part of the barrier analysis., as the following excerpt from VCS 2007.1 suggests: *"...* *5.8 Additionality* *...* *Step 2: Implementation Barriers* *The project shall face one (or more) distinct barrier(s) compared with barriers faced by alternative projects.* *• Investment Barrier – Project faces capital or investment return constraints that can be overcome by the additional revenues associated with the generation of VCUs.* *• Technological Barriers – Project faces technology-related barriers to its implementation.* *• Institutional barriers – Project faces financial, organizational, cultural or social barriers that the VCU revenue stream can help overcome."* In the current version of the proposed New VCS methodology, we established a similar requirement which we included in the barrier analysis section. This section being the one in which the project proponent can present	OK. The impact of VCS registration is addressed in the barrier analysis Hence, CAR04 is resolved and closed.

		implementations barriers to the project activity such as those listed above: *"...* - *if there are more than one baseline scenario alternatives that are not prevented by any of the barriers, and these alternatives do not include the project activity without taking into account VERs, the project proponent shall explain how the registration of the VCS project activity will alleviate the barriers that prevent the proposed project activity from occurring.* *..."* Hence it is our opinion given the above observations, that the requirement to analyze the impact of the VCS registration is perhaps best kept as it is currently in the proposed VCS Methodology.	
CAR 05 Continuous measurement with hourly and monthly recording" will be preferable option for these key parameters: • Net electricity supplied; • Specific enthalpy of the steam; • Natural gas consumed; • Specific enthalpy of the hot water; • Return condensate and water temperature.	Page 15 of AR document	The monitoring frequencies presented in the proposed new VCS methodology have been modeled around similar parameters used in approved CDM methodologies such as AM0029 and AM0048, which share certain elements in common with the proposed VCS methodology. In choosing such monitoring frequencies we have aimed to ensure that adequate monitoring is built into the methodology. At the same time we are also very aware of monitoring costs, be this due to added human resources or increase metering and calibration costs associated to the use of metering equipment capable of a higher monitoring frequency, such as that proposed. If however the Validation team feels that such degree of monitoring frequency is necessary, we will proceed to make the necessary changes.	OK. Continuous measurement would be applied with hourly and monthly recording on the proposed key parameter data. CAR05 has been resolved and closed.

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CAR 06 QA/QC project activity procedures have to be briefly described in general and set up in separate row in the tables table for each of the monitored key parameters	Pages 40-46 of NM document	The QA/QC procedures have been added/expanded as appropriate. The changes are reflected in the attached methodology draft. It should be noted that the applied QA/QC procedures are largely based upon those adopted for similar parameters provided in AM0029 and AM0048, which share a number of common parameters as the new VCS methodology.	OK. The QA/QC procedures have been added to the tables with key data explanations. CAR06 have been resolved and closed.
CAR 07 There is no guidance on the approaches to assessing the uncertainty of key parameters and input data used in the calculations of emission reductions	Pages 38-46 of NM document	Most key parameters such as enthalpy data are obtained from monitored parameters that are subject to QA/QC procedures provided in approved CDM Baseline and Monitoring methodologies, such as AM0029 and AM0048. Hence, the uncertainty level of the parameters that are in turn based on these measured ones is low. The methodology allows for the use of energy consumption and production data, which may or may not be publicly reported. Reported data, when available, is usually made public as per requirements of local energy legislation. In the absence of reliable data however the methodology offers the means of determining what these values will be based on measured data or default values. Where measured date is applied, the necessary input data to determine emissions reductions is subject to QA/QC procedures which are commonly used under the CDM monitoring methodologies (e.g. AM0029, AM0048). Where measured data is employed, conservativeness is also applied, i.e. the choice of the value applied is in several cases such that it will result in a underestimation of emissions reductions (data that is averaged is indicated in the relevant tables). Where defaults are applied, the methodology is very demanding in	OK. Assessing the uncertainty of input data is examined in separate row of every key parameter monitored or not monitored. Hence, CAR07 have been resolved and closed.

		the sense that it even acknowledges that certain defaults that may change over time as a result of improvements that may be undertaken by the baseline heat generating equipment and the heat recovery system that lead to improved efficiency, and thus to the need for less fossil fuel to be burned to meat end user heat requirements. An example of this is the approach adopted to deal with possible improvements to the condensate recovery system that may occur throughout the crediting period but which are not attributable to the project activity and the requirement set by the methodology to verify the validity of the chosen default. For instance, this happens if the pressure of the condensate recovery system is increased, or an atmospheric system is converted to a pressurized system. The underlying approach applied throughout the methodology is one which resorts to a number of assumptions that lead to conservative values of emissions reductions, which serve as an extra layer of protection against uncertainty, even though the uncertainty level as discussed above and addressed with specific examples below is in our opinion anyhow very low and aligned with QA/QC procedures and monitoring frequencies that are very similar to those applied in other CDM baseline and monitoring methodologies. Examples of this are the assumption of peak steam and hot water generating efficiency, the assumption that there are no heat transmission and distribution heat losses (surface heat not losses due to leaks), no internal steam leaks into the condensate recovery system and no losses of condensate	

		between along the condensate recovery system (all steam condensed reaches a condensate recovery tank), amongst other. We therefore feel that the level of uncertainty is low as a result of the application of CDM commonly applied QA/QC procedures, monitoring frequencies and data handling and the adoption of a methodological approach to determine baseline emissions which is underpinned by a number of conservative assumptions.	