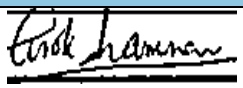
Voluntary Carbon Standard Version 2007 Verification Report

19 November 2007

Verification Report:

Name of Verification company:	Date of the issue:
Bureau Veritas Certification Holding SAS	23.11.2009
Report Title:	**Approved by:**
Verification Report of Kargilik 24 MW Hydropower Plant, Turkey	Ashok Mammen 
Client:	**Project Title:**
Tektug Elektrik Uretim A.S.	Kargilik 24 MW Hydropower Plant, Turkey
Summary:	
Bureau Veritas Certification has made the verification of Kargilik 24 MW Hydropower Plant in Kahramanmaras province, Turkey. The verification scope is defined as a periodic independent and objective review and an ex-post determination of the monitored reductions in GHG emissions during defined verification period and consisted of the following three phases: i) desk review of the project design, baseline and monitoring plan, and the monitoring report; ii) site visit and follow-up interviews with project stakeholders: iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Desk Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures. The first output of the verification process is a list of Clarification and Corrective Actions Requests (CL and CAR), presented in Annex in this Verification Report. Taking into account this output, the project proponent revised its Monitoring Report document. In summary, it is Bureau Veritas Certification's opinion that the project correctly applies the baseline and monitoring methodology ACM0002, ver. 09 and meets the relevant VCS requirements, and local legislation. Based on the information we have seen and evaluated, we confirm the following statement: Reporting period: 28/03/2006 to 31/12/2008 Emission reductions: 85,249 tCO_{2e} Vintage 2006: 22,827 tCO_{2e} Vintage 2007: 27,866 tCO_{2e} Vintage 2008: 34,556 tCO_{2e}	
Work carried out by:	**Number of pages:**
Burcu Mutman – Lead Verifier	14

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1 Introduction

Tektug Elektrik Uretim A.S. has commissioned Bureau Veritas Certification to verify the emission reductions of its VCS "Kargilik 24 MW Hydropower Plant Project". This report summarizes the findings of the first periodic verification of the project, performed on the basis of VCS – Voluntary Carbon Standard version 2007.1 criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

Verification is the periodic independent review and ex post determination of the monitored reductions in GHG emissions during defined verification period. The objective of the periodic verification is to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan; further more, the periodic verification evaluates the GHG emission reductions data and express a conclusion with a high, but not absolute, level of assurance about whether the reported GHG emission data is free of material misstatements; and verifies that the reported GHG emission reductions data is sufficiently supported by evidence, i.e. monitoring records.

The verification shall consider both quantitative and qualitative information on emission reductions. Quantitative data comprises the monitoring reports submitted to the verifier by the project entity. Qualitative data comprises information on internal management controls, calculation procedures and procedures for transfer, frequency of emissions reports, review and internal audit of calculations/data transfers.

The verification is based on criteria set by VCS – Voluntary Carbon Standard version 2007.1.

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan, monitoring report and other relevant documents. The information in these documents is reviewed against VCS – Voluntary Carbon Standard version 2007.1. The verification is not meant to provide any consulting towards the Client. However, stated requests for corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 VCS project Description

The Kargilik 24 MW Hydropower Plant, Turkey is a run-of-river hydropower project located in Kahramanmaras province, Turkey. It utilizes the gross water head of 150m on the Kesis River to generate and supply electricity from clean and renewable resources.

It utilizes the water head of the Savrun River between elevations 490 m and 240 m. The objective of the project is to generate electricity and supply it into the public grid. "Kargilik" HEPP will be registered as a Voluntary Emission Reduction (VER) project and facilitate the project implementation with carbon revenue coming from the carbon credits sale. The Project Activity is in operation since 25.04.2005. According to the generation license, the total annual net electricity supply is estimated to be 71,000 MWh annually, corresponding to GHG emission reductions of 43,717 tCO_2e every year. The crediting period starts from 28.03.2006 as per the requirements of VCS 2007.1.

1.4 Level of assurance

The Level of assurance of the Validation Report is defined as high.

2 Methodology

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The Verification Report shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The Project Description Template of the Kargilik project was reviewed and compared with the Project Description Template, of 19 November 2007.

The verification of the project was carried out from March 2009 to November 2009.

The verification consisted of the following steps:

- A desk review of the of the project design, baseline and monitoring plan, and the monitoring report which were submitted by the client.
- A visit to the project site which was done on 08/04/2009
- Interviews with the personnel of Tektug Elektrik, Mavi Consultants and villagers.
- Clarification, Corrective Action and (CL & CAR)
- Resolution of CLs, CARs and FARs by the client
- Preparation of the Verification Report

The methodologies used in the PD are as follows:

- *Baseline and Monitoring Methodology:* ACM0002 Version 09 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"
- *Baseline and Monitoring Methodological Tool:* Tool to calculate emission factor for an electricity system, version 01.
- *VCS Program Specific Methodology:* ISO 14064-2:2006
- *Additionality:* CDM Methodological Tool "Tool for the demonstration and assessment of additionality" version 05.2

The ACM0002 methodology is applicable to this project activity due to the following reasons:

1. VCS 2007.1 requires the use of UNFCCC methodologies for baseline and monitoring
2. The Project is a large scale (>15 MWe) project
3. The Project is in line with the following ACM0002 rules;
    - The project activity is the installation of a hydro power plant.
    - The project activity results in new reservoirs and the power density of the power plant is greater than 4 W/m2.
    - The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available
    - Project activities does *not* involve switching from fossil fuels to renewable energy sources at the site of the project activity

According to the being validated VCS PD, the only parameter that will be monitored is the "Net Electricity Generation of the Project Activity in MWh"

3 Verification Findings

3.1 Remaining issues, including any material discrepancy, from previous validation

There are no remaining issues from the previous validation.

3.2 Project Implementation

The project activity has been implemented according to the Project Description, presently being validated to be registered.

3.3 Completeness of Monitoring

The first periodic verification covers the period from 28.03.2006 to 31.12.2008.

GHG emission reductions during this period were achieved through the dispatched electricity generated by Kargilik HEPP which, in the absence of the project, would have been generated through non-renewable sources from Power Plants connected to the Turkish Interconnected System, fostering the emission of greater quantities of green house gases.

Baseline scenario is that electricity delivered to the grid by the project would have otherwise been generated by the operation of a grid-connected thermal power plant, as reflected in the combined margin calculations.

Monitoring has the objective of measuring the emission reductions achieved by the project. The monitoring plan has followed the Monitoring Methodology of the small scale CDM methodology AMS-I.D. grid-connected electricity generation from renewable sources.

According to the being validated VCS PD, the only parameter that will be monitored is the “Net Electricity Generation of the Project Activity in MWh”.

All monitoring data is available on the spreadsheat “VCS-Monitoring-Kargilik.xls” file. This file has multiple worksheets for each monitoring year. The monthly electricity generation and consumption data of the Project are stored in the same worksheets and the emission reductions are calculated using the emission factor calculated in the PD. The generation and consumption data are acquired from the web portal (PMUM - *Electricity Market Financial Settlement Centre*) of the public electricity buyer TEIAS (*Transmission Line Operator)*, which are also verified by the verification team.

3.4 Accuracy of Emission Reduction Calculations

Emission reductions are calculated based on the following formulae:

1. Emission Reductions = Baseline Emissions – Project Emissions – Leakage

   Project Emissions and Leakage are zero according to the used methodology.
2. Baseline Emissions = Net Electricity Generated * Grid Emission Factor
3. Net Electricity Generated = Gross Electricity Generated – Electricity Consumed

The following calculation steps are applied for calculating the emission reductions;

1. The grid emission factor is taken from the baseline calculations as a constant parameter.
2. Amount of gross electricity generated and gross electricity consumed by the Project are obtained from the public grid operator TEIAS’s web portal PMUM.

3. Monthly PMUM data are aggregated in a spreadsheat. As the available data have a breakdown into 3 time periods during day (T1, T2, T3 for peak, normal and low demand periods), the monthly data are stored accordingly.
4. The net electricity generation is found by:
    a. Subtracting monthly gross consumption from the monthly gross generation for each of the daily time periods T1, T2 and T3
    b. Adding up the T1, T2 and T3 net electricity generation breakdowns for each month to obtain the annual net electricity generation.
    c. Multiplying the annual net electricity generation with the grid emission factor.

The collected data will be kept and stored at least for 2 years during the crediting period by the project owner. The PMUM web site also provides relevant data in detail for unlimited time (which are also used as the basis for invoicing).

The calculated emission reductions are given in the below table:

Date	Net Electricity Generation, EG (kWh)	Emission Factor (tCO_2/MWh)	Emission Reductions (tCO_2)
April 2006	12.403.300	0,616	7.637,11
May 2006	6.312.800	0,616	3.886,99
June 2006	3.340.000	0,616	2.056,54
July 2006	2.737.000	0,616	1.685,26
August 2006	2.091.900	0,616	1.288,05
September 2006	1.706.400	0,616	1.050,68
October 2006	2.058.500	0,616	1.267,48
November 2006	4.202.100	0,616	2.587,37
December 2006	2.220.300	0,616	1.367,11
2006 Total	**37.072.300**	**0,616**	**22.826,59**
January 2007	1.889.600	0,616	1.169,64
February 2007	4.338.800	0,616	2.671,54
March 2007	10.414.894	0,616	6.412,78
April 2007	6.293.371	0,616	3.875,03
May 2007	4.692.895	0,616	2.889,56
June 2007	3.291.054	0,616	2.026,41
July 2007	1.949.099	0,616	1.200,12
August 2007	1.655.735	0,616	1.019,49
September 2007	850.479	0,616	523,67
October 2007	1.435.058	0,616	883,61
November 2007	2.420.951	0,616	1.490,66
December 2007	6.014.668	0,616	3.703,42
2007 Total	**45.256.604**	**0,616**	**27.865,93**
January 2008	3.093.723	0,616	1.904,90
February 2008	4.682.741	0,616	2.883,31
March 2008	13.972.811	0,616	8.603,50
April 2008	11.480.331	0,616	7.068,80
May 2008	5.791.337	0,616	3.565,91
June 2008	2.995.836	0,616	1.844,63
July 2008	1.908.906	0,616	1.175,37
August 2008	1.594.720	0,616	981,92
September 2008	1.654.983	0,616	1.019,03
October 2008	1.868.060	0,616	1.150,22
November 2008	3.149.259	0,616	1.939,10
December 2008	3.929.794	0,616	2.419,70
2008 Total	**56.122.501**	**0,616**	**34.556,41**
Total	**138.451.405**	**0,616**	**85.248,93**

The above approach in calculating the emission reductions is found appropriate by the verification team. The source of data is highly reliable and has been checked by the verification team also against the invoices and PMUM pages.

3.5 Quality of Evidence to Determine Emission Reductions

All the information made available by the project participants to the verification team, including the reliability of the evidence and the source and nature of the evidences (external, internal, oral and documented) were considered sufficient in quantity and appropriate in quality.

The Voluntary Carbon Standard Monitoring Report, version 01, issued on May 15, 2009, was the base utilized for this Verification Report.

3.6 Management and Operational System

On behalf of the project participants, Mrs. Elvan Tugsuz Guven (board member of the project owner) from Ciltug Isi San. Tic. A.S. is responsible for the preparation of the monitoring report. This task includes accessing the PMUM settlement web site with a unique ID and password and printing the monthly reports for the crediting period prior to verification. These reports used to fill in the summary table, which is the final document for calculating total emission reductions, basis for VCS VCUs. Both the scans of monthly PMUM reports and the summary Excel table prepared by Mrs. Elvan Tugsuz Guven and submitted to the verifying DOE for verification.

4 Verification Conclusion

Bureau Veritas Certification has made the first periodic verification of the VCS Kargilik 24 MW Hydroelectric Power Plant Project, of Tektug Elektrik Uretim A.S. which is located in the Mediterrenean region, Kahramanmaras province, Turkey.

The verification was performed on the basis of VCS 2007.1 criteria, Monitoring Methodology ACM0002 Version 09 host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The management of Tektug Elektrik Uretim A.S. is responsible for the preparation of the GHG emission reductions data and the reported GHG Monitoring and Verification Plan, as indicated in the final VCS PD version 3 dated May 15, 2009.

The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project is the responsibility of the management of the project.

Bureau Veritas Certification confirms that the project is implemented as planned and described in the Project Design Document. Installed equipment being essential for generating emission reductions runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions.

Bureau Veritas Certification can confirm that the GHG emission reductions are calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emission reductions, reported and related to the valid and registered project baseline and monitoring and its associated documents.

Based on the information we have seen and evaluated, we confirm the following

statement:

Reporting period: From 28/03/2006 to 31/12/2008.

Leakage: 0 tCO_{2e}

Project Emissions: 0 tCO_{2e}

Emission Reductions: 85.249 tCO_{2e}

Vintage 2006: 22.827 tCO_{2e}

Vintage 2007: 27.866 tCO_{2e}

Vintage 2008: 34.556 tCO_{2e}

5 References

The documents that relate directly to the GHG components of the project activity, and that were submitted to the DOE are listed below:

1. PD of Kargilik 24 MW Hydropower Plant, Turkey, version 03 dated May 15, 2009.
2. Monitoring Report of Kargilik 24 MW Hydropower Plant, Turkey, version 01, dated May15, 2009.

6 Verification Protocol

Table 1 Verification requirements based on the Validation and Verification Manual (EB44 Annex 3)

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
1 Project implementation in accordance with the registered project design document			
It is assessed if the VCS project activity has been implemented and operated as per the registered PDD[1]			
a Are all physical features of the proposed VCS project activity, proposed in the registered PDD, in place?	Yes, all physical features of the proposed VCS project activity, proposed in the PD in place.	OK	OK
b Have the project participants operated the proposed VCS project activity as per the registered PDD?	Yes, proposed project activity operated as per the PDD.	OK	OK
c Is the proposed VCS project implemented against the description in the PDD?	Yes, the project implemented against the description in the PDD.	OK	OK
d Was an on-site visit conducted?	Yes, the site visit conducted on 08.04.2009	OK	OK
e If not, justify the rationale of the decision.	n.a.		
2 Compliance of the monitoring plan with the monitoring methodology			
It Is assessed if the monitoring plan of the proposed VCS project activity is in accordance with the applied methodology			
a Is the validated monitoring plan in accordance with the approved methodology applied by the proposed VCS project activity?	Yes, the monitoring plan is in accordance with the approved methodology ACM0002. Regarding to monitoring plan only data which is monitoring is the electricity generation.	OK	OK
b If no, was a request for revision of the monitoring plan was done? (The DOE may request for revision of the monitoring plan covering the monitoring period under verification, for approval by the Board)	n.a.	-	-
c Are there any monitoring aspects of the project activity that are not specified in the methodology, particularly in	No, there are no monitoring aspects of the project activity that are not specified in the methodology.	OK	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
the case of small-scale methodologies (e.g. additional monitoring parameters, monitoring frequency and calibration frequency)?			
3 Compliance of monitoring with the monitoring plan			
It is assessed if monitoring of reductions in GHG emissions to result from the proposed VCS project activity is implemented in accordance with the monitoring plan contained in the registered PDD or the accepted revised monitoring plan[1].			
a Have the monitoring plan and the applied methodology been properly implemented and followed by the project participants?	Yes, the monitoring plan and the applied methodology been properly implemented and followed by the project participants.	OK	OK
b Have all parameters stated in the monitoring plan, the applied methodology been sufficiently monitored and updated as applicable, including:	Yes, regarding to the monioring plan it is stated that Electricity Generation (EG) has been monitored.	OK	OK
i Project emission parameters?	There is no reservoir in the project and regarding to methodology project emissions can be neglected since power density is above 10. As a result project emission parameters defined as 0 regarding to ACM0002 Version 09.	OK	OK
ii Baseline emission parameters?	EF calculated as ex/ante. OM and BM will be calculated during second crediting period.	OK	OK
iii Leakage parameters?	Leakage is negligable regarding to the methodology.		
iv Management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan?	Yes, the management and operational system are in accordance with the monitoring plan.	OK	OK
c Is the accuracy of equipment used for monitoring are calibrated in accordance with the monitoring plan?	Yes, accurancy of equipment used for monitoring in accordance with the monitoring plan. Their accuracy is ensured by TEIAS.	OK	OK
i Are monitoring results consistently reccorded as per approved frequency?	Yes, monitoring results consistently recorded annually as per approved frequency.	OK	OK
ii Have quality assurance and quality control procedures	It is not mentioned that quality assurance and quality	CAR1	OK

CHECKLIST QUESTION	COMMENTS	Draft Concl	Final Concl
been applied in accordance with the monitoring plan monitoring plan?	control procedures been applied in accordance with the monitoring plan.		
4 Assessment of data and calculation of greenhouse gas emission reductions			
It is assessed if GHG emission reductions achieved by / resulting from the proposed VCS project activity are calculated applying the selected methodology			
a Is a complete set of data for the specified monitoring period is available? (If no, i.e., only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, the DOE shall opt to either make the most conservative assumption theoretically possible in finalizing the verification report, or raise a request for deviation if appropriate).	Yes, a complete set of data for the specified monitoring period is available. (TEIAS invoices)	OK	OK
b Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?	Yes, the information cross checked with the PMUM web page.	OK	OK
c Have calculations of baseline emissions, proposed VCS project activity emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document?	Yes, the calculations of baseline emissions are in accordance with the monitoring plan.	OK	OK
d Have any assumptions used in emission calculations been justified?	There are no assumptions used in emission calculations.	OK	OK
e Have appropriate emission factors, IPCC default values and other reference values been correctly applied?	Yes, emission factor which has been approved by the specialist used for the calculations.	OK	OK

TABLE 2 RESOLUTIONS OF CORRECTIVE ACTION / FORWARD ACTION / CLARIFICATION REQUESTS.

Draft report clarifications and corrective action requests by verification team	Reference to checklist question in Periodic Verification Checklist	Summary of project owner response	Verification team conclusion
CAR1- It is not mentioned that quality assurance and quality control procedures been applied in accordance with the monitoring plan.	3.c.2	The data is of high quality and accuracy in agreement with the monitoring plan stated in the VCS PDD. Data quality is ensured due to quality assurance and control procedures.	The validation team considered the explanation plausible. This CAR is closed.

7 Verifier CV's

Internal Technical Reviewer : Ashok Mammen - PhD (Oils & Lubricants)
Bureau Veritas Certification - Internal Technical Reviewer
Over 20 years of experience in chemical and petrochemical field. Dr. Mammen is a lead auditor for environment, safety and quality management systems. He is also a lead verifier and tutor
for GHG projects and has been involved in the validation and verification processes of more than 60 CDM/JI/VCS and other GHG projects.

Lead Verifier : Ms. Burcu Mutman – Environmental Engineer
Bureau Veritas Certification – Seniour Technical Specialist
Burcu Mutman is an auditor for environment, safety and quality management systems. She is also lead verifier for GHG projects.