

VERIFICATION REPORT

KOYULHISAR HEPP

NO.: VCS-21218413



Document Prepared By TÜV Rheinland

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Summary:

TÜV Rheinland has performed a VCS Verification of the project Koyulhisar with 63 MW installed generation capacity in Turkey. The Verification is based on the currently valid documentation of VCS Version 3 and made to a reasonable level of assurance applying materiality threshold of 5%.

The Verification Team concludes that the project as described in the VCS Monitoring Report, Version 2, made of 14th December 2011 covers all the relevant requirements as to the criteria mentioned above. The development and maintenance of records and reporting procedures is consistent with this report. The calculation and determination of GHG Emission Reductions from the project is in the responsibility of the management of the project and it is done on the basis set out within the project description.

The Verification Team confirms that the project is implemented as planned and described in the validated and registered project design documents. Installed devices essential for gathering information about the electricity generation and self-consumption run reliably.

The Verification Team confirms that the GHG emissions reductions are calculated without material misstatements. The opinion relates to the project's emissions reductions reported and the valid and registered project baseline and monitoring, and its associated documents.

The Verification covers 100% of the available data for ER calculation tracked to its origin.

A brief overview of the Verification steps covers the following points:

Desk Review of preliminary VCS Monitoring Report (Version 1, 17th November 2011), registered PD (Version 1.4, 8th November 2011), Validation Report created by TÜV Rheinland (11th November 2011, applied baseline and monitoring methodology ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources", v.11 (EB52).

On-site visit (12th – 13th December 2011)

Issue of the checklist with corrective action request (CARs) and clarification requests (CLs) (See, Annex)

Desk review of revised VCS Monitoring Report (version 2, 14th December 2011)

Review of proposed CARs and CLs

Issue of the Final Verification Report & Protocol (See, Annex)

Finally, TÜV Rheinland issues a positive verification opinion to the project

Based on the information we have seen and evaluated we confirm the following statement:

Monitoring Period (DD-MM-YYYY) : From 17-11-2009 to 31-10-2011 (including both days)

Verified GHG Emission Reductions in the Monitoring Period: 213.059 t CO₂

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1 INTRODUCTION

Turkuaz Karbon as responsible party for quantification of ER has commissioned an independent Verification by TÜV Rheinland of its project: Koyulhisar Hydropower Plant 63 MWe. Bereket Enerji as Project Owner is involved in the Verification activity as contracting party of the Verification with TÜV Rheinland. Some of the work especially commencement of the on-site visit and ER calculations was outsourced to Ekobil Environmental Services Ltd.

The Verification activity is the periodic independent review and ex-post determination by the Designated Operational Entity / Independent Entity of the monitored reductions in GHG emissions during the defined Verification period. TÜV Rheinland as the Verification body of the project has been accredited as a DOE by UNFCCC and also meets the competence requirements as set out in ISO 14065:2007.

1.1 Objective

This Initial Verification is aimed at verifying and certifying the Verified Carbon Units (VCUs) reported for the Koyulhisar Hydropower Plant” for the period 17th November 2009 to 31st October 2011. The final Verification Report will assure that the project is implemented as planned and confirm that the monitoring system is in place and fully functional.

The Verification considers both quantitative and qualitative information on GHG emissions. Quantitative data comprises the Monitoring Reports submitted to the verifier by the project entity as well as underlying evidence such as calculation spreadsheets, monthly power production protocols duly signed by the grid operator company and the project owner, daily recorded power production data to be used as consistency check and electronic print-outs from the electricity regulation authority PMUM. 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 follows the VCS Version 3 based on UNFCCC criteria, referring to the Kyoto Protocol criteria and the modalities as agreed in the Bonn Agreement and the Marrakech Accord.

The document review was conducted by categorizing the supporting documents by Validation issues, such as: baseline emissions, project conformity to national legislation, project start data and crediting period, monitoring, etc. This process represents an efficient way to review, compare and make references to the documents along the Validation Report.

Finally the objective as set out in VCS v. 3 is the Verification of claimed ER reductions to a reasonable level of assurance applying materiality threshold of 5%, whereas for this Verification no risk based approach was chosen and 100% of the raw data originating at its source was used to verify the ER to an exact match as indicated in the MR.

1.2 Scope and Criteria

The Verification includes a review of the Monitoring Report covering the monitoring period from 17th November 2009 to 31st October 2011, based on the registered VCS Project Document as part of the

project design, monitoring parameters, Monitoring Plan, emission reduction calculation, monitoring methodology and all related evidences provided by project participant. Those documents have been reviewed and verified against VCS Version 3 requirements, UNFCCC rules and associated interpretations. The Verification is based on validated project design document including baseline calculations.

The main scopes of this Verification are:

- Verify whether the Emission Reductions generated by the project are in line with the VCS Verification Protocol and the information provided by the project participants contains all the necessary information to evidence the project's compliance with all criteria in the VCS.
- Verify that the project has been implemented as described in the Project Design Document (PDD) during the Verification period.
- Confirm that the Monitoring Plan was implemented and fully functional to generate Verified Emission Reductions (VCU) without any double counting during the whole Verification period.
- Give a conclusion whether reported data are accurate, complete, consistent, and transparent, with a high level of assurance and free of material error or misstatement.

In particular, the project baseline, Monitoring Plan and the project compliance with relevant applicable protocols and criteria (i.e. UNFCCC, VCS, Host Party and others) are to be verified in order to confirm that the project design, as documented, is sound and reasonable and meets the applicable criteria.

The correct application of the CDM approved baseline and monitoring methodologies: ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources", v.11 (EB52) and "Tool to calculate the emission factor for an electricity system", v.02; were already validated by TÜV Rheinland on November 11, 2011.

1.3 Level of assurance

Requirements related to assurance level are set out by VCS v.3 to be reasonable. Therefore TÜV Rheinland has focused on providing a reasonable level of assurance that the emission reduction calculation methodology is appropriate and correctly applied, and that Emission Reductions have been accurately monitored. During the course of Verification all primary data at its data source shall be used to verify the ER assertions. In the case it is required, TÜV Rheinland may discount verified Emission Reductions or requests a discount of these by applying conservative assumptions for uncertainties in emission reduction calculations that cannot be fully quantified or that cannot give a desired level of assurance.

1.4 Summary Description of the Project

The project is located on the geographic coordinates: Latitude: 40°16'13,48' North and Longitude: 37°50'55,58' East, on the downstream of two state owned dams: Kılıçkaya Dam (124 MW) and

Çamlığöze Dam (33MW), operating as peak power plants with a maximum flow rate of 160 m³/s in Turkey. The project collects the water that leaves the spillway of Çamlığöze Dam and it is kept up to 5 hours behind the spill weir regulator. The water is transferred to a set of open canals and tunnels that bring the water to a head pond from which it is loaded to the penstock that brings pass the water to the power house where it reaches a multiple diversion weirs and a power station with 3 Francis-type turbines. One of three turbines are in permanent standby mode, intended to operate only whenever one of the other two turbines will not be operating for the purpose of maintenance and repair. The head difference between the spill regulator and the tail water of 101 m and a project flow of 28 m³/sec.

The weirs have a reservoir with roughly 1,204,040 m² surface area. Figure 2. The turbines have a capacity of 21 MW each, totalling to 63 MW, according to the turbine purchase contract. The estimated net power supply to the grid is 220 GWh per year, this has been recalculated by considering, a well documented, 16% production loss due to the seasonal and topographic conditions (37, 40). The generated power will be supplied to the national power grid via a 154 kV transmission line.

The project aims at the reduction of greenhouse gases in Turkey by substituting emissions from fossil fuel fired power plants. The Validation Team was able to confirm the accuracy of the project description by reviewing maps and technical drawing during the site visit, as well as interviews and inspections conducted during the on-site audit.

The project participant and the carbon consultant participated at the onsite assessment on October the 05th, 2011 were:

- Özgür Erol from the company Bereket Enerji Üretim San. ve Tic. A. Ş. Project finance manager (project participant)

- Özgün Gül from the company Bereket Enerji Üretim A. S., Environmental Officer (project participant)

- Emre Özer from the company Bereket Enerji Üretim A. S. Deputy Project finance manager. (project participant)

- Zahid Karakaya from the company Turkuaz Karbon Varlık Yönetimi Enerji Pro. Dan. San. İth. İhr. Ltd. Sti.. Managing Partner, PD developer (carbon consultant)

- Asli Sezer Özcelik and Murat F. Özcelik from the company Ekobil Ltd., Managing Partners (carbon consultant)

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

Validation Schedule

Contract award for Validation	2011- 09 - 09
Receipt of Draft VCS PD	2011- 09 - 20
Desk Review Findings	2011- 09 - 28
On-site assessment	2011-10 – 05/06
Validation Protocol	2011-10 - 07
Draft Validation Report	2011-10 -17
Internal Technical Review	2011-11 -08
Final Validation Report	2011-11 -11

The Methods and Criteria applied during the Validation process were aimed at gathering all relevant information to confirm statements made by the responsible party in the VCS PD, specially the spreadsheet to calculate the baseline, grid emission factor and the Emission Reductions.

The revised data comprised the gross electricity generation, the self-consumption as well as net generated electricity that is fed in the grid. The calculation of the baseline emissions was verified by means of re-computation according to the approved methodology "Tool to calculate the emission factor for an electricity system", v.02 based on the spreadsheet provided. The use of this tool by the responsible party is in line with the VCS Version 3 requirements as approved methodologies and related Tools shall be used for identification of the baseline emissions.

Additionally, all primary data that was found in said spreadsheet was routed back to its origin supplied by TEIAS (Grid operator in Turkey) and double checked with the imported figures. The calculated annual overall CO₂ emissions were also checked for plausibility by re-calculation.

The feasibility studies have been used to verify all relevant project details concerning the technical design and the plausibility of claimed achievable Emission Reductions. There are three feasibility studies available because the project ownership was transformed twice. However the content in each study is based upon the preceding documentation.

During the on-site visit comments by stakeholders were received. The overall impression was that no objections were filed concerning the project. This was confirmed by the head of district authority who initially mentioned concerns about a natural bridge that was situated upstream of the diversion weir and potentially endangered to be submerged due to water back-surge from the weir. The project owner confirmed that the risk can technically be mitigated by means of the water control structures (gates).

Upon receipt of the Draft VCS PD a list of CAR/CL was forwarded to the responsible party solely derived from the Desk review of the Draft VCS PD also including a document request form. By providing all requested documentation TÜV Rheinland was able to verify the assertions made in The Draft VCS PD. For reason of confidentiality some information concerning the financial details of the project may not be disclosed, however the received documents were revised for the purpose of Validation. No material discrepancies were observed during the Validation process.

2.2 Validation Findings

2.2.1 Gap Validation

This section does not apply since the project was not subject to any VCS approved GHG program.

2.2.2 Methodology Deviations

No deviations were observed.

The determination of the baseline was done according to the following methodologies: ACM0002 "Consolidated methodology for grid-connected electricity generation from renewable sources", v.11 (EB52) and the UNFCCC methodological tool to calculate the emission factor for an electricity system, v.02, applicable under VCS 2007.1

The justification of the baseline was made comprehensively in the PDD taking into account: scale of the project (being > 15MW), VCS Version 3 requirements, project resulting in new reservoir, project boundaries, Greenfield consideration and Methodology version.

The project emissions are considered "0" because of the power density greater than 10 W/m², and because of the emissions through the use of the diesel auxiliary generators being negligible. Therefore the baseline emissions result from the product of net electricity that is generated within the facility and the combined margin emission factor of the electricity grid.

A three step approach was used to proof additionality, Step1, identification of project alternatives, Step2, IRR Step3, Common practice analysis. The approved additionality tool "Tool for the demonstration and assessment of additionality v. 5.2" was applied. Finally, the Validation Team does acknowledge that through the analysis of these steps, conducted appropriately and sufficiently elaborated, the project is additional.

2.2.3 New Project Activity Instances

This section does not apply because there are no grouped projects.

2.3 Validation Conclusion

TÜV Rheinland conducted the Validation of the GHG assertion in accordance with the requirements of the VCS program requirements, the standard ISO 14064-3 and approved UNFCCC methodology ACM0002 to a reasonable level of assurance by applying a materiality threshold of 5 %. The project information validated included the VCS PD delivered to TÜV Rheinland and all relevant information and evidence acquired during the Validation process as stated in the Validation Report as of November 11th, 2011.

TÜV Rheinland came to the conclusion that based on the review and all available documentation the GHG assertion was made in accordance with the requirements of the VCS program and was material correct and fairly represented the GHG emissions data and information without material discrepancies.

3 VERIFICATION PROCESS

3.1 Method and Criteria

The Verification is based on validated project design document including baseline and Monitoring Report. These documents are reviewed against VCS Version 3 requirements as indicated in the sections above. TÜV Rheinland did not deploy a risk based approach but applied a 100% coverage of all data used for ER calculations tracked back to its original source.

The Verification includes the next steps: desk review of the project design documents and Monitoring Report; on-site visit and follow-up interviews and resolution of outstanding issues and the issuance of the final Verification Report and opinion.

3.2 Document Review

The following table outlines the documentation reviewed during the Verification process.

No	Document	Comment
1	UNFCCC, CDM Validation and Verification Manual	Official reference, (Version 01.2), EB55 Annex 1
2	UNFCCC, ACM0002	Official reference, "Consolidated methodology for grid-connected electricity generation from renewable sources", v.11 (EB52).
3	UNFCCC calculation tool for emission factor	Official reference, "Tool to calculate the emission factor for an electricity system", v.02. EB 50
4	UNFCCC additionality tool	Official reference, "Tool for the demonstration and assessment of additionality", v05.2
5	VCS Project Description Document	VCS PD registered, Version 1.4
6	VCS Validation Report	Final Validation Report TUV Rheinland made of November 11, 2011
7	VCS Monitoring Report, Version 01	First draft Monitoring Report
8	VCS Monitoring Report, Version 02	Latest version of the Monitoring Report

9	Emission Reductions Calculation	Spreadsheet part of the Monitoring Report
10	Primary Meter	Calibration certificate Serial number ACTARIS SL7000-Serial Number: 53030781
11	Secondary Meter	Calibration certificate Serial number ACTARIS SL7000-Serial Number: 53030782
12	VCS Program Version 3	Official reference, www.v-c-s.org
13	Commissioning Date prove document	Document to support the commissioning Date of November 17, 2009
14	PMUM MFRC spreadsheet	Spreadsheet with electronic copies of the direct PMUM generation Data including daily figure, this is used for consistency check
15	ER calculations spreadsheet	ER spreadsheet provided by the PP used as basis for re-calculation
16	Meter letter of guarantee	Factory outlet guarantee Statement for both metering devices
17	Single line wiring diagram	includes signed agreement between TEIAS and the PO, this is used to prove technical implementation and the incorporation of the meter(s) as a two way meter to make sure the power consumption of the plant is recorded by this meter(s).
18	TEIAS Protocols, Nov 2009- Oct 2011	The monthly power production protocols signed by TEIAS and the PO. These monthly protocols are direct excerpts from the data recorded by the metering devices including, self consumption and gross production figures.
19	Plant protocols February 2010	Internal protocols recorded by the plant operating staff hourly. All 28 protocols have been checked and the figures have been used to recalculate the electricity generation of February as a consistency check

3.3 Interviews

Plant Staff		
Ihsan Seker	Plant Manager	Operation, maintenance, regulation, coordination of electricity accounting, rules and regulation compliance, responsible for data management
Eser Bozkurt	Chief Mechanical Engineer	Assigned from headquarter, regular visits, maintenance
Musa Kantik	Chief Electrical Engineer	Currently assigned to a different plant, does regular visits to site, previous plant manager, el. Engineer responsible for maintenance
Management PO		
Özgün Gül	Chief Environmental Officer	Responsible for compliance with legal requirements and environmental issues, employed by the PO.
Tevfik Kasaplar	Environmental Engineer	Assigned by the PO, support to Ms. Gül
Carbon Consulting		
Asli Sezer Özcelik	Carbon Consultant, PP	Primary contact for Verification
Murat Özcelik	Carbon Consultant, PP	
Zahid Karakaya	Turkuaz Karbon Varlik Yonetimi Enerji Sti..	Managing Partner, PD developer
Stakeholder		
Mehmet Yilmaz	Müdür, Kaymakamlik Office	As governor of the region was able to confirm compliance of project implementation with laws and regulations, issues related to environmental and social concerns
Adnan Alemdar	Member of the board of Muhtas	Was interviewed related to social, environmental and expropriation aspects.
Enver Kilic	Kalebasi Muhtar	Delivered statements related to the commitment of the PO to develop a sustainable and social policy.

3.4 Site Inspections

An on-site inspection was conducted with the purpose to clarify whether the project had been carried out as described in the VCS PD, assessment of documents and interview personnel in order to verify the project conditions. The site inspection was conducted during one single day for the VCS Verification:

Audit Day 1, 12 th Dec.			
09:00	Hotel in Sivas	Transfer to the site subsequent to confirmation of availability of personnel.	none
11:30	Plant	Introduction, audit related to responsibilities and general performance, general document check	Responsible Officer
13:00	Plant, relay station, gate/spillway, backup generator, reservoir	Inspection of relevant attributes according to Monitoring Plan	PP
14:00	Plant, office	Document check for power production, interview with el. Technician, SCADA gear, and control room	Technician, Plant Manager
15:00	Plant, office	De-briefing Monitoring	All
15:30	Plant, office	Transition to SocialCarbon	All

The on-site visit at the Koyulhisar Hydropower Station confirmed that monitoring and reporting is carried out consistently and in line with established procedures and as per the requirements of the Monitoring Plan mentioned in the registered PDD.

3.5 Resolution of Any Material Discrepancy

This process is aimed at resolving any outstanding issues which need to be clarified prior to TÜV Rheinland's conclusion on the project design and monitoring results. In order to ensure transparency a Verification Protocol is customised for the project. The protocol shows in transparent manner criteria (requirements), means of Verification and their results against the identified criteria.

Findings established during the Verification can either be seen as a non-fulfilment of CDM methodological criteria and VCS Version 3, or where a risk to the fulfilment of project objectives is identified. Corrective action requests (CAR) issued where mistakes have been made with a direct influence on project results. Moreover, clarifications (CL) were requested where additional information is needed to fully clarify an issue. During the course of Verification the consistency check using the daily protocols of the electricity generation data against the monthly protocols that were used to calculate the ER revealed that monthly protocols did not represent the actual indicated

monitoring period (the protocol data was shifted by one month exactly including one month prior to crediting period and neglecting the last month of October of the MP. This issue has been resolved on-site as the resulting error was deemed relevant with materiality of 4,3 % of the ER assertions.

4 VERIFICATION FINDINGS

The findings of the Verification are stated in the following sections. The Verification criteria (requirements), the means of Verification and its results against the identified criteria are derived from an internal Verification Protocol and reflect the requirements of VCS v.3.

4.1 Project Implementation Status

The project has started operation in 2009 which is why the Verification of the project directly follows the Validation that was made during the 2 year eligibility period for retroactive Validation.

During the onsite assessment, it was physically observed by the Verification Team that the power generation equipments and necessary facilities as described in the registered PDD are all in place. By checking their nameplates, the project activity was confirmed to install 3 water turbines with installed capacity of 63 MWe and the metering devices have been in compliance with relevant regulation and accepted to operate (10,11,12).

The project activity is a newly built hydro energy based power generation project, which has generated GHG Emission Reductions by avoiding CO₂ emissions from electricity generation of fossil fuel fired power. Operation of the project does not lead to GHG emissions. Thus it is confirmed that the project was not implemented to create GHG emissions primarily for the purpose of its subsequent removal or destruction.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

The Monitoring Plan describes how the requirements related to the data acquisition and storage are being met. As described in the Monitoring Report and physically observed by the Verification Team during the on-site visit, two bidirectional meters were installed at the plant of the project to measure electricity exported to and imported from the grid. The meters at the plant are identified as primary meter (No. ACTARIS SL7000-Serial Number: 53030781) and secondary meter (No. 53030782) which are being used within the facility to ensure accuracy and exclusion of false readings. The values for the gross electricity generation and self consumption are measured by these devices. Currently, the meters at the substation are not in use, but they are calibrated as they can be used as backup in case it is required.

The accuracy of the primary and secondary meters is 0.2 % (CLASS2) as required by national legislation ("Elektrik Piyasasında Kullanılacak Sayacalar Hakkında Tebliğ" (Communiqué for Metering Devices to be used in the Electricity Market). Both meters are in compliance with the communiqué for Metering Devices to be used in the Electricity Market.

TEIAS staff (Grid operator in Turkey) is responsible for the monthly record and the transmission to the PMUM database. The monthly readings are transferred by fax from previous printouts to the project owner and aggregated there for data storage.

The Verification Team has reviewed the calibration reports (10, 11) of the installed monitoring meters and confirmed that their calibration frequencies and measurement accuracies are in compliance with the Monitoring Plan of the registered PDD and hence all concerned meters were effective during this monitoring period. The primary and secondary meters seals were identified and they are intact. The serial numbers have been cross checked with the numbers reported in the Final Validation Report (13)

Meters:

Function	Primary	Secondary
Located	At the plant	At the plant
Serial No.	53030781	53030782
Calibration date	13.08.2009	13.08.2009

As the monitored and metered data recorded on the monthly TEIAS records is directly input to the emission reduction calculations the accuracy is considered very high in light of the materiality threshold of 5%.

The Verification Team assessed the Monitoring Report and Emission Reductions Calculation Spreadsheet and confirmed that GHG emission calculations presented in them are consistent as described in the registered PDD and the methodology ACM002 and thus deemed appropriate.

The CO₂ emissions reductions were correctly calculated using quantity of net electricity generated and CO₂ emission factor for an electricity system of 0.528 tCO₂/MWh according to the baseline methodology mentioned above and applicable under VCS Version 3.

All calculations made in the Emission Reductions spreadsheet (15) have been verified through re-computation by the Verification Team. The data used in the spreadsheet was tracked back to its origin at a coverage rate of 100% using the monthly TEIAS records. The consistency of all values and monthly generation amounts have been verified. The monthly generation data was again checked for consistency by cross checking with daily production records of the month February 2010 where hourly records are taken by the plant operating staff.

The total electricity production during the monitoring period have been verified as below:

Period	Gross Electricity generation (MWh)	Self Consumption electricity (MWh)	Net electricity generation (MWh)
17 th November 2009 – 31 st October 2011	403.537,579	214.14	403.323,44

The net amount of electricity supplied to the grid is determined as 89,406 MWh. The GHG emissions in the given monitoring period are therefore calculated below:

$$ER_{CP} = 403,323.44 \text{ MWh} * 0.52826 \text{ tCO}_2/\text{MWh} = \mathbf{213,059 \text{ tCO}_2} \text{ (conservatively rounded down)}$$

Therefore, the Verification Team considered that the monitoring of the project is complete and in compliance with the selected monitoring methodology, UNFCCC methodology AMS I.D. "Grid connected renewable electricity generation", v.13, the grid emission factor in compliance with the "Tool to calculate the emission factor for an electricity system", v.02 and the ER calculations have been verified.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

TÜV Rheinland was able to verify that Koyulhisar Hydropower Station has adequate monitoring mechanisms where the required parameters have been monitored on a monthly basis. This was verified during the site visit when the plant records were verified to assess the correctness of the reported data.

The Project Owner has shown evidence of the meter's calibration as requested by Measurement and Measuring Tools Inspection Regulation", Date: 24/07/1994, Official Gazette Number: 22000 - Article 9, in which periodical inspections of "gauges for electric, water, coal gas, natural gas and, current and voltage measuring transformers has to be made once in 10 years". This is in line with the Monitoring Plan and national requirements. The accuracy of the meters is high relative to the applied materiality threshold and errors in meter reading are observed by the operator by comparison of both meter readings from primary and secondary meter. The meters are replaced in case of deviation higher than 0.2% between both meters. It was verified using the spreadsheet calculation that this did not occur during the crediting period.

The monthly printouts for the power generation data were in good readable quality and have all been reviewed to use the figures for recalculation of the claimed ER.

The Emission Reductions have been correctly calculated. A complete set of data for the specified monitoring period was available and verified while undertaking site visit plant records maintained at site. As no further uncertainties or quality restriction affect the calculations the Verification Team has

reviewed the above-mentioned evidences and considered that calculations are in line with VCS v.3 requirements.

4.4 Management and Operational System

The Monitoring Plan used for determining the emission reduction by the Project is based on the approved methodology ACM0002. The aim of the plan is to maintain credible and transparent measurement and collection of data for precise calculation of emission reduction during the crediting period.

The Monitoring Plan includes the monitoring of two parameters for ER calculation, the quantity of the net electricity that is delivered to the grid derived from gross production ($EG_{PP-gross, y}$) and self consumption ($EG_{PP-self\ consumption, y}$).

According to the VCS-PD the gross electricity generated ($EG_{PP-gross, y}$), as well as the electricity consumed by the facility ($EG_{PP-self\ consumption, y}$) will be recorded by two redundant metering devices continuously. The difference will represent the net electricity that is going to be delivered to the grid. Two power meters will back up each other for accuracy, and are placed in the control room of the plant.

The meters will be read each month by TEİAŞ employees. A metering protocol will be signed by both TEİAŞ and a plant employee. These records will provide the data for the monthly invoicing to TEİAŞ and are accessible via the official PMUM website.



Figure: Meters sealed and used by TEİAŞ for taking monthly readings

Maintenance and calibration of the metering devices will be made by TEİAŞ periodically, every 10 years or before in case of failure. If there is a noticeable difference between the readings of two devices, maintenance and tests of the metering devices and the associated equipment will be done before waiting for the periodical maintenance.

The emission reduction calculations will be based on the monthly TEİAŞ reports as the power meters are placed where net electricity fed into the grid.

The following table shows the parameters to be monitored as part of the Monitoring Plan.

Data	Parameter	Description Source of Data Unit	Monitoring Unit	Frequency	QA/QC Procedures to be Applied
EGPP-gross, y	Quantity of electricity produced by the power plant, in year y	Two metering devices used in power plant, monthly records signed by TEİAŞ and plant manager and invoices will be used. Secondary source of data PMUM/MFRC website (column ISVM).	MWh	Continuous measurement and monthly recording	Two calibrated meters will act as backup for each other. Maintenance/ calibration of the metering devices will be made by TEİAŞ when necessary. If the difference between the readings of two devices exceeds 0.2%, maintenance will be done before waiting for periodical maintenance.
EGPP-self consumption, y	Quantity of electricity imported by the power plant from the grid for self consumption, in year y	Two metering devices used in power plant, monthly records signed by TEİAŞ and plant manager and invoices will be used. Secondary source of data PMUM/MFRC website and it will be calculated as the difference between the column ISVM, and UECM.	MWh	Continuous measurement and monthly recording	Two calibrated meters will act as backup for each other. Maintenance/calibration of the metering devices will be made by TEİAŞ when necessary. If the difference between the readings of two devices exceeds 0.2%, maintenance will be done before waiting for periodical maintenance.
PEFC, j,y	Quantity of diesel fuel for auxiliary power generator	Site manager's log book	Liter	Whenever applicable	Recorded amounts to be cross-checked with purchase receipts

The data collection process in place has been verified on site to be as follows:

- TEİAŞ connects a laptop computer to the metering devices each month where the data to be monitored is transferred to this computer and printed out on-site.
- The printouts are signed by both parties, PO and TEİAŞ
- The printouts are then transferred by fax to the headquarters of the PO and as well kept for storage at the plant.
- The PO will archive the printouts and send electronic copies to the PP for the purpose of ER calculation
- The data from the printouts is input to the spreadsheet calculation for ER

- Data slips of diesel consumption have been checked for PEFC, j,y

The data is collected according to well defined data collection procedures: The monitoring and reporting of parameters is in accordance with the established operational procedures, no documented instructions were requested and reviewed.

5 VERIFICATION CONCLUSION

The Verification Team of TÜV Rheinland has performed a Verification for the Koyulhisar Hydropower Project in Turkey on the basis of VCS Version 3 and UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The Verification Team concluded that the project as described in the VCS Monitoring Report (version 02, 14th December 2011), meets all relevant requirements of the above-defined criteria. TÜV therefore issues a positive Verification opinion.

The verified Emission Reductions during the concerned monitoring period (17th November 2009 – 31st October 2011) are displayed as follows:

GHG Emission Reductions or Removals	tCO ₂
Baseline Emissions	213,059 tCO₂
Vintage Year	
2009 (17.11.2009 to 31.12.2009)	11,884
2010 (01.01.2010 to 31.12.2010)	115,208
2011 (01.01.2011 to 31.10.2011)	85,968
Project Emissions	0
Leakage	0
Net GHG Emission Reductions or removals	213,059 tCO₂¹

¹ Rounding results in deviation of 1 ton.

VERIFICATION STATEMENT

Bereket Enerji Üretim San. ve Tic. A. Ş.

15 Mayıs Mh.. 832 Sk.

No:2 K:2 75. Yıl Esnaf Sarayı DENİZLİ

Turkey

21 December 2011

RE: Verification Statement Koyulhisar Hydro Electricity Power Plant, Turkey under VCS, first monitoring period from 17.11.2009 to 31.10.2011

Bereket Enerji Üretim San. ve Tic. A. Ş with registered office at 15 Mayıs Mh.. 832 Sk. No:2 K:2 75. Yıl Esnaf Sarayı DENİZLİ, Turkey, has engaged TÜV Rheinland to review and verify the VCS Monitoring Report and all assertions related to the GHG project under VCS v.3.

We have conducted the VCS Verification in accordance with the requirements of the VCS Version 3 based on the UN Framework Convention on Climate Change (UNFCCC), Article 12 of the Kyoto Protocol, the CDM modalities and procedures. The project information has been verified and the VCS Verification Report "VERIFICATION REPORT 21218413 - Koyulhisar HEPP, Turkey" delivered on 06 July 2012 includes all relevant information and evidence acquired during the Verification process.

We have come to the conclusion that based on our review and all available documentation the assertions are made in accordance with the requirements of the VCS program and are material correct and fairly represents the required parameters without material discrepancies. The Emission Reductions claimed for the monitoring period 17th November 2009 – 31st October 2011 are verified to be 213,059 tCO₂.

Cologne, December 21, 2011

Roland Wollenweber

6 ANNEX 1 CAR/CL REPORT

CAR	CL	List of Requests for Corrective Action (CAR) and Clarification (CL)			
		Observation (CAR/CL)	Doc Reference No.	Summary of project owner response	Validation Team comments
1		Monitoring parameter "Quantity of electricity imported by the power plant from the Grid for self consumption, in year y" identifies primary meter with S-No.: 53030781 and secondary with S-No.: 53030782. The parameter "Quantity of electricity produced by the power plant , in y" identifies the same meters (S-No.). This implicates that both measured parameters are measured by the same device. In section monitoring frequency it is mentioned that TEIAS records the data monthly also for both parameters. To our knowledge there should be two different physical metering devices. Please correctly identify the meters and re-confirm the S-No. and the actual and exact place of physical installation.	MR, section 3.2	The meters are located in the power house as can be seen from the attached single line diagram and both the main meter and the control meter are measuring the same parameters to back up each other. The meters are measuring two ways, they are both measuring the electricity production and the electricity consumption. This is further clarified and updated in the MR version 2.0	It has been verified on site that meters installed do measure both parameters as indicated in the MR, the data was retrieved for both produced and consumed power on-site to verify this, in addition the serial numbers were verified against the validated serial numbers and the serial numbers on the seal of the meter. The seals were undamaged, therefore this CAR is CLOSED
2		Please clearly describe which meter reading is recorded monthly by TEIAS and where a protocol (paper version) is issued by TEIAS referencing the correct meter number and place of installation.	MR, section 3.2 and 3.3	The meter readings are recorded on a continual basis and the meters have an archiving capacity for one year. Please refer to the updated sections of the monitoring report version 2.0 for a full description of the data recording procedure from the moment the meter reads the data up to the stage it is entered into the spreadsheets that we do the	The updated version of the MR now truly reflects the path of data from generation at source to inclusion/transfer to the MR and the ER calculations. The track of data was also verified on-site to be consistent with this documentation, therefore this

				calculations for emission reductions.	CAR is CLOSED
1		The referenced meters as in CAR1/2 are described to be placed at the switchgear station. Please describe where the switchgear is placed and whether data acquired therefore includes deducted transmission losses to the switchgear. Please also refer to CAR1 and 2 since meters should also be placed inside the actual plant that should have different S-No. that account for the actual gross production of the Plant.	MR, section 3.3	The meters are located in the power house as can be seen from the attached single line diagram and please refer to the updated MR version 2.0 for a clarification of the positioning of the meters.	This has been cleared during the on-site visit therefore the CL is CLARIFIED
3		Please in more particular describe in section 3.3 where measurements (physical) are taken and recorded (with ref. to S.-No.), which values are used for calculation and which for cross checks.	MR, section 3.3	Please refer to the updated version of the MR Version 2.0. As also explained there the main meter readings are used for the calculations and the control meter readings are used for the cross checks.	it is referred to CAR 2 and the updated MR, therefore the CAR is CLOSED
4		Please correct the indicated Monitoring Periods as they are inconsistent (cover sheet: 17 November 2009 to 31 December 2011; Table 2: End:31.10.2011; Table 4: End:31.10.2011;	Cover Sheet	Will be updated in MR V 2.0	Accepted CAR CLOSED

5		Please include dates for the calibration dates and valid-date for the electricity meters. Also reference the S.-No. and physical location of meter referenced.	Section 2.1, Table 2	Will be updated in MR V 2.0	Accepted CAR CLOSED
6		Please include the calibration procedures in the "QA/QC procedures to be applied" section of the Monitoring Plan with reference to the meter S.-No. (period, e.g. every ten years as in VR)		The calibration is valid for 10 years as shown in the calibration reports provided as an attachment to this document and as explained in the relevant regulations. this is further explained in the MR version 2.0.	The procedure was discussed on-site and MR has been updated to further clarify this; moreover the calibration documentation has been submitted and the general procedures and requirements are known to the Verifier, therefore this CAR is CLOSED
7		The description of calculation of Baseline Emission and Emission reductions does not follow the rationale of the Monitoring Plan and the indications of parameters. Please correct the Baseline and ER calculations description to be consistent with the Monitoring Plan and Methodology, e.g.. "EG, facility" was not identified in the MR	Section 4.1	Will be updated in MR V 2.0	Accepted CAR CLOSED
8		Please include a Unit in Table 5 for the electricity production of the diesel generator. Please also include this in the section above as "W" does not measure amount of energy.	Section 4.2	Will be updated in MR V 2.0	Accepted CAR CLOSED
9		Please include an exact reference which meter data is transferred directly electronically to the PMUM website, incl. Ser.-No.	Section 3.2, Table	The meter reading data is not transferred electronically to the PMUM-MFRC system . the trade department of the Bereket Central management fills in the amount of electricity sold to the TEIAS via PMUM system. this is further clarified in the updated version of the MR (Version 2.0).	The transfer to PMUM web based platform is understood and has been verified on-site, therefore this CAR is CLOSED

	2	Please clarify the path of meter reading data that is ultimately used in the calculations for parameters "EGPP-gross, y" and "EGPP-self consumption, y" from origination of the data itself to the data source used by the PP to include in the MR.(readout, copying, transcription, hardcopy transfer etc..)	Section 3.3, Description of Monitoring	Please refer to response to CAR 2	Accepted CL is CLARIFIED
10		Please include the Project ID 713 on cover sheet	Cover sheet	Will be updated in MR V 2.0	Accepted CAR CLOSED
11		The data of TEIAS records to be taken for ER calculation is shifted by one month. The sheets of Data indicating Month x represent the actual production Data of the previous month. Please update the ER calculation MR respectively using the new numbers.	Monitoring report and ER calculation	The data was erroneously carried from the meter readings to our work book that calculates the emission reductions. The meter reading protocols provides the information of the previous month. This error is corrected and all the relevant tables and excel work book related to this mistake is updated in the MR version2.0.	The ER calculations have been updated to include the missing month and exclude the month that was included originally (Oct, 2009), therefore this CAR is CLOSED