

VALIDATION REPORT
KIRAZLIK
HYDROELECTRIC POWER PLANT
PROJECT
TURKEY



Document Prepared By TÜV Rheinland Energie und Umwelt GmbH

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Summary:

TÜV Rheinland Energie und Umwelt GmbH has been commissioned by Baren Enerji Üretim San. ve Ticaret A.Ş.. to perform the validation of the VCS project “Kirazlik Hydroelectric Power Plant (HPP) Project” in Turkey, as described in the VCS PD (version 2.02, 24/05/2013). This report summarises the findings of the validation of the project performed on the basis of the VCS Version 3.3 rules.

The VCS project description report subscribes to VCS Version 3.3, the applicable CDM methodology ACM0002 “Consolidated methodology for grid connected electricity generation from renewable sources” version 13.0.0 of UNFCCC and the local legislations.

During the validation process, TÜV Rheinland validator carried-out an on-site visit on the 14 and 15 of November 2012 of the hydroelectric power plant and interviewed the project participant and the project owner. Then, stated requests for clarifications and corrective actions have been provided and input for improvement of the project design have been taken into account in the VCS-PD of Kirazlik HPP version 2.02. TÜV Rheinland’s validation team concludes that the VCS project “Kirazlik Hydroelectric Power Plant Project (HPP)” in Turkey (version 2.02, 24/05/2013) meets all relevant requirements of the VCS Version 3.3 for VCS project.

The VCS project is expected to be operated the 22nd of October 2013. The installed capacity of Kirazlik HPP is 46.11 MWe and will generate 150,610 MWh per year. We confirm that the indicated amount of emission reductions of 813,070 tonnes of CO₂e over the 10 years crediting period from 22nd October 2013 to 21st October 2023, resulting in an average annual emission reduction of 81,307 tonnes of CO₂e.

TÜV Rheinland confirms that the project emission reductions calculations are without material misstatement in a conservative and appropriate manner. The Validation team confirms that the project participant applies correctly the baseline and monitoring methodology and demonstrated rigorously the additionality.

TABLE OF CONTENTS

1	Introduction	6
1.1	Objective	6
1.2	Scope and Criteria	6
1.3	Level of assurance	6
1.4	Summary Description of the Project.....	7
2	Validation Process.....	8
2.1	Method and Criteria.....	8
2.2	Document Review	8
2.3	Interviews.....	10
2.4	Site Inspections.....	11
2.5	Resolution of Any Material Discrepancy.....	12
3	Validation Findings	12
3.1	Project Design.....	12
3.2	Application of Methodology.....	15
3.2.1	Title and Reference	15
3.2.2	Applicability	16
3.2.3	Project Boundary	18
3.2.4	Baseline Scenario	19
3.2.5	Additionality.....	19
3.2.6	Quantification of GHG Emission Reductions and Removals	24
3.2.7	Methodology Deviations	29
3.2.8	Monitoring Plan	29
3.3	Environmental Impact.....	31
3.4	Comments by stakeholders	32
4	Validation conclusion	33
	Annex 1: Validation Protocol.....	34

Abbreviations List:

AEG _{total}	: Annual Electricity Generation
AFOLU	: Agriculture, Forestry and Other Land Use
CL	: Clarification
CAR	: Corrective Action Request
CDM	: Clean Development Mechanism
DSI	: Devlet Su Isleri (State Hydraulic Works)
EIA	: Environmental Impact Assessment
EMRA	: Electricity Market Regulatory Authority (EPDK)
EPDK	: Elektrik Piyasasi Duzenleme Kurulu (EMRA)
FSR	: Feasibility Study Report
HPP	: Hydroelectric Power Plant
MoEF	: Ministry of Environment and Forestry
MP	: Monitoring Plan
PD	: Project Description
PO	: Project Owner
PP	: Project Proponent
TEIAS	: Turkiye Elektrik Iletim A.S. (Turkish Electricity Transmission Company)
VCS	: Voluntary Carbon Standard
VCU	: Voluntary Carbon Unit
VER	: Voluntary Emissions Reductions / Verified Emissions Reductions
VVB	: Validation/Verification Body

1 INTRODUCTION

1.1 Objective

The purpose of the Validation Report is to demonstrate that the implementation of the project is made in accordance with the applied GHG methodologies and the VCS Version 3.3. Therefore the Validation Statement issued shall be made to a reasonable assurance level and confirm that the project additionally reduces GHG emissions compared to the alternative scenario without implementation of the project. The likelihood of the GHG emission reduction assertions made by the responsible party has to be verified during the course of validation of this project. This report summarizes the validation findings by applying the common scope and criteria as indicated. Upon successful validation the project shall be approved by the VCS program to be included as registered VCS project generating Verified Emission Reductions (VERs) or so-called voluntary carbon units (VCUs).

1.2 Scope and Criteria

The validation scope is defined as an independent and objective review of the VCS PD including the project's baseline and monitoring plan, investment analysis and emission reduction calculations. The information in these documents is reviewed against the methodologies and tools from the UNFCCC, VCS Version 3.3 requirements and the local regulations.

During an on-site visit which occurred on the 14th and 15th of November 2012, the actual situation of the project has been compared with the VCS-project description, including the review of the relevant documents such as feasibility study, permits, licences, engineering documentation and actual physical evidences. The forecasted achievable GHG emission reductions were checked and a special attention was given to the national grid emission factor value as the baseline of an HPP refers to this grid.

Validation criteria are extracted or included in the methodological approach that is derived from using the following approved methodologies and tools:

- ACM0002. "Consolidated baseline methodology for grid connected electricity generation from renewable sources" version 13.0.0;
- "Tool to calculate the emission factor for an electricity system", version 03.0.0;
- "Tool for the demonstration and assessment of additionality", version 07.0.0;
- "Combined Tool to identify baseline scenario and demonstrate additionality", version 05.0.0;
- "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", version 02.

The crediting period of the project activity is 10 years.

1.3 Level of assurance

As stated in the VCS Version 3.3, the validation shall be validated to a reasonable level of assurance. The VCS Program Guide generally uses as its core the requirements set out in *ISO 14064-3:2006*.

The quantitative threshold of materiality with respect to the aggregate of errors, omissions and misrepresentations relative to the total reported GHG emission reductions shall be 5% for “projects” as defined under the VCS standard version 3.3 paragraph 5.3.1 item 4. Under the VCS version 3.3, “projects” are defined as project reducing an estimated average annual GHG emission reduction less than or equal 300,000 tonnes of CO₂e per year which is the case of Kirazlik HPP, i.e. 81,307 tonnes of CO₂e per year.

1.4 Summary Description of the Project

The project is a hydroelectric with a small reservoir with a downstream regulation power plant, constructed on Botan stream with an installed capacity of 46.11 MWe and is expected to generate 150,610 MWh of electricity per year. It is located within the Eastern Anatolia Geographic district of Turkey within the Siirt city borders. The geographic coordinates of the dam of the HPP project are 37°55'28.43" north latitude and 42°3'40.31" east longitude and the coordinates of the powerhouse of the HPP project are 37°55'25.73" north latitude and 42°3'41.38" east longitude (i.e. coordinate of the powerhouse).

The Kirazlik project is a newly-built hydroelectric project. This project consists of a dam structure to store water in a reservoir (i.e. area of 1,000,000 m²), a penstock with 3 rectangular cross sectioned 6mX8mX34.50 m unit and one circular unit with a radius of 2.30 m and a length of 38 m. The project includes also a powerhouse with 3 units of Vertical Axis Kaplan turbines of 14.54 MWe each (i.e. 14.54 MWe X3) and 1 unit of Vertical Axis Kaplan turbine of 2.50 MWe. The electricity generated by the power plant will be delivered to the Turkish national grid through.

The hydroelectric plant is expected to be commissioned on 22 October 2013. Other important milestones are listed below.

Table 1: Milestones of Kirazlik HPP

TASK NAME	Date	
	START	FINISH
Revised Feasibility Study Report	1/07/2012	
Licensing by EMRA	09/10/2009	08/09/2057
EIA Report Approval	19/08/2009	
Construction phase of Kirazlik HPP	28/06/2010	Sept 2013
Amendment to Water Usage Agreement	29/04/2010	
Licence modifications approved by EMRA	29/04/2010	
E&M Contract signed (Investment decision date)	19/01/2011	
DSI correspondence to EMRA, stating that they recognize the “Feasibility Study Report” and they wait for EMRA to update the “Production License” so that they can amend 2008 Water “Usage Agreement”	24/04/2013	

TASK NAME	Date	
	START	FINISH
Application to EMRA For the addition of the Fourth Turbine	25/04/2013	
Commissioning date	22/10/2013	

2 VALIDATION PROCESS

2.1 Method and Criteria

Validation process includes gathering all relevant information to confirm statements made by the responsible party in the VCS-PD as well as in the supporting spreadsheets providing the detailed calculation of the emission reductions and the investment analysis.

The validation of Kirazlik HPP has been performed in accordance to the internal procedures of TÜV Rheinland Energie und Umwelt GmbH for validation of VCS projects, which strictly follow ISO 14046-3 and ANSI accreditation to ISO 14065¹. During preparation stage following tasks are accomplished:

- Selection of an appropriate validation team;
- Development of the audit plan;
- Preparation of project and standard specific validation protocol, which shows in a transparent manner, criteria and requirements, means of validation and the results from validating the different identified issues;

The core validation consisted of the following phases:

- desk review of the project design documents;
- on-site visit (site inspection) and follow-up interviews with project stakeholders;
- resolution of outstanding issues including material discrepancies and the issuance of the draft validation report;
- Internal technical review and issuance of final validation report.

The following sections outline each step in more detail.

2.2 Document Review

The desk review phase is characterised by the assessment of the documents listed below which have been provided by the carbon consultant. All documents have all been reviewed during the validation process.

The following table outlines the documents reviewed as part of the validation process:

¹ TÜV Rheinland Energie und Umwelt GmbH was awarded a Certificate of Accreditation by ANSI on 22/06/2012

Ref no.	Reference Document
/1/	/1.1/ Kirazlik VCS Project Document (VCS-PD) version 1, dated 5/11/2012 and issued on 5/11/2012
	/1.2/ Kirazlik VCS Project Document (VCS-PD) version 2.0, dated 25/04/2013 and issued on 25/04/2013
	/1.3/ Kirazlik VCS Project Document (VCS-PD) version 2.01, dated 7/05/2013 and issued on 7/05/2013
	/1.4/ Kirazlik VCS Project Document (VCS-PD) version 2.02, dated 24/05/2013 and issued on 20/05/2013
/2/	/2.1/ Financial analysis Kirazlik HPP version 1, dated 5/11/2012 and issued on 5/11/2012
	/2.2/ Financial analysis Kirazlik HPP version 2.01, dated 25/04/2013 and issued on 25/04/2013
	/2.3/ Financial analysis Kirazlik HPP version 2.02, dated 24/05/2013 and issued on 24/05/2013
/3/	/3.1/ Emission reduction calculation Kirazlik HPP version 1, dated 5/11/2012 and issued on 5/11/2012
	/3.2/ Emission reduction calculation Kirazlik HPP version 2.0, dated 7/05/2013 and issued on 7/05/2013
/4/	Project Description template, version 3.1
/5/	VCS Program Guide, version 3.4
/6/	VCS Standard, version 3.3
/7/	VCS Program Definitions, version 3.4
/8/	UNFCCC, Approved Baseline & Monitoring Methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 13.0.0, EB67
/9/	UNFCCC, "Tool to calculate the emission factor for an electricity system", version 3.0.0, EB70 Annex 22
/10/	UNFCCC, "Tool for the demonstration and assessment of additionality", version 7.0.0, EB20 Annex 8
/11/	UNFCCC, "Combined tool to identify the baseline scenario and demonstrate additionality", version 5.0.0, EB20 Annex 9
/12/	UNFCCC, "Guidelines on the assessment of investment analysis", version 05, EB62 Annex 5
/13/	UNFCCC, "Glossary of CDM terms", version 7.0, EB70 Annex 7
/14/	UNFCCC "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" Version 02, EB41 Annex 11
/15/	/15.1/ Kirazlik HPP - Baren Enerji Üretim San. ve. Ticaret Limited Şirketi.- Tax Plate, dated 21/11/2006
	/15.2/ Kirazlik HPP - Baren Enerji Üretim San. ve. Ticaret A.Ş. - Tax Plate, dated 22/04/2013
/16/	Kirazlik HPP - Connection Agreement, dated 4/01/2012
/17/	Kirazlik HPP - Construction Works Contract, dated 28/06/2010
/18/	Kirazlik HPP - E&M contract- signed, dated 19/01/2011
/19/	UNFCCC, "Guidelines on Common Practice" version 02.0
/20/	Kirazlik HPP - Transmission Facility Contract, dated 1/05/2012
/21/	Kirazlık HPP - EIA Affirmative Certification, dated 19/08/2009
/22/	Kirazlık HPP - EIA Report Final, dated July 2009
/23/	Kirazlik HPP - Life Line Water E&M contract, dated 24/04/2012
/24/	Kirazlık HPP - Water Usage Agreement signed with DSI, dated 12/08/2008

Ref no.	Reference Document
/25/	Kirazlik HPP - ERMA Electricity Production Licence, dated 09/10/2008
/26/	Kirazlik HPP - Licence modifications approved by EMRA, dated 29/04/2010
/27/	Kirazlik HPP - Application to EMRA For the addition of the Fourth Turbine, , Baren Letter Sent to EMRA, dated 25/04/2013
/28/	Kirazlik HPP - Feasibility Study Report (revision of the 1st FSR version from July 2007), dated September 2012
/29/	Kirazlik HPP – KIR single line diagram
/30/	Kirazlik HPP – Fish Ladder Implementation Project
/31/	Kirazlik HPP - Elevation-Volume-Area Graphics
/32/	Kirazlik HPP – Feasibility Drawings, dated September 2012
/33/	Kirazlik HPP - DSI correspondence to EMRA, stating that they recognize the “Feasibility Study Report” and they wait for EMRA to update the “Production License” so that they can amend 2008 Water “Usage Agreement”, dated 24/04/2013
/34/	Summary of the Moody's Index for the Government of Turkey for the past 4 years
/35/	Institute for Global Environmental Strategies (IGES): 2006 IPCC Guidelines for National Green House Gas Inventories: - CO2 emission factor of fossil fuel type i in year y: table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories.
/36/	TEIAS ELECTRICITY GENERATION & TRANSMISSION STATISTICS OF TURKEY: - 2008 data: http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2008/index.htm (last visited 21/05/2013) - 2009 data http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2009/index.htm (last visited 21/05/2013) - 2010 data: http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2010/İstatistik%202010.htm (last visited 21/05/2013)
/37/	/37.1/ Kirazlik HPP - Common practice data version 1, dated 5/11/2012 and issued on 5/11/2012 /37.2/ Kirazlik HPP - Common practice data version 2, dated 25/04/2013 and issued on 25/04/2013
/38/	Kirazlik E&M manufacturers work schedule
/39/	ELECTRICITY Special Commission Report: - Proof for the HPP economic lifetime, http://ekutup.dpt.gov.tr/enerji/oik585.pdf (page 4.25 – p72 of PDF document Last visited on 22/07/2012) - Proof for the need to replace HPP equipment every 20 years, http://ekutup.dpt.gov.tr/enerji/oik585.pdf (page 4.26 - p73 of PDF document Last visited on 22/07/2012)
/40/	Change of status from a Limited Liability to a Corporation – Chamber of Commerce, 24/04/2013
/41/	Change of status from a Limited Liability to a Corporation announcement in the Trade Registry Gazette, dated 26/04/2013
/42/	Change of status from a Limited Liability to a Corporation – Letter to EMRA, 11/B6/2013

2.3 Interviews

TÜV Rheinland validation team carried out an on-site visit on the 14th and 15th of November 2012 and performed interviews with the project representatives and stakeholders.

Date	Name	Organisation	Topic
14/11/2012	Dr. Aslı Sezer Özçelik, (Carbon consultant)	Ekobil Çevre Hizmetleri Danışmanlık Ltd. Şti.	- Project start; - Project implementation; - Local permits and local requirements - Applied project technology - Physical conditions - Project history - Project barriers - Project status - Discussion on additionality, baseline scenario and emission reduction calculation; - Feasibility study; - Environmental and social impacts and/or community benefits; - Financial issues; - Supporting documents;
15/11/2012	Elçin Caner (Project Development manager) Cercis Günes (Mechanical Equipment Project Manager)	Baren Enerji Üretim San. ve. Ticaret A.Ş.	- General project perception; - Project history and implementation - Financial issues; - Supporting documents; - Substantiation of loan and loan conditions; - Clarification on high project cost - Contribution to the regional sustainable development; - Safety training of employees - Health and safety trainings. - Explanation on electricity meters

2.4 Site Inspections

The site visit took place the 14th and 15th of November 2012 which consisted of the visit of the offices of Baren Enerji Üretim San. ve. Ticaret A.Ş. on the 14th of November, as well as the project site of Kirazlık HPP on the 15th of May, where only road construction works were finalised. The project is located in a mountainous area close to Siirt city. The project area is not being used for irrigation or feedstock purposes.

The site visit was conducted to validate the accuracy and completeness of the project description as specified in the VCS PD. During the site visit, the validation team reviewed the available project activity designs, feasibility studies, documentation check and comparison analysis with equivalent projects as appropriate. The site inspection was also carried out by means of interviews with the persons indicated in section 2.3 (above).

2.5 Resolution of Any Material Discrepancy

The validation protocol has been added as Annex 1 to this report. The validation protocol was prepared following the site visit during which all issues identified during the desk review were discussed. All CAR/CL have been resolved by PPs via provision of additional supporting evidence and appropriate changes to the VCS PD.

3 VALIDATION FINDINGS

3.1 Project Design

As per the requirements defined under VCS (version 3.3) /6/, especially specified in section 3 of VCS version 3.3, the following matters will be subject to further validation.

- Project scope, type, technologies and measures implemented, and eligibility of the project

Kirazlik project activity falls under the Sectoral Scope 1: Energy industries (renewable and non-renewable sources) as per the sectoral scopes defined by the CDM Executive Board. As described in the VCS PD /1.4/ and other key documents of the project such as the EMRA Generation Licence /25/, the Feasibility Study Report /28/, the project activity has for main purpose to generate energy from Botan River as a renewable resource.

During the site visit, it has been confirmed that the Kirazlik hydroelectric plant will be connected to the national electricity grid of Turkey. Hence, the Validation team substantiates that the project type is electricity generation from renewable sources.

The project activity is a hydroelectric power plant with an installed capacity of 46.11 MWe consisting of 3 units of Vertical Axis Kaplan turbines of 14.54 MWe each and 1 unit of Vertical Axis Kaplan turbine of 2.50 MWe. It is expected to reach an annual electricity production of 150,610 MWh. These features are supported by the EMRA Generation Licence /25/, the approved modification licence /26/, the application to EMRA for the addition of the forth turbine /27/ and the Feasibility Study Report /28/. The Validation team confirms that the information has been adequately used throughout the VCS PD.

The project owner is expecting to construct an environmentally friendly hydroelectric power plant which enables the use of natural resources in a much more sustainable state and enhance the Eastern Anatolia Region economic development. This statement has been approved by Validation team with the Feasibility Study Report /28/ support.

The VCS PD /1.4/ and the site visit demonstrate that the project activity is not a grouped project as it does not involve combination of GHG projects or other project categories. It is a single project and there are no other project participants involved.

According to section 3.4.9 of the VCS Standard version 3.3, a set of eligibility criteria shall ensure that new project activity instances:

- 1) Meet the applicability conditions set out in the methodology applied to the project.

The project proponents have demonstrated that the project activity meets the applicability conditions of the UNFCCC methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 13.0.0 EB 66 (see section 3.2.2 of this Validation report);

2) Use the technologies or measures specified in the project description.

The Kirazlik project consists of hydroelectric technology. The technology is exhaustively described in section 1.8 of the VCS PD /1.4/ and corresponds to the Feasibility Study Report /28/.

3) Apply the technologies or measures in the same manner as specified in the project description.

The Kirazlik project consists of hydroelectric technology. During the site visit in November 2012, the construction phase was on-going and the observations of the plants were matching with the Feasibility Study Report /28/ and the VCS PD /1.4/. The VCS PD states that the construction began the 28 June 2010 and the Validation team can confirm that the expected operation date in the VCS PD is correct.

4) Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.

In accordance with the methodology ACM0002, the Project Proponent has stated in the VCS PD that since the project activity is the installation of a new grid-connected renewable power plan, the baseline scenario is "Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system" (see section 3.2.4 of this Validation report).

5) Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area.

The PP has exhaustively demonstrated that the project activity is not financially attractive through an Investment analysis and electricity generated from hydroelectric plant is not a common practice. Further development of the validation of the additionality is provided in section 3.2.5 of this Validation report.

The above explanation proves that Kirazlik project activity meets the VCS Standard version 3.3 eligibility criteria.

Finally, the Validation team confirms that the proposed project activity fulfils VCS program specific issues (see section 2 of the VCS Standard version 3.3), i.e.

- Handle CO₂, one of the six Kyoto protocol greenhouse gasses;
- VCS project design and validation report are provided in English, site inspection and interviews are also conducted in English;
- PP claims real and measurable emission reduction credits;
- PP applies for 10 years crediting period;
- Project is submitted to VCS registry within 2 years after operation.

- Project proponent

Baren Enerji Üretim San. ve. Ticaret A.Ş. and *Ekobil Environmental Services and Consulting Ltd.* are identified as project proponents. *Baren Enerji Üretim San. ve. Ticaret A.Ş.* is the project owner (PO) of the project activity, owner of the electricity generation licence /25/ and the project participant. *Baren Enerji Üretim San. ve. Ticaret A.Ş.* /15.2/ was initially a Limited Liability Company named *Baren Enerji Üretim San. ve. Ticaret Limited Şirketi.* /15.1/. But on the 26/04/2013, the company has changed to a Corporation and this change of status was announced in the Trade Registry Gazette on the same day /41/. This change of status has been indicated to EMRA through a letter which has been provided to the VVB /42/.

During the Validation, a FAR (see FAR01) has been raised by the Validation team (see table 3 in Annex 1). Ekobil is the carbon consultant, the entity which prepared VCS PD. Both entities have been interviewed by the Validation team.

- Project start date

According to section 3.7 of the VCS Standard version 3.3, the Project start date is defined as “the date on which the project began generating GHG emission reductions” which thus corresponds to the commissioning date (i.e. operation date) of the project activity. The project proponent has stated in the VCS PD /1.4/ that Kirazlik project start date is the 22 October 2013.

This date is provided as the expected date of commissioning by the project owner, based on the E&M installation work plan provided by the E&M contractor. The work schedule of the E&M manufacturers indicate the last date for the wet test of the first turbine to be commissioned as 22nd of October 2013. This statement has been confirmed to the Validation team during interviews with the project owner at the time of the on-time visit (see section 2.3 of this Validation report). Moreover, the E&M manufacturers work schedule was provided to the validation team /38/ which substantiates the planned commissioning date of the Kirazlik HPP project.

- Project crediting period

According to section 3.8 of the VCS Standard version 3.3, “the project crediting period shall be a maximum of ten years”. Kirazlik meets VCS Standard version 3.3 as the crediting period of the project stated in VCS PD /1.4/ starts 22 October 2013 and end 21 October 2023. Hence, the PP has appropriately selected a crediting period of 10 years.

- Project scale and estimated GHG emission reductions or removals

According to section 3.9 of the VCS Standard version 3.3, projects are categorized by size according to their estimated average annual GHG emission reductions or removals, as follows:

- 1) Projects: Less than or equal to 300,000 tCO₂e per year; and
- 2) Large projects: Greater than 300,000 tCO₂e per year.

The project proponent has provided to the VVB the Emission reduction calculations of Kirazlik project /3.2/. The emission reduction calculations are transparently documented and appropriate assumptions regarding the expected amount of electricity generated have been used to forecast emission reductions. The Validation team has crosschecked the whole Excel spreadsheet and is deemed to be correct. Kirazlik HPP expects to reduce 81,307 tCO₂e annually which correspond to the “Projects” category (see point 1 above) as the project activity forecasts to reduce less than 300,000 tCO₂e per year.

According to UNFCCC rules and regulations, Kirazlik HPP project activity is a large scale project as its installed capacity is higher than 15 MW (see Glossary of CDM terms /13/), i.e. 46.11 MWe.

- Project activities

According to VCS Program Definitions, version 3.3 /7/, a project activity is defined as a “specific set of technologies, measures and/or outcomes, specified in a methodology applied to the project, that alter the conditions identified in the baseline scenario and which result in GHG emission reductions”.

Kirazlik HPP applies hydroelectric technology consisting of an impoundment facility, a regulator and a small reservoir. It applies to the UNFCCC Approved consolidated baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable

sources". The project affects the conditions of the baseline scenario which is based on ACM0002 methodology "Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system" (see section 3.2.4 of this Validation report for further development on the baseline scenario).

Hence, according to the VCS Program Definitions version 3.4, Kirazlik HPP is a project activity.

- Project location

Kirazlik HPP project activity is located on the Botan River within the Siirt city borders, in Siirt Province, Turkey. During the site visit, the locations of the dam and the powerhouse have been confirmed. For instance the geographic coordinates of the dam are 37° 55' 28.43" north latitude and 42° 3' 40.31" east longitude. The accuracy of the geographical coordinates was checked by the Validation team from public online source (i.e. Google Map) and deemed to be appropriate.

- Project compliance with applicable laws, statutes and other regulatory frameworks

Kirazlik HPP project activity is in compliance with the host country (i.e. Republic of Turkey) regulations as stated in section 2.5 of the VCS PD /1.4/. The following legal documents prove the compliance of the project activity:

- EMRA Generation Licence /25/ and amendment /26/,
- EIA approval /21/,
- Water Usage Agreement /24/.

- Ownership and other programs

The legal documents and more specifically the EMRA generation licence /25/ indicate that *Baren Enerji Üretim San. ve Ticaret A.Ş.* is the project owner of Kirazlik HPP. The information provided in VCS PD /1.4/ is accurate and deemed to be correct by the Validation team.

The interviews with the project proponent during the site visit indicated that the project has not participated and is not registered under other GHG Programs and has not generated any other form of environmental credits.

- Additional information relevant to the project

No additional information is necessary to be added as Kirazlik HPP project activity is not part of grouped projects, is neither an AFOLU project or has any commercial sensitive information. All information was available during the Validation process by the VVB.

3.2 Application of Methodology

3.2.1 Title and Reference

This section corresponds to the title and reference of the applied methodology. Under the VCS Program, eligible methodologies include all CDM methodologies.

Kirazlik HPP project activity uses the approved consolidated baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” Version 13.0.0 /8/ to develop the VCS PD of the proposed activity. The methodology is valid from 11 May 2012 onwards and is still valid at the time of validation of the project activity.

Additionally methodology related tools and relevant guidelines are applied as well, including:

- “Tool to calculate the emission factor for an electricity system”. Version 03.0.0 /9/,
- “Tool for the demonstration and assessment of additionality” Version 07.0.0 /10/,
- “Combined tool to identify the baseline scenario and demonstrate additionality”, version 5.0.0 /11/,
- “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” Version 02 /14/,
- “Guidelines on the assessment of investment analysis” Version 05 /12/.

3.2.2 Applicability

The approved baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” version 13.0.0 /8/ has been used to develop the VCS PD /1.4/ of Kirazlik HPP project activity.

The validation team determined the applicability of ACM0002 version 13.3.0 as follows:

Applicability criteria of the methodology ACM0002 version 13.0.0	Criteria fulfilled	Determination by the validation team
This methodology is applicable to grid-connected renewable power generation project activities that a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); b) involve a capacity addition c) involve a retrofit of (an) existing plant(s) d) involve a replacement of (an) existing plant(s)	☒ Yes ☐ No	No renewable power plant was operated prior to the implementation of the project activity so Kirazlik HPP is a greenfield plant (a). This is verified via document review of FSR /28/ and the EMRA generation licence /25/ as well as during on-site observation and interview with the project owner and technical staff.
The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;	☒ Yes ☐ No	As stated in the EMRA generation licence /25/ the proposed project activity is developed and operated as an accumulation reservoir hydroelectric power plant.

Applicability criteria of the methodology ACM0002 version 13.0.0	Criteria fulfilled	Determination by the validation team
In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use Option 2: on page 10 to calculate the parameter EGPJ,y): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;	☒ Yes ☐ No	N.A.
In case of hydro Power Plants one of the following conditions must apply: - The project activity is implemented in an existing single or multiple reservoirs, with no change in the volume of any of reservoirs; or - The project activity is implemented in an existing single or multiple reservoirs, where the volume of any of reservoirs is increased and the power density of each reservoir, as per the definitions given in the project emissions section, is greater than 4 W/m²; - The project activity results in new single or multiple reservoirs and the power density of each reservoir, as per the definitions given in the project emissions section, is greater than 4 W/m²	☒ Yes ☐ No	Kirazlik HPP is a green-field project, i.e. no power plant or reservoirs existed which was observed during the site visit. Hence, the project activity will result in a new single reservoir. During the interview with the carbon consultant on site, explanation on calculation of power density and parameters were provided and confirmed that the applied power density is 46.11 W/m ² , which is greater than 4W/m ² , i.e. installed capacity is 46.11 MW (EMRA modification approved /26/) and the reservoir area is 1 km ² (from FSR /28/).
In case of hydro power plants using multiple reservoirs where the power density of any of the reservoirs is lower than 4 W/m ² all the following conditions must apply.	☒ Yes ☐ No	N.A. It is stated in the EIA /22/ that Kirazlik HPP consists of 1 reservoir with a surface area of 1 km ² .
The methodology is not applicable to the following: - Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; - Biomass fired power plants; - A hydro power plant that results in the creation of a new single reservoir or in the increase in an existing single reservoir where the power density of the power plant is less than 4 W/m².	☒ Yes ☐ No	The proposed project does not involve switching from fossil fuel to renewable energy source, neither is it a biomass fired power plant, nor a hydropower plant with power density less than 4 W/m ² (see above). This statement has been crosschecked and deemed valid by the Validation team.

Applicability criteria of the methodology ACM0002 version 13.0.0	Criteria fulfilled	Determination by the validation team
In the case of retrofits, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance”.	☒ Yes ☐ No	N.A. Proposed project activity is greenfield plant.

The project participant has demonstrated appropriately in the VCS PD /1.4/ that Kirazlik HPP project activity meets all applicability criteria of the approved methodology ACM0002 version 13.0.0. The Validation team concludes that the selected methodology is applicable for the proposed project activity.

3.2.3 Project Boundary

According to the ACM0002 version 13.0.0 /8/, “the spatial boundary of the project activity includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to”.

The sources of greenhouse gas identified in the VCS PD are deemed to be appropriate.

Emissions	GHGs involved	Description
Baseline emissions	CO ₂	Grid electricity generation: The carbon dioxide (CO ₂) emissions from the thermal power plants connected to the Turkish national grid are considered as a baseline emission source. These data from 2008 to 2010 are publically available on TEIAS website /36/ and this emission source has been appropriately included in the emission reduction calculations /3.2/.
Project emissions	CH ₄	According to the methodology ACM0002 version 13.0.0, PE _{HP} (Project emissions from reservoirs of hydro power plants in year y (tCO ₂ e)) must be accounted. However, as the power density (PD) of the project activity is greater than 10 W/m ² (i.e. 46.11 W/m ²) PE _{HP} = 0
Leakage	None	According to the methodology ACM0002 version 13.0.0, no leakage emissions are considered

In summary, the project boundary was correctly identified in accordance with the methodology ACM0002 (Version 13.0.0). All greenhouse gas emissions occurring within the proposed project activity boundary as

a result of the implementation of the proposed CDM project activity have been appropriately addressed in the VCS PD /1.4/.

3.2.4 Baseline Scenario

As Kirazlik HPP project activity is a new grid-connected renewable power plant, according to ACM0002 version 13.0.0 methodology, the baseline scenario is the following:

“Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.

Furthermore, the project participant indicated that “In the absence of the project activity, same amount of electricity would have been generated by other resources in order to meet the energy demand of Turkey”.

The validation team confirms that the proposed project activity meets the methodology requirements. Therefore, the baseline scenario as prescribed in the ACM0002 Version 13.0.0 /8/ is applicable to the proposed project activity.

3.2.5 Additionality

According to VCS Standard version 3.3 /6/ “Additionality shall be demonstrated and assessed in accordance with the requirements set out in the methodology applied to the project”.

The UNFCCC methodology ACM0002 version 13.0.0 stipulates to use the “Tool for the demonstration and assessment of additionality” version 06.0.0 /10/ and the “Combined tool to identify the baseline scenario and demonstrate additionality” version 03.0.1 /11/. To support the development of the financial analysis of Kirazlik HPP project, “Guidelines on the assessment of investment analysis” version 05 is also used by the PP.

Step 1: Alternatives

As required by methodology ACM0002 version 13.0.0, the following three alternative scenarios must be considered which has been correctly applied and discussed in the VCS PD /1.4/:

- A. The proposed project activity undertaken without being registered as a CDM project activity;
- B. Other realistic and credible alternative scenario(s) to the proposed CDM project activity scenario that deliver outputs services (e.g., wind power plants);
- C. Continuation of the current situation.

The PP has appropriately demonstrated the most realistic and credible alternative scenario which is the baseline scenario as shown above in section 3.2.4 of this Validation report. Furthermore, the project participant has proven that the selected alternative (baseline scenario) is consistent with the mandatory laws and regulations in Turkey.

The validation team confirms this by reviewing the relevant legislations and regulations that govern power projects in Turkey and it is deemed to be correct.

Step 2: Investment Analysis

The PP has provided the Validation team with a Financial Analysis version 2.02 /2.3/ including an IRR calculation and Sensitivity analysis. The first version of the Feasibility Study is from July 2007 which resulted in the Water Usage Agreement from DSI /24/. However, the values from this first version have been revised and updated in a most recent Feasibility Study Report /28/ completed in September 2012 and the input values have been used for the Financial Analysis. The PP has used the input values from the most recent FSR (Sept 2012) which has been available one year and half after the Investment Decision date, i.e. 19/01/2011, because no further recent data were available.

The VCS PD /1.4/ includes as well a table with milestones of the project activity (see also section 1.4 of this Validation report). The Investment Decision date corresponds to E&M contract signature date /18/, i.e. 19/01/2011, which relates to the first commitment of the project owner to the Kirazlik HPP project activity.

The financial analysis calculation /2.3/ starts from 2013 which corresponds to the time of the commissioning date and the period of assessment covers 20 years which correspond to the “Guidelines on the assessment of investment analysis” version 05 /12/, and an additional 2 years (prior to project commissioning date) is also taken into account as the loan and interest charges, i.e. 2011 and 2012 (i.e. EMRA Generation Licence /25/ starts from 09/10/2008 and is valid for 49 years (i.e. until 8/10/2057).

The timing of the investment decision and all the input values have been correctly used and consistently applied in all calculations as per the paragraph 6 of the “Guidelines on the assessment of investment analysis” version 05 /12/ requires.

Furthermore, the equity IRR after tax has been selected as the financial indicator for assessing the financial viability of the project activity. The investment analysis has been presented in a transparent manner and the Validation team was able to reproduce the results.

Benchmark determination

The project participant has correctly demonstrated that the benchmark approach for the investment analysis is the only applicable and most appropriate method. Hence, the PP has selected a benchmark based on parameters that are standard in the market. As the “Guidelines on the assessment of investment analysis” version 05 /12/ stipulates default benchmark values per country and sector are provided. However, the republic of Turkey is not included in the Appendix of the Guidelines. But PP can nevertheless research the “Moody’s rating for bonds” at the date of investment decision in Turkey and then find a matching country in Appendix of the “Guidelines on the assessment of investment analysis” version 05 /12/ which has the same “Moody’s rating for bonds”, hence the expected return on equity can be defined.

The PP has determined the Turkish Moody’s rating for bonds for the January 2011, the time of investment decision, which is Ba2. It has been cross-checked by the Validation team with Moody’s website and by the 8/01/2010 rating action paper and 13/08/2011 announcement published by Moody’s /34/.

Hence, the countries corresponding to a Moody's rating for bonds of Ba2 in Appendix of the "Guidelines on the assessment of investment analysis" version 05 /12/ have a benchmark of 12.5%. The Validation team considers the procedure to determine the benchmark is correct and valid.

IRR calculation

Based on the "Guidelines on the assessment of investment analysis" version 05 /12/ and the "Tool for the demonstration and assessment of additionality" version 07.0.0 /10/, the financial indicators (i.e. benchmark and IRR) must be compared. Hence, the project participant has calculated the equity IRR after tax /2.3/. The Validation team has validated the parameters which were used to calculate this equity IRR of Kirazlik HPP project activity.

Parameter 1	Total investment cost, incl. VAT
Value applied for the IRR calculation:	128,732,273 USD
Source of the value:	Based on construction /17/ and EM contracts /18/ and estimations on Expropriation and security expenses
Justification by the validation team according to §113 of VVM: (cross checking and comparison as applicable)	The value used for the calculation of equity IRR within the investment analysis is the expected investment cost at the time of decision making as per the construction /17/ and EM contracts /18/.

Parameter 2	Operation and maintenance cost
Value applied for the IRR calculation:	1,228,574 USD/year
Source of the value:	FSR Report Chapter 9 /28/
Justification by the validation team according to §113 of VVM: (cross checking and comparison as applicable)	Operation and maintenance costs are adopted from the Kirazlik HPP Feasibility Study Report /28/. These costs correspond to real staff costs based on the estimation of each employee. Furthermore, these costs are based on the maintenance and cost of spare parts required during the operation of the HPP.

Parameter 3	Interest rate
Value applied for the IRR calculation:	Confidential information
Source of the value:	Defined by the lender İŞ BANKASI, YKB, ZİRAAT, TSKB
Justification by the validation team according to §113 of VVM: (cross checking and comparison as applicable)	The validation team examined the Interest factor suggested from İŞ BANKASI, YKB, ZİRAAT, TSKB /2.3/ and the Validation team confirms the use of the accurate interest rate for the investment analysis.

Parameter 4	Electricity sales price (assumption)
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Value applied for the IRR calculation:	0.09 USD/kWh
Source of the value:	Based on the estimations in the DSI recognised FSR Chapter 9 /28/
Justification by the validation team according to §113 of VVM: (cross checking and comparison as applicable)	Project owner made an assumption and considered electricity price to be 9 USD cent/kWh which is indicated in the FSR /28/ and DSI has recognized this report. PP adopts the electricity sales price over the entire investment analysis which is deemed to be correct by the Validation team.

Parameter 5	Operational lifetime
Value applied for the IRR calculation:	50 years with partial equipment replacement every 20 years
Source of the value:	Electricity Special Commission Report /39/
Justification by the validation team according to §113 of VVM: (cross checking and comparison as applicable)	The economic life time of a hydro power plant investment is assumed to be about 50 years, based on the experts' committee report /39/ on energy under the 8 th development plan published by the Turkey's State Planning Organization. Even if the facility can last for 50 years the major equipment needs to be replaced in every 20 years /39/

Parameter 6	Energy generation
Value applied for the IRR calculation:	150,610 MWh
Source of the value:	Feasibility study report /28/
Justification by the validation team according to §113 of VVM: (cross checking and comparison as applicable)	The energy production is estimated based on the specific river and environment characteristics and published in the Feasibility study report /28/.

The financial spreadsheet was received, verified and found to be correct by the validation team. The assumptions used in the financial calculations are correct.

The financial analysis is in accordance with the "Tool for demonstration and assessment of additionality" version 07.0.0 and the "Guidelines on the assessment of investment analysis" version 05. All input parameters used in the IRR calculation were valid at the time of investment decision making. The validation team confirms that the equity IRR after tax without any CDM revenue works out to be 6.48 % which is below the benchmark of 12.5%.

Sensitivity Analysis

The project participant has carried out a Sensitivity analysis using the Investment cost, the annual expenses, the electricity price and amount of electricity generated variables. A range of +10% and -10%

has been used which is deemed appropriate by the Validation team. The equity IRR varies between 4.89% and 8.76 % which is below the benchmark (i.e. 12.5 %). The Validation team concludes that the Sensitivity analysis is deemed appropriate.

Step 3: Barrier analysis

As the Investment Analysis has been developed (see above), this issue has not been covered as according to the “Tool for the demonstration and assessment of additionality” version 06.0.0.

Step 4: Common practice

According to the “Tool for the demonstration and assessment of additionality” version 07.0.0 /10/ and the “Guidelines on Common Practice” version 02 /19/, the common practice analysis acts as credibility check to complement the investment analysis and the PP has followed the sub-steps of the tools.

No.	Criteria selected	Determination by the validation team	Criteria justified
1	Geographical scope	The PP has demonstrated that the applicable geographical area is the country of Turkey which has a closed grid. This statement has been supported by a map of the Turkish grid from the EPDK (= EMRA). The Validation team confirms that the geographical scope is deemed to be plausible for the common practice analysis (step 1 of the Guidelines). It was evidenced that the climatic regime for this region and the water availability are specific and region specific.	☒ Yes ☐ No
2	Technology	Following the “Guidelines on Common Practice”, 41 projects with similar technology were identified (step 2 of the Guidelines), being hydroelectric power plants with installed capacity in the range 23.05 MW to 69.16 MW, which was commissioned before the start date of Kirazlik HPP. HPP under construction or seeking VER revenues are not included. Hence, it reduces to 33 projects with similar features as Kirazlik HPP project activity (step 3 of the Guidelines). $N_{all} = 33$	☒ Yes ☐ No
4	Regulatory framework	There is to the knowledge of the Validation Team no regulatory framework in place which grants any kind of incentives for renewable energy projects, besides the Law on Utilization of Renewable Energy Resources, which ensures the guaranteed feed-in tariff, or which stipulates a mandatory requirement to develop those.	☒ Yes ☐ No
5	Different conditions	The PP has demonstrated that from the 33 identified projects ($N_{all} = 33$) with similar technology (hydro power plant) within the similar range of installed capacity than the Kirazlik HPP project, this 33 projects are all different in either the type of developer (e.g. auto-producer), or different water catchment (i.e. out of the Tigris Catchment). Hence, $N_{diff} = 33$ (step 4 of the Guidelines)	☒ Yes ☐ No

No.	Criteria selected	Determination by the validation team	Criteria justified
6	Access to technology	Purchase contracts suggest that technology and implementation know-how are commonly purchased from foreign countries.	☒ Yes ☐ No

According to the “Guidelines on Common Practice” version 02 /19/, “the proposed project activity is not a “common practice” within a sector in the applicable geographical area as the factor F is greater than 0.2 and $N_{all}-N_{diff}$ is greater than 3 which is not the case of Kirazlik HPP project activity as $F_{Kirazlik} = 0$ and $N_{all}-N_{diff} = 0$. Hence, the validation team concludes that Kirazlik HPP is not a common practice activity

Conclusion of assessment of the additionality

The evidences to demonstrate the additionality of Kirazlik HPP project activity were transparently reviewed by the validation team and considered to be effective. Investment analysis and sensitivity analysis clearly demonstrate that the proposed project activity is financially unattractive. Common practice analysis was carried out showing that similar activities are observed, but essential distinctions between the project activity and similar activities can reasonably be explained, then the proposed project activity is not a common practice. Therefore, the proposed project activity is not business-as-usual, i.e. the proposed project activity is additional.

3.2.6 Quantification of GHG Emission Reductions and Removals

The GHG emissions reduction calculations are transparently documented and appropriate assumptions regarding the expected amount of electricity generated have been used to forecast emission reductions.

According to the selected methodology ACM0002, Version 13.0.0, and the definition of the Project Boundary (see section 3.2.4 of this Validation report), the project emissions and the leakage emissions equal zero for the Kirazlik HPP project activity.

Hence, the emission reductions (ER_y) by the project activity during the crediting period are the baseline emissions (BE_y).

As required by the methodology ACM0002, the baseline emissions are demonstrated and are calculated in the Emission Reduction spreadsheet /3.2/. The different steps for the emission reduction calculations are as follow.

Baseline emission calculations

Based on methodology ACM0002 version 13.0.0, the baseline emissions are calculated as follows:

$$BE_y = EG_{PJ,y} \cdot EF_{grid,CM,y}$$

Where:

BE_y Baseline emissions in year y (tCO₂)
 EG_{PJ,y} Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM (/VER) project activity in year y (MWh)

$EF_{grid,CM,y}$ Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO₂/MWh)

Calculation of $EG_{PJ,y}$

Kirazlik HPP project activity has been identified as a Greenfield project and according to ACM0002 version 13.0.0 methodology $EG_{PJ,y}$ is defined as follows:

If the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, then:

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

$EG_{PJ,y}$ Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)

$EG_{facility,y}$ Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

$EG_{PJ,y}$: The PP has correctly applied the ACM0002 version 13.0.0 methodology to define $EG_{PJ,y}$ which is the expected electricity generation of Kirazlik HPP per year stated in the EMRA Generation Licence Modification /26/ and the Feasibility Study Report /28/.

$$EG_{PJ,y} = 150,610 \text{ MWh per year}$$

Estimating the Combined margin CO₂ emission factor for grid connected power generation in year y calculated

The combined margin (CM) emission factor has been determined using the “Tool to calculate the emission factor for an electricity system” version 3.0.0 as the methodology ACM0002 version 13.0.0 stipulates. The CM emission factor has been correctly calculated in a spreadsheet provided to the Validation team /3.2/. Furthermore, the Validation team was able to reproduce the results. The described steps for identification of the relevant electricity grid, identification of operating margin (OM) and build margin (BM) and all relevant assumptions are sufficiently documented within the VCS PD, as follow:

- Identification of the relevant electricity systems

For Kirazlik HPP project activity “the project electricity system” and “the connected system” are the same and the Turkish National Grid is the relevant electricity system. TEIAS, the transmission line operator in Turkey, confirms that the Turkish grid is interconnected which can be substantiated by TEIAS website /36/.

- Determine the Operating margin (OM) emissions factor

Based on Step 4 of the “Tool to calculate the emission factor for an electricity system” version 03.0.0, since the electricity generation and CO₂ emission factor of individual power plants/units are not available Option B is used. Hence, the simple OM emission factor is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost / must run power plants / units,

and based on fuel type(s), and total fuel consumption of the project electricity system, and OM simple emission factor is determined as follows;

$$EF_{\text{grid,OMsimple},y} = \frac{\sum_i (FC_{i,y} \times NCV_{i,y} \times EF_{\text{CO}_2,i,y})}{EG_y}$$

Where:

$EF_{\text{grid,OMsimple},y}$	Simple operating margin CO ₂ emission factor in year y (t CO ₂ /MWh)
$FC_{i,y}$	Amount of fossil fuel type i consumed in the project electricity system in year y (mass or volume unit)
$NCV_{i,y}$	Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit)
$EF_{\text{CO}_2,i,y}$	CO ₂ emission factor of fossil fuel type i in year y (t CO ₂ /GJ)
EG_y	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost / must-run power plants / units, in year y (MWh)
i	All fossil fuel types combusted in power sources in the project electricity system in year y
y	The relevant year as per data vintage chosen in step 3 in VCS PD /1.4/ (i.e. 2008, 2009, 2010).

$FC_{i,y}$: PP has correctly used the quantity of each fossil fuel type consumed in the electricity system of Turkey over 2008, 2009 and 2010. These data of the selected three years are available publically available on TEIAS website /36/. The historic data are credible since TEIAS is a private entity responsible of the electricity generation and transmission in Turkey and compile data on its website. The values in the spreadsheet /3.2/ have been crosschecked by the Validation team and have been used correctly.

$NCV_{i,y}$: PP has correctly calculated the net calorific value (energy content) of each fossil fuel type consumed by the power plants within the Turkish grid for the past three years operational history.

PP has calculated the NCVs of the power plants in Turkey based on the Heat Values data from TEIAS /36/. The calculations have been crosschecked by the Validation team and are deemed to be carried out appropriately.

$EF_{\text{CO}_2,i,y}$: PP has correctly used the CO₂ emission factor of each fuel type consumed in the project electricity system of Turkey for the past three years. The emission factors per fossil fuel are from IPCC default values at the lower limit of uncertainty /35/. The values and calculations have been crosschecked by the Validation team and are deemed to be used appropriately.

EG_y : PP has correctly used the electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants for the last three years from TEIAS /36/. These calculations have been crosschecked by the Validation team and are deemed to be used adequately.

$EF_{\text{grid,OMsimple},y} = 0.6561 \text{ tCO}_2/\text{MWh}$ which the calculations have been replicated by the Validation team and are deemed to be valid and correct.

- Determine the Build Margin (BM) emissions factor

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

Where:

$EF_{grid,BM,y}$	Build margin CO2 emission factor in year y (t CO2/MWh)
$EG_{m,y}$	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
$EF_{EL,m,y}$	CO2 emission factor of power unit m in year y (t CO2/MWh)
m	Power units included in the build margin (power units of the SET _{sample})
y	Most recent historical year for which power generation data is available.

PP has correctly calculated the sample group of power unit to calculate the build margin and has selected “the annual electricity generation of the project electricity system, excluding power units registered as CDM project activities (AEG total, in MWh)” procedure in Step 5 of the “Tool to calculate the emission factor for an electricity system” version 03.0.0. Hence, the SET_{sample} has been determined by adding the electricity generation of all power units between years 2008 and 2010 to obtain the 20% of AEG_{total}.

$EF_{EL,m,y}$ is determined as follows:

$$EF_{EL,m,y} = \frac{EF_{CO_2,m,i,y} \times 3.6}{\eta_{m,y}}$$

Where:

$EF_{EL,m,y}$	CO2 emission factor of the power unit m in year y (t CO2/MWh)
$EF_{CO_2,m,i,y}$	Average CO2 emission factor of fuel type i used in power unit m in year y (t CO2/GJ)
$\eta_{m,y}$	Average net energy conversion efficiency of power unit m in year y (ratio)
m	All power units serving the grid in year y except low-cost/must-run power units
y	The relevant year as per the data vintage chosen in Step 3 (in VCS PD)

PP has correctly calculated the electricity generated and delivered by the most recently commissioned plants of the SET_{sample}. The data are from TEIAS /36/. The values have been crosschecked by the Validation team and are deemed to be used appropriately.

$EF_{CO_2,m,i,y}$: See the description of $EF_{CO_2,i,y}$ above;

$\eta_{m,y}$: PP has correctly used the default efficiency factors for power plants per generation technology from the Appendix 1 of the “Tool to calculate the emission factor for an electricity system” version 3.0.0. In case the default value is not provided in the Appendix, the efficiency value of the most similar primary fuel source is used, e.g. for bitumen and lignite the efficiency factor of coal is considered.

$EF_{grid,BM,Simple,y} = 0.4235$ tCO₂/MWh which the calculations have been replicated by the Validation team and are deemed correct.

- Determine the Combined Margin (CM) emissions factor

$$EF_{grid,CM,y} = EF_{grid,OM,y} \cdot w_{OM} + EF_{grid,BM,y} \cdot w_{BM}$$

Where:

$EF_{grid,BM,y}$	Build margin CO ₂ emission factor in year y (tCO ₂ /MWh)
$EF_{grid,OM,y}$	Operating margin CO ₂ emission factor in year y (tCO ₂ /MWh)
w_{OM}	Weighting of operating margin emissions factor (%)
w_{BM}	Weighting of build margin emissions factor (%)

For this project activity based on the “Tool to calculate the emission factor for an electricity system” Version 03.0.0 $w_{OM} = 0.5$ and $w_{BM} = 0.5$ for the 10-years of fixed crediting period since the project activity is a hydroelectric plant.

$EF_{grid,CM,y} = 0.5398$ tCO₂/MWh which the calculation have been replicated by the Validation team and are deemed correct.

PP has correctly calculated grid emission factor of Turkey as shown in the Emission Reduction spreadsheet /3.2/. The calculations are in line with the requirements of the methodology ACM0002 Version 13.0.0 and the “Tool to calculate the emission factor for an electricity system” version 03.0.0.

Estimating the baseline emissions

As per ACM0002 version 13.0.0, the baseline emissions (BE_y) are calculated as follows:

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y} = 150,610 \text{ MWh} * 0.5398 \text{ tCO}_2\text{-eq/MWh}$$

$$BE_y = 81,307 \text{ TCO}_2\text{-eq}$$

The calculations of the baseline emissions have been crosschecked by the Validation team and are deemed to be valid and correct.

Project Emissions of the project activity

According to the methodology ACM0002 version 13.0.0, the project emissions are calculated as follows:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

Where

PE_y	Project emissions in year y [tCO ₂ ,eq/year]
$PE_{ff,y}$	Project emissions from fossil fuel consumption in year y
$PE_{GP,y}$	Project emissions from operation of geothermal power plant due to the release of non-condensable gases in year y
$PE_{HP,y}$	Project emissions from water reservoirs of hydro power plant in year y .

For hydroelectric project, only $PE_{HP,y}$ has to be considered. PP has correctly calculated PE_{HP} and has demonstrated that the power density (PD) of the project activity is greater than 10 W/m² (i.e. 46.11 W/m²), thus $PE_{HP} = 0$

The calculation of the power density has been crosschecked by the Validation team and is deemed to be valid and correct.

Leakage emissions of the project activity

According to the methodology ACM0002 version 13.0.0, no leakage emissions are considered

Emission Reduction of the project activity

The above calculation is summarised in the following table:

Baseline Emission	81,307 tCO ₂
Project Emissions	0 tCO ₂
Leakage Emissions	0 tCO ₂
Emission Reduction per year	81,307 tCO ₂

The estimated total emission reduction of approximately 813,070 tCO₂e over the 10 years crediting period represents a reasonable estimation using the assumptions given by the project. All the assumptions underlying this estimate have been validated by the validation team as conservative and realistic. The validation team confirms that the estimates of baseline emissions can be replicated using the information provided. It can also be verified using the spreadsheet /3.2/ for calculations of Emission Reduction. The methodology is correctly applied for calculation of baseline emissions and emission reductions.

3.2.7 Methodology Deviations

The validation team assessed the proposed project activity and related project description in detail and confirm that the selected methodology and methodological tools are implemented accurately without any deviations.

3.2.8 Monitoring Plan

The project monitoring plan is included in the VCS PD /1.4/ and is in compliance with the monitoring methodology ACM0002 (Version 13.0.0) /8/ “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, and was correctly applied to the proposed project activity.

Data and Parameters available at validation

The following are parameters used to calculate the emission reductions that are available at validation and their respective documents which have been crosschecked:

- 1) **EG_y** - Net electricity generated and delivered to the grid by all power sources serving the system excluding low-cost/must-run (in MWh), with $y = 2008, 2009, 2010$. The data is sourced from official grid data provided by TEIAS /36/, which is an acceptable source of data according to the Tool. The Validation team confirms the accuracy of the data;
- 2) **FC_{i,y}** - Amount of fossil fuel type i consumed by power unit m in year y (in mass or volume unit), with $y = 2008, 2009, 2010$. The data is sourced from official grid data provided by TEIAS /36/, which is an acceptable source of data according to the Tool;
- 3) **NCV_{i,y}** – Net calorific value (energy content) of fossil fuel type i in year y , with $y = 2008, 2009, 2010$. NCVs are calculated based on Heat Values available from official grid data provided by TEIAS /36/. According to 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Chapter 1 of Volume 2, Box 1.1) /35/, NCVs can be calculated by dividing Heat Value and FC

(i.e. Amount of fossil fuel type i consumed by power unit m in year y) which is deemed to be valid by the Validation team;

- 4) $EF_{CO_2,i,y}$, same as $EF_{CO_2,m,i,y}$ - CO₂ emission factor of fossil fuel type i in year y (in tCO₂/GJ). The data source is the IPCC default values /36/ at the lower limit of the uncertainty range. Using these factors is acceptable according to the Tool;
- 5) $\eta_{m,y}$ - default efficiency factors for power plants per generation technology are from Appendix 1 of the “Tool to calculate the emission factor for an electricity system” version 3.0.0 /9/ and so are valid;

Section 4.1 of the VCS PD also lists the following parameters, which are correctly calculated from the above parameters. The validation team has replicated the calculations and confirms the accuracy of the values.

- 6) $EG_{m,y}$ - Net electricity generated and delivered to the grid by power unit m , in year y (SET_{sample}). The validation team has confirmed that the data is correctly calculated based on the TEIAS values /36/;

The validation team confirms that all relevant parameters have been sufficiently considered and the values of the parameters are real, measureable and conservative.

Data and Parameters monitored

According to the approved methodology ACM0002, (Version 13.0.0) /8/ “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, the following parameters will be monitored:

Sl. No.	Parameters	Description & Assessment
1	$EG_{PP-self\ consumption,y} / EG_{PP-gross,y}$	Annual net electricity generated and delivered to the electricity grid by Kirazlik HPP project activity (in GWh). The HPP main source of data is from the 3 TEIAS meters located at the Kirazlik HPP Powerhouse. The data will be read remotely by TEIAS through these meters and are recorded at the monthly reading protocols, the column related to electricity supplied to the Grid. Furthermore, TEIAS records continuously the electricity generated by the project activity and the electricity generation is recorded monthly on the PMUM/MFRC (Piyasa Mali Uzlaştırma Merkezi / Market Financial Reconciliation Centre) website. The monitoring method of this parameter is acceptable.
2	Cap_{PJ}	Installed capacity of the hydropower plant after the implementation of the Project Activity. CAP_{PJ} will be continuously monitored using the Scada system. The monitoring method of this parameter is valid.
3	A_{PJ}	Area of the reservoir measured in the surface of the water, after the implementation of the Project Activity, when the reservoir is full. A_{PJ} will

		be continuously monitored using the Scada system water level readings. The monitoring method of this parameter is acceptable.
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Applicability and eligibility of monitoring equipment and procedures

Description of measurement for each of the identified parameters and procedures to be applied is included in the monitoring plan.

According to the VCS PD /1.4/, the project monitoring plan outlines the following:

- Responsibility: management structure is illustrated for the VCS project monitoring;
- Training: VCS monitoring training is indicated;
- Monitoring data: frequency of parameters monitored, accuracy and calibration, metering measurement, and monitoring procedures;
- Data and Records management, reporting: procedures that Kirazlik HPP Operating Manager needs to follow to keep and store the collected data, additional necessary data and information, etc.; All the data will be kept for two years following the end of the crediting period;
- QA: Calibration procedures to reach a sufficient accuracy of electricity meters;
- QC: Amount of electricity (EG_y) is crosschecked by Kirazlik HPP Operating Manager with the TEIAS electricity invoices;
- Back up meters in case of emergency: A check energy meter installed by TEIAS was installed in case of a break-down of the power plant;

Detailed procedures have been developed and the implementation of these procedures will enable subsequent verification of the project's emission reductions. The management team for monitoring of the project is identified in the VCS PD /1.4/ requesting the involvement of Kirazlik HPP operating manager (same as monitoring team manager), chief electrical manager and chief mechanical engineer and accountant manager. Clear and detailed monitoring procedures, monitoring structure, monitoring items and functions were clearly demonstrated in VCS PD /1.4/ and were crosschecked during the site visit. The Validation team have met the key staffs who take care of the monitoring (see section 2.3 of this Validation report) during the site visit and the team considers that the PP has the ability to implement the monitoring plan under the assistance of the carbon consultant.

3.3 Environmental Impact

Kirazlik HPP project activity complies with the "Environmental Law" and an Environmental Impact Assessment (EIA) /22/ has been prepared according to the national EIA Regulations, i.e. EIA Required Projects, Article 7-1-b. After submitting the EIA Report to the Ministry of Forestry and Urban Planning (formerly named Ministry of Environment and Forestry (MoEF)), the project owner received an "EIA affirmative Certification" on 19/08/2009 /21/. This certificate proves that the project activity does not lead to any significant negative impacts on air quality, water and waste management, waste oil and hazardous wastes, solid waste and biodiversity. Each category has been assessed for the construction and operation phases which are summarised in the section 5 of the VCS PD /1.4/.

The validation team concludes that the environmental impact by the project activity is been assessed by the project participant and the same is stated in the VCS PD /1.4/. To confirm the impact associated with the project activity, the validation team has physically inspected during the on-site visit and also through

conducting interviews with the relevant entities (see section 2.3 of this Validation report). It is validation team's opinion that the project activity does not cause the adverse environmental impacts. It is confirmed by the Environmental Certificate issued by the Ministry of Forestry and Urban Planning on the 19th August 2009 /21/.

3.4 Comments by stakeholders

A stakeholder meeting was held on 02/04/2009 at the Public Educational Centre Meeting Hall of Aydınlar town of Siirt Province. The meeting was announced through the bulletin boards of the governor house, and municipality, and by loudspeakers, several times before the day of the meeting. This meeting was organised by the consultant company that prepared the EIA report. Several comments were raised about the expropriation process and the amount of compensation money and all questions were answered. No negative comments about the project activity have been raised. No additional stakeholder meeting was organised as the project activity does not lead to resettlement and does not affect any agricultural lands or others. During the site visit, the Validation team has checked this statement through interviews and it is deemed to be correct.

4 VALIDATION CONCLUSION

Baren Enerji Üretim San. ve. Tic. A.Ş.
Hafta Sokak No:9
Çankaya
Ankara
TÜRKİYE



RE: Validation Statement for Baren Enerji Üretim San. ve. Ticaret A.Ş. – Kirazlik Hydroelectric Power Plant, Turkey under VCS, first crediting period from 22/10/2013 to 21/10/2023

Baren Enerji Üretim San. ve. Ticaret A.Ş. has engaged TÜV Rheinland Energie und Umwelt GmbH to review and validate the VCS PD and all assertions related to the GHG project under VCS version 3.3 conditions respectively. The GHG assertions, indicated through the VCS PD made on 24/05/2013, indicate annual achievable emission reductions of 81,307 t CO_{2e} per annum.

We have conducted the validation of the GHG assertion in accordance with the requirements of the VCS program requirements, the standard ISO 14064-3 and approved methodology ACM0002 (Version 13.0.0) “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” to a reasonable level of assurance by applying a materiality threshold of 5 %. The project information validated includes the VCS PD delivered to TÜV Rheinland Energie und Umwelt GmbH and all relevant information and evidence acquired during the validation process as stated in the validation report as of 17/06/2013.

We have come to the conclusion that based on our review and all available documentation the GHG assertion is made in accordance with the requirements of the VCS program and is material correct and fairly represents the GHG emissions data and information without material discrepancies.

Place: Cologne, Germany



Adeline de Lamar

Auditor

ANNEX 1: VALIDATION PROTOCOL

Table 1: Validation requirement

Checklist question	Ref.	MoV[1]			Findings, comments, references, data sources	Documents to verify	Draft conclusion	Final conclusion
		DDR	IVS	IC				
1. VCS Project Description Document								
1.1. Is the VCS PD presented for validation based on the latest template available at the VCS website? <i>Indicate Yes / No answer and describe all inconsistencies in the Table 2 accordingly.</i>	/1/	√			Yes. Kirazlik VCS PD is following the latest template available at the VCS website, called "VCS Project Description Template, v3.1"		OK	OK
1.2. Has the VCS PD been established in accordance with the VCS requirements for completing VCS PD issued by the VCS Association?	/1/	√			Yes. The VCS PD has been established in accordance with the VCS requirements for completing VCS PD as per the VCS Standard version 3.3.		OK	OK
2. Project Description								
2.1. Does the VCS PD contain a description, which provides the reader with a clear understanding of the precise nature of the project activity and the technical aspects of its implementation?	/1/ /xx/	√			In section 1.8 of the VCS PD a description of the Kirazlik project activity is provided. The information in the VCS PD correspond with the Feasibility Study /26/ and the electrical licence from EMRA /25/, including: - The project activity is a hydroelectric power plant as stated in the ; - The project activity is located on the Botan river in the Easter Anatolia region of Turkey; - The total installed capacity of the project activity is 46.11 MWe and consists of 4 Kaplan turbines units;		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
2.2. In the case of green-field project activity, is the project design described sufficiently by means of specifications, drawings and manuals? <i>Provide Yes/No answer and indicate the documents which have been reviewed in relation to the issue.</i>	/1/ /xx/	√			Yes. Kirazlik HEPP project activity is a greenfield project and the PP has provided a process flow chart of the Kirazlik HEPP in section 1.1 of the VCS PD. This flow chart corresponds with the observation made by the Validation team during the on-site visit. Moreover, the PP has provided to the Validation team the latest Feasibility study /28/ that describe the project design and the project specifications have been correctly given in the VCS PD.		OK	OK
2.3. Does the project activity reflect current good practices, uses state of the art technology or would the technology result in a significantly better performance, than any commonly used technologies in the host country? <i>Provide the description of how validation has been carried out and what comparisons have been made.</i>	/1/ /18/	√			The project activity reflects current good practices. The project participant has selected Zhejiang Orient Engineering Co., Ltd., China as the Supply and erection works of electromechanical equipment contractor for Kirazlik plant. Zhejiang Orient +ABB Engineering Co. Ltd. has advanced technical knowledge and decades of experience in the turnkey construction of hydropower power plants which can be confirmed through Zhejiang Orient +ABB Engineering Co., Ltd. website (http://www.orientengg.com/en/business.php) and E&M contract. The E&M contract between Baren Enerji Uretim San. ve. Ticaret A.Ş. and Zhejiang Orient Engineering Co. Ltd. is dated from the 19 January 2011 /18/ has been provided.		OK	OK
2.4. In cases where the project activity involves the alteration of an existing installation or process, does the VCS PD provide a clear description of the differences between the project and the pre-project scenario? <i>Please, provide Yes/Now answer and update Table 2 if there is anything unclear in the provided description.</i>	/1/	√			Not Applicable. The project activity does not involve the alteration of an existing installation or process. The on-site visit observation can confirm this statement		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
2.5. Does the project grouping apply for the proposed project? If yes, does the VCS PD include a description of one central GHG information system and controls associated with the project and monitoring?	/1/	√			Not applicable. The project activity is not a grouped one.		OK	OK
2.6. Does the central GHG information system and controls include items identified in ISO14064-3:2006, clause 4.5?	/1/	√			Yes.		OK	OK
2.7. How has the sampling been determined? Have any of the sub groups and associated activities within each sub group been considered? Does the sampling meet the requirement set out under IAF Guide to ISO/IEC 66/1999 at a minimum?	/1/	√			Not applicable. No sampling has been necessary.		OK	OK
3. Project Start Date and Crediting Period								
3.1. Are the project's start date clearly defined and evidenced? Does the project start date meet the requirements as stated in VCS 2007.1 clause 5.2.1? <i>If project grouping is applied, each grouped project shall meet the requirement of VCS 2007.1 clause 5.2.1.</i>	/1/ /xx/	√			The VCS PD in section 1.5 clearly defines the Kirazlik HEPP start date which is the 1st October 2013.		OK	OK
3.2. Is the start of the crediting period clearly defined and reasonable?	/1/	√			The VCS PD in section 1.6 clearly defines the Kirazlik HEPP clearly period which starts the 1st October 2013 and end the 30th October 2023.		OK	OK
4. Baseline and Monitoring methodology								
4.1. General requirements								

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
4.1.1 Is the methodology used in the project activity an approved VCS Program methodology or a methodology from a VCS-approved GHG program? Is the selected methodology version still valid?	/1/	√			Yes. ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 13.0.0" is a CDM methodology under UNFCCC and consequently is an approved methodology under the VCS Program and the version is valid		OK	OK
4.2. Applicability of the selected methodology to the project activity								
4.2.1 Are all applicability conditions of the selected baseline and monitoring methodology and all tools involved satisfied by the project activity? <i>Please indicate Yes/No answer. In case of positive conclusion provide details of the validation measures.</i>	/1/ /8/ /9/ /10/	√			Yes. The project activity applies all the applicability conditions of the ACM0002 methodology. The project activity is grid-connected renewable power generation that install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant); Kirazlik is a hydropower plant project activity and the PP has demonstrated that the power density of the HEPP is greater than 4 W/m2 (i.e. Feasibility Study /28/); The proposed project activity does not have multiple reservoirs which has been observed during the on-site visit; Moreover, the PP applies the appropriate tools, including: - "Tool for the demonstration and assessment of additionality" (Version 6.0.0); - "Tool to calculate the emission factor for an electricity system" (Version 2.2.1)		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
4.2.2 Is the selection of the applied baseline and monitoring methodology justified?	/1/ /8/	√			Yes. The selected baseline and monitoring methodology is correctly justified in section 2.4 of the VCS PD. The baseline scenario is prescribed under ACM0002 (Version 13.0.0) and is applicable to the project activity: "Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the. Tool to calculate the emission factor for an electricity system (v.02.2.1)."		OK	OK
4.2.3 Is the selected methodology correctly quoted in all related documents?	/1/ /8/	√			Yes. ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version 12.1.0" is quoted correctly in all VCS PD.		OK	OK
4.2.4 Does the VCS PD sufficiently describe all the GHG emission sources or sinks occurring as a result of project activity, which have not been accounted for under the selected methodology and are expected to contribute more than 1% of the overall expected average annual emission reductions? <i>Provide Yes/No answer. Indicate the sources or sinks of GHG, which were proved to be negligible. Otherwise amend the Table 2</i>	/1/ /8/	√			Yes. GHG emission sources as a result of project activity emissions which have not been accounted are well described in the VCS PD. Table 1 of the ACM0002 methodology states that CH ₄ emissions from reservoir associated to hydro power plants may involve major emission sources. However, the description of Project Emissions in Section 3.2 of VCS PD describes that PEs from Kirazlik reservoir are assumed to be zero following the relevant steps of ACM0002 methodology. PP has demonstrated that "the power density of the project activity (PD) is greater than 10 W/m ² ", thus PEHP,y = 0;		OK	OK
4.3 Project boundary								

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
4.3.1 Does the VCS PD correctly describe the project boundary? <i>Provide Yes/No answer. And amend the Table 2 if needed.</i>	/1/	✓			Yes. As per ACM0002 methodology in Section 2.3. of the VCS PD		OK	OK
4.3.2 Does the VCS PD correctly indicate and describe the emission sources and sinks of GHG gases that are included in the project boundary?	/1/	✓			Yes. The VCS PD correctly indicates the emissions sources of the baseline and the project activity. Table 4 in section 2.3 of the VCS PD shows that the main emission source of the project activity comes from the baseline emissions and more specifically the thermal power plants connected to the Turkey's electricity grid.		OK	OK
4.3.3 In cases where the methodology allows project participants to choose whether a source or gas is to be included in the project boundary, is the choice explained and justified by PPs?	/1/	✓			Not Applicable		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments, references, data sources	Documents to verify	Draft conclusion	Final conclusion
		DDR	IVS	IC				
4.4 Baseline identification								
4.4.1 Has the procedure contained in the selected methodology to identify the most reasonable baseline scenario been applied correctly and documented in the VCS PD?	/1/ /8/	√			Yes. There is only one option in ACM0002 methodology that can apply to the project activity which is a new grid-connected renewable power plant. The baseline scenario is prescribed under ACM0002 (Version 13.0.0) for new grid-connected renewable power plant and is applicable to the project activity: “Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the. Tool to calculate the emission factor for an electricity system (v.02.2.1).” It has been followed correctly to identify reasonable baseline scenario and has been well referenced to support each statement.		OK	OK
4.4.1.1 Is the identified baseline scenario plausible?	/1/	√			Yes. The selected baseline scenario is plausible since the baseline scenario complies with existing legislation and policy (as described in sub-step 1.b of section 2.5), the PP is under no obligation to implement the project. The project is not attractive on financial grounds without the VCU revenues (see further in the Additionality section);		OK	OK
4.4.1.2 Are all assumptions stated in a transparent and conservative manner?	/1/	√			Yes. All assumptions were based on transparent and reliable sources (i.e. TEIAS and DSI), as well as conservative (e.g. BM calculation for the emission factor		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
					calculation);			
4.4.2 Does the selected methodology require the use of tools <u>and</u> does VCS PD reflect that correctly?	/1/ /8/ /9/ /10/ /11/	v			Yes. ACM0002 version 13.0.0 refers to the following tools: - "Tool to calculate the emission factor for an electricity system", version 02.2.1; - "Tool for the demonstration and assessment of additionality", version 06.0.0; - "Combined tool to identify baseline scenario and demonstrate additionality" version 03.0.1; - "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" version 2; This is correctly reflected in section 2.1 of the VCS PD.		OK	OK
4.4.2.1 Were all the tools applied correctly?	/1/ /8/ /9/	v			Yes. All tools that the methodology requires to use have been correctly applied. The following tools were applied: - "Tool to calculate the emission factor for an electricity system", - "Combined tool to identify the baseline scenario and demonstrate additionality", - "Tool to determine the remaining lifetime of equipment", - "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion". The six steps of the "Tool to calculate the emission factor for an electricity system" have been followed: - Step 1: PPs have demonstrated that the relevant electricity systems in Turkey is the national electricity grid of this country; - Step 2: PPs have correctly chosen Option 1, i.e. to exclude off-grid power plants; - Step 3: PP have correctly chosen the	VCS PD	CL1	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
					Simple OM method. PPs have correctly chosen the ex-ante option to calculate the Simple OM. The most recent data at the time of submitting the PDD for validation was 2008-2010; - Step 4: PPs have correctly chosen Option B, since there are no power plant-specific emission factors available. Equation (6) from the Tool is correctly applied; - Step 5: PPs should choose the group of power plants to be included in the BM. CL1: Please follow the directions of the Tool in step 5 and provide explanations in VCS PD section 3.1. Explain clearly the sample group of power units which is used to calculate the BM for the project activity (i.e. the five most recently commissioned plants or 20% of the grid capacity counting those plants most recently added in reverse order of the date of their coming into operation). Provide in a table with reference the list of power plants and the relevant AEGs; - Step 6: Equation (13) of the Tool is correctly applied. Weights have been correctly chosen as wOM=0.5 and wBM=0.5. Regarding the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", the methodology ACM0002 indicates that no leakage emissions are considered.			
4.4.3 In case the methodology requires several alternative scenarios to be considered in the identification of the most reasonable baseline scenario, have all scenarios been considered <u>and</u> have no reasonable alternative scenario been excluded?	/1/ /8/	v			The baseline scenario is prescribed under ACM0002 (Version 13.0.0) for new grid-connected renewable power plant and is applicable to the project activity: "Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
					generation sources, as reflected in the combined margin (CM) calculations described in the. Tool to calculate the emission factor for an electricity system (v.02.2.1)." Hence no alternative scenarios need to be considered.			
4.4.3.1 Has the choice of the baseline scenario been done using conservative assumptions?	/1/ /8/	√			Yes. There is only one option applicable of baseline scenario for greenfield projects		OK	OK
4.4.4 Is the identified baseline scenario reasonable according to the assumptions, calculations and rationales used in the VCS PD and other reference sources?	/1/ /8/	√			Yes. The identified baseline scenario is reasonable according to the assumptions provided in the VCS PD and reference sources are reliable (official sources) and correctly applied.		OK	OK
4.4.5 Does the VCS PD describe how the national and sectoral policies relevant to the baseline scenario have been identified and considered in the VCS PD?	/1/	√			Yes. VCS PD includes in section 2.5 and Annex 1 an exhaustive list of the national and sectoral policies relevant to the baseline scenario. Outcome of Step 1b (i.e. Consistency with mandatory applicable laws and regulations) is valid.		OK	OK
4.4.6 Does the VCS PD provide a verifiable description of the identified baseline scenario, including a description of the technology that would be employed and/or the activities that would take place in the absence of the project activity?	/1/ /8/	√			CAR1: The description of the identified scenario is verifiable. However, it should be more developed including a description of the technology that would be employed and/or the activities that would take place in the absence of the project activity	VCS PD	CAR1	OK
4.5 Algorithm and/or formulae used to determine emission reductions								

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
4.5.1 Are all calculations applied and documented according to the selected methodology and in a complete and transparent manner?	/1/ /9/	√			Yes. All calculations applied in the ER calculation spreadsheet follow the “Tool to calculate the emission factor for an electricity system”, version 02.2.1; All data have been applied in a complete and transparent manner based on the publically available data from TEIAS, the Turkish Electricity Transmission Company.		OK	OK
4.5.2 In case the methodology allows a selection between different options for equations or parameters, has adequate justification been given and have the correct equations and parameters been used, in accordance with the methodology selected?	/1/ /9/	√			Yes. Adequate justifications have been provided to all selected options for equations and parameters in section 3 of the VCS PD.		OK	OK
4.5.3 In case some data and parameters will not be monitored throughout the crediting period, but have already been determined and fixed, are all data sources, assumptions and calculations correct, applicable to the proposed VCS project activity and conservative?	/1/ /9/	√			Yes. The list of data and parameters available at validation has been correctly provided in section 4.1 of VCS PD using publically available data from TEIAS (i.e. Turkish power plants information for 2008-2010), IPCC data (i.e. EF for fossil fuel type), and also IPCC data (i.e. efficiency factors). All the parameters used in the equations are stated and valid.		OK	OK
4.5.4 In case data and parameters will be monitored on implementation and hence become available only after validation of the project activity, are the estimates provided in the VCS PD for these data and parameters reasonable?	/1/ /9/ /xx/	√			Yes. The list of data and parameters which will be monitored on implementation of the project activity is provided in section 4.2 of VCS PD. The estimated provided are reasonable. The main monitoring parameter is the electricity generation (E _g), which is estimated at 150.51 GWh/year, value from the electrical licence from ERMA /25/.		OK	OK
4.5.5 Have the major risks and uncertainties, which can influence the emission reduction estimates, been identified and addressed in the VCS PD?	/1/ /9/	√			The VCS PD does not identify specific major risk to the emission reduction estimates.		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
4.6 Leakage								
4.6.1 Has the leakage been identified and calculated according to the approved methodology?	/1/ /8/	√			Not applicable. Under ACM0002 methodology version 13.0.0, no leakage emissions are considered.		OK	OK
4.6.2 Have the leakage been addressed in complete, conservative and substantiated manner?	/1/ /8/	√			N/A		OK	OK
4.6.3 Are uncertainties in the leakage emission estimates properly addressed?	/1/ /8/	√			N/A		OK	OK
5. Additionality								
5.1 Identification of alternatives								
5.1.1 What additionality tool has been selected in the VCS PD? Does it comply with the requirement of VCS 2007.1 clause 5.8 and the latest FAQs at VCS website? (http://www.v-c-s.org/faq.html)	/1/ /8/	√			The "Tool for the demonstration and assessment of additionality" (version 6.0.0) is a consolidated CDM reference, which is applicable for VCS projects		OK	OK
5.1.2 Does the VCS PD identify and list credible alternatives to the VCS project activity in order to determine the most realistic baseline scenario, unless selected approved methodology prescribes/identifies the baseline scenario and no further analysis is required?	/1/ /8/	√			Yes, the PPs have identified and listed the credible alternatives and the most realistic baseline scenario is the "Continuation of the current situation" as under the "Tool for the demonstration and assessment of additionality" version 06.0.0.		OK	OK
5.1.3 Does the list of alternatives include as one of the options that the project activity is undertaken without being registered as a VCS project activity?	/1/ /8/	√			Yes, the first alternative defined in Sub-step 1a of section 2.5 of the VCS PD /1/ is the project activity undertaken without the VER revenues, so without being registered as a VCS project activity.		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
5.1.4 Does the list contain all realistic/credible alternatives that the DOE, on the basis of its local and sectoral knowledge, considers to be viable means of supplying the outputs or services that are to be supplied by the project activity? <i>Note: All alternatives listed in the selected methodology should be included, as well as those not covered by the methodology.</i>	/1/ /8/	√			Yes, the list in step 1 of section 2.5 of the VCS PD contains all realistic and credible alternatives. The Validation team considers that all alternatives listed are viable.		OK	OK
5.1.5 Is the exclusion of the alternatives for legal reasons justified? <i>Note: Some alternatives might be illegal, according to the local regulations, but still widely practiced due to lack of enforcement. It should be verified.</i>	/1/ /8/	√			Not applicable. No alternatives have been excluded.		OK	OK
5.2 Investment Analysis								
5.2.1 Are all sources of revenues (including savings) have been considered in the VCS PD and all calculations?	/1/ /2/ /8/ /12/	√			Yes. The revenues are based on electricity sales. In the IRR spreadsheet calculations /2/, the annual energy production is 150,610 MWh. The tariff is 0.073 USD/kWh. The spot market won't be applied.		OK	OK
5.2.2 Is the type of investment analysis selected correctly in the VCS PD?	/1/ /2/ /8/ /12/	√			Yes. The type of investment analysis has been selected correctly. Option III benchmark analysis has been selected. Hence, the equity IRR is calculated. The benchmark selected is appropriate and is based on Turkey's Moody's index at the investment decision date (i.e. 19/01/2011) and the default values for the expected return on equity table in Appendix of the Guidelines on the assessment of investment analysis /12/.		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
5.2.3 Is the selected financial indicator chosen and applied correctly?	/1/ /2/ /8/ /12/	√			Yes. It is stated in section 2.5 of VCS PD that equity IRR has been chosen as financial indicator. As the benchmark is based on after taxes values, the equity IRR of Kirazlik HEPP project activity has been calculated accordingly.		OK	OK
5.2.4 Is the guidance on IRR calculation and assessment correctly applied? <i>Note: Means of validation should be recorded.</i>	/1/ /2/ /8/ /12/	√			Yes. On site, the PP and the Validation team have checked the IRR spreadsheet and comments have been raised when necessary and discussion has been developed and issues have been closed. The "Guidelines on the assessment of investment analysis" v.05 have been correctly applied.		OK	OK
5.2.5 In case project participants use values from Feasibility Study Reports (FSR) is it possible to verify that the period between the FSR date and investment decision was reasonably short and FSR values did not change materially?	/1/ /2/ /8/ /12/				Most of the values for the financial analysis have not been taken from the FSR as the period between FSR date and investment decision was almost two years. Traceable, most up to date information at the time of investment haven been used in the investment decision.		OK	OK
5.2.6 Are all the values consistent between FSR and VCS PD <u>and</u> are inconsistencies properly justified?	/1/ /2/ /8/ /12/				The FSR values are consistent with the VCS PD. The values from other documents have been justified and evidences provided		OK	OK
5.2.7 Were all the values from FSR applicable and valid at the time of the investment decision?	/1/ /2/ /8/ /12/				Not all the values from the FSR were valid at the time of investment decision in which case more up to date information has been used.		OK	OK
5.2.8 Is it reasonable to assume that no investment would be made at a rate of return lower than the benchmark by, for example, assessing previous investment decisions by the project participants or some verifiable circumstances that have lead to a change in the benchmark?	/1/ /2/ /8/ /12/				The energy market in Turkey is relatively new for private investors, so there is limited information and experience available. However, the financial analysis proved that the equity IRR for the project activity is lower than the selected benchmark so the project is financially not attractive.		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
5.2.9 Is the Investment Analysis prepared in compliance with the latest version of the "Guidance on the Assessment of Investment Analysis" as provided by the CDM EB?	/1/ /2/ /8/ /12/				Yes, the "Guidelines on the assessment of investment analysis" version 05 have been correctly applied.		OK	OK
5.3 Barrier analysis								
5.3.1 Are there any issues addressed in the barrier analysis that have a clear impact on the financial viability of the project activity and that shall be assessed by an investment analysis?	/1/ /8/	√			The Barrier analysis has not been developed as it is optional when the Investment Analysis concludes that the proposed VCS project activity is unlikely to be the most financially attractive.		OK	OK
5.3.2 Do the listed barriers exist <u>and</u> is their existence substantiated? Note: (a) by independent sources of data such as relevant national legislation, surveys of local conditions and national or international statistics and/or (b) by interviews with relevant individuals: including members of industry associations, government officials or local experts if necessary?	/1/ /8/	√			Not Applicable.		OK	OK
5.3.3 Would any of the identified barriers prevent the implementation of the project activity but not equally prevent the implementation of the possible alternatives, in particular the implementation of the identified baseline scenario?	/1/ /8/	√			Not Applicable.		OK	OK
5.4 Common practice analysis								
5.4.1 Does the additionality tool require common practice analysis for the project?	/1/ /8/	√			Yes. The "Tool for the Demonstration and Assessment of Additionality" v.06 requires common practice analysis which is described in Step 4 of Section 2.5 of the VCS PD		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
5.4.2 If the PPs claim in the VCS PD that VCS project activity is the “first of its kind”, is it justified?	/1/ /8/	√			Not Applicable		OK	OK
5.4.3 Are the geographical scope of the project activity identified correctly?	/1/ /8/	√			Yes. The geographical area selected by the PP is the Turkish grid which represents the whole country of Turkey. This is considered appropriate by the Validation Team.		OK	OK
5.4.4 Does the VCS PD provide an explanation why this region was selected and deemed more appropriate <u>and</u> is this explanation traceable and reliable?	/1/ /8/	√			Yes. The applicable geographical area is the host country of the project activity which is Turkey. The statement is considered appropriate, traceable and reliable by the Validation Team.		OK	OK
5.4.5 Are there similar operational project activities, other than VCS activities, “widely observed and commonly carried out” in the defined region? <i>Note: Use official sources and local and industry expertise.</i>	/1/ /8/	√			PP has discussed in step 4 of section 2.5 of the VCS PD that 32 hydropower plant projects are identified and have a similar output or capacity range of the project activity as +/-50% as well as located in the same region. However, the PP have demonstrated that all 32 projects differ with the project activity as either they are different type of developer (e.g. auto producer), or are developed by the private sector, or are developed in a different DSI jurisdictional regions.		OK	OK
5.4.6 In case there are similar commercially operated project activities, other than VCS activities, already “widely observed and commonly carried out” in the defined region, are there essential distinctions between the VCS project activity and the other similar activities?	/1/ /8/	√			According to TEIAS statistics, PPs have demonstrated that all projects identified (i.e. 32) are differently operated than the project activity as either they are different type of developer (e.g. auto producer), or are developed by the private sector, or are developed in a different DSI jurisdictional regions.		OK	OK
6. Monitoring plan								
6.1 Are all parameters required by the selected approved methodology or tool identified <u>and</u> listed in the VCS PD?	/1/ /8/	√			Yes. All relevant parameters are recorded in the monitoring section, including their unit, description, source, monitoring frequency and justification of data source.		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
6.2 Is the measurement method clearly stated for each value to be monitored and deemed appropriate?	/1/ /8/	√			Yes. The measurement method is clearly stated for each value and deemed appropriate. $EG_{Kirazlik,y}$ will be monitored by two metering devices. Each month, a TEIAS officer will record the measurements from the meters and then invoiced by TEIAS to the Kirazlik project owner.		OK	OK
6.3 Are values of the ex-ante parameters / monitoring parameters selected correctly and conservative in accordance to methodology or tools?	/1/ /8/	√			Yes, in general the parameters are correctly selected and conservative. Most of the data are from the TEIAS publically available data, IPCC and official data which are deemed to be valid and correct by the Validation team.		OK	OK
6.4 Is the measurement equipment for each parameter described and deemed appropriate?	/1/ /8/	√			Yes. $EG_{Kirazlik,y}$, the net electricity generation will be monitored through metering devices and TEIAS will issue monthly invoice to Kirazlik plant manager. Two calibrated meters will be installed and act as a backup. TEIAS will maintain and calibrate the meters periodically. This measurement equipment is deemed appropriate since it permits the identification of errors and provides accurate data for ER calculation The HEPP will be operational in 2013. Hence, monitoring method should be verified at the first verification stage.		OK	OK
6.5 Is the measurement accuracy addressed and deemed appropriate?	/1/ /8/	√			Yes. The measurement accuracy is addressed and deemed appropriate. The data accuracy will be guaranteed by installation of two meters, both measuring consumption and production. If a different measurement between them is identified, calibration will be held by TEIAS.		OK	OK
6.6 Are procedures in place on how to deal with erroneous measurements <u>and</u> are the corrective actions identified?	/1/ /8/	√			Yes. Two calibrated meters will be installed and checked continuously. If a difference between the readings of the two devices exceeds 0.2% is noticed, maintenance will be carried out before the planned periodic maintenance which is in accordance with the		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
					methodology ACM0002.			
6.7 Is the frequency of measurement identified and deemed appropriate?	/1/ /8/	√			Yes. The measurement method is clearly stated for each value and deemed appropriate. EGKirazlik,y will be recorded continuously and reported monthly based on TEIS Meter reading protocols.		OK	OK
6.8 Is the monitoring plan documented according to the approved methodology and in a complete and transparent manner?	/1/ /8/	√			The monitoring plan is described in section 4.3 of VCS PD and is well documented according to ACM0002 methodology. It assures transparent and unbiased monitoring of the project parameters.		OK	OK
6.9 Are the sampling, measurement methods and procedures defined?	/1/ /8/	√			Yes. EG _{Kirazlik,y} will be monitored by two meting devices. Each month, a TEIAS officer will record the measurements from the meters and then invoiced by TEIAS to the Kirazlik project owner.		OK	OK
6.10 Are procedures identified for maintenance of monitoring equipment and installations?	/1/ /8/	√			Maintenance will depend on calibration. The calibration intervals will be made each 10 years according to Turkish law. If a significant inconsistence is detected between the 2 metering devices, maintenance and calibration are carried out by TEIAS.		OK	OK
6.11 Are the equipment calibration intervals identified and justified?	/1/ /8/	√			The calibration intervals of the electrical meters and transformers will be carried out each 10 years or earlier which is in accordance with Turkish law.		OK	OK
6.12 Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	/1/ /8/	√			Yes. All data collected will be recorded daily and achieved both electronically and as a hard copy for at least two years.		OK	OK
6.13 Are the monitoring arrangements described in the monitoring plan feasible within the project design?	/1/ /8/	√			Yes, the monitoring arrangements are feasible in the VCS PD.		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
6.14 Are the means of implementation of the monitoring plan, including the data management and quality assurance and quality control procedures, sufficient to ensure that the emission reductions achieved by / resulting from the project activity can be reported ex post and verified?	/1/ /8/	√			Yes. The means of implementation of the monitoring plan are sufficient to ensure that the ER can be reported ex-post and verified.		OK	OK
6.15 Do the PPs make provisions for personnel training needs?	/1/ /8/	√			No. CL2: Please provide information regarding the provisions for personnel training needs	VCS PD	CL2	OK
6.16 Is the authority and responsibility of overall project management clearly described?	/1/ /8/	√			Yes. The operating manager and operator and turbine technician's role and responsibilities are clearly described.		OK	OK
6.17 Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/ /8/	√			CL3: Please provide procedures for emergency preparedness in the VCS PD	VCS PD	CL3	OK
6.18 Are procedures identified for review of reported results/data?	/1/ /8/	√			Yes. TEIAS will prepare a monthly report (i.e. invoice) with energy production data and send to the project owner. These results will be revised.		OK	OK
6.19 Is the data archiving period for this project activity stated in the VCS PD and appropriate? <i>Note: All archived monitoring data, required for verification and issuance, should be kept for at least two years after the end of the crediting period or the last issuance of CER.</i>	/1/ /8/	√			Yes. It is stated that monitoring data will be achieved electronically until at least 2 years after the end of the last crediting period.		OK	OK
7. Monitoring of the leakage								
7.1 Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/ /8/	√			Not applicable. Under ACM0002 methodology version 13.0.0, no leakage emissions are considered.		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
7.2 Is the choice of project leakage indicators made according to selected methodology in a reasonable and conservative manner? <i>Note: local knowledge and sectoral expertise shall also be considered.</i>	/1/ /8/	√			N/A		OK	OK
7.3 Is the measurement method clearly stated and deemed appropriate for each leakage value?	/1/ /8/	√			N/A		OK	OK
8. Sustainable development								
8.1 If VCS PD indicates any additional environmental benefits of the project, other than GHG emission reductions, were those benefits properly substantiated?	/1/	√			The VCS PD does not indicate any additional environmental benefit apart from GHG emission reductions		OK	OK
9. Stakeholders' consultation and comments								
9.1 Were the stakeholders identified in appropriate and complete manner?					Yes. As per the EIA requirements, a stakeholder consultation meeting has been organised. CL4: Please list the type of stakeholders, i.e. chiefs of the villages, representatives of ministries, NGOs, others?	VCS PD	OK	OK
9.2 Are the identified stakeholders plausible?					See CL4	VCS PD	CL4	OK
9.3 Does VCS PD describe the means being used to invite local stakeholder's comments?	/1/	√			Yes. Section 6 of the VCS PD states that the meeting was announced at the bulletin boards of the governor house, and municipality, and by loudspeakers.		OK	OK
9.4 Were those means appropriate?	/1/	√			Yes		OK	OK
9.5 Was the project presented to the stakeholders in unbiased manner?	/1/	√			Yes		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
9.6 If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	√			CL5: Please state clearly in section 6 of the VCS PD if stakeholder consultation process is required by regulations/laws in Turkey;	VCS PD	CL5	OK
9.7 Is a summary of the stakeholder comments provided in the VCS PD?	/1/	√			Yes. Section 6 of the VCS PD states that most of the questions from the stakeholders were related to the expropriation process and the amount of compensation money.		OK	OK
9.8 Has due account of any stakeholder comments been taken by PPs and reflected in the VCS PD?	/1/	√			Yes. The project owner representatives and environmental consultants made due account of all comments/questions received and was able to comfort the participants concerns.		OK	OK
10. Environmental impacts								
10.1 Is the documentation supplied by the PPs regarding environmental impacts relevant and accurately reflected in the VCS PD?	/1/ /21/ /22/	√			Yes. The Environmental Impact Assessment report /22/ has been provided to the Validation team. A summary of the possible environmental impacts during construction and operation phases has been provided in section 5 of the VCS PD. No significant negative impacts have been identified and a "Certificate of EIA affirmative" has been delivered by the Ministry of Environment and Forestry on the 19/08/2009 /21/		OK	OK
10.2 Is an environmental impact assessment (EIA) required for the VCS project activity? <i>Note: determine by using a review of relevant legislation and local expertise.</i>	/1/ /22/	√			Yes. According to the "Environmental Law" No. 2872, run-off river type Hydroelectric Power Plants with an installed capacity of 50 MW or more are subject to a full EIA process or report preparation. The Kirazlik's EIA Report /22/ was prepared as per the national EIA Regulations-EIA Required Projects, even though the installed capacity is below 50MW (i.e. 46.11MW). This assessment interprets the impacts of the Kirazlik HEPP project to project site and environment in detail. The EIA Report was submitted to the Ministry of Environment and		OK	OK

Checklist question	Ref.	MoV[1]			Findings, comments,	Docum	Draft	Final
					Forestry (MoEF).			
10.3 In case an EIA is required, has the EIA has been approved by local authorities and is the outcome accurately reflected in the VCS PD?	/1/ /21/ /22/	√			Yes. MoEF approved the EIA Report for Kirazlik HEPP Project on 19/08/2009 /21/		OK	OK
10.4 Does the VCS PD include a brief description of the environmental effects of the project, including transboundary?	/1/ /22/	√			Yes. Section 5 of the VCS PD include a summary of the possible environmental impacts during construction and operation phases. CL6: Provide a description of the potential transboundary positive and/or negative environmental effects of the project if relevant	VCS PD	CL6	OK
10.5 Are those effects properly addressed in the design of the project activity?	/1/ /22/	√			Yes		OK	OK
10.6 Does the project comply with environmental legislation in the host country?	/1/ /21/ /22/	√			Yes. Kirazlik project activity complies with the Turkish environmental legislation, "Environmental Law" No. 2872		OK	OK

[1] MoV = Means of Verification, DDR = Desk Document Review, IVS = Issues to verify on site, IC = Issues to clarify

Table 2: List of CARs and CLs

	Observation (CAR/CL)	Reference	Summary of project owner response	Validation team conclusion
1	CL1: Please follow the directions of the Tool in step 5 and provide explanations in VCS PD section 3.1. Explain clearly the sample group of power units which is used to calculate the BM for the project activity (i.e. the five most recently commissioned plants or 20% of the grid capacity counting those plants most recently added in reverse order of the date of their coming into operation). Provide in a table with reference the list of power plants and the relevant AEGs;	VCS PD /1/ section 3.1; Financial Analysis /2/	Updated Please see Version 2.0 of both the PD and the EM calculation sheet (Also the relevant tab in the financial analysis workbook).	OK
2	CAR1: The description of the identified scenario is verifiable. However, it should be more developed including a description of the technology that would be employed and/or the activities that would take place in the absence of the project activity	VCS PD /1/ section 2.4	An explanatory sentence is added to section 2.4 stating that in the absence of project activity the same amount of electricity will be supplied by the existing grid where 75 % of the electricity is sourced by thermal power plants. Please see version 2.0 of the VCS-PD.	OK
3	CL2: Please provide information regarding the provisions for personnel training needs in the Monitoring Plan section	VCS PD /1/ section 4.3	In version 2.00 of the VCS PD, An explanatory paragraph is added to the monitoring plan to define the trainings that will be given to the project staff, on how they will perform the monitoring.	OK

	Observation (CAR/CL)	Reference	Summary of project owner response	Validation team conclusion
4	CL3: Please provide procedures for emergency preparedness in the VCS PD Monitoring Plan	VCS PD /1/ section 4.3	The emergency action plan of the project is described in pages 196 to 198 of the project activity, and the emergency action flow charts are given in Addendum 14 of the EIA. In version 2.0 of the VCSPD, we have added a phrase referring to the EIA and indicated that those action plans will be implemented in case of emergency.	OK
5	CL4: Please list the type of stakeholders, i.e. chiefs of the villages, representatives of ministries, NGOs, others?	VCS PD /1/ section 6	This meeting targeted government officials, village heads (Muhtar's) of the nearby villages, and any interested local inhabitants as stakeholders of the project. This is also indicated in the version 2.0 of the VCSPD	OK
6	CL5: Please state clearly in section 6 of the VCS PD if stakeholder consultation process is required by regulations/laws in Turkey;	VCS PD /1/ section 6	The LSC meeting was organized under the coordination of the local branch of MoEF, within the context of EIA process, to comply with the environmental regulations of the host country. This is also indicated in the version 2.0 of the VCS=PD.	OK

	Observation (CAR/CL)	Reference	Summary of project owner response	Validation team conclusion
7	CL6: Provide a description of the potential transboundary positive and/or negative environmental effects of the project if relevant	VCS PD /1/ section 5	The project is located on the Botan River. A tributary of the Tigris river. It is going to hold the water in its reservoir for a certain period but will then leave it as it will be producing electricity therefore it is not possible to talk about a permanent water reduction in the water flow regime. Besides there are international agreements that bind the host country and DSI who is the owner of the surface and ground water on behalf of public would inform the project owner to release water in case there is a need or drought in the down stream so that Turkey can comply with the international agreements.	OK

Table 3: List of forward action requests (FARs)

FAR number	Reference	Summary of project owner response	Validation team conclusion
FAR01 <i>During the Validation stage, Baren Enerji Üretim San. ve. Ticaret A.Ş. /15.2/ was initially a Limited Liability Company named Baren Enerji Üretim San. ve. Ticaret Limited Şirketi. /15.1/. But on the 26/04/2013, the company has changed to a Corporation Baren Enerji Üretim San. ve. Ticaret A.Ş. has sent a letter to EMRA to indicate this change on the 11/06/2013. The letter has been provided to the VVB /42/. Hence, the electricity production licence has not been changed yet to the new company name.</i>	/25/ /26/ /27/	We understand and appreciate this FAR, we will be providing up to date licence whereby the new company status will be indicated as Baren Enerji Üretim San. ve Ticaret A.Ş.	During the 1st verification, the VVB needs to check the consistency of the documents and especially the company name mentioned in the electricity production licence.