"VERIFICATION REPORT OF KIRAZLIK HYDROELECTRIC POWER PLANT PROJECT"

Prepared by EPIC Sustainability Services Private Limited

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Summary:

Ekobil Environmental Services and Consulting Ltd contracted EPIC Sustainability Services Private Limited on behalf of Baren Enerji Üretim San. ve. Ticaret A.S. to conduct verification of the project registered under VCS standard titled “Kirazlik Hydroelectric Power Plant Project”, VCS reference No. 2092 with regard to the relevant requirements of VCS programme guidelines and standard (VCS standard v4.3/1/, & VCS program guide v4.2/2/). Relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting has been applied for verification.

The verification of the 2nd monitoring period covers from 01/03/2021 to 31/12/2021 (including both dates)

The verification includes confirming the implementation of the monitoring plan of the registered PD/20/ and the application of the monitoring methodology as per ACM0002 v13.0/4/ “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” and the tools relevant to the monitoring methodology.

The project activity involves construction of Hydroelectric Power Plant at the Eastern Anatolia Geographical district over the Botan river, Turkey with total installed capacity of 46.11 MWe. The Kirazlik Hydroelectric power plant is located downstream, counting from the closest upstream directions. The project consists of 4 units in which 3 units are of capacity 14.537 MWe and 1 unit is of capacity 2.5 MWe and the units were commissioned on 05/12/2013, 15/01/2014, 14/03/2014 and 16/05/2014 respectively. The start date of the project is 05/12/2013 which is the commissioning date of first unit.

A risk-based approach has been followed to perform this verification. In the course of verification, 01 Corrective Action request (CARs), 00 Forward Action request (FARs), and 03 Clarification request

(CLs) were raised and successfully closed.

In conclusion, EPIC confirms that the project is implemented in accordance with the registered PD. The monitoring system is in place and the emission reductions are calculated without material misstatements. And meets the relevant VCS requirements and the estimated GHG removal from the project is real, measurable, and permanent and the emission reduction from the project activity is 40,122 tCO_2e during the monitoring period and the amount of net electricity produced during the monitoring period is 74,321.37 MWh

1 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 Verification Process 7
2.1 Method and Criteria 7
2.2 Document Review 9
2.3 Interviews 9
2.4 Site Inspections 11
2.5 Resolution of Findings 11
2.5.1 Forward Action Requests 11
2.6 Eligibility for Validation Activities 11
3 Validation Findings 12
3.1 Participation under Other GHG Programs 12
3.2 Methodology Deviations 12
3.3 Project Description Deviations 12
3.4 Grouped Project 12
4 Verification Findings 12
4.1 Project Implementation Status 12
4.2 Safeguards 14
4.2.1 No Net Harm 14
4.2.2 Local Stakeholder Consultation 14
4.3 AFOLU-Specific Safeguards 14
4.4 Accuracy of GHG Emission Reduction and Removal Calculations 14
4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals 20

4.6 Non-Permanence Risk Analysis 22

5 Verification conclusion 22

APPENDIX I: Corrective action request and clarification request 24

APPENDIX II: ABBREVIATIONS 26

APPENDIX III: REFERENCE 28

1 INTRODUCTION

1.1 Objective

Ekobil Environmental Services and Consulting Ltd contracted EPIC Sustainability Services Private Limited on behalf of Baren Enerji Üretim San. ve. Ticaret A.S. to verify the project titled "Kirazlik Hydroelectric Power Plant Project" in Turkey under registered VCS reference No. 2092 for 2nd Monitoring Period covers from 01/03/2021 to 31/12/2021

- The purpose of the verification is to conduct an independent, third party assessment to confirm whether the project activity meets the qualification criteria set of by the VCS Standard v4.3/1/ requirements to attain real, additional and permanent emission reduction. The verification statement opinion is a written assurance that the project complies with all the applicable VCS requirements and has the ability to generate the emission reductions over the stated project crediting period.
- To verify that the actual monitoring system and procedures are in full compliance with the system and procedures described in the Monitoring Report v2.0/12/ dated 29/12/2022 (hereinafter referred to as MR) as well as with the applicable methodology.
- To verify the reported data is accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emission reduction calculation.
- To verify and certify the reported GHG emission reduction of the project for the period from 01/03/2021 to 31/12/2021.

1.2 Scope and Criteria

The scope of verification is to assess and verify the claims and assumptions made in the VCS monitoring report (MR) v2.0/12/ against the VCS criteria, including but not limited to, VCS standard v4.3, applied methodology and other relevant rules and requirements established for VCS project activities.

The Verification is not meant to provide any consulting towards the project participants. However, stated requests for clarification and/or correction actions request may have provided inputs for improvement of the project design.

1.3 Level of Assurance

In line with VCS requirements and as per ISO 14064-3:2019 Para 5.1.3, a reasonable level of assurance has been followed for the verification of the project. Based on the desired level of accuracy EPIC has established an internal quality control process and assures that the information given in the MR is materially correct and is a fair representation of the actual project details, and is prepared in accordance with the VCS requirements and the applied CDM methodology for information pertaining to additionality, GHG quantification, monitoring and reporting. The verification report is carried out as per this requirement and details are presented in the verification statement in section 4 below.

1.4 Summary Description of the Project

The project activity comprises of the construction of grid connected downstream based hydro power project in Turkey. The purpose of the project is to produce electricity utilizing the energy from Boton river as renewable resource. The total installed capacity of the Kirazlik Hydroelectric Power Plant is 46.11 MWe which consists of 3 units of capacity 14.537 MWe + 1 unit of capacity 2.50MWe.

Project includes implementation of 4 units, commissioned on 05/12/2013, 15/01/2014, 14/03/2014 & 16/05/2014 respectively. The start date of the project is 05/12/2013 i.e., date on which the 1st, unit was implemented. The 4 units are of capacity 3x14.537 MWe and 1x2.50 MWe resulting to a total capacity of 46.11 MWe with two-way electricity measurement meters.

The electricity produced from the project is sold to Turkish Electricity Transmission Corporation (TEIAS) by transmission line of electrical voltage 154 kV.

The current monitoring period of the project is from 01/03/2021 to 31/12/2021 (both dates included). The emission reduction of the project for current monitoring period is 40,122 tCO_2. The net electricity produced during the monitoring period is 74,321.37 MWh.

The project activity is undergoing 2nd verification, and the description of project activity, implementation of monitoring plan is verified against the registered VCS PD. The remote audit was conducted on 24/08/2022 to verify the details. Based on the assessment, the verification team is able to confirm that the project activity is fully functional and implemented as described in the registered VCS PD /20/.

2 VERIFICATION PROCESS

2.1 Method and Criteria

The EPIC verification process consists of the following phases:

- Document review of the project description and preparation of verification of protocol
- Remote audit to the project activity and interviews with the project proponent, project consultant, and relevant stakeholders
- Resolution of outstanding issues and the issuance of the final verification report and opinion.

In order to ensure transparency, a verification protocol was customised for the project according to the VCS guidelines. The protocol describes the findings, criteria (requirements), means of the verification, results from the validation and how the identified criteria, have been met in a transparent manner, the verification protocol serves the following purposes:

- It organises, details and clarifies the requirements of a VCS project is expected to meet.
- It ensures a transparent verification process where the verifier will document how a particular requirement

The protocol includes an Appendix, which lists the findings from validation that were categorised as non-fulfilment of validation protocol requirements or any hazards that interferes in project's completion. A Corrective Action Request (CAR) was issued, detailing the following:

- Mistakes were committed that had a direct impact on the project's outcomes; or
- The requirements of the validation protocol have not been met; or
- There was a chance that the project might be rejected as a VCS project or that the emission reductions would not be certified.

APPENDIX: RESOLUTION OF CORRECTIVE ACTION AND CLARIFICATION REQUESTS			
Draft report clarifications and correction action requests by verification team	Reference to section of the PD	Summary of project proponent response	Verification team conclusion
If the conclusions from the draft validation are either a CAR or CL, these should be listed in this section	Reference to the section of the PD where the relevant CAR or CL raised	The response given by the project proponent during the communications with the verification team should be summarized in this section	This section should summarise the verification team's responses and final conclusions

The following team members from EPIC are involved in identifying the following.

Name	Role	Components reviewed
Priyanka MS	Lead Auditor	Completeness check, desk review, discussion with project representatives, issuance of findings, report preparation.
Karthik Lakshman Ashwin Kumar Bharath S Prasanna MP	Auditor	Completeness check, desk review, discussion with project representatives, issuance of findings, report preparation
Fikriye Seda Yucel	Technical Expert	Technical inputs to the team
R. Vijayaraghavan	Technical Reviewer	Technical issues related to project.

2.2 Document Review

The initial MR v1.0/11/ submitted by the client and additional backgrounds documents related to the project design and baseline was reviewed as an initial step of the verification process. As a result of review and findings, PP had submitted the revised MR v2.0/12/ dated 29/12/2022.

Following are the documents reviewed during the verification;

- Calibration Reports/5/
- Commissioning Certificates/6/
- Emission reduction Calculation sheet/7/
- Training records/10/
- EIA Affirmation13/
- EIA Report/14/
- Production License/15/
- Single line diagram/16/
- System usage Agreement/17/
- Water Usage Agreement/18/
- Maintenance records/22/
- The PMUM/MFRC data of electricity (Screen shots)/24/

2.3 Interviews

The remote audit was conducted on 23rd August, 2022 through zoom application with reference to the evaluation of the project description and documents. The project representatives were also invited to follow-up meeting.

The remote audit was conducted on 24th August, 2022 through zoom application with reference to the evaluation of the project description and documents. The project representatives were also invited to follow-up meeting.

The following people were interviewed during the remote audit:

Sl.No	Name of the stake holder	Position/ Designation and Address	Details of interview
1	Fatih Baydar	Assistant Manager, Budget and Pricing, Limak Hidroelektrik Santral Yatırımları Anonim Şirketi	Completeness check, desk review, Interview with project representatives & stakeholders, issuance of findings, report preparation. Baseline, monitoring plan, Proof of title, Technical Details, electricity generation, Monitoring system, calibration frequency, Infrastructure, Wheeling Agreement, Overall Project management.
2	Dr. G.Aslı Sezer Özçelik (Team Head)	Ekobil Environmental Services and Consulting Ltd	
	Ekin Sevim (Consultant)		
	Aysenaz Toptas (Consultant)		
3	Yavuz Zirek	Kirazlik Project manager	Technical Details, Monitoring system, calibration frequency, Power Purchase Agreement, Land Ownership details, Overall Project management.
	Ahmet Cevik		
	Kem Kprpoulut		
4	Huseyin Arslan	Head of the Ciftlikkoy Village (Muhtar)	Local stake holder consultation and On-going communication as part of local stakeholder engagement
	Deniz Sahin	Private Security	
	Orhan Sonmez	Nisankaya Village Resident	
	Ozgur Arslan	Ciftlikkoy Village Resident	
	Tuncay Sonmez	freelance facility worker for different roles	

2.4 Site Inspections

During the remote audit, the operation and monitoring plan of the project activity were compared with the details and description given in the monitoring report. The technical details, manufacturing system, environmental impacts aspects, calibration and level of accuracy were examined.

An on-site assessment was conducted as a part of verification activity and involved:

1) An assessment of the implementation and operation of the project activity as per the MR

2) A review of information flows for generating, aggregating and reporting of the monitoring parameters

3) Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the MR

4) A cross-check between information provided in the MR and data from other sources

5) A review of baseline and additionality of the project

6) A check of the monitoring equipment including calibration performance, and observations of monitoring practices against the requirements of the MR and the applied methodology

7) A review of calculations and assumptions made in determining the GHG data and ERs, and

8) An identification of QA/ QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters.

2.5 Resolution of Findings

The objective of this step of the verification was to resolve any outstanding issues, such as corrective action requests and clarification requests that needed to be addressed before EPIC could issue a positive conclusion on the project design. During this phase, three CLs and one CAR are raised. The issues highlighted and replies made are summarised in **Appendix I** of this report to ensure that the verification process is transparent. The MR is updated to include all corrective actions.

Clarification requests (CL) is raised if the project reporting lacks transparency and further information is needed to determine if a material discrepancy is present. Corrective action requests (CAR) is raised if the verification has identified a material discrepancy or non- conformance that the project proponent must address. All the CARs and CLs were resolved during this phase.

2.5.1 Forward Action Requests

There are no outstanding forward action requests raised during this verification.

2.6 Eligibility for Validation Activities

The scope of work includes verification only. EPIC is accredited for all the VCS sectors for validation and as well as verification. The validation/verification body has verified all of the data and information to provide reasonable assurance and to meet the materiality requirements of the project.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The verification team has checked whether the project activity has claimed any other GHG programs and project owner has provided a declaration confirming that there is no double counting associated with project activity and, the project does not seek or participated in any other GHG programs.

In conclusion, this project is valid for issuance of the verified carbon credits.

3.2 Methodology Deviations

There is no methodology deviation in the project activity.

3.3 Project Description Deviations

In the validated PD it is stated that all meters will be in compliance with the Communiqué for Metering Devices to be used in the Electricity Market and they have an accuracy class of Class002S indicating an accuracy range of 0.2%. In this monitoring period, the accuracy of the meters is 0.5% which is also in compliance with the regulations in Turkey. Other than that, the project activity is in compliance with the scenario described at the Project Design Document/20/, and validated by the validation report dated 17/06/2013. The change in accuracy of meter has not resulted in any significant difference on the reading. The verification team has verified the turkey regulations for meters and confirms that there is no difference in the measurement/ accuracy of the data. And Verification team confirms that there is no other deviation in the project activity. The deviation does not impact the applicability of the methodology, additionality or the appropriateness of the baseline scenario, and the project remains in compliance with the applied methodology.

Hence, the project description Deviation is accepted.

3.4 Grouped Project

The project is not a grouped project activity, nor de-bundled part of a grouped project activity

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity involves the construction of Hydroelectric Power Plant at the Eastern Anatolia Geographical district of Turkey over the Botan River that is one of the major tributaries of the Tigris. The Kirazlık Hydroelectric Power Plant is located at the downstream of the following energy projects, counting from the closest to the upstream direction: Alkumru, Çetin, Pervari, Narlı, Olur and Keskin. initially, the designed capacity of the plant was 37.62 MWe later electromechanical equipment producers proposed to increase the capacity to 43.62 MWe by improving the turbine and generator efficiencies.

An additional installation of turbine was done to utilize the energy of water before its discharge into the lifeline water to support the aquatic life. This in turn resulted in adding up 2.50MWe of capacity to the proposed increased capacity of the project activity i.e., 43.62 MWe. Giving rise to the total capacity of 46.11 MWe.

In total, 4 units are implemented in this project with capacity 3x14.537 MWe and 1x 2.50 MWe commissioned on 05/12/2013, 15/01/2014, 14/03/2014 and 16/05/2014 respectively. Each unit consists of one main and one backup meter which is connected to the transmission line of electrical voltage 154 kV owned by Turkish Electrical Transmission Corporation (TEIAS).

Based on the turkey's combined margin emission factor of 0.53985 tCO_2/MWh the project produces an amount of 40,122 tCO_2 of emission reduction during the monitoring period.

The project boundary in the registered VCS PD/20/ is in line with the actual project boundary. The generated electricity is fed to the Turkish national grid. The current project status is verified through photographic evidence of technology used and monitoring status, indicating the real time generation data and hence it is confirmed that the project is fully functional.

The project has produced a net total of 74,321.37 MWh of electricity during the monitoring period. The PMUM/MFRC data of electricity (screen shots)/24/ are cross checked against the data of net electricity generation stated in MR verification team.

The factory calibration of meters which were replaced by TEIAS was carried out on 12/10/2020. The energy meters used for the monitoring are of accuracy class 0.5S; they are sealed & calibrated by the respective state utility once in 10 years. The verification team has verified the calibration certificates and confirmed that the meters are calibrated in accordance with the frequency as outlined in the registered monitoring plan.

- There are no material discrepancies between project implementation and the project description.
- The implementation status of the monitoring plan and the completeness of monitoring, including the suitability of the implemented monitoring system is in line with registered VCS PD (i.e., process and schedule for obtaining, recording, compiling and analysing the monitored data and parameters).
- There are no material discrepancies between the actual monitoring system, and the monitoring plan set out in the project description and the applied methodology.
- The project has not participated or been rejected under any other GHG programs since validation or previous verification.
- The project has not received or sought any other form of environmental credit, or has not become eligible to do so since validation or previous verification.
- The GHG emission reductions generated by the project has not included in any emissions trading program or any other mechanism that includes GHG allowance trading.
- The project has implemented the activities that result in the SD contributions described in the monitoring report.

There are no previously validated methodology deviations. The project used UNFCCC methodology of ACM0002 v13.0/4/ and its related tools are applied.

In conclusion, the verification team has verified the final VCS MR v2.0[/11/] and confirmed that the procedure for monitoring plan, monitoring system, data & variables stated is consistent with the registered VCS PD[/20/]. The emission reductions achieved under this monitoring period 01/03/2021 to 31/12/2021 (including both dates) is 40,122 tCO_2.

By reviewing the maintenance records the verification team confirms that there was no major breakdown by or shutdowns during the monitoring period which might affect the applicability of methodology or might cause material errors in emission reductions.

4.2 Safeguards

4.2.1 No Net Harm

The project has no potential negative environmental and socio-economic impacts identified by the project proponent. The project activity involves the generation of electricity utilizing hydro energy as renewable resource. This does not emit any harmful gases to the atmosphere. The project supports energy security, improved air quality, alternative sustainable energy, improved local source of income and sustainable renewable energy industry development contributing to positive impact on environment.

4.2.2 Local Stakeholder Consultation

The local stakeholder consultation meeting held on 2nd April, 2009 in Aydinlar town of Siirt Province prior to the implantation of the project activity. The meeting was organized within the context of the EIA process to comply with the environmental regulations of the host country. The project activity was addressed to the local stakeholders and information about the environmental impacts due to the project activity was provided. Stakeholders raised questions about expropriation process and the compensation money these questions were answered by project owner and environmental consultants. There were no grievances from the local stakeholders on the project activity during the meeting.

During the remote audit the local stakeholders were interviewed and they are very happy about the project and its benefits. No active court cases are filed against the project or project proponent. They also confirmed that the project is not affecting the aquatic system and the project has built a fish passage for the movement of fish.

The project proponent has implemented mechanism for ongoing communication with local stakeholders to raise any concerns regarding the project activity and its potential negative impacts during the operation of the plant. Stakeholders can communicate directly with the plant manager and can visit the facility at any time to express their concerns to seek for their issues.

4.3 AFOLU-Specific Safeguards

This project is a Non-AFOLU project. Hence, this section is not applicable.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

Particulars	Verification opinion
Emission reductions for the monitoring period	As per the applied methodology (ACM0002

(ER_y)	v13.0[4], ER_y is calculated as follows. $ER_y = BE_y – PE_y - LE_y$ Where, BE_y- Baseline emissions during the monitoring period PE_y- Project emissions during the monitoring period LE_y –Leakage emissions during the monitoring period The opinion of the same is detailed below.
Baseline emissions during the monitoring period (BE_y)	As per para 38 of the applied methodology and the registered PD[20], baseline emissions include only CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. $Bey = EG_{PJ,y} \times EF_{grid,CM,y}$ 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 $EF_{grid,CM,y}$ –Combined margin CO_2 emission factor for grid connected power generation in year y The opinion of the same is detailed below.
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 ($EG_{PJ,y}$)	As per para 39 and 40 of the applied methodology, for a greenfield project, $EG_{PJ,y}$ is calculated as follows. $EG_{PJ,y} = EG_{facility,y}$ Where $EG_{facility,y}$ – Quantity of net electricity generation supplied by the project plant/unit to the grid in year y The opinion of the same is detailed below.

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

Month	$EG_{pp\text{-}gross,y}$ / $EG_{pp\text{-}self\ consumtion,y}$ in MWh	$EG_{facility,y} = EG_{pp\text{-}gross,y} - EG_{pp\text{-}self\ consumtion,y}$
March 2021	12,649.32 / 120.32	12,529.00
April 2021	16,557.76 / 111.86	16,445.90
May 2021	4,417.35 / 100.95	4,316.40
June 2021	6,846.52 / 99.42	6,747.10
July 2021	12,883.46 / 119.45	12,764.01
August 2021	12,458.38 / 117.82	12,340.56
September 2021	6,840.29 / 96.89	6,743.40
October 2021	1,798.50 / 71.30	1,727.20
November 2021	645.40 / 0.00	645.40
December 2021	62.40 / 0.00	62.40
Total	75,159.39 / 838.01	74,321.37

As per the registered PD[/20/], net electricity is calculated as a difference of export and import values. The generation voltage of electricity from the generator is 154 kV before fed into the grid.

The main meter installed at the power transformer at the substation. The bidirectional main meter continuously records the electricity values and is recorded every month.

The verification team has reviewed the generation details and invoices and confirmed the values as correct.

As per the monitoring report, the electricity meter will be calibrated every 10 years periodically from a certified testing agency. The verification team has checked the calibration certificates against meter number, serial number, date of calibration, validity and actual error and found that if meters are calibrated by the certified agency and are having sufficient accuracy and the validity covering the monitoring period. By review of the calibration reports, verification team confirmed that the meters were replaced in 2020 by TEIAS and were factory calibrated before its installation i.e., on 12/04/2020. Hence, there is no delay in meter calibration.

The verification team has reviewed MR. PP has included the organisational structure where roles and responsibilities of each for monitoring activities are defined. This includes the roles of plant manager, electrical engineer, accounting manager, Board operator.

The verification team has reviewed MR. PP has included the organisational structure where roles and responsibilities of each for monitoring activities are defined. This includes the roles of plant manager, electrical engineer, accounting manager, Board operator.

The revised MR now reports the methods used for generating/measuring, recording, storing, aggregating, collating and reporting the data on monitored parameters. This was verified to be correct.

The revised MR also reports how internal control of the monitoring parameters. Since there is no sampling approach adopted by the PP as all date is measured and recorded.

<table>
<tr>
<td>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 ($EG_{PJ,y}$)
<table>
<tr><td>Year</td><td>$EG_{PJ,y}$</td></tr>
<tr><td>2021 (Mar to Dec)</td><td>74,321.37 MWh</td></tr>
<tr><td>Total</td><td>74,321.37 MWh</td></tr>
</table>
</td>
<td>As per para 39 and 40 of the applied methodology, for a greenfield project, EGPJ,y is calculated as follows.
$EG_{PJ,y} = EG_{facility,y}$</td>
</tr>
<tr>
<td>Amount of fuel combusted for electricity production in Turkey in the years 2008, 2009, 2010 ($F_{C,i,y}$) in cubic meter
(ex-ante parameter 1 of 6 of registered PD v2.02/20/)</td>
<td>This is sourced from the validated registered PD/20/. Hence accepted by the verification team.</td>
</tr>
<tr>
<td>Net Calorific Values for fossil fuel type in year, for the years 2008, 2009 and 2010 ($NCV_{i,y}$) in GJ/Mass or Volume Unit
(ex-ante parameter 2 of 6 of registered PD v2.02/20/)</td>
<td>This is sourced from the validated registered PD/20/. Hence accepted by the verification team.</td>
</tr>
<tr>
<td>CO_2 emission factor of fossil fuel type i in year y ($EF_{CO2,i,y}$) in tCO_2
(ex-ante parameter 3 of 6 of registered PDD v2.02/20/)</td>
<td>This is sourced from the validated registered PD/20/. Hence accepted by the verification team.</td>
</tr>
<tr>
<td>Net electricity generated in the project electricity system in other words, 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 (Egy) in MWh
(ex-ante parameter 4 of 6 of registered PD v2.02/20/)</td>
<td>This is sourced from the validated registered PD/20/. Hence accepted by the verification team.</td>
</tr>
<tr>
<td>Net electricity generated and delivered to the grid by power unit m in year y ($EG_{m,y}$) in MWh
(ex-ante parameter 5 of 6 of registered PD v2.02/20/)</td>
<td>This is sourced from the validated registered PD. Hence accepted by the verification team.</td>
</tr>
<tr>
<td>Specific electrical efficiency for all relevant energy sources (natural gas, lignite, coal/anthracite, fuel/motor oil) ($\eta_{m,y}$)
(ex-ante parameter 6 of 6 of registered PD v2.02/20/)</td>
<td>This is sourced from the validated registered PD/20/. Hence accepted by the verification team.</td>
</tr>
<tr>
<td>Operating margin CO_2 emission factor for grid connected power generation in year y ($EF_{grid,OM,y}$)</td>
<td>As per the registered PD, Operating margin CO_2</td>
</tr>
</table>

= 0.65613 tCO_2/MWh	emission factor for grid connected power generation in year y is 0.65613 tCO_2/ MWh. Hence it is accepted by the verification team.
Building margin CO_2 emission factor for grid connected power generation in year y ($EF_{grid,BM,y}$) =0.42357 tCO_2/MWh	As per the registered PD[/20/], Building margin CO_2 emission factor for grid connected power generation in year y is 0.42357 tCO_2/ MWh. Hence it is accepted by the verification team.
Combined margin CO_2 emission factor for grid connected power generation in year y ($EF_{grid,CM,y}$) = 0.53985 tCO_2/MWh	As per the registered PD, the CO_2 emission factor for grid connected power generation is 0.53985 tCO_2/ MWh. Hence it is accepted by the verification team.
Baseline emissions during the monitoring period (BE_y) Year: 2021 (Mar to Dec) — BE_y: 40,122	As per the para 39 of applied methodology, the baseline is calculated as follows $BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$
Project emissions (PE_y)	As per para 30 of the applied methodology, project emissions is calculated as follows. $Pey = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$ Where $PE_{FF,y}$ – Project emissions from fossil fuel consumption in year y $PE_{GP,y}$ – Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y $PE_{HP,y}$ – Project emissions from water reservoirs of hydro power plants in year y
Project emissions from fossil fuel consumption during the monitoring period y ($PE_{FF,y}$) Year: 2021 (Mar to Dec) — $PE_{FF,y}$: 0 tCO_{2e}	As per para 32 of the applied methodology, the use of fossil fuels for the back up or emergency purposes (e.g. diesel generators) can be neglected. There is one diesel generator in the project boundary, but it is used for backup only. So the verification team has accepted project emission from fossil fuel consumption is zero.
Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y ($PE_{GP,y}$) Year: 2021 (Mar to Dec) — $PE_{GP,y}$: 0 tCO_{2e}	Since the project activity is not geothermal project activity, $PE_{GP,y}$ = 0 tCO_{2e}

Project emissions from water reservoirs of hydro power plants in year y ($PE_{HP,y}$)	As per para 36 of the applied methodology, for hydro power project activities that result in new single or multiple reservoirs and hydro power project activities that result in the increase of single or multiple existing reservoirs, PP shall account for CH_4 and CO_2 emissions from the reservoirs, estimated as follows. $PE_{HP,y} = EF_{Res} \times TE_{Gy}$, if the power density is greater than 4 W/m2 and less than 10 W/m2 As per para 37 of the applied methodology, $PD = (Cap_{PJ}-Cap_{BL})/(A_{PJ}-A_{BL})$ Where Cap_{PJ} – Installed capacity of the hydro power plant after the implementation of the project activity Cap_{BL} – Installed capacity of the hydro power plant before the implementation of the project activity A_{PJ} – Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full A_{BL} – Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full The verification opinion of the same is detailed below.
Installed capacity of the hydro power plant after the implementation of the project activity (Cap_{PJ}) = 46.11 We	By reviewing the technical specification of turbine units, it is accepted by the verification team.
Installed capacity of the hydro power plant before the implementation of the project activity (Cap_{BL}) = 0 Mwe	As per the methodology ACM0002 v.13[4] the installed capacity for new reservoir is zero.
Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (A_{PJ}) = 1,000,000 m^2	By reviewing the project topographical maps, it is accepted by the verification team.
Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (A_{BL}) = 0 m^2	As per the methodology ACM0002 v13[4] the area of the new single or multiple reservoirs is zero.
Power density (PD) = 46.11 We/m^2	As per para 37 of the applied methodology, $PD = (Cap_{PJ}-Cap_{BL})/(A_{PJ}-A_{BL})$
Project emissions from water reservoirs of hydro	Since the power density is greater than 10 W/m2, and as per para equation 4 of the applied

<table>
<tr>
<td>power plants in year y ($PE_{HP,y}$)
<table><tr><td>Year</td><td>$PE_{HP,y}$</td></tr><tr><td>2021 (Jan to Dec)</td><td>0 tCO_{2e}</td></tr></table></td>
<td>methodology, $PE_{HP,y}$ = 0 tCO2e</td>
</tr>
<tr>
<td>Project emissions (PE_y)
<table><tr><td>Year</td><td>PE_y</td></tr><tr><td>2021 (Jan to Dec)</td><td>0 tCO_{2e}</td></tr></table></td>
<td>As per para 30 of the applied methodology, project emissions is calculated as follows.
Pey = $PE_{FF,y}$ + $PE_{GP,y}$ + $PE_{HP,y}$</td>
</tr>
<tr>
<td>Leakage emissions (LE_y)
<table><tr><td>Year</td><td>LE_y</td></tr><tr><td>2021 (Jan to Dec)</td><td>0 tCO_{2e}</td></tr></table></td>
<td>As per para 53 of the applied methodology, no leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, and transport). These emissions sources are neglected.</td>
</tr>
<tr>
<td>Emission reductions for the monitoring period (ER_y)
<table><tr><td>Year</td><td>ER_y</td></tr><tr><td>2021 (Mar to Dec)</td><td>40,122 tCO_2e</td></tr><tr><td>Total</td><td>40,122 tCO_2e</td></tr></table></td>
<td>As per para 54 of the applied methodology (ACM0002 v13.0[4]), ER_y is calculated as follows.
$ER_y = BE_y – PE_y – LE_y$</td>
</tr>
</table>

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

The generated electricity is connected to Turkish national grid and is monitored continuously by two-way meters (Three Main meters and Three Back up-meters) that were sealed by TEIAS. Calibration procedures and test reports of all online energy meters covering the reported monitoring period were verified for their frequency to industry standards. The meters are in compliance with the standards of the Turkish Standards institute and have obtained a “Type and system Approval” certificate from the ministry of trade and industry. The sensitivity of the Main and Back-up meters is Class 0.5S for active energy. The meters are calibrated by manufacturers before its installation. TEIAS is responsible for calibration and maintenance of the meters as per the registered VCS PD[20]. Project owner does not have control on the installed meter. If any major discrepancy occurs between the two meters the necessary measure are taken. The calibration of the meters was done on 12.10.2020 and the validation of the meters is done once in 10 year. The validity of the current meters is up to 11.10.2030. If the difference between main meter and backup meters is 0.5 %, the calibration is repeated. The monthly generation of electricity is emailed to project owner. The net electricity produced ($EG_{PP\text{-}net,y}$) in year y is calculated by subtracting the total electricity consumed by the hydroelectric power plant ($EG_{PP\text{-}selfconsumption,y}$), from the gross electricity generation ($EG_{PP\text{-}}$

$_{gross,y}$) . After obtaining the net electricity production value, the emission reductions is calculated by multiplying the net electricity with the Ex-ante Combined Margin Emission Factor.

	Main Meters		
Function	**Unit 1**	**Unit 2**	**Unit 3**
Serial No.	10013575	10013577	10013579
Unit Installation	12.10.2020	12.10.2020	12.10.2020
Location	Inside the plant	Inside the plant	Inside the plant
Calibration date	12.10.2020	12.10.2020	12.10.2020
Valid Until	11.10.2030	11.10.2030	11.10.2030
Make and Country	EMH metering gmbh & co. kg And Germany	EMH metering gmbh & co. kg And Germany	EMH metering gmbh & co. kg And Germany
Model	LZQJ-XC	LZQJ-XC	LZQJ-XC
Accuracy Class	0.5S	0.5S	0.5S
Maximum permissible error	0.5%	0.5%	0.5%
Calibration delay if any	Nil	Nil	Nil

	Backup Meters		
Function	**Unit 1**	**Unit 2**	**Unit 3**
Serial No.	10013576	10013578	10013580
Unit Installation	12.10.2020	12.10.2020	12.10.2020
Location	Inside the plant	Inside the plant	Inside the plant
Calibration date	12.10.2020	12.10.2020	12.10.2020

Valid Until	11.10.2030	11.10.2030	11.10.2030
Make and Country	EMH metering gmbh & co. kg And Germany	EMH metering gmbh & co. kg And Germany	EMH metering gmbh & co. kg And Germany
Model	LZQJ-XC	LZQJ-XC	LZQJ-XC
Accuracy Class	0.5S	0.5S	0.5S
Maximum permissible error	0.5%	0.5%	0.5%
Calibration delay if any	Nil	Nil	Nil

4.6 Non-Permanence Risk Analysis

This section is not applicable for the non-AFOLU project activity.

5 VERIFICATION CONCLUSION

EPIC performed verification of the VCS project "Kirazlık Hydroelectric Power Plant Project under registered VCS reference No. 2092". The verification was carried out to independently assess whether the project confirms to the qualification criteria and requirements of the Voluntary Carbon Standard[1] (VCS), including the baseline and monitoring methodology applied. The VCS program provides the standard and framework for independent verification based on ISO 14064-2:2019 and ISO14064-3:2019 standards.

The verification was performed using a risk based approach, the review of the project description and the subsequent follow-up interviews provided EPIC with sufficient evidence to determine the fulfilment of the stated criteria.

The GHG emission calculations are documented in a complete and transparent manner. The formulae and methodologies for accounting GHG emissions are appropriate and emission factors are deemed to be of sufficient accuracy. The emission reductions forecast has been checked and it is deemed likely that the stated amount is achievable on the basis that the underlying assumptions do not change.

The monitoring plan is in line with the approved monitoring methodologies of ACM0002 v13.0. The plan adequately addresses all necessary information for monitoring and reporting of emissions reductions due to the project activity. Responsibilities and authorities for project management, monitoring and

reporting, and the data quality control and quality assurance procedures have been described in the final MR.

The verification was carried out in accordance with the requirements of the CDM Validation and Verification standard for project activities v3.0[/25/] and VCS Standard v4.3[/1/]. As a result of the verification, the verification team confirms that for the reporting period:

- all operations of the project were implemented as described in the registered PD, (project ID 2092) ,
- The monitoring plan is in accordance with the approved monitoring methodology applied by the project activity.
- the monitoring has been carried out in accordance with the MR[/12/] v2.0 dated 29/12/2022.
- the monitoring aspects (i.e. additional monitoring parameters, monitoring frequency and calibration frequency) were in place and functional, with the installed equipment essential for generating emission reduction operating appropriately and the calibration of all the equipment had been carried out accordingly and appropriate adjustments had been made when there were delays in the calibration, and
- The GHG emission reductions achieved were calculated correctly on the basis of approved monitoring methodology.

We have verified that the information included in the final MR was correct and that the emission reductions achieved had been determined correctly. In our opinion, the GHG emission reductions for the monitoring period stated in the latest revised monitoring report for the project are fairly stated.

The verifier confirms that the GHG emission reductions were calculated without material misstatements for the whole monitoring period. Our opinion is based on the project's GHG emissions and resulting GHG emission reductions reported, and, to the valid and registered project baseline and monitoring documents. We confirm that verified GHG emission reductions and removals for the period from 01/03/2021 to 31/12/2021 is 40,122 tCO2e

Verification period: From 01/03/2021 to 31/12/2021

Verified GHG emission reductions and removals in the above verification period*:*

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
Year 2021	40,122	0	0	40,122
Total	40,122	0	0	40,122

APPENDIX I: CORRECTIVE ACTION REQUEST AND CLARIFICATION REQUEST

Correction Action Request (CAR) or Clarification Request (CR) or Forward Action Request (FAR)	Response from project participant	Validation team conclusion
CL 1 As per the MR in section 1.6, it states that the crediting period of the project is 10 years and can be renewed twice; whereas this does not comply with the VCS Standard v4.3. Please clarify in this regard.	VCS Standard Version 4.3 were issued on the 19th of September 2019. According to this version of the standard where Verra issues new requirements relating to projects, registered projects do not need to adhere to the new requirements for the remainder of their project crediting periods (i.e., such projects remain eligible to issue VCUs through to the end of their project crediting period without revalidation against the new requirements). The new requirements shall be adhered to at project crediting period renewal, as set out in Section 3.8.9. Therefore, the crediting period for the Kirazlik HPP is 10 years from 05-12-2013 to 04-12-2023 and renewable twice as it was stated in the validated PDD of the project.	As per the VCS standard 3.0 the crediting period for the project is said to be 10 years and can be renewed twice. At the time of project implementation the VCS Standard v3.0 was valid and PP has applied the same in the report. Therefore, the crediting period for the project is 10 years and can be renewed twice. Hence, CL1 is closed

Correction Action Request (CAR) or Clarification Request (CR) or Forward Action Request (FAR)	Response from project participant	Validation team conclusion
CL 2 PP to demonstrate how the maintenance of project activity is done.	Maintenance is periodically done in-house and there are no third-party contractors. During maintenance activity, there is no electricity production. In case of maintenance of the project activity emergency plans present for fire, security, health and flood plans are put into effect. In order to prepare the employees of the project facility, In-house training was carried out for first-aid kit under training for professional competence.	The maintenance of project activity is done in-house. The training records are submitted by project proponent and are verified by the verification team. Hence, CL 2 is closed
CL 3 Please explain how the calibration of the meters validity is covering the monitoring period and provide the supporting evidence.	The validity of the meters has been done for 10 years, according to the legislation in Turkey, in 2020, it is valid for 10 years until 2030. Periodic tests are done by TEIAS in every 2 years and in reference to the test reports provided by TEIAS the validity of the meters can be extended with renewed calibration covering the monitoring period.	The meters installed in the year 2013 were replaced by TEIAS in the year 2020 and is valid upto 2030. As per the Measurement and measuring instruments inspection regulation published by the precedency of republic of Turkey the calibration of meters is done in once in 10 years. The verification team has verified the Calibration reports of the meters installed in the year 2020. Hence, CL 3 is Closed
CAR 1 Please provide the objective evidence for SDG 7 and SDG 8.	In line with SDG-7 – the project has been constructed on the Botan River, Siirt, Turkey	The list of employees employed in the project activity is submitted by the project proponent as object

Correction Action Request (CAR) or Clarification Request (CR) or Forward Action Request (FAR)	Response from project participant	Validation team conclusion
	Provinces, the project is estimated to produce 150,610 MWh of electricity per year from renewable sources which enables consumers to access reliable and sustainable energy without relying on imported fossil fuels in Turkey. In line with SDG 8 – to promote sustained, inclusive and sustainable economic growth the local workers are given priority during the hiring for plant operation. There are 61 employees hired for the project and 35 of the service personnel are local employees which creates local employment opportunities and inclusive economic growth in the region. Also in this project, occupational trainings were given regularly. Specifically, certificate of professional competence training was given to promote sustained economic growth (Please check the documents in the link shared to find the details of the trainings).	evidence for SDG 7 and training records conducted in the plant is submitted as objective evidence for SDG 8. The documents are verified by the verification team. Hence, CAR 1 is closed

APPENDIX II: ABBREVIATIONS

BE	Baseline Emission

CAR	Corrective Action Request
CL	Clarification Request
CDM	Clean Development Mechanism
EG	Electricity Generation
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
GHG	Green House Gases
LE	Leakage Emission
MR	Monitoring Report
PD	Project Description
PE	Project Emission
PP	Project Proponent
QA/ QC	Quality assurance/ quality control
VCS	Verified Carbon Standard
UNFCCC	United Nations Framework for Convention on Climate Change
TEIAS	Turkish Electricity Transmission Corporation
PMUM/ MFRC	Piyasa Mali Uzlaştırma Merkezi/ Market Financial Reconciliation Center

APPENDIX III: REFERENCE

No	Author	Title	Provider
1	VCS	VCS Standard v4.3 https://verra.org/wp-content/uploads/2022/06/VCS-Standard_v4.3.pdf	Publicly available
2	VCS	VCS Program Guide v4.2 https://verra.org/wp-content/uploads/2022/06/VCS-Program-Guide-v4.2.pdf	Publicly available
3	VCS	VCS Validation report template v4.1 https://verra.org/wp-content/uploads/2022/01/VCS-Validation-Report-Template-v4.1.docx	Publicly available
4	CDM	ACM0002: Grid-connected electricity generation from renewable sources V.13.0 https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG	Publicly available
5	Third Party	Calibration Report of electricity measuring meters	PP
6	PP	Commissioning Certificates of turbine units	PP
7	PP	Emission Reduction Calculation sheet	PP
8	Third Party	Measurement And Measuring Instruments Inspection Regulation https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=6381&MevzuatTur=7&MevzuatTertip=5	PP
9	TEIAS	Connection Agreement between TEIAS and Darenhes Elektrik Üretimi A.Ş	PP
10	PP	Training Records of employees	PP
11	PP	Initial MR dated 21/02/2022	PP
12	PP	Final MR dated 29/12/2022	PP
13	Third Party	EIA Affirmative	PP
14	Third Party	EIA Report	PP
15	Third Party	Production License for the project	PP
16	PP	Single Line Diagram	PP

17	PP	System Usage Agreement	PP
18	PP	Water Usage Agreement	PP
19	PP	Reservoirs Surface Area	PP
20	PP	Project registered PD	PP
21	PP	Document of Expropriation	PP
22	PP	Maintenance Records	PP
23	Third Party	Change of Meters	PP
24	PP	The PMUM/MFRC data of electricity (Screen shots)	PP
25	CDM	CDM Validation and Verification standard for project activities v3.0	Publicly available