



Verified Carbon Standard

JOINT VALIDATION AND VERIFICATION OF “OTLUCA HPPS RUN-OF-RIVER HYDRO PROJECT”



Document Prepared by LGAI Technological Center S.A.
(Applus+ Certification)

Project Title	Otluca HPPs Run-of-river hydro project
Report Title	Joint Validation & Verification of “Otluca HPPs Run-of-river hydro project”
Version	02
Report ID	TQC13921
Verification Period	01-August-2019 to 31-May-2022(Inclusive both days)
Client	Elen Enerji Üretimi Sanayi Ticaret A.Ş.
Pages	65
Date of Issue	16-March-2023
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Summary:

LGAI Technological Center S.A. (Applus+ Certification) (Hereafter referred as Applus+ Certification) has been appointed by “Elen Enerji Üretimi Sanayi Ticaret A.Ş.” to perform the Joint validation and verification of the “Otluca HPPs Run-of-river hydro project”.

The project activity is installation and operation of 46.017 MWe run-of-river hydro power plant located at the upstream part of the Anamur River in Anamur district. The project activity consists three sub-projects i.e. Otluca-1, Boğuntu and Otluca-2).

- Otluca-1, consists 3 vertical axis Francis turbines with the total installed capacity of 36.888 MWe.
- Boğuntu, consists 3 horizontal axis Francis turbine with the total installed capacity of 3.321 Mwe
- Otluca-2, consists 3 vertical axis Francis turbine with the total installed capacity of 5.808 MWe

The purpose of the project activities to generate energy electricity by the utilization of hydro power and further selling the generated energy to the National grid of Turkey. In this process there is no consumption of any fossil fuel and hence it does not lead to any greenhouse gas emissions. Thus, electricity would be generated through sustainable means without causing any negative impact on the environment.

Validation purpose: The main purpose is to conduct the validation for Renewal of Crediting Period (RCP) of the project activity. The scope of validation for RCP includes confirming the implementation of the monitoring plan as described in the Joint PD & MR and the application of methodology: ACM0002, version 21.0/4/. The project is registered with VCS ID 755. The start date of PA is 07-April-2011. The length of first VCS crediting period was from 07-April-2011 to 06-April-2021 and the 2nd crediting period will start from 07-April-2021 to 06-April-2031. The project activity was registered with the renewable crediting period of 10 years length. The same is evidenced from the VCS PD version 8.0 dated 22-August-2011. Thus, renewable of 2nd crediting period for 10 years is acceptable to VVBs. Furthermore, it is estimated that the 224,000 MWh of electricity will be produced annually in second crediting period, which will lead to the reduction of GHG's to the tune of 103,398 tCO₂e/annum/25/.

Verification purpose:

The main purpose of this verification activity is to have an independent third party for the assessment of the project design, monitoring report to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements.

The scope of the verification is the independent and objective review of the Joint Project Description (PD) and Monitoring Report (MR). The joint PD & MR is reviewed against the relevant VCS /CDM criteria including the approved applied methodology ACM 0002 (version 12.1.0) and ACM0002 (Version 21.0) The verification was based on the guidance given in the CDM validation and verification standard for project activities, version 03.0, review against previous registered project documents, Joint PD & MR (RCP), CDM Project Standard for project activities, version 03.0, VCS program guide v4.3 and VCS Standard v4.4.

Start date of the project activity is 07-April-2011. On this day project activity has started to export electricity to national grid and therefore, GHG reduction. The Joint Validation and verification covered the period from 01-August-2019 to 06-April-2021 under 1st crediting period and from 07-April-2021 to 31-May-2022 under 2nd crediting period. . During the current monitoring period from 01-August-2019 to 31-May-2022 (including both days), PA has achieved 244,723 tCO₂e (154,059 tCO₂e + 90,664 tCO₂e) VCUs and thereon displaced 476,982.26 MWh (280,569.17 MWh + 196,413.09 MWh) of net electricity from the generation-mix of power plants connected to the National Grid of Turkiye.

A risk-based approach has been followed to perform this RCP validation and verification activity. In the course of verification, 10 Corrective Action request (CAR) and 02 Clarification Requests (CLs) were raised and successfully closed. No FAR was raised during this RCP validation and verification. Remaining 01 FAR from previous verification has been closed. The review of the joint PD & MR and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and PP have provided Applus+ Certification with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

The assessment team has employed a risk-based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the MR. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VCUs. The validation of crediting period renewable and verification is not meant to provide any consulting towards the project participants. However, stated

requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring report combined.

The only purpose of the verification is its usage during the issuance process as part of the VCS project cycle. Therefore, Applus+ Certification can't be held liable by any party for decisions made or not made based on the verification opinion, which will go beyond that purpose.

The validation of RCP and verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. No sampling procedure applied for document verifications. The entire documents checked/verification conducted to arrive at positive verification conclusions.

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1 INTRODUCTION

1.1 Objective

LGAI Technological Center S.A. (Hereinafter referred as Applus + Certification) has been appointed by “Elen Enerji Üretimi Sanayi Ticaret A.Ş.” to perform the Joint validation and verification of the project entitled “Otluca HPPs Run-of-river hydro project” under VCS program Guide V4.3 and VCS standard V4.4. The objective of this validation for renewal of crediting period and verification activity is to have an independent third party for the assessment of the project design, Joint PD & MR and Final Joint Validation and Verification report and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular

- The project's baseline is assessed against “ACM0002 Grid-connected electricity generation from renewable sources --- Version 12.1.0”/09/(CP1: 01-August-2019 to 06-April-2021)
- The project's baseline is assessed against “ACM0002 Grid-connected electricity generation from renewable sources --- Version 21.0”/09/(CP2: 07-April-2021 to 31-March-2022)
- The project's monitoring plan is assessed against “ACM0002 Grid-connected electricity generation from renewable sources --- Version 12.1.0”.
- The project's monitoring plan is assessed against “ACM0002 Grid-connected electricity generation from renewable sources --- Version 21.0”.
- The projects compliance with the requirements of Article 12 of the Kyoto Protocol/06/, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS program guide V4.3 and standard version V4.4/09/.
- CDM Validation and Verification Standard for project activities version 03.0/06/
- VCS standard, v4.4/9/
- VCS Program Guide, v4.3

Joint Validation & verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of verified carbon units (VCUs) for the 1st crediting period 2nd crediting period under renewal This report contains the findings and resolutions from the validation and verification of the project activity.

1.2 Scope and Criteria

The scope of the Joint validation and verification is the independent and objective review of the Registered PD/12/ and Joint Project Description (PD) & Monitoring Report (MR)/4/. The Joint VCS PD & MR/04/ are reviewed against the relevant criteria (see 1.1) and decisions by the CDM Executive Board and VCS executive board, including the approved baseline and

monitoring methodology. The validation and verification were based on the guidance given in the VCS Program Guide, V4.3/9/ and VCS standard, v4.4/9/.

The validation & verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the Joint VCD PD and MR. In line with Guidelines for Application of materiality in validation & verifications (version 02), the validation/verification team has conducted a complete verification of all the information presented in the Joint VCS PD and MR and data presented ex-ante Emission reduction sheet and monitored data presented in the emission reduction calculation spread sheet. It invoices follows the paper trail back to the raw data such as meter reading records and invoices. There are no material errors, overestimation of ER, omission or misstatement. The validation/verification team has reviewed all the documents like commissioning certificates, Monthly Meter Readings, electricity sales records etc.

1.3 Reasonableness of Assumption and Level of Assurance

The Joint validation and verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. The entire documents checked. Joint validation & verification conducted by means of physical site visit to arrive at positive joint validation and verification conclusions.

1.4 Summary Description of the Project

The project activity is installation and operation of 46.017 MWe run-of-river hydro power plant located at the upstream part of the Anamur River in Anamur district. The geo-coordinates of the PA are provided in Section 1,12 of Joint PD & MR. The project activity consists three sub-projects i.e. Otluca-1, Boğuntu and Otluca-2). The details are as follows:

- Otluca-1, consists 3 vertical axis Francis turbines with the total installed capacity of 36.888 MWe.
- Boğuntu, consists 3 horizontal axis Francis turbine with the total installed capacity of 3.321 Mwe
- Otluca-2, consists 3 vertical axis Francis turbine with the total installed capacity of 5.808 MWe

The start date of project activity is 07-April-2011, which is the date when project activity started electricity exported to grid and started emission reductions.

The main purpose of the project is to generate approximately 224,000 MWh/year of electricity to supply the national grid using a renewable resource and tapping the significant hydropower potential in the region. The project activity reduces greenhouse gas (GHG) emissions that would have otherwise occurred in the absence of the project activity by avoiding electricity generation from fossil fuel sources. The estimated annual average emission reductions of the project are estimated to be 103,398 tCO_{2e} during the 2nd crediting period and total 1,033,980 tCO₂ entire crediting period of 10 years.

The project was commissioned on 07-April-2011. The provisional acceptance (commissioning certificate) /01/ and electricity sales agreement (power purchase agreement) /14/ is reviewed by the verification team and found to be appropriate. The verification team has conducted physical visit and found that project equipment's and monitoring arrangements

are as per Joint PD and MR and project activity has been implemented as described in the joint VCS PD & MR.

During the Current Monitoring Period from 01-August-2019 to 31-May-2022(First and last date included) the project activity has contributed 244,723 tCO_{2e} GHG reductions.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

Validation and Verification Scope: The scope is defined as an independent and objective review of the Joint project design document and Monitoring report. The Joint VCS PD and MR is reviewed against the criteria stated in Article 12 of the Kyoto Protocol/06/, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board and VCS standard version 4.4 and VCS Program Guide,V4.3/09/, including the approved baseline and monitoring methodology “ACM0002 Grid-connected electricity generation from renewable sources --- Version 12.1.0 and ACM0002 Grid-connected electricity generation from renewable sources --- Version 21.0”/9/. The validation and verification were based on the requirements in the Validation and Verification Standard for project activities, version 03.0, /06/ and VCS Program Guide v4.3 and VCS standard version 4.4./09/.

The validation and verification are not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the combined project document and the Monitoring report.

Validation and Verification Process: The project assessment is based on the Clean Development Mechanism Validation and Verification Standard for project activities version 03.0 and VCS standard v4.4 and Program Guide v4.3 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the VCS project activity are appointed.

Once the project is received by the assessment team, the members of the assessment team carried out:

- A desk review of the Joint project design documentation and monitoring report;
- Onsite visit and follow-up interviews with project participant;
- The resolution of outstanding issues and the issuance of the final Joint –VAL & Verification report and opinion.

The prepared Joint RCP validation and verification report and other supporting documents then undergo an internal quality control at the HQ (Accredited office) before being submitted to the VCS executive board.

In order to ensure transparency, assumptions must be clear and stated explicitly and background material must also be referenced. Applus+ Certification has developed a specific checklist customized for the project. The checklist demonstrates, in a transparent manner, the project criteria (requirements), discussion on each criterion by the assessment team, and the results from validating/verifying the identified criteria.

Appointment of the assessment team: -

According to the sectoral scope / technical area and experience in the sectoral or national business environment, Applus+ Certification has composed an assessment team in compliance with the Contract Review and Assessment Team appointment rules in the internal Quality Management System of Applus+ Certification as well as in compliance with the applicable requirements in the Accredited standard.

The composition of the Assessment Team (Applus+ Certification’s validation and verification team) has been approved by the Applus+ Certification during the Contract Review process ensuring that the required skills are covered.

The four qualification levels for team members that are assigned by formal appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A)
- Technical Expert (TE).
- Technical Reviewer (TR).
- Any of the above-mentioned roles in training (iT, e.g. AiT for auditor in training).

The sectoral scope / technical area knowledge linked to the applied methodology(ies) is covered by the assessment team as shown below:.

Name	Role	SS Coverage	TA Coverage	Financial aspect	Host country experience
Jitendra Mohan Singh	LA/TE	YES	YES	YES	YES
Denny Xue	TR/TE	YES	YES	YES	NA

The complete list of CVs is included as Appendix 3 of this report.

Internal quality Control:

As final step of a joint validation and verification of the final documentation including the final Joint validation and verification report and the checklist have to undergo an internal quality control by the technical review committee, i.e., each report has to be finally approved either by the head of the technical review committee or the deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one to avoid any conflict of Interest.

After confirmation of the project owners, the positive validation/verification opinion and relevant documents are submitted to the VCS secretariat through the VCS web-platform.

2.2 Document Review

The joint PD and MR and other related documents are reviewed as part of the validation and verification process, which is described in detail in appendix 1 of this document. A verification team uses a standard protocol to do the assessment of both validation and verification. The comparison of data from the Joint PD and MR with data from additional sources, if available, the team's sectoral or local experience, and, if necessary, independent background investigations

2.3 Interviews

On-site inspection has been performed by assessment team. The representatives of the PP and users were interviewed between 16-February-2023 to 17-February-2023. The details of the people interviewed are mentioned in the table:

Sr.No.	Interviewee			Subject	Team member
	Last name	First name	Affiliation		
1.	Tere	Mr. Veysel	PP representative Elen Enerji Galpani	Project Implementation, JMR & invoicing procedure, calibration, grievance mechanism, Management practices, data storage, QA/QC	Mr. Jitendra Mohan Singh
2.	Ehliz	Mr. Kasim	Caltibuku Village (Local Stakeholder)		
3.	Dogru	Ms.Ummu	Caltibuku Village (Local Stakeholder)		
4.	GoKKoca	Ilhami	PP representative Elen Enerji Galpani		
5.	Aslan	Kerem	Consultant Life Enerji		

2.4 Site Inspections

Duration of onsite audit: 16-February-2023 to 17-February-2023				
No.	Activity performed on-site	Site location	Date	Team member
1.	Assessment team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring.	Anamur district, Mersin province, Turkey	16- February-2023 to 17-February-2023	Mr. Jitendra Mohan Singh (Team Leader/Technical Expert/Financial Expert)

2.5 Resolution of Findings

The objective of this phase of the joint validation and verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for Applus+ Certification's positive conclusion on the project design and Monitoring report. The Corrective Action Requests and Clarification Requests raised by Applus+ Certification were resolved during communications between the Client and Applus+ Certification to guarantee the transparency of the validation process, the concerns raised and responses given are summarized below in the Appendix 2.

The final Joint VCS PD & MR Version 1.2/04/ submitted by project owners on 10-March-2023 serves as the basis for the final assessment presented. Additional changes to the project during the validation and verification process are not considered to be significant with respect to the main VCS objectives. The VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Project design document and Monitoring report	00	00	00
Description of project activity	00	03	01
Application of selected baseline and monitoring methodology and selected standardized baseline			
- Applicability of methodology and standardized baseline	01	02	00
- Deviation from methodology	00	00	00
- Clarification on applicability of methodology, tool and/or standardized baseline	00	00	00
Project boundary	00	00	00
Establishment and description of baseline scenario	00	00	00
Demonstration of additionality	00	01	00
Emission reductions	01	02	00
Calibration details	00	02	00
Monitoring plan	00	00	00
No Net harm assessment	00	00	00
Local stakeholder consultation	00	00	00
Others (please specify)	00	00	00
Total	02	10	01

The list of findings and their resolution is presented in Appendix 2 of this report.

2.5.1 Forward Action Requests

One FAR was raised during the previous verification has same has been closed.. No FAR has been raised for this joint validation and verification process. Please refer Appendix 2 for details.

3 VALIDATION FINDINGS

3.1 Project Details

The project activity has been undertaken to harness the available hydro power potential of the upstream part of the Anamur River in Anamur district, Türkiye. Otluca HPPs is a 46.017 MWe (3*12.296 MWe+ 3*1.936 MWe+ 3*1.107 MWe) run-of-river hydro power plant project consisting three sub-projects i.e. Otluca-1, Boğuntu and Otluca-2).

The Turbine type is Francis vertical axis for Otluca-1 (3*12.296 Mwe) and Otluca 2(3*1.107 MWe) and Francis horizontal axis for Boğuntu(3*1.936 MWe). The generated energy of Otluca HPPs is fed into the Namur switchyard, which is 20 km from Otluca-1 HEPP, where energy from all three plants is connected to the transmission line. Detailed technical characteristics of Otluca HPPs. The project activity has started commercial electricity generation on 07-April-2011.

The project activity is estimated to generate 224,000 MWh of electricity per annum, which is supplied to National Grid of Türkiye. The project activity will help in greenhouse gas (GHG) emission reduction by using renewable resources (hydro power) for generating electricity which otherwise would have been generated using grid mix power plants, which is dominated by fossil fuel based thermal power plants.

The project is located on the upstream part of Anamur River in Taşeli Plateau in southern Türkiye, Anamur district, Mersin province. The geographical coordinates of the weirs and the power plants are given below. Geo coordinates checked during the on-site visit through GPS meter and cross checked on Google earth. Verification team conclude geo coordinates of project locations are consistent with Joint PD and MR.

	Otluca-1 Weir	Otluca-1 HPP	Otluca-2 Weir	Otluca-2 HPP
Lat.	36° 18' 13.753"N	36° 15' 34.491" N	36° 15' 24.103" N	36° 14' 29.794" N
Long.	32° 46' 45.825" E	32° 49' 21.043" E	32° 49' 19.383" E	32° 49' 34.932" E

	Boğuntu Weir	Boğuntu HPP
Lat.	36° 16' 28.971" N	36° 15' 44.067" N
Long.	32° 49' 56.593" E	32° 49' 21.903" E

The operational lifetime of the HPP is considered as 40 years considering 150,000 hours life time of hydro turbine which is in accordance with the "Tool to determine the remaining lifetime of equipment" (version 1). Detailed technical specification of project activity are given below:

Project Main Characteristics	Type:	Run-of-river HPP
	HPP units	3
	Total Installed Power:	46.017 MWe
	Annual Power Generation:	224 GWh/year
Otluca-1		
Weir	Type	Concrete
	Elevation at crest	283.5 m
	Height from riverbed	11 m
	Length	29.8 m
Conveying Tunnel I&II	Type	Standard horseshoe, right bank
	Gradient	0.00075
	Width	3.7 m
	Total length	3,896 m + 2,209 m = 6,105 m
Conveying Canal	Type	Rectangular, reinforced concrete, right bank
	Gradient	0.0006
	Width	4.5 m
	Total length	501 m
Penstock	Type	Steel, with trifurcation
	Units	1
	Diameter	2.30 m
	Total length	507 m
Power Plant	Design discharge	20 m ³ /s
	Net head	209 m
	Units	3
	Installed power	37.539 MWe
Boğuntu		
Weir	Type	Concrete
	Elevation at crest	233.5 m
	Height from riverbed	5.5 m
	Length	26 m
Conveying Canal	Turbine Type	Rectangular, reinforced concrete, left bank
	Gradient	0.00047
	Width	3 m
	Total length	161.8 m

Conveying Tunnel	Type	795 MCM
	Gradient	0.0004
	Width	2.6 m
	Total length	1,552 m
Penstock	Type	Steel, with trifurcation
	Units	1
	Diameter	1.4 m
	Total length	93.8 m
Power Plant	Design Discharge	6 m ³ /s
	Net head	66 m
	Turbine type	Francis, horizontal axis
	Units	3
	Installed power	3.801 MWe
Otluca-2		
Weir	Type	Concrete
	Elevation at crest	159 m
	Height from riverbed	2.5 m
	Length	159 m
Conveying Tunnel I&II	Type	Standard horseshoe, right bank
	Gradient	0.00081
	Width	3.9 m
	Total length	457 m + 680 m = 1,137 m
Conveying Canal	Type	Rectangular, reinforced concrete, right bank
	Gradient	0.0006
	Width	5 m
	Total length	59 m + 351 m = 410 m
Penstock	Type	Steel, with trifurcation
	Units	1
	Diameter	3.20 m
	Total length	57 m
Power Plant	Design Discharge	24 m ³ /s
	Net head	28 m
	Turbine type	Francis, vertical axis
	Units	3
	Installed power	6.36 MWe

Assessment team has checked the technical specification of the project is validated through name plate of equipment during the on-site visit and cross checked from the manufactures specification/7/ and found consistent with the information provided in registered PD/15/ and Joint PD and MR/4/.

Estimated Average GHG emission reductions from the project activity will be 103,398 tCO_{2e} per year and total GHG emission reductions for the chosen 10-year crediting period will be 1,033,980 tCO_{2e}. This is a project activity and geographical boundary of the project activity is fixed as Turkiye only. Hence, all the project instances shall be located within the Turkiye only.

The current monitoring period covers the period of 1st CP from 01-August-2019 to 06-April-2021 and 2nd CP from 07-April-2021 to 31-May-2022. During the Current Monitoring Period from 01-August-2019 to 31-March-2022 (1st and last date included) the project activity has contributed 244,723 tCO_{2e} GHG reductions.

Since the project activity generates electricity through hydropower a clean renewable energy source it doesn't cause any negative impact on the environment and thereby contributes to climate change mitigation efforts.

Validation team confirmed that the project activity is not a grouped project.

There are no laws and regulations governing the power generation using hydro power. The project is a voluntary effort by the project proponent. There is no legal requirement on the choice of a particular technology for power generation. The project activity conforms to all the applicable laws and regulations in India.

The project is owned by Elen Enerji Üretimi Sanayi Ticaret A.Ş. and the project owner has the legal right to control and operate the project activity as per the project license/18/.

Assessment team checked during the remote audit interview and confirms that the details of the project proponent areas below

Organization name	Elen Enerji Üretimi Sanayi Ticaret A.Ş.
Contact person	Melis Ünal
Title	Deputy Manager
Address	Akfen Yenilenebilir Enerji A.Ş. Turan Güneş Bulvarı Galip Erdem Cad. No: 3 Çankaya/ANKARA
Telephone	+90 (312) 408 10 00 - 1434
Email	munal@akfen.com.tr

Other entity involved as a consultant and details are as below:

Organization name	Life İklim ve Enerji Ltd. Şti.
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Role in the project	Project Developer
Contact person	Kerem Aslan
Title	Carbon Consultant
Address	Oğuzlar Mahallesi, 1377. Sk. No:19, 06520 Çankaya/Ankara/ TÜRKİYE
Telephone	+90 312 481 2142
Email	erem.aslan@lifeenerji.com

Project start Date: -

The start date of the project is 07-April-2011. This is the date when PA started electricity export to grid and emission reductions.

Assessment team checked the commissioning details from the provisional acceptance protocol (commissioning certificate)/01/ provided by the project proponent and start date found correct.

Project crediting period: -

Assessment team confirms that the crediting period dates for the project is as below: -

Project crediting period: Renewal crediting period

Start date of Crediting period: 07-April-2021

End date of crediting period: 06-April-2031

Total number of years: 10

The project activity adopts renewable crediting period of 10 years which can be renewed for maximum 2 times.

Project scale & estimated GHG Emissions Reductions or Removals: -

Since the installed capacity of the project activity is 46.017 MW_e. Assessment team confirms that the scale of the project activity as per the section 3.10.1 of VCS standard v4.4/09/ the projects are classified as follows:

- 1) Projects: Less than or equal to 300,000 tonnes of CO_{2e} per year
- 2) Large Projects: Greater than 300,000 tonnes of CO_{2e} per year

The project activity instances being included currently have less than 300,000 tCO_{2e} Emission reductions, hence these project activity instances are classified as “Projects”

Project Scale	
Project	✓
Large project	

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
2021 (07-April-2021 to 31-December-2021)	76,203
2022 (01-January-2022 to 31-December-2022)	103,398
2023 (01-January-2023 to 31-December-2023)	103,398
2024 (01-January-2024 to 31-December-2024)	103,398
2025 (01-January-2025 to 31-December-2025)	103,398
2026 (01-January-2026 to 31-December-2026)	103,398
2027 (01-January-2027 to 31-December-2027)	103,398
2028 (01-January-2028 to 31-December-2028)	103,398
2029 (01-January-2029 to 31-December-2029)	103,398
2030 (01-January-2030 to 31-December-2030)	103,398
2031 01-January-2031 to 06-April-2031	27,195
Total number of crediting years	10
Average annual ERs	103,398

Condition prior to project initiation: -

Assessment team during the desk review and onsite assessment confirms that the project is an installation of hydropower plant and does not involve generation of GHG emissions for the purpose of their subsequent reduction, removal or destruction. The baseline scenario remains same as 1st as described in section 3.4.4 of this report and will continue to be the baseline in the absence of project activity.

Project compliance with applicable laws, statues, and other regulatory framework: -

Assessment team confirms that the Project has received necessary approvals for development and commissioning of the project from the Turkiye Government and is in compliance to the local laws and regulations. Assessment team checked the Commissioning certificates(Provision acceptance) , power purchase agreements to confirm the project capacity and its relevant statutory requirements as per the host country regulations. The project is a voluntary initiative by the project proponent and has not been implemented to meet any local/national laws or regulatory compliances /09/. The project activity is in compliance with current laws and regulations and there are no legal and / or regulatory requirements that prevent the project implementation Also, the assessment team has confirmed that there is no such compliance requirement with an emission trading program or any binding limits on GHG emissions for the project activity in Turkiye. The project has obtained required licensees for installation and operation from the Government and is in compliance with local laws and regulations. The following Laws as relevant to the project are (Law No. and Publication Date in Official Gazette):

(1) Electricity Market Law (6446, 30-03-2013)¹

(2) Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy (5346, 18-05-2005)²

(3) Environment Law (2872, 11-08-1983)³

(4) Occupational Health and Safety Regulation (6331, 30-06-2012)⁴

(5) Forest Law (Nr. 6831)⁵

The renewable Energy generation license for Otluca HPPs has been issued considering Electricity Law and Law in utilization of Renewable Energy Resources for generating electricity

¹ See: <https://www.resmigazete.gov.tr/eskiler/2013/03/20130330.pdf>

² See: <https://www.resmigazete.gov.tr/eskiler/2005/05/20050518-1.htm>

³ See <http://www.mevzuat.gov.tr/MevzuatMetin/1.5.2872.pdf>

⁴ See: <http://www.mevzuat.gov.tr/MevzuatMetin/1.5.6331.pdf>

⁵ See: <https://www.mevzuat.gov.tr/MevzuatMetin/1.3.6831.pdf>

energy. The project activity is also within the scope of and in compliance with Energy Efficiency Law. Environment Law is also satisfied, and it has been confirmed by Ministry of Environment that the Otluca HPPs is out of Environmental Impact Assessment Regulation. Forest Law, which specifies that forest areas can be allocated by Ministry of Environment and Forestry to institutions or individuals for energy, plants if the project implementation serves common good for public. As in Türkiye there is no applicable local regulations to HPP constructions the list above includes national regulation only.

Project ownership: -

Elen Enerji Üretimi Sanayi Ticaret A.Ş. is project proponent (PP) of project activity and they have the legal right to control and operate the project activities.

The project ownership has been checked by the Assessment Team and demonstrated through below supporting documents:

- Electricity sales agreement/Power Purchase Agreement (PPA)/ 14/
- Commissioning certificate (Provisional Acceptance protocol)/01/

Further, individual compliance aspects will be provided for each of the project activity instance to be included in the project activity based on the clearances/09/certificate received for implementation of project instance.

Emission Trading programs & other binding limits: -

Assessment team confirms that the Net GHG emission reductions or removals generated by the Project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions in any Emission Trading program or other binding limits. Further, Declaration/12/ in effect of the same has been submitted by project proponent to audit team and found to be correct. Thus, it is concluded that the project activity not involved on other Emissions trading programs and other binding limits.

Leakage Management for AFOLU project: -

Not applicable to the project activity.

Commercially Sensitive Information: -

No commercially sensitive information has been excluded from the public version of the project description. The details are presented transparently to the assessment team for analysis which lead to positive conclusion for this validation and verification.

Sustainable Development: -

The project helps Türkiye to stimulate and commercialize the use of grid connected renewable energy technologies and markets. The specific economic, social and technological benefits are:

- Reducing Türkiye expanding energy deficit;
- Diversification of Turkish electricity generation mix and reduction of import dependency;

- Creation of local employment and income during construction and operation of HPP (directly as well as indirectly via contracts with local providers for supply of construction material);
- Foster infrastructural investments with connected development benefits to the local rural community in the remote project area;
- Making rural electricity supply more reliable, better available and cost efficient thanks to decreasing distances between generation and consumption points.

The project is located on the upstream part of Anamur River in Taşeli Plateau in southern Türkiye, Anamur district, Mersin province. Electricity generated by the project is fed into the national electricity grid, displacing energy that would otherwise be generated by fossil fuels. The project facilitated 476,982.26 MWh renewable electricity generation and thus contributed 244,723 tCO_{2e} of VCUs during its third monitoring period/5/ ,

Further, inline with VCS Standard v4.4/09/, “The project proponent must demonstrate that a project contributes to at least three SDGs by the end of the first monitoring period, and in each subsequent monitoring period.” As per the provision of implementation deadline, “Projects registered before 20 January 2023 shall demonstrate contributions to at least three SDGs by 20 January 2025”. However, PP have provided the information on the SDG contributions by the project activity for SDGs:

1. SDG 7.2: Renewable energy share in the total final energy consumption.
2. SDG 8.8: Quantitative employment and income generation
3. SDG 13.0: Tonnes of greenhouse gas emissions avoided or removed.

VVB have assessed the SDG 7.2, SDG 8 and SDG 13.0 and supporting documents shared by PP and found values correct as provided in Section 1.17.2 of Joint VCS PD & MR version 1.2/04/.

Hence, in view of the assessment of VCS joint PD & MR /04/ and supporting documents are listed in Appendix 1 of this report. The assessment team is able to confirm that the description contained in the VCS Joint PD and MR for renewable of crediting period of the project activity and the technical aspects of its implementation. Consequently, assessment team confirms that the project description of the project contained in the joint VCS PD and MR /04/ to be complete and accurate. The VCS joint PD and MR complied with relevant forms and guidance for completing the VCS joint PD and MR. Moreover, CL 01 and CAR 01 were raised and closed successfully.

3.2 Participation under Other GHG Programs

The project has neither been registered nor seeking registration under any other GHG programs. The project is seeking registration only in VCS program. Further, declaration for the same is checked and found correct by the assessment team. Also, assessment team checked the following registries to confirm the same. The details of the registries checked are as follows:

1. <http://cdm.unfccc.int/>
2. <http://www.goldstandard.org/>

Rejection by other GHG program: -

The Project is not rejected by other GHG programs. A declaration for the same is checked and found correct by the assessment team. Also, assessment team checked the following registries to confirm the same. The details of the registries checked are as follows:

1. <http://cdm.unfccc.int/>
2. <http://www.goldstandard.org/>
3. www.verra.org

The project has not created any form of other credits and PP has not obtained any public funding. Also, the Project does not intend to generate any other form of GHG-related environmental credit for GHG emission reductions or removals claimed under the VCS Program. The project activity does not impact the emissions of goods and services in a supply chain. Moreover, CAR 02 was raised and closed successfully.

3.3 Safeguards

3.3.1 No Net Harm

The project activity promotes environmental and socio-economic well-being as it results in zero GHG emissions due to installation and operation of clean, renewable energy technology for electricity generation. No negative environmental and socio-economic impacts have been observed/recorded for this monitoring period as confirmed by the project participant and stakeholders during the physical site visit. According to the relevant “Reporting form for Land Acquisition / Social Impacts of Portfolio Projects⁶” for Otluca HPPs, an Environmental Impact Assessment was not required/21/.

The project activity takes into account negative comments -mostly provided by mukhtar- from local stakeholders for socio-economic impacts of the project activity and implements an action plan to take necessary actions accordingly. Project activity takes precautions for possible environmental impacts of the project such as; wastewater storage and disposal of them, hazardous and domestic waste storage, lifeline water and necessary training for all employees.

3.3.2 Local Stakeholder Consultation

As per the VCS requirements, it is necessary to invite the relevant stakeholders, prior of the validation process. Moreover, the stakeholder meeting took place prior to the start date of the project activity which fulfill the requirement VCS Standard v.4.4 The VVB checked the relevance of the dates during the validation remote interview audit. The Stakeholder meeting was conducted on 30-April-2010 at Çaltıbükü Villag. The participants were local stakeholders

⁶

<https://documents1.worldbank.org/curated/en/637481468339114337/pdf/E20650v230P112000TSKB00TLUCAOPIFOEN.pdf>

directly impacted by the project. The details description has been provided in Section 2.2 of Joint PD and MR.

The stakeholders identified by the project participant were local participants directly impacted by the project and local authorities, were informed through oral and written announcement about the meeting.

Further, logbook/13/is available for comments of local stakeholders' Complaint/suggestion/feedback is maintained at site as a part of ongoing communication with stakeholders in line with VCS Standard, v 4.4 and appropriate actions taken time to time by PP. In addition, was observed mukhtar (head of the village) has the contact information (e.g mobile phone) of public relationships expert, project manager and assistant general director of the company so that the local stakeholders can be able to reach these people whenever they have any complaints, suggestions, or ideas about the project. Since mukhtar is the head of the village, he is the main contact person between the project owner and the local stakeholders. Mukhtar is made sure that there is continuous communication between the two parties. Moreover, most of the stakeholders orally convey their complaints/requests to Mukhtar instead of using the logbook. Further, there are two different declarations by Mukhtar based on the confirmation given by the Mukhtar that the notebook is in the Mukhtar and the comments by the stakeholders conveyed to the mukhtar orally. Thus, assessment team is of the opinion that the ongoing stakeholder mechanism is adequate and appropriate. Moreover, CAR 03 was raised and closed successfully.

3.3.3 Environmental Impact

In Türkiye, there are 35 Nature Preservation Area⁷ and 33 National Parks⁸/16/. The project is not located in any of these. Furthermore, in Türkiye, there are 58-registered Monument of Nature⁹ and 16 registered Nature Park. None of these Monuments of Nature and Nature Parks is located in the project area.

According to the relevant Environmental Impact Assessment Regulation¹⁰ which is in the 1.14 section for the project activity, an Environmental Impact Assessment is not required. The official letter from Environment and Forestry Ministry confirming the non-applicability of this regulation has been available during the re-validation process.

⁷ <https://www.ktb.gov.tr/EN-99884/natural-protection-areas.html>

⁸ <https://www.ktb.gov.tr/EN-99769/national-parks.html>

⁹ <https://www.ktb.gov.tr/EN-99825/nature-monuments.html>

¹⁰ <http://www.mevzuat.gov.tr/MevzuatMetin/1.5.2872.pdf>

Environmental benefits

The project helps Türkiye to stimulate and commercialize the use of grid connected renewable energy technologies and markets. The specific economic, social, and technological benefits are:

- Reducing Türkiye's expanding energy deficit;
- Diversification of Turkish electricity generation mix and reduction of import dependency;
- Creation of local employment and income during construction and operation of HPP (directly as well as indirectly via contracts with local providers for supply of construction material);
- Foster infrastructural investments with connected development benefits to the local rural community in the remote project area;

Thus, the adequacy of the analysis carried out by the project participant for the impact of the implementation of the project activity on the environment has been validated as per the VVS standard for project activity version 03.0/06/.

3.3.4 Public Comments

No comments were received by the project proponent. The details were checked by the assessment team and found correct.

3.3.5 AFOLU-Specific Safeguards

The project activity is not AFOLU project; Hence this section is not required.

3.4 Application of Methodology

3.4.1 Title and Reference

Assessment team checked that following methodology and tools are applicable for the project activity for the proposed renewal of crediting period of PA. The details are as below:

Methodology:

Methodology: "ACM0002 Grid-connected electricity generation from renewable sources --- Version 21.0"¹¹

Sectoral scopes: 1

The methodology refers to following CDM tools:

- Tool to calculate the emission factor for an electricity system (TOOL07) (Version 07.0)¹²
- Tool for the demonstration and assessment of additionality (TOOL01) (Version 07.0.0)¹³

¹¹ <https://cdm.unfccc.int/UserManagement/FileStorage/ZPFJL01OU2RYC6N3HASIXV7K84QBG9>

¹² Please see <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

¹³ Please see <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v7.0.0.pdf>

- Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period (TOOL11) (Version 03.0.1)¹⁴.

Moreover, 04 and CAR 05 were raised and closed successfully,

3.4.2 Applicability

The applied baseline methodology is justified as it has been demonstrated that the proposed project activity is:

Para No.	Applicability Conditions (With para no and reference)	Project Case	VVB Assessment
4	1. This methodology is applicable to grid-connected renewable energy power generation project activities that: <ul style="list-style-type: none"> (a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plant(s)/unit(s); (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s). 	The project activity is a greenfield hydro power plant which is renewable energy generation. hence complies to the applicability condition (3.a). Hence the project activity meets the applicability condition of the methodology.	The project activity is greenfield project. Thus, fulfil criteria.
5	2. In case the project activity involves the integration of a BESS, the methodology is applicable to grid-connected renewable energy power generation project activities that: <ul style="list-style-type: none"> (a) Integrate BESS with a Greenfield power plant; (b) Integrate a BESS together with implementing a capacity addition to (an) existing solar photovoltaic or wind power plant(s)/unit(s); (c) Integrate a BESS to (an) existing solar photovoltaic or wind power plant(s)/unit(s) without implementing 	The project activity includes installation of grid connected run-of-river power project without any Battery Energy Storage System (BESS). The electricity generated from the project activity is directly fed to the electricity grid. Therefore, the applicability condition 5 is not applicable/relevant to the project activity.	The project activity is grid connected run-of-river hydro power plant. Hence, No battery is used.

¹⁴ Please see <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-11-v3.0.1.pdf>

Para No.	Applicability Conditions (With para no and reference)	Project Case	VVB Assessment
	<p>any other changes to the existing plant(s);</p> <p>(d) Integrate a BESS together with implementing a retrofit of (an) existing solar photovoltaic or wind power plant(s)/unit(s).</p>		
6	<p>3. The methodology is applicable under the following conditions:</p> <p>(a) Hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;</p> <p>(b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant/unit 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, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.</p> <p>(c) In case of Greenfield project activities applicable under paragraph 5 (a) above, the project participants shall demonstrate that the BESS was an integral part of the design of the renewable energy project activity (e.g. by referring to feasibility studies or investment decision documents);</p> <p>(d) The BESS should be charged with electricity generated from the</p>	<p>The project activity is a greenfield grid connected hydro plant with a run-of-river reservoir and hence complies to the applicability condition (6.a) of the methodology.</p> <p>Since the project activity does not include capacity additions, retrofits, rehabilitations or replacements of existing plant/unit, the applicability condition 6.b is not applicable/relevant for the project activity.</p> <p>Although the project is a green field project activity but does not include Battery Energy Storage System (BESS). And therefore, the applicability condition 6.c is not applicable/relevant for the project activity.</p> <p>The project activity does not include Battery Energy Storage System</p>	<p>The current project activity is newly installed run-of-river hydro power plant with single reservoir.</p>

Para No.	Applicability Conditions (With para no and reference)	Project Case	VVB Assessment
	<p>associated renewable energy power plant(s). Only during exigencies may the BESS be charged with electricity from the grid or a fossil fuel electricity generator. In such cases, the corresponding GHG emissions shall be accounted for as project emissions following the requirements under section 5.4.4 below. The charging using the grid or using fossil fuel electricity generator should not amount to more than 2 per cent of the electricity generated by the project renewable energy plant during a monitoring period. During the time periods (e.g. week(s), months(s)) when the BESS consumes more than 2 per cent of the electricity for charging, the project participant shall not be entitled to issuance of the certified emission reductions for the concerned periods of the monitoring period.</p>	<p>(BESS). And therefore, the applicability condition 6.d is not applicable/relevant for the project activity.</p>	
7	<p>4. In case of hydro power plants, one of the following conditions shall apply:¹⁵</p> <p>(a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or</p> <p>(b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density, calculated using equation (7), is greater than 4 W/m²; or</p> <p>(c) The project activity results in new single or multiple reservoirs and the power density, calculated using</p>	<p>The project is resulted in construction of a new single reservoir with a power density greater than 4 W/m².</p> <p>As in the case of the PA, Power density is well above the 4 W/m² threshold (~930.31 W/m²; reservoir size: 49,464 m², installed capacity: 46,017,000 W). emissions (CH₄ and CO₂) from the reservoir are zero according to the equation (10) of ACM0002 version 21.0.</p> <p>Thus, criterion (c) is applicable for this project activity.</p>	<p>The PD of the PA is threshold (~930.31 W/m²; reservoir size: 49,464m², installed capacity: 46,017,000 W). emissions (CH₄ and CO₂) from the reservoir are zero according to the equation (10)</p>

¹⁵ Project participants wishing to undertake a hydroelectric project activity that results in a new reservoir or an increase in the volume of an existing reservoir, in particular where reservoirs have no significant vegetative biomass in the catchments area, may request a revision to the approved consolidated methodology.

Para No.	Applicability Conditions (With para no and reference)	Project Case	VVB Assessment
	<p>equation (7), is greater than 4 W/m²; or</p> <p>(d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (7), is lower than or equal to 4 W/m², all of the following conditions shall apply:</p> <p>(i) The power density calculated using the total installed capacity of the integrated project, as per equation (8), is greater than 4 W/m²;</p> <p>(ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity;</p> <p>(iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be:</p> <p>(a) Lower than or equal to 15 MW; and</p> <p>(b) Less than 10 per cent of the total installed capacity of integrated hydro power project.</p>		<p>of ACM0002 version 21.0.</p> <p>Thus, criterion (c) is applicable for this project activity.</p>
8	<p>5. In the case of integrated hydro power projects, project participants shall:</p> <p>(a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or</p> <p>(b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration</p>	<p>The project activity is a hydro power plant with a single run-of-river reservoir. Thus, this criterion is not applicable for this project activity.</p>	<p>The project activity is a hydro power plant with a single run-of-river reservoir. PA is not a integrated hydro power. Thus, this criterion is not applicable for this project activity.</p>

Para No.	Applicability Conditions (With para no and reference)	Project Case	VVB Assessment
	<p>has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum of five years prior to the implementation of the CDM project activity.</p>		
9	<p>The methodology is not applicable to:</p> <p>(a) 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;</p> <p>(b) Biomass fired power plants/units.</p>	<p>The project activity is greenfield grid-connected hydro power project for generation of electricity hence the applicability condition 9” is not relevant as the same pertains to switching from fossil fuels to renewable energy sources or biomass fired power plants/units.</p>	<p>Hydro power is being utilized for electricity generation ,no fossil fuel has been used.</p>
10	<p>In the case of retrofits, rehabilitations, 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, that is 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”.</p>	<p>The project activity involves construction and operation of greenfield grid-connected run-of-river hydro power project for generation of electricity hence the applicability condition 10 is not relevant as the same pertains to retrofits,rehabilitations, replacements, or capacity additions.</p>	<p>The current project activity is newly constructed run-of-river hydro power plant.</p>

In addition to the above applicability criteria, the project also meets the criteria of the following methodological tools:

- Compliance to applicability conditions of Methodological Tool: Tool 01: Tool for the demonstration and assessment of additionality ties (Version 7.0.0) is demonstrated in section 3.5 of Joint PD & MR
- Compliance to applicability conditions of Methodological Tool: Tool 11: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” (version 03.0.1) are demonstrated in section 3.4 of Joint PD & MR

LGAI Technological Center S.A. (Applus+ Certification) confirms that the application of the baseline methodology is transparent and conservative and confirms that the chosen baseline and monitoring methodology is applicable to the project activity.

3.4.3 Project Boundary

As per ACM0002, version 21 “The spatial extent of the project extends to the project power plant and all power plant connected physically to the electricity system that the project power plant that connected to through the national grid and to be confined to physical, geographical site of renewable generating units. The boundary also extends to the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to.” Therefore, the entire Turkiye grid and all connected power plants have been considered in the project boundary for the proposed VCS project activity. The grid is also part of the project boundary as the project units are connected to the grid through power evacuation at common point.

The sources and GHG gases involved for proposed Project activity are as below:

Source		Gas	Included?	Justification/Explanation
Baseline	CO2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO ₂	Yes	Main emission source
		CH ₄	NO	Minor emission source
		N ₂ O	NO	Minor emission source
Project	Emissions of CH ₄ from the reservoir	CO ₂	NO	No CO ₂ emissions are emitted from the project
		CH ₄	NO	Minor emission source. The project activity will not create a new reservoir. Therefore, there will not be any project emission. This is conservative
		N ₂ O	NO	Project activity does not emit N ₂ O

3.4.4 Baseline Scenario

National policies and circumstances relevant to the baseline of the project activity:

(1) Electricity Market Law (6446, 30-03-2013)¹⁶

(2) Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy (5346, 18-05-2005)¹⁷

The renewable Energy generation license for the project activities have been issued considering Electricity Law and Law in utilization of Renewable Energy Resources for generating electricity energy. The project is also within the scope of and in compliance with Energy Efficiency Law. Environment Law is also satisfied, and it has been confirmed by Ministry of Environment that the project activity is HPPs is out of Environmental Impact Assessment Regulation. Forest Law, which specifies that forest areas can be allocated by Ministry of Environment and Forestry to institutions or individuals for energy, plants if the project implementation serves common good for public. As in Türkiye there is no applicable local regulations to HPP constructions the list above includes national regulation only.

The assessment team assessed the validity of the updated baseline through an assessment of the following points:

- a) The impact of new relevant national and/or sectoral policies and circumstances on the baseline considering relevant guidance from the Board with regard to renewal of the crediting period of the VCS project activity
- b) The correctness of the application of the approved methodologies for the determination of the continued validity of the updated baseline and the estimation of GHG emission reductions for the applicable crediting period of the VCS project activity.
- c) The assessment of estimation of emission reductions for the applicable crediting period.

The validity of the baseline has been assessed as per the methodological tool “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” version 03.0.1. The assessment is performed as follows:

The methodological tool “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period”¹⁸ (version 03.0.1) is adopted to assess

¹⁶ See: <https://www.resmigazete.gov.tr/eskiler/2013/03/20130330.pdf>

¹⁷ See: <https://www.resmigazete.gov.tr/eskiler/2005/05/20050518-1.htm>

¹⁸ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf>

the continued validity of the baseline and to update the baseline. This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period, as required by paragraph 49 (a) of the modalities and procedures of the clean development mechanism. According to this tool, the following steps are applied.

Step 1: Assess the validity of the current baseline for the next crediting period

The validity of the current baseline is assessed using the following Sub-steps:

Sub Step 1.1 Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies.

The project baseline is the “Grid-connected electricity generation”. It complies with the current legal framework. There are no additional laws that came into force that has an impact on the project activity and the project activity is still in line with the available law and regulations.

Sub Step 1.2 Assess the impact of circumstances.

The new national circumstances have an impact on the EF of the grid and thus on the project’s current baseline emissions. Accordingly, the EF is updated for the second crediting period in conformity with the latest version of the publication of the Türkiye’s National Electric Grid Emission Factor for the year of 2020. There has been no major deviation or change in the market characteristic during the first crediting period.

Sub Step 1.3 Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested.

Operational lifetime of the HPP is calculated as 40 years for the Otluca HPPs by using the ‘Tool to determine the remaining lifetime of equipment’ (version 1). In the tool it is said that lifetime for the Hydro Turbines is 150,000 hours. In order to determine operational lifetime of the HPP firstly capacity factor of the HPP should be calculated because HPP will not be in operation for whole year. By dividing annual generation (224,000 MWh/year) to the installed capacity (46.017 MW), the operation time in a year will be found which is 4,869.57 hr/year. Since operation lifetime is related to the economic analysis, in the calculation of operational lifetime annual generation and installed capacity figures are taken from Generation License of the HPP. Finally dividing lifetime of the equipment (150,000 hours) to the operational time per year, lifetime of the equipment will be found in terms of year which is 30.8. To be conservative operational lifetime of the hydro turbines will be found as 31 years. Also, the operational lifetime is in line with the technical lifetime of the electromechanical equipment.

Sub Step 1.4 Assessment of validity of the data and parameters.

The emissions reduction calculations are based on two main parameters: the energy produced and the grid emission factor. The latter will be updated as explained in the next paragraph. As a requirement of the methodology, only the grid emission factor has been updated during the second crediting period renewal.

Step 2: Update the current baseline and the data and parameters

Sub Step 2.1: Update the current baseline

As confirmed in Step 1, under the current context of the sectoral policies and circumstances, the project baseline for the next crediting period is the use of electricity from the national grid. This is conformed to the provisions of the latest version of the approved applicable methodology. Therefore, there has been no deviation in the baseline scenario.

Sub Step 2.2: Update the data and parameters

The grid emission factor is updated according to the publication of Turkish Ministry of Energy and Natural Resources that is indicating Türkiye's National Electric Grid Emission Factor for the year of 2020.

According to details of publication¹⁹,

Parameter	Value	Source
EF _{grid, CM,y}	0.7424 tCO _{2e} /MWh	For the combined margin CO ₂ emission factor that were used to calculate estimated emission reductions, publication of Turkish Ministry of Energy and Natural Resources which is indicating Türkiye's National Electric Grid Emission Factor for the year of 2020 was used. Please see: https://enerji.gov.tr/evced-cevre-ve-iklim-turkiye-ulusal-elektrik-sebekesi-emisyon-faktoru
EF _{grid, OM,y}	0.3680 tCO _{2e} /MWh	For the emission BM factor, that were used to calculate estimated emission reductions, publication of Turkish Ministry of Energy and Natural Resources which is indicating Türkiye's National Electric Grid Emission Factor for the year of 2020 was used. Publication includes calculated Emission Factor values that are Operating Margin (OM), Growth Based Margin (Build Margin-BM) and Combined Margin (CM) Emission Factors, for the relevant year with usage of

¹⁹ $(0.7424 * 0.25 + 0.3680 * 0.75 = 0.4616 \text{ tCO}_2/\text{MWh})$

<https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%B0klim/%C4%B0klimDe%C4%9Fi%C5%9Fikli%C4%9Fi/TUEmisyonFktr/Belgeler/Bform2020.pdf>

Parameter	Value	Source
		the IPCC's Clean Development Methodology Tool 07-V07.0 ²⁰ .
EF _{grid, BM, y}	0.4616 tCO _{2e} /MWh	For the combined margin CO ₂ emission factor that were used to calculate estimated emission reductions, publication of Turkish Ministry of Energy and Natural Resources which is indicating Türkiye's National Electric Grid Emission Factor for the year of 2020 was used. Please see: https://enerji.gov.tr/evced-cevre-ve-iklim-turkiye-ulusal-elektrik-sebekesi-emisyon-faktoru

In addition, there was no change for the capacity and reservoir area during the 1st crediting period. Therefore, PP opted not to keep there is further no need to monitor the CAP_{PJ} and A_{PJ} parameters for the 3rd monitoring period under 1st crediting period. Even, newest version of ACM0002 version 21.0 state as the monitoring frequency²¹: "Once at the beginning of each crediting period" for CAP_{PJ} and A_{PJ} parameters. It is apparent that these two parameters, which are monitored in this (3rd) monitoring period under 2nd crediting period, do not need to be monitored for the next verifications under 2nd crediting period. Thus, only parameter will be monitored for the next verification periods under 2nd crediting period will be "EG_{PJ, facility, y}" which is related to electricity production.

3.4.5 Additionality

In accordance with the paragraph 3.8.9, a full reassessment of additionality is not required when renewing the project crediting period unless otherwise specified in the methodology. Project Proponent has submitted the Joint PD and MR for Joint validation & Verification for renewal of crediting period. The additionality of the project activity is same as per registered VCS PD for the first crediting period. investments analyses show that the project is not economically feasible without VCUs income. Moreover, the sensitivity analysis described in registered PD of 1st CP confirmed that the project activity is unlikely to be economically attractive without the revenues from VCUs as even the maximum IRR result for the best-case scenario (11.24%) is below the benchmark, which is 15%. Consequently, the project activity is still additional, and it still has

²⁰ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

²¹ Please see: <https://cdm.unfccc.int/UserManagement/FileStorage/ZPFJL010U2RYC6N3HASIXV7K840BG9>
(Page 28 - Data / Parameter table 17.)

ongoing financial need. Therefore, it is not applicable during the validation of renewal of crediting period.

Project compliance with applicable laws, statutes and other regulatory surplus / frameworks

Project proponent has demonstrated the regulatory Surplus in accordance with the requirements set out in the VCS Program V.4.3 and VCS standard v4.4 in Section 1,14 and Section 3.5 of revised Joint PD and MR submitted for RCP. Assessment team confirms that there is no any regulation to install the hydropower projects and the project activity is a voluntary step taken by PP. Baseline emission factor as mentioned in Section 3.4 of Joint PD and MR shows that the fossil fuel based power generation is dominant over the renewable based power generation, thus baseline scenario remains same as original. As discussed in section 3.5 of VCS Joint PD and MR, there is no any Impact of the national and/or sectoral policies and circumstances upon the baseline scenario of the project activity and project activity is additional as per CDM Tool for the demonstration and assessment of additionality and as per VCS Program rules.

Laws as relevant to the project are (Law No. and Publication Date in Official Gazette):

- (1) Electricity Market Law (6446, 30-03-2013)²²
- (2) Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy (5346, 18-05-2005)²³
- (3) Environment Law (2872, 11-08-1983)²⁴
- (4) Occupational Health and Safety Regulation (6331, 30-06-2012)²⁵
- (5) Forest Law (Nr. 6831)²⁶

Assessment team confirms that any enforced law, statute, regulatory surplus, or other regulatory framework shall not mandate the project. The project activity is not mandated by any state or national laws. The project proponent is not bound by any legislative mandate to implement the project activity

The project is in compliance with the given laws. Assessment team confirms that the description of the VCS project activity, as contained in the VCS Joint PD & MR sufficiently covers all relevant elements, is accurate and complete and that it provides the reader with a clear understanding of the nature of the VCS project activity. Moreover, CAR 06 was raised and closed successfully,

²² See: <https://www.resmigazete.gov.tr/eskiler/2013/03/20130330.pdf>

²³ See: <https://www.resmigazete.gov.tr/eskiler/2005/05/20050518-1.htm>

²⁴ See <http://www.mevzuat.gov.tr/MevzuatMetin/1.5.2872.pdf>

²⁵ See: <http://www.mevzuat.gov.tr/MevzuatMetin/1.5.6331.pdf>

²⁶ See: <https://www.mevzuat.gov.tr/MevzuatMetin/1.3.6831.pdf>

3.4.6 Quantification of GHG Emission Reductions and Removals

Assessment team checked the baseline, project and leakage calculation and confirm that the evaluation of baseline, project and leakage is as per the approved methodology and formula used to calculate the same is correct. The detail analysis is as below:

Baseline Emissions: As per para 47 of ACM0002, Grid-connected electricity generation from renewable sources --Version 21.0/09/, the Baseline emissions for other systems are the product of amount electricity displaced with the electricity produced by the renewable generating unit and an emission factor.

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

where:

BE_y	Baseline emissions in year y (t CO ₂ /yr)
$EG_{PJ,y}$	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/yr)
$EF_{grid,CM,y}$	Combined margin CO ₂ emission factor for grid connected power generation in year y calculated using TOOL07 (t CO ₂ /MWh)

Since the project is a green-field power plant therefore calculation of quantity of net electricity generation ($EG_{PJ,y}$) is carried out in accordance to section 5.5.1.1, paragraph 49 of the approved consolidated Methodology ACM0002, Version 21.0 :

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

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

Project Emissions: -

According to the applied methodologies, for hydropower plants if the power density of the reservoir is higher than 10 W/m², then $PE_y = 0$. The power density of the project is calculated as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where;

PD = Power density of the project activity (W/m²)

Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W)

Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero

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 (m²)

ABL = 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 (m²). For new reservoirs, this value is zero.

The project activity is a green field run-of-river hydropower project, so Cap_{BL} and A_{BL} are equal to zero. For Otluca HPP Run-of-River Hydro Project:

$A_{PJ} = 49,464 \text{ m}^2$ (as per topography/satellite image/23)/)

$Cap_{PJ} = 46,017,000 \text{ W}$

$PD = 46,017,000 / 49,464 = 930.31 \text{ W/m}^2$

As the power density is higher than 10W/m², the project emissions of the project are equal to zero (PE_y=0). Thus, PE_y = 0

Leakage Emissions: - As per the methodology ACM0002 v21, para 61, no other leakage emissions are considered. In accordance to the methodology “The emissions potentially arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport etc.) are neglected”.

Therefore, the net emission reduction is calculated as

$$ER_y = BE_y - PE_y$$

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
2021 (07-April-2021 – 31-December-2021)	76,203	0	0	76,203
2022 (01-January-2022 – 31-December-2022)	103,398	0	0	103,398
2023(01-January-2023 – 31-December-2023)	103,398	0	0	103,398
2024 (01-January-2024 – 31-December-2024)	103,398	0	0	103,398
2025 (01-January-2025 – 31-December-2025)	103,398	0	0	103,398
2026 (01-January-2026 – 31-December-2026)	103,398	0	0	103,398
2027 (01-January-2027 – 31-December-2027)	103,398	0	0	103,398

2028 (01-January-2028 – 31-December-2028)	103,398	0	0	103,398
2029 (01-January-2029 – 31-December-2029)	103,398	0	0	103,398
2030 (01-January-2030 – 31-December-2030)	103,398	0	0	103,398
2031 (01-January-2031 – 06-April-2031)	27,195	0	0	27,195
Total	1,033,980	0	0	1,033,980

The total emission reductions are 1,033,980 tCO₂e over 10 years (second) crediting period.

Through the assessment process validation team confirmed that:

- All the assumptions and data used by the project participants are listed including their references and sources;
- All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the Joint PD and MR;
- All values used in the Joint PD and MR are considered reasonable in the context of the VCS project activity;
- The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;

All estimates of the baseline emissions can be replicated using the data and parameter values provided in the Joint PD and MR. Moreover, CAR 07 was raised and closed successfully,

3.4.7 Methodology Deviations

The assessment team confirms that the Joint PD and MR complies with the requirements in the Approved consolidated methodology ACM0002, version 21.0. Hence, there is no any methodology deviation applicable for the project activity.

3.4.8 Monitoring Plan

The project monitoring plan is in compliance with the approved applied methodology ACM0002, version 21.0. In accordance with the applied methodology, project emission and leakage has not been consisted. Assessment team checked the monitoring practice onsite during physical site visit and confirmed that the monitor-able action plan for the same has been included in section 5.3 of the Joint PD and MR/4/. Validation team confirms that the project participant is able to implement the monitoring plan

Parameters determined ex-ante:

Emission factor calculations have been done for the second crediting period in accordance with “Tool to calculate the emission factor for an electricity system” (Version 07), para 86 clause (b), calculation of the combined margin for renewable energy projects (except wind and solar) second crediting period, the following values need to be used for w_{OM} and w_{BM} .

According to Tool 07’s specifications, renewable energy projects – except for wind and solar ones – should calculate the CM factor for the second and third crediting period by taking w_{OM} as 0.25 and w_{BM} as 0.75.²⁷

The data used to calculate the combined margin were published by Türkiye’s Energy and Natural Resources Ministry in 20-September-2022. The data -which includes build margin and operating margin factors - have been obtained from the ministry’s most recent factsheet. This document contains the latest available data in the country and is issued by the highest authority to make such calculations and determine the factors. The combined margin emission factor is calculated as follows:

$$EG_{grid,CM,y} = 0.25 * 0.7424 = 0.75 * -.3680$$

$$= 0.4616 \text{ tCO}_2/\text{MWh}$$

Parameters determined ex-post:

The project applies approved consolidated methodology ACM0002: Grid-connected electricity generation from renewable sources --- Version 21.0”, as per the applied methodology “Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)” i.e $EG_{facility,y}$ is to be monitored.

The $EG_{facility,y}$ data are subject to the accounting quality systems of both parties to the power purchase agreement, TEİAŞ and Elen Enerji Üretimi Sanayi Ticaret A.Ş. With this, no additional structures or processes must be implemented to insure the availability of necessary data for monitoring. At the end of the monitoring period, the data from the monthly meter reading records by PMUM (as mentioned in Joint PD and MR, PMUM records were given as reference for electricity generation. However, the name of this institution was changed, and electricity generation records have been belonged to EPIAŞ) Therefore, EPIAŞ records are adding up to the yearly electricity generation and multiplied with the combined margin emission factor with the help of an excel spreadsheet that also contains the combined margin calculation. In addition to the EPIAŞ records, TEİAŞ is responsible for reading monthly on both main and backup meters. Meter reading protocols for the whole of the monitoring period have been provided as cross check values apart from the invoices.

The project owner has no right to intervene in electricity meters. The electricity meters are controlling remotely to ensure the uninterrupted electricity generation. Therefore, the calibration

²⁷ Tool 07 v.07, Section 6.6.1.

and/or test protocol of the electricity meters depend on whether project owner/TEİAŞ has any doubt on the electricity values that is steadily monitoring. TEİAŞ has a right to conduct the calibration procedure or the testing procedure if any mismatching occurs between the values monitored by themselves and values monitored by project owner. The other case is that project owner can request testing protocol or calibration protocol from TEİAŞ if any mismatching occurs between the values monitored by TEİAŞ and values monitored by project owner. No non-conformance has been identified between follow-up by TEİAŞ and project owner's internal auditing so far. As above mentioned, the data acquisition and management and quality assurance procedures that are anyway in place, no additional procedures must be established for the monitoring plan.

It is reported that the data will be kept for 2 years following the end of the crediting period or till the last issuance of VCUs for the project activity whichever occurs later.

The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the interview.

3.5 Non-Permanence Risk Analysis

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
NA	NA	NA	NA	NA

4 VERIFICATION FINDINGS

4.1 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the monitoring plan in the Joint PD & MR. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of Joint PD & MR.
Findings	CAR 08 raised on this section and closed successfully. Please refer Appendix 1 for further details
Conclusion	Ex-ante Parameter:

	<p>Ex-ante values for 1st Crediting Period:</p> <p>EF_{grid, OM, y}: Parameter is fixed ex-ante for the entire 1st crediting period and as per the registered PD/15/ same was fixed 0.6534 tCO₂/MWh.</p> <p>EF_{grid, BM, y}: Parameter is fixed ex-ante for the entire 1st crediting period and as per the registered PD/15/ same was fixed 0.4448 tCO₂/MWh tCO₂/MWh.</p> <p>EF_{grid, CM, y}: Parameter is fixed ex-ante for the entire 1st crediting period and as per the registered PD/15/ same is fixed 0.5491 tCO₂/MWh. Verification team found same was used in the ER calculations.</p> <p>Ex ante value of OM and BM emission and combined margin value found in consistent with registered VCS PD (1st CP).</p> <p>Other ex-ante parameters are as follows:</p> <p>Gross electricity generation (MWh); Gross Electricity supplied to the grid by relevant sources (2006-2008) used for calculation of grid emission factor for the 1st crediting period. The values are 131,681,100 MWh; 154,982,500 MWh; 163,919,400 MWh.</p> <p>Import and Export data is used to identify total net electricity fed into the grid in the years of 2006, 2007 and 2008.</p> <p>Turkish Electricity Transmission Company (TEİAŞ), Annual Development of Türkiye's Gross Electricity Generation of Primary Energy Resources (1975-2008) TEİAŞ</p> <p>Net Electricity Generation: Net electricity fed into the grid. Used for the calculation of the net/gross relation (Including Import and Export figures).</p> <p>This data is used to find relation between the gross and net electricity delivered to the grid by fossil fuel fired power plants. Data was used for calculation of ex-ante grid emission factor for the 1st crediting period. The values are 169,543.1 GWh; 183,339.7 GWh; 189,761.9 GWh.</p> <p>Sample Group for BM emission factor: Name of the plants, MW capacities, fuel types, annual electricity generations and dates of commissioning.</p> <p>TEİAŞ is the national electricity transmission company, which makes available the official data of all power plants in Türkiye. The latest data available during PD preparation was for 2008.</p> <p>EF_{CO2, i, y} (tCO₂/GJ): Emission factor for fuel type i</p>
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	<p>IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the IPCC Guidelines on National GHG Inventories</p> <p>$\eta_{m,y}$- Average energy conversion efficiency of power unit m in year y. Default value for natural gas is used from “Tool to calculate the emission factor for an electricity system” version 07.</p> <p>$HV_{i,y}$- Mass or volume unit Heating Values of Fuels Consumed in Thermal Power Plants in Türkiye by The Electric Utilities, TEİAŞ. Heating Values of fuels consumed for electricity generation in the years of 2006, 2007 and 2008. These data were use for calculation of ex-ante grid emission factor.</p> <p>$FC_{i,y}$- Mass or volume unit Annual Development of Fuels Consumed in Thermal Power Plants in Türkiye by The Electric Utilities, TEİAŞ. Fuels consumed for electricity generation in the years of 2006, 2007 and 2008 used for ex-ante grid emission factor calculation.</p> <p>$NCV_{i,y}$ (TJ/kton, TJ/million m³)- Net Calorific Value of fuel types in the years of 2006, 2007 and 2008, Calculated by using $HV_{i,y}$ to $FC_{i,y}$ as Net Calorific Values of fuel types are not directly available in Türkiye. These data were used for calculation of ex-ante grid emission factor.Hence, no relevance of data during the current MP.</p> <p>Ex-ante values for for 2nd Crediting Period</p> <p>$EF_{grid,OM,y}$= Parameter is fixed ex-ante for the entire 2nd crediting period. The latest data available for the year 2020 published by Türkiye’s Energy and Natural Resources Ministry on dated 20-September-2022²⁸. PP has sourced the values directly from the publication. The calculated value of OM is 0.7424 tCO₂/MWh.</p> <p>$EF_{grid,BM,y}$= Parameter is fixed ex-ante for the entire 2nd crediting period. Ministry of Energy and Natural Resources makes available the official data in Türkiye. The latest data available for the year 2020 published by Türkiye’s Energy and Natural Resources Ministry on dated 20-September-2022²⁹. PP has sourced the value BM directly the from the publication. The value of BM is calculated to be 0.3680 tCO₂/MWh.</p>
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²⁸ <https://enerji.gov.tr/evced-cevre-ve-iklim-turkiye-ulusal-elektrik-sebekesi-emisyon-faktoru>

²⁹ <https://enerji.gov.tr/evced-cevre-ve-iklim-turkiye-ulusal-elektrik-sebekesi-emisyon-faktoru>

	<p>EF_{grid,CM,y} = Parameter is fixed ex-ante for the entire 2nd crediting period. The calculated value of CM is 0.4616 tCO₂/MWh. The latest data available for the year 2020 published by Türkiye’s Energy and Natural Resources Ministry on dated 20-September-2022/10/. The data used to calculate the combined margin were published by Türkiye’s Energy and Natural Resources Ministry on dated:20-September-2022/10/.</p> <p>The grid Emission factor has been calculated for the renewal of crediting period on accordance with the “Tool to calculate the emission factor for an electricity system” (Version 07), Calculation of the combined margin for renewable energy projects (except wind and solar) second crediting period, the following values need to be used for w_{OM} and w_{BM}.</p> <p>According to Tool 07’s specifications, renewable energy projects – except for wind and solar ones – should calculate the CM factor for the second and third crediting period by taking w_{OM} as 0.25 and w_{BM} as 0.75.³⁰</p> <p>Assessment team has checked the sources of data and found correct. Assessment team also confirmed that this the latest data available with the PP, thus accepted by VVB.</p> <p>The baseline Emissions for a given year is calculated by multiplying the energy baseline (EB) with the combined margin grid emission factor. The grid in this case would be the ‘National grid of Türkiye’</p> <p>Formula Used for calculation of baseline emission for the 2nd crediting period: -</p> $BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$ <p>Where:</p> <p>BE_y = Baseline emissions in year y (tCO₂/yr).</p> <p>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).</p> <p>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” v07.0. (tCO₂/MWh).</p> <p>The project activity is the installation of a Greenfield power plant, Hence, EG_{PJ,y} = EG_{facility,y}</p>
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³⁰ Tool 07 v.07, Section 6.6.1.

	<p>Where:</p> <p>$EG_{PJ,y}$ = 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/yr).</p> <p>$EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr).</p> <p>$BE_y = EG_{Facility,y} \times EF_{grid,CM,y}$ $BE_y = 224,000 \text{ MWh/year} \times 0.4616 \text{ tCO}_2/\text{MWh}$ $= 103,398 \text{ tCO}_2/\text{year}(\text{round down})$</p> <p>Project emissions: The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m². The power of the PA is above the 10W/m² threshold (930.31 W/m²; reservoir size: 49,464 m², installed capacity: 46,017,000 W). Hence, the project emission ($PE_{HP,y}$) is zero in line with the section 5.4.3 para 42(C),Equation (10)] of the ACM0002 methodology version 21.0. Thus, $PE_y=0$</p> <p>Leakage: No Leakage emissions are considered. The main emission potentially giving rise to leakage in the context of electrical sector projects is emission arising due to activities arising such as power plant construction and upstream emission from fossil fuel use (e.g. extraction, processing, and transport). These emission sources are neglected. Therefore, $BE_y = ER_y$ $ER_y = PE_y - LE_y = 0 - 0$ $ER_y = 103,398 \text{ tCO}_2/\text{year}$</p> <p>Monitored Parameter: $EG_y/EG_{facility,y} = 476,982.26\text{MWh}$</p> <p>The verification team has checked the monthly settlement notification EPIAS screenshots submitted by PP for quantity of net electricity supplied to the grid and found correct. Assessment team has also crosschecked data with sales data from TEİAŞ receipts and found consistent. The parameter has been monitored and recorded as per the monitoring plan in the registered PD and joint PD & MR. The verification team has crosschecked the revised emission reduction sheet and monitoring report data with the monthly Breakup sheet and invoice and found all the values are matching.</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Crediting Period</th> <th>MWh</th> </tr> </thead> <tbody> <tr> <td>01-August-2019 to 31-December-2019</td> <td>First Crediting Period</td> <td>39,896.94</td> </tr> </tbody> </table>	Year	Crediting Period	MWh	01-August-2019 to 31-December-2019	First Crediting Period	39,896.94
Year	Crediting Period	MWh					
01-August-2019 to 31-December-2019	First Crediting Period	39,896.94					

	01-January-2020 to 31-December-2020		184,964.20
	01-January-2021 to 06-April-2021		55,708.03
		Sub Total	280,569.17
	07-April-2021 to 31-December-2021	Second Crediting Period	83,748.29
	01-January-2022 to 31-May-2022		112,664.80
		Sub Total	196,413.09
	Total		476,982.26

Monitoring Period under first Crediting Period (01-August-2019 to 06-April-2021):
 Baseline Emission in year 2019(01-August-2019 to 31-December-2019),
 $BE_y = 39,896.94 \text{ MWh} * 0.5491 \text{ tCO}_2\text{e/MWh}$
 $= 21,907 \text{ tCO}_2\text{e}$ (Rounded Down Value)

Baseline Emission in 2020(01-January-2020 to 31-December-2020),
 $BE_y = 184,964.20 \text{ MWh} * 0.5491 \text{ tCO}_2\text{e/MWh}$
 $= 101,563 \text{ tCO}_2\text{e}$ (Rounded Down Value)

Baseline Emission in 2021(01-January-2021 to 06-April-2021),
 $BE_y = 55,708.03 \text{ MWh} * 0.5491 \text{ tCO}_2\text{e/MWh}$
 $= 30,589 \text{ tCO}_2\text{e}$ (Rounded Down Value)

Monitoring Period under 2nd Crediting Period (07-April-2021 to 31-December-2021):
 Baseline Emission in 2021(07-April-2021 to 21-December-2021),
 $BE_y = 83,748.29 \text{ MWh} * 0.4616 \text{ tCO}_2\text{e/MWh}$
 $= 38,658 \text{ tCO}_2\text{e}$ (Rounded Down Value)

Baseline Emission in 2022(01-January-2022 to 31-May-2022),
 $BE_y = 112,664.80 \text{ MWh} * 0.4616^{31} \text{ tCO}_2\text{e/MWh}$
 $= 52,006 \text{ tCO}_2\text{e}$ (Rounded Down Value)

Total Baseline Emission achieved throughout current Monitoring Period (01-August-2019 to 31-May-2022) = **21,907 tCO₂e + 101,563 tCO₂e + 30,589 tCO₂e + 38,658 tCO₂e + 52,006 tCO₂e**

Therefore, total baseline emissions during the current monitoring period are **244,723 tCO₂e**

³¹ From 07-April-2022, second crediting period of the project activity started so the Combined Margin Emission Factor of second crediting period 0.4616CO₂/MWh has been applied.

	<p>Emission reductions</p> <p>According to the applied methodology ACM0002 version 12.1.0/ACM0002, version 21.0 and the registered PD/Joint PD & MR, the GHG emission reductions are calculated as follows:</p> $ER_y = BE_y - PE_y$ <p>Where:</p> <p>ER_y = Emission reductions in year y (tCO₂e/yr) BE_y = Baseline emissions in year y (tCO₂e/yr) PE_y = Project emissions in year y (tCO₂e/yr)</p> <p>Project Emissions</p> <p>According to the applied methodologies, for hydropower plants if the power density of the reservoir is higher than 10 W/m², then PE_y = 0. The power density of the project is calculated as follows:</p> $PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$ <p>Where;</p> <p>PD = Power density of the project activity (W/m²) Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W) Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero 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 (m²) 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 (m²). For new reservoirs, this value is zero.</p> <p>The project activity is a green field run-of-river hydropower project, so Cap_{BL} and A_{BL} are equal to zero. For Otluca HPP Run-of-River Hydro Project:</p> <p>A_{PJ} = 49,464 m² (verified with topographical surveys or maps/23/) Cap_{PJ} = 46,017,000 W (verified with project license, turbine data /name plate and photos of the generator and turbine of each turbine which mentioned the capacity /24/) PD = 46,017,000 / 49,464 = 930.31 W/m²</p> <p>As the power density is higher than 10W/m², the project emissions of the project are equal to zero (PE_y=0). The leakage can be neglected in line with the applied methodologies. Therefore, the emission reductions generated during the monitoring period are equal to baseline emissions</p>
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	<p>Hence, $ER_y = BE_y - PE_y$ $= 244,723 \text{ tCO}_2\text{e} - 0$ $= 244,723 \text{ tCO}_2\text{e}$</p> <p>Other monitoring parameters:</p> <p>CAP_{PJ}: The installed capacity of the power plant is monitored in accordance with the registered PD (CP1)/15/ and Joint PD & MR (2nd CP)/4/ . supplier information on the equipment and the number of turbines. The project activity consists of 3 sub-projects. These projects are Otluca-1, Boğuntu and Otluca-2. Each project has 3 Francis turbines. For Otluca-1, the total installed capacity is 36.888 MWe, for Boğuntu, it is 3.321 MWe and for Otluca-2, it is 5.808 MWe. Therefore, the total of the installed capacity of the project activity is 46.017 MWe which is in line with the provisional acceptance protocol. Assessment team hereby confirms that there hasn't been any change regarding the total installed capacity of the project.</p> <p>AP_J: The area of the reservoir is monitored via topographical surveys, maps and satellite pictures/11/. The reservoir area has been checked through the reservoir layout drawing of the project as in the registered PD(1st CP) and Joint PD and MR(2nd CP). The reservoir area is 49,464 m². There is no change in reservoir area.</p> <p>Assessment team confirms through the on-site visit and reviewed documents that all physical features of the project activity including data collecting systems and storage have been implemented in accordance with the registered PD and Joint PD & MR. The project activity is completely operational and the same has been confirmed through the provided evidences including EPIAS records, TEIAS meter reading protocols, electricity meter test protocols.</p>
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4.2 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the Calibration details of the monitoring meters with the calibration certificates.
Findings	CAR 09 and CAR 10 were raised on this section and closed successfully. Please refer Appendix 1 for further details
Conclusion	The verification team checked meters details during site visit including the calibration certificates of the monitoring equipment's used during the current monitoring period. Quantity of net electricity displaced as a result of the implementation of this project activity is the monitoring parameter as per the Joint VCS PD &

MR/01/. The net electricity is measured continuously by one main electricity meter at the grid interface and recorded monthly. There is also one back up electricity meter. The metering arrangement is bi-directional energy meters of accuracy class 0.2s. The meters to be used in the electricity market shall be compliant with the standards of Turkish Standards Institute or IEC and have obtained "Type and System Approval" certificate from the Ministry of Trade and Industry.' The calibration frequency of meters is once in 10 years in with paragraph (b) of the Article 9 of the 'Regulation of Metering and Testing of Metering Systems' (Regulation) of Ministry states.

The details of meters are as follows:

Name	Serial Number	Brand - Model	Accuracy Class
Main Meter	4241357	EMH - LZQJ-XC	0.2s
Back-up meter	4241358	EMH - LZQJ-XC	0.2s

The serial number of the currently available main meter and backup meter been verified during the site visit and meter change protocol/22/ dated 20-March-2014 and Dated 12-November-2020/22/.

The first protocol date (first calibration record) date was on 20-March-2014 for current meters. Latest test record date is 12-November-2020 for both meters during this monitoring period. Assessment team has checked the Meter protocol and confirms that the calibration details of meters are provided I Appendix 5 of this report.

Verification team confirms that main meter and backup meter are of accuracy class of 0.2s and are calibrated as per the calibration frequency mentioned in monitoring plan in registered PD and Joint PD & MR/4/, No delayed calibrations were observed in the project activity for this monitoring period. All the meters are of same accuracy class i.e., 0.2s as per the requirement of the registered PD/15/ and Joint PD & MR/4/.

The break down log is checked and there is no major breakdown during the monitoring period. No unforced error observed. No sampling procedure applied for monitoring of the data parameter and entire documents were checked by the assessment team to arrive at positive verification conclusions. The monitoring plan is followed at the project site. The monitoring meters were calibrated in line with the registered monitoring plan and there was no delay in calibration observed. Thus, assessment team concluded that the evidences are sufficient in quantity, and appropriate for the quality, to determine the GHG reductions and removals.

Based on the above, the assessment team confirms the sufficiency and appropriateness of the quality of evidence provided by the PP to determine

	the GHG reductions and further deems them to be acceptable.
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5 VALIDATION AND VERIFICATION CONCLUSION

LGAI Technological Center, S.A. (Applus+ Certification), contracted by Elen Enerji Üretimi Sanayi Ticaret A.Ş. to perform a joint validation and verification of the VCS project activity “Otluca HPPs Run-of-river hydro project” for the verification and renewable of the crediting period.

The joint validation and verification process were performed on the basis of all guidance and criteria as provided in VCS Program Guide V4.3 , VCS Standard v.4.4 and Registration & Issuance Process (version 4.3).

The management of the project participant/owner is responsible for the preparation of the GHG emissions data and the reported/estimated GHG emissions reductions on the basis set out within the project’s Monitoring Plan in the Joint VCS PD & MR and the approved methodologies; “ACM0002 Grid-connected electricity generation from renewable sources --- Version 12.10.0 and Version 21.0/09/.

The conclusions of validation and verification process can be individually summarized as follows:

Validation Conclusion:

Our Validation approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board and VCS board. Our approach is risk-based, drawing on an understanding of the risks associated with estimated GHG emissions data and the controls in place to mitigate these. The validation can confirm that:

- The projects description compliance with, the requirements of Article 12 of the Kyoto Protocol/06/, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS Program Guide v4.3 and standard version 4.4/09/.
- The project’s baseline and additionality are assessed against “ACM0002 Grid-connected electricity generation from renewable sources ---Version 21.0. and against Tool for the demonstration and assessment of additionality - Version 07.0.0./09/

- The project’s monitoring plan is assessed against “ACM0002 Grid-connected electricity generation from renewable sources --Version 21.0. /09/
- A risk-based approach has been followed to perform this validation activity. The review of the project description and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews with Project Owner have provided LGAI Technological Center S.A. (Applus+ Certification) with sufficient evidence for positive validation opinion as per the requirement of VCS.

Validated GHG emission reductions and removals in the above period:

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
Year 2021	76,203
Year 2022	103,398
Year 2023	103,398
Year 2024	103,398
Year 2025	103,398
Year 2026	103,398
Year 2027	103,398
Year 2028	103,398
Year 2029	103,398
Year 2030	103,398
Total estimated ERs	27,195
Total number of crediting years	1,033,980
Average annual ERs	103,398

Verification Conclusion: -

Our Verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that

- The project is operated as planned and described in the registered VCD PD (CP01) Joint PD and MR(CP02);
- The monitoring plan is as per the applied methodology;
- The monitoring process in Joint PD and MR is as per the joint PD & MR.
- The development and maintenance of records and reporting procedures are in accordance with the monitoring plan;
- The installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately
- The monitoring system is in place and generates GHG emission reductions data;
- The GHG emission reductions are calculated without material misstatements.
- No limitation observed for the present verification

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

Year	Baseline emissions or removals (tCO2e)	Project emissions or removals (tCO2e)	Leakage emissions (tCO2e)	Net GHG emission reductions or removals (tCO2e)
2019 (01-August-2019 to 31-December-2019)	21,907	0	0	21,907
2020 (01-January-2020 to 31-December-2020)	101,563	0	0	101,563
2021 (01-January-2021 to 31-December-2021)	69,247	0	0	69,247
2022 (01-January-2022 to 31-May-2022)	52,006	0	0	52,006
Total	244,723	0	0	244,723

The estimated ex-ante GHG emission reductions and removals and the achieved emission reductions and removals for this monitoring period:

Year	Ex-ante emissions reductions/removals	Achieved emissions reductions/removals	Percent difference	Justification for the difference
Year 2019 (01-August-2019–31-December-2019)	51,560	21,907	-58%	Emission reductions during this period 2019 (01-August-2019 to 31-December-2019) is 58% lower than the ex-ante estimates values. This is due to lower discharge period and therefore lower generation of energy considering last months of the year. The difference in emission reduction and estimated emission reduction in these months, when production is expected to be low, is normal and no control under PP.
Year 2020 (01-January-2020–31-December-2020)	123,340	101,563	-18%	It is observable that there are drastic decreases and increases in the velocity of the river course with the effect of rainfall. The difference is quite in agreement with estimated emission reductions
Year 2021 (01-January-2021–31-December-April-2021)	113,726	69,247	-39%	The Actual VCU is 39% lower than the estimated for the in the year 2021. This due to lower discharge in the river and drop in the electricity generation of project activity in 2021-year. The graph of 'Yearly Rainfall and Rain Days Averages' for Mersin region ³² . It was observed that there are drastic decreases and increases in the velocity of the river course with the effect of rainfall apart from the other

³² <https://www.worldweatheronline.com/mersin-weather-averages/mersin/tr.aspx>

				<p>factors such as such as freezing in the river due to the climate condition of related area. The difference in 2021 year –where electricity production has decreased significantly due to climate change in this project activity– is normal since rainfall amount is seriously decreased in related year.</p>
Year 2022 (01-January-2022–31-May-2022)	45,679	52,006	14%	<p>The actual VCUs is 14%% higher than the estimated. Moreover, this period contains only 5 months of electricity generation which is 22% more than estimated.</p>
Total	244,723	334,305	-27%	<p>Overall, during the current monitoring period, the actual VCUs is 27% lower than the estimated during the current monitoring period. This due to lower generation of energy and changed in grid emission factor for the 2nd CP. The values from EPIAS(JMRs) issued by electricity utility company have been checked with the invoice values and found to be perfectly aligned. The lower generation is due to seasonal variation during current monitoring period and not in control of PP. The project activity operated as per description in registered PD & Joint PD &MR.</p>

APPENDIX 1: DOCUMENTS REVIEW UNDER VALIDATION & VERIFICATION

No.	Author	Title	References to the document	Provider
1.	Govt of Turkiye	Provisional Acceptance protocol/Commissioning certificate	Dated 07/04/2011	Project participant
2.	Applus	Contract of the PP with the DOE	Contract of the PP with the DOE	Project participant
3.	NA	Technical specifications	Technical specifications of turbines & Generator from manufacturers	Project participant
4.	PP	Joint VCS PD & MR Version 1.0 Final Joint VCS PD & MR version 1.2	31-January-2023 10-March-2023	Project participant
5.	PP	Emission Calculation sheet-version 1.0 Estimated & Actual ER Emission Calculation sheet-version 1.2 Estimated and actual ERs	31-January-2022 10-March-2023	Project participant
6.	PP	<ul style="list-style-type: none"> • CDM validation and verification standard for project activities, Version 03.0 • Kyoto Protocol (1997) 	<ul style="list-style-type: none"> • https://cdm.unfccc.int/Reference/Standards/index.html • https://unfccc.int/process-and-meetings/the-kyoto-protocol/what-is-the-kyoto-protocol/kyoto-protocol-targets-for-the-first-commitment-period 	Project participant
7.	NA	The operational lifetime of the project activity from the manufacturer= (Technical specifications)	Manufacturer technical specifications	Project participant
8.	PP	Employment contract of staff	Monitoring period	Project participant
9.	UNFCCC/ VERRA	Tools/ guidelines used in the project activity	UNFCCC CDM web site <ul style="list-style-type: none"> • Methodology: ACM0002 Grid-connected electricity generation from renewable sources --Version 12.1.0 • Methodology: ACM0002 Grid-connected electricity generation from renewable sources --Version 21.0. 	UNFCCC

No.	Author	Title	References to the document	Provider
			<ul style="list-style-type: none"> • Tool 01 - Tool for the demonstration and assessment of additionality - Version 07.0.0 • Tool 07 - Tool to calculate the emission factor for an electricity system -Version 07.0 • VCS joint validation and verification report template Version 4.2. • VCS standard V4.4 (updated on 17-January-2023) • VCS Program Guide V4.3 (updated on 17-January-2023) 	
10.	PP	National Electric Grid Emission Factor published by Turkish Ministry of Energy and Natural Resources	Dated: 20-September-2022	Project participant
11.	PP	EPIAS Screenshots and TEİAŞ (electricity sales receipts)/ topographical surveys, maps and satellite	Meter Reading Report (JMR + Invoices) covering entire monitoring period	Project participant
12.	PP	VCS Declaration	Declaration from PP for Participation under Other GHG Programs dated:24-February-2023	Project participant
13.	PP	LSC/ ongoing communication	Dated 22-March-2023	Project participant
14.	PP	Electricity sales agreement with TEİAŞ	and Bangladesh Power Development Board (BPDB) dated on 04-November-2018	Project participant
15.	PP	Registered PD (Version 8)	Dated: 22-August-2011	
16.	PP	Logbook for registering grievance	For the complete monitoring period	Project participant
17.	PP	Letter of Undertaking for no double counting	Dated 24-February-2023	Project participant
18.	PP	Project License	Dated 30/01/2020	Project participant
19.	PP	Guidelines for Application of materiality in validation & verifications	Version 02	Others UNFCCC
20.	UNFCCC	Tool to determine the remaining lifetime of equipment'		Others UNFCCC
21.	PP	EIA not required"	Dated 26-December-2006	Project Participant

No.	Author	Title	References to the document	Provider
22.	PP	Meter protocol/Calibration report 2014 & 2020	Dated 20-March-2014 Dated_12-November-2020	Project Participant
23.	PP	topographical surveys or maps	For the entire monitoring period	Project Participant
24.	PP	Turbine data /name plates/ photos of the generator and turbine.	For the entire monitoring period	Project Participant
25.	PP	Ex-ante ER sheet for CP 2	Version 1.0 Dated 10-March-2023	Project Participant

APPENDIX 2: CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS, FORWARD ACTION REQUESTS (CAR/CL/FAR)

Table 1. Remaining FAR from previous verification

FAR ID	NA	Section no.	3.1	Date: 20-February-2023
Description of FAR				
The reference to Argentina and Beyobasi Enerji Uretimi A.S. in VCS registry link of the project shall be corrected during or before the next verification process.				
Project participant response				Date: 25-February-2023
‘Project summary’ section of VCS registry link of the project is already corrected. Link is accessible via link below. https://registry.verra.org/app/projectDetail/VCS/755				
Documentation provided by project participant				
Revised Joint PD & MR				
VWB assessment				Date: 10-March-2023
Assessment team has checked the webpage of PA at VERRA website and confirmed that the reference of Argentina and Beyobasi Enerji Uretimi A.S. from VCS registry link of the project has been corrected. FAR closed.				

Table 2. CL from this validation and verification

CL ID	01	Section no.	3.4	Date: 20-February-2023
Description of CL				
PP shall clarify the use of ex-ante parameter other than OM, BM and CM mentioned in Section 6.1 of Joint PD & MR as the value of OM, BM, and CM is directly sourced from the government published data. Moreover, few ex-ante parameters are missing in Joint PD & MR submitted for verification and RCP.				
Project participant response				Date: 25-February-2023
Section 6.1 of Joint PD&MR has now been revised in detail. In addition, OM, BM, and CM values published by Ministry of Türkiye have been discussed in Section 6.1 since those parameters will be fixed during the 2 nd crediting period of project activity.				

Moreover, all fixed ex-ante parameters for 1 st crediting period in the registered PD have already been checked and included in Section 6.1.	
Documentation provided by project participant	
Revised Joint PD & MR Revised ER sheet	
VVB assessment	Date: 10-March-2023
<p>Pp has revised the Section 6.1 of Joint PD&MR. In addition, OM, BM, and CM values published by Ministry of Türkiye have been discussed in Section 6.1 since those parameters will be fixed during the 2nd crediting period of project activity.</p> <p>PP has included all fixed ex-ante parameters for 1st crediting period in Joint PD & MR in accordance with the registered PD for 1st CP.</p> <p>CL closed.</p>	

CL ID	02	Section no.	3.4.6	Date : 20-February-2023
Description of CL				
As per Section 6.2 of Joint PDD and MR, main meter and check meter are installed at the TEİAŞ substation as well as at Plant site. However, PP has indicated only one set of meter in Joint PD and MR. PP shall clarify the same.				
Project participant response				Date: 25-February-2023
One set of main meter and check meter installed at power plant are just for internal purposes and following up. Electricity meters which located at substation (Sızır Transmission Center) are approved by TEİAŞ and those meters are available to track remotely for EPIAŞ and TEİAŞ.				
Documentation provided by project participant				
Revised Joint PDD and MR				
VVB assessment				Date: 10-March-2023
Joint metering has been done based on the main meter and check meter located at substation (Sızır Transmission Center) and also invoicing has been done based on the data recorded by meters installed at substation. Meters located at plant side is internal purpose, no use in invoicing. Hence OK. CL closed.				

Table 3. CAR from this validation and verification

CAR ID	01	Section no.	3.1	Date: 20-February-2023
Description of CAR				
<p>VVB has reviewed review the Joint PD & MR submitted for RCP and verification and observed followings:</p> <ul style="list-style-type: none"> • Project proponent shall fill the Sections of Joint PD and MR in accordance with the instruction provided in in the template. • PP shall keep consistency in date format (DD-Month-YYYY) throughout the Joint PD & MR. • PP shall indicate the monitoring period and emission reductions separately in Section 1.1 for both CP and keep same patter throughout the doc. • Title 				

Project participant response	Date: 25-February-2023
<ul style="list-style-type: none"> Otluca HPPs, Joint PD&MR document has filled in line with the template of Joint PD&MR. All date formats have now been corrected throughout the Joint PD&MR. Monitoring period and emission reductions have now been revised separately throughout the Joint PD&MR. 	
Documentation provided by project participant	
<i>Revised Joint PD & MR</i>	
VVB assessment	Date: 10-March-2023
PP has submitted revised Joint PD & MR. Verification team has reviewed the same and confirms that: <ul style="list-style-type: none"> PP has updated the Section of Joint PD & MR in accordance with the guidance in Joint PD & MR. Hence OK. PP has corrected the date format (DD-Month-YYYY) throughout the joint PD & MR. Hence OK. PP has now indicated the emission reductions separately for both the CP in section 1.1. CAR closed.	

CAR ID	02	Section no.	3.2	Date: 20-February-2023
Description of CAR				
<i>Declaration regarding no participation in other trading / GHG programs is not submitted by PP. PP requested to submit the same. PP shall also confirm if any rejection under other GHG program etc.</i>				
Project participant response				Date: 25-February-2023
<i>Two different declarations (regarding no participation in other mechanism and including any rejection under other mechanism) signed and stamped by project owner have now been provided to DOE.</i>				
Documentation provided by project participant				
<i>Declaration for no participation in other GHGs program.</i>				
VVB assessment				Date: 10-March-2023
PP has submitted declaration regarding no participation in other trading GHG programs and also the project activity is not rejected under other GHG program. However, in declaration wind project has been referred. PP shall submit revised declaration about the project activity. Hence, this CAR is open.				
Project participant response				Date: 10-March-2023
<i>Related typo has now been corrected in declarations provided and shared back.</i>				
Documentation provided by project participant				
<i>Declarations for no participation in other GHGs program have been revised and provided again.</i>				
VVB assessment				Date: 15-March-2023
PP has rectified the declaration submitted for no participation in other trading GHG programs and also the project activity is not rejected under other GHG program. The same is accepted and CAR closed.				

CAR ID	03	Section no.	3.3.2	Date: 20-February-2023
Description of CAR				
PP has not indicated the stakeholder consultation in Section 2.2. of Joint PD & MR. Also, mechanisms for ongoing communication with local stakeholders to allow stakeholders to raise concerns about potential negative impacts during project implementation is not included.				
Project participant response				Date: 25-February-2023
Two different declarations by Mukhtar (Headman of neighbourhood) have now been provided to demonstrate the on-going communication between local people and project owner. In addition, additional statements have now been included in Section 2.2 of Joint PD&MR.				
Documentation provided by project participant				
Revised Joint PD & MR				
VVB assessment				Date: 10-March-2023
PP has indicated the stakeholder consultation in section 2.2 of revised joint PD & MR of the year 2010. However, PP has not described the ongoing communication with the stakeholders and also not submitted the supporting such as grievances register or any mechanism adopted at site to register grievances. Hence, this CAR is open .				
Project participant response				Date: 10-March-2023
Additional sentences have now been included in Section 2.2 to more clarity on on-going communication with the stakeholders.				
Documentation provided by project participant				
Two different declarations by Mukhtar (Headman of neighbourhood).				
VVB assessment				Date: 15-March-2023
PP has now included the ongoing communication with the stakeholders and also submitted the supporting of two different declarations by Mukhtar. CAR closed.				

CAR ID	04	Section no.	3.4	Date: 20-February-2023
Description of CAR				
Title of applied methodology ACM0002 (version 21.0) is not consistent in in Section 3.1 of Joint PD & MR. Further, PP shall demonstrate each eligibility criteria (in tabular form) of applied methodology and Tool in Section 3.2 of Joint PD & MR				
Project participant response				Date: 25-February-2023
The title of applied methodology has now been corrected throughout the PSF. In addition, Applicability criteria of applied tools and methodology have now been discussed in detail under Section 3.2 of Joint PD&MR.				
Documentation provided by project participant				
Revised Joint PD & MR				
VVB assessment				Date: 10-March-2023

PP has corrected the title of applied methodology in the revised Joint PD & MR.
Also, applicability of methodology has been revised in Section 3.2. Hence, CAR closed.

CAR ID	05	Section no.	3.4	Date: 20-February-2023
Description of CAR				
<p>PP shall include a diagram or map of the project boundary, clearly showing the physical locations of the various installations as part of the project activity (Refer description in Section 1.11 of Joint PD & MR PP shall indicate ex-ante values of OM, BM and CM in Section 3.4 under sub step 2.2. Further, reference of grid emission factor used for RCP is not accessible to VBB. PP is requested to submit the hard copy for the same.</p>				
Project participant response				Date: 25-February-2023
<p>A map for the project boundary and physical locations has now been provided in Section 1.11 of Joint PD&MR. OM, BM and CM values in Section 3.4 have now been provided under sub-step 2.2 of Joint PD&MR. Reference of grid emission factor has now been provided as 9.0</p>				
Documentation provided by project participant				
9.0. Grid emission factor published by Ministry				
VVB assessment				Date: 10-March-2023
<p>PP has included the project boundary in section 1.11 of revised joint PD & MR. Also, OM,BM and CM values added in Section 3.4 of revised Joint PD & MR. PP has indicated the values of OM, BM and CM in section 3.4 under sub step 2.2. PP has indicated reference of grid emissions factor used for RCP in revised Joint PD & MR. CAR closed</p>				

CAR ID	06	Section no.	3.4.5	Date: 20-February-2023
Description of CAR				
Information related to regulatory surplus requirements is missing under additionality in Section 3.5 of Joint PD & MR				
Project participant response				Date: 25-February-2023
Related information has now been provided in Section 3.5 of Joint PD&MR.				
Documentation provided by project participant				
Revised Joint PD & MR				
VVB assessment				Date: 10-March-2023
<p>PP has now regulatory surplus requirement in Section 3.5. PP clarified that any enforced law, statute, regulatory surplus, or other regulatory framework shall not mandate the project. The project activity is not mandated by any state or national laws. CAR closed.</p>				

CAR ID	07	Section no.	3.4.6	Date: 20-February-2023
Description of CAR				
PP shall submit the supporting of estimated net export of energy to grid for verification of emission reductions achieved during the reported monitoring period.				
Project participant response				Date: 25-February-2023
<i>The reference for estimated electricity generation has now been provided as 1.0.</i>				
Documentation provided by project participant				
1.0. License of Otluca				
VVB assessment				Date: 10-March-2023
PP has submitted the License of Otluca HPPs (License No.EU/9147-12/04464, dated 30/01/2020) which confirmed the ex-ante estimate of net export 224,000 MWh. The same value has been used for ex-ante emission reduction in 1 st CP as well as for CP 2.CAR closed.				

CAR ID	08	Section no.	4.1	Date: 20-February-2023
Description of CAR				
During the site visit PP has not submitted the supporting documents of net electricity supply to grid and supporting electricity sales invoices/records for cross check. PP shall submit the same for verification of emission reductions and cross check.				
Project participant response				Date: 25-February-2023
All realized electricity generation and consumptions values and receipts/invoices of them (as cross check) have now been provided. In addition, the comparison of estimated vs actual electricity generations have already been detailed in ER sheet. Moreover, Comparison of estimated vs actual emission reductions have already been detailed in ER and in Section 7.5 of Joint PD&MR.				
Documentation provided by project participant				
NA				
VVB assessment				Date: 10-March-2023
PP has submitted monthly EPIAŞ screenshots of electricity generations. The same has been checked by the assessment team and found that data provided in emission reductions sheet are correct. PP has also submitted the TEIAŞ receipts for cross check of data and same is also included in ER sheet. Verification team has cross-checked the net export data and found consistent. CAR closed.				

CAR ID	09	Section no.	4.2	Date: 20-February-2023
Description of CAR				
VVB has reviewed the Joint PD & MR and observed following:				
<ul style="list-style-type: none"> • Data /parameter in Section 7.1 of Joint PD & MR is not consistent with the registered PD. Further, PP shall provide information of Quantification of GHG emission reductions and removals in Section 7.1 and Section 7.2 separately for CP1 and CP 2 • PP has not indicated period of ERs comparison between estimated vs Achieved in Section 7.5 of Joint PD & MR. 				

<ul style="list-style-type: none"> Baseline emission and emission reductions values is not consistent in Section 7.5 of Joint PD & MR considered project emission and Leakage zero. 	Date: 25-February-2023
Project participant response	
<ul style="list-style-type: none"> Data/parameter in Section 7.1 have now been corrected throughout Section 7.1. In addition, quantification of GHG emission reductions has now been provided in Section 7.2 for both crediting periods separately. The periods at comparison table in Section 7.5 have now been corrected. The table in Section 7.5 has now been corrected in detail. 	
Documentation provided by project participant	
<i>Revised Joint PD & MR</i>	
VVB assessment	
Date: 10-March-2023	
PP has submitted revised Joint PDD & MR and same has been checked by the assessment team and confirmed following: <ul style="list-style-type: none"> PP has revised Data/ Parameter in section 7.1 of joint PD& MR and it was consistent with the registered PD. Also, PP has provided information of Quantification of GHG emission reductions and removals in section 7.1 and section 7.2 separately for CP1 and CP 2. In the table of section 7.5, PP has now mentioned the periods correctly for ERs comparison. In section 7.5 of Joint PD & MR, PP has revised the values mentioned in the table. 	
CAR closed	

CAR ID	10	Section no.	4.2	Date: 20-February-2023
Description of CAR				
During the site visit, PP has not submitted the supporting of calibration of energy meters for validation and verification of meter calibration frequency and calibration compliance.				
Project participant response				Date: 25-February-2023
<i>Supporting calibration of electricity meters has now been provided to DOE as 10.0 and 13.0.</i>				
Documentation provided by project participant				
<i>10.0. and 13.0. Electricity Meters</i>				
VVB assessment				Date: 10-March-2023
PP has now submitted the supporting of meters calibration. Assessment team has checked the same and confirmed that calibration of meters are in compliance with the requirement if monitoring plan. There is no delay in calibration of meters found, Hence, CAR closed.				

Table 4. FAR from this validation & verification

FAR ID		Section No.	--	Date: DD-Month-YYYY
Description of FAR				
<i>N/a</i>				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

APPENDIX 3: COMPETENCE OF TEAM MEMBER AND TECHNICAL REVIEWER

Verification Team Member: -

No	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Lead Auditor/ Technical Expert	OR	Singh	Jitendra Mohan	TQC- Outsourced entity	Yes	Yes	Yes	Yes

Technical Reviewer and Approver of the Verification and Certification Report: -

No.	Role	Type of resource	Last name	First name	Affiliation (e.g., name of central or other office of DOE or outsourced entity)
1.	Technical reviewer (TR)	EI	Xue	Denny	Applus+ Certification
2.	Approver	IR	Calle de Miguel	Agustin	Applus+ Certification

Shorts CV of the Team:

1. **Mr. Jitendra Mohan Singh**, has done Advanced MSc in Sustainable Energy Systems and Management from International Institute of Management, University of Flensburg, Germany and B.Tech. in Agricultural Engineering from Allahabad University, India. He has more than 22 years of working experience in different organisations like IARI, IIT Delhi, ICAR, IRADe, CAPART, SMEC and Perenia Carbon and M B Power (Madhya Pradesh) Ltd. in the area of Agriculture, Energy & Environment and Climate Change. He also worked on contract basis (adhoc) as a RIT expert in UNFCCC from 2010 to 2013. Currently, he is associated with True Quality Certifications Private Limited and is empanelled with Applus+ Certification to carry out validation and verification related to GHG reductions projects. Mr. Jitendra Mohan Singh is based in Ghaziabad (Uttar Pradesh), India.
2. **Mr. Denny Xue** (Master's Degree in Environmental Engineering, Bachelor's Degree in Thermal Engineering) is an Auditor appointed by Applus+ LGAI for the GHG project assessment, auditing and technical review. He has more than 6 years of work experience in

CDM/GS4GG/VCS project assessment and technical review with Applus+. Before he joined Applus+ LGAI, he has been working for Shanghai Chuanji Investment and Management which is a CDM consultancy company as a project manager for CDM project development. Mr. Denny Xue is based in Shanghai, China.

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CERC	Central Electricity Regularity Commission
CMS	Central Monitoring system
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
OM	Operating Margin
GWP	Global Warming potential
JMR	Joint Metering reading
VVB	Validation/Verification Body

APPENDIX 5: CALIBRATION DETAILS

The calibration of all meters was valid during the current monitoring period. No delayed calibration observed during this monitoring period.

Name	Serial Number	Brand - Model	Calibration date	Validity of calibration
Main Meter	4241357	EMH - LZQJ-XC	20-March-2014	19-March-2023
			20-November-2020	19-Novemeber-2030
Back-up meter	4241358	EMH - LZQJ-XC	20-March-2014	19-March-2023
			20-November-2020	19-Novemeber-2030