



**Verified Carbon
Standard**

CEYHAN 61.7 MW HYDROPOWER

PROJECT, TURKEY



RUBY CANYON ENVIRONMENTAL

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Summary:

- The project includes the installation of a large-scale runoff river hydroelectric power plant (HEPP) with an installed capacity of 63.468MWm / 61.704 Mwe/D14/ on the Ceyhan River and Cevdetye irrigation structure downstream of Aslantas Dam in the city of Osmaniye, in South Anatolian Region of Turkey,
- The purpose of the project activity is to generate electricity and supply it into the public grid. The project activity reduces greenhouse gas (GHGs) emissions that would have otherwise occurred in the absence of the project activity by avoiding electricity generation from fossil fuel sources.
- The project involves 6 turbines, Oşkan HPP has three of the six pit Kaplan type turbines and Berkman HPP has the three turbines. Total installed capacity of 61.704 Mwe/D14/. The project is annually expected to generate 239,946 MWh of electricity/D14/. The Project is owned by “Enova Enerji Üretim A.Ş.”
- The scope of the verification is the independent and objective review of the monitored GHG reductions. The verification activity is based on the validated and registered PD version 03 and dated 02/02/2011.
- The project activity and the monitoring report are assessed against the requirements of the
- Article 12 of the Kyoto Protocol, CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision,
- “ACM0002 version 12.1.0”/D3/, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other related rules, according to the guidance given in the CDM Validation
- Verification Standard version 09, CDM Project Standard version 09 ,
- CDM Project Cycle Procedure version 09 and VCS version 4.1.
- The site visit was conducted on 06 January 2022 via online meeting.
- The only purpose of the verification and certification is its usage during the issuance process as part of the VCS project cycle.
- During this verification 2 Corrective Action Requests (CARs) and 1 Clarification Requests (CLs) were raised all of which were resolved by either revising the Monitoring Report or by sending objective evidence to the verification team
- Based on the evidence documented during the verification process, RCE concludes, to a reasonable level of assurance, that the Project’s greenhouse gas (GHG) assertion of 287,566 tCO2e emissions for the period of 1 June 2018 to 31 May 2020 is fairly stated.

	Baseline emissions or removals (tCO2e)	Project emissions or removals (tCO2e)	Leakage Emissions (tCO2)	Net GHG emission reductions or removals (tCO2e)
2018 (01 June 2018-31 December2018)	51,240	0	0	51,240
2019	163,587	0	0	163,587
2020	72,738	0	0	72,738

(01 January 2020-31 May 2020)				
Total	287,566	0	0	287,566

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1 INTRODUCTION

1.1 Objective

RCE has been appointed by “Enova Enerji Üretim A.Ş.” to perform the 3rd verification of the “Ceyhan 61.7 MW Hydropower Project” with the contract dated 30 December 2021 according to the requirements of the Verified Carbon Standard Version 4.1 /D1/ dated 22 April 2021. The objective of this verification activity is to assess, with objective evidence:

- that the monitoring report dated “03 January 2022” is in compliance with the requirements of the monitoring plan of the registered Project Description (PD) and the approved methodology
- that the project activity conforms with the monitoring report and the registered PD, and
- if the data reported in the monitoring report is accurate, complete, and transparent.

1.2 Scope and Criteria

The scope of the verification is the independent and objective review of the monitored GHG reductions. The verification activity is based on the validated and registered PD version 03 /D12/ dated 02 February 2011.

RCE conducted the verification based upon the following criteria:

- The project activity and the monitoring report are assessed against the requirements of the Article 12 of the Kyoto Protocol, CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, dated 30 November 2005
- CDM Project Standard version 09 dated 20 February 2015
- CDM Project Cycle Procedure version 09 and VCS version 3 dated 07 October 2021.
- Project Description Document, version 03 dated 02 February 2011
- Verified Carbon Standard (VCS) version 4.1 (22 April 2021).
- Clean Development Mechanism (CDM) methodology ACM0002 — “Grid-connected electricity generation from renewable sources” (version 12.1 sectoral scope: 01) (and all associated methodology tools).
- VCS Validation and Verification Manual version 3.2 (October 19, 2016).

- ISO 14064-3:2006 “Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions”

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

1.3 Level of Assurance

RCE hereby confirms that the level of assurance of this verification report is reasonable, with respect to material errors, omissions, and misrepresentations.

1.4 Summary Description of the Project

Ceyhan 61.7 MW Hydropower Project has been located on Ceyhan River in Osmaniye city of Turkey and developed by Enova Enerji Üretim A.Ş. The project has horizontal axis three Kaplan turbines with the installed capacity of 7.963 MWe each for Oşkan HEPP and horizontal axis three Kaplan turbines with the installed capacity of 12.605 MWe each for Berkman HEPP, so it has a total capacity of 63.468 MWm / 61.704 MWe in line with the electricity generation licence and provisional acceptance protocols and the project also supports the sustainable economic development in the region.

The key parameters about the technical design of the project are listed below in Table-1:

Table 1: Technical specifications of the project

Component	Property
Turbine type	Kaplan
Turbine firm	Alstom
Rotation	180 r / min
Production year	2010 (For all 6 turbines)
Average flow rate	89 m3 / s (For all 6 turbines)
Number of turbines	6
Serial numbers of the turbines	2075 & 2076 & 2077 (Oşkan HEPP) 2078 & 2079 & 2080 (Berkman HEPP)
Installed capacity of each turbine	7.963 MWe each for Oşkan HEPP (3 turbines) and 12.605 MWe each for Berkman HEPP (3 turbines)

The start date of the project activity is 03/06/2010 which is the date when the project is commissioned and the electricity was first supplied to the grid as verified through the provisional acceptance protocols and the first crediting period is from 03rd June 2010 until 02nd June 2020 with two times renewable crediting period of 10 years.

Important and significant dates in the project activity have been confirmed as below:

Date	Events
21/08/2003	Issuance of "EIA Certificate not required"
28/03/2008	Construction Start Date
03/06/2010	Commissioning of the Project
03/06/2010 - 31/05/2012	1st Monitoring Period
01/06/2012 - 31/05/2018	2nd Monitoring Period
01/06/2018 - 31/05/2020	3rd Monitoring Period

It is confirmed that the project activity is observed to export **468,419 MWh /D19/** of Electricity to the host country grid and imported **833 MWh /D19/** of electricity. As a result, the project is observed to create **287,566 tonnes** of baseline emissions and 0 tones of Project emissions, thus a net amount of **287,566 tonnes of GHG emissions /D19/** are produced by the project activity during this monitoring period.

The emission factor has been confirmed as **0.615 tCO₂/MWh** during the validation. /D12/

RCE confirms the following based on the results of document review and on-site assessment for the period between **01 June 2018 - 31 May 2020** (both days included):

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2018 (01 June 2018-31 December2018)	51,240	0	0	51,240
2019	163,587	0	0	163,587
2020 (01 January 2020-31 May 2020)	72,738	0	0	72,738
Total	287,566	0	0	287,566

2 VERIFICATION PROCESS

2.1 Method and Criteria

The verification process involved the following independent and objective activities:

- Select a Verification Team;
- Perform a Conflict of Interest Review;
- Conduct a kick-off meeting with Project Proponent;
- Review the validated Project Description;
- Review the Validation Report;
- Review the current Monitoring Report;
- Develop a verification plan and risk-based sampling plan;
- Conduct a virtual site visit on 06 January 2022
- Review the project information control systems and quality control procedures;
- Review the Project's emission reduction calculations;
- Issue corrective action requests, additional documentation requests, and clarification requests as necessary;
- Issue a verification report; and
- Conduct an exit meeting with Project Proponent.

The verification team was selected according to RCE's GHG Verification Policies & Procedures to ensure team members are qualified to perform verification activities pertaining to the Project. The Verification team consisted of the following individuals:

- ❖ Lead Verifier: Diana Xareni González Cuevas
- ❖ Senior Internal Reviewer: Jessica Stavole
- ❖ Team members: Furkan Sadıkoğlu, Mehmet Kumru

Prior to verification project activities, RCE performed a Conflict-of-Interest Assessment to determine whether any potential conflicts exist with the project developer. No issues were discovered that would affect the impartiality or independence of the verification team.

A kick-off conference call was held with Project Proponent on 5 January 2022. The purpose of the kick-off conference call was to introduce the Project Proponent personnel and the RCE verification team, review the verification objectives, process, and VCS requirements, and to confirm the verification schedule.

RCE developed a verification plan and sampling plan that were used throughout the verification of the Project. A sampling plan was created after reviewing the Project Monitoring Report, validated Project Description, and the VCS Standard (Version 4.1). A risk-assessment was performed based upon the criteria listed above and evidence provided to RCE by Project Proponent that pertained to the current reporting period. RCE used the verification plan throughout the verification as a basis for assessing the completeness, consistency, accuracy, and transparency of the Project's GHG emission reductions.

2.2 Document Review

The basis for the verification activity is the monitoring report version 01, dated 03 January 2022 /D17/ which was submitted to the verification team. This monitoring report was revised several times due to the issued CARs and CLs, version 2 dated 14 January 2022 /D18/being the final version

The following actions were involved in the desk review:

- A review of the data and information presented to verify their completeness
- A review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures
- An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions

The list of the documents which were reviewed during the verification period is given in the Table 2-1 below:

Table 2-1: List of the Reviewed Documents

Document Number	Document Name	Date
D1	VCS Standard, Version 4.1	22 April 2021
D2	VCS Program Guide, Version 4.0	19 September 2019
D3	CDM methodology ACM0002, "Grid-connected electricity generation from renewable sources", Version 12.1.0	26 October 2010
D4	Provisional Acceptance of the Berkman Unit 1-2-3	20 August 2010 28 August 2010 15 February 2012
D5	Provisional Acceptance of the Oşkan	03 June 2010
D6	TEİAŞ Calibration Records of Meters	30 October 2018 - 11 October 2019 and 14 October 2019
D7	Meter Change Protocol	19 October 2019
D8	EPIAS System Records (Cross Check)	01 June 2018 to 31 May 2020
D9	Organization Chart of the Ceyhan	
D10	Ministry of environment and forestry EIA not Required Certificate	21 August 2003
D11	OSOS Records	01 June 2018 to 31 May 2020
D12	VCS PD Version 01 VCS PD Version 02 Approved VCS PD Version 03	10 September 2009 12 October 2010 02 February 2011
D13	VCS Validation Report	25 March 2011
D14	Electricity Generation License	21 December 2006
D15	System Connection Agreement	08 July 2019
D16	Ceyhan Turbine and Generator Technical Data Sheet	
D17	VCS-Monitoring Report-Ceyhan v01	03 January 2022

D18	VCS Monitoring Report-Ceyhan v02	14 January 2022
D19	Ceyhan_ER Calculation Ver01	03 January 2022
D20	Project Photos	
D21	Training Records	
D22	SGK Records	
D23	Noise Measurement Records	28 August 2010 and 02 June 2010
D24	1 st Monitoring Report	22 November 2012
D25	2 nd Verification Report	05 January 2022
D26	Approved Design (at the development) for Reservoir and Screenshots	

2.3 Interviews

During the verification period follow-up interviews were realized by the verification team to further analyze the correctness and accurateness of the information provided.

The list of people who were interviewed during the validation period is given in the Table 2-2 below:

Table 2-2: List of persons interviewed

Reference Number	Means of interview	Full Name	Title	Organization
I1	Site visit	Sıla Duran	Consultant	Sekans Danışmanlık
I2	Site visit	Mustafa Öztürk	General Manager	Enova Enerji Üretim A.Ş
I3	Site visit	Koray Keskin	Electricity Trading Manager	Enova Enerji Üretim A.Ş
I4	Site visit	Arda Candemir	Deputy Operations Manager	Enova Enerji Üretim A.Ş
I5	Site visit	Kenan Özer	Deputy Mukhtar	Kumarlı Village
I6	Site visit	Yaşar Özer	Villager	Kumarlı Village
I7	Site visit	Mustafa Ağzikara	Villager	Kumarlı Village

2.4 Site Inspections

RCE conducted a virtual site visit at the Project location near Osmaniye province during reporting period on 06 January 2022. The site visit activities included a virtual inspection of the Project operations and a review of the Project's information control systems, data handling, QA/QC activities, and equipment calibration schedules. RCE confirmed the presence of six turbines via SCADA system which tracks operational information for all turbines. In addition, RCE inspected the monitoring equipment at the meters substation which is used for QA/QC purposes. RCE confirmed with technical staff that Project generation data is provided by primary meter's revenue meter. RCE also reviewed calibration and testing certificates for the primary meter. During the site visit, RCE also discussed the day-to-day operation of equipment, data aggregation and compilation, environmental and regulatory compliance, and emission reductions quantification.

2.5 Resolution of Findings

The verification of this VCS project activity includes the following steps:

- Assessment of the conformity of the actual project activity and its operation with the registered PD version 03 and dated 02/02/2011 /D12/.
- A virtual site visit was conducted on 06 January 2022 to assess that all physical features of the project activity proposed in the registered PD are in place and that the project participants has operated the project activity as per the registered PD.
- Assessment of the compliance of the monitoring plan with the monitoring methodology ACM0002 version 12.1 /D3/
- Assessment of the compliance of monitoring with the monitoring plan
- Assessment of data and calculation of greenhouse gas emission reductions
- Issuance of the verification report
- Independent technical review
- Approval of the verification report and request of issuance

The Verification Protocol is used for the assessment of each requirement during the execution of verification activities and is included in the internal registries of the verification.

The Verification Protocol is fulfilled by the verification team in line with the descriptions above and all the CARs, ADRs, CLs and FARs are listed in a transparent and clear manner.

Corrective Action Requests (CARs), Additional Documentation Requests (ADRs), and Clarification Requests (CLs)		
ID #	Action Item	Resolution
CLO1	Approved PD dated 02/02/2011 estimated electricity generation provided as 239,566 MWh but in MR it is described as 239,946 MWh. Please clarify.	According to PD page 3 the estimated electricity generation has been confirmed as 239,946 MWh.
CAR01	EIA Not Required Certificate not provided to DOE.	The certificate has been submitted.
CAR02	Stakeholder meeting dd. 10/04/2009 records are not submitted.	Stakeholder meeting was organized and the records were validated during the registration of the project activity. It is confirmed through registered PD dated 02/02/2011.

2.5.1 Forward Action Requests

The verification team raises a FAR during verification for actions if the monitoring and reporting require attention and/or adjustment for the next verification period as explained in Section 2.5.

There hasn't been FARs issued during this verification.

2.6 Eligibility for Validation Activities

RCE performed only verification activity.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project does not participate under other GHG Programs

3.2 Methodology Deviations

There were no methodology deviations during the current reporting period.

3.3 Project Description Deviations

There were no project description deviations during the current reporting period. Approved VCS PD Version 03 dated 02 February 2011 was not revised during the current monitoring period. The basis for the verification activity is the monitoring report version 01, dated 03 January 2022 /D17/ which was submitted to the verification team. This monitoring report was revised several times due to the issued CARs and CLs with Version 2, dated 14 January 2022 /D18/, being the final version.

3.4 Grouped Project

The project is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

Compliance of the Project Implementation with the Registered PD:

A site visit was performed to the project site on 06 January 2022. During this site visit, all the project elements were observed. As a result of this observation, RCE hereby confirms that the project is fully implemented according to the description given in the registered PD version 3./D12/

The project started operation on 03 June 2010/D4&D5/ which was verified through the provisional acceptance dated 03 June 2010.

The project activity does not consist of more than one site and does not have any phased implementation.

The GHG emission reductions generated by the project are not included in an emission trading program or any other mechanism that includes GHG allowance trading, because of the position of the host country.

The project activity has not received any other form of environmental credits, as there are no such crediting schemes in the host country.

The only other eligible GHG program in the host country is Gold Standard, and the project is not listed in the GS Registry, hence RCE confirms that the project has not participated or been rejected under any other GHG programs since validation.

Compliance of the Monitoring Plan with the Monitoring Methodology:

According to the monitoring methodology ACM0002 version 12.1 /D3/ the parameters that need to be monitored are quantity of net electricity generation supplied by the project plant to the grid (EGfacility, y), installed capacity of the hydro power plant after the implementation of the project activity (CAPPJ) and area of the reservoir (APJ). These parameters are noted in the monitoring plan that is also approved by the validation Designated Operational Entity (DOE) , hence the monitoring plan is in compliance with the monitoring methodology. The data and parameters that are monitored and the procedures in place for monitoring these data and parameters are listed below:

EGfacility, y: According to the monitoring plan in the registered PD, the net electricity generation data on the basis of imported energy and exported energy to the grid which is obtained on OSOS Records are crosschecked with electronic EPIAŞ records /D8/ and the logs kept in the power house by the staff. In addition, for crosschecking purposes, there are meters installed at the project site apart from the meters installed in the transformer station.

To cross-check the generation data, the following data flow procedures is applied:

The staff reads the active and reactive generation values hourly and records these values in a logbook. This data is also kept as a soft copy in an excel sheet.

During the site visit model, specifications and serial numbers of the main and backup meters have been verified and found to be as indicated in the VCS-MR. The serial numbers of the meters are confirmed as below;

Project Monitoring Equipment	Equipment ID/Serial Numbers
Main Electricity Meter OŞKAN - Unit 1	8923872
Main Electricity Meter OŞKAN - Unit 2	8923874
Main Electricity Meter OŞKAN - Unit 3	8923876
Main Electricity Meter OŞKAN - Unit 1 (Changed on 19.10.2019)	388202
Main Electricity Meter OŞKAN - Unit 2 (Changed on 19.10.2019)	388204
Main Electricity Meter OŞKAN - Unit 3 (Changed on 19.10.2019)	388207
Back-up Electricity Meter OŞKAN Unit 1	8923873
Back-up Electricity Meter OŞKAN Unit 2	8923875
Back-up Electricity Meter OŞKAN Unit 3	84260477
Back-up Electricity Meter OŞKAN Unit 1 (Changed on 19.10.2019)	388203
Back-up Electricity Meter OŞKAN Unit 2 (Changed on 19.10.2019)	388205
Back-up Electricity Meter OŞKAN Unit 3 (Changed on 19.10.2019)	388208
Main Electricity Meter BERKMAN - Unit 1	8923878
Main Electricity Meter BERKMAN - Unit 1 (Changed on 19.10.2019)	388228
Back-up Electricity Meter BERKMAN - Unit 1	8923879
Back-up Electricity Meter BERKMAN - Unit 1 (Changed on 19.10.2019)	388227

CAPP: According to the monitoring plan in the registered PD, the installed capacity of the power plant is monitored annually by observing the hydropower equipment. During the site visit the name plates of the turbines were reviewed and the installed capacity given in the monitoring report is in line with the installed capacity shown on the name plates of the equipment. RCE hereby confirms that the installed capacity is monitored according to the monitoring plan.

APJ: As stated into the project details, crest elevation is 85.5 m for the Oşkan and 75 m for the Berkman. Operational reservoir water levels for these weirs are 83 m and 72.5 m. Surface areas based on the water levels are 1,621,425.95 m² for the Oşkan and 1,648,560.79 m² for the Berkman.

Measured water levels by two Siemens meters are confirmed as;

Berkman: 72.55 m – 72.40-45 m (equal to 1,648,560.79 m²)

Oşkan: 83.05 m – 82.95 m (equal to 1,621,425.95 m²)

There is a backup power generator using diesel fuel to be used only when power cannot be supplied from the grid due to a connection loss. Under only very such rare occasions will the backup power generator operate and produce emissions. These emissions are expected to be very low and can be neglected; so assumed to be zero.

SGK records & Livelihood of the Poor: 31 Employee SGK records are submitted and confirmed. The project activity contributes to SDG-8 Decent Work and Economic Growth with 31 employed staff during the monitoring period in line with the provided and checked social security records.

Environmental Indicators (during operation): The environmental monitoring reports dated as 25/05/2015, 05/04/2016, 24/05/2017, 05/04/2018, 26/09/2019 and 16/09/2020 were issued by the related environmental authorities during the monitoring period and it could be confirmed that the relevant parameters (air quality, water quality, solid waste, biodiversity and noise pollution) are in line with the relevant legal regulation as indicated in the mentioned reports. Besides that, the photos of waste storage areas and the hazardous waste declaration forms to Ministry of Environment and Urbanization for 2018, 2019 and 2020 and waste water transfer and disposal records dated as 02/03/2010, 15/06/2011 and 14/11/2019 have been provided by the PP. The photographic evidences of fish passage and the noise measurement reports dated as 02/06/2010 and 20/08/2010 have also been provided.

RCE hereby confirms that the monitoring plan is in line with the applied monitoring methodology ACM0002 version 12.1 /D3/ and the monitoring is done according to this plan.

It is mandatory to perform calibration on the electricity meters once in every ten years. The periodic duration starts as of the first calibration and the official sealing day of the devices.

4.2 Safeguards

4.2.1 No Net Harm

In the context of the “EIA Not Required” /D10/ checked and confirmed within the project documents to the local branch of Osmaniye provincial directorate of environment and urbanism, during the project design phase, the following measures are undertaken in order to minimize the impacts during construction and operational periods.

The project activity is not on forest land. There are agricultural lands around the project area; however, since the project is constructed on water and, no reservoir, no negative impacts are expected on agricultural land.

The operation of equipment complies with the Turkish Standards and World Bank Guidelines.

Regarding the wastes, hazardous wastes are handled appropriately in closed containers and transported by licensed transporters to the licensed processing and disposal facilities. Wastewater is collected through within the septic tank and is transferred through these wage truck. Domestic wastes are transferred by the provincial administration⁶. The latest audit reports (16/09/2020) state that the Project Activity is in compliance with the regulations as following:

- Water pollution control regulation(nr.25687)
- Waste oil control regulation(nr.30985)
- Waste management regulation (nr.29314)
- Regulation on assessment and management of environmental noise(nr.27601)

In line with legal requirements, needed life water is released by the project activity as stated in EIA report.

There is not any negative environmental or socio-economic impact.

4.2.2 Local Stakeholder Consultation

The stakeholder meeting was held on 10th April 2009 in Karagedik Village in accordance with the World Bank Operational Manual requirements. The meeting was announced in local media and national (Bir Gün) newspapers and through Village Head of Karagedik. Also, national and local policy makers, local NGOs and the local people were invited. Residents in the village were informed about the event through the village heads of Karagedik, Karatepe and Nohuttepe. In this meeting authorized people from EN-ÇEV on behalf of the project owner Enova Enerji Üretim A.Ş. introduced project to the local people in terms of the size of the project, expected length of the construction period and to give details about how this project impacted their lives.

The feedback from the stakeholders was reflected on the project design and implementation. Also, a contact person from Enova Enerji Üretim A.Ş. and relevant contact information was announced in the relevant meetings for ongoing communication.

The local workers have been given priority during the hiring for plant operation.

The Project has resulted in the creation of new jobs in the project region and improvement in local roads, contributing to living standards in the region. The project owner helped local people and the institutions in many ways.

There was no specific environmental problem that concerned the locals more than others, and environmental issues need to be solved by the government. All people considered clear signs of climate change in the region in recent years.

The contact information of the plant responsible exist at the Mukhtars of Kumarlı village, the project owner and local community are always in touch. The project owner regularly checks with the Mukhtar if any complaint or a request exists. Any complaint or need from the local community could directly be received by the project owner and appropriate contributions or improvements are made to the local community. No complaint has been received during the monitoring period.

The project is operational and there is no update to the project design.

During the site visit interview, RCE personnel spoke with Mr. Kenan Özer, Mukhtar of Kumarlı Village, and stakeholder Mr. Yaşar Özen, an Kumarlı Village resident. They had no negative opinion concerning the project activity and stated that project owners have had positive communication with the stakeholders.

During the verification, CAR02 has been raised for Local Stakeholder Consultation as below;

CAR01: Stakeholder meeting dd. 10/04/2009 records are not submitted.

Stakeholder meeting records are provided through approved PD dated 02 February 2011 and **CAR02** has been closed.

4.3 AFOLU-Specific Safeguards

Not applicable.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

According to the applied methodology ACM0002 version 12.1 /D3/ and the registered PD version 3 /D12/ the GHG emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y = Emission reductions in year y (tCO₂e/yr)

BE_y = Baseline emissions in year y (tCO₂/yr)

PE_y = Project emissions in year y (tCO₂e/yr)

No Project Emissions are considered **PE_y = 0**.

The baseline emissions in the monitoring period are calculated using the following formula:

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

Where;

BE_y= Baseline emissions in year y (tCO₂/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 project activity in year y (MWh/y)

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

Since Ceyhan is a greenfield renewable power plant:

EG_{PJ,y} = EG_{facility,y}=The amount of net electricity produced and fed into the grid in year y.

Combined margin CO₂ emission factor (EF_{grid,CM,y}) is calculated once during the validation of the project activity and is valid throughout the first crediting period of 10 years.

The emission factor has been confirmed as **0.615 tCO₂/MWh** during the validation. /D12/

For Oşkan HPP

$$= 23,889,000 \text{ W} / 1,621,425.95 \text{ m}^2$$

$$= 14.733 \text{ W/m}^2$$

For Berkman HPP

$$= 37,815,000 \text{ W} / 1,648,560.79 \text{ m}^2$$

$$= 22.938 \text{ W/m}^2$$

Therefore, **PE_y = 0**

Month	(A) Electricity supplied to the grid [kWh]	(B) Electricity consumption from the grid [kWh]	(C) = (A) - (B) EG (ID 8) Net electricity supplied to the grid [kWh]	EF [tCO ₂ /MWh]	Baseline emission: BR = EG * EF [t CO ₂ -eq]
Jun-18	19.731.039,00	22.091,00	19.708.948,00	0,615	12.121,00
Jul-18	22.742.641,00	23.595,00	22.719.046,00	0,615	13.972,21
Aug-18	15.340.552,00	53.081,00	15.287.471,00	0,615	9.401,79
Sep-18	10.353.807,00	61.264,00	10.292.543,00	0,615	6.329,91
Oct-18	8.039.148,00	72.099,00	7.967.049,00	0,615	4.899,74
Nov-18	4.329.517,00	84.616,00	4.244.901,00	0,615	2.610,61
Dec-18	3.207.408,00	109.572,00	3.097.836,00	0,615	1.905,17
Total 2018	83.744.112,00	426.318,00	83.317.794,00	0,615	51.240,44
Jan-19	23.408.305,00	39.895,00	23.368.410,00	0,615	14.371,57
Feb-19	32.345.326,00	224,00	32.345.102,00	0,615	19.892,24
Mar-19	24.694.743,00	25.132,00	24.669.611,00	0,615	15.171,81
Apr-19	34.484.085,00	697,00	34.483.388,00	0,615	21.207,28
May-19	31.304.373,00	4.548,00	31.299.825,00	0,615	19.249,39
Jun-19	24.392.411,00	6.463,00	24.385.948,00	0,615	14.997,36
Jul-19	25.685.557,00	18.449,00	25.667.108,00	0,615	15.785,27
Aug-19	18.765.753,00	50.323,00	18.715.430,00	0,615	11.509,99
Sep-19	18.314.299,00	18.433,00	18.295.866,00	0,615	11.251,96
Oct-19	14.692.874,00	18.482,00	14.674.392,00	0,615	9.024,75
Nov-19	11.274.377,00	35.258,00	11.239.119,00	0,615	6.912,06
Dec-19	6.927.747,00	76.528,00	6.851.219,00	0,615	4.213,50
Total 2019	266.289.850,00	294.432,00	265.995.418,00	0,615	163.587,18
Jan-20	10.794.447,00	62.636,00	10.731.811,00	0,615	6.600,06
Feb-20	23.317.268,00	15.276,00	23.301.992,00	0,615	14.330,73
Mar-20	26.048.548,00	19.052,00	26.029.496,00	0,615	16.008,14
Apr-20	31.756.067,00	6.775,00	31.749.292,00	0,615	19.525,81
May-20	26.469.582,00	9.023,00	26.460.559,00	0,615	16.273,24
Total 2020	118.385.912,00	112.762,00	118.273.150,00	0,615	72.737,99

CL01 has been raised for estimated electricity generation as below;

CL01: Approved PD dated 02/02/2011 estimated electricity generation provided as 239,566 MWh but in MR it is described as 239,946 MWh. Please clarify.

Estimated electricity generation has been confirmed through approved PD dated 02 February 2011 page 3 and **CL01** has been closed.

According to the registered PD, the estimated emission reduction for this monitoring period would be 295,536 tCO₂e corresponding to the monitoring period. However, the project in operation totally reached 287,566 tCO₂e in this period.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

The GHG Emission Reductions are a function of the net electricity generated and fed into the grid by the project activity and the combined margin emission factor which is determined during validation for the whole crediting period. According to the Validation Report, the combined margin emission factor is validated and will remain the same for the first crediting period of 10 years.

Calibration of the electricity meters /D6/ have been confirmed as below;

Project Equipment	Monitoring	Equipment ID/Serial Numbers	Description
Main OŞKAN - Unit 1	Electricity Meter	8923872	Last Calibration 11/10/2019
Main OŞKAN - Unit 2	Electricity Meter	8923874	Last Calibration 11/10/2019
Main OŞKAN - Unit 3	Electricity Meter	8923876	Last Calibration 11/10/2019
Main OŞKAN - Unit 1 (Changed on 19.10.2019)	Electricity Meter	388202	Last Calibration 19/10/2019
Main OŞKAN - Unit 2 (Changed on 19.10.2019)	Electricity Meter	388204	Last Calibration 19/10/2019
Main OŞKAN - Unit 3 (Changed on 19.10.2019)	Electricity Meter	388207	Last Calibration 19/10/2019
Back-up OŞKAN Unit 1	Electricity Meter	8923873	Last Calibration 11/10/2019
Back-up OŞKAN Unit 2	Electricity Meter	8923875	Last Calibration 11/10/2019
Back-up OŞKAN Unit 3	Electricity Meter	84260477	Last Calibration 11/10/2019
Back-up OŞKAN Unit 1 (Changed on 19.10.2019)	Electricity Meter	388203	Last Calibration 19/10/2019
Back-up OŞKAN Unit 2 (Changed on 19.10.2019)	Electricity Meter	388205	Last Calibration 19/10/2019
Back-up OŞKAN Unit 3 (Changed on 19.10.2019)	Electricity Meter	388208	Last Calibration 19/10/2019
Main BERKMAN - Unit 1	Electricity Meter	8923878	Last Calibration 19/10/2019

Main Electricity Meter BERKMAN - Unit 1 (Changed on 19.10.2019)	388228	Last Calibration 30/10/2018
Back-up Electricity Meter BERKMAN - Unit 1	8923879	Last Calibration 19/10/2019
Back-up Electricity Meter BERKMAN - Unit 1 (Changed on 19.10.2019)	388227	Last Calibration 11/10/2019

RCE confirms that the calibrations are line with the Turkish national regulations. 1. According to Turkish regulation the calibration needs to be completed once in every 10 years. The substitute meter also serves to detect calibration faults between the two meters. In case of such a discrepancy, TEİAS is responsible for calibration and maintenance. The metering devices are under the control of TEİAS and since they are sealed, no one but TEİAS can intervene with these meters. Calibration and maintenance is also under responsibility of TEİAS.

The evidence used for calculation of project emissions are the name plates of the generators which include the installed capacity of both HEPPs. The validity of these name plates was assessed during the site visit. During the verification site visit, the reservoir areas /D26/ confirmed as below;

Berkman: 72.55 m – 72.40-45 m (equal to 1,648,560.79 m²)

Oşkan: 83.05 m – 82.95 m (equal to 1,621,425.95 m²)

Electricity generation value is taken from the official billing system OSOS (Automatic Meter Reading System)./D11/ Also EPIAŞ /D8/ has been used for cross checking and it is confirmed that there is no difference with the EPIAŞ records. To cross-check the OSOS data EPIAŞ forms for every month is submitted to and reviewed by the verification DOE. The OSOS Forms include hourly generation figures of the plant. This data was crosschecked with the data from EPIAŞ records.

RCE hereby confirms that the evidence used to determine the GHG emission reductions are sufficient in quantity and appropriate in quality

4.6 Non-Permanence Risk Analysis

Not Applicable

5 VERIFICATION CONCLUSION

RCE has performed the 3th annual verification of VCS “Ceyhan 61.7 MW Hydropower Project” which is a project with the registry ID number “810” for the period between 01 June 2018 to 31 May 2020 (both days included). The scope of the activities cover the verification and certification of GHG emissions reductions reported in Monitoring Report version 2 /D18/dated 14 January 2022 of “Ceyhan 61.7 MW Hydropower Project”

Sekans Danışmanlık acted as a consultant for the current reporting period and is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring Plan indicated in the final PD. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, is the responsibility of the management of the Project. The development and maintenance of the records and the related monitoring procedures are in accordance with the Monitoring Report Version 2 /D18/.

RCE hereby confirms that the project activity “Ceyhan 61.7 MW Hydropower Project” in Turkey, is implemented in accordance with the validated and registered PD version 3 /D12/ dated 02 February 2011. The monitoring system is in place and the emission reductions are calculated without material misstatements as per the applied approved methodology, which is ACM0002 Version 12.1 /D3/.

RCE concludes to a reasonable level of assurance that the GHG assertion is free of material misstatement. The emission reductions resulting the reporting period 1 June 2018 to 31 May 2020 can be considered in conformance with the:

- Verified Carbon Standard Version 4.1 (22 April 2021),
- Clean Development Mechanism methodology ACM0002 – “Grid-connected electricity generation from renewable sources” (version 12.1 sectoral scope: 01) (and all associated methodology tools).
- Validated VCS Project Description, version 03 dated 02 February 2011.

Verification period: From 01 June 2018 to 31 May 2020.

Verified GHG emission reductions and removals in the above verification period

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)

1

<https://www.mevzuat.gov.tr/File/GeneratePdf?mevzuatNo=22618&mevzuatTur=KurumVeKurulusYonetmeligi&mevzuatTertip=5>

2018	• 51,240	0	0	• 51,240
2019	163,587	0	0	163,587
2020	• 72,738	0	0	72,738
Total	287,566	0	0	287,566

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