FINAL VERIFICATION REPORT

"78 MW AKOCAK HYDROELECTRIC POWER PLANT"

RINA Services S.p.A.

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Summary:

RINA Services S.p.A. (RINA), commissioned by Çanakçı HES Elektrik Üretim A.Ş., has verified the greenhouse gas emission reductions reported for the project activity "78 MW Akocak Hydroelectric Power Plant" in Turkey, VCS Registration Reference N° 535, for the period 01/01/2016 to 30/06/2020, with regard to the relevant requirements for CDM and VCS activities.

The objective of the verification is to have an independent review ex post determination of the monitored reductions in GHG emission reductions, reported for the "78 MW Akocak Hydroelectric Power Plant" project in Turkey for the period 01/01/2016 to 30/06/2020.

Verification was conducted using RINA procedures in line with the requirements specified in the VCS Version 4.1 Requirements, CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques. The verification consisted of desk review, remote-site assessment and the resolution of outstanding issues and the issuance of the final verification report and certification.

The verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable VCS Version 4.1 requirements, which refer to CDM rules, in order to be certified.

In conclusion, it is RINA's opinion that the project activity "78 MW Akocak Hydroelectric Power Plant", in "Turkey", as described in the Monitoring Report version 05 of 14/09/2021, meets all relevant requirements for VCS and CDM activities and all relevant host Party criteria and correctly applies the baseline and monitoring methodology "ACM0002", "Consolidated methodology for grid connected electricity generation", version 10.0 of 28/05/2009. Hence, RINA is able to certify that the emission

reductions from the project during the monitoring period 01/01/2016 to 30/06/2020 amount to 557,944 tCO_2e.

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1 INTRODUCTION

1.1 Objective

The objective of the verification is to have an independent review ex post determination by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered VCS project activity during a defined monitoring period. Certification is the written assurance by the DOE that, during a specific time period, a proposed VCS project activity achieved the reductions in anthropogenic emissions by sources of GHGs as verified.

The objective of this verification/certification was to verify and certify emission reductions and effective implementation of the monitoring of sustainable development indicators and mitigation measures, reported for the "78 MW Akocak Hydroelectric Power Plant" project in Turkey for the period 01/01/2016 to 30/06/2020.

1.2 Scope and Criteria

The verification scope is:

- to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan;
- to evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement;
- to verify that reported GHG emission data is sufficiently supported by evidence;
- to evaluate whether all the mitigation measures have been effectively put in place according to the monitoring plan and that all the sustainable development indicators have been correctly monitored.

Verification shall ensure that reported emission reductions are complete and accurate in accordance with applicable VCS Version 4.1 requirements, which refer to CDM rules, in order to be certified.

UNFCCC criteria for CDM refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent decisions by the CDM Executive Board.

Verification is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring.

1.3 Level of Assurance

All the revisions of the verification report, before being submitted to the client, were subjected to an independent internal technical review to confirm that all verification activities had been

completed according to the pertinent RINA instructions. All evidence had been confirmed during remote site visit with the invoices of electricity generation. The level of assurance is reasonable.

The technical review was performed by a technical reviewer(s) qualified in accordance with RINA's qualification scheme for VCS and CDM validation and verification. The verification team and the technical reviewers consist of the following personnel:

Role/Qualification	Last Name	First Name	Country
VCS Team Leader – VCS Verifier – Technical Expert	Kiratli	Tugce	Turkey
Independent Technical Reviewer	Mathew	Vijay	India

1.4 Summary Description of the Project

Çanakçı HES Elektrik Üretim A.Ş. has commissioned RINA to carry out the verification and certification of emission reductions reported for the registered "78 MW Akocak Hydroelectric Power Plant" project in Turkey, VCS Registration Reference N° 535, for the period 01/01/2016 to 30/06/2020.

The project is hydroelectric power plant located in East Black Sea Region, Arakli District of the Trabzon Province, Turkey.

The project consists of two weirs. Erikli weir is located on Alcak Brook that is branch of Karadere River at 1,339 meters river elevation. Akocak weir is located on Karadere River at 1,328 meters river elevation. The water collected at Erikli weir is connected with a 3 meter diameter, circular section, derivation tunnel of 3,250 meters long to the upstream of Akocak weir. The Akocak weir transmits the collected waters to a surge tank through a 6,150 meters long transmission tunnel. The penstock extending from the surge tank to the powerhouse is 1,842 meters long, with an average diameter of 1.82 meters. In the power house, 2 vertical axis Pelton turbines are installed with a total capacity of 81 MWe. The generated electricity is transmitted to the National Electricity System through Arsin Substation, with a 154 kV and 32 km long energy transmission line.

The GHG benefit of the project activity was only accounted under VCS. There are not any other RECs were being issued for the project activity. Furthermore, as a host country in Turkey such any programme like a government-regulated system or programme for the constraint and monetisation of GHG emissions (such as emissions trading scheme, cap and trade or carbon tax mechanisms) has not been implemented.

The generated electricity is supplied to the National Electricity Transmission Grid of Turkey.

Project Participant(s)	Çanakçı HES Elektrik Üretim A.Ş.		
Project Title	78 MW Akocak Hydroelectric Power Plant		
Location of the project	East Black Sea Region, Arakli District of the Trabzon Province, Turkey.		
Methodology(ies)	"ACM0002", "Consolidated methodology for grid connected electricity generation", version 10.0 of 28/05/2009 /6/		
Sectoral Scope(s)	1	**RINA's Technical Area(s)**	1.2
Registered VCS PD	Version 03 of 20/07/2010		
VCS Registration Reference No	535		
Starting date of the crediting period	01/07/2010 (as confirmed through the Temporary Acceptance Protocol /12/)		
Project's crediting period	From 01/07/2010 to 30/06/2020		
Monitoring period	01/01/2016 - 30/06/2020 (both days included)		
Project documentation link	https://registry.verra.org/app/projectDetail/VCS/535		

2 VERIFICATION PROCESS

The project was validated by Bureau Veritas Certification Holding SAS on 26/07/2010 and it was registered under the VCS registration reference N° 535. This is the third verification assessment for the monitoring period 01/01/2016 to 30/06/2020 by RINA.

2.1 Method and Criteria

Verification was conducted using RINA procedures in line with the requirements specified in the VCS Version 4.1 Requirements, CDM M&P, the latest version of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques.

The verification consisted of the following three phases:

- Document review;
- On-site assessment (Remote Audit);

The resolution of outstanding issues and the issuance of the final verification report and certification.

2.2 Document Review

The monitoring report, version 05 of 14/09/2021 and previous versions /2/, the emission reduction calculations provided in the form of a spreadsheet, "VER_Calcs__Monitoring_Report_v03 11062021.xlsx" version 03 of 11/06/2021 and previous versions /8/, the approved baseline and monitoring methodology ACM0002 version 10.0 /6/ and all the documentation provided to support the monitoring period /01 – 23/ were assessed as part of the verification. In addition, the VCS Project Description (VCS PD) /1/, in particular as regards the baseline estimations and the monitoring plan, and the Validation Report of 26/07/2010 /7/ for the project, were reviewed.

The following table lists the documentation that was reviewed during the verification.

/1/	GTE Karbon: VCS PD for "78 MW Akocak Hydroelectric Power Plant" in Turkey, version 03 of 20/07/2010
/2/	GTE Karbon: Monitoring report for "78 MW Akocak Hydroelectric Power Plant" in Turkey, version 05 of 14/09/2021 GTE Karbon: Monitoring report for "78 MW Akocak Hydroelectric Power Plant" in Turkey, version 04 of 26/07/2021 GTE Karbon: Monitoring report for "78 MW Akocak Hydroelectric Power Plant" in Turkey, version 03 of 11/06/2021 GTE Karbon: Monitoring report for "78 MW Akocak Hydroelectric Power Plant" in Turkey, version 02 of 07/05/2021 GTE Karbon: Monitoring report for "78 MW Akocak Hydroelectric Power Plant" in Turkey,

	version 01 of 15/04/2021
/3/	VCS Verified Carbon Standard: VCS Program Guide, VCS Version 4 of 19/09/2019
/4/	VCS Verified Carbon Standard: VCS Standard, VCS Version 4 of 19/09/2019
/5/	VCS Verified Carbon Standard: Validation and Verification Manual, version 3.2 of 19/10/2016
/6/	CDM Executive Board: Baseline and monitoring methodology "ACM0002", "Consolidated methodology for grid connected electricity generation", version 10.0 of 28/05/2009
/7/	Bureau Veritas Certification Holding SAS: Validation Report for "78 MW Akocak Hydroelectric Power Plant" of 26/07/2010
/8/	GTE Karbon: Emission Reduction Calculation Spreadsheet "VER_Calcs__Monitoring_Report_v03 11062021.xlsx" version 03 of 11/06/2021 GTE Karbon: Emission Reduction Calculation Spreadsheet "VER_Calcs__Monitoring_Report_v02 07052021.xlsx" version 02 of 07/05/2021 GTE Karbon: Emission Reduction Calculation Spreadsheet "VER_Calcs__Monitoring_Report_v01 15042021.xlsx" version 01 of 15/04/2021
/9/	VCS Verified Carbon Standard: VCS Verification Report Template Version 4 of 19/09/2019
/10/	CDM Executive Board: Methodological Tool "Tool to calculate the emission factor for an electricity system", version 02 of 16/10/2009
/11/	Website: https://registry.verra.org/app/projectDetail/VCS/535 Argument: Verra Database Language: English; Retrieved on: 18/07/2021
/12/	The Ministry of Energy and Natural Resources: Temporary Acceptance Protocol of 30/06/2010 (Unit 1) The Ministry of Energy and Natural Resources: Temporary Acceptance Protocol of 29/07/2010 (Unit 2)
/13/	Energy Market Regulatory Authority: Generation License numbered EU/582-5/590 of 23/11/2005 (Amendment on 14/01/2010)
/14/	EPIAS: Monthly Meter Reading Protocols for the monitoring period 01/01/2016 to 30/06/2020
/15/	TEIAS: Monthly Meter Reading Protocols for the monitoring period 01/01/2016 to 30/06/2020
/16/	The Turkish Ministry of Trade and Industry: Regulation of Metering and Testing of Metering Systems of 24/07/1994
/17/	Turkish Energy Market Regulatory Authority: Communiqué for Measurement Devices used in the Electricity Market of 22/03/2003
/18/	The Energy Market Regulatory Authority: Electricity Market Balancing and Settlement Regulation of 14/04/2009
/19/	Turkish Electricity Transmission Company (TEIAS): First Index Protocol of 27/05/2010
/20/	Akocak HEPP: Operational Incident Report of 24/05/2020
/21/	Public Disclosure Platform (KAP): Sales Notification of 01/01/2016
/22/	Akocak HEPP: Erikli and Akocak Regulators Layout, submitted on 07/05/2021
/23/	RINA: Previous Verification Report "DFVR_16TQ07MD_VCS Ver_1.1_24052016_270516_approved.doc", of 27/05/2016
/24/	Environment And Urban Ministry (General Directorate of Environmental Impact Assessment, Permission and Inspection): EIA Positive Decision of 16/04/2018

/25/	Photos of the Fish Passages, submitted on 27/07/2021
/26/	State Hydraulic Works: Lifeline Water Records from 2016 to 2020

2.3 Interviews

The Plant Manager was interviewed by phone during remote audit. To see how the monitoring procedures were implemented, the whole process was explained to the verification team. The carbon consultant was interviewed about the monitoring report and related parameters. Whole process related emission reduction calculation was explained. The mukhtars were interviewed. They confirmed that no grievance was announced by the stakeholders.

The key personnel interviewed, and the main topics of the interviews are summarized in the table below.

	Date	Name and Role	Organization	Topic
/a/	04/05/2021	Merve AYGENC *Carbon Consultant*	GTE Karbon	Monitoring plan Monitoring methodology Monitoring data Implementation status of the project Monitoring equipment and operation Calibration certificates Emission Reductions calculation
/b/	04/05/2021	Hamdi GÜRSOY *Plant Responsible*	Canakci HES Elektrik	
/c/	04/05/2021	Temel AKSOY *Mukhtar*	Kayaiçi Village	Positive and negative impacts of the project activity Contact details of the project proponents
/d/	04/05/2021	Eyüp AYGÜN *Mukhtar*	Erikli Village	

2.4 Site Inspections (Remote Audit)

On 04/05/2021, RINA performed a remote audit for the wind power plant located in Arakli District, Trabzon province of Turkey. During the video conference for the project, it was confirmed that all the equipment and the systems were accessible. RINA assessed the implementation and operation of the proposed project activity, reviewed the information flows for generating, aggregating and reporting the monitoring parameters, interviewed key personnel of the plant to confirm the operational and data collection procedures, cross-checked between information provided in the monitoring report and data plant, checked the monitoring equipment including calibration performance, reviewed calculations and assumptions made in determining the GHG data and emission reductions, checked the quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

2.5 Resolution of Findings

The objective of this phase of the verification is to resolve any outstanding issues, which need to be clarified for RINA's positive conclusion on the monitoring report and emission reductions.

To guarantee transparency a verification protocol has been customized for the project. The protocol shows in a transparent manner the requirements, means of verification and the results from verifying the identified criteria. The verification protocol consists of three tables; the different columns in these tables are described in the figure below (see Figure 1). The completed verification protocol is enclosed in Appendix 4 to this report.

A corrective action request (CAR) is raised if one of the following occurs:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impair the estimate of emission reductions;
- Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A clarification request (CR) is raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements, which refer to CDM rules, have been met.

CARs, CRs identified are included in the verification protocol in Appendix A of this report.

During this monitoring period, 2 CARs and 3 CRs are raised. All findings are closed.

Figure 1 Verification protocol tables

Verification Protocol, Table 1 - Requirement checklist					
Checklist Question	**Ref.**	**MoV**	**Comments**	**Draft Conclusion**	**Final Conclusion**
Checklist questions organized in seven different sections.	Makes reference to documents where the answer to the checklist question or item is found.	Explain how conformance with the checklist question is investigated. Examples are document review (DR), interview or any other follow-up actions (I), cross checking (CC) with available information relating to projects, (N/A) means not applicable.	The discussion on how the conclusion is arrived at and the conclusion on the compliance with checklist question so far.	For CAR, CR and FAR see the definitions above.	OK is used if the information and evidence provided is adequate to demonstrate compliance with VCS requirements which refer to CDM rules.

Verification Protocol, Table 2: Resolution of Corrective Action Requests and Clarification			
Corrective action requests and/or clarification requests	**Reference to Table 1**	**Response by project participants**	**Verification Conclusion**
The CAR and/or CRs raised in table 1 are repeated here.	Reference to the checklist question number in Table 1 where the CAR or CR is explained.	The responses given by the project participants to address the CARs and/or CRs.	The verification team's assessment and final conclusion of the CARs and/or CRs.

Verification Protocol, Table 3 - Forward Action Requests		
Forward action request	**Reference to Table 1**	**Response by project participants Verification Conclusion**
The FAR raised in table 1 is repeated here.	Reference to the checklist question number in Table 1 where the FAR is explained.	Response by the project participants on how forward action request will be addressed.

2.5.1 Forward Action Requests

According to the previous verification Report /23/, no FAR is raised.

2.6 Eligibility for Validation Activities

The project activity is registered under VCS registration reference Number 535 /11/; hence this section is not applicable.

3 VALIDATION FINDINGS

In the registered VCS PD for "78 MW Akocak Hydroelectric Power Plant" in Turkey, version 03 of 20/07/2010 /1/, the installed capacity is defined as 42.09 MWm/ 41.25 MWe as confirmed through the Temporary Acceptance Protocols /12/. *T*he average electricity generation is estimated as 257,440 MWh as per the registered VCS PD /1/. The additionality of the project activity is demonstrated by applying investment analysis registered VCS PD /1/.

The project was validated by Bureau Veritas on 26/07/2010 /7/ and it was registered under the VCS registration reference N° 535.

3.1 Participation under Other GHG Programs

The project activity is not participated under other GHG Programs as confirmed through the websites of the standard /11/.

3.2 Methodology Deviations

There is no methodology deviation in this monitoring period.

3.3 Project Description Deviations

The installed capacity of the project was increased from 82.46 MWm / 81 MWe to 84.18 MWm / 82.5 MWe on 06/11/2017. However, the annual production amount (257,440 GWh) did not change as confirmed through the Generation License /13/.
In addition, Akenerji Elektrik Üretim A.Ş., the former project owner, was changed to Çanakçı HEPP Elektrik Üretim A.Ş. on 01/01/2016 as confirmed through the Public Disclosure Platform /21/.

3.4 Grouped Project

This project is not a grouped project. Hence, this section is not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

It was verified during the remote audit conducted on 04/05/2021 that the proposed project activity has been implemented and it is in operation in accordance to the project activity described in the registered VCS PD /1/.

The project activity has been implemented in 2 phases. On 30/06/2010, the power plant has started operation with 1 turbine and on 29/07/2010 the remaining 1 turbine has been commissioned. Each commissioning date was confirmed through the Temporary Acceptance Protocols /12/. The carbon crediting period and therefore the monitoring starts when the plant commences electricity generation. Therefore, the crediting period starts on 01/07/2010.

The project activity consists of 2 vertical axis Pelton turbines, each with 40.5 MWe capacity and making the total installed capacity of 81 MWe as confirmed through the Technical Specification of Turbines /16/ and Generation License /13/. The project boundary in the registered VCS PD /1/ is in line with the actual project boundary. The generated electricity is fed to the national grid. The generated electricity is transmitted to the National Electricity System through Arsin Substation, with a 154 kV and 32 km long energy transmission line. The geographic coordinates of the project activity is confirmed through the registered PDD /1/.

There are no material discrepancies between the actual monitoring system and plan. The project contributes to SDG 7 by generating electricity from clean energy. The project also greatly supports sustainable economic development in the region. In accordance with SDG 8, employment was created during the construction and operation phases of the power plant. Compared to the business-as-usual scenario, which is considered a contribution to SDG 13, it has a significant contribution to reducing carbon emissions and protecting the climate. Therefore, the project has positive effects on sustainable development.

4.2 Safeguards

4.2.1 No Net Harm

4.2.2 The damage caused by hydroelectric power plants is gathered on two issues. One of them is the fish pass. There are two regulatory bodies in this project, Erikli and Akocak. Both regulators have fish passages that allow fish mobility as confirmed through the photos of the fish passages /25/.

Another issue is the amount of water released into the riverbed. This amount of water is controlled by DSI and the General Directorate of Nature Conservation and National Parks on the lifeline waters as confirmed through the records /26/.

In addition, The General Directorate of Environmental Impact Assessment, Permission and Inspection gave an EIA positive decision on 16/04/2018 /24/.

4.2.3 Local Stakeholder Consultation

The first Stakeholder meeting of the project was held on 27 October 2008 in Araklı District of Trabzon Province.

For this monitoring period, local people were interviewed by phone. It was learned that in general, the main form of communication between the local people and the project owner is face-to-face. They stated that in case of any problem, they can easily reach the responsible persons and convey their complaints. There are no complaints/compliance related to the project implementation during this monitoring period.

4.3 AFOLU-Specific Safeguards

This project is not an "Agriculture, Forestry and Other Land Use (AFOLU)" project.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The emission reduction calculations provided in the spreadsheet /8/ have been verified to be correct and in line with the registered VCS PD /1/.

According to the applied methodology "ACM0002", "Consolidated baseline methodology for grid-connected electricity from renewable sources", version 10 of 28/05/2009 /6/, the emission reductions have been calculated based on the following formula:

$ERy = BEy - PEy - LEy$

Where:

BEy = Baseline emissions in year y (tCO_2e/yr)

PEy = Project emissions in year y (tCO_2e/yr)

LEy = Leakage emissions in year y (tCO_2e/yr)

Baseline emissions

The baseline emissions include the CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity, multiplying the electricity supplied to the grid (MWh) with the combined margin CO_2 emission factor for grid connected power generation in year.

BEy = EGy x EFy

Where:

EGy = Net electricity delivered to the grid by the project activity in year y excluding transmission losses of the grid (MWh)

EFy = Combined margin grid emission factor (tCO_2/MWh)

Project emissions

Project emissions from reservoir has been assumed to be 0 since the power density is larger than 10 W/m² as per the ACM0002 version 10 of 28/05/2009 /6/ as defined in the validated VCS PD /1/. In the registered VCS PD for "78 MW Akocak Hydroelectric Power Plant" in Turkey, version 03 of 20/07/2010 /1/, the power density has been calculated based on the only reservoir area of Erikli weir. To be on the conservative side, the reservoirs both of Erikli and Akocak have been taken into consideration and power density is calculated accordingly in the Monitoring Report /2/. The power density is still higher than 4 W/m²; therefore, project emissions are neglected.

Leakage emissions

The leakage emissions are assumed to be zero as per the ACM0002 version 10 of 28/05/2009 /6/ as defined in the registered VCS PD /1/.

The data presented in the monitoring report /2/ were assessed by reviewing in detail project documentation, collection of monitored data, observation of established monitoring and reporting practices and assessment of the reliability of monitoring equipment. Sufficient evidence was presented and verified by RINA for the reported emission reductions.

Parameters Available at Validation and Data Fixed Ex-ante

DATA/PARAMETER	Source of data	Reported value for the project period	Assessment/Observation
$EF_{grid,CM,y}$ Baseline emission factor	TEIAS statistics	0.645 tCO_2/MWh	According to the approved methodology ACM0002 version 10.0, the combined emission factor has been determined using the ex-ante option and so it is not requested to monitor and recalculate the emission factors during the crediting period. The emission factor is determined to be 0.645 tCO_2/MWh in the VCS PD /1/ and validation report /7/.

Parameters and Data Monitored

DATA/PARAMETER	$EG_{facility,y}$
Data Unit	MWh
Description	Net Electricity generated and delivered to the grid by Akocak HEPP in year y
Source of data	Monthly Facility Reports for Electricity Generation Monthly Meter Reading (OSF) Forms
Description of measurement methods and procedures to be applied	The electricity generation figures are based on the EPIAS records /14/ and the Monthly Facility Reports for Electricity Generation /15/ are used for crosscheck.
Frequency of monitoring/recording	Continuously monitoring and monthly recording
Value monitored	865,034 MWh
Monitoring equipment	Two unit's electricity meters (two main meters and two backup meters) are installed at the project site. The main meters are ACTARIS SL761 A071 with serial number 53064405 and 53064407. The backup meters are ACTARIS SL761 A071 with serial number 53064406 and 53064408. The meters have the accuracy of 0.5s as confirmed through the first index protocol /11/ and test reports /12/. The accuracy class of the meters complies with the "Communiqué for Measurement Devices used in the Electricity Market" /19/.
QA/QC procedures to be applied	TEIAS is responsible for calibration and maintenance of the meters as per the registered VCS PD /1/. The project owner has no control on the meters since the meters are sealed by the TEIAS as confirmed during the site visit. If any major discrepancy occurs between the two meters, TEIAS performs necessary calibration. The meters were calibrated by the TEIAS on 27/05/2010 as confirmed through the first index protocol /19/. Also, the meters were tested by the electricity transmission company at the project site on 08/12/2012, 11/12/2013, 10/10/2014 and 16/10/2015 during this monitoring period. As per the "'Regulation of Metering and Testing of Metering Systems" /16/, the meters shall be calibrated every 10 years, therefore the calibration of meters is deemed appropriate and in compliance with the national regulation. During on-site assessment, it was confirmed that the meters are in place and functions well. During the monitoring period, no brake down has been recorded.
Purpose of the data	To calculate the baseline emission value
Calculation method	The electricity generation and consumption are measured in line with the TEIAS rules and requirements /18/. The electricity generation supplied to the grid and electricity consumption from the grid is stored by PMUM on the web site. The Project owner has an ID and password to access this data on the web site. The collected data during the monitoring period will be kept by the project owner at least two years after end of the last

	crediting period as stated in the registered VCS PD /1/ and monitoring report /2/ in line with the ACM0002 version 10 of 28/05/2009 /6/.
Comments	-

DATA/PARAMETER	Cap_{PJ}
Data Unit	W
Description	Installed capacity of the hydro power plant after the implementation of the project activity
Source of data to be used	- Labels on the equipment - Letter for approval of commissioning issued by Ministry of energy and Natural Resources
Value data for the monitoring period	82,500,000 W
Measuring and reporting frequency; recording procedure	Yearly
Type of monitoring equipment and its accuracy	The parameter is monitored through the Generation License and Letter for Approval of Commissioning; therefore, measurement equipment is not used.
Calibration frequency/interval	NA
How were the values in the monitoring report verified and cross-checked?	The parameter is monitored through the Generation License /13/ and Letter for Approval of Commissioning /12/.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	NA
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	All the data were available for the whole monitoring period.

DATA/PARAMETER	A_{PJ}
Data Unit	m^2
Description	Area of the reservoir measured on the surface of the water, after the implementation of the project activity, when the reservoir is full

Source of data to be used	Technical drawing
Value data for the monitoring period	Erikli Weir: 33,877.016 m^2 Akocak Weir: 38,543.722 m^2
Measuring and reporting frequency; recording procedure	Yearly
Type of monitoring equipment and its accuracy	The parameter is monitored through the technical drawing; therefore, measurement equipment is not used.
Calibration frequency/interval	NA
How were the values in the monitoring report verified and cross-checked?	The parameter is monitored through the technical drawing /31/.
Does the data management (from monitoring equipment to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions?	NA
If only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	All the data were available for the whole monitoring period.

Emission Reductions Achieved

The emission reductions calculation reported in the Monitoring Report version 05 of 14/09/2021 /2/ and calculation spreadsheet "VER_Calcs__Monitoring_Report_v03 11062021.xlsx" version 03 of 11/06/2021 /8/ have been verified to be correct.

The emission reductions from the project for the monitoring period from 01/01/2016 to 30/06/2020 as reported in the Monitoring Report version 05 of 14/09/2021 /2/ is equivalent to 557,944 tCO_2e. According to the registered VCS PD /1/, the estimated emission reductions are equivalent to 651,064.5 tCO_2e. The reported averaged emission reductions are 14.3% lower than the estimated emission reduction.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

The generated electricity monitored continuously by two-unit meters that were sealed by TEIAS. Two-unit electricity meters (two main meters and two backup meters) are installed at the

project site. The main meters are ACTARIS SL761 A071 with serial number 53064405 and 53064407. The backup meters are ACTARIS SL761 A071 with serial number 53064406 and 53064408. The meters have the accuracy of 0.5s as confirmed through the first index protocol /19/. The accuracy class of the meters complies with the "Communiqué for Measurement Devices used in the Electricity Market" /17/.

TEIAS is responsible for calibration and maintenance of the meters as per the registered VCS PD /1/. The project owner has no control on the meters since the meters are sealed by the TEIAS as confirmed during the site visit. If any major discrepancy occurs between the two meters, TEIAS performs necessary calibration. The meters were calibrated by the TEIAS on 27/05/2010 as confirmed through the first index protocol /19/. As per the "'Regulation of Metering and Testing of Metering Systems" /18/, the meters shall be calibrated every 10 years, therefore the calibration of meters is deemed appropriate and in compliance with the national regulation. The calibration frequency has been respected.

The electricity generation figures are based on the EPIAS records /14/ and the Monthly Meter Readings /15/ are used for crosscheck from 01/01/2016 to 30/06/2020. The records and emission reduction calculation spreads sheet /8/ are consistent.

4.6 Non-Permanence Risk Analysis

There is no non-permanence risk rating determined by the project proponent.

5 VERIFICATION CONCLUSION

RINA Services Spa (RINA) has performed verification of the emission reductions reported for the project activity "78 MW Akocak Hydroelectric Power Plant" in Turkey, VCS Registration Reference N° 535, for the period 01/01/2016 to 30/06/2020, with regard to the relevant requirements for CDM and VCS activities.

It is RINA's opinion that the GHG emission reductions stated in the Monitoring Report version 05 of 14/09/2021 for the "78 MW Akocak Hydroelectric Power Plant" project in Turkey for the period 01/01/2016 to 30/06/2020 are fairly stated. The GHG emission reductions were calculated correctly, on the basis of the approved monitoring methodology "ACM0002", "Consolidated methodology for grid connected electricity generation", version 10.0 of 28/05/2009 and the monitoring plan contained in the registered VCS PD.

Hence, RINA is able to certify that the emission reductions from the project during the monitoring period 01/01/2016 to 30/06/2020 amount to 557,944 tCO_2e.

Verification period: From 01/01/2016 to 30/06/2020

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

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
Year 2016	110,792	0	0	110,792
Year 2017	106,299	0	0	106,299
Year 2018	137,940	0	0	137,940
Year 2019	106,186	0	0	106,186
Year 2020	96,727	0	0	96,727
Total	557,944	0	0	557,944

APPENDIX 4

VERIFICATION PROTOCOL

Table 1. Remaining FAR from validation and/or previous verification

FAR ID	1	Section no.		Date:
Description of FAR				
Project participant response				Date:
Documentation provided by project participant				
DOE assessment				Date:

Table 2. CR from this verification

CR ID	1	Section no.	1	Date: 05/05/2021
Description of CR				
- In VCS Portal and VCS-PD, the PP is presented as Akenerji Elektrik Uretim and not in line with the Monitoring Report. The change regarding the project owner should be explained in the report and the VCS portal should be corrected. Also, the necessary supporting document should be provided to the verification team. - In addition, the installed capacity is also not line with the VCS-PD. The change regarding the capacity should be clearly defined in the Monitoring Report.				
Project participant response				Date: 07/05/2021
- Owner change has been mentioned under Section 2.3.2. Supporting document provided. Account holder will be changed on online portal. A request mail screenshot has been shared. - Installed capacity has been revised as 82.5 MWe throughout MR. The change is mentioned under Section 2.3.2.				
Documentation provided by project participant				
DOE assessment				Date: 10/06/2021
- According to the provided documentation, it is now confirmed that Akocak HEPP was sold to Canakci HES Elektrik Uretim A.S. However, for VCS portal changes, the provided documentation is not related. It is about transferring the account of the project. Please be sure that PP is presented as Canakci HES in VCS Portal. - It is now defined in the report that “Project installed capacity has been increased from 82.46 MWm / 81 MWe to 84.18 MWm / 82.5 MWe on 06/11/2017. However, the annual generation which is 257.440 GWh has remained the same. So, there is no need to change the additionality of the project. Please clearly explain how the annual generation can be the same when the installed capacity has been increased. Please provide a confirmation from VCS to continue in this condition. **Hence, CR 1 is not closed.**				

Project participant response	Date: 15/06/2021
- It has been corrected from the online portal. - Response from the site manager declares that there is no major capacity increase affecting the generation dramatically. The full capacity of 82.5 MWe is only used almost 1.5 months in a year. The screenshot of the e-mail is shared.	
DOE assessment	**Date:** 23/06/2021
- In VCS Portal, PP is presented correctly. - Since the value of electricity generation is not changed, the explanation is acceptable from our side. **Hence, CR 1 is closed.**	

CR ID	2	Section no.		Date: 05/05/2021
Description of CR				
In Section 1.3 Project Proponent, the titles of the tables cannot be read because of their color. In addition, GTE Karbon is also presented as PP in this section. Please prove if GTE also benefits from carbon revenue.				
Project participant response				Date: 07/05/2021
- Colour changed. GTE benefits from the carbon revenue. The related part of the agreement has been shared.				
Documentation provided by project participant				
DOE assessment				Date: 10/06/2021
In section 1.3, the color of the table is now revised. The agreement between PP and carbon consultant is now provided. According to the agreement, it can be confirmed that GTE also benefits from carbon revenue. **Hence, CR 2 is closed.**				

CR ID	3	Section no.		Date: 05/05/2021
Description of CR				

Please correct or explain the issues given below: - Please provide the contact details of the stakeholders living near to the project area. - Footnote 1 – 2 – 3 – 4 – 5 – 9 – 10 are not available. Please check. - In Section 1.11 of the MR, positive influences on sustainable development should be explained clearly. - In Section 2.1 of the MR, Summarize the potential negative environmental and socio-economic impacts and steps taken to reduce them. - In Section 2.2 of the MR, please clearly describe the process for, and the outcomes from, ongoing communication with local stakeholders conducted prior to verification as per the guideline of the MR form. - In Section 3.1 of the MR, the implementation status of the project activity(s) should be described according to the given information in VCS-MR-Template. - TEIAS links given in Section 4.1 are not available. Please check.

Project participant response	**Date:** 07/05/2021
- Stakeholder contact info have been shared. - Footnotes revised, but some of them are not accessible and could not be found. Therefore, removed from the MR. - Section 1.11 has been revised. - Section 2.1 has been revised. - Section 2.2 has been revised. - Section 3.1 has been revised. - TEIAS website links does not work properly. Therefore, the links has been removed since all data was validated before.	

Documentation provided by project participant

DOE assessment	**Date:** 10/06/2021
- The contact details of the stakeholders living near to the project area are now provided. - Footnote 1 is still not available. Footnote 2 – 3 – 4 – 5 are now working. Footnote 9 – 10 are now removed. - In Section 1.11 of the MR, positive influences on sustainable development are now explained clearly. - In Section 2.1 of the MR, the potential negative environmental and socio-economic impacts and steps taken to reduce are now summarized. - In Section 2.2 of the MR, related part is now revised, and all necessary information is now given. - In Section 3.1 of the MR, the implementation status of the project activity(s) is now described according to the given information in VCS-MR-Template. - TEIAS links are now removed from Section 4.1. **Hence, CR 3 is not closed.**	

Project participant response	**Date: 11/06/2021**
- Footnote 1 is revised.	

DOE assessment	**Date:** 23/06/2021

- Footnote 1 is now available. **Hence, CR 3 is closed.**

Table 3. CAR from this verification

CAR ID	1	**Section no.**	A.5	**Date:** 05/05/2021
Description of CAR				
- The end of first crediting period is presented as 31/07/2020. This date should be revised as per the start date of the crediting period. The report and the calculations should be revised accordingly. - The main data is defined as TEIAS monthly meter readings and the crosscheck data is EPIAS. However, EPIAS data is used as a main data. Please correct. In addition, arrange excel in order to verify the consumption of two different meters in the project area separately.				
Project participant response				**Date:** 07/05/2021
- End date of the crediting period and the calculations have been revised through MR. - Calculations are now done according to the main data source. Excel format is also revised.				
Documentation provided by project participant				
DOE assessment				**Date:** 10/06/2021
- The end of first crediting period is now corrected as 30/06/2020. The report and the calculations are revised accordingly. - TEIAS data is now used as a main data. In addition, the excel sheet has been arranged in order to verify the consumption of two different meters in the project area separately. - In TEIAS data, the value of June 2016 is not in line in the calculation excel sheet. Please check and revise the necessary part of the report. **Hence, CAR 1 is not closed.**				
Project participant response				**Date: 11/06/2021**
- June 2016 value is revised. The numbers are also revised in the whole MR.				
DOE assessment				**Date:** 23/06/2021
- In TEIAS data, the value of June 2016 is now in line in the calculation excel sheet. The necessary parts of the report are now revised accordingly. **Hence, CAR 1 is not closed.**				

CAR ID	2	**Section no.**		**Date:** 05/05/2021
Description of CAR				
- The electricity meters' information should be check. Calibration date of the meters should be presented in the MR. The information about new meters should be removed since they are not relevant to these monitoring period. - The value for CAPpj should be revised since the installed capacity is changed. In addition, please re-calcualte power density with the revised installed capacity. - Please provide evidence to confirm the area of the Akocak and Erikli Weirs and revised footnote 7 if necessary.				

Project participant response	Date: 07/05/2021
- Section 4.3 has been revised accordingly. - CAP_{pj} value and PD calculation have been revised. - Reference provided.	
Documentation provided by project participant	
DOE assessment	**Date:** 10/06/2021
- The electricity meters' information is now revised, information about the new meters is now removed. However, calibration date of the meters is not presented in the MR. - The value for CAPpj is now revised as per the installed capacity. In addition, power density is now re-calculated with the revised installed capacity. - Evidence to confirm the area of the Akocak and Erikli Weirs is now provided and footnote 7 is now revised. **Hence, CAR 2 is not closed.**	
Project participant response	**Date:** 15/06/2021
- The calibration documents are not available in the archieve. It was requested from TEİAŞ. Yet, it should have been confirmed during the previous monitoring periods.	
DOE assessment	**Date:** 23/06/2021
- The calibration date of the meters is now presented in the MR. **Hence, CAR 2 is closed.**	

Table 4. FAR from this verification

FAR ID	1	Section No.		Date:
Description of FAR				
Project participant response				**Date:**
Documentation provided by project participant				
DOE assessment				**Date:**

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classification, certification, inspection & testing

CERTIFICATO DI QUALIFICA PER GLI SCHEMI VOLONTARI*
*QUALIFICATION CERTIFICATE FOR VOLUNTARY SCHEMES**

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms:

Tugce Kiratli

è qualificato come:
is qualified as:

TEC, VAL, VER, TL, ITRP
LOCAL EXPERT

per le seguenti aree tecniche:
for the following technical areas:

AREE TECNICHE *TECHNICAL AREAS*	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
1.2	Renewables	1
13.1	Solid waste and wastewater	13

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	19/07/2016	First issue with new template
1	09/06/2017	Added qualification as ITRP and Local Expert

Responsabile di schema
Scheme Leader
Laura Severino

*SCHEMI VOLONTARI/ VOLUNTARY SCHEMES: ACR American Carbon Registry, CCB The Climate, Community & Biodiversity Alliance, GS Gold Standard, JI Joint Implementation, SCS Social Carbon Standard, VCS Verified Carbon Standard.

TEC: Technical expert; VAL: Validator; VER: Verifier; TL: Team leader; FIN EXP: Financial Expert; ITRP: Independent technical reviewer

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VCSA	per condurre la Validazione e la Verifica di Progetti VCS *to carry out Validation and Verification of VCS Projects*
GS Foundation	per condurre la Validazione e la Verifica di Progetti GS *to carry out Validation and Verification of GS Projects*
Ecologica Institute	per condurre la Validazione e la Verifica di rapporti SCS *to carry out Validation and Verification of SCS Reports*
American Carbon Registry ACR	per condurre la Validazione e la Verifica di Progetti ACR *to carry out Validation and Verification of ACR projects*
The Climate, Community & Biodiversity Alliance CCB	per condurre la Validazione e la Verifica di Progetti co-benefit CCB *to carry out Validation and Verification of co-benefit CCB projects*

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*QUALIFICATION CERTIFICATE FOR VOLUNTARY SCHEMES**

Si attesta che il sig./sig.ra:
We declare that Mr/Mrs/Ms:

Vijay Mathew

è qualificato come:
is qualified as:

TEC, VAL, VER, TL, ITRP

per le seguenti aree tecniche:
for the following technical areas:

AREE TECNICHE *TECHNICAL AREAS*	DESCRIZIONE DELL'AREA TECNICA *TECHNICAL AREA DESCRIPTION*	SCOPO SETTORIALE *SECTORAL SCOPE*
1.2	Renewables	1

REVISIONE *REVISION*	DATA *DATE*	MOTIVAZIONI PER LA REVISIONE *REASON FOR THE REVISION*
0	19/07/2016	First issue with new template (this certificate is linked to CDM qualification)
1	18/04/2017	Update qualification as VER and ITRP

Responsabile di schema
Scheme Leader
Laura Severino

*SCHEMI VOLONTARI/ VOLUNTARY SCHEMES: ACR American Carbon Registry, CCB The Climate, Community & Biodiversity Alliance, GS Gold Standard, JI Joint Implementation, SCS Social Carbon Standard, VCS Verified Carbon Standard.

TEC: Technical expert; VAL: Validator; VER: Verifier; TL: Team leader; FIN EXP: Financial Expert; ITRP: Indipendent technical reviewer

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VCSA	per condurre la Validazione e la Verifica di Progetti VCS *to carry out Validation and Verification of VCS Projects*
GS Foundation	per condurre la Validazione e la Verifica di Progetti GS *to carry out Validation and Verification of GS Projects*
Ecologica Institute	per condurre la Validazione e la Verifica di rapporti SCS *to carry out Validation and Verification of SCS Reports*
American Carbon Registry ACR	per condurre la Validazione e la Verifica di Progetti ACR *to carry out Validation and Verification of ACR projects*
The Climate, Community & Biodiversity Alliance CCB	per condurre la Validazione e la Verifica di Progetti co-benefit CCB *to carry out Validation and Verification of co-benefit CCB projects*

Document information

Version	*Date*	*Description*
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