



**Verified Carbon  
Standard**

## SIRMA RUN-OF-RIVER HYDRO PROJECT



**RINA SERVICES S.P.A.**

|                            |                                                                                                                                                                                                                                          |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Project Title</b>       | SIRMA Run-of-river hydro project                                                                                                                                                                                                         |
| <b>Report Title</b>        | Joint Validation & Verification Report of "SIRMA Run-of-river hydro project"                                                                                                                                                             |
| <b>Version</b>             | 2.0Aa                                                                                                                                                                                                                                    |
| <b>Report ID</b>           | 2021XTMD9 & 2021XTMD10                                                                                                                                                                                                                   |
| <b>Verification Period</b> | 01-07-2013 to 05-06-2019                                                                                                                                                                                                                 |
| <b>Client</b>              | Elen Enerji Uretim Sanayi Ticaret A.S.                                                                                                                                                                                                   |
| <b>Pages</b>               | 38                                                                                                                                                                                                                                       |
| <b>Date of Issue</b>       | 23-09-2021                                                                                                                                                                                                                               |
| <b>Prepared By</b>         | RINA Services S.p.A.                                                                                                                                                                                                                     |
| <b>Contact</b>             | Address : Via Corsica, 12 - 16128 Genoa, ITALY<br>Telephone : +39 010 538 55 09<br>email : ghg.services@rina.org<br>web site : www.rina.org                                                                                              |
| <b>Approved By</b>         | <b>Laura Severino</b> (Authorized officer signing for the DOE)<br>Head of Sustainability Compliance & New Scheme Development<br>Coordination Unit<br> |
| <b>Work Carried Out By</b> | Tugce KIRATLI; VCS Team Leader, VCS Validator, Technical Expert                                                                                                                                                                          |

## Summary:

RINA Services S.p.A. (RINA), commissioned by Elen Enerji Uretimi Sanayi Ticaret A.S., has performed the validation of the project activity “SIRMA Run-of-river hydro project” in Turkey, with regard to the relevant requirements for CDM and VCS activities.

The objective of the Validation is to have an independent evaluation of a project activity by a designated operational entity against the requirements of the VCS Version 4.0 and GHG program applied, on the basis of the project design document. The validation scope is to review the VCS-JOINT PD&MR against the UNFCCC criteria for CDM and VCS Version 4.0 Requirements.

Validation was conducted using RINA procedures in line with the requirements specified in the 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 validation consisted of desk review, on-site assessment and the resolution of outstanding issues and the issuance of the final validation report.

The validation shall ensure that reported emission reductions are complete and accurate in accordance with applicable VCS Version 4.0 requirements, which refer to CDM rules, in order to be certified.

RINA Services S.p.A. (RINA), commissioned by Elen Enerji Uretimi Sanayi Ticaret A.S., has verified the greenhouse gas emission reductions reported for the project activity “SIRMA Run-of-river hydro project” in Turkey, VCS Registration Reference N° 603, for the period 01/07/2013 to 05/06/2019, 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 “SIRMA Run-of-river hydro project” project in Turkey for the period 01/07/2013 to 05/06/2019.

Verification was conducted using RINA procedures in line with the requirements specified in the VCS Version 4 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, on-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 requirements, which refer to CDM rules, in order to be certified.

In conclusion, it is RINA's opinion that the project activity “SIRMA Run-of-river hydro project” in Turkey, as described in the VCS-JOINT PD&MR version 04 of 29/07/2021, meets all relevant requirements for VCS activities and all relevant host Party criteria and correctly applies the baseline and monitoring methodology “AMS-I.D.: Grid connected renewable electricity generation”, version 18.0 of 28/11/2014. Hence, RINA is able to certify that the emission reductions from the project during the monitoring period 01/07/2013 to 05/06/2019 amount to 58,070 tCO<sub>2</sub>e.

# CONTENTS

---

|                                                                                                                  |                                                                             |           |
|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|-----------|
| <b>1</b>                                                                                                         | <b>INTRODUCTION .....</b>                                                   | <b>4</b>  |
| 1.1                                                                                                              | Objective .....                                                             | 4         |
| 1.2                                                                                                              | Scope and Criteria .....                                                    | 4         |
| 1.3                                                                                                              | Level of Assurance .....                                                    | 5         |
| 1.4                                                                                                              | Summary Description of the Project .....                                    | 5         |
| <b>2</b>                                                                                                         | <b>VALIDATION AND VERIFICATION PROCESS .....</b>                            | <b>6</b>  |
| 2.1                                                                                                              | Method and Criteria .....                                                   | 6         |
| 2.2                                                                                                              | Document Review .....                                                       | 7         |
| 2.3                                                                                                              | Interviews .....                                                            | 8         |
| 2.4                                                                                                              | Site Inspections .....                                                      | 9         |
| 2.5                                                                                                              | Resolution of Findings .....                                                | 9         |
| <b>3</b>                                                                                                         | <b>VALIDATION FINDINGS .....</b>                                            | <b>14</b> |
| 3.1                                                                                                              | Project Details .....                                                       | 14        |
| 3.2                                                                                                              | Participation under Other GHG Programs .....                                | 15        |
| 3.3                                                                                                              | Safeguards .....                                                            | 16        |
| 3.4                                                                                                              | Application of Methodology .....                                            | 17        |
| 3.5                                                                                                              | Non-Permanence Risk Analysis .....                                          | 22        |
| <b>4</b>                                                                                                         | <b>VERIFICATION FINDINGS .....</b>                                          | <b>22</b> |
| 4.1                                                                                                              | Accuracy of GHG Emission Reduction and Removal Calculations .....           | 22        |
| 4.2                                                                                                              | Quality of Evidence to Determine GHG Emission Reductions and Removals ..... | 25        |
| <b>5</b>                                                                                                         | <b>VALIDATION AND VERIFICATION CONCLUSION .....</b>                         | <b>26</b> |
| <b>APPENDIX 4. .... CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS&gt; .....</b> |                                                                             | <b>28</b> |

# 1 INTRODUCTION

## 1.1 Objective

The objective of the Validation is to have an independent evaluation of a project activity by a designated operational entity against the requirements of the VCS Version 4.0 and GHG program applied, on the basis of the project design document. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant VCS Version 4.0 requirements, GHG program requirements and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation 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 Voluntary Carbon Units (VCUs).

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 "SIRMA Run-of-river hydro project" project in Turkey for the period 01/07/2013 to 05/06/2019.

## 1.2 Scope and Criteria

The validation scope is to review the VCS-JOINT PD&MR against the UNFCCC criteria for CDM and VCS Version 4.0 Requirements.

UNFCCC criteria for CDM refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, the procedures for registration of programme of activity as a single CDM and the subsequent decisions by the CDM Executive Board.

Validation 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 project design.

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 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 joint validation and verification report before being submitted to the client were subjected to an independent internal technical review to confirm that all validation and verification activities had been completed according to the pertinent RINA instructions.

In line with VCS Standard and as per 14064-3:2006 para A.2.3.2, a reasonable level of assurance is defined for the validation of the project activity. For the verification, 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 VCS VER validation and verification. The validation and verification team and the technical reviewers consist of the following personnel:

| Role/Qualification                                        | Last Name        | First Name       | Country |
|-----------------------------------------------------------|------------------|------------------|---------|
| VCS Team Leader, VCS Validator&Verifier, Technical Expert | Kiratli          | Tugce            | Turkey  |
| Technical Reviewer                                        | Amalorpavanathan | Cyril Augustus A | India   |

### 1.4 Summary Description of the Project

The purpose of the project activity is to install and generated electricity hydro power plant with a total installed capacity of 5.88 MWe as per the Temporary Acceptance Protocol [/12/](#). The generated electricity will be fed to National Electricity Transmission Grid of Turkey. The project is

within boundaries of Aegean Region, Aydın City, Bozdoğan district, close to Sirma village. The project qualifies as a small-scale CDM project activity.

Elen Enerji Uretimi Sanayi Ticaret A.S. has commissioned RINA to carry out the verification and certification of emission reductions reported for the registered “SIRMA Run-of-river hydro project” project in Turkey, VCS Registration Reference N° 603, for the period 01/07/2013 to 05/06/2019.

The project activity is a hydro power plant consists of 3 turbines with making the total installed capacity 5.88 MWe as confirmed through the Temporary Acceptance Protocols [/12/](#). The turbines were commissioned on 23/05/2009 [/12/](#).

|                                              |                                                                                                                         |                                 |     |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------|-----|
| <b>Project Participant(s)</b>                | Elen Enerji Uretimi Sanayi Ticaret A.S.                                                                                 |                                 |     |
| <b>Project Title</b>                         | SIRMA Run-of-river hydro project                                                                                        |                                 |     |
| <b>Location of the project</b>               | Aegean Region, Aydın City, Bozdoğan district, Turkey.                                                                   |                                 |     |
| <b>Methodology(ies)</b>                      | “AMS-I.D.”, “Grid connected renewable electricity generation”, version 18.0 of 28/11/2014 <a href="#">/6/</a>           |                                 |     |
| <b>Sectoral Scope(s)</b>                     | 1                                                                                                                       | <b>RINA's Technical Area(s)</b> | 1.2 |
| <b>VCS Registration Reference No</b>         | 603                                                                                                                     |                                 |     |
| <b>Starting date of the crediting period</b> | 07/06/2009                                                                                                              |                                 |     |
| <b>Project's crediting period</b>            | From 07/06/2009 to 06/06/2019                                                                                           |                                 |     |
| <b>Monitoring period</b>                     | 01/07/2013 - 05/06/2019 (both days included)                                                                            |                                 |     |
| <b>Project documentation link</b>            | <a href="https://registry.verra.org/app/projectDetail/VCS/603">https://registry.verra.org/app/projectDetail/VCS/603</a> |                                 |     |

## 2 VALIDATION AND VERIFICATION PROCESS

### 2.1 Method and Criteria

Validation and Verification were conducted using RINA procedures in line with the VCS Version 4.0 requirements and the requirements specified in the 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 validation consisted of the following three phases:

- Document review;
- On-site assessment;
- The resolution of outstanding issues and the issuance of the final verification report and certification.

## 2.2 Document Review

The VCS-JOINT PD&MR version 04 of 29/07/2021 /1/, in particular the applicability of the methodology, the baseline determination, the additionality of the project activity, the starting date of the project, the monitoring plan, “ER calculations\_Sirma HPP\_v2.xls” version 02 of 02/04/2021 /8/, the approved baseline and monitoring methodology AMS-I.D. version 18.0 /6/ and all the documentation provided to support the monitoring period /1 – 30/ were assessed as part of the verification and validation.

The following table lists the documentation that was reviewed during the validation and verification:

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| /1/  | Life Enerji: VCS-JOINT PD&MR for “SIRMA Run-of-river hydro project” in Turkey, version 04 of 29/07/2021<br>Life Enerji: VCS-JOINT PD&MR for “SIRMA Run-of-river hydro project” in Turkey, version 03 of 02/04/2021<br>Life Enerji: VCS-JOINT PD&MR for “SIRMA Run-of-river hydro project” in Turkey, version 02 of 26/03/2021<br>Life Enerji: VCS-JOINT PD&MR for “SIRMA Run-of-river hydro project” in Turkey, version 01 of 15/03/2021 |
| /2/  | Life Enerji: Registered VCS-PD for “SIRMA Run-of-river hydro project” in Turkey, version 5 of 28/02/2011                                                                                                                                                                                                                                                                                                                                 |
| /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 “AMS-I.D.”, “Grid connected renewable electricity generation”, version 18.0 of 28/11/2014                                                                                                                                                                                                                                                                                       |
| /7/  | EPDK: Generation License for “SIRMA Run-of-river hydro project”, No. EU/9147-11/04430 of 30/01/2020                                                                                                                                                                                                                                                                                                                                      |
| /8/  | Life Enerji: Emission Reduction Calculation Spreadsheet “ER calculations_Sirma HPP_v2.xls” version 02 of 02/04/2021<br>Life Enerji: Emission Reduction Calculation Spreadsheet “ER calculations_Sirma HPP_v1.xls” version 01 of 26/03/2021<br>Life Enerji: Emission Reduction Calculation Spreadsheet “ER calculations_Sirma HPP.xls” version 00 of 15/03/2021                                                                           |
| /9/  | VCS Verified Carbon Standard: VCS Joint Validation & Verification Report Template Version 4.0 of 19/09/2019                                                                                                                                                                                                                                                                                                                              |
| /10/ | CDM Executive Board: Methodological Tool “Tool to calculate the emission factor for an electricity system”, version 07.0 of 31/08/2018                                                                                                                                                                                                                                                                                                   |
| /11/ | Website:<br><a href="https://registry.verra.org/app/projectDetail/VCS/603">https://registry.verra.org/app/projectDetail/VCS/603</a>                                                                                                                                                                                                                                                                                                      |

|      |                                                                                                                                                                                                                                                |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|      | Argument: Verra Database<br>Language: English; Retrieved on: 19/04/2021                                                                                                                                                                        |
| /12/ | Energy and Natural Resources Ministry: Temporary Acceptance Protocol of 23/05/2009                                                                                                                                                             |
| /13/ | Energy Market Regulatory Authority: Electricity Market Law, No: 6446 of 30/03/2013                                                                                                                                                             |
| /14/ | Energy Market Regulatory Authority: Renewable Energy Sources Law No: 5346 of 18/05/2005                                                                                                                                                        |
| /15/ | Energy Market Regulatory Authority: Environmental Law No: 2872 of 11/08/1983                                                                                                                                                                   |
| /16/ | T.R. Presidential Legislation Information System: Occupational Health and Safety Law No: 6331 of 20/06/2012                                                                                                                                    |
| /17/ | T.R. Presidential Legislation Information System: Forest Law No: 6831 of 31/08/1956                                                                                                                                                            |
| /18/ | Website: <a href="https://www.vcsprojectdatabase.org/#/pipeline_details/PL1913">https://www.vcsprojectdatabase.org/#/pipeline_details/PL1913</a><br>Argument: Verified Carbon Standard Registry<br>Language: English, Retrieved on: 19/04/2021 |
| /19/ | Website: <a href="https://registry.goldstandard.org/projects">https://registry.goldstandard.org/projects</a><br>Argument: Gold Standard Registry<br>Language: English, Retrieved on: 19/04/2021                                                |
| /20/ | The Ministry of Trade and Industry: Regulation of Metering and Testing of Metering Systems of 24/07/1994                                                                                                                                       |
| /21/ | Turkish Energy Market Regulatory Authority: Communiqué for Measurement Devices used in the Electricity Market of 22/03/2003                                                                                                                    |
| /22/ | TEDAS: First Index Protocol of Old Electricity Meters dated 09/04/2009<br>ADM: First Index Protocol of New Electricity Meters dated 04/09/2019                                                                                                 |
| /23/ | EPIAS: Monthly Meter Reading Protocols for the monitoring period 01/07/2013 to 05/06/2019                                                                                                                                                      |
| /24/ | ITRON: Calibration Report for the new electricity meters of 06/02/2019                                                                                                                                                                         |
| /25/ | TEIAS&ADM: Monthly Meter Readings for the monitoring period 01/07/2013 to 05/06/2019                                                                                                                                                           |
| /26/ | CDM Executive Board: Methodological Tool “Tool for the demonstration and assessment of additionality”, version 07.0 of 23/11/2012                                                                                                              |
| /27/ | CDM Executive Board: Methodological Tool “Tool to determine the remaining lifetime of the equipment”, version 01.0 of 16/10/2009                                                                                                               |
| /28/ | CDM Executive Board: 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 of 02/03/2012                                         |
| /29/ | Ministry of Environment and Forestry - General Directorate of Environmental Impact Assessment and Planning: Opinion letter stating that it is out of the scope of EIA of 30/10/2006                                                            |
| /30/ | Sirma Village: Logbook, submitted on 20/04/2021                                                                                                                                                                                                |

## 2.3 Interviews

On 22/03/2021, RINA was performed remote audit to resolve questions and issues identified during the document review and to perform interviews with relevant stakeholders in the host country.

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

|     | Date       | Name and Role                                    | Organization  | Topic                                                 |
|-----|------------|--------------------------------------------------|---------------|-------------------------------------------------------|
| /a/ | 22/03/2021 | Hazal OZTURK<br><i>Carbon Consultant</i>         | Life Enerji   | Description of the project activity                   |
| /b/ | 22/03/2021 | Melis UNAL<br><i>Energy Trade Deputy Manager</i> | Elen Enerji   | Implementation status of the project                  |
| /c/ | 22/03/2021 | Ozkan AVCI<br><i>Maintenance Responsible</i>     | Elen Enerji   | Monitoring plan and monitoring arrangements           |
| /d/ | 22/03/2021 | Yasar USTUN<br><i>Market Owner</i>               | Sirma Village | Baseline and Additionality Eligibility Criteria       |
| /e/ | 22/03/2021 | Sezgin KOCAESKI<br><i>Pita Restaurant Owner</i>  | Sirma Village | Emission reductions calculations                      |
|     |            |                                                  |               | Positive and negative impacts of the project activity |
|     |            |                                                  |               | Contact details of the project proponents             |
|     |            |                                                  |               | Logbook                                               |

## 2.4 Site Inspections

On 22/03/2021, RINA was performed remote audit to resolve questions and issues identified during the document review and to perform interviews with relevant stakeholders in the host country.

Representatives of project owner (Elen Enerji Uretim Sanayi Ticaret A.S.) and carbon consultant (Life Enerji) were interviewed about the applicability of the methodology, eligibility criteria, baseline scenario, and project boundary. 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. Also, stakeholders of Sirma village were interviewed, and confirmed that no negative feedback was received.

## 2.5 Resolution of Findings

The objective of this phase of the validation is to resolve any outstanding issues, which need to be clarified for RINA's positive conclusion on the project design.

To guarantee transparency a validation protocol has been customized for the project. The protocol shows in a transparent manner the requirements, means of validation and the results from

validating the identified criteria. The validation protocol consists of three tables; the different columns in these tables are described in the figure below (see Figure 1). The completed validation protocol is enclosed in Appendix A to this report.

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

- The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions.
- The VCS Version 4.0 requirements have not been met.
- There is a risk that the emission reductions cannot be monitored or calculated.

A clarification request (CR) is raised if information is insufficient or not clear enough to determine whether the applicable VCS Version 4.0 requirements have been met.

Figure 1 VCS Validation Protocol Tables

| Validation Protocol, Table 1 - Requirement checklist                                                                                                  |                                                                                           |                                                                                                                                                                                                                                                        |                                                                                                                         |                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Checklist Question                                                                                                                                    | Ref.                                                                                      | MoV                                                                                                                                                                                                                                                    | Comments                                                                                                                | Conclusion                                                                                                                                                          |
| The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organized in five 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 CDM/VCS requirements. |

| Validation 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                                                | Validation Conclusion                                                         |
| The CAR and/or CLs 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 validation team's assessment and final conclusion of the CARs and/or CRs. |

| Validation Protocol, Table 3 - Forward Action Requests (if no FAR the table 3 is deleted) |                                                                                   |                                                                                                                   |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| Forward action request                                                                    | Reference to Table 1                                                              | Response by project participants<br>Validation 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 prior to first verification. |

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, 1 CAR and 5 CRs are raised. All findings are closed.

**Figure 2 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

No FAR is raised during the Validation and Verification.

## 3 VALIDATION FINDINGS

### 3.1 Project Details

The project is small-scale hydro power plant, which has a total installed capacity of 5.88 MWe according to the Temporary Acceptance Protocol [/12/](#). The scope of the SIRMA Run-of-river hydro project was outlined in Section 1.2 of this report as Type I, Renewable Energy Projects and Category: I.D, Grid connected renewable electricity generation.

The proposed project is a Greenfield project where no other power plant was located at the same site prior to the implementation of the project activity, which is confirmed during the remote audit. The project activity has 5.88 MWe total installed capacity.

SIRMA Run-of-river hydro project has been implemented as a hydro power plant in order to provide electricity to the Turkish National Grid. Due to its technology, it uses water as source and provides energy without any GHG emission. Therefore, the project has not been implemented to generate GHG emissions for the purpose of their subsequent reduction, removal or destruction.

RINA was able to verify all the documented evidence listed above during the validation and verification process and can confirm that data and considerations are complete and accurate.

#### Project proponent

The project proponents and their responsibility are clearly defined under Section 1.5 of the VCS-JOINT PD&MR [/1/](#). Elen Enerji Uretim Sanayi Ticaret A.S. is the project owner and developer and Life Enerji is project consultant.

#### Project start date

The starting date of project activity is 07/06/2009 and it is in line with the VCS Standard [/4/](#).

As per the VCS Standard [/4/](#), the project start date is the date on which the project began generating GHG emission reductions or removals. The defined starting date is also in line with the AMS-I.D. [/6/](#).

#### Project crediting period

Crediting period of 10 years has been chosen for the project activity and is planned to be renewable twice.

The first crediting period starts from 07/06/2009-06/06/2019.

The second crediting period starts from 07/06/2019-06/06/2029.

### Project scale and estimated GHG emission reductions or removals

The estimated average annual emission reductions from the project are estimated to be on the average 12,551 tCO<sub>2</sub>e per year over the selected 10 year crediting period (renewed twice).

Projects are categorized by size according to their estimated average annual emission reductions or removals according to VCS Standard /4/. Since the estimated annual emission reductions resulting from the project is less than 300,000 tCO<sub>2</sub>e, the category of the project is defined as “Project” as per the VCS Standard /4/.

### Project location

The project is within boundaries of Aegean Region, Aydın City, Bozdoğan district, close to Sirma village. The coordinates are confirmed as per the Generation License /7/.

The coordinates of the project areas are given below:

|            | Latitude (N)     | Longitude (E)    |
|------------|------------------|------------------|
| Head pond  | 37 ° 36' 24.960" | 28 ° 28' 26.460" |
| Power Houe | 37 ° 36' 26.280" | 28 ° 28' 26.340" |

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

The relevant applicable local laws and regulations related to the project are given below:

- Electricity Market Law /13/
- Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy /14/
- Environmental Law /15/
- Occupational Health and Safety Regulation /16/
- Forest Law /17/

The project is in compliance with the given laws.

## 3.2 Participation under Other GHG Programs

**Right of use:** The legal right to control and operate the project activity belong to Elen Enerji Uretim Sanayi Ticaret A.S.

**Emissions trading programs and other binding limits:** Net GHG emission reductions or removals generated by the project will not be used for compliance with an emissions trading program or for meeting binding limits on GHG emissions.

**Participation under other GHG programs:** The project has not been registered or seeking registration under other GHG programs as confirmed through the GS or VCS project activity /18/ /19/.

*Other forms of environmental credit sought or received:* The project has not created another form of Environmental Credit.

*Rejection by other GHG programs:* The project has not been rejected by other GHG programs as confirmed through the GS and VCS project data base [/18/](#) [/19/](#).

### **Additional information relevant to the project**

*Eligibility criteria for grouped projects:*

The project is not a grouped project.

*Any further information:*

Not applicable.

## **3.3 Safeguards**

### **3.3.1 No Net Harm**

As confirmed by the project participant and stakeholders during the interview there is no harm identified from the project activity.

### **3.3.2 Local Stakeholder Consultation**

This is the second crediting period of the project activity. During the initial crediting period, 15 local employees were employed during the construction phase. This issue was confirmed according to the interviews made with the Sirma Village Headman and randomly selected stakeholders as stated in the registered VCS-PD. In the negotiations for this crediting period, they are still expressing their satisfaction. It has been confirmed that no comments have been written in the opinion book since the beginning of the project.

### **3.3.3 Environmental Impact**

According to the opinion letter of the General Directorate of Environmental Impact Assessment and Planning of the Ministry of Environment and Forestry, the Sirma HEPP project with an installed capacity of 5.88 MWe was evaluated outside the scope of the EIA Regulation since it is not included in the Annex-21 and Annex-2 Lists of the EIA Regulation [/29/](#).

### **3.3.4 Public Comments**

There are no public comments.

### **3.3.5 AFOLU-Specific Safeguards**

This is a non-AFOLU projects, therefore this section is not required.

## 3.4 Application of Methodology

### 3.4.1 Title and Reference

The CDM approved baseline and monitoring methodology AMS-I.D. version 18.0: “Grid connected renewable electricity generation — Version 18.0” [/6/](#) is correctly applied for the project activity.

### 3.4.2 Applicability

The project correctly applies the approved baseline and monitoring methodology “AMS-I.D.”, “Grid-connected renewable electricity generation”, version 18.0 of 28/11/2014 [/6/](#).

The proposed project activity meets the criteria defined in the baseline methodology as it ensures that:

- The installed capacity of the project activity is 5.88 MWe that is not larger than the 15 MW as validated through the Temporary Acceptance Protocol [/12/](#).
- The proposed project activity does not involve switching from fossil fuels to renewable energy sources at the site of project activity.
- The proposed project activity does not involve combined heat and power (co-generation) systems.
- The proposed project activity does not involve addition of renewable energy generation units at an existing renewable power generation facility.
- The proposed project activity does not involve biomass fired power plants.
- The project activity is not retrofit or replacement project. The project is a Greenfield plant.

The project activity applies the following methodological tools:

- Methodological Tool “Tool to calculate the emission factor for an electricity system”, version 07.0 of 31/08/2018 [/10/](#)
- Methodological Tool “Tool for the demonstration and assessment of additionality”, version 07.0 of 23/11/2012 [/26/](#)
- Methodological Tool “Tool to determine the remaining lifetime of the equipment”, version 01.0 of 16/10/2009 [/27/](#)
- 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 of 02/03/2012 [/28/](#)

RINA hereby confirms that the selected baseline and monitoring methodology has been previously approved by the CDM Executive Board and allowed the use of VCS Board, and is applicable to the Project, which complies with all the applicability conditions therein and the selected version is valid at the time of submission of the proposed project activity for registration. It is also confirmed that the methodology is correctly applied by comparing it with the actual text of the applicable version of the methodology.

### 3.4.3 Project Boundary

The project boundary clearly defined in accordance with the applied methodology, According to the approved baseline and monitoring methodology “AMS-I.D. [/6/](#)”, “Grid-connected renewable electricity generation”, version 18.0 of 28/11/2014 the project boundary includes the project

power plant and all power plants connected physically to the electricity system that the project is connected to.

Emissions sources included in the project boundary are shown in the table below:

|                           | GHGs involved    | Description                                                                                                |
|---------------------------|------------------|------------------------------------------------------------------------------------------------------------|
| <b>Baseline emissions</b> | CO <sub>2</sub>  | According to AMS-I.D., only CO <sub>2</sub> emissions from electricity generation should be accounted for. |
|                           | CH <sub>4</sub>  | Excluded according to methodology of AMS-I.D.                                                              |
|                           | N <sub>2</sub> O | Excluded according to methodology of AMS-I.D.                                                              |
| <b>Project emissions</b>  | CO <sub>2</sub>  | Excluded according to methodology of AMS-I.D.                                                              |
|                           | CH <sub>4</sub>  | Excluded according to methodology of AMS-I.D.                                                              |
|                           | N <sub>2</sub> O | Excluded according to methodology of AMS-I.D.                                                              |

By checking the information by the physical site, RINA can confirm that all the emission sources, gases have been included in the project boundary, and the description in the VCS-JOINT PD&MR is accurate and complete, and also that the selected sources and gases are justified for the proposed project activity.

#### 3.4.4 Baseline Scenario

According to the approved baseline methodology AMS-I.D. /6/, the baseline scenario is “Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid”.

The methodologic 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) is applied to assess the continued validity of the baseline and to update the baseline.

##### **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:

##### **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 is also in line with the current legal framework. There are no additional laws enacted that have an impact on the project activity, and the project activity is still operated according to existing laws and regulations.

##### **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 Turkey’s National Electric Grid Emission

Factor for the year of 2018. There has been no major deviation or change in the market characteristic during the first crediting period.

**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.**

The technical lifetime of the equipment (hydro turbines) are 150,000 hours (18 years) and lifetime exceeds the crediting period for which renewal is requested. Equipment only requires regular maintenance. The baseline scenario identified at the validation of the project activity was the continuation of grid-connected electricity generation. Under this scenario, no investment from the project's proponent or third party (or parties) has been envisioned later specifically for the project.

**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. As a requirement of the methodology, only the grid emission factor has been updated during the second crediting period.

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

**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 conform to the provisions of the latest version of the approved applicable methodology to the project activity namely: AMS-I.D version 18.0 : Grid Connected Renewable Electricity Generation. So, there has been no deviation in the baseline scenario.

**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 which is indicating Turkey's National Electric Grid Emission Factor for the year of 2018.

### 3.4.5 Additionality

In line with VCS Standard version 4.0, the additionality of the project activity is ascertained in line with the applicable guidance from the UNFCCC. This is the second crediting period of the project activity. Investments analysis performed on first crediting period shows that the project is not economically feasible without VCUs income. Moreover, the sensitivity analysis confirms that the proposed project activity is unlikely to be economically attractive without the revenues from VCUs as even the maximum IRR result for the best-case scenario (12.34%) is below the benchmark, which is 15%. Consequently, the project activity is additional, it has still ongoing financial need.

### 3.4.6 Quantification of GHG Emission Reductions and Removals

The emission reduction  $ER_y$  by the proposed project activity during the crediting period is the difference between baseline emissions ( $BE_y$ ), project emission ( $PE_y$ ).

#### Baseline Emissions

The baseline emissions ( $BE_y$  in  $tCO_2e$ ) are the product of the baseline emission factor ( $EF_{grid,CM,y}$  in  $tCO_2e$ ) times the net electricity supplied by the project activity to the grid ( $EG_{PJ,y}$  in MWh). The baseline emission factor for the project activity is determined ex-ante as a combined margin (CM) consisting of the combination of operating margin (OM) and build margin (BM) according the methodological “Tool to calculate the emission factor for an electricity system”. The relevant electric power system is identified in accordance with the tool [/10/](#).

The OM is defined to be  $tCO_2e/MWh$  0.6993 and the BM is defined to be  $tCO_2e/MWh$  0.3812. The CM is defined as 0.5403  $tCO_2e/MWh$  as per the publication of Turkish Ministry of Energy and Natural Resources and the net electricity supplied by the project activity to the grid is estimated to be 23,230 MWh/year.

The annual baseline emissions generated by the project activity is calculated to be 12,551  $tCO_2e/year$ .

#### Project Emissions

Project emissions are neglected since the project activity is a hydro power plant in line with the AMS-I.D. [/6/](#).

#### Leakage

As per the methodology, “General guidance on leakage in biomass project activities shall be followed to quantify leakages pertaining to the use of biomass residues”. It is not applicable since the project is not a biomass project.

#### Emission Reductions

The emission reductions ( $ER_y$ ) are calculated as the following formula:

$$ER_y = BE_y - PE_y - LE_y$$

$$ER_y = BE_y$$

$$= 12,551 \text{ tCO}_2e/year$$

The annual emission reductions generated by the project activity is calculated to be 12,551  $tCO_2e/year$  over the selected 10 years crediting period.

The estimation of the emission reductions can be replicated using the data and parameter values provided in the VCS-JOINT PD&MR [/1/](#) and supporting file [/8/](#). The data sources mentioned have been verified by RINA and confirms that the GHG emissions reduction calculation is complete and transparent, and the data accuracy has been verified.

### 3.4.7 Methodology Deviations

There are no deviations about the methodology of the project activity.

### 3.4.8 Monitoring Plan

The approved baseline and monitoring methodology “AMS-I.D.”, “Grid connected renewable electricity generation”, version 18.0 of 28/11/2014 /6/ has been applied.

The monitoring plan is in accordance with the monitoring methodology; the monitoring plan will give opportunity for real measurement of achieved emission reductions.

RINA has checked all the parameters presented in the monitoring plan against the requirements of the methodology; no deviations relevant to the project activity have been found in the plan.

RINA confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design, and the means of implementation of the monitoring plan are sufficient to ensure the emission reductions achieved by/resulting from the proposed VCS project activity can be reported ex post and verified.

### Parameters Determined Ex-ante

The ex-ante parameters that are mentioned in the methodology are included in the VCS-JOINT PD&MR and are provided in compliance with the methodology:

|     | <b>Data<br/>Parameter</b>                                 | <b>Unit</b>                | <b>Value<br/>applied</b> | <b>Assessment</b>                                                                                                                                                                                  |
|-----|-----------------------------------------------------------|----------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| /1/ | Operating<br>Margin of<br>Turkey<br>National<br>Grid (OM) | tCO <sub>2</sub> e/<br>MWh | 0.6993                   | The data used to determine the OM emission factor of the grid is obtained from publication of Turkish Ministry of Energy and Natural Resources.                                                    |
| /2/ | Build<br>Margin of<br>Turkey<br>National<br>Grid (BM)     | tCO <sub>2</sub> e/<br>MWh | 0.3812                   | The data used to determine the BM emission factor of the grid is obtained from publication of Turkish Ministry of Energy and Natural Resources.                                                    |
| /3/ | Combined<br>Margin of<br>Turkey<br>National<br>Grid (CM)  | tCO <sub>2</sub> e/<br>MWh | 0.5403                   | The emission factor is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the tool /10/. |

### Parameters Monitored Ex-post

The ex-post parameters that are mentioned in the methodology are included in the VCS-JOINT PD&MR and are provided in compliance with the methodology, and they will be monitored during the crediting period:

|  | <b>Parameter</b> | <b>Description/Assessment</b> |
|--|------------------|-------------------------------|
|--|------------------|-------------------------------|

|     |                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| /1/ | EG <sub>P,J,facility,y</sub><br>(MWh/y) | <p>Quantity of net electricity generation supplied by the project plant/unit to the grid in year y.</p> <p>The quantity of electricity supplied by the project plants/units to the grid and the quantity of electricity delivered to the project plant/unit from the grid will be measured. Net generation will be calculated via subtracting energy delivered by the project activity to the grid for internal consumption from electricity fed to the grid.</p> <p>The electricity generation of the plant will be calculated based on EPIAS records and crosschecked with monthly meter readings.</p> <p>The net electricity will be measured continuously and recorded at least monthly.</p> <p>Net electricity generation will be measured by two meters which are sealed by TEIAS. The meters will comply with EMRA (Energy Market Regulatory Authority) regulation /20/. The accuracy class of the meters defined and confirmed as 0.5s are in line with the “Communiqué for Measurement Devices used in the Electricity Market” /21/ as explained in the VCS-JOINT PD&amp;MR /1/. The maintenance and calibration of meters are under TEIAS responsibility. If any major discrepancy occurs between the two meters, TEIAS performs necessary calibration.</p> |
|-----|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### Management System and Quality Assurance

The electricity generation and consumption are measured in line with the TEIAS rules and requirements /20/. The generated electricity fed to grid will be measured by two meters which are sealed by TEIAS. Two meters are installed, the main meter is used for monitoring, and the secondary meter is used for quality control and back-up purposes.

The electricity generation supplied to the grid and electricity consumption from the grid is monitored by OSOS and ARAS. As indicated in the VCS-JOINT PD&MR /1/, the monitored data will be kept for two years after the end of the crediting period or the last issuance of VERs in line with the methodology /6/.

## 3.5 Non-Permanence Risk Analysis

There is not any risk for the project activity.

# 4 VERIFICATION FINDINGS

## 4.1 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-JOINT PD&MR /1/.

According to the applied methodology “AMS-I.D.”, “Grid connected renewable electricity generation”, version 18.0 of 28/11/2014 /6/, the emission reductions have been calculated based on the following formula:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

$BE_y$  = Baseline emissions in year y (tCO<sub>2</sub>e/yr)

$PE_y$  = Project emissions in year y (tCO<sub>2</sub>e/yr)

$LE_y$  = Leakage emissions in year y (tCO<sub>2</sub>e/yr)

### ***Baseline emissions***

The baseline emissions include the CO<sub>2</sub> 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<sub>2</sub> emission factor for grid connected power generation in year.

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

Where:

$EG_{PJ, facility, y}$  = Net electricity delivered to the grid by the project activity in year y excluding transmission losses of the grid (MWh)

$EF_{grid, CM, y}$  = Combined margin grid emission factor (tCO<sub>2</sub>/MWh)

### ***Project emissions***

Project emissions has been assumed to be zero as per the AMS-I.D. version 18.0 of 28/11/2014 /6/ as defined in the validated VCS-JOINT PD&MR /1/.

### ***Leakage emissions***

The leakage emissions are assumed to be zero as per the AMS-I.D. version 18.0 of 28/11/2014 /6/ as defined in the validated VCS-Joint PD&MR /1/.

The data presented in the VCS Joint PD&MR /1/ 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 <sub>grid,CM,y</sub><br>CO2 emission factor | Turkey's National Electric Grid Emission Factor for the year of 2018 | 0.5403 tCO <sub>2</sub> /MWh          | According to the approved methodology AMS-I.D. version 18.0, 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.<br><br>The emission factor is determined to be 0.5403 tCO <sub>2</sub> /MWh in the VCS-JOINT PD&MR /1/. |

### Parameters and Data Monitored

| DATA/PARAMETER                                                  | EG <sub>PJ,facility,y</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data Unit                                                       | MWh                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Description                                                     | Quantity of net electricity generation supplied by the project plant/unit to the grid in year y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Source of data                                                  | EPIAS records                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Description of measurement methods and procedures to be applied | Generation data were recorded by metering devices continuously. These records provided the data for the monthly invoicing to TEIAS which form the basis for EPIAS data. According to meter reading protocols, the internal consumption of the facility was subtracted from the gross generation. EPIAS is the main data and site records are used for cross-check. Relevant documents were provided.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Frequency monitoring/recording                                  | of Continuous measurement at the site and monthly recording were applied. The plant manager and the staff extracted the records regularly every day. The monthly records recorded by TEIAS were used for monitoring emission reductions.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Value monitored                                                 | For 71 months period, total generation has been 105,547 MWh.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Monitoring equipment                                            | two electricity meters (one main and one backup meter) are installed at the project site. The main meter is ELSTER with serial number of 368721 and for back-up meter is also ELSTER with a serial number of 368720. The meters have the accuracy of 0.5s as confirmed through the First Index Protocol /22/. The accuracy class of the meters complies with the "Communiqué for Measurement Devices used in the Electricity Market" /21/. The calibration of the meters was performed on 09/04/2009 and valid till 09/04/2019. Therefore on 06/02/2019, meters are changed. The new main meter is ITRON with serial number of 84260496 and for back-up meter is also ITRON with a serial number of 84260497. The meters have the accuracy of 0.5s as confirmed through the First Index Protocol /22/. The accuracy class of the meters complies with the |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                | “Communiqué for Measurement Devices used in the Electricity Market” /21/.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| QA/QC procedures to be applied | TEIAS is responsible for calibration and maintenance of the meters as per the registered VCS-JOINT PD&MR /1/. The project owner has no control on the meters since the meters are sealed by the TEIAS. If any major discrepancy occurs between the main and back-up meters, TEIAS performs necessary calibration.<br>The calibration date of the old meters was on 09/04/2009 and the calibration date of the new meters was on 06/02/2019 as confirmed through the First Index Protocols /22/. As per the “Regulation of Metering and Testing of Metering Systems” /20/, the meters shall be calibrated every 10 years, therefore the calibration of new meters is deemed appropriate and in compliance with the national regulation. |
| Purpose of the data            | To calculate the baseline emission value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Calculation method             | Net Electricity generated and delivered to the grid by the project during the monitoring period is calculated by subtracting the internal consumption of the facility from the gross power generation.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Comments                       | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

#### Emission Reductions Achieved

The emission reductions calculation reported in the VCS Joint PD&MR version 04 of 29/07/2021 /1/ and calculation spreadsheet “ER calculations\_Sirma HPP\_v2.xls” version 02 of 02/04/2021 /8/ have been verified to be correct.

The emission reductions from the project for the monitoring period from 01/07/2013 to 05/06/2019 as reported in the VCS Joint PD&MR version 04 of 29/07/2021 /1/ is equivalent to 58,070 tCO<sub>2</sub>e. According to the registered PDD /2/, the estimated emission reductions are equivalent to 75,840 tCO<sub>2</sub>e. The reported averaged emission reductions are 23% lower than the estimated emission reduction.

## 4.2 Quality of Evidence to Determine GHG Emission Reductions and Removals

The generated electricity monitored continuously by two electricity meters (one main and one backup meter) are installed at the project site. The old main meter is ELSTER with serial number of 368721 and for back-up meter is also ELSTER with a serial number of 368720. The meters have the accuracy of 0.5s as confirmed through the First Index Protocol /22/. The accuracy class of the meters complies with the “Communiqué for Measurement Devices used in the Electricity Market” /21/. The new main meter is ITRON with serial number of 84260496 and for back-up meter is also ITRON with a serial number of 84260497. The meters have the accuracy of 0.5s as

confirmed through the First Index Protocol /22/. The accuracy class of the meters complies with the “Communiqué for Measurement Devices used in the Electricity Market” /21/.

TEIAS is responsible for calibration and maintenance of the meters as per the registered VCS-JOINT PD&MR /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 main and back-up meters, TEIAS performs necessary calibration.

The calibration date of the old meters was on 09/04/2009 and the calibration date of the new meters was on 06/02/2019 as confirmed through the First Index Protocols /22/. As per the “Regulation of Metering and Testing of Metering Systems” /20/, the meters shall be calibrated every 10 years, therefore the calibration of new 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 /23/ and monthly meter readings /25/ are used for crosscheck from 01/07/2013 to 05/06/2019. The records and emission reduction calculation spreads sheet /8/ are consistent.

## 5 VALIDATION AND VERIFICATION CONCLUSION

RINA Services Spa (RINA) has performed validation of the project activity “SIRMA Run-of-river hydro project” in Turkey, with regard to the relevant requirements for VCS Version 4.0 activities.

The review of the project design document and the subsequent follow-up interviews have provided RINA with sufficient evidence to determine the fulfillment of the stated criteria.

The project correctly applies the approved baseline and monitoring methodology “AMS-I.D.”, “Grid connected renewable electricity generation”, version 18.0 of 28/11/2014.

By generating renewable energy from solar plant, the project results in reduction of CO<sub>2</sub> emissions that are real measurable and giving long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the “SIRMA Run-of-river hydro project” are estimated to be on average 12,551 tCO<sub>2</sub>e per year over the selected 10 years renewable crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

The monitoring plan provides for the monitoring of the project’s emission reductions and of the sustainable development indicators. The monitoring arrangements described in the monitoring

plan are feasible within the project design and it is RINA's opinion that the project participants are able to implement the monitoring plan.

In conclusion, it is RINA's opinion that the project activity "SIRMA Run-of-river hydro project" in Turkey, as described in the VCS-JOINT PD&MR version 04 of 29/07/2021, meets all relevant UNFCCC and VCS Version 4.0 requirements for the VCS VER and all relevant host Party criteria and correctly applies the baseline and monitoring methodology "AMS-I.D.", "Grid connected renewable electricity generation", version 18.0 of 28/11/2014.

RINA Services Spa (RINA) has also performed verification of the emission reductions reported for the project activity "SIRMA Run-of-river hydro project" in Turkey, VCS Registration Reference N° 603, for the period 01/07/2013 to 05/06/2019, with regard to the relevant requirements for CDM and VCS activities.

It is RINA's opinion that the GHG emission reductions stated in the VCS Joint PD&MR version 04 of 29/07/2021 for the "SIRMA Run-of-river hydro project" project in Turkey for the period 01/07/2013 to 05/06/2019 are fairly stated. The GHG emission reductions were calculated correctly, on the basis of the approved monitoring methodology "AMS-I.D.", "Grid connected renewable electricity generation", version 18.0 of 28/11/2014 and the monitoring plan contained in the registered VCS-JOINT PD&MR.

Hence, RINA is able to certify that the emission reductions from the project during the monitoring period 01/07/2013 to 05/06/2019 amount to 58,070 tCO<sub>2</sub>e.

Verification period: From 01/07/2013 to 05/06/2019

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

| Year      | Baseline emissions or removals (tCO <sub>2</sub> e) | Project emissions or removals (tCO <sub>2</sub> e) | Leakage emissions (tCO <sub>2</sub> e) | Net GHG emission reductions or removals (tCO <sub>2</sub> e) |
|-----------|-----------------------------------------------------|----------------------------------------------------|----------------------------------------|--------------------------------------------------------------|
| Year 2013 | 11,111                                              | 0                                                  | 0                                      | 11,111                                                       |
| Year 2014 | 6,870                                               | 0                                                  | 0                                      | 6,870                                                        |
| Year 2015 | 16,306                                              | 0                                                  | 0                                      | 16,306                                                       |
| Year 2016 | 9,088                                               | 0                                                  | 0                                      | 9,088                                                        |
| Year 2017 | 6,254                                               | 0                                                  | 0                                      | 6,254                                                        |
| Year 2018 | 5,533                                               | 0                                                  | 0                                      | 5,533                                                        |
| Year 2019 | 2,908                                               | 0                                                  | 0                                      | 2,908                                                        |
| Total     | 58,070                                              | 0                                                  | 0                                      | 58,070                                                       |

# APPENDIX 4. CLARIFICATION REQUESTS, CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS>

**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. |  | Date: 23/03/2021 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------|--|------------------|
| Description of CR                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |             |  |                  |
| <p>Please correct the issues given below:</p> <ul style="list-style-type: none"> <li>- The name of the project given in the Joint PD&amp;MR is not in line with the Verra-VCS Database.</li> <li>- Footnote 2-3-6-7-8- are not available or incorrect, please check.</li> <li>- The version of the tool “Tool to calculate the emission factor for an electricity system” given in the Joint PD&amp;MR is not the latest version.</li> <li>- “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period “, should also be added under the applied tools.</li> <li>- The project capacity given as 6 MWe given in Section 1.2 of the Joint PD&amp;MR is not in line with the Generation License.</li> <li>- Please add information for “Leakage Management” and “Commercially Sensitive Information” under Section 1.17. In addition, the given information “oreoveri” under Sustainable Development part could not be understood.</li> <li>- The given SDG Table under Sustainable Development part is not discussed under “Monitoring Parameters”. Please check.</li> <li>- The Construction Start Date given under Table 6 “Project Implementation Schedule” could not be verified since no supporting document is provided.</li> <li>- Please add a description of the change of the project participant.</li> </ul> |   |             |  |                  |
| Project participant response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |             |  | Date: 26/03/2021 |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <ul style="list-style-type: none"> <li>- Name of project is in line with the Verra-VCS Database now in the Joint PD&amp;MR.</li> <li>- Footnote 2-3-6-7-8- has been now revised.</li> <li>- The version of the tool (“Tool to calculate the emission factor for an electricity system”) has been revised as latest version in the Joint PD&amp;MR</li> <li>- “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period “, has been now added under the applied tools.</li> <li>- The project capacity has been now corrected in Section 1.2 of the Joint PD&amp;MR.</li> <li>- Necessary information has been now added for “Leakage Management” and “Commercially Sensitive Information” under Section 1.17. In addition, the given information “oreoveri” has been now removed.</li> <li>- The given SDG Table under Sustainable Development part has been now removed from this section.</li> <li>- Because of this wrong spelling, construction start date has been removed from this table.</li> <li>- Necessary description has been added for this issue in section 1.5 in the Joint PD&amp;MR.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                  |
| Documentation provided by project participant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                  |
| DOE assessment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Date: 01/04/2021 |
| <p>Please correct the issues given below:</p> <ul style="list-style-type: none"> <li>- The name of the project given in the Joint PD&amp;MR is still not in line with the Verra-VCS Database. Please check Section 1.3 – 1.11 – 2.1 of the Joint PD&amp;MR.</li> <li>- Footnote 3-6-7-8 are now working. However, Footnote 2-is still not available. In addition, a new footnote is added (footnote 7) and this footnote does not deliver the requested information.</li> <li>- The version of the tool “Tool to calculate the emission factor for an electricity system” given in the Joint PD&amp;MR is not the latest version. Please check the whole report.</li> <li>- “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period “is not presented under Section 3.1 Title and Reference of Methodology.</li> <li>- The project capacity given as 6 MWe is now revised in Section 1.2 of the Joint PD&amp;MR.</li> <li>- The information is now added for “Leakage Management” and “Commercially Sensitive Information” under Section 1.17. In addition, the given information “oreoveri” under Sustainable Development part is also revised.</li> <li>- The given SDG Table under Sustainable Development part is now removed. However, please check the information given as “SDG” in Joint PD&amp;MR (the parameter EFgrid,cm,y).</li> <li>- The Construction Start Date is now removed from Table 6 “Project Implementation Schedule”.</li> <li>- A description is now stated about the change of the project participant.</li> </ul> <p><b><u>Hence, CR 1 is not closed.</u></b></p> |                  |
| Project participant response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Date: 02/04/2021 |

- Section 1.3 – 1.11 – 2.1 have been now revised of the Joint PD&MR.
- Footnote 2 has been now revised. In addition, footnote 7 removed in the Joint PD&MR.
- The version of the tool (“Tool to calculate the emission factor for an electricity system”) has been corrected as latest version in the Joint PD&MR.
- “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period “ has been added under Section 3.1 Title and Reference of Methodology.
- Information given as “SDG” has been now removed in Joint PD&MR (the parameter EFgrid,cm,y).

**DOE assessment**
**Date:** 02/04/2021

Please correct the issues given below:

- The name of the project given in the Joint PD&MR is still not in line with the Verra-VCS Database. Please check Section 1.3 – 1.11 – 2.1 of the Joint PD&MR.
- Footnote 2-is now available. In addition, footnote is 7 is now removed from the report.
- The version of the tool “Tool to calculate the emission factor for an electricity system” given in the Joint PD&MR is now the latest version.
- “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period “is now presented under Section 3.1 Title and Reference of Methodology.
- The information given as “SDG” is now removed from Joint PD&MR (the parameter EFgrid,cm,y).

**Hence, CR 1 is closed.**

| CR ID                                                                                                                                                                                                                                                                                                                                                                                                                          | 2 | Section no. | 2.2 – 2.5 | Date: 23/03/2021        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------|-----------|-------------------------|
| <b>Description of CR</b>                                                                                                                                                                                                                                                                                                                                                                                                       |   |             |           |                         |
| <ul style="list-style-type: none"> <li>- In Section 2.2 of the Joint PD&amp;MR, information of Local Stakeholder Consultation is not related with the re-validation or monitoring period process. Please add the interviews for these periods and also share the contact details to confirm their opinion.</li> <li>- According to the Template of Joint PD&amp;MR Form, Section 2.5 should be added to the report.</li> </ul> |   |             |           |                         |
| <b>Project participant response</b>                                                                                                                                                                                                                                                                                                                                                                                            |   |             |           | <b>Date:</b> 26/03/2021 |
| <ul style="list-style-type: none"> <li>- Irrelevant information has been removed and necessary information has been added for revalidation and monitoring period process in section 2.2 of the Joint PD&amp;MR. Also, contact details have been shared.</li> <li>- Section 2.5 has been added to the Joint PD&amp;MR.</li> </ul>                                                                                               |   |             |           |                         |
| <b>Documentation provided by project participant</b>                                                                                                                                                                                                                                                                                                                                                                           |   |             |           |                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                |   |             |           |                         |
| <b>DOE assessment</b>                                                                                                                                                                                                                                                                                                                                                                                                          |   |             |           | <b>Date:</b> 01/04/2021 |

- In Section 2.2 of the Joint PD&MR, information of Local Stakeholder Consultation is now revised. However, no date is given for the stakeholder consultation interview. In addition, it is stated that “it was seen that the project had a positive effect on the stakeholders”. Please explain in more detail what positive effects it has.
- In Section 2.2 Local Stakeholder Consultation, it is stated that “the lands of the project belong to the Treasury Ministry and they have been rented by the project developer”. However, this information is not in line with the Feasibility Report. It has been stated in the Feasibility Report that approximately 5000 m2 area is private land and it will be expropriated by the company. Please clarify.
- According to the Template of Joint PD&MR Form, Section 2.5 is now added to the report.

**Hence, CR 2 is not closed.**

**Project participant response**

**Date: 02/04/2021**

- In Section 2.2 of the Joint PD&MR, related date has been now given for the stakeholder consultation interview. In addition, more detail has been added regarding positive effects.
- In Section 2.2 Local Stakeholder Consultation, this information is misspelled in the Feasibility Report. The company has made an agreement with DSI for the relevant area (approximately 5000 m<sup>2</sup>) and has obtained the right of usage of this land from the Ministry of Treasury. Relevant document has been now provided.

**DOE assessment**

**Date: 02/04/2021**

- In Section 2.2 of the Joint PD&MR, date is given for the stakeholder consultation interview. In addition, it is now clearly explained about “it was seen that the project had a positive effect on the stakeholders”.
- For Section 2.2 Local Stakeholder Consultation, the given explanation is found acceptable and according to the given supporting document it is confirmed that the relevant area (approximately 5000 m<sup>2</sup>) was belong to DSI.

**Hence, CR 2 is closed.**

| CR ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 3 | Section no. | 3 | Date: 23/03/2021        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------|---|-------------------------|
| <b>Description of CR</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |   |             |   |                         |
| <ul style="list-style-type: none"> <li>- In Section 3.3 of the Joint PD&amp;MR, the given source of the “Baseline Emission” and “Project Emission” should be corrected as per the methodology of ACM0002.</li> <li>- In Section 3.4 of the Joint PD&amp;MR, the given information for Baseline Scenario should be revised as per the “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” tool.</li> <li>- In Section 3.5 of the Joint PD&amp;MR, the given information for Additionality should be revised as per the “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” tool.</li> </ul> |   |             |   |                         |
| <b>Project participant response</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |             |   | <b>Date: 26/03/2021</b> |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <ul style="list-style-type: none"> <li>- In Section 3.3 of the Joint PD&amp;MR, Given source of the “Baseline Emission” and “Project Emission” has been corrected as per the methodology of ACM0002.</li> <li>- In Section 3.4 of the Joint PD&amp;MR, the given information for Baseline Scenario has been now revised as per the “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” tool.</li> <li>- In Section 3.5 of the Joint PD&amp;MR, the given information for Additionality has been now revised as per the “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” tool.</li> </ul>                                                                                                                                                                                                                                                                     |                  |
| /Documentation provided by project participant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                  |
| DOE assessment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Date: 01/04/2021 |
| <ul style="list-style-type: none"> <li>- In Section 3.3 of the Joint PD&amp;MR, the given source of the “Project Emission” is now corrected as per the methodology of ACM0002. However, “Baseline Emission” source is still presented as before.</li> <li>- In Section 3.4 of the Joint PD&amp;MR, the given information for Baseline Scenario is now revised as per the “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” tool. However, please clarify that the grid emission factor will be updated or is used for the year of 2018 Turkish Ministry of Energy and Natural Resources. Please check the sentences.</li> <li>- In Section 3.5 of the Joint PD&amp;MR, the given information for Additionality is now revised as per the “Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period” tool.</li> </ul> <p><b><u>Hence, CR 3 is not closed.</u></b></p> |                  |
| Project participant response                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Date: 02/04/2021 |
| <p>- “Baseline Emission” source has been now updated as per the methodology of ACM0002.</p> <p>- Related sentences have been now revised.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                  |
| DOE assessment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Date: 02/04/2021 |
| <ul style="list-style-type: none"> <li>- In Section 3.3 of the Joint PD&amp;MR, the “Baseline Emission” source is now presented.</li> <li>- In Section 3.4 of the Joint PD&amp;MR, the sentence is now revised.</li> </ul> <p><b><u>Hence, CR 3 is closed.</u></b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                  |

|                   |   |             |   |                  |
|-------------------|---|-------------|---|------------------|
| CR ID             | 4 | Section no. | 5 | Date: 23/03/2021 |
| Description of CR |   |             |   |                  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <p>Data and Parameters Available at Validation (Section 5.1)</p> <ul style="list-style-type: none"> <li>- Gross Electricity Generation: This parameter is no longer used for Baseline Emission Calculation. Please remove.</li> <li>- Sample Group for BM emission factor: This parameter is no longer used for Baseline Emission Calculation. Please remove.</li> </ul> <p>Data and Parameters Monitored (Section 5.2)</p> <ul style="list-style-type: none"> <li>- EGfacility,y: The name, unit and description of the parameter is not in line with the methodology. The frequency of the monitoring should also be revised as per the methodology. The information about the monitoring equipment should be revised according to the 2013 – 2019 verification period. In QA/QC procedure, Pak Enerji is stated, please check. The purpose of data should be revised since this parameter is not used for “Project Emissions”. The calculation method of the parameter should be revised as per the current situation.</li> <li>- In Section 5.3 of the Joint PD&amp;MR, Pak Enerji is stated, please check. In addition, Monthly Meter Reading Documents should be changed as ADM invoices. The organization chart should be revised as per the current situation.</li> </ul>                                                                                                                                                                                  |                         |
| <b>Project participant response</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <b>Date: 26/03/2021</b> |
| <p>Data and Parameters Available at Validation (Section 5.1)</p> <ul style="list-style-type: none"> <li>- Gross Electricity Generation: This parameter has been now removed.</li> <li>- Sample Group for BM emission factor: This parameter has been removed and then, it is now revised as EF<sub>grid,BM,y</sub>.</li> </ul> <p>Data and Parameters Monitored (Section 5.2)</p> <ul style="list-style-type: none"> <li>- EGfacility,y: The name, unit and description of the parameter is in line with the methodology now. The frequency of the monitoring has been now revised as per the methodology. The information about the monitoring equipment has been now revised according to the 2013 – 2019 verification period. In QA/QC procedure, Pak Enerji has been changed as Elen Enerji. The purpose of data has been now revised since this parameter. The calculation method of the parameter has been revised as per the current situation.</li> <li>- In Section 5.3 of the Joint PD&amp;MR, Pak Enerji has been changed as Elen Enerji. In addition, Monthly meter reading documents will be used in the second crediting period. ADM invoices were used only for this monitoring period. For this reason, it has been noted in this section that the Monthly Meter Reading Documents have been changed as ADM invoices for this monitoring period. Organization chart has been revised and related supporting document has been provided.</li> </ul> |                         |
| <b>Documentation provided by project participant</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                         |
| <b>DOE assessment</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Date: 01/04/2021</b> |

**Data and Parameters Available at Validation (Section 5.1)**

- Gross Electricity Generation: This parameter is now removed from report since no longer used for Baseline Emission Calculation.
- Sample Group for BM emission factor: This parameter is now revised as  $EF_{grid,BM,y}$ .

**Data and Parameters Monitored (Section 5.2)**

- $EG_{facility,y}$ : The name, unit and description of the parameter is now in line with the methodology. The frequency of the monitoring is now revised as per the methodology. The information about the monitoring equipment is still not in line with the project activity. The meters are changed on 06/02/2019. According to chosen verification period, both old and new meters information should be presented in the same table. In QA/QC procedure, Pak Enerji is now removed. The purpose of data is now revised. The calculation method of the parameter is now revised as per the current situation.
- In Section 5.3 of the Joint PD&MR, Pak Enerji is now revised as Elen Enerji. In addition, additional information is given about Monthly Meter Reading Documents and ADM invoices. The organization chart is revised as per the current situation.

**Hence, CR 4 is not closed.**

**Project participant response**

**Date:** 02/04/2021

**Data and Parameters Monitored (Section 5.2)**

- $EG_{facility,y}$ : According to chosen verification period, both old and new meters information has been now presented in the same table.

**DOE assessment**

**Date:** 01/04/2021

- $EG_{facility,y}$ : The information about the monitoring equipment is now in line with the project activity. The meters are changed on 06/02/2019. According to chosen verification period, both old and new meters information are now presented in the same table.

**Hence, CR 4 is closed.**

|                                                                                                                                                                                                                                                                                                                                                                                     |   |             |   |                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------------|---|------------------|
| CR ID                                                                                                                                                                                                                                                                                                                                                                               | 5 | Section no. | 6 | Date: 23/03/2021 |
| Description of CR                                                                                                                                                                                                                                                                                                                                                                   |   |             |   |                  |
| <ul style="list-style-type: none"><li>- In Section 6.1 of the Joint PD&amp;MR, the name, unit and description of the parameter is not in line with the methodology.</li><li>- In Section 6.2 of the Joint PD&amp;MR, with an explanation, let it be stated that the emission factor used in this section belongs to the first crediting period of this monitoring period.</li></ul> |   |             |   |                  |
| Project participant response                                                                                                                                                                                                                                                                                                                                                        |   |             |   | Date: 26/03/2021 |
| <ul style="list-style-type: none"><li>- In Section 6.1 of the Joint PD&amp;MR, the name, unit and description of the parameter is now in line with the methodology.</li><li>- In Section 6.2 of the Joint PD&amp;MR, necessary explanation has been added.</li></ul>                                                                                                                |   |             |   |                  |
| Documentation provided by project participant                                                                                                                                                                                                                                                                                                                                       |   |             |   |                  |
|                                                                                                                                                                                                                                                                                                                                                                                     |   |             |   |                  |
| DOE assessment                                                                                                                                                                                                                                                                                                                                                                      |   |             |   | Date: 01/04/2021 |

- In Section 6.1 of the Joint PD&MR, the name, unit and description of the parameter is now in line with the methodology.
- In Section 6.2 of the Joint PD&MR, with an explanation, it is clearly stated that the emission factor used in this section belongs to the first crediting period of this monitoring period.

**Hence, CR 5 is closed.**

**Table 3. CAR from this verification**

|                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |                    |     |                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--------------------|-----|-------------------------|
| <b>CAR ID</b>                                                                                                                                                                                                                                                                                                                                                                                                                     | 1 | <b>Section no.</b> | 6.5 | <b>Date:</b> 23/03/2021 |
| <b>Description of CAR</b>                                                                                                                                                                                                                                                                                                                                                                                                         |   |                    |     |                         |
| The first 5 days of the electricity generation for June 2019 could not be verified with the provided supporting document. Please check.                                                                                                                                                                                                                                                                                           |   |                    |     |                         |
| <b>Project participant response</b>                                                                                                                                                                                                                                                                                                                                                                                               |   |                    |     | <b>Date:</b> 26/03/2021 |
| Electricity generation data has been now revised for June 2019 and related supporting document has been provided.                                                                                                                                                                                                                                                                                                                 |   |                    |     |                         |
| <b>Documentation provided by project participant</b>                                                                                                                                                                                                                                                                                                                                                                              |   |                    |     |                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                   |   |                    |     |                         |
| <b>DOE assessment</b>                                                                                                                                                                                                                                                                                                                                                                                                             |   |                    |     | <b>Date:</b> 01/04/2021 |
| The first 5 days of the electricity generation for June 2019 could now be verified with the provided supporting document. However, in the calculation excel sheet; <ul style="list-style-type: none"> <li>- In monitoring plan page, the given value of "Generation During Total Crediting Period (162.610 MWh/year) is not calculated correctly. 7 years are chosen for the length of crediting period. Please check.</li> </ul> |   |                    |     |                         |
| <b>Hence, CAR 1 is not closed.</b>                                                                                                                                                                                                                                                                                                                                                                                                |   |                    |     |                         |
| <b>Project participant response</b>                                                                                                                                                                                                                                                                                                                                                                                               |   |                    |     | <b>Date:</b> 02/04/2021 |
| - In the calculation excel sheet; <p>The given value of "Generation During Total Crediting Period (162.610 MWh/year) has been now corrected for 10 years.</p>                                                                                                                                                                                                                                                                     |   |                    |     |                         |
| <b>DOE assessment</b>                                                                                                                                                                                                                                                                                                                                                                                                             |   |                    |     | <b>Date:</b> 01/04/2021 |
| In the calculation excel sheet; <ul style="list-style-type: none"> <li>- In monitoring plan page, the given value of "Generation During Total Crediting Period is now calculated correctly. 10 years are chosen for the length of crediting period.</li> </ul>                                                                                                                                                                    |   |                    |     |                         |
| <b>Hence, CAR 1 is closed.</b>                                                                                                                                                                                                                                                                                                                                                                                                    |   |                    |     |                         |

**Table 4. FAR from this verification**

|               |   |                    |  |              |
|---------------|---|--------------------|--|--------------|
| <b>FAR ID</b> | 1 | <b>Section No.</b> |  | <b>Date:</b> |
|---------------|---|--------------------|--|--------------|

|                                               |       |
|-----------------------------------------------|-------|
| Description of FAR                            |       |
|                                               |       |
| Project participant response                  | Date: |
|                                               |       |
| Documentation provided by project participant |       |
|                                               |       |
| DOE assessment                                | Date: |
|                                               |       |

**Document information**

| <i>Version</i> | <i>Date</i> | <i>Description</i>   |
|----------------|-------------|----------------------|
| 01.0           | 10/06/2016  | Initial publication. |



**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:

**Cyril Augustus Arokiasamy Amalorpavanathan**

è qualificato come:  
 is qualified as:

**TEC, VAL, VER, TL, Local Expert, ITRP**

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

| AREE TECNICHE<br>TECHNICAL AREAS | DESCRIZIONE DELL'AREA TECNICA<br>TECHNICAL AREA DESCRIPTION | SCOPO SETTORIALE<br>SECTORAL SCOPE |
|----------------------------------|-------------------------------------------------------------|------------------------------------|
| 1.1                              | Thermal energy generation                                   | 1                                  |
| 1.2                              | Renewables                                                  | 1                                  |
| 3.1                              | Energy Demand                                               | 3                                  |
| 5.1                              | Chemical Industry                                           | 5                                  |
| 13.1                             | Solid Waste and wastewater                                  | 13                                 |

| REVISIONE<br>REVISION | DATA<br>DATE | MOTIVAZIONI PER LA REVISIONE<br>REASON FOR THE REVISION                         |
|-----------------------|--------------|---------------------------------------------------------------------------------|
| 0                     | 19/07/2016   | First issue with new template (this certificate is linked to CDM qualification) |
| 2                     | 09/10/2017   | Qualification update as 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 Soda Carbon Standard, VCS Verified Carbon Standard.

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

RINA Services S.p.A. è accreditato/recognized da

RINA Services S.p.A. is accredited/recognized by

|                                                    |                                                                                                                                                                                                    |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UNFCCC                                             | quali Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects |
| 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                                                           |



**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<br>TECHNICAL AREAS | DESCRIZIONE DELL'AREA TECNICA<br>TECHNICAL AREA DESCRIPTION | SCOPO SETTORIALE<br>SECTORAL SCOPE |
|----------------------------------|-------------------------------------------------------------|------------------------------------|
| 1.2                              | Renewables                                                  | 1                                  |
| 13.1                             | Solid waste and wastewater                                  | 13                                 |

  

| REVISIONE<br>REVISION | DATA<br>DATE | MOTIVAZIONI PER LA REVISIONE<br>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

RINA Services S.p.A. è accreditato/riconosciuto da  
 RINA Services S.p.A. is accredited /recognized by

|                                                       |                                                                                                                                                                                                      |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| UNFCCC                                                | come Entità Operativa Designata (DOE), per condurre la Validazione e la Verifica di Progetti CDM<br>as Designated Operational Entity (DOE), to carry out Validation and Verification of CDM Projects |
| VCSA                                                  | per condurre la Validazione e la Verifica di Progetti VCS<br>to carry out Validation and Verification of VCS Projects                                                                                |
| GS Foundation                                         | per condurre la Validazione e la Verifica di Progetti GS<br>to carry out Validation and Verification of GS Projects                                                                                  |
| Ecologica Institute                                   | per condurre la Validazione e la Verifica di rapporti SCS<br>to carry out Validation and Verification of SCS Reports                                                                                 |
| American Carbon Registry<br>ACR                       | per condurre la Validazione e la Verifica di Progetti ACR<br>to carry out Validation and Verification of ACR projects                                                                                |
| The Climate, Community & Biodiversity Alliance<br>CCB | per condurre la Validazione e la Verifica di Progetti co-benefit CCB<br>to carry out Validation and Verification of co-benefit CCB projects                                                          |

GHG\_QUAL\_CERT\_EN\_07\_16 Voluntary(Certificate)

Page 1 of 1