



VCS MONITORING REPORT

SIRMA RUN-OF-RIVER HYDRO PROJECT

Project title	SIRMA RUN-OF-RIVER HYDRO PROJECT
Project ID	603
Monitoring period	07-June-2019- 31-December-2023
Original date of issue	28-July-2024
Most recent date of issue	21-May-2025
Version	10
VCS Standard Version	4.7
Prepared by	Life İklim ve Enerji Ltd. Şti.

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PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Sırma Run-of-River Hydro Project (herein referred to as Sırma HEPP in short), with a project start date of 07-June-2009, is a run-of-river dam-based hydro power plant project developed by Elen Enerji Üretimi Sanayi Ticaret A.Ş. (referred to as the “project proponent” from here on). The project has an installed capacity of 5,88 MW ($3 \times 2.166 \text{ MW}_m / 3 \times 1.960 \text{ MW}_e$), which annually feeds emission-free electricity into the national grid in Türkiye. Sırma HEPP displaces electricity from the current generation mix, which is based to a large amount on thermal power plants and affects the planned capacity extension of the electricity system.

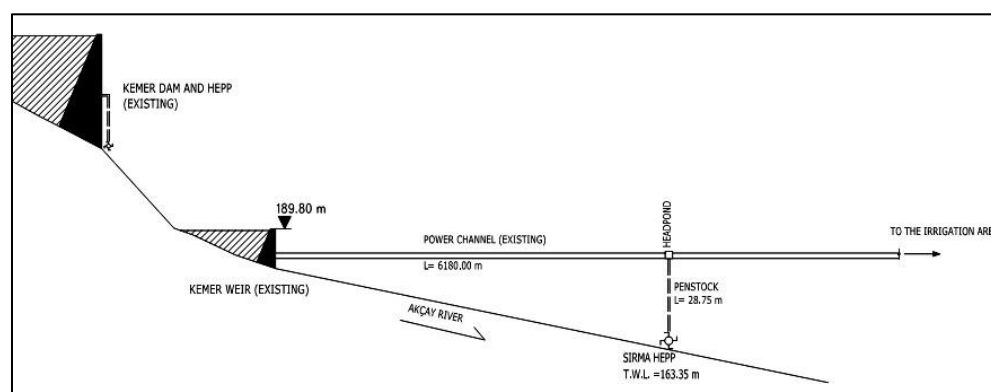
The project replaces electricity that would have otherwise been generated by fossil fuel-based power plants, thereby reducing greenhouse gas emissions. By displacing fossil fuel-based electricity with renewable energy and so, reducing greenhouse gas emissions, it also project contributes to global efforts to combat climate change. As the project activity consists of grid connected run-of-river hydro power plant which provides clean energy to the national grid and a total installed capacity, 5.88 MW, which is smaller than 15 MW, the CDM methodology AMS-I.D Grid connected renewable electricity generation Version 18.0 has been applied.

Sırma HEPP generates electricity and feeds it into the national Turkish grid by using the renewable energy source of the current of Akçay Creek, which arises from Mountainous areas in the northeast of Muğla province, Türkiye. All Turkish power plants are connected to this grid and are dispatched centrally by the Turkish grid operator Türkiye Elektrik İletim A.Ş. (TEİAŞ) and its Enerji Piyasaları İşletme A.Ş. (EPİAŞ) (Energy Exchange Istanbul - EXIST). The electricity supplied to the national grid is dominated by thermal power plants.

As the 5.88 MW Sırma run-of-river HPP produces electricity for transmission into the national grid, it uses kinetic energy of the water in the pre-existing power channel on the left bank of Akçay River, downstream of Kemer Weir. The water is directed towards a head pond from where it is being sent through a penstock to three turbines powering three generators for electricity generation. Figure 1 gives an overview.

Also, as Sırma HEPP is a run-of-river HPP, the electricity amount supplied to the grid depends on external physical conditions, i.e., the flow rate at Akçay river, though it is regulated to a certain extent by an appropriate management of the planned reservoir. In contrast, the thermal power plants connected to the national grid can fully be regulated.

Figure 1: Technical overview of Sirma HEPP



Sirma HEPP thus involves the construction of installations on the left bank area of Akçay River (head pond, penstock, power plant and grid connection line).

The Turbine type is vertical-axis Kaplan type with fixed blades. (for a picture of the turbine, please see Figure 4). Generated electricity is fed into the national grid via a connection to Karacasu distribution center via a 20 km long 36 kV single line from the switchyard close-by to the power plant. The net annual electricity production of the project activity is expected to be 23.230 GWh. Detailed technical characteristics of Sirma HEPP are given in table 1, 2 and figure 3 (Single Line Diagram) below.

Table 1: Technical Characteristics of Sirma HEPP

Project Main Characteristics	Type: Run-of-river HPP Gross Head: 21.3 m Design Discharge: 33.00 m ³ /s Total Installed Power: 5.88 MWe Net Power Generation: 23.230 GWh/year
Weir, Water Intake Structure	Type: Concrete Elevation at crest: 189.8 m Height from riverbed: 12.8 m
Channel	Type: rectangular, concrete Gradient: 0.003 Bottom Width: 5.0 m Length (to head pond): 6,180 m
Headpond	Width: 10.0 m Length: 23.5 m Height: 9.5-20 m
Penstock	Diameter: 3.2 m, Length: 28.75 m, Steel Thickness: 10 mm (St52)
Turbine	Type: Vertical Axis Kaplan, with fixed blades Installed Power: 3 x 1.960 MWe (2178 kVA, power factor: 0.9) Manufacturer: Zhejiang Orient Engineering Co.Ltd.
Generator	Number of Generators: 3 Type: Vertical Axis, 3-phase, synchronized Nominal Voltage: 6.3 kV (+/- 5%) Frequency: 50 Hz Synchronic Rotation Frequency: 600 rpm Zhejiang Orient
Transmission Line	Type: 3x477 MCM, single line Line Voltage: 36 kV Connection Point: Karacasu Distribution Center Length: 20 km

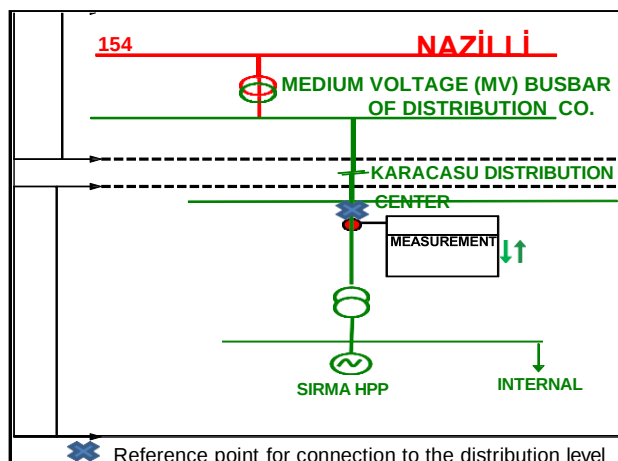


Figure 2: Single Line Diagram of Sirma HEPP



Figure 3: Photo of Kaplan Turbine

To conclude, the electricity produced by Sirma HEPP displaces power generation by thermal power plants, which leads to savings in fuel combustion and thus to the reduction of GHG emissions, as specified and explained in detail in Section 5.

For the 1st monitoring period, which corresponds to the period between 07-June-19 and 31-December-2023, the net electricity generation for Sirma HEPP has been recorded as 46,393.54 MWh. In line with this net generation, the actual emission reduction has been calculated as 25,064.00 tCO₂e. The table below includes the differences in the estimated and actual achieved emission reductions. The technical description of the installed technology and equipment are given in the table below.

Table 1 Estimated and actual reduction comparison

Vintage		n of days	Actual ER _y (tCO ₂)	Estimated ER _y (tCO ₂)	% by year
7.06.2019	31.12.2019	208	5,341	7,152	-25%
1.01.2020	31.12.2020	366	5,835	12,586	-54%
1.01.2021	31.12.2021	365	3,181	12,551	-75%
1.01.2022	31.12.2022	365	7,436	12,551	-41%

1.01.2023	28.03.2023	365	3,271	12,551	-74%
Total		1,669	25,064	57,391	-56%

As aforementioned above, Sirma HEPP is a run-of-river HPP, the electricity amount supplied to the grid depends on external physical conditions, i.e., the flow rate. That is why the actual emission reduction amounts are lower than the estimated amount since electricity generated is also lower than the estimated amount of electricity. Within the scope of this project, a reservoir area whose detailed data are given in Table 1 was formed for the installation of the plant.

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
1st Crediting Period	07-June-2009 – 06-June-2019	VCS	RINA SERVICES S.P.A.	10 years
1st Monitoring Period	07-June-2009 – 30-June-2013	VCS	RINA SERVICES S.P.A.	4 years, and 23 days
2nd Monitoring Period	01-July-2013 – 05-June-2019	VCS	RINA SERVICES S.P.A.	5 years, 11 months, and 4 days
2nd Crediting Period	07-June-2019 – 06-June-2029	VCS	RINA SERVICES S.P.A.	10 years
1st Monitoring Period	07-June-2019– 31-December-2023	VCS	Re Carbon Ltd.	4 years, 6 months, and 24 days

1.3 Sectoral Scope and Project Type

Sectoral scope¹	1 “Energy Industry – Renewable -/Non-renewable Sources
Project activity type	Small-scale CDM project activity

1.4 Project Proponent

Organization name	Elen Enerji Üretimi Sanayi Ticaret A.Ş.
Contact person	Ayşe Uncuoğlu

¹ Projects, activities, or methodologies may be developed under any of the 16 VCS sectoral scopes: <https://verra.org/programs/verified-carbon-standard/vcs-program-details/#sectoral-scopes>

Title	Project Executive
Address	İlkbahar Mah. Turan Güneş Bulvarı Galip Erdem Cad. No:3 Çankaya / Ankara / Türkiye
Telephone	+90 312 408 10 00
Email	auncuoglu@akfen.com.tr

1.5 Other Entities Involved in the Project

Organization name	Life İklim ve Enerji Ltd. Şti.
Role in the project	Project Representative
Contact person	Mehmet Aydoğdu
Title	Carbon Consultant
Address	Oğuzlar Mahallesi, 1377. Sk. No:19, 06520 Çankaya/Ankara/ Türkiye
Telephone	+90 312 481 21 42
Email	mehmet.aydogdu@life-climate.com

Organization name	Akfen Yenilenebilir Enerji A.Ş.
Role in the project	Mother Company
Contact person	Ayşe Uncuoğlu
Title	Project Executive
Address	İlkbahar Mah. Turan Güneş Bulvarı Galip Erdem Cad. No:3 Çankaya / Ankara / Türkiye
Telephone	+90 312 408 10 00
Email	auncuoglu@akfen.com.tr

1.6 Project Start Date

Project start date	<i>The start date of project activity is 07-June-2009 and it is in line with the VCS Standard version 4.7.</i>
Justification	<i>As per the VCS Standard version 4.7, 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. version 18.0.</i>

1.7 Project Crediting Period

Crediting period	☐ Seven years, twice renewable ☐ Ten years, fixed ☒ Other <i>Crediting period of 10 years has been chosen for the project activity and is planned to be renewable twice</i>
Start and end date of first or fixed crediting period	<i>07-June-2009 – 06-June-2019</i>

1.8 Project Location

The project is located in the Aegean Region, Aydın City, Bozdoğan district, close to Sirma village, in Türkiye. The geographical coordinates of the hydro power plant are:

Table 3: Geographic coordinates of the Weir and the Sirma HPP:

	<i>Latitude (N)</i>	<i>Longitude (E)</i>
<i>Head pond</i>	<i>37° 36' 24.960"</i>	<i>28° 28' 26.460"</i>
<i>Power House</i>	<i>37° 36' 26.280"</i>	<i>28° 28' 26.340"</i>



Figure 4: Location of the Plant

1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	AMS-I.D. version 18.0	AMS-I.D. "Grid connected renewable electricity generation	Version 18.0
Tool	Tool 07	Tool to calculate the emission factor for an electricity system	version 07.0
Tool	Tool 01	Tool for the demonstration and assessment of additionality	version 07.0
Tool	Tool 10	Tool to determine the remaining lifetime of the equipment	version 01.0

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.10.2 Registration in Other GHG Programs

Was the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

1.12 Sustainable Development Contributions

During this monitoring period, Sirma HPP, a run-of-river hydropower project, generated 46,393.54 MWh of clean electricity and supplied it to the national grid, contributing to SDG 7.2.1. The project also avoided 25,064 tCO₂e emissions (SDG 13.0) and provided employment to 8 local workers under safe and fair working conditions in line with SDG 8.5.1. Additional measures such as GHG emission reduction and local social engagement activities were implemented to enhance

environmental and social co-benefits. These contributions support national sustainable development priorities. Supporting evidences is submitted to the VVB.

Table 2: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix	7.2.1 Renewable energy share in the total final energy consumption	Implemented activities to increase	A net 46,393.54 MWh clean energy has been provided to the national grid in this monitoring period	Project activity expects to contribute a net 23,230 MWh of clean energy to the national grid annually during this crediting period which has the start and end dates as 07/06/2019 and 06/06/2029, respectively (For details, please see the registered PD)
2)	8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value.	8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities	Implemented activities to increase	8 employments (all the employees are local) have been provided during this monitoring period.	There will be 7-9 employees employed during this crediting period which has the start and end dates as 07/06/2019 and 06/06/2029, respectively. (Not: Since SDG 8 contribution was not assessed in the registered PD and therefore the number of employees in project activity throughout the project lifetime was not claimed during the validation phase, it is stated as 7-9 people in this monitoring report and it will be expected to be this way in the following monitoring periods)

3)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	25,064 tCO ₂ e emission have been reduced by the project activity during this monitoring period.	A total of 125,510 tCO ₂ e emission reduction has been estimated to be reduced by the project activity during this crediting period (For details, please see the registered PD)
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1.13 Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the monitoring report.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification	Local stakeholder identification process was determined to include the female, male, young and elderly residents of Sirma Village who live around the project area and may be directly affected by the project, the village headman who is in constant contact with the village people, and local businesses.
Legal or customary tenure/access rights	N/A.
Stakeholder diversity and changes over time	N/A
Expected changes in well-being	No expectation has been raised by the stakeholders.
Location of stakeholders	Sirma Köyü

Location of resources	N/A
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2.1.2 Stakeholder Consultation and Ongoing Communication

Ongoing consultation	A new logbook was delivered to the mukhtar of Sirma village during the site visit for this monitoring period that took place on 29/07/2024. Also, a declaration provided by Life Climate stating that the logbook was delivered to the mukhtar was signed by the mukhtar as the recipient and by the consultant at Life Climate as the deliverer. This declaration was submitted to VBB in a scanned form. The contact information of the authorized person from the owner company is available in the logbook so that the local stakeholders can reach these people whenever they have any complaints, suggestions or ideas about the project.
Date(s) of stakeholder consultation	25-March-2021
Communication of monitored results	The logbook and contact information of the authorized person from the owner company is available at village head's office so that the local stakeholders are able to reach these people whenever they have any complaints, suggestions or ideas about the project.
Consultation records	Logbook and declaration
Stakeholder input	No feedback is provided to the logbook.

2.1.3 Free, Prior, and Informed Consent

There are no ongoing conflicts or issues with stakeholders. Hence, the cells in the table below have been stated as N/A.

Consent	N/A
Outcome of FPIC	N/A

2.1.4 Grievance Redress Procedure

To ensure transparent, accessible, and fair resolution of concerns, Sirma HPP has established a grievance redress mechanism that outlines clear steps for submitting and addressing formal complaints.

The procedure is as follows:

1. Submission of Complaints

Community members and stakeholders may submit grievances through multiple channels:

- In-person at the project site via the grievance register located at the site office
- By phone or SMS to the designated community liaison officer
- By email or through the project's official website
- Via local representatives (mukhtar) or municipal offices for those with mobility or access limitations

2. Acknowledgement

All grievances are formally acknowledged within 7 working days. A written or verbal confirmation is provided to the complainant, depending on the mode of submission.

3. Assessment and Investigation

The project team logs the complaint and initiates an internal assessment. Relevant personnel investigate the issue and, if needed, consult with the complainant and/or third parties.

4. Resolution and Feedback

A resolution is proposed and communicated to the complainant within 30 working days. The response includes the steps taken, justification for the outcome, and contact details for follow-up.

5. Appeals Process

If the complainant is not satisfied, they may appeal. An independent third party or local authority may be involved to ensure impartial review.

6. Monitoring and Reporting

All grievances and resolutions are recorded and reviewed quarterly to identify trends and improve the mechanism. Anonymized summaries may be shared in project updates.

The grievance mechanism is designed to be inclusive, with specific outreach to vulnerable or marginalized groups who may face barriers in submitting complaints. Information about the grievance process is publicly displayed in local languages at accessible community points and shared during stakeholder meetings.

Grievances received	Resolution and outcome
N/A	During the site visit, logbooks were delivered to the village headman, where local stakeholders could submit their complaints in writing, and a report was stating that it was delivered to the village headman has been shared with VVB. In addition, during the site visit, local stakeholders stated that they were in contact with the village headman and

authorized persons in the project site and that they could directly get in contact with the relevant people in case they had a complaint.

2.1.5 Public Comments

No public comments were received for the project.

Summary of comments received	Actions taken
N/A	N/A

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

Akfen Yenilenebilir Enerji A.Ş., as a mother company, has played a significant role in the installation of renewable energy plants in Türkiye since 2009 and has completed numerous project activities through various voluntary carbon standards. During the installation and operation phases of renewable energy plants, Akfen Yenilenebilir Enerji A.Ş. provides occupational safety training to its employees through safety companies and engages environmental consulting firms for waste management services. Additionally, for consultancy on voluntary carbon projects, the company has been collaborating for many years with Life Climate, which has 15 years of experience in the field.

2.2.2 Risk assessment

	Risk identified	Mitigation or preventative measure(s) taken
Natural and human-induced risks to stakeholders' wellbeing	No risk identified	As no natural and human-induced risk has been identified in the project site and nearby during validation and no risk mitigation was provided in the PDD for this impact, no mitigation or preventative measure(s) has been taken in this monitoring period.
Risks to stakeholder participation	No risk identified	As no risk to stakeholder participants has been identified in the project site and nearby during validation and no risk mitigation

		was provided in the PDD for this impact, no mitigation or preventative measure(s) has been taken in this monitoring period.
Working conditions	No risk identified	As all the employments are carried out in accordance with the labor law ² , no risk is identified, and no mitigation or preventative measure(s) has been taken
Safety of women and girls	No risk identified	As no specific risk for woman and girls has been identified in the project site and nearby during validation and no risk mitigation was provided in the PDD for this impact, no mitigation or preventative measure(s) has been taken in this monitoring period.
Safety of minority and marginalized groups, including children	No risk identified	As there is no specific risk for minority, marginalized groups and children have been identified on the project site and nearby during validation and no risk mitigation was provided in the PDD for this impact, no mitigation or preventative measure(s) has been taken in this monitoring period.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	No risk identified	As no chemical is used in any operation process of the plant and no noise and exhaust occur due to technical operations, no relevant risk has been identified in the project site and nearby during validation and no risk mitigation was provided in the PDD for this impact. Hence, no mitigation or preventative measure(s) has been taken in this monitoring period.

² <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=4857&MevzuatTur=1&MevzuatTertip=5>

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

Risks identified ³		Mitigation or preventative measure(s) taken
Discrimination	No risk identified	As no discrimination risk has been identified in the project site and nearby during this monitoring period, no mitigation or preventative measure(s) for this impact has been taken in this monitoring period. Yet, a logbook has been provided to the headman of Sirma Village where local stakeholders can constantly express their complaints and opinions.
Sexual harassment	No risk identified	As no sexual harassment risk has been identified in the project site and nearby during this monitoring period, no mitigation or preventative measure(s) for this impact has been taken in this monitoring period. Yet, a logbook has been provided to the headman of Sirma Village where local stakeholders can constantly express their complaints and opinions.
Gender equity in labor and work	No risk identified	As no gender equity in labor and work risk has been identified in the project site and nearby during this monitoring period, no mitigation or preventative measure(s) for this impact has been taken in this monitoring period. Yet, a logbook has been provided to the headman of Sirma

³ The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

		<i>Village where local stakeholders can constantly express their complaints and opinions.</i>
Forced labor	<i>No risk identified</i>	<i>As no forced labor risk has been identified in the project site and nearby during this monitoring period, no mitigation or preventative measure(s) for this impact has been taken in this monitoring period. Yet, a logbook has been provided to the headman of Sirma Village where local stakeholders can constantly express their complaints and opinions.</i>
Child labor	<i>No risk identified</i>	<i>As no child labor risk has been identified in the project site and nearby during this monitoring period, no mitigation or preventative measure(s) for this impact has been taken in this monitoring period. Yet, a logbook has been provided to the headman of Sirma Village where local stakeholders can constantly express their complaints and opinions.</i>
Human trafficking	<i>No risk identified</i>	<i>As no human trafficking risk has been identified in the project site and nearby during this monitoring period, no mitigation or preventative measure(s) for this impact has been taken in this monitoring period. Yet, a logbook has been provided to the headman of Sirma Village where local stakeholders can constantly express their complaints and opinions.</i>

2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	In this monitoring period, no risk for rights of IPs, LCs, and customary rights holders in line with applicable international human rights law, and the United Nations Declaration on the Rights of Indigenous Peoples and ILO Convention 169 on Indigenous and Tribal Peoples has been identified. Yet, a logbook has been provided to the headman of Sirma Village where local stakeholders can constantly express their complaints and opinions.

2.3.3 Indigenous Peoples and Cultural Heritage

Risks identified	Mitigation(s) or preventative measure taken
No risk identified	In this monitoring period, no risk related to recognizing, respecting, and promoting the protection of the rights of IPs, LCs, and customary rights holders, and to preserving and protecting cultural heritage as part of project activities has been identified. Yet, a logbook has been provided to the headman of Sirma Village where local stakeholders can constantly express their complaints and opinions.

2.3.4 Property Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified	In this monitoring period, there is no risk related to protecting and preserving the property rights of IPs, LCs, and customary rights holders, and to protecting legal or customary tenure/access rights to territories, property, and resources, including collective and/or conflicting rights, held by stakeholders, has been identified. Yet, a logbook has been provided to the headman of Sirma Village where local stakeholders can

	constantly express their complaints and opinions.
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2.3.5 Benefit Sharing

Summary of the benefit sharing plan	<i>As the project activity has not impacted the property rights, this section is not applicable.</i>
Benefit sharing during the monitoring period	<i>As the project activity has not impacted the property rights, no outcomes resulted from the benefit sharing plan in this monitoring period.</i>

2.4 Ecosystem Health

	Risk identified	Mitigation or preventative measure(s) taken during the monitoring period
Impacts on biodiversity and ecosystems	<i>No risk identified</i>	<i>As the project is not located in, or adjacent to habitats for rare, threatened, or endangered species, no risk has been identified for this impact in the project area.</i>
Soil degradation and soil erosion	<i>No risk identified</i>	<i>As the project is not located in, or adjacent to a place that carries risks of soil degradation and soil erosion, no risk has been identified for this impact in the project area.</i>
Water consumption and stress	<i>No risk identified</i>	<i>As the project is not located in, or adjacent to a place that carries risks of water consumption and stress, no risk has been identified for this impact in the project area.</i>

2.5.1 2.4.1 Rare, Threatened, and Endangered species

Species or habitat	<i>As the project is not located in, or adjacent to habitats for rare, threatened, or endangered species, no risk has been identified for this impact in the project area.</i>
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Areas needed for habitat connectivity	There are no risks on impacts on biodiversity and ecosystems.
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2.5.22.4.2 Introduction of species

Species introduced	Classification	Justification for use	Adverse effects and mitigation
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
N/A	N/A
N/A	N/A
N/A	N/A

	Risks identified	Mitigation or preventative measure(s) taken
Invasive species	No risk identified	No risks have been identified regarding the impacts of invasive species

2.5.32.4.3 Ecosystem conversion

	Risks identified	Mitigation or preventative measure(s) taken
Ecosystem conversion	No risk identified	No risks related to ecosystem conversion have been identified on the project area during this monitoring period.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

Date (DD/MM/YYYY)	Activity
05-July-2007	Issuance of the License
25-August-2007	Requests for proposals from consultants for VER development
16-October-2007	Contract Signature with Zhejiang Orient Engineering Co. Ltd. (generator/turbine)
23-October-2007	Contract Signature with Yapı-TEK and Bugato İnşaat, Ordinary partnership (construction)
01-November-2007	Starting construction activities with roads and site preparation
01-March-2008	Agreement with Akfen İnşaat Co. (for management of construction)
07-April-2008	Contract agreement with Hitit Sanayi İnşaat for hydromechanical equipment
25-April-2008	Contract agreement with Köseoğlu Elektrik for transmission line
01-September-2008	Initial agreement with a VER consultant
07-June-2009	Start of commercial operation/starting date of VER project, first monitoring and crediting period
27-March-2009	Financial closure with bank
13-April -2010	Signature with FutureCamp Türkiye for VER development
31-July-2010	Termination of first monitoring/reporting period; An annual reporting is envisioned.
31-May-2019	Termination of the first crediting period
01-July-2013	Start date of the second monitoring period
05-June-2019	End date of the second monitoring period
07-June-2019	Start date of second crediting period (revalidation)
	Start date of first monitoring period
31-December-2024	End date of first monitoring period
06-June-2029	End date of second crediting period

3.2 Deviations

3.2.1 Methodology Deviations

Any methodology deviations have not been applied during this monitoring period

3.2.2 Project Description Deviations

The project baseline for this 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.

3.3 Grouped Projects

This is not a grouped project activity.

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes ☒ No

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	EF _{grid,BM,y}
Data unit	tCO ₂ /MWh
Description	For the emission BM factor, that were used to calculate estimated emission reductions, publication of Turkish Ministry of Energy and Natural Resources which is indicating Türkiye's National Electric Grid Emission Factor for the year of 2018 was used. Publication includes calculated Emission Factor values that are Operating Margin (OM), Growth Based Margin (Build Margin-BM) and Combined Margin (CM) Emission Factors, for the relevant year with usage of the IPCC's Clean Development Methodology Tool 07-V06.0.
Source of data	Please see: 0c6b62ea-bf2f-4fea-b9b3-28bc6f48ddf2_Bilgi_Formu_-_Web_Sitesi.pdf (etkb.gov.tr)
Value applied	0,3812 tCO ₂ /MWh
Justification of choice of data or description of	Ministry of Energy and Natural Resources makes available the official data in Türkiye. The latest data available during this document preparation was for 2018.

measurement methods and procedures applied	
Purpose of data	Used for baseline emissions
Comments	-

Data / Parameter	EF_{grid,CM,y}
Data unit	tCO ₂ /MWh
Description	For the combined margin CO ₂ emission factor that were used to calculate estimated emission reductions, publication of Turkish Ministry of Energy and Natural Resources which is indicating Türkiye's National Electric Grid Emission Factor for the year of 2018 was used.
Source of data	Please see: 0c6b62ea-bf2f-4fea-b9b3-28bc6f48ddf2_Bilgi_Formu_-_Web_Sitesi.pdf (etkb.gov.tr)
Value applied:	0.5403 tCO ₂ /MWh
Justification of choice of data or description of measurement methods and procedures applied	The baseline emissions are the product of electrical energy baseline expressed in MWh of electricity produced by the renewable generating unit multiplied by an emission factor.
Purpose of Data	Used for baseline emissions
Comments	-

Data / Parameter	EF_{grid,OM,y}
Data unit	tCO ₂ /MWh
Description	For the combined margin CO ₂ emission factor that were used to calculate estimated emission reductions, publication of Turkish Ministry of Energy and Natural Resources which is indicating Türkiye's National Electric Grid Emission Factor for the year of 2018 was used.
Source of data	Please see: 0c6b62ea-bf2f-4fea-b9b3-28bc6f48ddf2_Bilgi_Formu_-_Web_Sitesi.pdf (etkb.gov.tr)

Value applied:	0,6993 tCO ₂ /MWh
Justification of choice of data or description of measurement methods and procedures applied	The baseline emissions are the product of electrical energy baseline expressed in MWh of electricity produced by the renewable generating unit multiplied by an emission factor.
Purpose of Data	Used for baseline emissions
Comments	-

4.2 Data and Parameters Monitored

Table 1

Data / Parameter	<i>EG_{PJ, facility, y} (SDG 7)</i>
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	The data from the Electricity Meters are the basis for the settlement notification of EPIAS. Data are gathered electronically from the meters by TEIAS and stored on the secured website of EPIAS, which is accessible to project developer with a private password. For monitoring, the monthly settlement notification of EPIAS shall be used as source of data.
Description of measurement methods and procedures applied	Regarding the electricity meters: two meters are placed (one main and one reserve) at the TEIAS substation. These meters are sealed by TEIAS and intervention by project proponent is not possible. The fact that two meters are installed in a redundant manner keeps the uncertainty level of the only parameter for baseline calculation low. High data quality of this parameter is not only in the interest of the emission reduction monitoring, but paramount for the business relation between the plant operator and the electricity buyers.
Frequency of monitoring/recording	Continuous monitoring, hourly measurement and at least monthly recording
Value monitored	46,393.54 (MWh) (For the 1st monitoring period, which corresponds to the period between 07-June-2019 and 31-December-2023)
Monitoring equipment	The data from the Electricity Meters are the basis for the settlement notification of EPIAS. Data are gathered electronically from the meters by TEIAS and stored on the secured website of EPIAS, which is accessible to project developer with a private password. For monitoring, the monthly settlement notification of EPIAS shall be used as source of data. Calibration frequency: According to Article 9 of the relevant regulation, periodical inspections of "gauges for electric, water, coal gas, natural gas and, current

and voltage measuring transformers will be made once in 10 years". This is in line with the monitoring plan and national requirements. TEIAS decides when to carry out the next calibration. The Project owner has no control over or access to the measurement devices and is not entitled to perform any type of maintenance or calibration.

Old meter	Main meter	Beck-up meter
Serial no	368721 (ELSTER)	368720 (ELSTER)
Accuracy class	0.5 S	0.5 S
*First index protocol date: 09-April-2009		
New meter	Main meter	Beck-up meter
Serial no	84260496 (ITRON)	84260497 (ITRON)
Accuracy class	0.5 S	0.5 S
*Calibration test report date is 06-February-2019 ⁴		

The electricity meters used in the Sirma HEPP were purchased in 2009 and calibrated. Since these meters completed 10 years in 2019, they were replaced with ITRON electricity meters.

QA/QC procedures to be applied

According to the Article 2 of the 'Communiqué Regarding the Meters to be used in the Electricity Market '⁵ (Communiqué): 'The meters to be used in the electricity market shall be compliant with the standards of Turkish Standards Institute or IEC and have obtained "Type and System Approval" certificate from the Ministry of Trade and Industry.' Therefore, the Ministry of Trade and Industry (Ministry) is responsible for control and calibration of the meters.

Paragraph b) of the Article 9 of the 'Regulation of Metering and Testing of Metering Systems'⁶ (Regulation) of Ministry states that: 'b) Periodic tests of meters of electricity, water, coal gas, natural gas and current and voltage transformers are done every 10 years.' Therefore, periodic calibration of the meters carries out every 10 years.

Also, according to Article 67 (page 20) of this regulation, the calibration shall be done in calibration stations which have been tested and approved by Ministry of Trade and Industry. Article 10-d) of Communiqué requires the meters shall be three phase four wire and Article 64 of Regulation clearly states how calibration shall be performed for this kind of meter.

According to Article 3 of System Usage Agreement⁷ done by 'Elen Enerji' and TEIAS; other than periodic tests, if a party alleges the meters are not working appropriately tests of the meters will be done by presence of both parties. If, after controls, it is seen that the meter is not working appropriately, the

⁴ Please see: Calibration test report.

⁵ See, <https://www.epdk.gov.tr/Detay/DownloadDocument?id=+6B2PMv4N4A> = (<https://www.epdk.gov.tr/Detay/Icerik/3-0-0-128/tebligler>)

⁶ See, <http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.6381&MevzuatIliski=0&sourceXmlSearch=>

⁷ See, <http://www.teias.gov.tr/sistemkullanim1.doc> , (page 3, 2-b)

	measurements of reserve meters are taken into account beginning from date both meters are reading the same (page 3, 2-c) As above mentioned, the data acquisition and management and quality assurance procedures are anyway in place, no additional procedures have to be established for the monitoring plan.
Purpose of data	Used for baseline emissions
Calculation method	Regarding the electricity meters: two meters are placed (one main and one reserve) at the Sirma HEPP which meters the electricity transferred to TEİAŞ substation. These meters are sealed by TEİAŞ and intervention by project proponent is not possible. The fact that two meters are installed in a redundant manner keeps the uncertainty level of the only parameter for baseline calculation low. High data quality of this parameter is not only in the interest of the emission reduction monitoring, but paramount for the business relation between the plant operator and the electricity buyers. Measured hourly and readings monthly. Monthly settlement notifications of EPIAŞ consist of hourly electricity production and withdrawn from the grid. Since the meters are reading electricity supplied to the system and withdrawn from the system separately, the net electricity amount supplied to the grid is calculated by electricity supplied minus electricity withdrawn which is be taken from monthly settlement notifications. Thus, with this procedure is monitored sufficient and no extra Monitoring must be implemented.
Comments	-

Data / Parameter	ER_y (SDG 13)
Data unit	tCO _{2e}
Description	Emission reductions in year y
Source of data	AMS-I.D. version 18.0 (Methodology)
Value applied:	25,064 tCO _{2e} (During this monitoring period)
Justification of choice of data or description of	Baseline emissions include only CO ₂ emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have

measurement methods and procedures applied	been generated by existing grid-connected power plants and the addition of new grid-connected power plants. $ER_y = BE_y = EG_{PJ,y} \times EF_{grid,y}$ (BE_y= Baseline emissions in year y (tCO₂) ER_y= 46,393.54 (MWh) x 0.5403 (tCO₂/MWh) ER_y= 25,066.43 tCO₂ (During this monitoring period) (As round down has been applied to emission reduction of each year in the monitoring period, the conservative value achieved in this monitoring period appears as 25,064.00 tCO₂)
Purpose of Data	Used for baseline emissions
Comments	For the equation provided above, please see Equation (1) and Equation (9) in AMS-I.D version 18.0.

Data / Parameter	Quantity of Employment (SDG 8)
Data unit	Number of employments
Description	Long term employment created directly due to the project activity
Source of data	Official employment records (Statement of employment) of each employee
Value applied:	8 employments have been provided in this monitoring period
Justification of choice of data or description of measurement methods and procedures applied	According to the Host Country's Labor Law ⁸ , employers are obliged to insure their employees for the duration of their employment. Employers' insurance records are proof that there is income generation by the employer which is project owner.
Purpose of Data	Assessing the impact of the project activity on SDG 8
Comments	No additional comment has been found

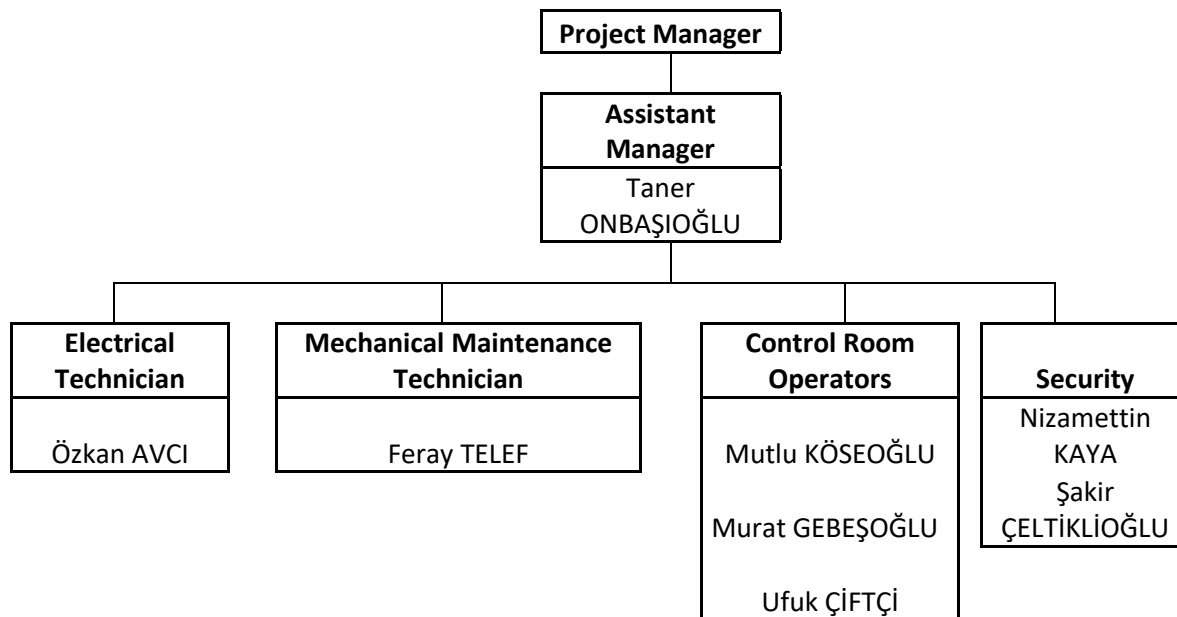
⁸ <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=4857&MevzuatTur=1&MevzuatTertip=5>

4.3 Monitoring Plan

As described above, the only relevant data that has to be monitored is the net electricity generation ($EG_{PJ, facility, y}$) per year, these data are subject to the accounting quality systems of both parties to the power purchase agreement, TEİAŞ and ‘Elen Enerji’. The monthly meter reading documents (settlement notifications of EPIAS) are stored by ‘Elen Enerji’ and TEİAŞ. The settlement notification, which is issued by TEİAŞ and includes the meter reading data, is stored on a TEİAŞ file server and accessible for ‘Elen Enerji’ via a secured website. The meters themselves can always be read as plausibility check for verification. With this, no additional structures or processes have to be implemented to ensure the availability and high quality of the necessary data for monitoring.

In this monitoring period, the data from the monthly settlement notifications have been added up to the yearly net electricity generation and multiplied with the combined margin emission factor with the help of an excel spreadsheet that also contains the combined margin calculation. Thus, the complete baseline approach is always transparent and traceable. For the elaboration and quality assurance of the monitoring report, Life Enerji Türkiye, an expert in the project mechanisms who already supported in the project design, is assigned.

Currently the following information on staff and responsibilities at Sırma HEPP can be seen below:



‘Elen Enerji’ keeps all the data needed for the calculation of emission reductions during the crediting period and until two years after the last issuance of VCS VERs for Sırma HEPP.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Used Formulas:

The total emission reductions can be calculated with the results of the below described equations. The emission reduction is equal to the baseline emissions minus project emissions and leakage emissions. Leakage emissions in this project are considered to be negligible. There are no project emissions in this kind of project. The general equation is as follows:

Emission reductions

Baseline emissions are calculated as per AMS-I.D., formula 1:

$$BE_y = E_{GBL,y} \times EF_{CO_2,grid,y} \quad (1)$$

Where:

BE_y : Baseline emissions in year y (tCO₂/yr).

$E_{GBL,y}$: Electricity supplied by the project activity to the grid (MWh).

$EF_{CO_2,grid,y}$: Combined margin CO₂ emission factor for grid connected power generation in year y and validated value = 0.5403 tCO₂/MWh.

Emission reductions achieved by the project activity are calculated as per formula 2 of AMS-I.D.:

$$ER_y = BE_y - PE_y - LE_y \quad (2)$$

Where:

ER_y : Emission reductions in year y (tCO₂/yr).

BE_y : Baseline emissions in year y (tCO₂/yr).

PE_y : Project emissions in year y (tCO₂/yr); validated value = 0.

LE_y : Leakage emissions in year y (tCO₂/yr); validated value = 0.

$$BE_y = E_{PJ, facility,y} * EF_{grid, CM,y} = 46,393.54 * 0.5403 \text{ tCO}_2/\text{MWh} = 25,066.43 \text{ tCO}_2$$

(As the round down operation has been applied to the emission reduction calculation of each year in the monitoring period, the conservative total actual emission reduction value for this monitoring period found as 25,064.00 tCO₂e. Please see ER calculation spreadsheet)

5.2 Project Emissions

As per para 39 of AMS-I.D. Grid connected renewable electricity generation version 18.0, for most renewable energy project activities, $PE_y = 0$. The proposed project activity involves the generation of electricity by development of run-of-river hydro plant which is a renewable energy resource. Therefore, the project emission (PE_y) has been taken as 0 tCO₂/year.

5.3 Leakage Emissions

As in para 42 of AMS-I.D grid connected renewable electricity generation version 18.0 only the leakage of biomass has been mentioned, the leakage emission (LE_y) has been taken as 0.

5.4 GHG Emission Reductions and Carbon Dioxide Removals

According to AMS-I.D version 18.0, emission reductions are calculated as:

$$ER_y = BE_y - PE_y - LE_y$$

where

ER_y Emission reductions in year y (tCO₂/yr)

BE_y Baseline emissions in year y (tCO₂/yr)

PE_y Project emission in year y (tCO₂/yr)

LE_y Leakage emissions in year y (tCO₂/yr)

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

$$BE_y = EG_{PJ, facility, y} * EF_{grid, CM, y} = 46,393.54 * 0.5403 \text{ tCO}_2/\text{MWh} = 25,066.43 \text{ tCO}_2$$

(As the round down operation has been applied to the emission reduction calculation of each year in the monitoring period, the conservative total actual emission reduction value for this monitoring period found as 25,064.00 tCO₂e. Please see ER calculation spreadsheet)

Vintage period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Reduction VCU (tCO ₂ e)	Removal VCU (tCO ₂ e)	Total VCUs (tCO ₂ e)
07-Jun-2019 to 31-Dec-2019	5,341	0	0	5,341	0	5,341
01-Jan-2020 to 31-Dec-2020	5,835	0	0	5,835	0	5,835

01-Jan-2021 to 31-Dec-2021	3,181	0	0	3,181	0	3,181
01-Jan-2022 to 31-Dec-2022	7,436	0	0	7,436	0	7,436
01-Jan-2023 to 31-Dec-2023	3,271	0	0	3,271	0	3,271
Total	25,064	0	0	25,064	0	25,064

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
07-Jun-2019 to 31-Dec-2019	7,152	5,341	-25%	The monitoring period started in June 2019 and hence the plant was generated electricity 6 months in this year. Also, as the electricity generation is below the estimated generation in each month of 2019, a difference of -25% occurred.
01-Jan-2020 to 31-Dec-2020	12,586	5,835	-54%	Since there was no electricity generation in January 2020, February 2020, March 2020, October 2020, November 2020 and December 2020 and as the electricity generation is below the estimated generation in each month of 2020 a difference of -54% occurred.
01-Jan-2021 to 31-Dec-2021	12,551	3,181	-75%	Since there was no electricity generation in January 2021, February 2021, March 2021, September 2021, October 2021, November 2021 and December 2021 and as the electricity generation is below the estimated generation in each month of 2021, a difference of -75% occurred.
01-Jan-2022 to 31-Dec-2022		7,436		Since there was no electricity generation in January 2022,

	12,551		-41%	November 2022 and December 2022, and the generation remained below the estimated electricity generation in every month of 2022, a difference of -41% has occurred.
01-Jan-2023 to 31-Dec-2023	12,551	3,271	-74%	Since there was no electricity generation in January 2023, February 2023, March 2023, April 2023, May 2023, October 2023, November 2023 and December 2023, and since production remained below the estimated electricity generation in every month of 2023, a difference of -74% emerged.
Total	57,391	25,064	-56%	For each year in the monitoring period, due to the reasons mentioned above, there was a -56% difference between the total actual emission reduction and the total estimated electricity reduction.

APPENDIX 1: COMMERCIALY SENSITIVE INFORMATION

Section	Information	Justification
N/A	N/A	No commercially sensitive information has been excluded from the public version of the monitoring report.