EGLENCE I-II HYDROELECTRIC POWER PLANT

2ND MONITORING REPORT

Document Prepared by GTE Karbon Sürdürülebilir Enerji Eğitim Danışmanlık ve Ticaret A.Ş.

Project title	Eglence I-II Hydroelectric Power Plant
Project ID	1221
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PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The project activity, Eglence I-II HEPP, a run-off-river hydroelectric power plant, is located on the Eglence River, in the Mediterranean Region within the Karaisali disrict of Adana province. Eglence I-II consists of construction of a green field project with 70.98 MWm / 68.65 MWe of installed capacity comprising two weirs and two power houses (Upstream one is Eglence I and downstream one is Eglence II). The installed capacity of the Eglence I HEPP is 42.65 Mwe and the installed capacity of the Eglence II HEPP is 26.00 MWe[1]. The installed capacity of the Eglence I and Eglence II HEPPs are revised as 44.55 MWm/43.5 Mwe and 28 MWm/27.2 Mwe, respectively due to change in electromechanic equipment[2].

A regulator at a talweg elevation of 693.0 meters within the borders of Yenikoy district exists. The rising water is first taken to a sedimentation pool followed by a two-peace conveyance tunnel. There is a conduit between them. With the aid of a shaft, water is transferred to the Eglence I powerhouse. The tail water coming out of Eglence I power station is transferred to the conveyance tunnel after which water is first transferred to a head pond and a penstock. Finally, water is transported to the Eglence II powerhouse, founding on the right bank of the river. Each powerhouse is comprised of three turbines. There is no dam within the context of project activity.

According to registered PD, the project is to generate approximately 205,299 MWh/year of electricity to supply the national grid. The average annual emission reduction of the project is estimated to be 114,065 tonnes of CO_2. However, in this monitoring period (around 2.3 years), the project generated 121,648.87 MWh electricity per annum and therefore reduced 67,588 tonnes CO_2/year. The project activity reduces greenhouse gases (GHGs) emissions that would have otherwise occurred in the absence of the project activity because electricity generation from fossil fuel sources is avoided.

According to the methodology, baseline scenario was identified as “the electricity delivered to the grid by the project activity that otherwise would have been generated by the operation of grid-connected power plants and by the addition of new generation sources”.

The project milestones are provided in the table below:

Table 1. Milestones of the project

Milestone	Date
Generation License (Final Amendment Date)	27/12/2007

[1] Please see the page 3 of the registered PD, second paragraph

[2] Please see the Revised Generation Licenses and the Letter of the Ministry of Environment and Urbanisation dated 24.04.2018

Environmental Impact Assessment (Approval)	Eglence I: 28/07/2010 Eglence II: 30/07/2010
Construction Agreement – Investment decision date	14/12/2010
Loan Agreement	07/07/2011
VCS Registration Date	25/12/2013
Environmental Impact Assessment (EIA exempt – Capacity Revision)	Eglence I: 21/01/2014 Eglence II: 27/05/2013
Commissioning of the Eglence-I HEPP	04/06/2013
Commissioning of the Eglence-II HEPP	26/03/2013
Project Start Date (confirmed through the Eglence II Commissioning date by validation)	10/04/2013
First Monitoring Period	10/04/2013 - 31/12/2020
Second Monitoring Period	01/01/2021 – 09/04/2023

Table 2. Technical Properties of Eglence I and II Hydropower Plants, Turkey

Location	Karaisali District, Adana Province, Turkey
Total Installed Capacity	70.98 MWm / 68.65 MWe
Number Of Units	3+3
Turbine Capacity Eglence I	8.53 + 2x17.55 MWm / 8.25 + 2x17.20 MWe
Turbine Capacity Eglence II	5.63 + 2x 10.86 MWm / 5 + 2x 10.5 MWe
Total Installed Capacity Eglence I	43.63 MWm / 42.65 MWe
Total Installed Capacity Eglence II	27.35 MWm / 26.00 MWe
Turbine Type Eglence I	Vertical Axis Francis Turbines
Turbine Type Eglence II	Horizontal Axis Francis Turbines
Average Annual Power Generation	205,299 MWh
Transmission Line – Eğlence I[3]	154 kV Karaisali TM
Transmission Line – Eğlence II[4]	154 Kv Eğlence II HES TM

The main goals of the Eglence I-II HEPP project include;

[3] Please see the System Connection Agreement page 10

[4] Please see the System Connection Agreement page 10

- Using Turkey's hydroelectric potential to meet the increasing demand for electricity and contributing toward the guarantee of Turkey's energy security.
- Increase the share of run of river type HEPPs in the mix of electricity generation in Turkey, reduce dependency on imported fossil fuel and as a consequence provide a tangible reduction in GHG emissions.
- Contribute to economic development by creating direct and indirect job opportunities during the construction and operation phases.

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation/ Registration	22/06/2011 – 23/06/2011 (audit) 10/04/2013 – 09/04/2023	VCS	BUREAU VERITAS	10 years
Verification	16/03/2021 (audit) 10/04/2013-31/12/2020	VCS	RECARBON	7.73 years
Verification	12/02/2024 (audit) 01/01/2021 – 09/04/2023	VCS	RINA	2.27 years

1.3 Sectoral Scope and Project Type

Sectoral scope[5]	Scope 1: Energy Industry – Renewable -/Non-renewable Sources
Project activity type	Grid connected renewable electricity generation

[5] *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*

1.4 Project Proponent

Organization name	Egenda Ege Enerji Uretim A.S.
Contact person	Fatih Çandır
Title	-
Address	Sehit Nevres Bulvari, No:10, Deren Plaza, Kat:7, Konak-35210, IZMIR TURKEY
Telephone	+90 212 267 42 06
Email	fatih.candir@endaenerji.com.tr

1.5 Other Entities Involved in the Project

Organization name	GTE Karbon Sürdürülebilir Enerji Eğitim Danışmanlık ve Ticaret A.Ş.
Role in the project	Project consultant
Contact person	M. Kemal Demirkol
Title	Director
Address	Mustafa Kemal Mah. Barıs Sitesi 2111. Sok. No:5
Telephone	Cankaya/Ankara – TURKEY
Email	+90 312 514 63 63

1.6 Project Start Date

Project start date	10 April 2013
Justification	The commissioning of Eglence II HEPP occurs on 10 April 2013[6].

[6] Please see the Provisional Acceptance Dcoument of Eglence II HEPP

1.7 Project Crediting Period

Crediting period	☐ *Seven years, twice renewable* ☐ *Ten years, fixed* ☒ *Other (state the selected crediting period and justify how it conforms with the VCS Program requirements)*
Start and end date of first or fixed crediting period	10 April 2013 to 09 April 2023 (10 years, renewable once)

1.8 Project Location

The Project sites are located in Turkey, in the Mediterranean Region, Adana province, in the boundaries of Aladağ and Karaisali districts. The project's location is given by Figure 1 below.

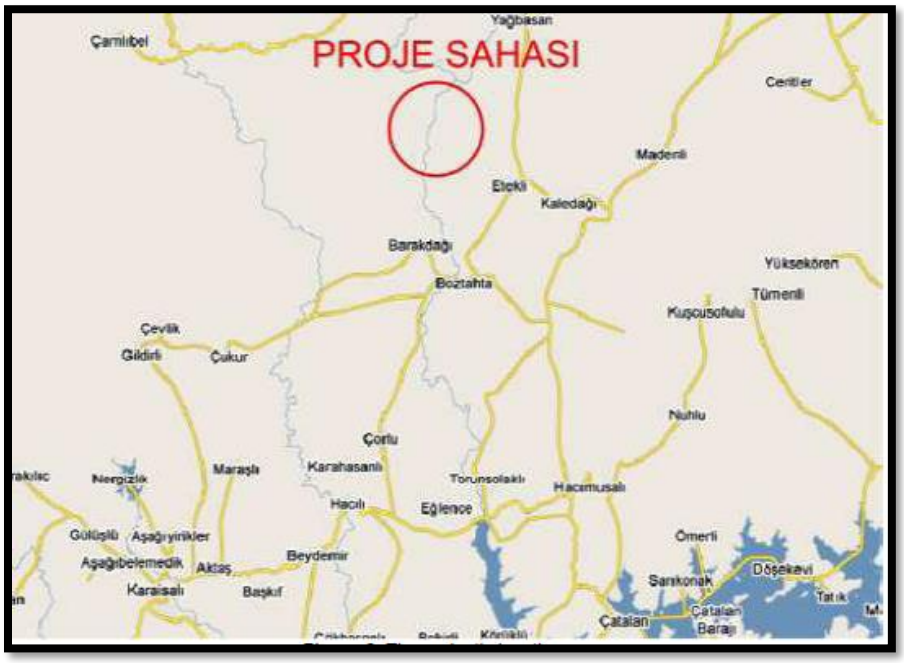


Figure 1. Project location

The coordinates for the Eglence I and II are as follows:

Eglence I: 695 000 – 696 000 N / 4 148 000 – 4 149 000 E

Eglence II: 695 000 – 696 000 N / 4 142 000 – 4 143 000 E[7]

[7] Feasibility Report, executive summary

1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	ACM0002	Consolidated baseline methodology for grid-connected electricity generation from renewable sources	13.0.0
Tool	TOOL 01	Tool for the demonstration and assessment of additionality	07.0.0
Tool	TOOL 07	Tool to calculate the emission factor for an electricity system	07.0

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

If yes, provide required evidence of no double issuance as outlined by the VCS Standard.

1.10.2 Registration in Other GHG Programs

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

☐ Yes ☒ No

If yes, provide the registration number and all relevant details including the date of project inactivity in the other GHG program.[8]

[8] The requirement to provide the date of project inactivity only applies to projects which request registration or crediting period renewal under the VCS Program on or after 1 January 2025.

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

If yes, provide all required evidence of no double claiming as outlined by the VCS Standard.

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

If yes, provide all required evidence of no double claiming as outlined by the VCS Standard.

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

If yes:

Is the project proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

If yes:

Has the project proponent(s) or authorized representative posted a public statement on their website saying, “Carbon credits may be issued through the Verified Carbon Standard project [project ID] for the greenhouse gas emission reductions or removals associated with [project proponent or authorized representative organization name(s)] [name of product(s) whose emissions footprint is changed by the project activities].”

☐ Yes ☒ No

If yes to all:

Provide evidence of the public statement. Evidence must be provided in this section or in an appendix.

1.12 Sustainable Development Contributions

The project helps Turkey to stimulate the commercial application of grid connected renewable energy technologies and markets. It also supports energy security, improved air quality, alternative sustainable energy, improved local source of income and sustainable renewable energy industry development. The project contributes to the reduction of GHGs, thereby reducing the effects of global climate change in the medium and long term. The project also contributes to economic and social development in the region. It contributes to reduction of local air pollutants damaging the quality of agriculture which will cause economic harm in the region. Additionally, the project provides job opportunities for local people in addition to road and potable water supports to locals. Therefore, the project has positive influences on sustainable development and contributes to UN sustainable development goals (SDG) 13, 8 and 7.

- Climate Action (SDG 13): Renewable energy power plants will contribute to "Emission Reductions or Removals and/or Adaptation to Climate Change" by reducing CO_2 emissions caused by fossil fuel-fired power plants that are displaced due to the project activity. The project has reduced 153,507 tCO_2 in this monitoring period.
- Decent Work and Economic Growth (SDG 8): The project will generate employment and income. The project has been created permanent job opportunity for 25 people (as 14 from Eğlence I and 11 from Eğlence II).
- Affordable and Clean Energy (SDG 7): Increasing the number and percentage of renewable energy power plants will provide substantial increase in the share of renewable energy in the global energy mix and ensure universal access to affordable, reliable and modern energy services. The project has generated 276,292.90 MWh of electricity in total and 121,648.87 MWh/year of annual electricity during this monitoring period.

Table 3: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	13.3	Tonnes of greenhouse gas emissions avoided	Implemented activities to increase	By generating electricity from clean sources, project has prevented 153,507 tCO_2 in total and 67,588 tCO_2/year into the atmosphere during this monitoring period.	During the first monitoring period (10/04/2013-31/12/2020) according to approved MR, the annual and total emission reductions are calculated as 91,494 tCO_2/year and 706,792 tCO_2, respectively. And during this monitoring period (01/01/2021 to 09/04/2023), project has prevented 153,507 tCO_2 in total and 67,588 tCO_2/year into the atmosphere. The total emission reductions i.e., the sum of two monitoring periods, make 860,299 tCO_2. According to the registered PD, the project is estimated to prevent the release of 1,127,938 tons of CO_2 into the atmosphere for the first crediting period. .
2)	8.5	Job opportunities created	Implemented activities to increase	Due to the activity of the power plant, 25 people were employed.[9]	Due to the activity of the power plant, 25 people were employed during this monitoring period

[9] Social security records showing the employment are shared with the VVB

3)	7.2	7.2.1 Renewable energy share in the total final energy consumption	Implemented activities to increase	The project generated 276,292.90 MWh of electricity in total and 121,648.87 MWh/year annually from hydropower which is a renewable source during this monitoring period.	During the first monitoring period (10/04/2013-31/12/2020) according to approved MR, the annual and total electricity generations are calculated as 164,677.24 MWh/year and 1,272,131.66 MWh, respectively. And during this monitoring period (01/01/2021 to 09/04/2023), the annual and the total electricity generations are calculated as 121,648.87 MWh/year and 276,292.90 MWh. The total electricity generation amount i.e., sum of two monitoring periods, make 1,548,424.56 MWh of electricity generation. Also, according to the registered PD, the project generated 205,299 MWh/year electricity from hydropower which is a renewable source during first crediting period.

1.13 Commercially Sensitive Information

There is not any commercially sensitive information that has been excluded from the public version of the monitoring report using Appendix 1.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification	**The closest communities are identified as local stakeholders in the project.**
Legal or customary tenure/access rights	No expropriation was required during the implementation period. There are no lands which was occupied by Indigenous People (IPs), local communities (LCs), and customary rights holders.
Stakeholder diversity and changes over time	There were no changes in the stakeholder diversity. The locals of the nearby villages are the stakeholders.
Expected changes in well-being	The project does not have any negative impacts.
Location of stakeholders	As a part of a EIA process local stakeholder consultation for Eglence I and II held on 24th of November 2009 in Etekli Neighbourhood Karaisali Adana and 25th of November 2009 in Boztahta Neighbourhood Karaisali Adana, respectively.
Location of resources	Etekli Neighbourhood and Boztahta Neighbourhood Karaisali - Adana

2.1.2 Stakeholder Consultation and Ongoing Communication

Ongoing consultation	People around the region prefers face-to-face communication. Project manager is accessible by locals all the time. There is no problem encountered about the project/way of communication so far. If there is an input or grievance, locals can express them directly or via mukhtar.
Date(s) of stakeholder consultation	For Eglence I and II held on 24th of November 2009 in Etekli Neighbourhood Karaisali Adana and 25th of November 2009 in Boztahta Neighbourhood Karaisali Adana, respectively.
Communication of monitored results	People around the region prefers face-to-face communication. Project manager is accessible by locals all the time. There is no problem encountered about the project/way of communication so far. If there is an input or grievance, locals can express them directly or via mukhtar. The grievance might be negative as well as positive by local stakeholders related to the operation of the project activity. The book availability is also communicated to all local stakeholders by PP. PP will resolve all the grievances during whole crediting period.
Consultation records	People around the region prefers face-to-face communication. Project manager is accessible by locals all the time.
Stakeholder input	Stakeholders did not report any critical issues regarding the Project activity during this monitoring period.

2.1.3 Free, Prior, and Informed Consent

Consent	As a part of the Environmental Impact Assessment of Eglence I-II project, in line with the article 9 of EIA Regulation, to incorporate stakeholders into the EIA process, apply for their comments about the project a community two community meetings were organised. The first meeting which is organised for Eglence I was held on November 24th, 2009, in Etekli Village Coffeehouse, Karaisali, Adana. The second meeting was organised for

	the Eglence II part of the project on November 25th, 2009, in Boztahta village Coffeehouse, Karaisali, Adana. Newspaper advertisements were published on a local and a national gazette to reach more people.
Outcome of FPIC	At the end of both meetings, all stakeholders were content that environment-friendly energy production was going to be realized, meaning that the project does neither consume nor contaminate the Eglence river.

2.1.4 Grievance Redress Procedure

Grievances received	Resolution and outcome
No grievance is received from the stakeholders.	-

2.1.5 Public Comments

Summary of comments received	Actions taken
No positive or negative comments received from the stakeholders.	-

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

The management teams have expertise or experience in implementing similar project activities and engaging communities. The necessary trainings are provided to the employers before the employment.

2.2.2 Risk assessment

	Risk identified	Mitigation or preventative measure(s) taken
Natural and human-induced risks to stakeholders' wellbeing	There is no risk identified for stakeholders.	According to the Environmental Impact Assessment Regulation (No:25318 and Date:16.12.2003), as a requirement, the stakeholders are included in the project steps. Also, with the stakeholder precipitation meeting (again conducted as a requirement of the EIA process), comments of the stakeholders are taken. As a part of EIA process and as a part of carbon crediting, the wellbeing of the stakeholders is checked and documented.
Risks to stakeholder participation	There is no risk identified for the stakeholder participation.	According to the Environmental Impact Assessment Regulation (No:25318 and Date:16.12.2003), as a requirement, a stakeholder participation meeting was conducted. Local stakeholders can communicate with the project site personnel verbally to share their grievances and inputs in a Continuous Input / Grievance Expression Process Book.
Working conditions	There is no risk identified for the working conditions.	The project owner provides necessary training for the working conditions.
Safety of women and girls	There is no risk identified for the safety of women and girls.	Türkiye has ratified ILO convention 100[10], 111[11], 122[12]

[10] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312245:NO

[11] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312256:NO

[12] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312267:NO

		and 142[13], which provides gender equality.
Safety of minority and marginalized groups, including children	There is no risk identified for the safety of minority and marginalized groups, including children.	PO will never be complicit in violence or human rights abuses or child/forced labor. Türkiye is a party of IPEC[14] since 1932 and ratified ILO convention 29[15], 138[16] and 182[17].
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	According to EIA Report, the following conditions possess risks for the environment: - Domestic solid and liquid wastes from personnel, - Noise during operation activities, - Impacts on the stream bed, - Impacts on the natural ecosystem of the region, - Impacts on agricultural areas in the region - There will be no air emissions during the operation activities.	According to EIA Report, the following precautions will be taken for the mentioned risks: - Domestic wastewater will be collected and accumulated in septic tanks and disposal will be ensured and spreading to the environment will be prevented. - Domestic solid wastes will be collected in sealed containers and given to Karaisali Municipality landfill. Recyclable solid wastes that can be recovered recycling of wastes will be ensured. - During the operation activities, only noise will be generated from the power plant. This noise is indoor noise and is not expected to have a negative impact on the environment. - To prevent the negative impact of the power plant on the stream bed, lifeline support water will be released to the stream.

[13] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312287:NO

[14] https://www.ilo.org/turkiye

[15] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312174:NO

[16] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312283:NO

[17] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312327:NO

		- There is no impact on the natural ecosystem of the region.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified[18]	Mitigation or preventative measure(s) taken
Discrimination	No discrimination occurred.	PO will never be complicit in violence or human rights abuses or child/forced labor. Türkiye is a party of IPEC[19] since 1932 and ratified ILO convention 29[20], 138[21] and 182[22].
Sexual harassment	No sexual harassment occurred.	
Gender equity in labor and work	Equal opportunities have been provided in the context of gender equity and pay for labor and work.	Türkiye has ratified ILO convention 100[23], 111[24], 122[25] and 142[26], which provides gender equality.
Forced labor Child labor Human trafficking	Project does not use victims of human trafficking, forced labor, and child labor. Türkiye has ratified ILO convention 100[27],	All the workers are socially secured by the PO and protected by employment agreements. If any complaint is received by the PO, they will act on the issue right away throughout the lifetime of

[18] 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.

[19] https://www.ilo.org/turkiye

[20] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312174:NO

[21] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312283:NO

[22] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312327:NO

[23] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312245:NO

[24] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312256:NO

[25] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312267:NO

[26] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312287:NO

[27] https://webapps.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312245:NO

[redacted]		project activity. PO will never be complicit in violence or human rights abuses or child/forced labor. Türkiye is a party of IPEC[28] since 1932 and ratified ILO convention 29[29], 138[30] and 182[31].

2.3.2 Human Rights

The PO recognizes, respects, and promotes the protection of the rights of LCs, and customary rights holders in line with applicable international human rights law. Türkiye has ratified ILO convention32. PO will never be complicit in violence or human rights abuses. If any complaint is received by the PO, they will act on the issue right away throughout the lifetime of project activity.

Risks identified	Mitigation or preventative measure(s) taken
No risks identified.	PO will never be complicit in violence or human rights abuses or child/forced labor. Türkiye is a party of IPEC[33] since 1932 and ratified ILO convention 29[34], 138[35] and 182[36].

2.3.3 Indigenous Peoples and Cultural Heritage

There are no lands which was occupied by IPs.

[28] https://www.ilo.org/turkiye

[29] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312174:NO

[30] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312283:NO

[31] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312327:NO

[32] https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo ankara/documents/genericdocument/wcms_645630.pdf

[33] https://www.ilo.org/turkiye

[34] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312174:NO

[35] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312283:NO

[36] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312327:NO

Risks identified	Mitigation(s) or preventative measure taken
No risks identified.	There are no lands which was occupied by IPs. PO will never be complicit in violence or human rights abuses or child/forced labor. Türkiye is a party of IPEC[37] since 1932 and ratified ILO convention 29[38], 138[39] and 182[40].

2.3.4 Property Rights

No expropriation was required during the implementation period.

Risks identified	Mitigation or preventative measure(s) taken
No risks identified.	No expropriation was required during the implementation period. There are no lands which was occupied by IPs. The project site is not a private land.

2.3.5 Benefit Sharing

The project does not impact property rights. So, this section is N/A.

Summary of the benefit sharing plan	N/A
Benefit sharing during the monitoring period	N/A

2.4 Ecosystem Health

Risk identified	Mitigation or preventative measure(s) taken during the monitoring period

[37] https://www.ilo.org/turkiye

[38] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312174:NO

[39] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312283:NO

[40] https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO:12100:P12100_INSTRUMENT_ID:312327:NO

Impacts on biodiversity and ecosystems	According to EIA Report, since the flow rate between the regulator and the power plant will decrease, the aquatic ecosystem will be affected.	This effect will be minimised with the lifeline support water to be released.
Soil degradation and soil erosion	No risks identified.	-
Water consumption and stress	According to EIA Report, since the flow rate between the regulator and the power plant will decrease, the aquatic ecosystem will be affected.	This effect will be minimised with the lifeline support water to be released.

2.4.1 Rare, Threatened, and Endangered species

Species or habitat	According to EIA Report, there are no areas, biosphere reserves, biotopes, biogenetic reserve areas that are important for scientific research and/or habitats of endangered or endangered species and species endemic to the country.
Areas needed for habitat connectivity	-

2.4.2 Introduction of species

Species introduced	Classification	Justification for use	Adverse effects and mitigation
There is no introduction of species			

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
There is no invasive species identified	

	Risks identified	Mitigation or preventative measure(s) taken
Invasive species	There is no invasive species identified	

2.4.3 Ecosystem conversion

This project is not an ARR, ALM, WRC, or ACoGS project.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The project activity, Eglence I-II HEPP, a run-off-river hydroelectric power plant, is located on the Eglence River, in the Mediterranean Region within the Karaisali disrict of Adana province. Eglence I-II consists of construction of a green field project with 70.98 MWm / 68.65 MWe of installed capacity comprising two weirs and two power houses (Upstream one is Eglence I and downstream one is Eglence II).

A regulator at a talweg elevation of 693.0 meters within the borders of Yenikoy district exists. The rising water is first taken to a sedimentation pool followed by a two-peace conveyance tunnel. There is a conduit between them. With the aid of a shaft, water is transferred to the Eglence I powerhouse. The tail water coming out of Eglence I power station is transferred to the conveyance tunnel after which water is first transferred to a head pond and a penstock. Finally, water is transported to the Eglence II powerhouse, founding on the right bank of the river. Each powerhouse is comprised of three turbines. The installed capacity of Eglence I is 42.65 MWe, and the installed capacity of Eglence II is 26.00 MWe. There is no dam within the context of project activity.

The technical properties of both Eglence I and II power plants are as follows.

Table 4 Technical details of Eglence I and II power plants

Location	Karaisali District, Adana Province, Turkey
Total Installed Capacity	70.98 MWm / 68.65 MWe
Number Of Units	3+3
Turbine Capacity Eglence I	8.53 MWm / 8.25 MWe 2x (17.55 MWm / 17.20 MWe)
Turbine Capacity Eglence II	5.63 MWm / 5 MWe 2x (10.86 MWm / 10.5MWe)
Total Installed Capacity Eglence I	43.63 MWm / 42.65 MWe

Total Installed Capacity Eglence II	27.35 MWm / 26.00 MWe
Turbine Type Eglence I	Vertical Axis Francis Turbines
Turbine Type Eglence II	Horizontal Axis Francis Turbines
Average Annual Power Generation	205,299 MWh

3.2 Deviations

3.2.1 Methodology Deviations

N/A

3.2.2 Project Description Deviations

The deviations are listed below. It should be mentioned that these deviations do not impact the applicability of the methodology, the project additionality or the appropriateness of the baseline scenario.

1. Revisions in Installed Capacity of the Plants

According to registered PDD (version 06, dated 25/09/2013), the installed capacities of the Eğlence I and Eğlence II HEPPs are revised as 42.65 Mwe and 26.00 Mwe which makes a total capacity of 68.65 Mwe. These amendments are stated in the approved PDD (version 06, dated 25/09/2013) and the Revised Generation License as well. **It is stated in the approved PDD page 3 that the installed capacity of Eglence I will be 42.65 MWe, generating approximately 127,280 MWh of clean energy per annum, while the installed capacity of Eglence II will be 26.00 MWe, generating approximately 78,019 MWh of clean energy per annum. In total the electricity generation was taken as (127,280 MWh (Eğlence II) + 78,019 MWh (Eğlence I) 205,299 MWh/year.** The referred capacities of 42.65 MWe and 26.00 MWe can be seen as amendments in the tables below.

After this amendment, the capacity of the plant is changed again with an amendment, and on **20.02.2018** Energy Market Regulatory Board approved[41] that the capacity of the Eğlence I and Eğlence II HEPPs are revised as 43.50 Mwe and 27.2 MWe, respectively. With this revision, the total capacity is revised as 70.70 Mwe. As explained in the Letter of the Ministry of Environment and Urbanisation, the change in capacity is conducted only due to change in electromechanic equipment i.e., in this case a new turbine installation. As a result of the review, it was understood that the project installed capacity, and a new turbine should be installed due to the differences in the project elevations that measured earlier, without any changes in the project flow rate and project units. It has been understood that the planned facility locations have not been changed, only a new turbine should be installed instead of the existing turbine according to the changes in the elevations.

[41] Please see the Revised Generation Licenses and the Letter of the Ministry of Environment and Urbanisation dated 24.04.2018

Although the installed capacities of the plants are revised as 44.55 MWm/43.5 MWe and 28 MWm/27.2 MWe[42] for Eğlence I and Eğlence II HEPPs, t**he corresponding electricity generations remain same as 78,019 MWh/year and 127,280 MWh/year, for Eğlence I and Eğlence II HEPPs, respectively[43].** According to Letter of the Ministry of Environment and Urbanisation dated 24.04.2018, this revision is performed due to change only in electromechanic equipment. According to the referred letter, Feasibility Report is submitted to DSI (State Hydraulic Works) and this report is approved and the capacity of the plants are revised.

According to VCS Standard Version 4.7 paragraph 3.21.2, in case of project deviations Annex 3: CDM Guidelines on assessment of different types of changes from the project activity[44] as described in the registered PDD – Version 01 should be followed. According to Annex 3 paragraph 4, the changes that affect the additionality of the project activity includes changes in the effective output capacity due to increased installed capacity. As stated above, the installed capacities of the plants are revised due to change in elevations. However, as can be seen in the Revised Generation Licenses, the effective output capacity, i.e., electricity generation, did not change. In the registered PD page 38, the grid connected output is stated as 205,299 MWh (127,280 MWh (Eğlence II) + 78,019 MWh (Eğlence I) = 205,299 MWh) and this figure is used in the investment analysis as it can be seen in the registered PD page 35, Energy Production. Although the capacity of the plants is revised, the assigned generations, i.e., effective output, remained the same. Thus, the investment analysis conducted in the registered PD remains the same and it is still applicable.

The described deviation needs to be assessed in terms of methodology applicability and the baseline scenario as well. The applicability conditions stated in the ACM0002 Consolidated baseline methodology for grid-connected electricity generation from renewable sources – Version 13.0.0 and in terms of these conditions the project is assessed as follows:

- Eglence I-II HEPP Project is still a grid connected renewable power generation project activity that is installed as a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant). The project activity involves the installation of a power plant of hydro power.
- The power density of the power plant, as per definitions given in the Project Emissions section of ACM0002 / Version 13 0.0, is much greater than 4 W/m^2 as calculated in section 5.2.
- The project does not involve switching from fossil fuels to renewable energy at the site of the project activity,
- The project involves construction of new units in a brand-new plant, in other words the project does neither involve the addition of renewable energy generation units at an existing renewable

[42] Please see the Revised Generation Licenses and the Letter of the Ministry of Environment and Urbanisation dated 24.04.2018

[43] Please see the Revised Generation Licenses for Eğlence I and Eğlence II HEPPs

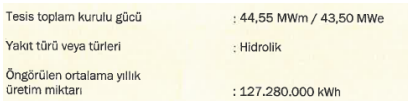
[44] https://cdm.unfccc.int/EB/047/eb47annagan3.pdf

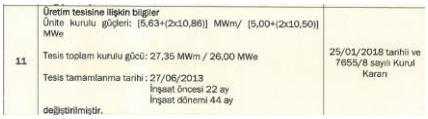
power generation facility, nor does it foresee to retrofit or modify an expired facility of renewable energy generation.

In terms of baseline scenario according to ACM0002 V13.0.0., the baseline scenario is still the Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

In this regard, the ACM0002 – Version 13.0.0 and the baseline scenario identified in the approved PDD, are still applicable to the project and the explained project description deviation did not affect the applicability of the applied methodology.

The amendments in the licenses are as follows:

Eğlence I – Amendment in plant capacity (as per page 5 of the Revised Generation License)	Eğlence I – New Capacity as Mwe and Effective Output (as per page 1 of the Revised Generation License)	Eğlence I – Capacity and Effective Output (as per approved PDD page 3 paragraph 19)
		The installed capacity of Eglence I will be 42.65 MWe, generating approximately **127,280 MWh of clean energy** per annum.

Eğlence II – Amendment in plant capacity (as per page 5 of the Revised Generation License)	Eğlence II – New Capacity as Mwe and Effective Output (as per page 1 of the Revised Generation License)	Eğlence II – Capacity and Effective Output (as per approved PDD page 3 paragraph 19)
		The installed capacity of Eglence II will be 26.00 MWe, generating approximately **78,019 MWh of clean energy per annum.**

3.3 Grouped Projects

N/A

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	FCi,y
Data unit	Ton (m^3 for Natural Gas)
Description	Amount of fossil fuel type i consumed in the project electricity system in year y
Source of data	Turkish Electricity Transmission Company (TEIAS) http://www.teias.gov.tr/istatistik2008/43.xls http://www.teias.gov.tr/istatistik2008/44.xls
Value applied	Please see Section 2.3 in the registered PD
Justification of choice of data or description of measurement methods and procedures applied	TEIAS (Turkish Electricity Transmission Company) is the official source for this data, providing the most up-to-date and accurate information available.
Purpose of data	Calculation of project emissions
Comments	-

Data / Parameter	NCV
Data unit	TJ/Ton (TJ/m3 for Natural Gas)
Description	Net calorific value of fossil fuel type
Source of data	Turkish Electricity Transmission Company (TEIAS) http://www.teias.gov.tr/istatistik2008/45.xls http://www.teias.gov.tr/istatistik2008/46.xls
Value applied	

	Net Calorific Value (NCVi,y)		
	2007	2008	2009
hard coal	22,3	22,2	22,2
lignite	6,9	6,8	6,4
fuel oil	39,9	39,7	39,8
diesel oil	43,1	42,4	42,4
natural gas	36,7	36,6	37,2
lpg	0,0	0,0	0,0
naphtha	43,2	44,6	43,6

Justification of choice of data or description of measurement methods and procedures applied	TEIAS (Turkish Electricity Transmission Company) is the official source for this data, providing the most up-to-date and accurate information available.
Purpose of data	Calculation of project emissions
Comments	The conversion factor of 4.187 Joules/Cal is used.

Data / Parameter	**$EFCO_2$, i, y**
Data unit	tCO_2/GJ
Description	Default CO2 emission factor of fossil fuel type i
Source of data	IPCC default values (as provided in Table 1.4, Chapter 1, Volume 2 (Energy), 2006 IPCC) Guidelines for National Greenhouse Gas Inventory) are used. Link: http://www.ipccnggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
Value applied	
Justification of choice of data or description of	There is no information on the fuel specific default emission factor in Turkey. Hence, IPCC values haves been used as per

	kg CO2/GJ			Default Carbon Oxidation Factor
	min	mid	max	
hard coal	92.8	96.1	100.0	1.0
lignite	90.9	101.0	115.0	1.0
fuel oil	75.5	77.4	78.8	1.0
diesel oil	72.6	74.1	74.8	1.0
natural gas	54.3	56.1	58.3	1.0
lpg	61.6	63.1	65.6	1.0
naphta	69.3	73.3	76.3	1.0
wind	0.0	0.0	0.0	-
hydro	0.0	0.0	0.0	-
geothermal	0.0	0.0	0.0	-
renew.+wastes	0.0	0.0	0.0	-
biogas	0.0	0.0	0.0	-

measurement methods and procedures applied	the “Tool to calculate the emission factor for an electricity system (version 02.01.0)”.
Purpose of data	Calculation of project emissions
Comments	-

Data / Parameter	**Electricity Imports**
Data unit	GWh
Description	Electricity imported to the Grid from other countries
Source of data	Turkish Electricity Transmission Company (TEIAS) http://www.teias.gov.tr/istatistik2008/23.xls
Value applied	

Electricity generation (GWh)	2007	2008	2009
Gross Electricity Production	191.558,1	198.418,0	194.812,9
Net Electricity Production	183.339,7	189.761,9	186.619,3
Net/Gross	0,957	0,956	0,958
Net Electricity Production from Thermal Sources	148.333,3	156.768,3	150.323,4
Net Electricity Production incl. Mobile producers	148.333,3	156.768,3	150.323,4
Imports	864	789	812
Net Generated + Imports	149.197,6	157.557,7	151.135,4

Justification of choice of data or description of measurement methods and procedures applied	TEIAS (Turkish Electricity Transmission Company) is the official source for this data, hence providing the most up-to-date and accurate information available.
Purpose of data	-
Comments	-

Data / Parameter	**Capacity additions**
Data unit	Name of the plant; Installed capacity (MW); Fuel type; Commissioning date.
Description	Set of power capacity additions in the electricity system that comprise 20% of the system generation (in GWh) and that have been built most recently.
Source of data	Turkish Electricity Transmission Company (TEIAS) Generation units put into operation in 2004, 2005, 2006, 2007 and 2008. The Annex 2 of TEIAS Capacity Projection Reports for years 2008, 2007, 2006, 2005 and 2004 are applied for the capacity additions: *http://www.teias.gov.tr/projeksiyon/KAPASITE%20PROJEKSIYONU%202005.pdf* for year 2004. *http://www.teias.gov.tr/projeksiyon/KAPASITE%20PROJEKSIYONU%202006.pdf* for year 2005. *http://www.teias.gov.tr/projeksiyon/KAPASITE%20PROJEKSIYONU%202007.pdf* for year 2006 *http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2008.pdf* for year 2007 *http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2009.pdf* for year 2008
Value applied	38.9 TWh which is 20 percent of the overall generation of 194.8 TWh.
Justification of choice of data or description of measurement methods and procedures applied	TEIAS (Turkish Electricity Transmission Company) is the official source for this data, hence providing the most up-to-date and accurate information available.
Purpose of data	-
Comments	-

Data / Parameter	**EFgrid,CMy**
Data unit	tCO2/MWh
Description	Baseline emission factor: the combined emission factor of the project grid system
Source of data	Validated VCS Project Description (Version 6) of the Project.
Value applied	0.5556
Justification of choice of data or description of measurement methods and procedures applied	” Tool to calculate the emission factor for an electricity system”
Purpose of Data	Baseline emission calculation

Comments	EFgrid,CMy value (0.5556 tCO2/MWh) is valid for the duration of the crediting period which is between 10/04/2013 and 09/04/2023

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{PJ,facility,y}$
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant to the grid in year y
Source of data	Electricity meters, EPIAS records and Meter reading records-OSF forms
Description of measurement methods and procedures to be applied	EPIAS records and meter reading records provides the exact electricity generation of the facility and the imports from the grid. According to meter reading protocols, the internal consumption of the facility was subtracted from the gross generation. EPIAS data are used for the quantity of net electricity delivered to the grid, and it has been cross checked with the meter reading records (OSF forms) provided to the company by TEIAS. PMUM (now EPIAS) (formerly PMUM, the change happened on 01/09/2015 after EPİAŞ received Market Operating License. Market operations transferred from PMUM to EPİAŞ.)
Frequency of monitoring/recording	Continuous measurement / Monthly recording
Value applied	See table below For this monitoring period total electricity generation is 276,292.90 MWh.

DATE	EG (MWh)
2021 (01/01/2021-31/12/2021)	82.679,99
2022 (01/01/2022-31/12/2022)	166.563,70
2023 (01/01/2023-09/04/2023)	27.049,22
Total EG	276.292,90
EG for per annum	**121.649**

Monitoring equipment

The electricity meters are replaced on 22.05.2021. The technical details of the replaced meters are given below.

	Replaced Meters	
	Eğlence I HEPP	**Eğlence II HEPP**
	Main	**Spare**
Brand	ITRON	
Model	SL761B071	
Standard/Class	0.5s	
Serial No	Main: 65000771 Back-up: 65000770	Main: 65000772 Back-up: 65000773

The technical details of the current electricity meters are given belove.

	Active Meters	
	Eğlence I HEPP	**Eğlence II HEPP**
	Main	**Spare**
Brand	EMH	
Model	LZQJ-XC	
Standard/Class	0.5s	
Serial No	Main: 9798953 Back-up: 9798954	Main: 9798955 Back-up: 9798956
Calibration Date (First Index Protocol)	Eğlence 1: 22/05/2021 Eğlence 2: 22/05/2021	

QA/QC procedures to be applied

Cross check measurements result with records for sold electricity. Calibration of the meters are valid for 10 years based on related regulation[45]. In addition to the meters which is used for billing purposes, records taken by meters using at project site is used for comparison.
The meters also comply with EPDK regulations which define the accuracy class of the meters as 0.2S or 0.5S depending on the capacity of the circuit.
Maintenance and calibration of the metering devices are made by TEIAS. If there is a noticeable difference between the readings of two devices, maintenance and tests of the metering devices and the associated equipment is done before waiting for the periodical maintenance.
In cases where electricity meters are regulated (e.g. the electricity is supplied to the electric grid), the electricity meter is subject to regular maintenance and testing in accordance with the stipulation of the meter supplier and/or as per the requirements

[45] https://www.kayseri.bel.tr/uploads/yonetmelikler/olcu_ve_olcu_aletleri_muayne_yonetmeligi.pdf

	set by the grid operators or national requirements. The calibration of meters, including the frequency of calibration, should be done in accordance with national standards or requirements set by the meter supplier or requirements set by the grid operators. The accuracy class of the meters should be in accordance with the stipulation of the meter supplier and/or as per the requirements set by the grid operators or national requirements.
Purpose of data	To calculate the quantity of net electricity delivered to the grid
Calculation method	$EG_{Facility,y}=EG_{export,y}-EG_{import,y}$ (Annual electricity generation of the plant is calculated as the sum of the monthly generations obtained from EPIAS records. After deducting the amount of imported electricity from the generated electricity, the net electricity supplied to the grid is evaluated).
Comments	-

Data / Parameter	**CapPJ**
Data unit	MW
Description	Installed capacity of the Eglence-I hydro power plant after the implementation of the project activity
Source of data	Project site
Description of measurement methods and procedures to be applied	Supplier information on the equipment
Frequency of monitoring/recording	Yearly
Value monitored	42.65 MW
Monitoring equipment	N/A
QA/QC procedures to be applied	Supplier information on the related equipment and the existence of the equipment can be checked. Also this information can be checked from EPDK.
Purpose of the data	Baseline Emission Calculations
Calculation method	N/A

Comments	No change on the installed capacity with respect to project generation license

Data / Parameter	**CapPJ**
Data unit	MW
Description	Installed capacity of the Eglence-II hydro power plant after the implementation of the project activity
Source of data	Project site
Description of measurement methods and procedures to be applied	Supplier information on the equipment
Frequency of monitoring/recording	Yearly
Value monitored	26.00 MW
Monitoring equipment	N/A
QA/QC procedures to be applied	Supplier information on the related equipment and the existence of the equipment can be checked. Also, this information can be checked from EPDK.
Purpose of the data	Baseline Emission Calculations
Calculation method	N/A
Comments	No change on the installed capacity with respect to project generation license

Data / Parameter	**APJ**
Data unit	m^2
Description	Area of the reservoir measured in the surface of the water for Eglence-I HEPP, after the implementation of the project activity, when the reservoir is full
Source of data	Project site
Description of measurement methods and procedures to be applied	Topographical surveys, GPS readings

Frequency of monitoring/recording	Yearly
Value monitored	Eğlence I: 63,269.84 m^2
Monitoring equipment	-
QA/QC procedures to be applied	The readings will be done during the period when the water flow is high to have the largest reservoir area
Purpose of the data	Project emission calculations
Calculation method	-
Comments	Maximum area is already calculated and confirmed through technical drawings. Annual measurements are not expected to be higher than this value.

Data / Parameter	**APJ**
Data unit	m^2
Description	Area of the reservoir measured in the surface of the water for Eglence-II HEPP, after the implementation of the project activity, when the reservoir is full
Source of data	Project site
Description of measurement methods and procedures to be applied	Topographical surveys, GPS readings
Frequency of monitoring/recording	Yearly
Value monitored	Eğlence II: 14,603.79 m^2
Monitoring equipment	-
QA/QC procedures to be applied	The readings will be done during the period when the water flow is high to have the largest reservoir area
Purpose of the data	Project emission calculations
Calculation method	-
Comments	Maximum area has already been calculated and confirmed through technical drawings. Annual measurements are not expected to be higher than this value.

4.3 Monitoring Plan

The purpose of the monitoring plan is to ensure that the monitoring and calculation of emission reductions of the proposed Project within the crediting period is complete, consistent, clear and accurate.

There are three sets of data to be monitored during the project activity; quantity of net electricity delivered to the grid, installed capacity of the project after the implementation, and area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full. The generated electricity was measured continuously and reported in a monthly basis. During the monitoring period, EPIAS (former PMUM records) and meter reading records (OSF forms) were presented to the DOE, together with the calculation details. The installed capacity has not changed in the monitoring period. The maximum reservoir area has been defined in the project documents with the confirmation through technical drawings. There is no possibility that the reservoir level can exceed this level since the excess water will flow from spillway when the water level exceeds maximum operating level.

The table below shows the waste disposal records. The related documents showing records are shared with DOE.

Table 5 Summary of waste disposal records

	Eğlence I HEPP	Eğlence II HEPP
Wastewater Disposal – Septic Truck Service Records	20/12/2021	30/06/2021
	22/12/2021	19/07/2022
	24/06/2021	20/12/2022
	30/06/2021	12/06/2023
	16/12/2022	22/12/2021
	10/06/2022	25/11/2020
	19/07/2022	07/04/2020
	20/12/2022	
	09/06/2023	
	19/06/2023	
Hazardous Waste Disposal	2021 – Solid Wastes	2021– Hazardous Waste Declaration
	2022– Solid Wastes	2022 – Hazardous Hydraulic Wastes
		2022 – Contaminated Solid Waste
		2022 – Mixed Metals
		2022 – Hazardous Waste Declaration

	Eğlence I HEPP	Eğlence II HEPP
Domestic Solid Wastes	07/04/2022	07/02/2022
	09/09/2022	07/04/2022
	14/11/2022	09/09/2022
	14/04/2023	09/12/2022
		14/11/2022
		08/09/2023
		11/07/2023
		14/04/2023

The necessary trainings are provided to the personnel by the project owner. The list of those training are summarized below.

- Occupational Health and Safety Training
- Working at Hight Training
- Environmental Management Training
- Risk Management System Implementation Training
- Operating Technician Training

In order to demonstrate the emission reduction, the required data is the net electricity delivered to the grid by the project activity. TEIAS has started to extract generation data from the facilities remotely through the EPIAS (previously PMUM system) which forms the basis for the billing. There is already an electricity meter installation, and these records provided the data for the monthly invoicing to TEIAS. During the monitoring period EPIAS records were used as the source of calculation of electricity generation and emission reductions. Facility meter reading protocols-OSF forms and EPIAS records were compared for cross-check.

Net electricity generation was recorded by both TEIAS and project owners for billing purpose. Power Plant Manager was responsible for the electricity generated, gathering all relevant data and keeping the records. The procedures to collect data were in line with the TEIAS requirements and rules. The plant manager was responsible for communication with TEIAS and undertaking the corrective action in line with the TEIAS procedures and rules if it fell under the authority of the plant manager. However, this might need the involvement of TEIAS as well as the project owners were not allowed to make changes or fixes on the meters. Thus, in case of non-conformity, the plant manager will report it instantly to TEIAS.

Generation data collected during crediting period was submitted to GTE Karbon Sürdürülebilir Enerji Eğitim Danışmanlık ve Ticaret A.Ş. who is responsible for calculating the emission reduction subject to verification. Generation data was used to prepare monitoring reports which were used to determine the vintage from the project activity. These reports were submitted to the duly authorized and appointed Designated Operational Entity 'DOE' before each verification period.

VER Team Members is expected to include the following staff of the HEPP:

Plant Engineers (Electrical and mechanical): Responsible for the specific actions required by the monitoring plan; control of the electricity supplied to the grid and imported from the grid with TEIAS, and of devices.

Accounting Manager: Responsible for keeping data about power sales, invoicing and purchasing.

Operations Manager: the VER coordinator, responsible for developing, executing, analyzing and improving the VER Monitoring/Reporting Procedures.

GTE Karbon Sürdürülebilir Enerji Eğitim Danışmanlık ve Ticaret A.Ş.: Responsible for emission reduction calculations, preparing monitoring report and periodical verification process.

Each period, the monitoring report is submitted to DOE for the verification. The report covers the monitoring of grid-connected power generation, check report, report on calculation of the emission reductions and records of monitoring instrument repair and calibration, etc. All data collected as part of monitoring is archived electronically and kept at least for 2 years after the end of the last crediting period. The company establishes a dedicated maintenance system to ensure the data availability for the required period.

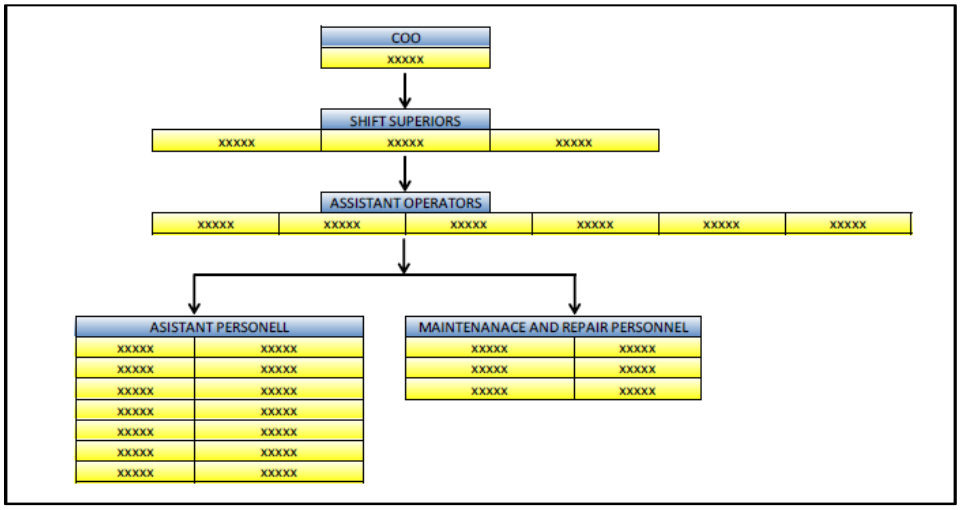


Figure 2 Site Organizational Chart

There are two meters attached to the power plant for measurement of the generated electricity. One of the meters is main meter and the other is back-up meter. The role of the second meter is to check if the main meter measures the generated electricity accurately. Generation data were recorded by these main and back-up metering devices continuously. EPIAS data is obtained remotely by TEIAS and includes grid loss. Meter reading records and EPIAS data are used for cross-check. The internal consumption of the facility was subtracted from the gross generation.

According to registered MR of 10/04/2013-31/12/2020 period, the previous meters in Eğlence I HEPP were commissioned on 20/04/2013. According to the test reports of meters, the meters of Eglence I HEPP were tested by TEIAS on 24/04/2015 and the meters of Eglence II HEPP were tested by TEIAS on 16/10/2018. Afterwards the meters were tested on 15/11/2020. The test frequency of the meters is stated as 2 years in the System Usage Agreement.

The electricity meters are replaced on 22.05.2021. The first index protocol for the Eğlence I HEPP and Eğlence II HEPP meters are shared with VVB. This protocol also shows the replacement. Calibration of the meters are valid for 10 years based on related regulation[46]. The technical details of the meters are as follows.

Table 6 Active Electricity Meter's Properties

	Eglence I	Eglence II
Brand	EMH	
Model	LZQJ-XC	
Standard/Class	0.5s	
Serial Number	Main: 9798953 Back-up: 9798954	Main: 9798955 Back-up: 9798956
Calibration Date (First Index Protocol)	22/05/2021	22/05/2021

Table 7 The previous meters and the currently active meters with their serial numbers

	Previous Meters		Replacement date of the meters	Active Meters	
	Meter	Serial No		Meter	Serial No
Eglence I	Main	65000771	22/05/2021	Main	9798953
	Spare	65000770		Spare	9798954
Eglence II	Main	65000772		Main	9798955
	Spare	65000773		Spare	9798956

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Baseline emission is calculated according to the formula

[46] https://www.kayseri.bel.tr/uploads/yonetmelikler/olcu_ve_olcu_aletleri_muayne_yonetmeligi.pdf

$$BE_y = EG_y \times EF_y$$

Where:

BE_y = Baseline emissions in year y (tCO_2)

EG_y = Net electricity delivered to the grid by the project activity in year y excluding transmission losses of the grid.

EF_y = Emission factor calculated according to selected methodology

$$276{,}292.90\ MWh \times 0.5556\ tCO_2/MWh = 153{,}507\ tCO_2$$

$$BE_y = 153{,}507\ tCO_2$$

5.2 Project Emissions

For most renewable energy project activities, PE_y = 0. However, for the following categories of project activities, project emissions have to be considered following the procedure described in ACM0002 v13.0.0.

- Emissions related to the operation of geothermal power plants (e.g. non-condensable gases, electricity/fossil fuel consumption)
- Emissions from water reservoirs of hydro power plants"

Therefore, as per ACM0002 : Grid-connected electricity generation from renewable sources, v13.0.0

The proposed project activity involves the generation of electricity by hydroelectric power plant therefore project activity does not result in greenhouse gas emissions.

$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$

Where:

PE_y = Project emissions in year y (t CO_2e/yr)

$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (t CO_2/yr)

$PE_{GP,y}$ = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (t CO_2e/yr)

$PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year y (t CO_2e/yr)

- Since this project uses hydroelectric power, $PE_{GP,y}$ is "0" (t CO_2/yr)
- The only emission source in the plant is the diesel generator which is used as auxiliary power source when there is no electricity generation in the plant or supply by the grid. In urgent cases, a diesel-powered generator will be operated for the daily consumption of personnel and the building, which is negligible. Project emissions are taken as zero. The

same is also stated in para 33 of "ACM0002: Grid-connected electricity generation from renewable sources" v13.0.0. Hence it is neglected. Therefore; $PE_{FF,y}$ = 0 (t CO_2/yr)

Beside of the diesel generator, other potential project emission for this proposed project is $PE_{HP,y}$.

However, if the power density of the project activity is greater than 10 W/m^2 than $PE_{HP,y}$ =0

The power density (PD) of the project activity is calculated as follows:

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

Where:

PD = Power density of the project activity (W/m^2)

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

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

A_{PJ} = Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m^2)

A_{BL} = Area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero.

		EGLENCE I	EGLENCE II
Parameter	**Description & Unit**	**Value**	**Value**
Cap_{PJ}	Power density of the project activity (W/m2)	42,650,000	26,000,000
Cap_{BL}	Installed capacity of the hydro power plant after the implementation of the project activity (W)	0	0
A_{PJ}	Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero	63,270	14,604
A_{BL}	Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m2)	0	0
PD	Area of the reservoir measured in the surface of the water, before the implementation of the	**674.10**	**1,780.36**

	project activity, when the reservoir is full (m2). For new reservoirs, this value is zero.		

Since the power density values for both plants are greater than 10 W/m², $PE_{HP,y}$ is taken as 0. $PE_{GP,y}$, $PE_{FF,y}$ and $PE_{HP,y}$ are equal to 0 as described above. In this regard, PE_y adds up to 0.

5.3 Leakage Emissions

The energy generating equipment is not transferred from or to another activity. Therefore, leakage is also considered as "0", according to the ACM0002 "Grid-connected electricity generation from renewable sources" methodology, v13.0.0.

$$LE_y = 0$$

5.4 GHG Emission Reductions and Carbon Dioxide Removals

Total Emission Reduction has been determined as;

$ER_y = BE_y - PE_y - LE_y$

where;

ER_y = Emission reductions in year y (tCO_2)

BE_y = Baseline emissions in year y (tCO_2)

PE_y = Project Emissions in year y (tCO_2)

LE_y = Leakage emissions in year y (tCO_2)

The project emissions and leakage are considered as "0". Thus, $ER_y = BE_y$

Vintage period	Baseline emissions (tCO_2e)	Project emissions (tCO_2e)	Leakage emissions (tCO_2e)	Reduction VCUs (tCO_2e)	Removal VCUs (tCO_2e)	Total VCUs (tCO_2e)
2021 01/01/2021 – 31/12/2021	45,937	0	0	45,937	45,937	45,937
2022 01/01/2022 – 31/12/2022	92,542	0	0	92,542	92,542	92,542
2023	15,028	0	0	15,028	15,028	15,028

01/01/2023 - 09/04/2023						
Total	153,507	0	0	153,507	153,507	153,507

The achieved reduction for this monitoring period is 41% lower than the ex-ante value. The difference between ex-ante and the achieved reductions are calculated as follows.

(153,507 – 259,068)/259,068 *100 = **-41%**

Vintage period	Ex-ante estimated reductions/ removals	Achieved reductions/ removals	Percent difference	Explanation for the difference
2021 01/01/2021 – 31/12/2021	114,065	45,937	-60%	It should be mentioned that the electricity generation is dependent on water flow estimation and seasonal effects are significant on the monthly generation rates and deviations. According to 2022 Precipitation Evaluation Report released by Directorate General of Meteorology of Turkey, the amount of precipitation decreased for 6.5% with respect to usual amount in Mediterranean Region where Adana province is located[47]. Also, according to 2022 Climate Report, the number of days with precipitation for the year 2022 decreased to 75 days[48]. According to 2022-2023 Water Year 12 Month Areal Cumulative Precipitation Report, for Mediterranean Region the precipitation amount decreased by 15% with respect to normal. This precipitation decrease can be linked to percent difference between calculated and estimated values for electricity generation.
2022 01/01/2022 – 31/12/2022	114,065	92,542	-19%	
2023 01/01/2023 - 09/04/2023	30,938	15,028	-51%	
Total	259,068	153,507	-41%	

[47] https://www.mgm.gov.tr/FILES/arastirma/yagis-degerlendirme/2022yagisdegerlendirmesi.pdf

[48] https://www.mgm.gov.tr/FILES/iklim/yillikiklim/2022-iklim-raporu.pdf

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

Use the table below to describe the commercially sensitive information included in the monitoring report to be excluded in the public version.

Section	Information	Justification

APPENDIX X: <TITLE OF APPENDIX>

Use appendices for supporting information. Delete this appendix (title and instructions) where no appendix is required.