



Verified Carbon Standard

EGLENCE I-II HYDROPOWER PLANT, TURKEY



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

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1 PROJECT DETAILS

1.1 Summary Description of the Project

The project activity, EĞLENCE I-II HYDROELECTRIC POWER PLANT, a run-off-river hydroelectric power plant, is located on the Eglence River, in the Mediterranean Region within the Karaisali district of Adana province. Eglence I-II consists of construction of a green field project with 72.55 MWm / 70.7 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-piece 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 initial installed capacity of Eglence I is 42.65 MWe, and the initial installed capacity of Eglence II is 26.00 MWe. The installed capacity had changes to total of 72.55 MWm / 70.7 MWe. Where Eglence-I new installed capacity is 44.55 MWm / 43.50 MWe and Eglence-II new installed capacity is 28 MWm / 27.2 MWe, as per the latest generation licence. According to Letter of Ministry of Environment and Urbanisation dated 24.04.2018¹, this revision is performed due to change only in electronic 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. There is no dam within the context of project activity.

The project is to generate approximately 205,299 MWh/year (Eğlence I: 127,280 MWh/year + Eğlence II 78,019 MWh/year = 205,299 MWh/year) of electricity to supply the national grid. The average annual emission reduction of the project is estimated to be 94,766 tonnes of CO₂. 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. The project milestones are provided in the table below:

Table 1 Project implementation milestones

Milestone	Date
First Feasibility Report	April 2005
Water Usage Agreement for Eglence I-II	27 November 2007
Generation License (Final Amendment Date)	27 December 2007

¹ Please see the files named as “Letter of the Ministry of Environment and Urbanisation” for Eglence I HEPP and Eglence II HEPP

Local Stakeholder Consultation Meeting	24 – 25 November 2009
Environmental Impact Assessment (Approval)	Eglençe I: 28 July 2010 Eglençe II: 30 July 2010
Loan Agreement with the bank	07 July 2011
Construction Agreement- Investment decision date	14 December 2010
VCS Registration Date	25 December 2013
Commissioning of the Eglençe-II HEPP	26 March 2013
Commissioning of the Eglençe-I HEPP	04 June 2013
Project Start Date (confirmed through the Eglençe II Commissioning date by validation)	10 April 2013
First Crediting Period	10 April 2013-09 April 2023
First Monitoring Period	10 April 2013 – 31 April 2020
Second Monitoring Period	01 April 2023 – 09 April 2023
Second Crediting Period	10 April 2023 – 09 April 2033

The main goals of the EGLENÇE I-II HYDROELECTRIC POWER PLANT project include followings:

- 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 consequently 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 June 2011 - 23 June 2011 (audit)	VCS	BUREAU VERITAS	10 years
	10 April 2013 - 09 April 2023			
1 st Verification	16 March 2021 (audit)	VCS	RECARBON	7.73 years
	10 April 2013-31 December 2020			

2 nd Verification	12 February 2024 (audit)	VCS	RINA	2.27 years
	01 January 2021-09 April 2023			
Validation	13 February 2024 (audit) 10 April 2023 – 09 April 2033	VCS	RINA	10 years

1.3 Sectoral Scope and Project Type

Sectoral scope ²	1 – Energy (renewable/non-renewable)
Project activity type	Grid connected renewable electricity generation

1.4 Project Eligibility

1.4.1 General eligibility

The concept of hydropower projects undertaken by private sector is a very immature concept in the country. In this sense, the project will help Turkey to stimulate the commercial application of grid connected renewable energy technologies and markets. It will also be a crucial sample of establishing the feasibility of larger grid connected small to medium scale runoff-river HEPPs as a tool to support energy security, improved air quality, alternative sustainable energy, improved local source of income and sustainable renewable energy industry development. The specific benefits of the project are:

- Reduce greenhouse gas emissions in Turkey compared to the business-as-usual scenario,
- Help to stimulate private sector participation in hydro power industry in Turkey,
- Create employment during the construction and the operation phase of the plant,
- Relatively reduce some other pollutants from power generation industry in Turkey, compared to a business-as-usual scenario,
- Help to diminish Turkey's increasing energy deficit,
- Diversify the electricity generation portfolio and reduce dependency on import of other energy sources.

Despite somewhat reasonable figures in the financial feasibility studies, bankability of renewable energy projects is still in question because banks and other financial institutions are very cautious in providing loans to these projects for various reasons: Lack of long-term markets in the country, poor understanding of private sector participation in renewable energy investment and the fragile macro-economic stability

² 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>.

play a significant role in long-term financing decisions of financial institutions. Even if the projects are appraised to be bankable, the interest rates are significantly high due to risk premiums stemming from limited appetite of banks in providing loans to the industry. As private sector participation in renewable energy industry is a very new practice in the country, banks have limited experience and technical knowledge in the appraisal of such projects. The appetite for lending in such projects is curbed because the final output from the project in terms of electricity is always in question. Hence, confirmation of project existence from an independent third party and the resulting financial support from international buyers of carbon emission would be a leap of faith for the banks and financial institutions which hesitate to be on the long-term financing side of such projects. The support would not only ease the crediting process for the project owners but would also give a stronger hand in negotiating for less expensive loans. Eventually, even if such projects achieve some financing from the local banks; the project owners are seldom content with the credit terms regarding the tenor and the price. As also seen in the subject EGGLECE I-II HYDROELECTRIC POWER PLANT project, there are also cases that the project developers face unexpected costs over the construction of the projects and seek extra financing to complete the project. Carbon finance revenue also becomes vital while raising extra financing for such projects.

The project contributes to sustainable development in Turkey in following ways:

- Generating electricity from hydropower energy does not result in emissions of pollutants into the atmosphere with zero residuals that carry adverse impacts on soil, water etc. Regular emissions from conventional electricity generation such as sulphur dioxide, nitrogen oxide and particulates will not occur in this case.
- As a renewable energy source hydropower can be used without jeopardizing the supply of primary energy sources in the future
- The proposed project will significantly contribute to the reduction of GHGs.

1.4.2 AFOLU project eligibility

N/A

1.4.3 Transfer project eligibility

N/A

1.5 Project Design

The project has been designed as multiple locations. Eglençe HEPP comprises two weirs and two power houses. Eglençe I is located upstream of Eglençe River and Eglençe II is located downstream of the river.

1.5.1 Grouped project design

N/A

1.6 Project Proponent

Organization name	Egenda Ege Enerji Üretim A.S.
Contact person	Fatih Çandır
Title	-
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Email	fatih.candir@endaenerji.com.tr

1.7 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
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Telephone	+90 312 514 63 63
Email	kemal.demirkol@gte.com.tr

1.8 Ownership

As per the license issued by Energy Market Regulatory Authority (EMRA), all legal rights of the project are given to Egenda Eger Enerji Üretim A.Ş.

1.9 Project Start Date

Project start date	10/04/2013
Justification	According to Partial Provisional Acceptance Report issued by Ministry of Energy and Natural Resources, Eglence II HEPP has been accepted on 10/04/2013.

1.10 Project Crediting Period

Crediting period	<input type="checkbox"/> Seven years, twice renewable <input type="checkbox"/> Ten years, fixed <input checked="" type="checkbox"/> Other (state the selected crediting period and justify how it conforms with the VCS Program requirements)
Start and end date of first crediting period	10/04/2013 - 09/04/2023 (Ten years, twice renewable)
Start and end date of second crediting period	10/04/2023 - 09/04/2033

1.11 Project Scale and Estimated GHG Emission Reductions or Removals

- < 300,000 tCO₂e/year (project)
- ≥ 300,000 tCO₂e/year (large project)

Calendar year of crediting period	Estimated GHG emission reductions or removals (tCO ₂ e)
10 - April - 2023 to 31 - December - 2023	69,062
01-January-2024 to 31-December-2024	94,766
01-January-2025 to 31-December-2025	94,766
01-January-2026 to 31-December-2026	94,766
01-January-2027 to 31-December-2027	94,766

Calendar year of crediting period	Estimated GHG emission reductions or removals (tCO _{2e})
01-January-2028 to 31-December-2028	94,766
01-January-2029 to 31-December-2029	94,766
01-January-2030 to 31-December-2030	94,766
01-January-2031 to 31-December-2031	94,766
01-January-2032 to 31-December-2032	94,766
01-January-2033 to 09-April-2033	25,704
Total estimated ERRs during the first or fixed crediting period	947,660
Total number of years	10 years
Average annual ERRs	94,766

1.12 Description of the Project Activity

The project activity, Eglence I-II Hydroelectric Power Plant, a run-off-river hydroelectric power plant, is located on the Eglence River, in the Mediterranean Region within the Karaisali district of Adana province. The project specifications are summarized below.

Project Specifications	
River	Eglence
Location	Adana Turkey
Type	Run-off river
Capacity in MWe	70.7 MWe
Transmission line	154 kV ³

³ Please refer to TEIAS Connection Agreement of Eglence I and Eglence II

The technology used in the plant includes first hand hydro turbines and its auxiliary equipments with extensive automatization. The project does not need extensive initial training and maintenance efforts in order to work as presumed during the project period. Necessary trainings to the plant staff will be delivered by the supplier in line with the agreement between the project owner and the supplier.

Table 2 Technical Properties

	Eglence I	Eglence II
Regulator		
Type	concrete	concrete
Talweg elevation (m)	693	404
Crest elevation (m)	695,5	413,45
Conveyance Tunnel		
Diameter (m)	3,4	3,4
Length (m)	5398,50	1918,24
Capacity (m ³ /s)	17,4	17,4
Penstock		
Type	steel	steel
Diameter (m)	2,4	2,4
Length (m)	1146	700
Capacity (m ³ /s)	17,4	17,4
Powerhouse		
Type	on the ground	on the ground
Tailwater elevation (m)	410	235

The Project is expected to supply electricity from renewable sources into the national electricity grid, thereby creating the following expected annual emission reductions:

Expected Net Electricity Generation	205,299 MWh/yr
Annual Emission Reductions	94,766 t CO ₂ e/yr

The Project activity will feed clean electricity without storage to the national grid via a high voltage transmission line and thus reduce GHG emissions by displacing electricity from the pool of grid-connected fossil fuel fired power plants. This way, it will contribute to climate change mitigation along with other environmental benefits. Considering Project's expected operational life, it will continue to reduce emissions further after the end of the crediting period.

The Project owner has obtained the generation license on 27/12/2007 for 49 years and estimates a Project lifetime of 49 years, 0 months.

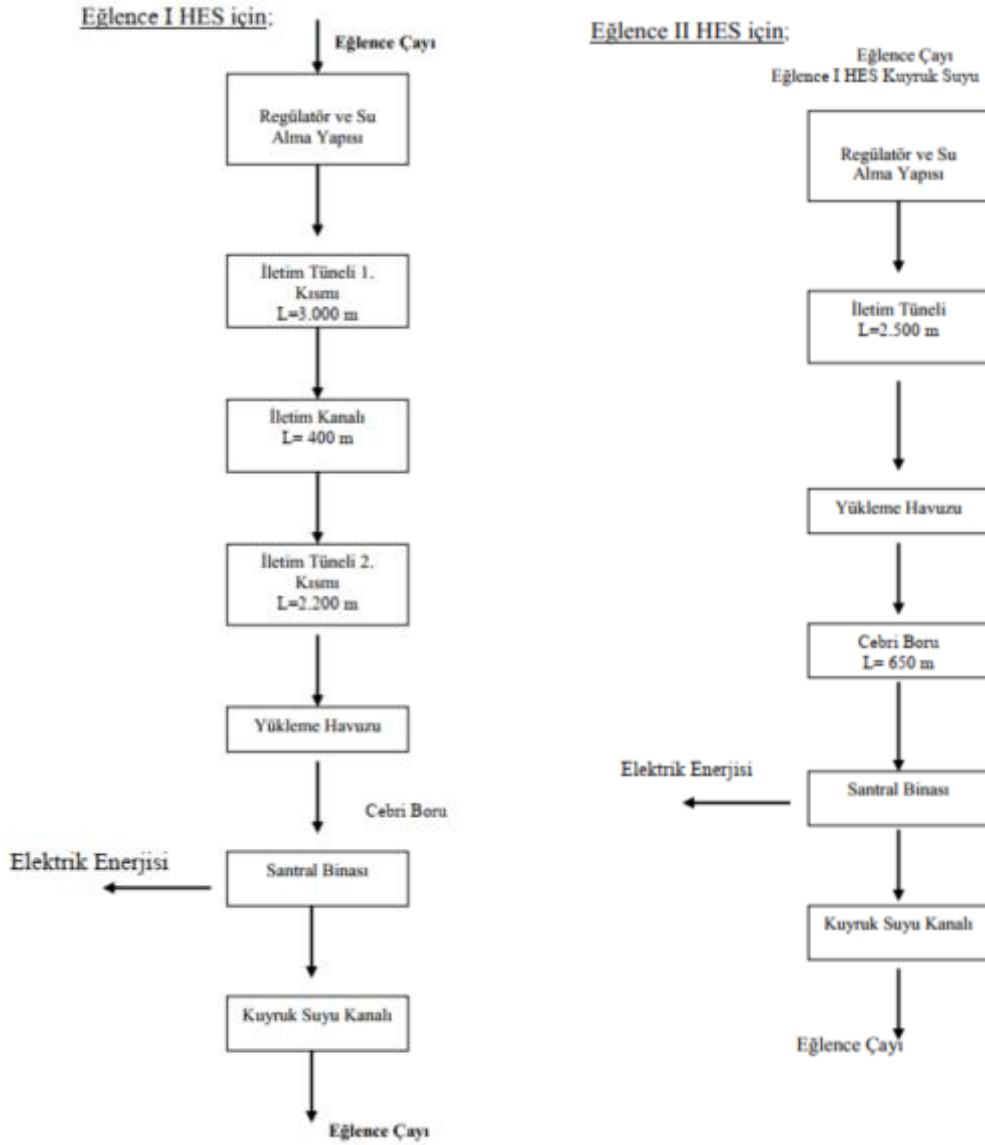


Figure 1 Workflow Diagram for Eglençe I (left) and Eglençe II (right)⁴

1.13 Project Location

The Project sites are located in Turkey, in the Mediterranean Region, Adana province, in the boundaries of Aladağ and Karaisali districts. Coordinates are as follows.

Eglençe I: 37°24'23.44" N / 35°12'17.46" E

Eglençe II: 37°22'54.81" N / 35°12'5.66" E

⁴ Referring to EIA Reports of both Eglençe I and II

The following figure shows the project's location:

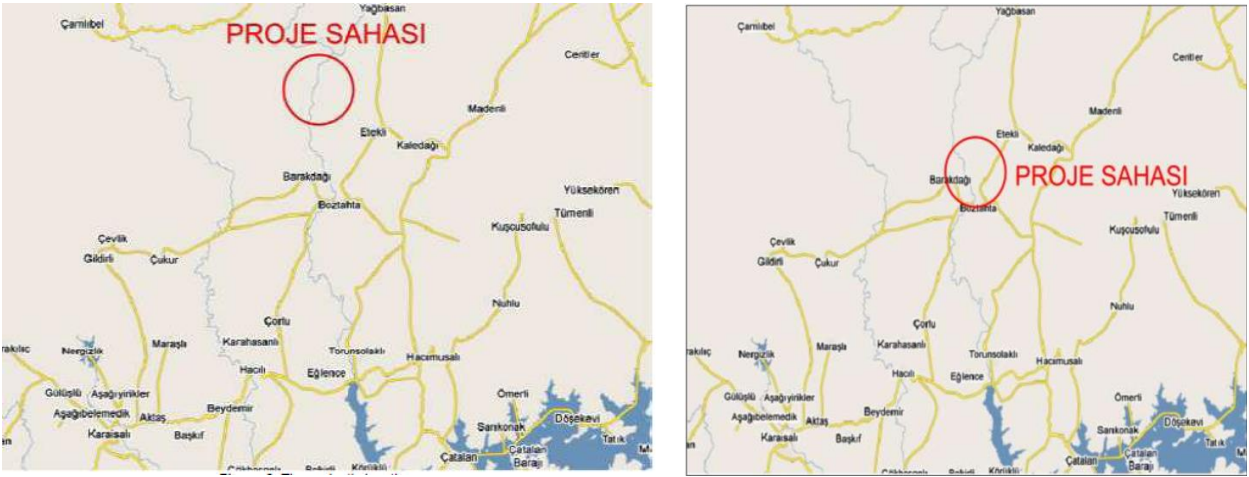


Figure 2 Location of the Project on the map (left Egilence I and right Egilence II)

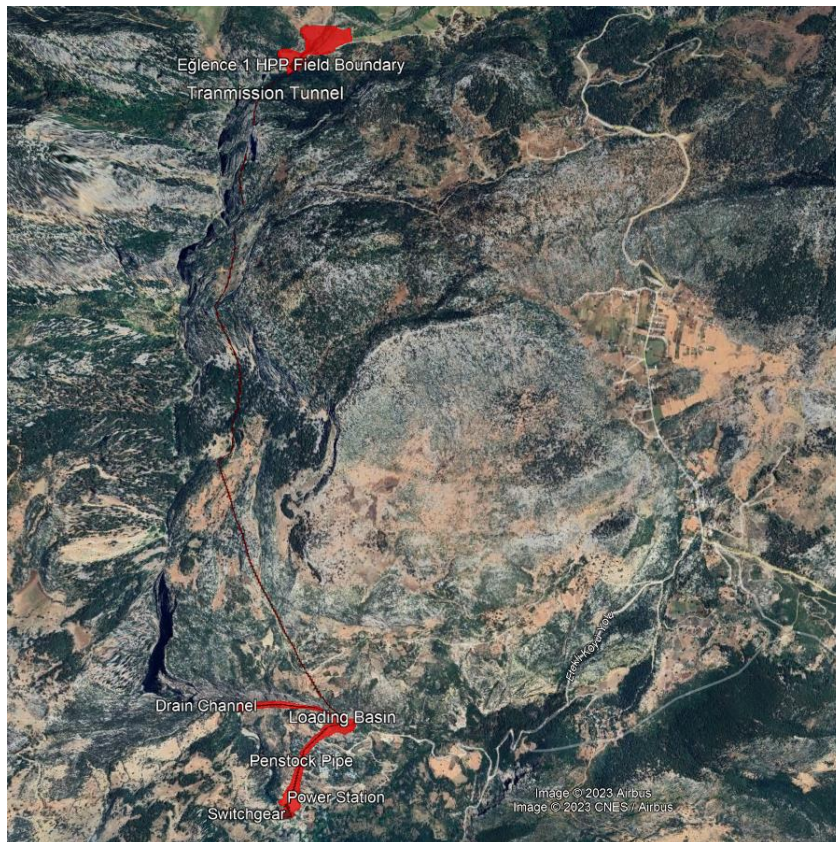


Figure 3 Location of Egilence I HPP

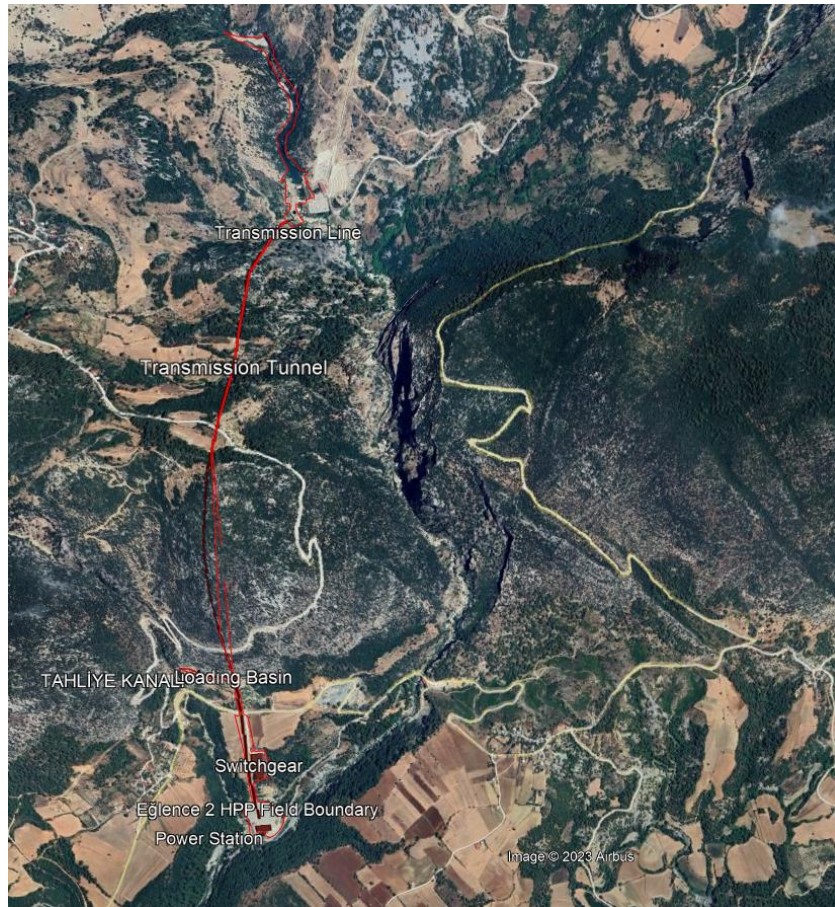


Figure 4 Location of Egence II HPP

1.14 Conditions Prior to Project Initiation

Before the implementation of the project, it has been found out that there was a very small area of maquis typed forest land. The rest of the land was mentioned to be uncultivated area. Regarding the maquis typed land, an approved development plan was prepared for determination of the land reserved for the transformer station and the powerhouse and the mentioned development plan was approved by the Adana Provincial Special Administration in line with the Forest Law (17th Act of No: 6831; “The Regulation about The Permissions Granted to Forest Land”)⁵.

As the project activity is a Greenfield project, the conditions prior to the project initiation is the continuation of the current situation, i.e. the equivalent amount of energy would have been produced by other grid-connected units, which are mainly thermal power plants, undertaking business as usual maintenance. Since the proposed project whose characteristics are summarized above, aims at generating emission free energy through hydropower; thus, will result in emission reduction in parallel with its electricity generation figures. Moreover, the project is not implemented to generate GHG

⁵ Refer to EIA Reports of both Egence I and II

emissions for the purpose of its subsequent reduction. The CH₄ emission will be counted as negligible since the power density of the project is far above 10 W/m².

1.15 Compliance with Laws, Statutes and Other Regulatory Frameworks

It is important to note that there are no local laws and regulations in Turkey because it is not a federal state. The Egence I-II HEPP is in compliance with relevant national laws and regulations related to the project.

The applicable mandatory laws that will be applied for the project are:

- i. Electricity Market Law⁶: The latest version was enacted in April 10, 2023. The Law aims to ensure the development of a financially sound and transparent electricity market operating in a competitive environment under the provisions of the civil law. It also underlines the needs to produce a sufficient, high quality, low cost and environmentally friendly electricity to consumers. The text also provides guidelines to structure the autonomous regulation and the supervision of the market.
- ii. The Renewable Energy Law⁷: It compels electricity selling companies to purchase from “Green” energy providers until 2011 at a defined ratio and at a defined price. This ratio is based on previous year sales over total energy sold in the country. The price is based on a yearly average wholesale purchase price predetermined by the Energy Market Regulatory Authority (EMRA).
- iii. Environmental Law⁸: The law that came into force in 1983, considering the environment as a single domain aims not only to prevent and eliminate environmental pollution, but also to allow the management of land and natural resources with an integrated manner. According to its basic principles, as stated also in the Constitution, citizens as well as the State bear responsibility for the protection of the environment. It is also stated in the Law that in all economic activities every measure should be taken to minimize pollution.
- iv. Regulation on procedures and principles of signing the agreement of water resources utilization to generate electricity for the electricity market.

The project complies with all aforementioned laws as its activity aims at generating electricity by using a renewable resource: hydroelectric power; in a sufficient, low-cost and environmentally friendly manner, using the latest technology available on the market.

1.16 Double Counting and Participation under Other GHG Programs

1.16.1 No Double Issuance

⁶ <https://www.epdk.gov.tr/detay/icerik/3-0-0-2256/kanunlar>

⁷ <https://www.epdk.gov.tr/detay/icerik/3-0-0-2256/kanunlar>

⁸ <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=2872&MevzuatTur=1&MevzuatTertip=5>

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

Yes No

1.16.2 Registration in Other GHG Programs

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

Yes No

1.16.3 Projects Rejected by Other GHG Programs

Has the project been rejected by any other GHG programs?

Yes No

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

1.17.1 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

1.17.2 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

1.17.3 Supply Chain (Scope 3) Emissions

Do the project activities specified in Section 1.12 affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

Yes No

1.18 Sustainable Development Contributions

The project helps following sustainable development goals:

1 – Affordable and Clean Energy (SDG 7): The project promotes clean and sustainable energy production and use. The total net electricity production of the project is estimated to be 205,299 MWh/year.

2 – Decent Work and Economic Growth (SDG 8): The project generates employment for all. The employees have required technical training and certifications. The number of employees is 14 for Eglence I and 11 for Eglence II, in total 25 people are employed.⁹

14 hours of Occupational Health and Safety training, 4 hours of Emergency Training and Drills, 4 hours of Working at Height Drill, 5 hours of Carbon Footprint Training, 1 hour of Training on what to do in disasters in workplaces and 1 hour of Body Language Training are provided to the employees.¹⁰

3 – Climate Action (SDG 13): The project contributes to SDG 13 with an amount of 94,766 tonnes of CO₂e per annum, which represent direct and quantifiable impact on climate security.

They are added to the monitoring plan as well.

1.19 Additional Information Relevant to the Project

1.19.1 Leakage Management

N/A

1.19.2 Commercially Sensitive Information

N/A

1.19.3 Further Information

N/A

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

⁹ Please see the Social Security Records for both Eglence I and Eglence II

¹⁰ Please see the Training Records

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification	<p>Through consultation meetings, stakeholders are identified. 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.</p> <p>In addition to locals and mukhtars, people from Regional Directorate of Forestry and Environment of Adana province, Provincial Directorate of Agriculture of Adana, The 6th Area Director of State Water Works of Adana province, Egenda Ege Enerji Uretim A.S and Aruv Cevre Mühendislik Müsavirlik Hizmetleri San. ve Tic. Ltd. Attended the consultation meetings.¹¹</p>
Legal or customary tenure/access rights	<p>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. On the contrary it is a government land that classified as forestry area. The property is leased to the project owner by the government until the end of the generation license.</p>
Stakeholder diversity and changes over time	<p>According to Feasibility Report, the groups that have a significant influence on the culture of the region are especially the migrant Yoruk and Turkmen tribes¹².</p> <p>As stated in the mentioned Feasibility Report, agricultural activities have an important place in the region's economy due to fertile land and suitable climate conditions. Manufacturing industry activities in the region have developed based on agricultural activities, especially cotton.</p> <p>In terms of mining potential of the area, there are amyant, lignite, zinc and chrome deposits in Karaisalı, where the project site is located.</p>
Expected changes in well-being	<p>According to registered PD Version 6, the project would not have any negative impacts on stakeholders' well-being¹³.</p>
Location of stakeholders	<p>According to EIA report of both Eglence I and II, both project areas and its immediate surroundings are within Posyagabasan and Boztahta villages.</p>

¹¹ Referring to registered PDD Version 6 Section 6 Stakeholder Comments

¹² Referring to Feasibility Reports both Eglence I and II Section 2.2.2 Kültürel Durum

¹³ Referring to registered PDD Version 6 Section 6 Stakeholder Comments

The project area that are predicted to be impacted by the project are is given by the Figure 5 and Figure 6¹⁴. According to EIA Reports of both Eglence I and Eglence II, environmental impacts from the activity are expected to occur at low levels at the tunnel mouths, connection roads, in the area where transmission canal will be constructed, in areas of limited size such as the construction of the loading pond and power plant building, at a level that will not affect settlements.¹⁵

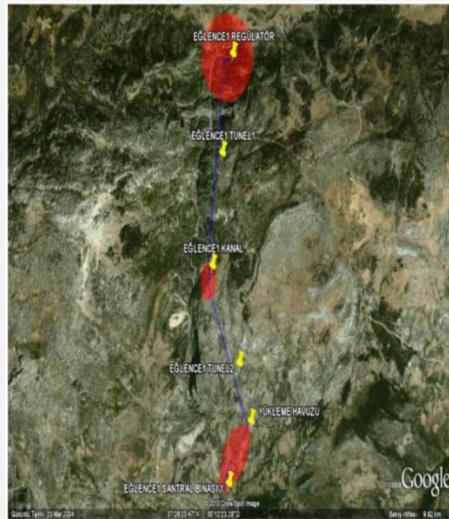


Figure 5 Satellite Image of the Area Considered to be Affected by the Project Site Eglence I

¹⁴ Refer to EIA Reports of both Eglence I and II

¹⁵ Refer to EIA Reports of both Eglence I and II

2.1.2 Stakeholder Consultation and Ongoing Communication

<p>Date of stakeholder consultation</p>	<p>First Meeting for Egience I HPP: 24 November 2009 Second Meeting for Egience II HPP: 25 November 2009</p>
<p>Stakeholder engagement process</p>	<p>Local newspaper invitations were published to reach people. The invitations are below:</p> <div style="display: flex; flex-direction: column; gap: 5px;"> <div data-bbox="597 415 865 548"> <p style="text-align: center;">DUYURU</p> <p>Adana İl, Karaisalı İlçesi, Egience Çayı Üzerinde, Posyağbasan Köyü ile Kıp mahallesi arasında, Egencia Ege Enerji Üretim A.Ş. tarafından yapılıması planlanan Egience I Regülatörü ve Hidroelektrik Santral Projesi ile ilgili ÇED Yönetmeliği gereği halkı bilgilendirmek amacıyla aşağıda belirtilen tarih, saat ve yerde Halkın Katılımı Toplantısı düzenlenecektir. Duyurulur.</p> <p>Tarih: 24.11.2009 Saat: 11:00 Yer: Karaisalı, Elekli Köyü, Elekli Köy Kahvesinde</p> <p style="text-align: center;"><small>Milliyet Gazetesi 12.11.2009</small></p> </div> <div data-bbox="597 554 865 699"> <p style="text-align: center;">DUYURU</p> <p>Adana İl, Karaisalı İlçesi, Egience Çayı Üzerinde, Posyağbasan Köyü ile Kıp mahallesi arasında, Egencia Ege Enerji Üretim A.Ş. tarafından yapılıması planlanan Egience I Regülatörü ve Hidroelektrik Santral Projesi ile ilgili ÇED Yönetmeliği gereği halkı bilgilendirmek amacıyla aşağıda belirtilen tarih, saat ve yerde Halkın Katılımı Toplantısı düzenlenecektir. Duyurulur.</p> <p>Tarih: 24.11.2009 Saat: 11:00 Yer: Karaisalı, Elekli Köyü, Elekli Köy Kahvesinde</p> <p style="text-align: center;"><small>Yeni Adana Gazetesi 12.11.2009</small></p> </div> <div data-bbox="597 705 865 850"> <p style="text-align: center;">DUYURU</p> <p>Adana İl, Karaisalı İlçesi, Egience Çayı Üzerinde, Bataltı Köyü, Köpekli Mahallesi Mevâkinde, Egencia Ege Enerji Üretim A.Ş. tarafından yapılıması planlanan Egience II Regülatörü ve Hidroelektrik Santral Projesi ile ilgili ÇED Yönetmeliği gereği halkı bilgilendirmek amacıyla aşağıda belirtilen tarih, saat ve yerde Halkın Katılımı Toplantısı düzenlenecektir. Duyurulur.</p> <p>Tarih: 25.11.2009 Saat: 11:00 Yer: Karaisalı, Bataltı Köyü, Bataltı Köy Kahvesinde</p> <p style="text-align: center;"><small>Milliyet Gazetesi 12.11.2009</small></p> </div> <div data-bbox="597 856 865 1045"> <p style="text-align: center;">DUYURU</p> <p>Adana İl, Karaisalı İlçesi, Egience Çayı Üzerinde, Bataltı Köyü, Köpekli Mahallesi Mevâkinde, Egencia Ege Enerji Üretim A.Ş. tarafından yapılıması planlanan Egience II Regülatörü ve Hidroelektrik Santral Projesi ile ilgili ÇED Yönetmeliği gereği halkı bilgilendirmek amacıyla aşağıda belirtilen tarih, saat ve yerde Halkın Katılımı Toplantısı düzenlenecektir. Duyurulur.</p> <p>Tarih: 25.11.2009 Saat: 11:00 Yer: Karaisalı, Bataltı Köyü, Bataltı Köy Kahvesinde</p> <p style="text-align: center;"><small>Yeni Adana Gazetesi 12.11.2009</small></p> </div> </div> <p>The outcomes of the consultation meetings were given in EIA Reports of Egience I and II. The outcomes are also given in the registered PDD¹⁶.</p>
<p>Consultation outcome</p>	<p>The outcomes of the consultation meeting were as follows¹⁷:</p> <ul style="list-style-type: none"> - All stakeholders were content that environment-friendly energy production was going to be realized, meaning that the project does neither consume nor contaminate the Egience river. - The reservoir area of negligible size would come into existence and the project would not cause any negative impacts to the underground water and no negative impacts for the flora and the fauna as well as the inhabitants were going to be experienced.
<p>Ongoing communication</p>	<p>According to Mukhtar Letter that has been shared with DOE, contact information of the project owner is given to the Posyağbasan,</p>

¹⁶ Referring to registered PDD version 6 Section 6 Stakeholder Comments

¹⁷ Referring to registered PDD version 6 Section 6 Stakeholder Comments

	Boztahta and Etekli Village Mukhtar’s Office. In case any stakeholder want to share their grievances or inputs with the project owner, they can reach the project owner via the provided information.
Stakeholder input	There is no input received from the stakeholders during the consultation.

2.1.3 Free Prior and Informed Consent

Obtaining consent	<p>As a part of the EIA process, in line with the article 9 of EIA Regulation, to obtain consent of the stakeholders, the community meetings were organised. In these meetings general information about the construction site, duration of the construction and cost of the project, technical information about the equipment’s to be used at the project, the potential environmental impacts and the measures to be taken are presented to the stakeholders.</p> <p>At the end of both meetings, all stakeholders were content that environment-friendly energy production was going to be realized. The outcomes of the meeting were stated in EIA Report.</p> <p>EIA Positive decision was given for both plants i.e., for Eglence I HPP on 28 July 2010 and for Eglence II HPP on 30 July 2010.</p>
Outcome of FPIC	EIA Positive decision was given for both plants i.e., for Eglence I HPP on 28 July 2010 and for Eglence II HPP on 30 July 2010.

2.1.4 Grievance Redress Procedure

Development process	<p>According to Mukhtar Letter that has been shared with DOE, contact information of the project owner is given to the Etekli Village Mukhtar’s Office.</p> <p>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.</p> <p>PP will resolve all the grievances during whole crediting period.</p>
Grievance redress procedure	The grievance, negative or positive, can be provided by local stakeholders related to operation of the project activity. PP will resolve all the grievances during whole crediting period.

2.1.5 Public Comments

Comments received	Actions taken
No comment received from the stakeholders.	-

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

Egenda Ege Enerji Üretim A.Ş. was established in 1997 and it includes Eğlence I HEPP, Eğlence II HEPP, Alaçatı WPP, Mordoğan WPP, Germiyan WPP, Urla WPP, as well as its operating subsidiaries; Tuzla GPP, Yaylaköy WPP and Su Enerji (Çaygören HEPP)¹⁸. In this regard, management teams have expertise or experience in implementing similar project activities.

2.2.2 Risk Assessment

	Risks identified	Mitigation or preventative measure taken
Natural and human-induced risks to stakeholders' wellbeing	No risk identified	-
Risks to stakeholder participation	No risk identified	-
Working conditions	<ul style="list-style-type: none"> Occupational accidents due to the use of vehicles, machinery and equipment, Fire risk 	<ul style="list-style-type: none"> Basic occupational health and safety training Emergency drill Training Training on working at height Training on safe driving techniques The training records are shared with the DOE.
Safety of women and girls	No risk identified	-
Safety of minority and marginalized	No risk identified	-

¹⁸ <https://www.egenda.com.tr/egenda-ege-enerji-uretim-a-s.aspx>

groups, including children		
Pollutants (air, noise, discharges to water, generation of waste, release of hazardous materials)	Risks identified with generation of wastewater and solid wastes	<p>According to EIA Reports of both Eglence I and II¹⁹</p> <ul style="list-style-type: none"> - Domestic wastewater will be collected in a septic tank to prevent the spread of wastewater to the environment. - Domestic solid wastes are collected in closed sealed containers and sent to appropriate landfill area by Karaisali Municipality. - It is not possible to have air emissions during operational activities. - During operational activities, noise from the power plant will be generated. However, this noise is an 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, life water will be released to the stream.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

Discrimination and sexual harassment	Türkiye has ratified ILO convention 100, 111, 122 and 142. All the workers are socially secured by the PO and protected by employment agreements.
Management experience	EGENDA has been operating exclusively in the energy sector since 1997, both through its subsidiaries and affiliates. Its fields of activity and areas of interest are to develop energy investment projects with all kinds of

¹⁹ Referring to EIA Reports for both Eglence I and II Section VIII.1.

	<p>production technologies, especially renewable energy resources, as an investor, to realize investments and to operate production plants²⁰. Egenda, which is the company that realizes the investments and carries out the works within the portfolio of Enda Energy Holding, includes Eğlence I HEPP, Eğlence II HEPP, Alaçatı WPP, Mordoğan WPP, Germiyan WPP, Urla WPP, as well as its operating subsidiaries; Tuzla GPP, Yaylaköy WPP and Su Enerji (Çaygören HEPP)²¹. As shared with DOE, the necessary trainings are provided to the employers.</p>
<p>Gender equity in labor and work</p>	<p>Turkey has ratified ILO convention 100 and 111²² and discrimination based on gender is illegal in Turkey. The project tries to align with the national gender strategy. So, the project does not involve and is not complicit in any form of discrimination based on gender difference.</p>
<p>Human trafficking, forced labor, and child labor</p>	<p>Türkiye has ratified ILO convention 100, 111, 122 and 142. 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 project activity.</p>

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 convention²³. 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.

2.3.3 Indigenous Peoples and Cultural Heritage

There are no lands which was occupied by IPs.

2.3.4 Property Rights

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. On the contrary it is a government land that classified as

²⁰ <https://www.egenda.com.tr/egenda-ege-enerji-uretim-a-s.aspx>

²¹ <https://www.egenda.com.tr/egenda-ege-enerji-uretim-a-s.aspx>

²² https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo-ankara/documents/genericdocument/wcms_645630.pdf

²³ https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo-ankara/documents/genericdocument/wcms_645630.pdf

forestry area. The property is leased to the project owner by the government until the end of the generation license.

2.3.5 Benefit Sharing

As explained in Section 2.3.4, the project does not impact property rights. So this section is N/A

2.4 Ecosystem Health

	Risks identified	Mitigation or preventative measure taken
Impacts on biodiversity and ecosystems	No risk identified	-
Soil degradation and soil erosion	No risk identified	-
Water consumption and stress	No risk identified	-
Usage of fertilizers	No risk identified	-

2.4.1 Rare, Threatened, and Endangered species

Is the project located in or adjacent to habitats for rare, threatened, or endangered species?

Yes No

2.4.2 Introduction of species

N/A

2.4.3 Ecosystem conversion

The project is not an AFOLU project.

3 APPLICATION OF METHODOLOGY

3.1 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 ²⁴	21.0
Tool	TOOL01	Tool for the demonstration and assessment of additionality ²⁵	07.0.0
Tool	TOOL07	Tool to calculate the emission factor for an electricity system ²⁶	07.0
Tool	TOOL11	Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period ²⁷	03.0.1

3.2 Applicability of Methodology

The choice of methodology ACM0002, is justified as the project activity meets its applicability criteria. Egience HEPP is a large-scale hydro power type, greenfield, grid connected renewable electricity generation project.

Methodology ID	Applicability condition	Justification of compliance
ACM0002	This methodology is applicable to grid-connected renewable energy power generation project activities that: a) Install a Greenfield power plant;	Egience I - II HEPP is a large-scale hydropower-solar type, Greenfield, grid connected renewable electricity

²⁴ <https://cdm.unfccc.int/methodologies/DB/HF3LP6O41YY0JIP1DK6ZRJO9RSCX3S>

²⁵ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

²⁶ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf>

²⁷ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-11-v3.0.1.pdf>

Methodology ID	Applicability condition	Justification of compliance
	<ul style="list-style-type: none"> b) Involve a capacity addition to (an) existing plant(s); c) Involve a retrofit of (an) existing operating plant(s)/unit(s); d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or e) Involve a replacement of (an) existing plant(s)/unit(s). 	<p>generation project. So, the project meets (a) Install a Greenfield power plant.</p>
ACM0002	<p>In case the project activity involves the integration of a Battery Energy Storage System (BESS), the methodology is applicable to grid-connected renewable energy power generation project activities that:</p> <ul style="list-style-type: none"> a) Integrate BESS with a Greenfield power plant; b) Integrate a BESS together with implementing a capacity addition to (an) existing solar photovoltaic¹ or wind power plant(s)/unit(s); c) Integrate a BESS to (an) existing solar photovoltaic or wind power plant(s)/unit(s) without implementing any other changes to the existing plant(s); d) Integrate a BESS together with implementing a retrofit of (an) existing solar photovoltaic or wind power plant(s)/unit(s). 	<p>The project does not include integration of BESS.</p>
ACM0002	<p>The methodology is applicable under the following conditions:</p> <ul style="list-style-type: none"> a) Hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit; b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the 	<ul style="list-style-type: none"> (a) The project is a hydropower plant with reservoir. (b) The project does not include retrofits, rehabilitations or replacements. (c) The project is a Greenfield project but not categorized under paragraph 5. (d) The project does not include integration of BESS.

Methodology ID	Applicability condition	Justification of compliance
	<p>calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity;</p> <p>c) In case of Greenfield project activities applicable under paragraph 5 (a) above, the project participants shall demonstrate that the BESS was an integral part of the design of the renewable energy project activity (e.g. by referring to feasibility studies or investment decision documents);</p> <p>d) The BESS should be charged with electricity generated from the associated renewable energy power plant(s). Only during exigencies² may the BESS be charged with electricity from the grid or a fossil fuel electricity generator. In such cases, the corresponding GHG emissions shall be accounted for as project emissions following the requirements under section 5.4.4 below. The charging using the grid or using fossil fuel electricity generator should not amount to more than 2 per cent of the electricity generated by the project renewable energy plant during a monitoring period. During the time periods (e.g. week(s), months(s)) when the BESS consumes more than 2 per cent of the electricity for charging, the project participant shall not be entitled to issuance of the certified emission reductions for the concerned periods of the monitoring period.</p>	

Methodology ID	Applicability condition	Justification of compliance
ACM0002	<p>In case of hydro power plants, one of the following conditions shall apply:</p> <ul style="list-style-type: none"> a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density, calculated using equation (7), is greater than 4 W/m²; or c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (7), is greater than 4 W/m²; or d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (7), is lower than or equal to 4 W/m², all of the following conditions shall apply: <ul style="list-style-type: none"> i. The power density calculated using the total installed capacity of the integrated project, as per equation (8), is greater than 4 W/m²; ii. Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; iii. Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be: <ul style="list-style-type: none"> a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project. 	<p>The project is a hydro power plant.</p> <p>(c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (7), is greater than 4 W/m².</p>
	<p>In the case of integrated hydro power projects, project participants shall:</p>	<p>The project is not a integrated hydro power project. Hence, this condition is N/A.</p>

Methodology ID	Applicability condition	Justification of compliance
	<p>a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or</p> <p>b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum of five years prior to the implementation of the CDM project activity.</p>	
ACM0002	<p>The methodology is not applicable to:</p> <p>a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;</p> <p>b) Biomass fired power plants/units.</p>	<p>a) The project does not involve switching from fossil fuel use to renewable energy at the site of the project activity.</p> <p>b) The project is not a biomass fired power plant.</p>
ACM0002	<p>In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity</p>	<p>The project does not involve retrofits, rehabilitations, replacements. Hence, this condition is N/A.</p>

Methodology ID	Applicability condition	Justification of compliance
	and undertaking business as usual maintenance”.	
	In addition, the applicability conditions included in the tools referred to below apply	Given below.

Applicability as per “Tool 07: Tool to calculate the emission factor for an electricity system, version 07.0”.

Tool ID	Applicability condition	Justification of compliance
TOOL07	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g., demand-side energy efficiency projects).	The project activity supplies electricity to a grid. Hence, this condition is met.
TOOL07	Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e., option IIa and option IIb. If option IIa is chosen, the conditions specified in “Appendix 1: Procedures related to off-grid power generation” should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation	CO2 emission factor for the displacement of electricity generated by power plants in an electricity system is determined by calculating the “combined margin” emission factor (CM) of the electricity system.

Tool ID	Applicability condition	Justification of compliance
	and not to other aspects such as transmission capacity.	
TOOL07	In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	The project electricity system is not located partially or totally in an Annex I country. Hence, this condition is N/A.
TOOL07	Under this tool, the value applied to the CO2 emission factor of biofuels is zero.	The project does not involve biofuels in any way.

Applicability as per “Tool 01: Tool for the demonstration and assessment of additionality, version 07.0.0”

Tool ID	Applicability condition	Justification of compliance
TOOL01	The use of the “Tool for the demonstration and assessment of additionality” is not mandatory for project participants when proposing new methodologies. Project participants may propose alternative methods to demonstrate additionality for consideration by the Executive Board. They may also submit revisions to approved methodologies using the additionality tool.	Tool for the demonstration and assessment of additionality is applied in this project since there is no new methodologies proposed. Hence, this condition is N/A.
TOOL01	Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.	The additionality tool is applied using this methodology.

Applicability as per “Tool 11: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, version 3.0.1

Tool ID	Applicability condition	Justification of compliance
TOOL11	This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period, as required by paragraph 49 (a) of the modalities and procedures of the clean development mechanism.	This is the renewal of the crediting period. Therefore, this tool is applicable.

Tool ID	Applicability condition	Justification of compliance
	<p>The tool consists of two steps. The first step provides an approach to evaluate whether the current baseline is still valid for the next crediting period. The second step provides an approach to update the baseline in case that the current baseline is not valid anymore for the next crediting period</p>	

3.3 Project Boundary

The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the national electricity grid. Figure 7 and Figure 8 show the project boundary.

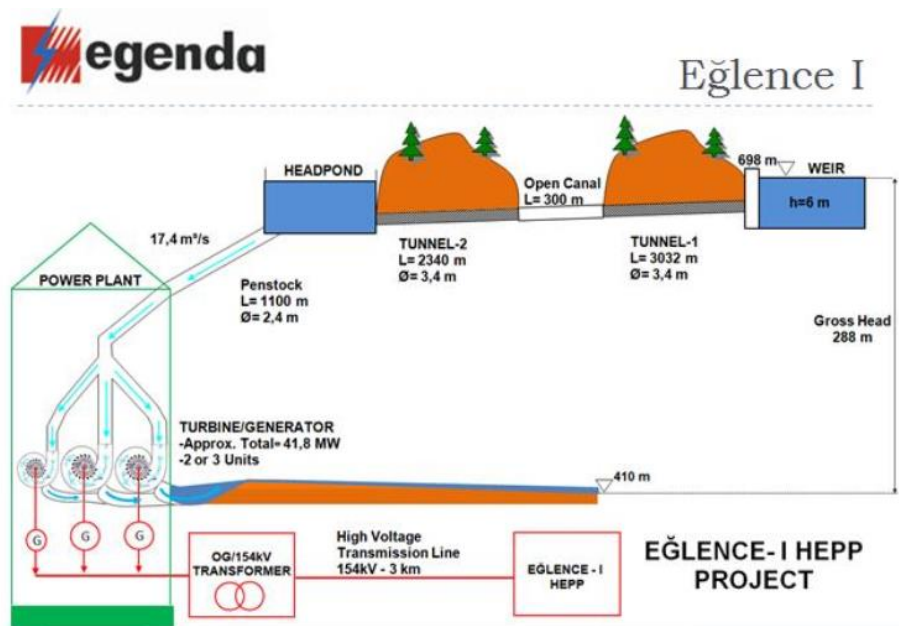


Figure 7 Eğlence I HEPP Project Boundary

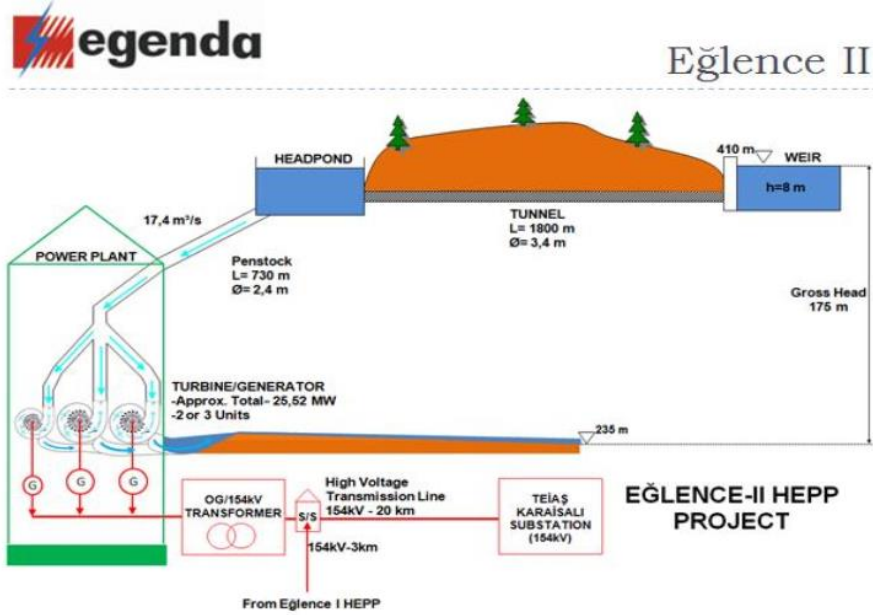


Figure 8 Eğence II HEPP Project Boundary

The greenhouse gases and emission sources included in or excluded from the project boundary are listed in the table below:

Source	Gas	Included?	Justification/Explanation	
Baseline	Generation mix of electricity grid in Turkey	CO ₂	Yes	CO ₂ emission from fossil fuel fired power plant that are displaced due to project activity was considered.
		CH ₄	No	Minor emission sources as suggested by ACM0002, Version 21.0
		N ₂ O	No	Minor emission sources as suggested by ACM0002, Version 21.0
		Other	No	Minor emission sources as suggested by ACM0002, Version 21.0
Project	Construction and Operation of the project activity	CO ₂	No	As net electricity approach is adopted, emissions that occur during construction and during the operation are negligible and non-existent respectively.
		CH ₄	No	Minor emission sources as suggested by ACM0002, Version 21.0
		N ₂ O	No	Minor emission sources as suggested by ACM0002, Version 21.0

Source	Gas	Included?	Justification/Explanation
	Other	No	Minor emission sources as suggested by ACM0002, Version 21.0. Emissions that occur during the construction are negligible.

3.4 Baseline Scenario

According to the Tool 11: Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period, Version 3.0.1, there are two steps to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period.

The first step provides an approach to evaluate whether the current baseline is still valid for the next crediting period. The second step provides an approach to update the baseline in case that the current baseline is not valid anymore for the next crediting period.

Step 1: Assess the validity of the current baseline for the next crediting period

The “Procedures for the renewal of the crediting period of a registered CDM project activity” approved by the CDM Executive Board require assessing the impact of new relevant national and/or sectoral policies and circumstances on the baseline. The validity of the current baseline is assessed using the following Sub-steps:

Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies:

The current baseline complies with all relevant mandatory national and/or sectoral policies which have come into effect after the submission of the project activity for validation or the submission of the previous request for renewal of the crediting period and are applicable at the time of requesting renewal of the crediting period.

Step 1.2: Assess the impact of circumstances:

The baseline circumstances are no valid in the second crediting period since the national grid properties / shares of each technology, etc. have been changed.

Step 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested:

There is no change in the investment type and technology in the second crediting period.

Step 1.4: Assessment of the validity of data and parameters:

The default values and ex-ante values have been changed.

Although there is no change in national/sectoral policies affecting project implementation (Step 1.1.) and investment and technology (Step 1.3.), the current situations such as margin calculations (Step

1.2) and parameters not monitored (Step 1.4) have been changed. In this regard, **Step 2** has been applied.

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

Step 2.1: Update the current baseline

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”.

Step 2.2: Update the data and parameters:

Default values and ex-ante values have been revised. Combined margin is revised as follows.

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times 0.25 + EF_{grid,BM,y} \times 0.75$$

$$EF_{grid,CM,y} = 0.7424 \times 0.25 + 0.3680 \times 0.75 = \mathbf{0.4616 \text{ tCO}_2/\text{MWh}}$$

New combined margin is calculated as 0.4616 tCO₂/MWh using values by Ministry of Energy and Natural Resources.

Turkish electricity generation is mainly composed of thermal power plants and the share of renewable resources. Since Turkey is an advanced developing country, there is an increasing demand for electricity which is fully expected to continue in the foreseeable future.

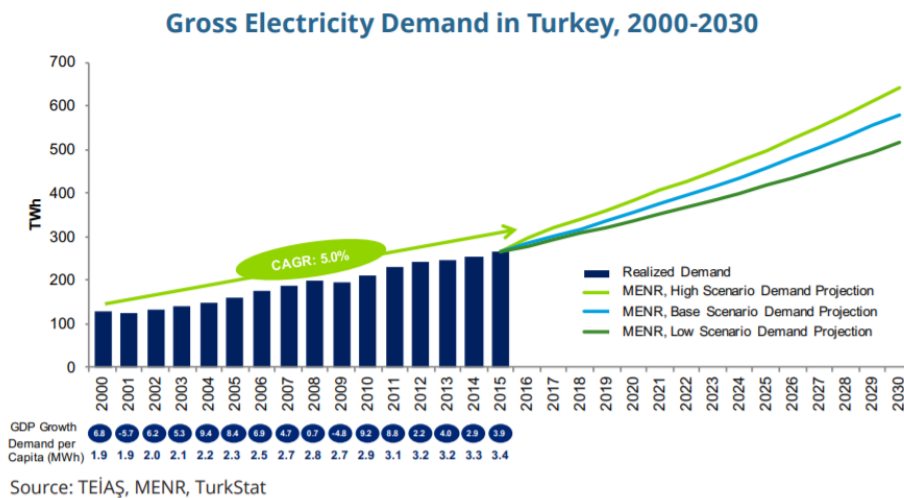


Figure 9. Turkey’s electricity demand projection²⁸

Turkey as a developing nation has been dealing with energy security by developing and constructing high-capacity coal and natural gas power plants (Figure 10). The development of thermal power

²⁸ <https://www.dunyaenerji.org.tr/wp-content/uploads/2017/10/turkish-energy-market-outlook.pdf>

plants has also been encouraged by the large natural resource availability, especially the abundance of economically accessible lignite (Figure 11).

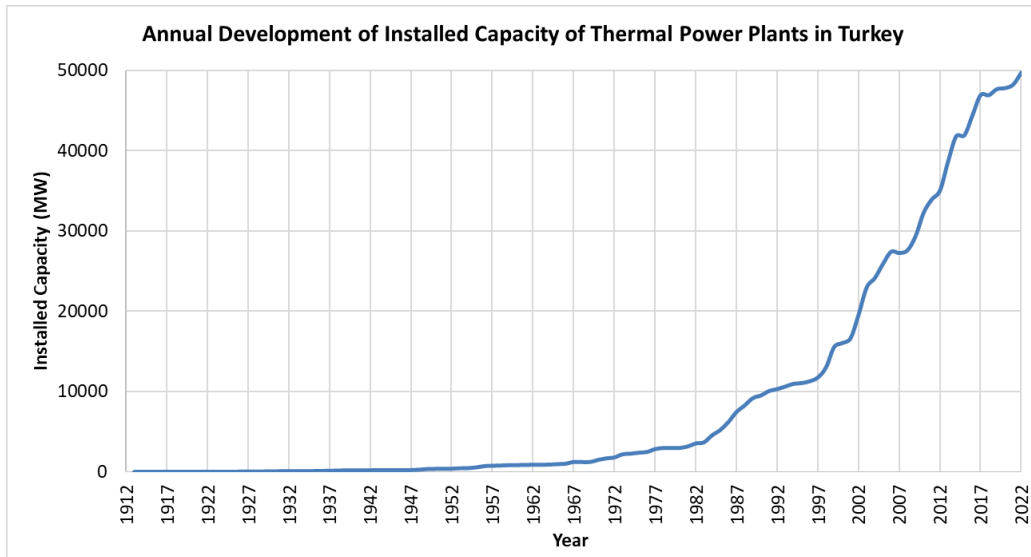


Figure 10. Development of Turkey’s Thermal Power Plants’ Installed Capacity²⁹

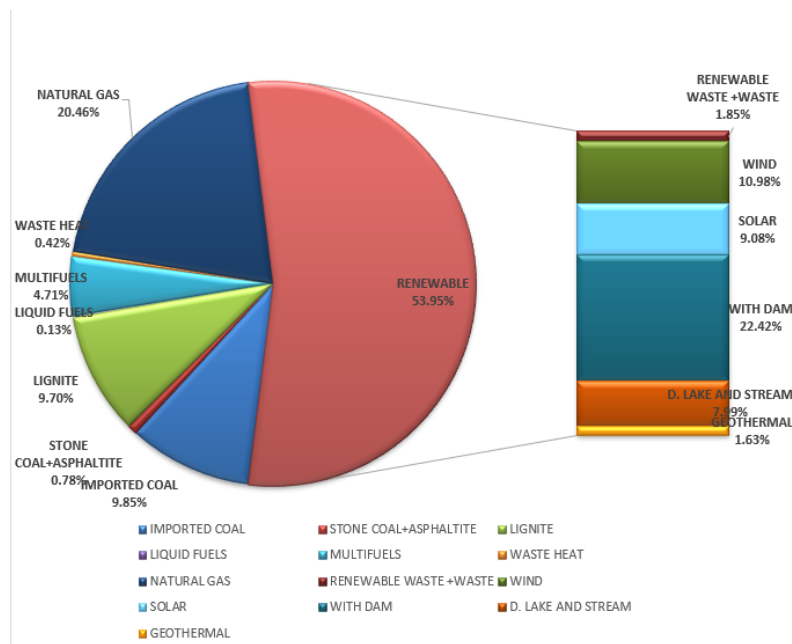


Figure 11. Distribution of installed capacity by primary energy resources (published in 2023)³⁰

²⁹ Published by TEİAŞ in 2023 <https://webim.teias.gov.tr/file/0c1d3422-3ffc-4a38-843f-3dd39300dd14?download>

³⁰ Published by TEİAŞ in 2023 <https://webim.teias.gov.tr/file/2acaeaa8-542e-47a7-a9f5-73e013bb93ff?download>

In the absence of the proposed project activity, the same amount of electricity would be required to be supplied by either the current power plants or the new thermal power plants which would lead to increasing GHG emissions.

According to the TEİAŞ statistics³¹, share of HEPP's in total installed capacity of Turkey is about 30.41% (sum of dam (22.42%) and lake and stream (7.99%)) (Figure 11), whereas share of HEPP's in total generation is only 19.3%³². The share of coal and natural gas for the year 2023 in the electricity generation adds up to 57.1% which is higher value compared to that of HEPP's i.e., 19.3%³³. When the historical data is examined, it is observed that total installed capacity of thermal power plants has shown a rapid growth (Figure 10) in parallel with the demand for electricity. As can be seen in Figure 13, in terms of installed capacity thermal power plants dominate the electricity grid more compared to renewable energy source hydro.

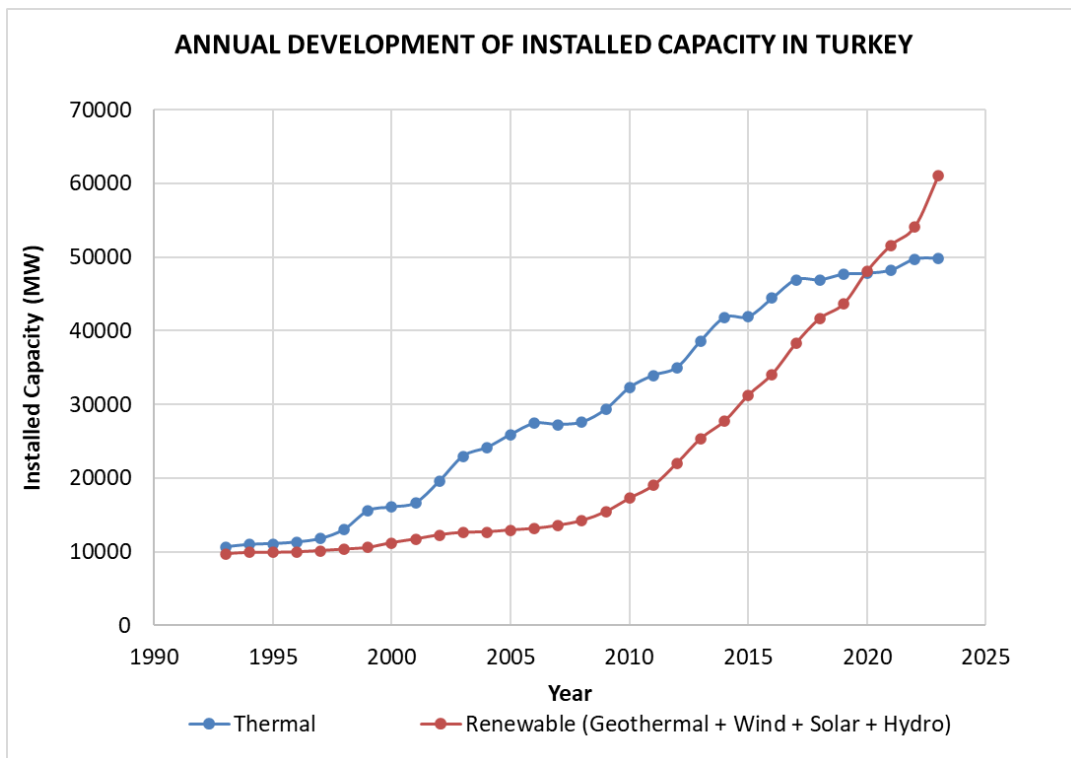


Figure 12. Annual Development of Installed Capacity in Turkey (thermal vs. renewables)³⁴

³¹ Published by TEİAŞ in 2023 <https://webim.teias.gov.tr/file/2acaeaa8-542e-47a7-a9f5-73e013bb93ff?download>

³² Published by TEİAŞ in 2023 <https://webim.teias.gov.tr/file/1b29994c-5a86-4815-8807-ad6fe596817e?download>

³³ Published by TEİAŞ in 2023 <https://webim.teias.gov.tr/file/1b29994c-5a86-4815-8807-ad6fe596817e?download>

³⁴ Published by TEİAŞ in 2023 <https://webim.teias.gov.tr/file/2f8c01e1-a21d-45e8-86db-0b648ca3cfa2?download>

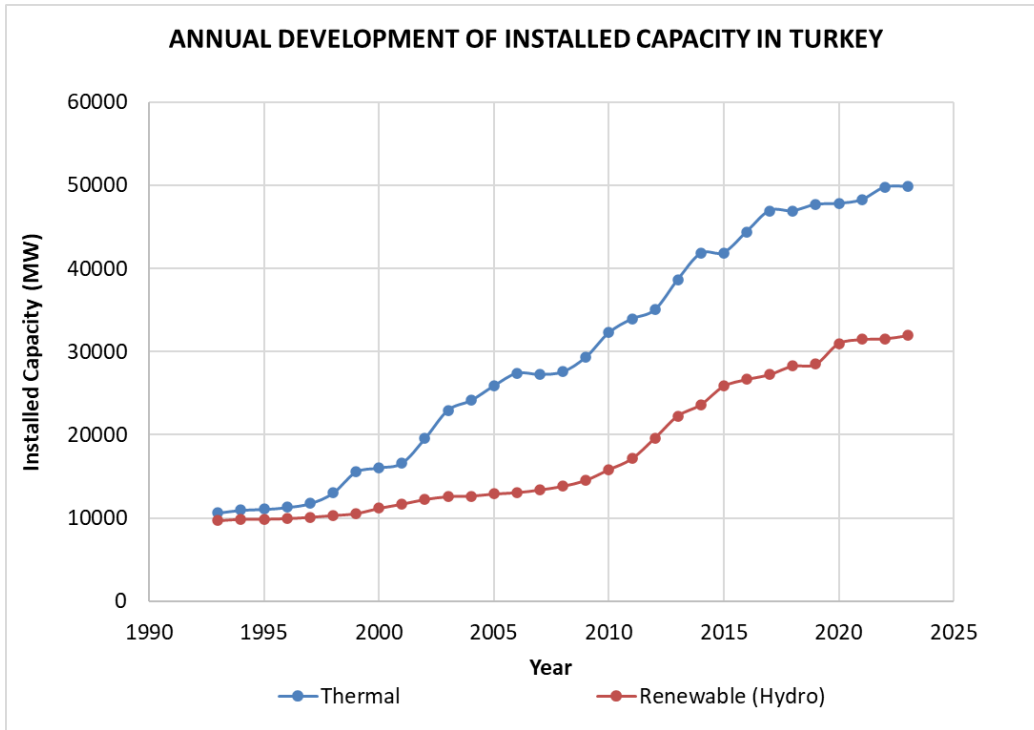


Figure 13 Annual Development of Installed Capacity in Turkey (thermal vs. hydro)³⁵

The installed capacity share of the renewable power plants including wind, solar, hydro and geothermal energy has increased to (Figure 11) 53.95% and therefore that of thermal power plants reached to 46.05%. Even though the installed capacity of the renewables has surpassed installed capacity of thermal power plants, electricity generation by the renewables has been less as shown in Figure 14. In terms of electricity generation, the share of renewable sources in total electricity generation is 39.65% and therefore the share of thermal power plants is 60.35%, which means that the thermal power plants still dominate the electricity grid of Turkey.

Figure 15 below shows the change in electricity generation for thermal and hydro sources. It can be seen that HEPPs dominate the electricity grid less than thermal power plants do.

³⁵ Published by TEİAŞ in 2023 <https://webim.teias.gov.tr/file/2f8c01e1-a21d-45e8-86db-0b648ca3cfa2?download>

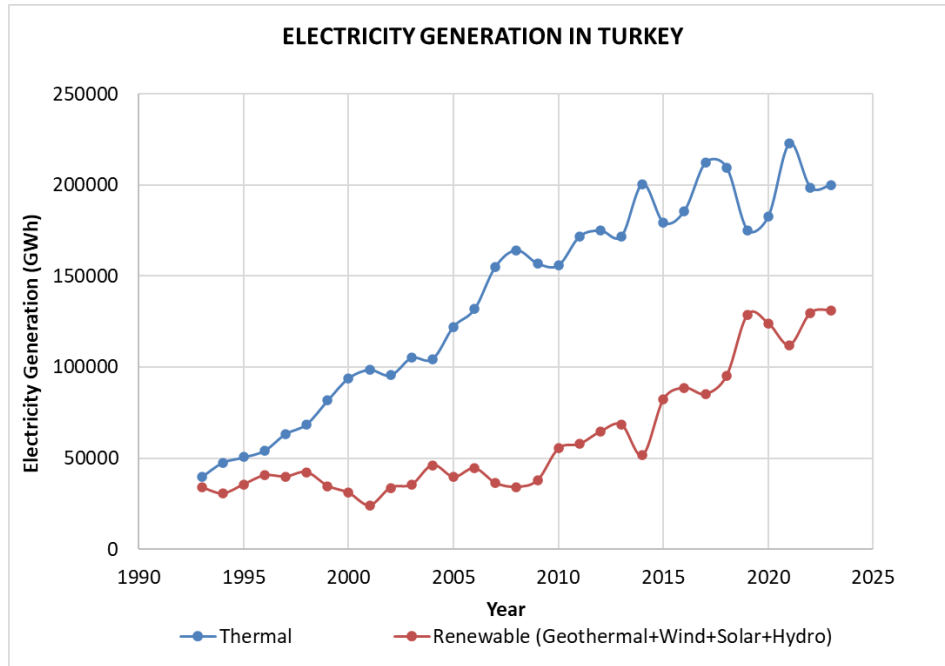


Figure 14 Electricity Generation in Turkey (thermal vs. renewables)³⁶

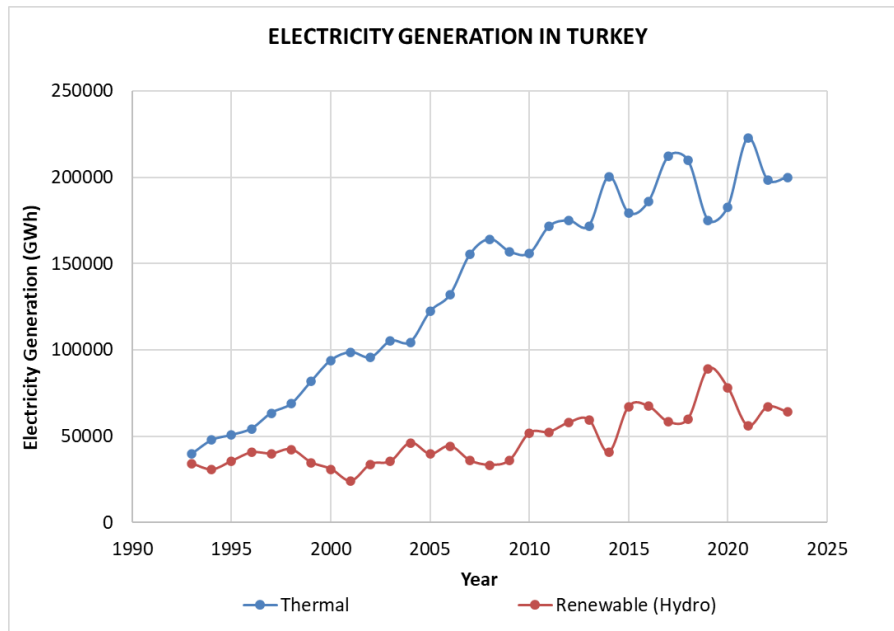


Figure 15. Annual Development of Electricity Generation in Turkey (thermal vs. hydro)³⁸

³⁶ Published by TEİAŞ in 2023 <https://webim.teias.gov.tr/file/2f8c01e1-a21d-45e8-86db-0b648ca3cfa2?download>

³⁸ Published by TEİAŞ in 2023 <https://webim.teias.gov.tr/file/2f8c01e1-a21d-45e8-86db-0b648ca3cfa2?download>

3.5 Additionality

This is the second crediting period. In the first crediting period, additionality of the project was presented. There has been no capacity change in the project between the first and the second crediting period. The Project is in compliance with all required relevant regulations but is not a mandatory Project. There is no change in the relevant national and/or sectoral regulations with respect to project activity or its technology till date through which the project activity is not found mandated by regulations. There is no breach of any legislation, and all required permits are obtained. Laws and regulations that apply for power generation facilities in the host country are mentioned in Section 1.15 of this PD. Hence this project is a regulatory surplus.

Ongoing Financial Need

During the first crediting period (11/08/2009-10/08/2016), first monitoring period (10/04/2013-31/12/2020) 706,792 credits were issued. Moreover, the last verification of the first crediting period is also under preparation and the physical site visit by the VVB has been done. The project conducts issuances due to its need of the revenue from carbon credits, even though the validation/verification fees have increased as well as issuance fees. Therefore, the project is willing to receive revenue from the carbon credits.

As of the end of 2023, the project has completed ten-year fixed feed-in-tariff period, i.e. the YEK-DEM⁴⁴ mechanism, income is lower due to lower market sales price (instead of fixed tariff) of electricity and increasing maintenance costs. The electricity is sold to grid at unpredictable, fluctuating unit price. The system uses and distribution fees has increased significantly, compared to the situation during implementation. Hence, significance of carbon revenues will be higher in the following years.

The implemented hydromechanical equipment have been operational since 26/03/2013 and 04/06/2013 for Eğlence-II and Eğlence-I, respectively. The hydromechanical equipment is therefore, around 11 years old. The older the hydromechanical equipment get, their O&M costs and operational problems become more frequent. This also applies to other equipment which have been in operation for similar timelines.

As per the registered PD, the corporate tax rate in Turkey was 20% during the implementation of the project which has increased to 25%⁴⁵ in 2023, which is the latest corporate tax % applied in Türkiye in 2024.

During the first crediting period, the VCUs and the corresponding monitoring periods are as follows.

1st CP - 1st MP (10/04/2013 – 31/12/2020): 706,792 tCO₂e

⁴⁴ Section 3 : <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=18907&MevzuatTur=7&MevzuatTertip=5>

⁴⁵ <https://www.pwc.com.tr/kurumlar-vergisi-orani>

The ongoing financial need derived from VCS certification is necessary to reduce unattractiveness of the project and enhance the project's operation in the third crediting period. This VCS finance helps to maintain project activity contributing to the development of local communities in terms of income and employment creation, worker quality increase and emission reductions.

3.5.1 Regulatory Surplus

Is the project located in an UNFCCC Annex 1 or Non-Annex 1 country?

- Annex 1 country Non-Annex 1 country

Are the project activities mandated by any law, statute, or other regulatory framework?

- Yes No

If the project is located inside a Non-Annex 1 country and the project activities are mandated by a law, statute, or other regulatory framework, are such laws, statutes, or regulatory frameworks systematically enforced?

- Yes No

The project is not located inside a Non-Annex 1 country and it is not mandated by any law.

3.5.2 Additionality Methods

In the first crediting period, additionality of the project was presented. There has been no capacity change in the project between the first and the second crediting period.

3.6 Methodology Deviations

No methodology deviations occurred.

4 QUANTIFICATION OF ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Accordingly, the baseline emissions BE_y are calculated as following:

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

where,

BE_y	Baseline emissions (tCO ₂ e)
$EG_{PJ,y}$	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh)
$EF_{grid,CM,y}$	Combined margin CO ₂ emission factor for grid connected power generation in year y calculated using the latest version of TOOL07 (v 07.0) “Tool to calculate the emission factor for an electricity system” (tCO ₂ e/MWh)

Emission factor calculated according to selected methodology and according to the Ministry of Energy and Natural Resources document named as Türkiye’s National Electricity Network Emission Factor Factsheet (20/09/2022), OM is calculated as 0.7424 tCO₂/MWh whereas BM is 0.3680 tCO₂/MWh. Therefore, CM is calculated as 0.6488 whereas 0.25 and 0.75 weightage factor given to OM and BM, respectively⁴⁶.

Since National Emission Factor calculated by Republic of Türkiye Ministry of Energy and Natural Resources was used, Step-1, Step-2, Step-3, Step-4, and Step-5 was conducted by the Ministry.

Step-6 is applied as follows:

Weighted average CM is calculated using weights, as per Equation 16.

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM}$$

Hydroelectric project activities: $w_{OM} = 0.25$ and $w_{BM} = 0.75$ for the crediting period and for subsequent crediting periods.⁴⁷ Hence:

⁴⁶ https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%C4%B0klim/%C4%B0klimDe%C4%9Fi%C5%9Fikli%C4%9Fi/TUES EmisyonFktr/Belgeler/2020_Sebeke_EF.pdf

⁴⁷ Para. 86(a) : <https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-07-v7.0.pdf>

$$EF_{\text{grid,CM},y} = EF_{\text{grid,OM},y} \times 0.25 + EF_{\text{grid,BM},y} \times 0.75$$

$$EF_{\text{grid,CM},y} = 0.7424 \times 0.25 + 0.3680 \times 0.75 = \mathbf{0.4616 \text{ tCO}_2/\text{MWh}}$$

Accordingly, BE_y is calculated as follows:

$$BE_y = 205,299 \text{ MWh}/y \times 0.4616 \text{ tCO}_2/\text{MWh} = 94,766 \text{ MWh}$$

4.2 Project Emissions

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

where:

PE_y = Project emissions in year y ($\text{tCO}_2\text{e}/\text{yr}$)

$PE_{\text{FF},y}$ = Project emissions from fossil fuel consumption in year y (tCO_2/yr)

$PE_{\text{GP},y}$ = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y ($\text{t CO}_2\text{e}/\text{yr}$)

$PE_{\text{HP},y}$ = Project emissions from water reservoirs of hydro power plants in year y ($\text{tCO}_2\text{e}/\text{yr}$)

- Since this project uses hydroelectric power, $PE_{\text{GP},y}$ is “0” (tCO_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 paragraph 33 of “ACM0002: Grid-connected electricity generation from renewable sources, v21.0”. Hence it is neglected. Therefore, $PE_{\text{FF},y} = 0$ (tCO_2/yr)

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

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

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/m^2)	43,500,000	27,200,000
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 (m^2)	0	0
PD	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.	687,53	1,862.53

Since the power density values for both plants are greater than $10 W/m^2$, $PE_{HP,y}$ 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.

4.3 Leakage Emissions

The energy generating equipment is not transferred from or to another activity. Therefore, leakage is also considered as “0”⁴⁸.

$$LE_y = 0$$

As a result, Total Emission Reduction is:

⁴⁸ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-05-v3.0.pdf>, Paragraph 6, item a

$$ER_y = BE_y$$

4.4 Estimated GHG Emission Reductions and Carbon Dioxide Removals

Emission reductions are calculated as follows. As per paragraph 62 of applied methodology ACM0002 version 21.0.

$$ER_y = BE_y - PE_y \tag{Equation (17)}$$

Where:

- ER_y = Emission reductions in year y (t CO₂e/yr)
- BE_y = Baseline emissions in year y (t CO₂/yr)
- PE_y = Project emissions in year y (t CO₂e/yr)

Vintage period	Estimated baseline emissions (tCO ₂ e)	Estimated project emissions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated reduction VCU (tCO ₂ e)	Estimated removal VCU (tCO ₂ e)	Estimated total VCUs (tCO ₂ e)
10 April 2023 to 31 December 2023	69,062	0	0	69,062	69,062	69,062
01 January 2024 to 31 December 2024	94,766	0	0	94,766	94,766	94,766
01 January 2025 to 31 December 2025	94,766	0	0	94,766	94,766	94,766
01 January 2026 to 31 December 2026	94,766	0	0	94,766	94,766	94,766
01 January 2027 to 31 December 2027	94,766	0	0	94,766	94,766	94,766
01 January 2028 to 31	94,766	0	0	94,766	94,766	94,766

Vintage period	Estimated baseline emissions (tCO _{2e})	Estimated project emissions (tCO _{2e})	Estimated leakage emissions (tCO _{2e})	Estimated reduction VCU (tCO _{2e})	Estimated removal VCU (tCO _{2e})	Estimated total VCUs (tCO _{2e})
December 2028						
01 January 2029 to 31 December 2029	94,766	0	0	94,766	94,766	94,766
01 January 2030 to 31 December 2030	94,766	0	0	94,766	94,766	94,766
01 January 2031 to 31 December 2031	94,766	0	0	94,766	94,766	94,766
01 January 2032 to 31 December 2032	94,766	0	0	94,766	94,766	94,766
01 January 2033 to 09 April 2033	25,704	0	0	25,704	25,704	25,704
Total	947,660	0	0	947,660	947,660	947,660

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	EF _{grid,CM,y}
Data unit	tCO ₂ / MWh
Description	CO ₂ emission factor of the grid electricity in year y

Source of data	Combined margin emission factor calculated by Turkey Ministry of Energy and Natural Resources ⁴⁹
Value applied	0.4616
Justification of choice of data or description of	Tool 07: Tool to calculate the emission factor for an electricity system, version 07.0

Combined margin emission factor calculated by Turkey Ministry of Energy and Natural Resources⁴⁹

The weblink may not be accessible to connections outside of Turkey. Therefore, the documents is as follows:

Original:

TÜRKİYE ULUSAL ELEKTRİK SEBEKESİ EMİSYON FAKTÖRÜ BİLGİ FORMU

Hesaplama Dönemi: 2020
Hesaplama Yayın Tarihi: 20.09.2022
Hesaplama Revizyon No: 00

Amaç:
Yüksek çabak hesaplanan Türkiye ulusal elektrik şebekesi emisyon faktörünün bildirilmesidir.

Kapsam:
Bu bilgi formunda Faaliyet Temelli Marj (Operating Margin-OM), Gelmiş Temelli Marj (Build Margin-BM) ve Birleşik Marj (Combined Margin-CM) Emisyon Faktörlerinin ilgili yıl için hesaplanan değerleri yer almaktadır.

Hesaplama Metodolojisi:
Hükümetler arası İklim Değişikliği Paneli (IPCC)'nin Temiz Kalkınma Mekanizması Tool 07-V07.0 yöntemi kullanılmıştır.

Veri Seti:

- TEİAŞ Türkiye elektrik üretim-tüketim ve kayıplar istatistikleri,
- Türkiye'nin Ulusal Sera Gazı Emisyon Raporu kapsamında hazırlanan Ortak Raporlama Formatı- Common Reporting Format (CRF) tablolarında yer alan elektrik üretimi (1.A.1.a.) emisyon değerleri,
- TEİAŞ Yük Tesis Daire Başkanlığı'ndan elektrik üretim santrallerinin kronolojik sıra ile devreye alınma tarihleri, santral isimleri, yakıt tipleri, kurulu güç değerleri, hesaplanan yıl için elektrik üretim miktarları,
- Gold Standard (GS), Verified Carbon Standard (VCS) ve Global Carbon Council (GCC) web adreslerinden gönüllü karbon azaltım sertifikası sahipliği durumu ve
- Temiz Kalkınma Mekanizması-Clean Development Mechanism (CDM) Tool 09-V03.0'den santral verim rakamları kullanılmıştır.

Elektrik Şebekesi Emisyon Faktörü:

Faktor Türü	Yıl	Değeri (CO ₂ /MWh)
Faaliyet temelli marj emisyon faktörü	2020	0,7424
Gelmiş temelli marj emisyon faktörü	2020	0,3680

TÜRKİYE ULUSAL ELEKTRİK SEBEKESİ EMİSYON FAKTÖRÜ BİLGİ FORMU

Faaliyet temelli marj ve gelişim temelli marj emisyon faktörü rakamları birleşik marj emisyon faktörünün hesaplanmasında kullanılmaktadır.

Hesaplanan faaliyet temelli marj ve gelişim temelli marj kullanılarak güneş ve rüzgâr kaynaklı elektrik üretim santralleri ve diğer yenilenebilir enerji santralleri için iki farklı birleşik marj emisyon faktörü hesaplanmıştır.

Faktor Türü	Yıl	Değeri (CO ₂ /MWh)
Birleşik marj emisyon faktörü (güneş ve rüzgâr)	2020	0,6488
Birleşik marj emisyon faktörü (diğer yenilenebilir)	2020	0,5552

Yenilenebilir enerji kaynaklı elektrik üretimi ile sağlanacak sera gazı salım (SGS) azaltım hesaplanmasında kaynak türüne göre hesaplanan birleşik marj emisyon faktörleri kullanılacaktır.

EVGED, Çevre ve İklim Daire Başkanlığı - Telefon: +90 312 548 50 2500
e-posta: sem.kim@enerji.gov.tr

Yasal Bilgilendirme:
Yayımlanan bilgilerin güncelliği, doğruluğu, güvenliği ve tamlığı konusunda kim bir çalışmaya rağmen ulaşılabilecek hatalardan Enerji Verimliliği ve Çevre Dairesi (EVGED) hiçbir şekilde sorumlu tutulamaz. Bilgilerin yanlış kullanılması veya yorumlanması sonucunda doğrudan veya dolaylı bir zarar oluşması halinde EVGED'e hiçbir sorumluluk veya maddiyet yüklenmez. EVGED bilgilendirmede yer alan bilgilerin önceden bildirimde bulunmaksızın değiştirilebilir veya kullanım dışı bırakılabilir.

English Translation:

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TURKEY NATIONAL ELECTRICITY NETWORK EMISION FACTOR INFORMATION FORM

Calculation Period: 2020
Calculation Release Date: 20.09.2022
Calculation Revision No: 00

Purpose:
To inform the Turkish national electricity grid emission factor calculated annually.

Scope:
This information sheet contains the calculated values of the Operating Margin-OM, Build Margin-BM and Combined Margin-CM Emission Factors for the relevant year.

Calculation Methodology: The Clean Development Mechanism Tool 07-V07.0 method of the Intergovernmental Panel on Climate Change (IPCC) was used.

Data Set:

- TEİAŞ Turkey electricity generation-consumption and losses statistics, 2. Electricity generation (1.A.1.a.) in the Common Reporting Format (CRF) tables prepared within the scope of Turkey's National Greenhouse Gas Inventory Report emission values,
- Commissioning dates of electricity generation plants in chronological order from TEİAŞ Load Dispatch Department plant names, fuel types, installed power values, electricity generation amounts for the calculated year,
- Gold Standard (GS), Verified Carbon Standard (VCS) and Global Carbon Council (GCC) web addresses for voluntary carbon reduction certificate ownership and 5. Clean Development Mechanism (CDM) Tool 09-V03.0's plant efficiency figures from VCS.0 are used.

Electricity Network Emission Factor:

Faktor Türü	Yıl	Value (CO ₂ /MWh)
Activity based margin emission factor	2020	0.7424
Development based margin emission factor	2020	0.3680

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TURKEY NATIONAL ELECTRICITY NETWORK EMISION FACTOR INFORMATION FORM

The activity-based margin and development-based margin emission factor figures are used to calculate the combined margin emission factor.

Using the calculated activity-based margin and the development-based margin, two different combined margin emission factors are calculated for solar and wind power generation plants and other renewable power plants.

Faktor Türü	Yıl	Value (CO ₂ /MWh)
Combined margin emission factor (solar and wind)	2020	0.6488
Combined margin emission factor (other renewables)	2020	0.5552

Combined margin emission factors calculated according to the source type can be used in the greenhouse gas emission (SGS) reduction calculations to be provided by electricity generation from renewable energy.

EVGED, Environment and Climate Department - Phone: +90 312 548 50 2500
e-mail: sem.kim@enerji.gov.tr

Legal Disclosure:
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<https://enerji.gov.tr//Media/Dizin/EVCED/tr/%C3%87evreVe%cc4%B0klim/%C4%B0klimDe%C4%9Fi%C5%9Fi%Cl4%9Fi/TUES EmisyonFktr/Belgeler/Bform2020.pdf>

measurement methods and procedures applied	
Purpose of data	Baseline emission calculation
Comments	-

Data / Parameter	CAP _{BL}
Data unit	W
Description	Installed capacity of the hydro power plant before the implementation of the project activity.
Source of data	Project Site
Value applied	(For both Eğlence I and II HEPP) 0
Justification of choice of data or description of measurement methods and procedures applied	For new hydro power plants, this value is zero
Purpose of data	To calculate Project Density value
Comments	-

Data / Parameter	A _{BL}
Data unit	m ²
Description	Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m ²).
Source of data	Project Site
Value applied	(For both Eğlence I and II HEPP) 0
Justification of choice of data or description of measurement methods and procedures applied	For new hydro power plants, this value is zero
Purpose of data	To calculate Project Density value
Comments	-

5.2 Data and Parameters Monitored

Data / Parameter	EG_{PJ, facility, y}
Data unit	MWh
Description	Quantity of net electricity delivered to the grid in year y.
Source of data	PMUM (Market Financial Settlement Center) records
Description of measurement methods and procedures to be applied	The produced and consumed electricity is continuously measured by the main and check meters attached to the power plant. This continuous measurement is recorded in a monthly basis.
Frequency of monitoring/recording	Continuous measurement and at least monthly recording
Value applied	205,299 MWh/year
Monitoring equipment	Electricity meters
QA/QC procedures to be applied	Cross check measurements result with records for sold electricity. Calibration of all the meters will be undertaken at required intervals and faulty meters will be duly replaced immediately.
Purpose of data	To calculate the quantity of net electricity delivered to the grid
Calculation method	$EG_{Facility, y} = EG_{export, y} - EG_{import, y}$
Comments	-

Data / Parameter	CapPJ
Data unit	MW
Description	Installed capacity of the Egience-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 applied	43.50 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 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 applied	27.20 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 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 applied	Eglence I: 63,270 m ² Eglence II: 14,604 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 data	Project emission calculations
Calculation method	-
Comments	Maximum area is already calculated and confirmed through technical drawings. The Google Earth images are shared with VVB. Annual measurements are not expected to be higher than this value.

Data / Parameter	Quantitative Employment
Data unit	Number of employed staff
Description	To monitor the contribution of the project to SDG 8, the number of employed staff is monitored.
Source of data	Social Security Records
Description of measurement methods and procedures to be applied	Social Security Records
Frequency of monitoring/recording	Annually
Value applied	The number of employees is 14 for Eglence I and 11 for Eglence II, in total 25 people are employed. ⁵⁰
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	To monitor the contribution of the project to SDG 8 goal
Calculation method	-
Comments	-

Data / Parameter	Qualitative Employment
Data unit	Hours of training provided
Description	To monitor the contribution of the project to SDG 8, the trainings provided are monitored.
Source of data	Training Records
Description of measurement methods and procedures to be applied	Training Records
Frequency of monitoring/recording	Annually
Value applied	14 hours of Occupational Health and Safety training, 4 hours of Emergency Training and Drills, 4 hours of Working at Height

⁵⁰ Please see the Social Security Records for both Eglence I and Eglence II

	Drill, 5 hours of Carbon Footprint Training, 1 hour of Training on what to do in disasters in workplaces and 1 hour of Body Language Training are provided to the employees. ⁵¹
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	To monitor the contribution of the project to SDG 8 goal
Calculation method	-
Comments	-

5.3 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.

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. Should nonconformity was identified; 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

⁵¹ Please see the Training Records

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, analysing 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.

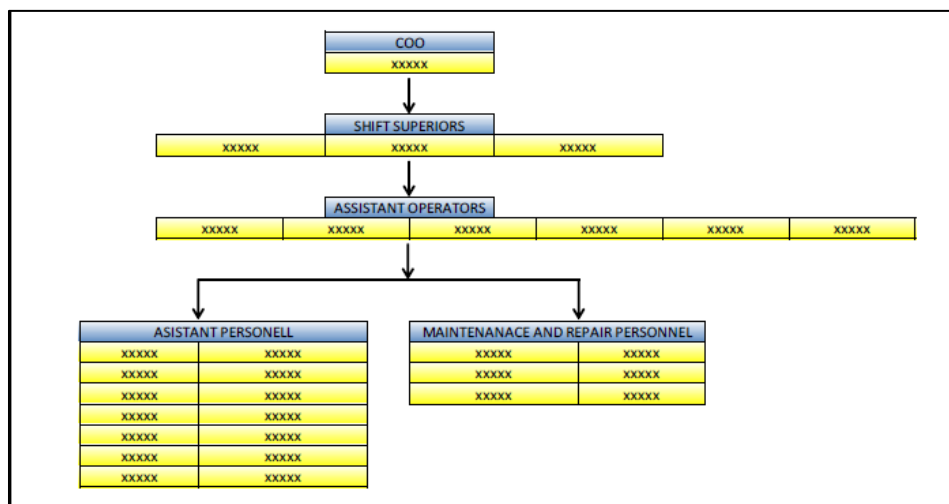


Figure 16 Site Organizational Chart

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.

Two calibrated meters are back up each other. 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. As per the regulations, calibration is valid for 10 years⁵². The meters are tested every 2 years⁵³.

The main meters and back-up meters for Eglence I-II HEPP were changed on 22 May 2021 by the decision of the distribution company. First index protocol date (test date) of the Eglence I HEPP and Eglence II HEPP meters was on 22 May 2021. Eglence I HEPP and Eglence II HEPP meters were calibrated on 30 December 2020 and 31 December 2020 by TEIAS respectively. Properties of the meters are given by Table 3 below.

Table 3 Meter Properties

	Eglence I		Eglence II	
	Replaced	New	Replaced	New
Brand	ITRON	EMH	ITRON	EMH
Model	SL761B071	LZQJ-XC	SL761B071	LZQJ-XC
Standard/Class	0.5s	0.5s	0.5s	0.5s
Serial Number	Main:65000771 Back-up: 65000770	Main: 9798953 Back-up: 9798954	Main: 65000772 Back-up: 65000773	Main: 9798955 Back-up: 9798956

Table 4 Dates of testing for the currently active main and spare meters

	Meter	Serial No	Date of Testing	Calibration Date
Eglence I	Main	9798953	22 May 2021	30 December 2020
	Spare	9798954		
Eglence II	Main	9798955	22 May 2021	31 December 2020
	Spare	9798956		

⁵² <https://www.resmigazete.gov.tr/eskiler/2023/11/20231123-2.htm>

⁵³ <https://www.mevzuat.gov.tr/MevzuatMetin/yonetmelik/7.5.6381.pdf>

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

Use the table below to describe the commercially sensitive information included in the project description 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.