Efeler GPP Capacity Extension Project

Non-Technical Summary

October 2018

Quality information

Prepared by	Checked by	Approved by
AECOM Turkey	Burcu Yazgan Kayabali, ESIA and EDD Section Manager	Dr. Hande Yukseler Environment End Market (EM) Director Turkey

Revision History

Revision	Revision date	Details	Authorized	Name	Position
Rev1	30.03.18	Draft	30.03.18	Dr. Hande Yükseler	Environment End Market (EM) Director Turkey
Rev2	13.06.18	Draft	13.06.18	Dr. Hande Yükseler	Environment End Market (EM) Director Turkey
Rev3	22.06.18	Draft	22.06.18	Dr. Hande Yükseler	Environment End Market (EM) Director Turkey
Rev4	19.07.2018	Draft	19.07.2018	Dr. Hande Yükseler	Environment End Market (EM) Director Turkey
Rev5	23.10.2018	Final Draft	23.10.2018	Dr. Hande Yükseler	Environment End Market (EM) Director Turkey

Prepared for:

Gurmat Elektrik Uretim A.Ş.

Prepared by:

Aecom Turkey Danışmanlık ve Mühendislik Ltd. Şti
Mustafa Kemal Mahallesi Dumlupınar Bulvarı Tepe Prime
No:266 B Blok
No:50-51 06800
Çankaya
Ankara
Turkey

T: +90 312 4429863
aecom.com

Table of Contents

List of Acronyms

Acronym	Description
AR5	IPCC Assessment Report 5
CH	Critical Habitat
CIA	Cumulative Impact Assessment
CSR	Corporate Social Responsibility
EBRD	European Bank for Reconstruction and Development
EIA	Environmental Impact Assessment
EMRA	Energy Market Regulatory Authority
ESAP	Environmental and Social Action Plan
ESP	Environmental and Social Policy
ESIA	Environmental and Social Impact Assessment
ESMAP	Energy Sector Management Assistance Program
EU	European Union
ETL	Energy Transmission Line
GEA	Geothermal Energy Association
GHG	Greenhouse Gas
GIIP	Good International Industrial Practice
GPP	Geothermal Power Plant
GWP	Global Warming Potential

Acronym	Description
HR	Human Resources
IAIA	International Association for Impact Assessment
IAPCR	Industrial Air Pollution Control Regulation
IUCN	International Union for Conservation of Nature
IBA	Important Bird Area
IPA	Important Plant Area
IFC	International Finance Corporation
IPCC	Intergovernmental Panel on Climate Change
KBA	Key Biodiversity Area
MoEU	Ministry of Environment and Urbanization
NCG	Non-condensable Gas
NTS	Non-technical Summary
OHS	Occupational Health and Safety
PAP	Project Affected People
PR	Performance Requirement
RAMEN	Regulation on Management and Assessment of Environmental Noise
REN21	the Renewable Energy Policy Network for the 21st Century
SEP	Stakeholder Engagement Plan
SLIP	Supplementary Lenders Information Package
SSC	Species Survival Commission
VESC	Valuable Ecosystem Component
WBCD	World Business Council for Sustainable Development
WRI	World Resource Institute
WWF	World Wide Fund for Nature
WWTP	Wastewater Treatment Plant

1. INTRODUCTION

Guris Insaat ve Muhendislik A.S. (“Guris”) was established in 1958 as Guris Kolektif and has been conducting its activities in construction, industry, energy, tourism and mining sectors. The sub-company of Guris involved in energy developments is the Mogan Enerji Yatirim Holding A. S. (“Mogan”), which, as stated in its website, aims to become a leading energy generation company in Turkey, through renewable energy projects. In line with this goal, Mogan is currently operating multiple geothermal power plants (GPPs), wind power plants and hydroelectric power plants, and a multitude of other Mogan renewable energy projects are either under construction or in development. Geothermal energy development of Mogan on the other hand is conducted by Gurmat Elektrik Uretim A.S. (“Gurmat Elektrik” or “the Project Company”), which was established in 1999. It is currently operating the largest GPP in Turkey, referred to as Gurmat-2 GPP, in Germencik district of Aydin province.

Gurmat Elektrik is planning to construct and operate the Efeler Geothermal Power Plant Capacity Extension Project (“Efeler GPP Project” or the “Project”) of the existing Gurmat-2 GPP. Existing Gurmat-2 GPPs in operation are Efe-1, Efe-2, Efe-3 and Efe-4 GPPs, whereas the Project consists of Efe-6, Efe-7 and Efe-8 GPPs. Of the Project GPPs, Efe-6 is in operation since August 2017, Efe-7 construction phase is ongoing and Efe-8 is currently in pre-construction planning stage.

The European Bank for Reconstruction and Development (EBRD) are considering providing a loan to Gurmat Elektrik for the Project. In line with the EBRD’s Environmental and Social Policy (2014), and its associated Performance Requirements (PRs), a project of this type and scale requires a fit for purpose Environmental and Social Impact Assessment (ESIA). Following a review of the previous Environmental Impact Assessment (EIA) reports prepared for Efe-6, Efe-7 and Efe-8 GPPs to meet National requirements, additional supplementary environmental and social studies have been developed to meet the EBRD PRs and international good practice. Therefore, the Project ESIA consists of the previous EIA report and the supplementary studies.

This Non-Technical Summary (NTS) is prepared as part of the Project ESIA to provide an easily understandable and compact summary of the results.

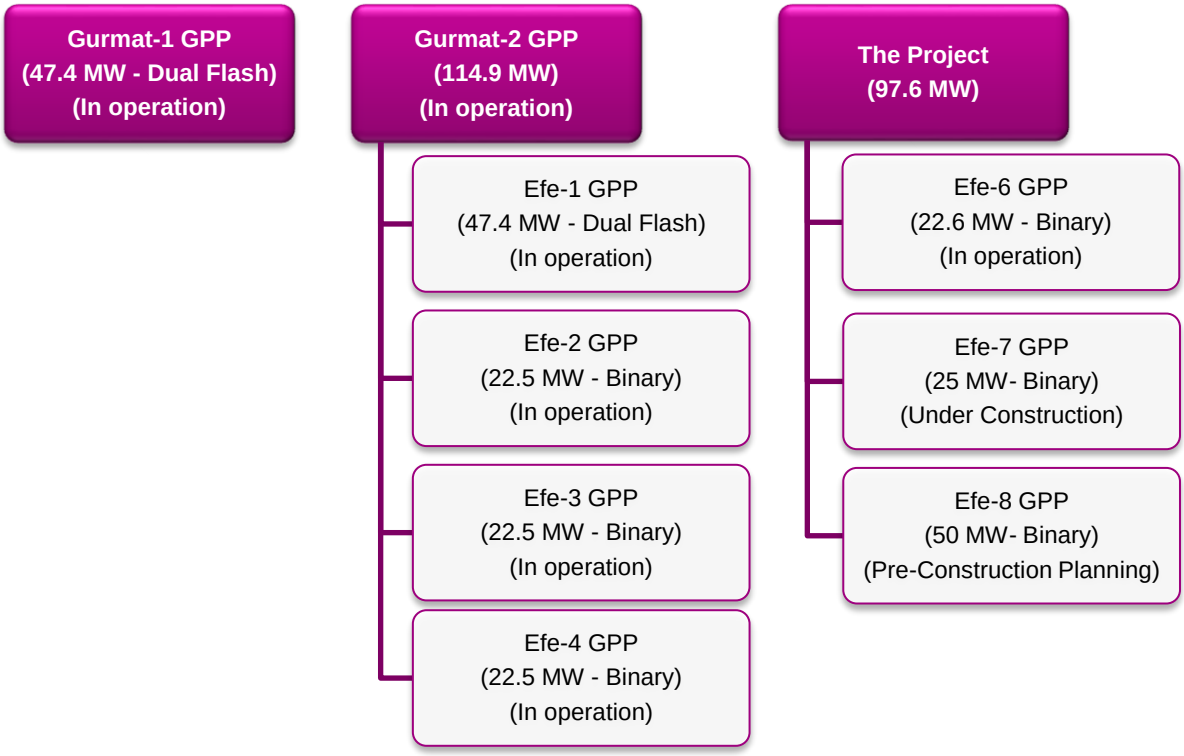
2. PROJECT DESCRIPTION

Turkey ranks 7th in the world and 1st in Europe in terms of geothermal potential and the country's potential geothermal energy capacity is 31,500 MWt (Ministry of Energy and Natural Resources website, http://www.enerji.gov.tr/). In 2015, with 159 MW of new geothermal installations, Turkey was the country that added the largest geothermal capacity and it is clear that even just based on the total potential of 31,500 MW, geothermal energy is still one of the most viable renewable generation technologies for Turkey.

This is also reflected in the Turkish Energy Policy, which draws attention to concentrating on domestic resources for meeting the increasing energy demands through use of resource diversity. The Strategic Plan (2015-2019) of the Ministry of Energy and Natural Resources aims to encourage use of renewable energy potential in Turkish economy.

In line with the said Strategic Plan for 2015-2019 and the Turkish Energy Policy, the Efeler GPP Project aims energy generation by utilizing the Germencik geothermal field waters. Located to the western part of the Buyuk Menderes Graben, which is a region of abundant geothermal activity, the Germencik field is one of the two hottest geothermal systems in Turkey. Accordingly, several geothermal power plants have been constructed over the last three decades in the Menderes Graben to harness the substantial geothermal potential of the area.

At the Project location, Gurmat Elektrik has been operating the existing Gurmat-1 GPP (also called Galip Hoca GPP) since 2009 and Gurmat-2 GPP since 2014. The Efeler GPP Project, with an installed capacity of 97.6 MWe, aims to increase the existing total operating capacities of Gurmat-2 GPPs from 114.9 MWe to 212.5 MWe. Installed capacities, energy generation technologies and current statuses for Gurmat-1, Gurmat-2 and the Project GPPs are shown below:



2.1 Project Background

The key milestones for Gürmat Elektrik GPPs utilizing the Germencik Geothermal Field are provided below:

Gurmat-1

2003
- EIA Positive Decision obtained for Gurmat-1 (47.4 MWe Galip Hoca GPP) Project from the Ministry of Environment and Forestry

2004
- Electricity Generation License obtained for Gurmat-1 (47.4 MWe Galip Hoca GPP) from the Energy Market Regulatory Authority (EMRA)

2009
- Gurmat-1 (47.4 MWe Galip Hoca GPP) has started to operate

Gurmat-2

2012
- Electricity Generation License obtained for Gurmat-2 (162.3 MWe Efe-1, Efe-2, Efe-3, Efe-4 and Efe-5 GPPs) from the EMRA
- EIA Positive Decision obtained for Gurmat-2 from the Ministry of Environment and Urbanization

2014
- Gurmat-2 has started to operate (Except for Efe-5, which is on hold)

The Project

2016
- EIA Positive Decision obtained for Efe-6 GPP (22.6 MWe) from the MoEU

2017
- Electricity Generation License obtained for Efe-6 GPP (22.6 MWe) from the EMRA
- Electricity Generation Pre-license obtained for Efe-7 GPP (25 MWe) from the EMRA
- Electricity Generation Pre-license obtained for Efe-8 GPP (50 MWe) from the EMRA
- EIA Positive Decisions obtained for Efe-7 (25 MWe) and Efe-8 (50 MWe) GPPs from the MoEU
- Efe-6 GPP has started to operate

2018
- Electricity Generation License obtained for Efe-7 GPP (25 MWe) from the EMRA

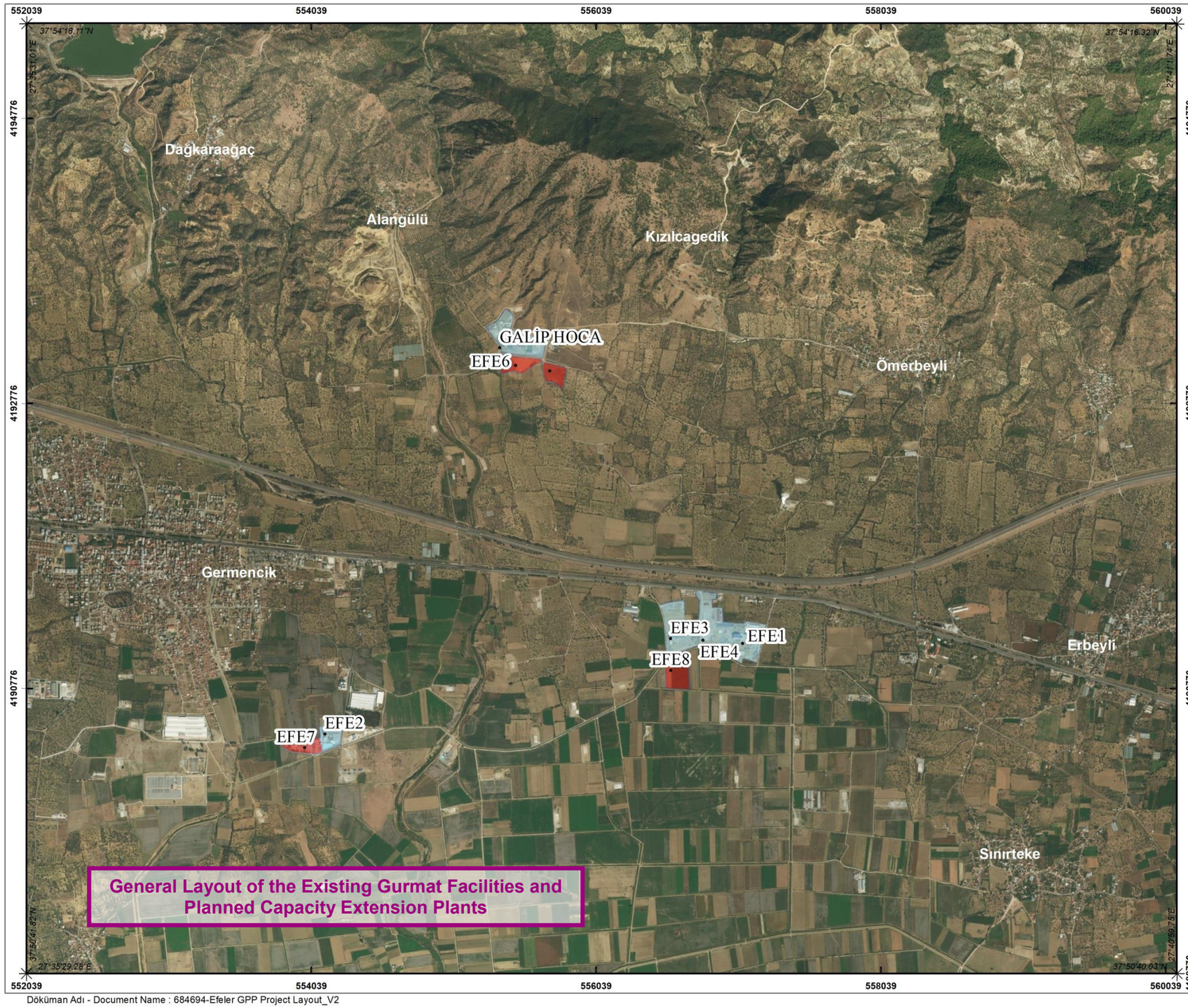
2.2 Project Location

The Project Area is located near Omerbeyli neighborhood of Germencik district in Aydin province. A map showing the existing and Project GPPs is provided below. As can be seen, Efe-6 GPP is located adjacent to Gurmat-1 GPP; Efe-7 GPP is located adjacent to Efe-2 GPP; and Efe-8 GPP is located adjacent to Efe-1, Efe-3 and Efe-4 GPPs.

All land acquisition processes for the Project GPPs are completed and title deeds/ right of way title deeds are obtained. Land acquisition was based on willingness and no expropriation or physical displacement occurred. Distances of Efe-6, Efe-7 and Efe-8 GPPs to the nearby settlements are provided in the table given below.

Distance (km) of the Project to Surrounding Settlements:

Settlement	Distance (km)		
	Efe-6 GPP	Efe-7 GPP	Efe-8 GPP
Germencik district center	3	1.6	3.7
Omerbeyli neighborhood	2.3	5	2.5
Kizilcagedik neighborhood	1.9	4.5	3
Alangullu neighborhood	1.5	3.8	3.7
Hidirbeyli neighborhood	4	4.1	5.6
Reiskoy neighborhood	5.1	1.8	4.5
Turanlar neighborhood	5.5	2.9	3.9
Sinirteke neighborhood	5	5.5	3
Erbeyli Neighborhood	4.2	5.8	3



GÖSTERİM - LEGEND

- Efeler JES Projesi / Efeler GPP Project
- Mevcut Gurmat JES Projeleri / Existing Gurmat GPP Projects

AECOM

Tel: +90 312 442 98 63
Fax: +90 312 442 98 63
environment.turkey@aecom.com
www.aecom.com

Mustafa Kemal Mah.
Dumlupınar Bulvarı No: 266
Tepe Prime B Blok Suite No:51
06800 Çankaya/Ankara Türkiye

Proje Adı - Project Name:	Efeler JES Kapasite Artışı Projesi Efeler GPP Capacity Extension Project
Harita Adı - Map Name:	Proje Yerleşimi Project Layout
Müşteri - Prepared for:	Gürmat Elektrik Uretim A.Ş.
Proje Grubu - Project Group:	Çevre / Environment
Proje Kodu - Project Code:	ENV-684694
Tasarım - Design:	C. Unustu
Son Güncelleme - Last Update:	4/5/2018 - 11:12 (cunustu / DESKTOP-681PFIO)
Projeksiyon - Projection:	Transverse Mercator
Koordinat Sistemi - Coordinate System:	WGS 1984 UTM Zone 35N
Sayfa Boyutu Sheet Size:	A3

Servis Katmanlarına Ait Telif Hakları - Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

0 0.4 0.8 1.2 Kilometers

Şablon Sürümü - Templeate version : 17-11 TR-EN

Döküman Adı - Document Name : 684694-Efeler GPP Project Layout_V2

2.3 Project Characteristics

Within the scope of the Project, the 22.6 MWe Efe-6 GPP is projected to generate an annual 180.8 GWh electricity, the 25 MWe Efe-7 GPP is projected to generate an annual 200 GWh electricity and the 50 MWe Efe-8 GPP is projected to generate an annual 400 GWh electricity.

2.3.1 Project Components

The Capacity Extension Project includes the construction and operation of the main components provided in the figure below. The GPP technology and the energy generation process are further detailed in the following section.

Main power plants

- Binary system consisting of various components including turbines, air cooled condenser and non-condensable gas (NCG) discharge system.

Production wells

- 22 production wells to tap into the reservoir for utilizing high temperature geothermal fluid for energy generation.

Reinjection wells

- 20 reinjection wells to reinject spent geothermal fluids back into the reservoir which will avoid reservoir depletion and related impacts such as decrease in energy generation capacity and risks such as subsidence.

Pipelines

- A network of pipelines that provide for connection of the production wells to the GPPs and following energy generation, the GPPs to reinjection wells.

Emergency ponds (ponds that collect geothermal waters during emergencies)

- Efe-6 will jointly use the existing 12,500 m^3 capacity emergency pond of Gurmat-1, in addition to a newly constructed 7,500 m^3 capacity emergency pond.
- Efe-7 will use the existing 9000 m^3 capacity emergency pond of Efe-2 GPP and no additional emergency ponds will be constructed.
- Efe-8 will use the existing 7500 m^3 capacity emergency pond of Efe-1 GPP and no additional emergency ponds will be constructed.

Switchyards (electrical facilities that adjust the voltage of generated electricity to national grid levels)

- A new switchyard has been constructed for Efe 6.
- A new switchyard will be constructed for Efe 8
- No switchyard is required for Efe-7.

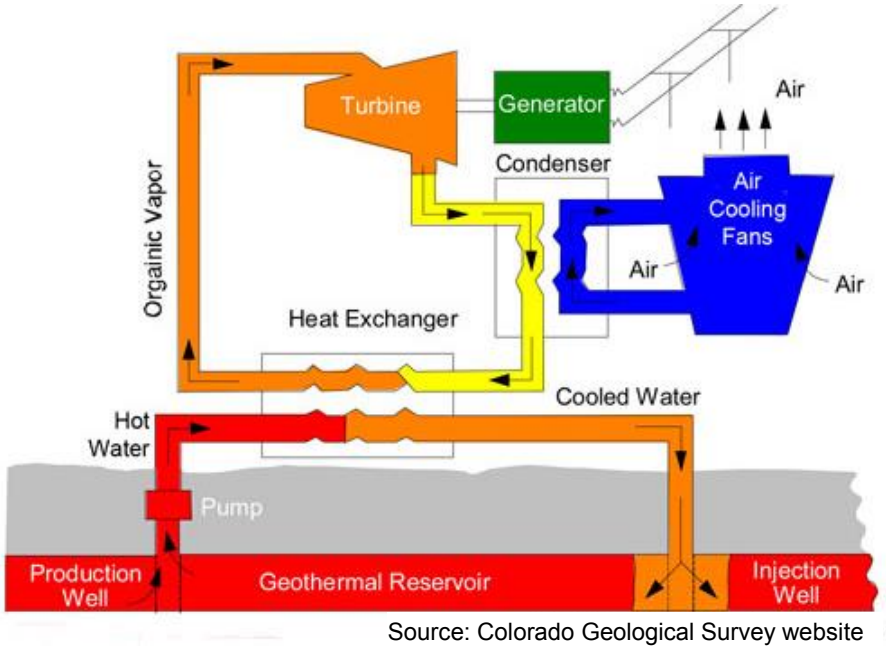
Energy Transmission Lines (ETL) (electricity transmission lines that provide connection to national grid)

- The grid connection of Efe-6 GPP is being provided by the existing 154 kV, 3.9 km overhead ETL of Gurmat-1 GPP
- The grid connection of Efe-7 GPP will be provided via a 31.5 kV, approximately 0.9 km underground cable system
- The grid connection of Efe-8 will be provided through the 154 kV ETL of Gurmat-2.

2.3.2 Description of Selected Technology and the Energy Generation Process

There are five different types of geothermal power plants: binary, single flash, double flash, back pressure and dry steam. At the utility scale, conventional steam turbines (single or double flash plants) and binary plants are used to generate electricity, with final technology selection based mainly on geothermal fluid temperature and reservoir conditions. Therefore, a detailed evaluation of the data produced from test wells is fundamental for specification of the process technology and plant design, including production and reinjection wells' locations and the pipeline routes.

Based on exploration phase studies, existing data of currently operational GPPs and further feasibility studies considering the estimated enthalpy, chemical characteristics and capacity of the resource, binary system has been selected as the most feasible alternative for all Project units. A simplified energy generation process flow for binary systems is presented below. In the binary process, a secondary working fluid is utilized. First, the geothermal fluid coming from the production wells is separated to steam and liquid phases. Afterwards, geothermal fluid is diverted to the evaporators to convert the pre-heated secondary fluid (n-pentane for Efeler GPP Project) into steam by yielding its heat without any direct contact. Vaporized pentane is then sent to the turbines for energy generation through the generators. Pentane coming out of the turbines in the form of exhaust steam is sent to the heat exchangers. Pentane passes through the heat exchangers as separate liquid and steam forms. Pentane in steam form transfers some of its heat to the liquid form and then lead to the cooling tower for condensation.



Source: Colorado Geological Survey website

NCGs

- One of the key factors for selecting and designing components (turbines, condensers, gas removal systems, hydrogen sulfide abatement systems, etc.) for GPPs is non-condensable gases (NCG) content of the gepthermal fluid. For binary systems, the system selected for Efeler GPP Project units, NCGs can be retained in a closed loop system. However, if the reservoir contains high NCG values, a closed loop is not applicable. Since the Germencik Geothermal Resource, the resource to be utilized by the Project, has a high NCG% (see Section 4.2 for details), a closed loop system will not be used by any of the Efeler GPPs.

Spent Fluids

- All GPPs within the scope of the Project will utilize a re-injection system, where the reject fluids are reinjected back into the reservoir, with no discharge to receiving environments. Therefore, impacts on soil, surface water and groundwater environments are avoided completely. In addition, drainage channels are constructed/will be constructed under the pipeline network. Together with the multiple emergency ponds, these drainage channels will collect geothermal fluids in case of equipment failure and the collected fluids will also be reinjected. Reinjection practice also minimizes impacts on geothermal resource in terms of resource sustainability and any potential subsidence risk that may occur due to reservoir depletion.

3. PROJECT BENEFITS

Each energy generation technology has its own advantages and challenges in terms of construction and operation aspects and the management of potential environmental and social impacts. Geothermal power plants provide renewable and sustainable energy capabilities that are implemented for various areas of use (e.g. heating, greenhouse cultivation, energy generation, etc.). Considering the overall impacts of energy projects, geothermal power plants are known to bring several benefits compared to its potential alternatives such as natural gas or coal plants.

Related benefits of energy generation based on geothermal energy and the Project benefits are summarized below:

Land Use	• Geothermal development activities result in lower long-term land disturbance than other technologies such as coal, solar and wind energy. The activities that will be carried out in the sites include exploration, drilling and construction for which the significant portion of the site can be reclaimed after the construction phase.
Waste Generation	• As they do not involve waste products associated with energy generation (e.g. coal ash), the life time waste generation for GPPs is significantly small.
Water Use	• Binary systems have very limited water requirements, especially when air cooling systems are used, as in the case of the Project GPPs.
Geothermal Resource	• Since GPPs utilize deep geothermal waters, the reservoir is of primary importance. Within the scope of the Project, geothermal fluid is pumped from the geothermal system and reinjected back to the reservoir to maintain the underground pressure and prevent the depletion of the source.
Electricity Availability and Operational Flexibility	• Construction costs of GPPs are relatively high, mainly due to requirement of deep drills. However, in terms of availability to generate electricity when needed and in terms of operational flexibility based on demand, GPPs are highly advantageous, since utilizing geothermal as a base-load operation is typical and since they can also be used as flexible operations.
Other	• Public benefit by safeguarding the increasing energy demand of the country while reducing energy dependency. • Local and national level employment opportunities will be created, the Project will prioritize employment from the local. • Indirect national and local scale economic benefits and subsequent employment opportunities will be sourced from services and materials procurement. The Project will prioritize local businesses for services and materials procurement. • Project will benefit local communities through infrastructure development activities such as improvement of access roads, implementation of potential community development projects and CSR activities. • The Project will be developed in compliance with EBRD Environmental and Social Policy (2014) and PRs. In this sense, it will be a Project that can form an example and benchmark for current and future businesses as well as environmental, social and health and safety authorities.

4. COMPLIANCE WITH EBRD PERFORMANCE REQUIREMENTS

This section of the NTS summarizes findings of the ESIA studies conducted to identify the Project's and existing Gurmat Elektrik GPPs' compliance with EBRD Performance Requirements (PRs) and describes the potential environmental and social impacts and how these impacts will be managed at the Project level.

4.1 Air Quality

According to the national EIAs for Efe-6, Efe-7 and Efe-8 GPPs, all of the calculated air emission values are below the limit values provided by the Industrial Air Pollution Control Regulation (IAPCR).

There are a total of 15 H_2S detectors around the existing Gurmat GPPs and H_2S monitoring is being conducted since February 2017 at 15 locations, which are also selected to represent conditions at vicinity settlements. As the Project GPPs are located adjacent to these GPPs, these points are also indicative for the Project. According to the monitoring results covering February 2017 to May 2018; the measurements range between 0.01-0.30 µg/m^3, which are significantly below the short term limit value of 20 µg/m^3 provided by IACPR.

In addition, a separate monitoring study is also being conducted at 8 sampling points that are indicative for Gurmat-1 GPP. A review of these results proved that all of the measured H_2S concentrations at these points are also significantly below the limit value provided by IAPCR

Considering these results, exceedance of the limit is not expected during joint operation of Gurmat-1, Gurmat-2 and Capacity Extension Project GPPs.

4.2 Greenhouse Gas Emissions

Electricity generation utilizing intermediate to high temperature geothermal resources contribute to GHG emissions, due to natural occurrence of non-condensable gasses (NCGs) and therefore some GHGs in the geothermal fluid. GHG composition of NCGs in geothermal reservoirs consists in majority of carbon dioxide (CO_2), and to a much smaller extent of methane (CH_4). Therefore, these two GHGs are considered in the assessments for exploration phase drilling activities and operation phase generation activities. Other GHGs considered in the assessment include emissions associated with fuel and SF_6, a significantly powerful GHG used in high voltage electrical equipment such as circuit breakers and switchgear.

The Germencik field, the resource to be utilized by the Project, is located in the northern Menderes Graben along and south of the Menderes Massif. Therefore, the field reflects the high CO_2 conditions expected in the reservoirs located in the high carbonate rocks of Menderes graben. Accordingly, "the Numerical Reservoir Simulation of Germencik Geothermal Resource" prepared by Veizades & Associates Inc. and Geologica Geothermal Group, Inc. identified that Germencik Geothermal Field is a geothermal system with a relatively high concentration of CO_2 in the reservoir fluid. Therefore, it is important to identify potential GHG emissions to be sourced from the Project, together with existing Gürmat Elektrik GPPs utilizing the same reservoir.

Baseline Emissions

The baseline emissions represent the pre-project emissions; usually zero where the project is a green-field development or the facility pre-investment annual emissions where the project comprises upgrading or refurbishment. Comprising of data provided by Gurmat Elektrik covering January 2015 to December 2017 for Gurmat-2 GPPs (Efe 1 to 4) and January 2016 to December 2017 for Gurmat-1 GPP, the NCG/ GHG data for Gurmat-1 and Efe-1 consists of actual measurements conducted at the plants, whereas the data for Efe-2, Efe-3 and Efe-4 is modelled based on actual measurements at Efe-1. In addition, continuous NCG monitoring is being conducted at wells indicative of these GPPs. Gurmat states that the measurement results obtained at the wells verify the modelled results.

The average baseline emission values were estimated as ,65 tonnes CO_2e/ MWh for Gurmat-1 GPP and 0.61 tonnes CO_2e/ MWh Gurmat-2 GPPs Efe 1 to 4). In addition, CO_2 and CH_4 ratios in the total GHG emissions were also calculated using the data provided by Gurmat Elektrik and it was identified that the baseline GHG content of the geothermal fluid consists 99.38% of CO_2 and 0.62% of CH_4 for the Gurmat-2 GPPs.

Predicted Emissions Comparison with Calculated Actual Emissions for Gurmat-2 GPPs

With an annual operating time of 8,672 hour (*WS Atkins International Ltd., 2014)* for each GPP Project, the total annual GHG emissions projected to be sourced from Gurmat-2 GPPs (Efe-1, Efe-2, Efe-3 and Efe-4) are provided in the table given below, together with most recent estimations based on the data provided by Gurmat. As can be seen, estimations based on the actual emissions data of Efe-1 and modelled data of Efe-2, Efe-3 and Efe-4 provided by Gurmat indicate that the GHG content of the reservoir is decreasing in time, as expected, due to decrease in NCG content of the reservoir caused by continuous emissions to atmosphere as the GPPs operate. The predicted total for Efe-1, Efe-2, Efe-3 and Efe-4 GPPs was 893,673 tCO_2e/ annum, which corresponds to 0.84 tCO_2e/ MWh (WS Atkins International Ltd., 2014); whereas the actual emissions occurred as 642,831tCO_2e/ annum or 0.61 tCO_2e/ MWh.

Predicted and Current Annual Reservoir Related GHG Emissions for Gurmat-2 GPPs (Efe-1, Efe-2, Efe-3 and Efe-4)

	Generation (MWh / annum)	GHG Emissions** (tCO_2e / hr)	GHG Emissions (tCO_2e /annum)	GHG Emissions (tCO_2e / MWh)
Predicted/ Efe-1*	NA	42.62	369,600	NA
Predicted/ Efe-2*	NA	20.98	177,581	NA
Predicted/ Efe-3*	NA	19.98	173,250	NA
Predicted/ Efe-4*	NA	19.98	173,242	NA
Predicted/ Total*	**1,069,307**	**103.06**	**893,673**	**0.84**
Efe-1 (average for August 2015 - December 2017) (based on measurements)	399,967	28,76	251,924	0.63
Efe-2 (average for January 2015 - December 2017) (modelled based on Efe-1 measurements, verified by well measurements)	221,763	15,34	134,343	0.61
Efe-3 (average for March 2015 - December 2017) (modelled based on Efe-1 measurements, verified by well measurements)	218,268	14,89	130,413	0.60
Efe-4 (average for July 2015 - December 2017) (modelled based on Efe-1 measurements, verified by well measurements)	219,024	14,40	126,130	0.58
Actual/ Total	1,059,023	**73.38**	**642,831**	**0.61**

** Source: Gurmat-2 Geothermal Power Plant EIA Addendum (WS Atkins International Ltd., 2014),*
*** Annual operating hours are assumed to be 8,672 in the actual case.*

Project Emissions

The Project GHG emissions were calculated for exploration, construction and operation phases and emission sources were identified as; fuel combustion and test well venting for the exploration phase, fuel combustion and purchased electricity for the construction phase and reservoir related GHG emissions for the operation phase.

A summary of estimated GHG emissions for Efe-6, Efe-7 and Efe-8 GPPs are presented in the tale given below.

Summary of GHG Emissions from Efe-6, Efe-7 and EFe-8:

Project Phase	Duration	Total Emissions (tonnes CO2-e)
Exploration Phase/ (Combustion)	14 months	1778.5
Exploration Phase/ (NCGs from test wells)	1944 hours	103,689
Exploration Phase/ Total	14 months	105,467
Construction Phase/ (Combustion)	40 months	1,109
Construction Phase/ (Purchased Electricity)	40 months	216
Construction Phase/ Total	40 months	1,325
Operation Phase (NCGs)	per annum	425,544
Operation Phase (SF6)	per annum	4.703
Operation Phase Total	per annum	425,549

Breakdown of total annual operation phase GHG emissions to be sourced from Gurmat-1 GPP, Gurmat-2 GPPs and the capacity extension project (Efe-6, Efe-7 and Efe-8 GPPs) during operation phase, considering an annual operating time of 8,672 for each GPP, is provided in the table given below.

Total GHG Emissions Estimation for Gurmat-2 and Capacity Extension Project GPPs (Efe-6, Efe-7 and Efe-8):

Baseline Emissions Gurmat-1	**377,493**	**28,20**	**247,034**	**0,65**
Baseline Emissions Gurmat-2 (Efe-1, Efe-2, Efe-3, Efe-4)	1,059,023	73.38	642,831	0.61
Capacity Extension/ Efe-6	180,800*	12.00	104,075	0.58
Capacity Extension/ Efe-7	200,000*	13.90	120,550	0.60
Capacity Extension/ Efe-8	400,000*	23.17	200,918	0.50
Capacity Extension Total (Efe-6, Efe-7, Efe-8)	**780,800**	**49.07**	**425,544**	**0.55**
Gurmat 2 and Capacity Extension Total	**1,839,823**	**122.45**	**1,068,375**	**0.59**
Gurmat-1, Gurmat-2 and Capacity Extension Total	**2,217,316**	**150.65**	**1,315,409**	**0.62**

** Source: Efe-6 GPP National EIA Report, August 2016; Efe-7 GPP National EIA Report, April 2017; Efe-8 GPP National EIA Report, April 2017.*
***Excluding SF6 emissions, since SF6 emissions correspond to 0.001% of reservoir related emissions.*

All Project GPPs (Efe-6, Efe-7 and Efe-8) will use online, continuous monitoring systems.

Numerical Reservoir Simulation and CO_2 Evolution over Time

Numerical Reservoir Simulation of Germencik Geothermal Resource Study (May 2017) was conducted by Veizade, Geologica and Leidos to investigate the potential for expansion of power generating capacity at Germencik Geothermal License. Starting with the end of January 2017, the model was run for 19.75 years (i.e. until 2035 year-end).

The modelling was conducted for 4 different production and injection scenarios, variants being the production and injection well configurations and timing of production/reinjection for the Gurmat-2 and the Project GPPs. Of these scenarios, only Scenario D considers operation of all Project GPPs (Efe-6, Efe-7 and Efe-8); which reflects the actual case. For the said scenario, the forecasted CO_2 evolution with time is summarized in the table given below. As can be seen, modelling results and the assessment concluded that the CO_2 mass fraction of the produced fluid declines significantly over time. This decrease is attributed to the depletion of CO_2 in the reinjected water, as well as influx of water without CO_2 from the lateral boundaries

Forecasted CO2 Mass Fraction Values for Gurmat-1, Gurmat-2 and Capacity Extension Project Production Wells:

	Gurmat-1	Gurmat-2			Capacity Extension Project		
		Efe-1	Efe-2	Efe-3	Efe-4	Efe-6	Efe-7	Efe-8
January 2017	0.016	0.015	0.020	0.021	0.021	na	na	na
December 2025	0.005	0.007	0.007	0.016	0.012	0.009	0.011	0.012
December 2035	0.003	0.004	0.005	0.008	0.009	0.005	0.006	0.007

Source: The Numerical Reservoir Simulation of Germencik Geothermal Resource (Veizades & Geologica & Leidos, 2017)

The CO_2 grid emission factor in Turkey is estimated as 0.486 t CO_2/MWh for the year 2018 and presents a fluctuating increase to 0.5 t CO_2/MWh in 2022 (*EBRD, 2015*). As detailed in the above summarized assessment, in the long run, the CO_2 emissions from the Project will be approaching the CO_2 grid emission factor in Turkey.

4.3 Water Resources

Potential impacts on water quantity/quality that may be sourced from the Project's construction and operation activities are summarized below, together with design and management related measures:

- Utility water and potable water is supplied by purchasing and no groundwater or surface water resource will be used during construction and operation phases. Therefore, there will be no on-site impact on water availability.
- The Projects utilize air cooling condenser systems, whereas a water cooling system will only be used for cooling of turbines and generators. Therefore, operation phase water requirement is kept to a minimum, consisting mainly of domestic water requirement for personnel.
- The production and reinjection wells drilled/to be drilled utilize leak proof well casings and blowout prevention equipment, which will prevent interaction of geothermal water and shallow groundwater.
- Following the completion of drilling, some test studies are conducted for determination of physical and chemical characteristics of the geothermal waters. If found to be suitable, the collected geothermal waters are moved to the geothermal fluid storage ponds that are already in place. The geothermal fluids collected in these ponds are later reinjected back in to the reservoir. In case this option is not possible, the geothermal fluids collected in the mud pools (i.e. not the geothermal fluid ponds but the impermeable ponds located in well sites) will only be discharged to receiving environments once related tests are conducted by licensed laboratories and compliance with discharge limits set by Water Pollution Control Regulation is ensured. Required treatment will be implemented prior to discharge in case the test results indicate that the tested parameters are not in compliance with the Regulation.

- The Project will utilize deep, high temperature groundwater for energy generation and will reinject the spent fluids back into the reservoir. The wells have/will have leak-proof well casings in order to ensure no interaction of deep and shallow groundwater resources occur.
- In case of rare emergencies, existing geothermal fluid storage ponds of Gurmat-1 and Gurmat 2 GPPs,as well as a new pond constructed for Efe-6 will be utilized. In addition, all generation activities will be halted in case of any emergency situation where the existing storage capacities are likely to be surpassed. The fluids stored in these ponds will later be reinjected back into the reservoir.
- Drainage channels are constructed/will be constructed under the pipeline network, for collection of geothermal fluids in case of pipeline failures or emergencies such as well blowouts. The drainage channels will discharge to above mentioned geothermal fluid storage ponds.
- During the construction phase of Efe-6, domestic wastewater was collected in septic tanks and transported off-site as required and currently, the existing, permitted WWTP of Gurmat-1 is being used. Efe-7 and Efe-8 on the other hand will use impermeable cesspools for collection of domestic wastewater during both construction and operation phases. The wastewater collected in these cesspools will be transported to Aydin Metropolitan Municipality WWTP by sewage trucks, within the scope of related agreements.
- According to the national EIA report for Efe-6, there are no natural river drainage patterns in the vicinity since groundwater and surface water is controlled by drainage and irrigation channels. Pipeline routes for all Project GPPs were designed to ensure these channels are not impacted by the Project activities.

4.4 Biodiversity and Living Natural Resources

Flora and fauna site surveys for Efe-6, Efe-7 and Efe-8 GPPs were conducted within the scope of the national EIA studies in September of 2016, which provide the baseline data for the ESIA Report and the Addendum studies. The ESIA Addendum provided further analyses on biodiversity features, with updates on previously identified species, especially those that have been recorded from literature as opposed to direct on-site observations.

The most up-to-date assessments made regarding priority biodiversity features that are “presumed present” at the Project Area are provided below:

Priority Biodiversity Features as per EBRD PR 6:

Priority Biodiversity Feature	Presumed Present Project Biodiversity Feature
Threatened habitats	There are no habitats that overlap with the Project site that are under pressure by national, regional or international assessments. No natural and priority habitats identified under the EU Habitats Directive Annex I.
Vulnerable Species	There are two endemic oak species that were identified during the national EIA studies. Presence of these species was not identified/ reported in the Project area and these species were not observed during the site studies. There is also one reptile; *Testudo gracea*, and one bird; *Streptopelia turtur*, species that are listed as VU according to the IUCN Red List. Although assessed as a VU species due to its global population status, *Testudo graeca* is quite widespread in all of Turkey. The regional population status does not call for any species-specific measure. *Streptopelia turtur,* on the other hand, is presumed to be present in the area from literature records. The species is known to occur in all of Turkey. However, Project Area and its vicinity, where there are high levels of anthropogenic impacts, are not expected to be inhabited by the species’ populations.
Significant biodiversity features identified by a broad set of stakeholders or governments	There are no protected areas or designated sites within the vicinity of the Project Area, which would be impacted by Project-related activities.
Ecological structure and functions needed to maintain the viability of priority biodiversity features	There are no identified structures or functions in the area that are vital to priority biodiversity features

In order to determine statuses of species identified during the national EIA studies, besides the IUCN Red List of Threatened Species utilized to determine endangered and critically endangered species, other criteria were also used in the Critical Habitat Assessment, wherever applicable. In determining “highly threatened and unique ecosystems”, habitats listed under Annex I to Habitats Directive, as well as IUCN Red List assignments for ecosystems were used as the main criteria. Potential critical habitat trigger biodiversity features for the Project are summarized below:

Potential Critical Habitat Trigger Biodiversity Features:

Critical Habitat as per EBRD PR 6	Potential Critical Habitat Trigger Biodiversity Feature
(i) Highly threatened or unique ecosystems	No such habitat or ecosystem
(ii) Habitats of significant importance to endangered or critically endangered species	No CR or EN species
(iii) Habitats of significant importance to endemic or geographically restricted species	*Quercus frainetto* and *Quercus aicheri* are two endemic oak species that have been reported to exist in the region, within the scope of the national EIA studies. Presence of these species was not identified/ reported in the Project area and these species were not observed during the site studies. Therefore, based on all available data, *Quercus frainetto* and *Quercus aicheri* do not trigger critical habitat at the Project Area.
(iv) Habitats supporting globally significant (concentrations of) migratory or congregatory species	No migratory or congregatory species
(v) Areas associated with key evolutionary processes	No such habitat or a species population
(vi) Ecological functions that are vital to maintaining the viability of biodiversity features described (as critical habitat feature)	No identified ecological functions that are vital to potential critical habitat trigger biodiversity feature

4.5 Noise

Within the scope of ESAP monitoring for Gurmat-2 GPP, monitoring studies were conducted in 2015 and 2016. None of the monitoring results exceed the noise limit values applicable to the Project.

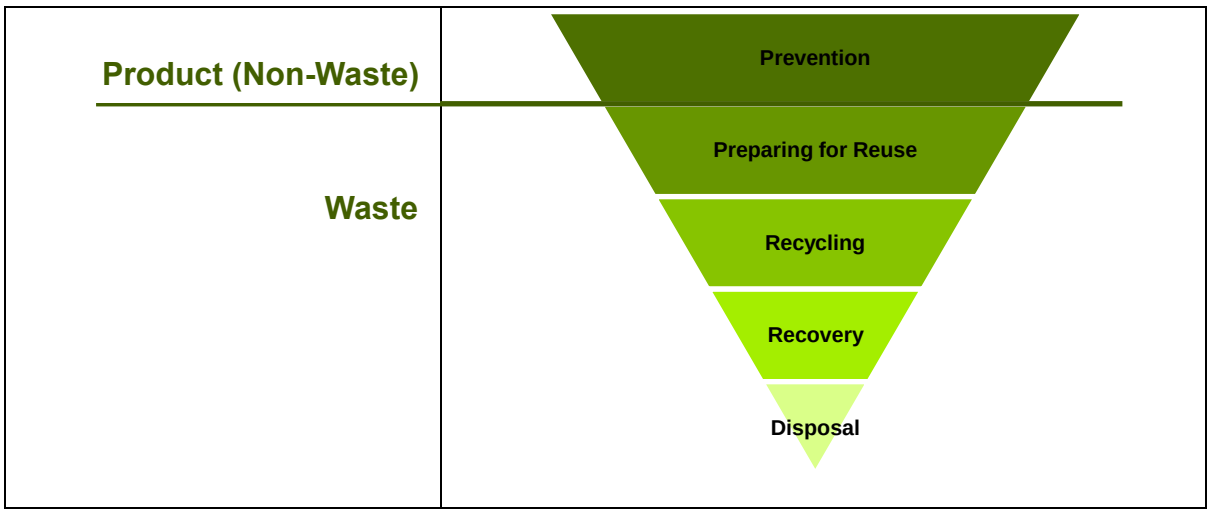
On the other hand, the national EIAs include assessments for construction phase noise to be sourced from construction activities, in terms of compliance with Turkish Regulation on Assessment and Management of Environmental Noise (RAMEN):

- For Efe-6, the construction phase limit of 70 dBA is ensured at only 10 m from the construction area. The closest residential areas are located at approximately 1,200 m away.
- For Efe-7, the construction phase limit of 70 dBA is ensured at approximately 125 m from the construction site. The closest residential area is located at approximately 1700 m away.
- For Efe-8, the construction phase limit of 70 dBA is also ensured at approximately 125 m from the construction site. The closest residential area is located approximately 400 m away.

During the operation phase, wellhead equipment and generators are expected to be the main noise generating sources. As equipment will all be housed in close spaces, the Project operation activities are not expected to have any noise impact on local communities.

4.6 Waste Management

The Project will follow the waste hierarchy as given below, which responds to financial, environmental, social and management considerations.



Types of waste anticipated to be generated in the scope of the Project are listed and related waste handling practices are summarized below:

Drilling Mud	• For production and reinjection wells drilled/ to be drilled within the scope of the Project, ponds covered with impermeable geomembrane layers are utilized to collect drilling mud. The drilling mud is analyzed by licensed laboratories for identification of its storage class. Depending on analysis results the collected drilling mud is either left on site or removed in accordance with related legislation.
Excavation Waste	• Any access excavated material that cannot be used on-site for filling and landscaping activities will be sent to excavation waste disposal areas.
Domestic Solid Waste	• Municipal solid waste will be segregated and licensed firms and Aydin Metropolitan Municipality will transport these wastes for final disposal/ recycling.
Medical Waste	• Medical waste will collected separately and sent by licensed transport vehicles to the medical waste disposal facility that has an agreement with Germencik Municipality.
Waste Oil and Waste Vegetable Oil	• Waste oil will be collected in leak-proof containers, stored in temporary waste storage areas and sent to licensed disposal/ recovery firms.
Other Hazardous Waste	• Waste batteries and accumulators, end-of life vehicles, waste tires, electronic waste and other hazardous and special wastes will be stored in temporary waste storage areas and sent to licensed reuse/ recovery/ recycling/ disposal firms.

4.7 Labour and Working Conditions and Occupational Health and Safety

Turkey is party to a multitude of ILO conventions and accordingly, the current Turkish Labor Law is in compliance with international labor standards and EBRD PR2 requirements; including aspects such as child labor, forced labor, non-discrimination and equal opportunity and right to join workers' organizations. Subsequently, and also due the fact that the Gurmat-2 GPP and the Project are conducting its activities in line with EBRD Environmental and Social Policy (2014), Gurmat is committed to full compliance with both national legislation and international standards in terms of labor management.

Gurmat has in place a Human Resources (HR) Procedure, which aims to increase effectiveness and efficiency in all matters of human resources and define the implementation principles for general human resources management. In addition to the HR Procedure, a Health and Safety Policy is also in place. In line with its policy statements, Gurmat's first aim is to take precautions to prevent accidents/incidents from occurring; constantly improving the OHS conditions and ensuring related trainings are in place for both its own personnel and the contractors' personnel.

To ensure the highest standards of OHS, the Company holds a certificate for OHSAS 18001:2007 Occupational Health and Safety Management System, applicable to its energy generation facilities. Personnel with necessary skills and background are employed both at corporate and site level for implementation of the OHS management system. In addition, a grievance mechanism for employees is in place and implemented.

According to the Annual Environmental and Social Report for Gurmat-2 GPPs– Reporting Period: 2015, two separate consultant companies are contracted to monitor health and safety procedures and to provide trainings. No accidents with injuries or fatalities occurred during this reporting term.

There is an Emergency Action Plan in place for Gurmat-2, covering Efe-1, Efe-2, Efe-3 and Efe-4 GPPs. This plan is required to be updated to cover the Project GPPs.

Labor statistics

During the construction phase of the Project, work hours will consist of 8 hr/day shifts in 26 days/month for 12 months/year. On the other hand, generation will constantly continue during the operation phase. Therefore a system of three 8 hour shifts will be implemented throughout the entire year.

Operation phase personnel data for the currently operational GPPs is provided in the table presented below.

Labor Statistics for Gurmat-2 and the Project GPPs:

	Gurmat-1 GPP	Gurmat-2 (Efe-1,2,3,4)	The Project* (Efe-6)
Number of direct employees	47	173	58
Number of contracted workers	47	173	58
Number of non-employee workers	0	0	132
Ratio of women workers (direct and contractor total)	%2.1	%1.7	%8.6

** Efe-7 construction phase is ongoing and Efe-8 construction phase is planned to be initiated in 2018..*

The total number of permanent personnel employed by the Company is 278, of which 269 are men and 9 are women. Out of 278 employees, 133 employees (48 percent) are hired from local communities. In addition, the Company employs interns who attend apprenticeship schools and industrial vocational schools. In 2017, 80% internees were hired from Aydin Province and 20% were hired from Ankara Province.

4.8 Community Health and Safety

As reported by the Company, the requests and suggestions of the public are taken into account. Accordingly, the Company implements necessary actions for appropriate requests/suggestions from local communities. Community Health and Safety related issues associated with the Project are summarized below:

- Compared to conventional fossil fuel plants, GPPs have significantly lower emissions. However, H_2S emissions are of concern due to the fact that it is a malodorous, toxic gas, which poses health and safety problems in case appropriate monitoring and management practices are not in place. In order to ensure that potential health and safety risks are managed appropriately. See Section 4.1 for details on H_2S management.
- Infrastructure and equipment related hazards to community health and safety may be caused due to contact with hot surfaces such as active wells and pipelines, risks associated to equipment failures and risks associated to abandoned wells. To date no pipeline failures or similar emergencies occurred. Geothermal fluid collection systems are designed, diverting the collected fluid to emergency ponds during any rare case of equipment or pipeline failure. To minimize risks to communities;
  - Shortest routes are selected for the pipeline network to minimize potential hazards,
  - Insulated pipes are used, which avoid thermal loss and therefore hazards associated with contact with hot surfaces.
  - Due to chemical characteristics of geothermal fluids, carbonate and sulphate can accumulate and create a crust on inner walls of pipes. This phenomenon result in limited flow rate and may eventually lead to leakages or pipeline failures. Therefore, chemical dosing (inhibitor injection) is conducted at each well head to prevent crust formation. This way, risk of failure and associated community health and safety risks are minimized; and as the pipelines are closed systems, these chemicals do not interact with the environment.
- Within the scope of Gurmat-2 GPPs (including Efe-6, which is in operation as of August 2017), a total of 30 security personnel are employed, in addition to 8 personnel employed for Gurmat-1. These personnel are employed mainly from the local, which ensures that no conflicts in terms of regional sensitivities occur.
- Utilization of geothermal resources may induce seismicity since drilling works for establishment of production and reinjection wells during the construction phase and especially production and reinjection activities conducted during the operation phase may alter the stress patterns of the area rock formations However, multiple studies identified that these seismic events are of small magnitudes and are almost never felt by communities. Regarding the Project GPPs and other Gurmat GPPs, no grievance related to induced seismicity was received.
- According to the Earthquake Zones Map of Aydin province, the entire province is located in a 1st degree earthquake zone. Therefore, the main natural hazard risks are associated with earthquakes. Detailed geological and geotechnical surveys and earthquake risk assessments are provided in the scope of the GPPs' Geological and Geotechnical Survey Reports (presented as annexes to EIA Reports). The Project GPPs are/will be in full compliance with provisions of national legislation regarding constructions on 1st degree earthquake zones.

4.9 Land Acquisition, Involuntary Resettlement and Economic Displacement

Land acquisition process is now complete and all required land was acquired on willingness basis, where agreements were reached with land owners in terms of a mutually agreed price. Therefore no expropriation occurred. As the acquired lands were all agricultural areas, physical displacement was also not required.

The land purchased for Efe-6 was partially used for fig production and fig trees were relocated before the construction of the plant. The land required for Efe-7 and Efe-8 are agricultural lands and the Company allowed (for Efe-7, which is currently under construction) and will allow (for Efe-8, which is in pre-construction planning) owners to use the land until initiation of land preparation activities

4.10 Cultural Heritage

According to the national EIA Reports, the Project GPP areas do not correspond to any cultural heritage sites or natural protection sites. In case any cultural heritage is encountered during land preparation or construction phase, as per national requirements, related Museum Directorate or Regional Board Directorate for Conservation of Cultural and Natural Assets will be informed. These local authorities will determine the process for handling the chance find.

4.11 Information Disclosure and Stakeholder Engagement

The Project will have in place a Stakeholder Engagement Plan (SEP), identifying primary stakeholders and pertinent engagement methods for each stakeholder, including information disclosure, regular meetings, grievance mechanism, networking and cooperation activities, etc.

Details on stakeholder engagement activities conducted to date are provided below:

Stakeholder Engagement within the scope of national EIA process

- In line with the requirements of the Turkish EIA Regulation, two Public Participation Meetings (one for Efe-6 GPP and one for Efe-7 and Efe 8 GPPs) were held in locations that are easily accessible for communities identified to be potentially affected by the Project. During these meetings, the following questions and concerns were raised by the communities:
- Details of the operation process to be conducted at the power plant;
- Air pollution caused by geothermal power plants operating in the region;
- Impacts of air pollutants emitted from these plants on agricultural lands;
- Disturbances due to steam emitted from the stacks of the power plants.

Stakeholder Engagement within the scope Gurmat-2 Environmental and Social Action Plan

- A stakeholder Engagement Plan is in place for Gurmat-2 (Efe-1, Efe-2, Efe-3 and Efe-4). Within this scope, a public consultation meeting was held on October 31, 2014. During the meeting, information regarding Gurmat-2, its potential environmental and social impacts, applicable national legislation and international standards were provided to the public. The key subjects raised by the public included following:
- Maximization of local employment;
- Request for further information regarding land acquisition procedure.

Grievance Mechanism

A grievance mechanism is also in place for Gurmat-2. Within this scope, the Company appropriately addresses all relayed grievances in a timely manner. The contractors are also responsible of receiving and addressing any grievances in line with the Company's standards.

Community Development

The Company is committed to keeping good community relations not only through addressing community grievances but also through planned corporate social responsibility (CSR) activities. Within the scope the project, a multitude of CSR and community development activities were conducted, and the Company will continue to implement additional community development activities, based on need of local communities. CSR activities conducted to date include:

- Sapling distribution, plantation campaign and reforestation activities carried out around the plants.
- Construction of a vocational school specializing in agriculture and other educational CSR activities including provision of scholarships, improvement of existing schools, etc.
- Construction and improvement of public spaces such as wedding halls, mosques, graveyards, construction of village headmen offices and infrastructure improvement such as road construction.
- Provision of required machinery and equipment to Germencik Municipality, as well as construction of various facilities for this municipality.
- Other CSR activities such as accepting visits from various universities and conducting Ramadan feasts.

5. CUMULATIVE IMPACT ASSESSMENT

A cumulative impact assessment (CIA) is undertaken when a series of developments, all of which are the same type (GPP), are occurring or being planned within an area where they would impact the same valued environmental and social components (VESCs). The VESCs may include physical features, social conditions and cultural aspects.

A six-step approach, as proposed by the IFC, has been followed to conduct a CIA for the Project. Accordingly, first spatial and temporal boundaries were determined followed by identification of VESCs and all GPP developments within the study area, determination of present conditions of the VESCs, assessment of cumulative impacts and evaluating their significance.

In identifying other contributing projects within the CIA Study Area, focus is given on GPP projects, as they would have common types of impacts that would affect the same VESCs. Existing and future projects that have been identified and included in the CIA together with the Project GPPs are presented below:

Certain (Existing)	Reasonably Foreseeable	Hypothetical
• **Gurmat Projects:** • Gurmat-1 GPP • Gurmat-2 GPP (Efe-1, Efe-2, Efe-3, Efe-4 GPPs) • Efe-6 GPP (as part of the Project) • **Other Projects:** • Mehmethan GPP • Kubilay GPP • Kerem GPP • Maren GPP • Deniz (Maren II) GPP • Gumuskoy GPP • Melih GPP • Senkron Efeler Biogas Power Plant	• **Gurmat Projects:** • Efe-7 GPP (as part of the Project) • Efe-8 GPP (as part of the Project) • **Other Projects:** • Kubliay GPP-2 • 3S Kale GPP • GG Combined Cycle Natural Gas Power Plant	• **Gurmat Projects:** • Efe-5 GPP • **Other Projects:** • Mehmethan GPP (Unit V) • Kerem GPP (Unit IV) • Maren VI GPP • Maren VII GPP • Harran Combined Cycle Natural Gas Power Plant

The potential cumulative environmental and social impacts have been assessed only for operation phases of the GPPs, since construction phase impacts are relatively insignificant, temporary and unlikely to coincide with each other.

Potential cumulative impacts of the Project are identified as;

- GHG Emission impacts, due to high reservoir GHG content.
- Impacts on biodiversity, minor, since high industrial and agricultural activity in the area has degraded the natural flora and fauna composition to a great extent already and no major further impacts are expected.
- Impacts on land use, minor, since the impact is limited to power plant and well footprints, which are relatively small compared to other energy generation technologies, and the very limited width of easement corridor for pipelines.
- Beneficial economic impacts on local communities in terms of employment, moderate, since all projects will contribute to employment opportunities for skilled and unskilled personnel from the region.
- Beneficial impact of CSR projects, moderate for Gurmat Elektrik GPPs since the Project Company conducts and will continue to conduct various community development activities and programs.

As the Project GPPs will use binary systems, their contribution to vapor in the local atmosphere will be minimal. Therefore no cumulative impact of the Project GPPs in terms of visual impacts of vapor is expected.

Similarly, as the Project GPPs will reinject the spent fluids directly back in to the reservoir (i.e. no discharge to receiving environments) by utilizing reinjection wells, emergency ponds, etc., which are designed to ensure no interaction with soil or shallow groundwater environments occurs, the Project is expected to have no impact on agricultural land, in terms of decrease in productivity due to geothermal fluid discharges.

For the long run, it is important to ensure that cumulative environmental and social impacts of GPPs and other projects operating within a geographical context are assessed in a well-structured, technically and scientifically correct manner through engagement with key stakeholders. As a result of such a study, regional action plans could be developed to clearly define roles and responsibilities of each party involved.

Considering the scale of such a study, participation by a multitude of stakeholders would be required and ideally the responsibility for conducting a detailed CIA would lie with relevant governmental authorities. If required, Gurmat Elektrik will participate and contribute to such a study.

6. Environmental and Social Action Plan

To ensure prevention and minimization of potential environmental and social impacts associated with the Project and to ensure best practices are maintained and implemented throughout all phases of the Project, an Environmental and Social Action Plan (ESAP) has been developed for the Project and disclosed as a separate document.

Contact Information

Project related information will be available on a dedicated web page of Gurmat Elektrik. The ESIA Addendum documents will also be publicly available for affected communities at the Project Sites. Contextually appropriate methods such as distribution of leaflets, posting information on information boards within the community, etc. will be used to publicize the disclosed documents.

Further information on the Project, as well as copies of environmental and social impact assessment studies can be found by contacting Gurmat Elektrik

Gurmat Head Office

Adress: Ankara Caddesi No: 222, Karaoğlan Mahallesi, Golbasi, 06830, ANKARA

Telephone number: +90 (312) 484 05 70

Fax: +90 (312) 484 45 78

E-mail: info@gurmat.com.tr

Website: www.mogan.com.tr

Project Site

Adress: Omerbeyli Koyu Mevkii, Germencik, Aydin, Turkey Telephone number: +90 (256) 563 33 25

Fax: +90 (256) 563 35 11

Contact Name: Necati Bayrakoğlu