DÜZCE-AKSU HYDRO ELECTRICITY POWER PLANT

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Düzce Aksu Elektrik Üretim A.S. which is owned by Aydem Yenilenebilir Enerji A.Ş. has constructed the Düzce-Aksu Regulator and Hydro Electricity Power Plant (HEPP) on the Aksu River, that is a branch of the Büyük Melen River, within the jurisdiction of Gölyaka Town of Düzce Province. The purpose of the project is electricity production using the potential energy of Aksu River as a renewable resource. Therefore, the electricity is going to be produced without causing airborne pollutants or Green House Gas (GHG) emissions. The construction and operation of the Düzce-Aksu Hydro Electric Power Plant (HEPP) is delaying the addition of conventional thermal power plants to the Turkish National Electricity Grid.

As shown on the EMRA approved electricity production license[1] the established capacity of Düzce-Aksu HEPP is 46.2 MW. The project is produce a total of 141,370 MWh of electricity per year therefore the plant load factor of the project calculates to be, 34.93 %, as shown in the below calculation:

$$\frac{141{,}370.00\ MWh}{46.2\ MWX365X24h} = \frac{141{,}370.00}{404{,}712} = 0.3493 = 34.93\%$$

Based on Turkey's Combined Margin Emission Factor of 0.53323 CO_{2e} tonnes /MWh, the project is expected to produce 75,382 tonnes of CO_{2e} GHG reductions each year.

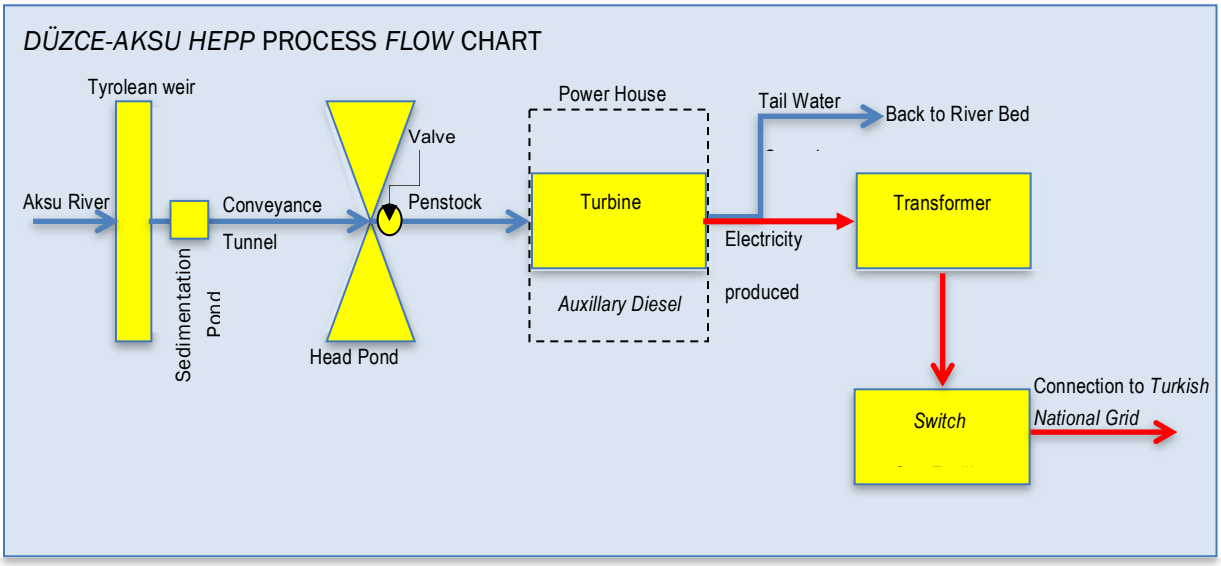
During this monitoring period the project has produced a net total of 620,825.67 MWh electricity and a total amount of 331,039 tCO2e of emission reduction.

The construction has started in 16.11.2009. The Düzce-Aksu HPP is made up of one regulating body, a sedimentation pond, a water conveyance tunnel, a head pond, a valve chamber, penstock, power plant, tail water canal and the switchgear area. The produced electricity is fed to the Turkish National grid via an 8 km transmission line. The project commissioned in 25.04.2014.

[1] Düzce-Aksu HPP Electricity Production Licence Dated 21/09/2006 numbered: EÜ/921-3/724

The water entering to the weir body and the water collecting area over the Aksu River at the 790.50 m elevation level. Then the water settled at the sedimentation pond and transferred to the conveyance tunnel. The water that pass this tunnel then transferred to the head pond where it fed to the penstock, and passed to the hydro power plant building where the electricity produced via turbines. The water than be left back to the Aksu River at the 138.2 m elevation level. How the project activity operating is shown below in Figure 1:

Figure 1: Flow chart showing the basic operational principles of the project activity. The project activity is connected to the grid via the 154 KV Osmanca Transformation Center, as indicated in the connection agreement provided to the validating DOE.



1.2 Sectoral Scope and Project Type

The project category is Sectoral Scope 1: Energy industries (renewable-/non -renewable sources). The project is a non-grouped, stand-alone project.

1.3 Project Proponent

Organization name	Aydem Yenilenebilir Enerji A.S. [2]
Contact person	Özgün Gül Koparan
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Address	Adalet Mah. Hasan Gönüllü Bulvarı No:15-1 Merkezefendi
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1.4 Other Entities Involved in the Project

Organization name	Ekobil Environmental Services and Consultancy Limited[3]
Role in the Project	Preparation of the Project Description Document
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[2] Bereket Energy was the major shareholder of Düzce Aksu Uretim A.S and as the Bereket changed tittle as a company policy they have disolved all the individual sister companies that hold licences of facilities (like the Duzce Aksu HPP) and changed the ownership as Aydem Yenilenebilir A.Ş.

[3] Ekobil was contracted by "Turkuaz Karbon Varlık Yönetimi Enerji Proje ve Dan. San. İth. İhr. Ltd. Şti." for the preparation of PD and now Ekobil is directly contacted by project proponent for monitoring report preparation **Ekobil is a limited liability company registered to the Ankara Chamber of Commerce with the registration number of 145009 and with the full tittle of Ekobil Çevre Hizmetleri Danışmanlık Eğitim Tarım Hayvancılık Madencilik İnşaat İthalat İhracat Turizm ve Ticaret Limited Şirketi**

1.5 Project Start Date

25.04.2014, is the date when the project started to supply electricity to the Turkish grid as substantiated by the partial acceptance letter sent to the Governance of Düzce Province, Düzce-Turkey.

1.6 Project Crediting Period

The project crediting period is 10 years: 25.04.2014 to 23.04.2024 (both days inclusive). Renewable twice.

1.7 Project Location

The project is located at the Western Part of the Northern Black Sea geographical district of Turkey at the Düzce Province as shown in the location Map below (Figure 2). The nearest settlement to the project site is Gölyaka that can be reached using the major İstanbul Ankara Motorway, along the route towards Ankara Gölyaka is situated 11 km's after the Düzce province. The coordinates of the weir and the the power house are indicated in the below table (Table 1).

Table 1: The geographical coordinates[4] indicating the location of the major components of the project activity:

Component's name	Latitude	Longitude
Weir	40°42'8.07"N	30°57'49.93"E
Powerhouse	40°45'39.31"N	30°59'20.59"E

[4] These coordinates are taken from .kmz file provided by the project owner, the file is also provided to the validating DOE.

Figure 2: Google Earth Satellite imagery showing the location of the project area

1.8 Title and Reference of Methodology

The following UNFFCC methodology and its related tools are utilised:

Approved consolidated baseline and monitoring methodology ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources.” Version 16.0.0.

The Approved Methodology refers to the following tools:

- “Tool for the demonstration and assessment of additionality” (Version 07.0)
- “Tool to calculate the emission factor for an electricity system”. (Version 05.0)
- "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" (Version 02)

- "Combined tool to identify the baseline scenario and demonstrate additionality" (Version 6.0.0).

Only the following tools are utilized:

- "Tool for the demonstration and assessment of additionality" (Version 07.0.0)
- "Tool to calculate the emission factor for an electricity system". (Version 05.0.0)

Also these tools are referred to in this PDD

- "Tool to determine the remaining lifetime of equipment" (Version 01)
- Tool to determine Common practice (Version 03.1)
- Methodological tool: Investment analysis (Version 06.0)

1.9 Participation under other GHG Programs

Not applicable

- Emission Trading Programs and Other Binding Limits: The project reduces GHG emissions from activities that are not included in an emissions trading program or any other mechanism that includes GHG allowance trading, therefore the net GHG emission reductions or removals generated during this monitoring period are not to be used for compliance under such programs or mechanisms.The host country does not have binding emissions limits and the project is not eligible to produce any compliance emmissions reductions.
- Other Forms of Environmental Credit: The project has not sought or has not received another form of GHG-related environmental credit, including renewable energy certificates, during this monitoring period. Additionally, the project activity is not eligible to create another form of GHG-related environment credit.
- Participation under Other GHG Programs: The project is not registered under any other GHG programs and, the project activity does not have any GHG credits claimed under such programs.

1.10 Other Forms of Credit

Not applicable

- Host country does not have an emissions trading scheme and the project activity is not taking place in any other form of environmental credit.

- Other Forms of Environmental Credit: The project has not sought or received any other form of GHG-related environmental credit, including renewable energy certificates, during this monitoring period.

1.11 Sustainable Development

The purpose of the project is electricity production using the potential energy of Aksu River as a renewable resource. Therefore, the electricity is going to be produced without causing airborne pollutants or Green House Gas (GHG) emissions. The construction and operation of the Düzce-Aksu Hydro Electric Power Plant (HEPP) will be delaying the addition of conventional thermal power plants to the Turkish National Electricity Grid.

The project produce an average total of 141,370 MWh of electricity per year therefore the plant load factor of the project calculates to be, 34.93 %. The project is a green field project and in the absence of the project activity an equivalent amount of electricity would have been generated in the fossil fuel based national grid.

The following is a list of the project's contribution to the UN SDG:

SDG 7 on access to affordable, reliable, and sustainable energy, as the project is not relying on imported fossil fuels.

SDG-8 decent work and economic growth. As the project is providing a decent and secure work environment.

SDG 13 on urgent action to combat climate change, as the project is replacing the fossil fuel based national grid and it is producing emission reductions.

2 SAFEGUARDS

2.1 No Net Harm

According to the rules and regulations at the time of licence application for electricity production the project was given a certificate of indicating that the Project does not need to undergo a full EIA process, by the Düzce Provincial Directorate of Environment and Forestry. Because, at the time of licence application the Hydro Power Plants that had installed capacity lower than 50 MW was considered to be out of scope according to EIA regulation that was active during the period of application. This letter is attached in Appendix 1.

Although there were no significant environmental impacts determined, the following is the summary of the impacts and the mitigation actions outlined in the Project Presentation Report submitted to the authorities:

Air Quality: Necessary precautions, such as watering roads, careful loading and unloading and covering the top of loaded trucks by tarpaulin; is taken in order to minimize the dust formed during excavation.

Water & Wastewater Management: Water for domestic use is supplied by tankers to the site and wastewater will be collected in septic tanks which will be emptied regularly. The wastewater will be discharged in accordance with Water Pollution Control Regulations.

The waste oil: Any kind of waste oil that may result during construction or operation stages, is collected in impermeable containers and transferred to recycling centers in accordance with Hazardous Waste Control Regulations and Waste Oil Control Regulations.

Solid Waste: Solid waste is collected and recyclables are separated to be sent to recycling centers. The rest is disposed to the nearest landfill site in coordination with Dereli Municipality.

Biodiversity: A fish passage is constructed to ease up and down stream movements of the fish living in Aksu river.

2.2 Local Stakeholder Consultation

The major stakeholders to the project are the central and local governmental institutions. These are namely: The Energy Market Regulatory Authority (EMRA), Düzce Provincial Directorate of Environment and Forestry, General Directorate of Forestry, Düzce Governorship, Düzce-Aksu

Municipality, General Directorate of Mining Affairs. The closest settlement is the Gölyaka town,and its bound villages.

The project owner identified these stakeholders and got into communication with them at the start of the project. Among the government authorities, EMRA is a significant stakeholder as they issue the electricity production licence and monitor the realization stages of the project.

The project owner informed these stakeholders and communicated officially along the designing stage of the project.

Amongst these stakeholders, the Ministry of Environment and Forestry (MoEF) and its Düzce Provincial Directorate are the two other significant stakeholders as they provide the relevant environmental permits. The General Directorate of Forestry is also very important as they give the land use permission for the forested areas.

2.3 AFOLU-Specific Safeguards

The Project is a non-AFOLU project.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

The construction of Düzce Aksu HPP has started in 16.11.2009. Düzce Aksu HPP consists of 2 units. Both units were commissioned in 25.04.2014, which is also the start date of the project. No major shutdown was observed during the monitoring period. Some minor failures in electricity generation have occurred due to drought and maintanance activities.Meters are checked and controlled everyday by the Operational Team (see Table 3). Also the data from these metering devices are recorded by TEIAS on monthly agreed protocols. Necessary tests were carried out regularly in the metering devices during the monitoring period and no problems were encountered.

Since the start date of the project, there is no special event that may have impact on monitoring of GHG emission reductions.The following table summarizes the project milestones:

Table 2: Chronological history of the project development and the Significant dates for the project monitoring period

Date	*Event*
23-03-06	Water usage agreement signed between DSI and Düzce-Aksu A.Ş.
21-09-06	Project Licence Granted by EMRA
13-02-07	Connection agreement signed between Düzce-Aksu and TEIAS
16-07-07	Project was granted EIA not needed certification
17-03-08	Turbine Contract Signed
16-05-09	Duzce-Aksu A.Ş. Board expressed a decision indicating the need for carbon revenue
16-11-09	Construction start Date
03-12-09	Turn Key contract signed between Düzce-Aksu and Bereket Enerji
07-06-10	Loan Agreement Signed

3.2 Deviations

3.2.1 Methodology Deviations

The UNFCCC methodology of ACM0002 (version 16.0.0) and its related tools are applied as they are without any deviation from methodology.

3.2.2 Project Description Deviations

For the Project Proponent part, Bereket Energy was the major shareholder of Düzce Aksu Uretim A.S and as the Bereket changed tittle as a company policy they have disolved all the individual sister companies that hold licences of facilities (like the Duzce Aksu HPP) and changed the ownership as Aydem Yenilenebilir A.Ş. Other than that the project activity is in compliance with the scenario described at the Project Design Document, and validated by the validation report dated 21.04.2016.

3.3 Grouped Projects

The project is not a grouped project activity.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

The following are the data and parameters available at validation:

Data / Parameter	$FC_{i,y}$
Data unit	Mass or Volume Unit (Tones or cubic meter)
Description	Amount of fuel i consumed by relevant power plants in Turkey in years, 2009, 2010, 2011
Source of data	Turkish Electricity Transmission Company (TEIAŞ) Web Site (http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2011/yakıt46-49/47.xls)
Value applied	Please see Appendix 2 Table 1
Justification of choice of data or description of measurement methods and procedures applied	Data used is taken from the TEİAŞ website, which is the website of the Turkish Electricity Distribution Company. The data published on the TEİAŞ website is the most up-to date and reliable data available for the Turkish grid.
Purpose of Data	Data used for the calculation of $EF_{grid,OM,Simple,y}$
Comments	-

Data / Parameter	NCV
Data unit	GJ/Mass or Volume Unit
Description	Net Calorific Values for fossil fuels in years 2009, 2010 and 2011
Source of data	Turkish Electricity Transmission Company Web Site (http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2011/yakıt46-49/49.xls http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2011/yakıt46-49/47.xls)
Value applied	Please see Appendix-2 Table 5
Justification of choice of data or description of measurement	Data used is taken from the TEİAŞ website, which is the website of the Turkish Electricity Distribution Company. The data published on the TEİAŞ website is the most up-to date and reliable data available for the Turkish grid.

methods and procedures applied	
Purpose of Data	Data used for the calculation of $EF_{grid,OM,Simple,y}$. As data on the NCV is not published directly on the TEİAŞ website, this data is calculated using the heating values of fuels and the volume or mass of fuels consumed for each year.
Comments	-

Data / Parameter	$EF_{CO2,i,y}$
Data unit	tCO_2/GJ
Description	CO_2 emission factor of fossil fuel type *i* in year *y*
Source of data	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories
Value applied	Please see Appendix 2 Table 2
Justification of choice of data or description of measurement methods and procedures applied	Data used is taken from the TEİAŞ website, which is the website of the Turkish Electricity Distribution Company. The data published on the TEİAŞ website is the most up-to-date and reliable data available for the Turkish grid.
Purpose of Data	Data used both for the calculation of $EF_{grid,OM,Simple,y}$ and $EF_{EL,m,y}$
Comments	-

Data / Parameter	EG_y
Data unit	MWh
Description	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost / must-run power plants / units, in year y
Source of data	Turkish Electricity Transmission Company Web Site http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2011/ uretim%20tuketim(22-45)/33(84-11).xls
Value applied	Please see Appendix 2 Table 3 and Table 4
Justification of choice of data or description of measurement methods and procedures applied	Data used is taken from the TEİAŞ website, which is the website of the Turkish Electricity Distribution Company. The data published on the TEİAŞ website is the most up-to-date and reliable data available for the Turkish grid.

Purpose of Data	Data used for the calculation of $EF_{grid,OM,Simple,y}$
Comments	-

Data / Parameter	$EG_{m,y}$
Data unit	MWh
Description	Net quantity of electricity generated and delivered to the grid by power unit m in year y
Source of data	Turkish Electricity Transmission Company Web Site (www.teias.gov.tr). Data is extracted from the relevant annexes of the capacity projection reports for the years 2011[5] and 2012[6].
Value applied	Please see Appendix 2-Table 6a and 6b
Justification of choice of data or description of measurement methods and procedures applied	Data used is taken from the TEİAŞ website, which is the website of the Turkish Electricity Distribution Company. The data published on the TEİAŞ website is the most up-to-date and reliable data available for the Turkish grid.
Purpose of Data	Data used for the calculation of $EF_{grid,BM,y}$
Comments	-

Data / Parameter	$\eta_{m,y}$
Data unit	-
Description	Average net energy conversion efficiency of power unit m in year y
Source of data	The default values provided at the annex 1 of the "Tool to calculate emission factor for an electricity sector (version 4.0.0)" are used
Value applied	Please see Appendix 2 Table 1
Justification of choice of data or description	According to the "tool to calculate emission factor

[5] http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2011.pdf

[6] http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf

of measurement methods and procedures applied	for an electricity system if documented manufacturer's specifications or data from the utility, the dispatch centre or official records are not available then the default values given in annex 1 of the tool shall be used. The first two options are not available for the power plants supplying the Turkish grid, therefore the default values are used.
Purpose of Data	Data used for the calculation of $EF_{grid,BM,y}$
Comments	-

4.2 Data and Parameters Monitored

The following are the data and parameters monitored subsequent to validation:

Data / Parameter	EG_y
Data unit	MWh
Description	Electricity
Source of data	Net Amount of Electricity supplied to the "Turkish National Grid" by the proposed project
Description of measurement methods and procedures to be applied	Data will be measured directly from meters and records on TEIAS readings protocol papers.
Frequency of monitoring/recording	Annually
Value monitored	620,825.67 MWh in total
Monitoring equipment	Data will be monitored continuously by redundant metering devices, which will provide the data for the monthly invoicing to TEİAŞ. All meters will be in compliance with the communiqué for Metering Devices to be used in the Electricity Market[7].
QA/QC procedures to be applied	There will be two meters that will backup each other. Generated electricity will also be monitored by the operator using software for internal monitoring.

[7] The latest version of the communiqué (in Turkish) can be found in the following link: http://www.epdk.gov.tr/web/elektrik-piyasasi-dairesi/44

Purpose of the data	Data to be used for the calculation of Baseline Emissions.
Calculation method	Direct Continuous Measurement
Comments	The collected data will be kept by Düzce Aksu Elektrik Üretim A.Ş. During the crediting period and until two years after the last issuance of VERs for the "Düzce-aksu Hydro Electricity Power Plant" project activity for that crediting period.

Data / Parameter	CapPJ
Data unit	W
Description	Installed capacity of the hydropower plants after the implementation of the Project Activity.
Source of data	Project site computers with SCADA system and the turbine name plates.
Description of measurement methods and procedures to be applied	Observed via the SCADA system of the Project Activity
Frequency of monitoring/recordin g	Once for each monitoring period
Value monitored	46,200,000 W
Monitoring equipment	SCADA system of the Project Activity
QA/QC procedures to be applied	Can be confirmed also by the parameter readings on the design plates of each turbine and by summing the two units.
Purpose of the data	Data to be used for the calculation of Baseline Emissions.
Calculation method	N/A.
Comments	-

Data / Parameter	APJ
Data unit	m^2

Description	Area of the reservoir measured in the surface of the water, after the implementation of the Project Activity, when the reservoir is at its maximum fullness.
Source of data	Surface area determined using the lake surface area map provided in Appendix-3
Description of measurement methods and procedures to be applied	The reservoir area corresponding to maximum operational level has been determined via the topographic map showing the lake area, presented in Appendix 3.
Frequency of monitoring/recordin g	Once during each monitoring period
Value monitored	708,282 m^2
Monitoring equipment	-
QA/QC procedures to be applied	Can be checked and compared to satellite imagery available by Google Earth.
Purpose of the data	Data to be used for the calculation of Baseline Emissions.
Calculation method	N/A
Comments	-

4.3 Monitoring Plan

Objectives of the monitoring program

The Monitoring plan is developed to ensure that the Project Activity is well organized from the start in terms of the collection and archiving of complete and reliable data that is needed to ensure reliable and accurate measurements of actual emission reductions.

Data to be monitored

Given that the emission factor is calculated on an ex-ante basis, the first data to be monitored is the net electricity supplied to the grid.

The second data to be monitored is the installed capacity of the Project Activity. Using the SCADA system installed capacity will be measured automatically.

The third data to be monitored is the reservoir area of the Project Activity. The reservoir area corresponding to maximum operational level has been determined as a certain value according to the topographical maps. In order to make verification of the reservoir area, the reservoir lake can be visited during the verification site visit and be compared to the reservoir area map, presented in Appendix 3.

The electricity produced will be sold to TEİAŞ. Therefore, TEİAŞ measures the electricity produced by two meters placed on the switchgear station where the power plant gets connected to the Turkish national grid. Those meters will provide official data which will be read and recorded monthly by TEİAŞ officers for invoicing. TEİAŞ also conducts the calibration and maintenance of these meters and thus, ensures the accuracy and quality of the measurements. The quality standards that the meters need to comply is "The ICE/TSE 62053-22: Electricity metering equipment (a.c) – Particular requirements - Part 22: Static meters for active energy (Classes 0,2 S and 0,5 S)" The calibration of the meters is done and the meters will be checked continuously if there is a difference of 0.2 % in the readings of the main and the auxiliary meters, the calibration is repeated.

The net electricity produced is calculated by subtracting the total electricity consumed by the hydroelectric power plant, from the gross electricity generation and a certain percentage is lost during the transmission. After obtaining the net electricity production value, the emission reductions will be calculated by multiplying the net electricity with the Combined Margin calculated above.

The monitoring will be conducted by the Verified Emission Reduction (VER) Monitoring Team. The VER Team Members, and their position and duties for the monitoring is outlined in the following table (Table 3):

Table 3: Positions and responsibilities of the VER monitoring team members.

Position	Responsibility
Düzce-Aksu HEPP Manager	Day to day operation of the Düzce-Aksu HEPP, Compliance of the project activity with the host country rules and regulations Coordination of the data collection and recording for the VCS monitoring report.
Chief Electrical Engineer	Day to day follow up of electrical equipment Recording and monitoring of the electricity generation data
Accounts Manager	Data keeping for power sales Data entry to PMUM system

Chief Mechanical Engineer	Day to day operation of the power plant Keeping records of malfunctions and repairs
Carbon Consultant	Emission reduction calculations Scripting of the periodic monitoring report Follow up of the verification process

The power generation meter readings will be performed by using the main metering devices and the auxiliary metering devices for accuracy checks only. Data from metering devices will be recorded by TEİAŞ on monthly agreed protocols and will form the basis for invoicing. In addition to the readings of the two metering devices, generation data of the Düzce-Aksu HEPP can be cross checked, via the TEİAŞ – PMUM web site (http://pmum.teias.gov.tr) which is accessible by a password available to the electricity generation companies. The electricity generation data at the Market Financial Reconciliation Centre (MFRC/PMUM) web page will exhibit the net electricity generated less transmission loss, to be able to produce comparable numbers , the figures taken from PMUM web site needs to be multiplied by the transmission loss factor of the grid.Detaills of the meters are given in the table below(Table 4).

Table 4:Information about the meters

Meter Serial Number	Manufacturer	Calibration Year[8]	Valid Until	Accuracy Class
Main Meter:65000766	ITRON	2011	2021	0.5S (+-%1)
Control Meter:65000767	ITRON	2011	2021	0.5S (+-%1)

[8] Within the scope of this Regulation in Turkey (https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=6381&MevzuatTur=7&MevzuatTertip=5), the stamp year is taken as basis and the year it is stamped is counted as the first year, regardless of the date in the year and the remaining period is calculated from the year following the year it was stamped.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The baseline emissions (BEy) are calculated based on the following formula:

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

Bey = Baseline emissions in year y (tCO2-yr)

$EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y (MWh-yr)

$EF_{grid,CM,y}$ = Combined margin CO2 emissions factor in year y (tCO2-MWh)And

And

$EG_{PJ,y} = EG_{Facility,y}$

$EG_{Facility,y}$ = Quantity of net electricity generation supplied by the project plant to the grid in year y (MWh-y)

The Combined margin CO_2 emissions factor in year y (tCO_2 -MWh), $EF_{grid,CM,y}$, is fixed ex-ante for the duration of the crediting period, and is 0. 53323 tCO_{2e} -MWh.

Table 5: Baseline emissions of the project calculated for the monitoring period (National Grid Emission Factor EF_{CM} is 0.53323 tCO2e-MWh).

	A-Gross Electricity Production		B-Self Electricity Consumption	C-Net electricity Production C=A-B	Baseline Emissions=EGPP-net,y* EFCM
	Symbol	EGPP-gross, y	EGPP-self consumption, y	EGPP-net, y	BE1
Year	Unit	MWh	MWh	MWh	tCO2e
2014	April	578.95	20.19	558.76	297.95
	May	10,405.98	3.22	10,402.76	5,547.06
	June	8,841.94	3.03	8,838.91	4,713.17
	July	2,338.27	19.8	2,318.47	1,236.28
	August	1,770.94	24.22	1,746.72	931.40
	September	2,647.39	22.79	2,624.60	1,399.52

	October	8,023.85	4.36	8,019.49	4,276.23
	November	10,252.12	0.98	10,251.14	5,466.22
	December	16,969.51	0.54	16,968.97	9,048.36
Total in 2014		61,828.95	99.13	61,729.82	32,916
2015	January	9,849.22	0.05	9,849.17	5,251.87
	February	13,181.57	0.09	13,181.48	7,028.76
	March	19,421.89	0.16	19,421.73	10,356.25
	April	26,978.56	0.01	26,978.55	14,385.77
	May	20,823.69	0	20,823.69	11,103.82
	June	11,731.27	0.07	11,731.20	6,255.43
	July	4,116.35	9.47	4,106.88	2,189.91
	August	400.03	34.13	365.9	195.11
	September	234.13	34.21	199.92	106.60
	October	5,582.56	9.14	5,573.42	2,971.91
	November	1,391.70	27.34	1,364.36	727.52
	December	1,565.02	31.36	1,533.66	817.79
Total in 2015		115,275.99	146.03	115,129.96	61,390
2016	January	13,392.69	5.02	13,387.67	7,138.71
	February	24,265.69	0.5	24,265.19	12,938.93
	March	22,726.09	0.02	22,726.07	12,118.22
	April	14,374.07	0.42	14,373.65	7,664.46
	May	10,982.36	0.02	10,982.34	5,856.11
	June	4,883.49	7.4	4,876.09	2,600.08
	July	283.05	32.92	250.13	133.38
	August	2,280.43	25.98	2,254.45	1,202.14
	September	1,213.00	27.33	1,185.67	632.23
	October	1,176.55	30.95	1,145.60	610.87
	November	2,374.00	23.44	2,350.56	1,253.39
	December	2,946.71	19.73	2,926.98	1,560.75
Total in 2016		100,898.13	173.73	100,724.40	53,709
2017	January	3,956.40	13.94	3,942.46	2,102.24
	February	7,420.45	4.24	7,416.21	3,954.55
	March	20,308.83	0	20,308.83	10,829.28
	April	17,921.06	0	17,921.06	9,556.05
	May	7,748.41	1.34	7,747.07	4,130.97
	June	10,088.45	0.27	10,088.18	5,379.32
	July	4,277.24	13.51	4,263.73	2,273.55
	August	751.36	26.05	725.31	386.76
	September	311.86	33.65	278.21	148.35
	October	3,804.10	19.01	3,785.09	2,018.32
	November	5,381.93	10.71	5,371.22	2,864.10

	December	10,830.75	0	10,830.75	5,775.28
Total in 2017		92,800.84	122.72	92,678.12	49,418
2018	January	7,950.68	0.15	7,950.53	4,239.46
	February	11,770.84	0	11,770.84	6,276.57
	March	20,307.14	0.01	20,307.13	10,828.37
	April	7,878.74	3.83	7,874.91	4,199.14
	May	7,507.98	8.69	7,499.29	3,998.85
	June	3,176.30	15.39	3,160.91	1,685.49
	July	1,222.21	31.16	1,191.05	635.10
	August	94.08	36.8	57.28	30.54
	September	1,094.84	33.05	1,061.79	566.18
	October	2,120.68	26.48	2,094.20	1,116.69
	November	4,302.39	19.15	4,283.24	2,283.95
	December	13,383.37	0.05	13,383.32	7,136.39
Total in 2018		80,809.25	174.76	80,634.49	42,996
2019	January	6,441.88	3.5	6,438.38	3,433.14
	February	9,139.17	0	9,139.17	4,873.28
	March	16,082.51	0.13	16,082.38	8,575.61
	April	22,350.74	0	22,350.74	11,918.09
	May	9,651.95	0.45	9,651.50	5,146.47
	June	7,733.81	5.49	7,728.32	4,120.97
	July	4,948.63	8.87	4,939.76	2,634.03
	August	4,525.42	12.89	4,512.53	2,406.22
	September	859.91	31.4	828.51	441.79
	October	1,570.73	27.72	1,543.01	822.78
	November	760.22	34.02	726.2	387.23
	December	5,485.19	6.88	5,478.31	2,921.20
Total in 2019		89,550.16	131.35	89,418.81	47,680
2020	January	4,572.71	5.46	4,567.25	2,435.39
	February	11,253.30	0	11,253.30	6,000.60
	March	24,522.27	0.18	24,522.09	13,075.91
	April	24,408.15	0	24,408.15	13,015.16
	May	9,307.75	0.35	9,307.40	4,962.98
	June	4,853.44	6.41	4,847.03	2,584.58
	July	1,707.28	27.88	1,679.40	895.51
	August	0.00	38.02	-38.02	-20.27
	September	0.00	36.53	-36.53	-19.48
Total in 2020		80,624.90	114.83	80,510.07	42,930
Grand Total		621,788.22	962.55	620,825.67	331,039

5.2 Project Emissions

As methodology states the PEy in case of a hydro power project will be calculated:

"Emissions from water reservoirs of hydro power plants ($PE_{HP,y}$)

For hydro power project activities that result in new reservoirs and hydro power project activities that result in the increase of existing reservoirs, project proponents shall account for CH_4 and CO_2 emissions from the reservoir, estimated as follows:"

"...the power density of the project activity (PD) is greater than 4 W/m² and less than or equal to 10 W/m²:"

As shown by the following calculation, The project has a power density of 65.23 W/m², this is greater than 10 W/m²,

Project Activity	Installed Capacity	/	Reservoir Area[9]	=	Power Density
Düzce-AksuHEPP	46,200,000 W	/	708,282 m²	=	65.23 W/m²

Therefore·

$$PE_{HP,y} = 0$$

Where:

PEHP,y

There may be one diesel generator installed within the project boundary. This is only going to be utilized as a back-up or emergency generator, therefore, the emissions from this back up generator have been deemed negligible as per the ACM0002 (version 16.0) methodology.

5.3 Leakage

There are no leakage emissions related to project activity.

[9] The reservoir Area map that indicates the aerial extent of the reservoir at maximum operation level is provided in Appendix 3.

5.4 Net GHG Emission Reductions and Removals

The following table (Table 6) gives a summary of the project activity related emission reductions with respect to vintage years:

Table 6 : Project activity related emission reductions with respect to vintage years.

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2014 25/04/2014 to 31/12/2014)	32,916	0	0	32,916
2015 20/01/2015 to 31/12/2015)	61,390	0	0	61,390
2016 01/01/2016 to 31/12/2016)	53,709	0	0	53,709
2017 01/01/2017 to 31/12/2017)	49,418	0	0	49,418
2018 (01/01/2018 to 31/12/2018)	42,996	0	0	42,996
2019 01/01/2019 to 31/12/2019)	47,680	0	0	47,680
2020 01/01/2020 to 30/09/2020)	42,930	0	0	42,930
Total	331,039	0	0	331,039

APPENDIX 1: THE EIA EXCEMPTION OF THE PROJECT ACTIVITY

T.C.
Çevre ve Orman Bakanlığı

T.C.
ÇEVRE ve ORMAN BAKANLIĞI
ÇEVRESEL ETKİ DEĞERLENDİRMESİ VE PLANLAMA GENEL MÜDÜRLÜĞÜ

Karar Tarihi: 16/07/2007
Karar No :

ÇED GEREKLİ DEĞİLDİR BELGESİ

16.12.2003 tarih ve 25318 sayılı Resmi Gazete'de yayımlanarak yürürlüğe giren Çevresel Etki Değerlendirmesi Yönetmeliği'nin 17. maddesi gereğince; "Düzce-Aksu HES *(46,20 MW)*" projesi hakkında "*Çevresel Etki Değerlendirmesi Gerekli Değildir*" kararı verilmiştir.

Osman TÜZÜN
Bakanın
Genel Müdürü

Proje Sahibi :Düzce-Aksu Hid. Elk.Enerjiden Elektrik Üretim Sant.Ltd. Şti.
Projenin Yeri :Düzce İli, Gölyaka İlçesi, Aksu Deresi.

APPENDIX 2: BASELINE INFORMATION

Table 1: Amount of fuel i consumed by relevant power plants in Turkey in years, 2009, 2010, 2011

TÜRKİYE TERMİK SANTRALLARINDA TÜKETİLEN YAKIT MİKTARLARININ ÜRETİCİ KURULUŞLARA DAĞILIMININ YILLAR İTİBARİYLE GELİŞİMİ
(BİRLEŞİK ISI-ELEKTRİK SANTRALLARINDA ISI ÜRETİMİ İÇİN KULLANILAN YAKITLAR DAHİL)
ANNUAL DEVELOPMENT OF FUELS CONSUMED IN THERMAL POWER PLANTS IN TURKEY BY THE ELECTRIC UTILITIES
(FUELS USED FOR HEAT PRODUCTION IN CHP PLANTS INCLUDED)

Birim(Unit):Ton/Gaz(gas) 10^3 m^3

			2009	2010	2011
EÜAŞ VE BAĞLI ORTAKLIKLARI *EÜAŞ AND AFFILIATED PARTNERSHIPS OF EÜAŞ*	Taşkömürü	*Hard Coal*	1,664,859	1,563,792	1,700,458
	Linyit	*Lignite*	57,850,129	50,123,941	54,558,282
	TOPLAM	*TOTAL*	**59,514,988**	**51,687,733**	56,258,740
	Fuel-Oil *Fuel Oil*	Asıl Yakıt *Main Fuel*	239,410	16,864	27,098
		Yrd. Yakıt *Auxiliary Fuel*	134,007	105,073	118,439
		TOPLAM *TOTAL*	**373,417**	**121,937**	145,537
	Motorin *Diesel Oil*	Asıl Yakıt *Main Fuel*	45,364	4	0
		Yrd. Yakıt *Auxiliary Fuel*	72,956	18,901	13,984
		TOPLAM *TOTAL*	**118,320**	**18,905**	13,984
	TOPLAM	*TOTAL*	**491,737**	**140,842**	159,521
	Doğal Gaz	*Natural Gas*	5,091,011	4,493,275	4,173,420
MOBİL SANTRALLAR *MOBILE POWER PLANTS*	Fuel-Oil	*Fuel Oil*	0	0	0
	Motorin	*Diesel Oil*	0	0	0
	TOPLAM	*TOTAL*	**0**	**0**	0
OTOPRODÜKTÖRLER ÜRETİM ŞİRKETLERİ İŞLETME HAKKI DEVİR ADÜAŞ* *AUTOPRODUCERS PRODUCTION COMP. TOOR ADÜAŞ*	Taşkömür+İthal kömür	*Hard Coal+Imported Coal*	4,956,318	5,855,911	8,873,976
	Linyit	*Lignite*	5,770,389	6,565,451	6,949,028
	TOPLAM	*TOTAL*	**10,726,707**	**12,421,362**	15,823,004
	Fuel-Oil	*Fuel Oil*	1,220,904	769,845	386,071
	Motorin	*Diesel Oil*	62,537	1,449	1,063
	LPG	*LPG*	111	0	0
	Nafta	*Naphta*	8,077	13,140	0
	TOPLAM	*TOTAL*	**1,291,629**	**784,434**	387,134
	Doğal Gaz	*Natural Gas*	15,887,029	17,290,139	18,631,167
TÜRKİYE *TURKEY*	Taşkömür+İthal kömür	*Hard Coal+Imported Coal*	6,621,177	7,419,703	10,574,434
	Linyit	*Lignite*	63,620,518	56,689,392	61,507,310
	TOPLAM	*TOTAL*	**70,241,695**	**64,109,095**	**72,081,744**
	Fuel-Oil	*Fuel Oil*	1,594,321	891,782	531,608
	Motorin	*Diesel Oil*	180,857	20,354	15,047
	LPG	*LPG*	111	0	0
	Nafta	*Naphta*	8,077	13,140	0
	TOPLAM	*TOTAL*	**1,783,366**	**925,276**	**546,655**
	Doğal Gaz	*Natural Gas*	**20,978,040**	**21,783,414**	**22,804,587**

Not:Ayrıca Otoprodüktör santrallarda kullanılan Ağaç Kabuğu, Talaş ,Sıvı Kükürt, Siyah Likör, Katran, Kükürt keki , Kok Gazı, YF Gazı Rafineri gazı,Biogaz ve Endüstriyel atık ile ilgili miktarlar tabloda yer almamaktadır.

Note: Quantities of Wood Wastes, Liquid Sulphur, Black Liquor, Bitumen Pyrite,Sulphur Cake etc. and Natural Gas,Coke Oven Gas , Blast Furnace Gas and Refinery Gas values used by autoproducers are not included in the table.

* ADÜAŞ'ın lisansı Eylül 2008 tarihinde serbest üretim lisansına dönüştürülmüştür.
ADÜAŞ's license has been turned into the IPP license in September 2008

Table 2: IPCC Default CO_2 Emission Factors

Fuel Type:	EF (tCO2/TJ)
Coal	92.80
Lignite	90.90
Fuel Oil	75.50
Diesel	72.60
LPG	61.60
Naphtha	69.30
Natural Gas	54.30
Bitumen	73.00

Table 3: Heating Values of Fuels Consumed in Thermal Power Plants in Turkey by the Electric Utilities (Tcal)

http://www.teias.gov.tr/TürkiyeElektrikIstatistikleri/istatistik2011/yakıt46-49/49.xls

TÜRKİYE TERMİK SANTRALLARINDA TÜKETİLEN YAKITLARIN KURULUŞLARA GÖRE ISI DEĞERLERİ
(BİRLEŞİK ISI-ELEKTRİK SANTRALLARINDA ISI ÜRETİMİ İÇİN KULLANILAN YAKITLAR DAHİL)
HEATING VALUES OF FUELS CONSUMED IN THERMAL POWER PLANTS IN TURKEY BY THE ELECTRIC UTILITIES
(FUELS USED FOR HEAT PRODUCTION IN CHP PLANTS INCLUDED)

Birim(Unit): Tcal

			2009	2010	2011
EÜAŞ VE BAĞLI ORTAKLIKLARI *EÜAŞ AND AFFILIATED PARTNERSHIPS OF EÜAŞ*	**Taşkömürü**	*Hard Coal*	5,452	4,990	5,511
	Linyit	*Lignite*	83,356	80,967	91,352
	TOPLAM	*Total*	**88,809**	**85,957**	**96,863**
	Fuel-Oil *Fuel Oil*	**Asıl Yakıt** *Main Fuel*	2,301	162	261
		Yrd. Yakıt *Auxiliary Fuel*	1,286	1,009	1,137
		TOPLAM *TOTAL*	**3,587**	**1,171**	**1,398**
	Motorin *Diesel Oil*	**Asıl Yakıt** *Main Fuel*	467	0	0
		Yrd. Yakıt *Auxiliary Fuel*	751	195	144
		TOPLAM *TOTAL*	**1,219**	**195**	**144**
	TOPLAM	*TOTAL*	**4,806**	**1,366**	**1,542**
	Doğal Gaz	*Natural Gas*	**42,335**	**37,354**	**34,621**
	TOPLAM	*TOTAL*	**135,949**	**124,676**	**133,026**
MOBİL SANTRALLAR *MOBIL POWER PLANTS*	**Fuel-Oil**	***Fuel Oil***	0	0	0
	Motorin	***Diesel Oil***			
	TOPLAM	***TOTAL***	**0**	**0**	**0**
OTOPRODÜKTÖRLER ÜRETİM ŞİRKETLERİ İŞLETME HAKKI DEVİR ADÜAŞ *AUTOPRODUCERS PRODUCTION COMP. TOOR ADÜAŞ*	**Taşkömür+İthal kömür**	*Hard Coal+Imported Coal*	29,677	34,556	52,056
	Linyit	*Lignite*	14,295	15,584	15,857
	TOPLAM	*Total*	**43,973**	**50,141**	**67,914**
	Fuel-Oil	*Fuel Oil*	11,573	7,398	3,882
	Motorin	*Diesel Oil*	612	15	11
	Lpg	*Lpg*	1	0	0
	Nafta	*Naphta*	84	105	0
	TOPLAM	*TOTAL*	**12,270**	**7,518**	**3,893**
	Doğal Gaz	*Natural Gas*	**143,931**	**157,134**	**167,443**
	TOPLAM	*TOTAL*	**187,904**	**207,275**	**235,357**
TÜRKİYE *TURKEY*	**Taşkömür+İthal kömür**	*Hard Coal+Imported Coal*	35,130	39,546	57,567
	Linyit	*Lignite*	97,652	96,551	107,210
	TOPLAM	*Total*	**132,781**	**136,097**	**164,777**
	Fuel-Oil	*Fuel Oil*	15,160	8,569	5,280
	Motorin	*Diesel Oil*	1,830	209	155
	Lpg	*Lpg*	1	0	0
	Nafta	*Naphta*	84	105	0
	TOPLAM	*TOTAL*	**17,076**	**8,884**	**5,435**
	Doğal Gaz	*Natural Gas*	**186,266**	**194,487**	**202,064**
	TOPLAM	*TOTAL*	**336,123**	**339,468**	**372,276**

Not 1 :Ayrıca Ağaç kabuğu,talaş,sıvı kükürt,siyah likör,katran,kok gazı,YF gazı,rafineri gazı v.b otoprodüktör santrallarda kullanılan yakıtların ısı değerleri tabloda yer almamaktadır.
Note 1: Heating values of wood wastes,liquid sulphur,black liquor,bitumen,coke oven gas,blast furnace gas,refinery gas used by autoproducers are not included in the table.

Table 4:Heating Values of Fuels Consumed in Thermal Power Plants in Turkey by the Electric Utilities (Gjoule)

TÜRKİYE TERMİK SANTRALLARINDA TÜKETİLEN YAKITLARIN KURULUŞLARA GÖRE ISI DEĞERLERİ
(BİRLEŞİK ISI-ELEKTRİK SANTRALLARINDA ISI ÜRETİMİ İÇİN KULLANILAN YAKITLAR DAHİL)
HEATING VALUES OF FUELS CONSUMED IN THERMAL POWER PLANTS IN TURKEY BY THE ELECTRIC UTILITIES
(FUELS USED FOR HEAT PRODUCTION IN CHP PLANTS INCLUDED)
1cal = 4,1868 Joule

Birim(Unit): Gjoule

			2009	2010	2011
EÜAŞ VE BAĞLI ORTAKLIKLARI *EÜAŞ AND AFFILIATED PARTNERSHIPS OF EÜAŞ*	**Taşkömürü**	*Hard Coal*	22,828,163	20,892,383	23,074,208
	Linyit	*Lignite*	348,995,433	338,990,622	382,472,805
	TOPLAM	*Total*	**371,823,595**	**359,883,005**	405,547,013
	Fuel-Oil *Fuel Oil*	**Asıl Yakıt** *Main Fuel*	9,632,696	679,656	1,091,289
		Yrd. Yakıt *Auxiliary Fuel*	5,386,180	4,223,229	4,760,433
		TOPLAM *TOTAL*	**15,018,876**	**4,902,885**	5,851,723
	Motorin *Diesel Oil*	**Asıl Yakıt** *Main Fuel*	1,956,278	159	0
		Yrd. Yakıt *Auxiliary Fuel*	3,146,162	815,082	603,737
		TOPLAM *TOTAL*	**5,102,441**	**815,241**	603,737
	TOPLAM	*TOTAL*	**20,121,317**	**5,718,126**	6,455,459
	Doğal Gaz	*Natural Gas*	**177,247,713**	**156,392,061**	144,950,365
	TOPLAM	*TOTAL*	**569,192,626**	**521,993,192**	556,952,838
MOBİL SANTRALLAR *MOBIL POWER PLANTS*	**Fuel-Oil**	***Fuel Oil***	0	0	0
	Motorin	***Diesel Oil***	0	0	0
	TOPLAM	***TOTAL***	**0**	**0**	0
OTOPRODÜKTÖRLER ÜRETİM ŞİRKETLERİ İŞLETME HAKKI DEVİR ADÜAŞ *AUTOPRODUCERS PRODUCTION COMP. TOOR ADÜAŞ*	**Taşkömür+İthal kömür**	*Hard Coal+Imported Coal*	124,253,075	144,680,890	217,948,438
	Linyit	*Lignite*	59,852,102	65,249,084	66,392,055
	TOPLAM	*Total*	**184,105,177**	**209,929,975**	284,340,493
	Fuel-Oil	*Fuel Oil*	48,452,601	30,974,336	16,254,037
	Motorin	*Diesel Oil*	2,560,350	61,818	45,552
	Lpg	*Lpg*	5,158	0	0
	Nafta	*Naphta*	352,524	440,154	0
	TOPLAM	*TOTAL*	**51,370,633**	**31,476,308**	16,299,589
	Doğal Gaz	*Natural Gas*	**602,609,967**	**657,887,178**	701,051,608
	TOPLAM	*TOTAL*	**786,715,144**	**867,817,153**	985,392,101
TÜRKİYE *TURKEY*	**Taşkömür+İthal kömür**	*Hard Coal+Imported Coal*	147,081,237	165,573,274	241,022,646
	Linyit	*Lignite*	408,847,535	404,239,706	448,864,860
	TOPLAM	*Total*	**555,928,772**	**569,812,980**	**689,887,506**
	Fuel-Oil	*Fuel Oil*	63,471,478	35,877,221	22,105,760
	Motorin	*Diesel Oil*	7,662,790	877,059	649,289
	Lpg	*Lpg*	5,158	0	0
	Nafta	*Naphta*	352,524	440,154	0
	TOPLAM	*TOTAL*	**71,491,950**	**37,194,434**	**22,755,049**
	Doğal Gaz	*Natural Gas*	**779,857,681**	**814,279,239**	**846,001,974**
	TOPLAM	*TOTAL*	**1,407,278,403**	**1,421,286,653**	**1,558,644,529**

Table 5:Net Calorific Values of Fuels in years 2009,2010 and 2011

NET CALORIFIC VALUES OF FUELS CONSUMED IN THE THERMAL POWER PLANTS

Unit: TJ/KT

			2009	2010	2011
EÜAŞ VE BAĞLI ORTAKLIKLARI *EÜAŞ AND AFFILIATED PARTNERSHIPS OF EÜAŞ*	Taşkömürü	*Hard Coal*	13.71	13.36	13.57
	Linyit	*Lignite*	6.03	6.76	7.01
	TOPLAM	*TOTAL*	**6.25**	**6.96**	7.21
	Fuel-Oil *Fuel Oil*	Asıl Yakıt *Main Fuel*	40.24	40.30	40.27
		Yrd. Yakıt *Auxiliary Fuel*	40.19	40.19	40.19
		TOPLAM *TOTAL*	**40.22**	**40.21**	40.21
	Motorin *Diesel Oil*	Asıl Yakıt *Main Fuel*	0.00	1.00	0.00
		Yrd. Yakıt *Auxiliary Fuel*	43.12	43.12	43.17
		TOPLAM *TOTAL*	**43.12**	**43.12**	43.17
	TOPLAM	*TOTAL*	**40.92**	**40.60**	40.47
	Doğal Gaz	*Natural Gas*	34.82	34.81	34.73
MOBİL SANTRALLAR *MOBILE POWER PLANTS*	Fuel-Oil	*Fuel Oil*	0.00	0.00	0.00
	Motorin	*Diesel Oil*	0.00	0.00	0.00
	TOPLAM	*TOTAL*	**0.00**	**0.00**	**0.00**
OTOPRODÜKTÖRLER ÜRETİM ŞİRKETLERİ İŞLETME HAKKI DEVİR ADÜAŞ* *AUTOPRODUCERS PRODUCTION COMP. TOOR ADÜAŞ*	Taşkömür+İthal kömür	*Hard Coal+Imported Coal*	25.07	24.71	24.56
	Linyit	*Lignite*	10.37	9.94	9.55
	TOPLAM	*TOTAL*	**17.16**	**16.90**	**17.97**
	Fuel-Oil	*Fuel Oil*	39.69	40.23	42.10
	Motorin	*Diesel Oil*	40.94	42.66	42.85
	LPG	*LPG*	0.00	1.00	0.00
	Nafta	*Naphta*	43.65	33.50	0.00
	TOPLAM	*TOTAL*	**39.77**	**40.13**	42.10
	Doğal Gaz	*Natural Gas*	37.93	38.05	37.63
TÜRKİYE *TURKEY*	Taşkömür+İthal kömür	*Hard Coal+Imported Coal*	22.21	22.32	22.79
	Linyit	*Lignite*	6.43	7.13	7.30
	TOPLAM	*TOTAL*	**7.91**	**8.89**	**9.57**
	Fuel-Oil	*Fuel Oil*	39.81	40.23	41.58
	Motorin	*Diesel Oil*	42.37	43.09	43.15
	LPG	*LPG*	46.47	0.00	0.00
	Nafta	*Naphta*	43.65	33.50	0.00
	TOPLAM	*TOTAL*	**40.09**	**40.20**	**41.63**
	Doğal Gaz	*Natural Gas*	37.17	37.38	37.10

Table 6a: Net quantity of electricity generated and delivered to the grid by power unit m in year y (2011)

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
SELİMOĞLU REG. VE HES	0.00	0.00	0.00	Private	Hydro	7-Jan-10
KULP IV HES (YILDIZLAR EN.ELK.ÜR.AŞ.)	12.30	41.00	23.00	Private	Hydro	13-Jan-10
TUZLA JEOTERMAL	0.00	0.00	0.00	Private	Geothermal	13-Jan-10
ROTOR ELEKTRİK (OSMANİYE RES)	0.00	0.00	0.00	Private	Wind	14-Jan-10
CİNDERE HES (İlave)	9.07	28.29	16.07	Private	Hydro	21-Jan-10
ETİ SODA ÜRE.PAZ.NAK.VE ELK.ÜRE.SAN.	24.00	144.00	144.00	Auto producer	Lignite	22-Jan-10
BAYBURT HES (BAYBURT ENERJİ ÜRET.)	14,6	51.00	24.00	Private	Hydro	28-Jan-10
UZUNÇAYIR HES (Tunceli) (İlave)	0.00	0.00	0.00	Private	Hydro	28-Jan-10
ALTINMARKA	4.60	37.02	37.02	Auto producer	Natural Gas	28-Jan-10
CAN TEKSTİL (Çorlu/TEKİRDAĞ)	7.83	60.25	60.25	Auto producer	Natural Gas	28-Jan-10
ALAKIR HES (YURT ENERJİ ÜRETİM)	2.06	6.00	4.00	Private	Hydro	29-Jan-10
CEV ENERJİ ÜRETİM (GAZİANTEP ÇÖP Biogas)	0.00	0.00	0.00	Private	Biogas	1-Feb-10
AKBAŞLAR (İlave)	1.54	1.54	12.08	Auto producer	Natural Gas	18-Feb-10
ASA ENERJİ (KALE REG.ve HES)	9,6	0.00	0.00	Private	Hydro	19-Feb-10
PETA MÜHENDİSLİK EN. (MURSAL II HES)	4.50	19.00	11.00	Private	Hydro	19-Feb-10
HETAŞ HACISALİHOĞLU (YILDIZLI HES)	1.20	5.00	3.00	Private	Hydro	23-Feb-10
ORTADOĞU ENERJİ (ODA YERİ) (Eyüp/İST.)	0.00	0.00	0.00	Private	LFG	24-Feb-10
KONYA ŞEKER SAN. VE TİC. A.Ş.1	6.00	36.00	36.00	Auto producer	Lignite	26-Feb-10
GLOBAL ENERJİ (PELİTLİK)	3.54	27.06	27.06	Private	Natural Gas	26-Feb-10
ASMAKİNSAN (BANDIRMA 3 RES)	20.00	0.00	0.00	Private	Wind	26-Feb-10

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
FLOKSER Tekstil (Çatalça-İstanbul)(Süetser tesisi)	-2.13	0.00	0.00	Auto producer	Natural Gas	28-Feb-10
RASA ENERJİ (VAN)	26.19	166.62	166.62	Private	Natural Gas	3-Mar-10
ROTOR ELEKTRİK (OSMANİYE RES)	17.50	0.00	0.00	Private	Wind	10-Mar-10
SOMA ENERJİ ÜRETİM (SOMA RES)	4.50	0.00	0.00	Private	Wind	10-Mar-10
DOĞUBAY ELEKTRİK (SARIMEHMET HES)	3.10	10.00	6.00	Private	Hydro	11-Mar-10
DENİZ ELEKTRİK (SEBENOBA RES)	10.00	0.00	0.00	Private	Wind	12-Mar-10
AKDENİZ ELEKTRİK (MERSİN RES)	33,0	0.00	0.00	Private	Wind	19-Mar-10
AKSA ENERJİ (ANTALYA)	25.00	192.50	192.50	Private	Natural Gas	20-Mar-10
NURYOL ENERJİ (DEFNE REG. VE HES)	7.23	22.00	13.00	Private	Hydro	26-Mar-10
MENDERES GEOTERMAL DORA-2	0.00	0.00	0.00	Private	Jeothermal	26-Mar-10
ASMAKİNSAN (BANDIRMA 3 RES)	4.00	0.00	0.00	Private	Wind	26-Mar-10
ÖZGÜR ELEKTRİK (AZMAK I REG.VE HES)	5.91	0.00	0.00	Private	Hydro	1-Apr-10
BİRİM HİDR. ÜRETİM AŞ. (ERFELEK HES)	3.23	9.50	5.50	Private	Hydro	3-Apr-10
BEYTEK EL. ÜR. A.Ş. (ÇATALOLUK HES)	9,5	0.00	0.00	Private	Hydro	7-Apr-10
NİSAN E.MEKANİK EN. (BAŞAK REG. HES)	6.85	22.00	12.00	Private	Hydro	9-Apr-10
BOREAS ENERJİ (BOREAS I ENEZ RES)	15,0	0.00	0.00	Private	Wind	9-Apr-10
UZUNÇAYIR HES (Tunceli) (İlave)	27.33	0.00	0.00	Private	Hydro	11-Apr-10
FIRTINA ELEKTRİK ÜR. A.Ş. (SÜMER HES)	21.60	59.41	33.27	Private	Hydro	16-Apr-10
FRİTOLAY GIDA SAN.VE TİC A.Ş.	0.07	4.00	4.00	Auto producer	Biogas	21-Apr-10
YILDIZ ENTEGRE AĞAÇ	12.37	79.79	79.79	Auto producer	Natural Gas	22-Apr-10

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
(Kocaeli)						
BAKRAS EN. ELKT.ÜR. A.Ş. ŞENBÜK RES	15,0	0.00	0.00	Private	Wind	22-Apr-10
ALİZE ENERJİ (KELTEPE RES)	1.80	0.00	0.00	Private	Wind	28-Apr-10
KAR-EN KARADENİZ EL.A.Ş. ARALIK HES	12.41	56.00	32.00	Private	Hydro	30-Apr-10
ITC-KA ENERJİ (SİNCAN)	0.00	0.00	0.00	Private	LFG	30-Apr-10
ATAER ENERJİ ELEKTRİK ÜRETİM A.Ş.	49.00	277.89	277.89	Private	Natural Gas	5-May-10
BİRİM HİDR. ÜRETİM AŞ. (ERFELEK HES)	3.23	9.50	5.50	Private	Hydro	14-May-10
CENGİZ ENERJİ SAN. VE TİC. A.Ş. (Tekkeköy)	101.95	802.00	802.00	Private	Natural Gas	22-May-10
KARADENİZ EL.ÜRET. (UZUNDERE-1 HES)	31.08	82.44	46.46	Private	Hydro	27-May-10
SİMKO(Kartal)	-2.05	0.00	0.00	Auto producer	Natural Gas	27-May-10
AKIM ENERJİ (CEVİZLİK REG. VE HES)	91,4	0.00	0.00	Private	Hydro	28-May-10
CEYHAN HES (OŞKAN HES) (ENOVA EN.)	23.89	0.00	0.00	Private	Hydro	3-Jun-10
ERENLER REG. ve HES (BME BİR.MÜT.EN.)	45.00	85.00	48.00	Private	Hydro	4-Jun-10
ROTOR ELEKTRİK (GÖKÇEDAĞ RES)	20.00	0.00	0.00	Private	Wind	5-Jun-10
ÇAKIT HES (ÇAKIT ENERJİ A.Ş.)	20.18	0.00	0.00	Private	Hydro	10-Jun-10
SOMA ENERJİ ÜRETİM (SOMA RES)	7.20	0.00	0.00	Private	Wind	10-Jun-10
PAŞA REG. VE HES (ÖZGÜR ELEKTRİK)	8.68	0.00	0.00	Private	Hydro	11-Jun-10
GÜZELÇAY-I HES (İLK ELEKTRİK ENERJİ)	3.14	16.67	9.30	Private	Hydro	15-Jun-10
KALE REG. VE HES (KALE ENERJİ ÜR.)	34.14	0.00	0.00	Private	Hydro	16-Jun-10
BERGAMA RES EN. ÜR. A.Ş. ALİAĞA RES	37.50	0.00	0.00	Private	Wind	16-Jun-10

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
MAZI-3 RES ELEKTRİK (MAZI-3 RES)	7.50	0.00	0.00	Private	Wind	18-Jun-10
UĞUR ENERJİ ÜRETİM TİC. VE SAN. A.Ş.	48.20	405.14	405.14	Private	Natural Gas	21-Jun-10
SÖKTAŞ (N+LPG)(Aydın)	-4.50			Auto producer	NAFTA	23-Jun-10
ÇAMLIKAYA REG. VE HES	5.65	19.00	11.00	Private	Hydro	30-Jun-10
ERİKLİ-AKOCAK REG. ve AKOCAK HES	41.25	0.00	0.00	Private	Hydro	30-Jun-10
BORASKO ENERJİ (BANDIRMA RES)	12.00	0.00	0.00	Private	Wind	30-Jun-10
AKSA ENERJİ (ANTALYA)	25.00	192.50	192.50	Private	Natural Gas	1-Jul-10
DİNAR HES (ELDA ELEKTRİK ÜRETİM)	4.44	15.00	9.00	Private	Hydro	3-Jul-10
DAMLAPINAR HES (CENAY ELEKTRİK ÜR.)	16.42	92.00	0.00	Private	Hydro	8-Jul-10
DİM HES (DİLER ELEKTRİK ÜRETİM)	38.25	123.00	70.00	Private	Hydro	8-Jul-10
ÖZGÜR ELEKTRİK (AZMAK I REG.VE HES)	5.91	0.00	0.00	Private	Hydro	10-Jul-10
ALTEK ALARKO ELEKTRİK SANTRALLARI	60.10	415.57	415.57	Private	Natural Gas	10-Jul-10
KİRPİLİK REG. VE HES (ÖZGÜR ELEKTRİK)	6.24	22.00	13.00	Private	Hydro	11-Jul-10
YAVUZ REG. VE HES (MASAT ENERJİ)	22.50	0.00	0.00	Private	Hydro	14-Jul-10
EREN ENERJİ ELEKTRİK ÜRETİM A.Ş.	160.00	4,005.88	4,005.88	Private	Coal	15-Jul-10
ZİYARET RES (ZİYARET RES ELEKTRİK)	12.50	0.00	0.00	Private	Wind	15-Jul-10
FLOKSER TEKSTİL (Çerkezköy/TEKİRDAĞ)	5.17	42.00	42.00	Autoproducer	Natural Gas	17-Jul-10
KAYABÜKÜ REG. VE HES (ELİTE ELEKT.)	14.58	0.00	0.00	Private	Hydro	21-Jul-10
RB KARESİ İTHALAT İHRACAT TEKSTİL	8.60	65.00	65.00	Autoproducer	Natural Gas	23-Jul-10

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
SOMA ENERJİ ÜRETİM (SOMA RES)	7.20	0.00	0.00	Private	Wind	28-Jul-10
ERİKLİ-AKOCAK REG. ve AKOCAK HES	41.25	0.00	0.00	Private	Hydro	29-Jul-10
CENGİZ ENERJİ SAN. VE TİC. A.Ş. (Tekkeköy)	101.95	802.00	802.00	Private	Natural Gas	31-Jul-10
GÖK REG. ve HES (GÖK ENERJİ EL. SAN.)	10.01	43.00	24.00	Private	Hydro	6-Aug-10
BULAM REG. VE HES (MEM ENERJİ ELK.)	7.03	0.00	0.00	Private	Hydro	10-Aug-10
KESKİNOĞLU TAVUKÇULUK VE DAM. İŞL.	3.50	25.00	25.00	Autoproducer	Natural Gas	11-Aug-10
SOMA RES (BİLGİN Wind SAN. EN.ÜR.)	32.50	0.00	0.00	Private	Wind	13-Aug-10
BİNATOM ELEKTRİK ÜRETİM A.Ş.	2.00	13.00	13.00	Private	Natural Gas	17-Aug-10
KURTOĞLU BAKIR KURŞUN SAN. A.Ş.	1.59	12.00	12.00	Autoproducer	Natural Gas	19-Aug-10
CAN ENERJİ ELEKTRİK ÜR. A.Ş.(Tekirdağ)	29.10	203.00	203.00	Private	Natural Gas	19-Aug-10
CEYHAN HES (BERKMAN HES)(ENOVA EN.)	12.61	0.00	0.00	Private	Hydro	20-Aug-10
SOMA ENERJİ ÜRETİM (SOMA RES)	6.30	0.00	0.00	Private	Wind	20-Aug-10
GÜDÜL I REG. VE HES (YAŞAM ENERJİ)	2.36	14.00	8.00	Private	Hydro	25-Aug-10
SÖNMEZ ENERJİ ÜRETİM (UŞAK)	33.24	248.59	248.59	Private	Natural Gas	26-Aug-10
CEYHAN HES (BERKMAN HES)(ENOVA EN.)	12.61	0.00	0.00	Private	Hydro	28-Aug-10
KARŞIYAKA HES (AKUA ENERJİ ÜRET.)	1.59	0.00	5.00	Private	Hydro	28-Aug-10
ITC ADANA BİOKÜTLE SANT.	0.00	0.00	0.00	Private	LFG	2-Sep-10
BELEN ELEKTRİK (BELEN RES) (İlave)	6.00	0.00	0.00	Private	Wind	2-Sep-10

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
TEKTUĞ ELEKTRİK (ANDIRIN HES)	40.50	106.00	60.00	Private	Hydro	3-Sep-10
ÜTOPYA ELEKTRİK (DÜZOVA RES) (İlave)	15.00	0.00	0.00	Private	Wind	3-Sep-10
BERGAMA RES EN. ÜR. A.Ş. ALİAĞA RES	52.50	0.00	0.00	Private	Wind	4-Sep-10
ROTOR ELEKTRİK (OSMANİYE RES)	17.50	0.00	0.00	Private	Wind	4-Sep-10
SELEN ELEKTRİK (KEPEZKAYA HES)	28.00	0.00	0.00	Private	Hydro	6-Sep-10
REŞADİYE 2 HES (TURKON MNG ELEKT.)	26.14	0.00	0.00	Private	Hydro	17-Sep-10
KOZAN HES (SER-ER ENERJİ)	4.00	9.00	5.00	Private	Hydro	21-Sep-10
SOMA RES (BİLGİN Wind SAN) (İlave)	27.50	0.00	0.00	Private	Wind	23-Sep-10
KIRKA BORAKS(Kırka) (Eti Maden İşl.) (İlave)	10.00	65.93	65.93	Autoproducer	Natural Gas	29-Sep-10
KAHRAMAN REG. VE HES (KATIRCIOĞLU)	1.42	6.00	3.00	Private	Hydro	30-Sep-10
NARİNKALE REG. VE HES (EBD ENERJİ)	3.10	10.00	6.00	Private	Hydro	30-Sep-10
SOMA ENERJİ ÜRETİM (SOMA RES) (İlave)	9.00	0.00	0.00	Private	Wind	1-Oct-10
ERENKÖY REG. VE HES (TÜRKERLER)	21.46	87.00	49.00	Private	Hydro	7-Oct-10
ENERJİ-SA (BANDIRMA)	1,000.00	7,540.00	7,540.00	Private	Natural Gas	7-Oct-10
UĞUR ENERJİ ÜR. TİC.VE SAN. A.Ş. (İlave)	12.00	100.86	100.86	Private	Natural Gas	7-Oct-10
ZİYARET RES (ZİYARET RES ELEK.)(İlave)	22.50	0.00	0.00	Private	Wind	13-Oct-10
KAHTA I HES (ERDEMYILDIZ ELEK. ÜRT.)	7.12	0.00	0.00	Private	Hydro	14-Oct-10
ROTOR ELEKTRİK (GÖKÇEDAĞ RES) (İlave)	2.50	0.00	0.00	Private	Wind	15-Oct-10
AZMAK-II REG. VE HES	-18.07	0.00	0.00	Private	Hydro	25-Oct-10

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
(Düzeltme)						
ITC ADANA BİOKÜTLE SANT. (Düzeltme)	0.00	0.00	0.00	Private	LFG	25-Oct-10
ENERJİ-SA (BANDIRMA) (Düzeltme)	-69.20	0.00	0.00	Private	Natural Gas	25-Oct-10
ULUABAT KUVVET TÜNELİ VE HES	48.51	0.00	0.00	Private	Hydro	27-Oct-10
SABUNSUYU II HES (ANG ENERJİ ELK.)	7.35	21.00	12.00	Private	Hydro	28-Oct-10
EREN ENERJİ ELEKTRİK ÜR. A.Ş. (İlave)	600.00	4,005.88	4,005.88	Private	Coal	1-Nov-10
BURÇ BENDİ VE HES (AKKUR ENERJİ)	27.33	0.00	0.00	Private	Hydro	4-Nov-10
KARADENİZ EL. (UZUNDERE-1 HES)(İlave)	31.08	82.44	46.46	Private	Hydro	7-Nov-10
GÜZELÇAY-II HES (İLK ELEKTRİK ENERJİ)	4.96	26.33	14.70	Private	Hydro	11-Nov-10
MURGUL BAKIR (Ç.Kaya) (İlave)	19.60	40.50	31.59	Private	Hydro	11-Nov-10
KUYUCAK RES (ALİZE ENERJİ ÜRET.)	8.00	0.00	0.00	Private	Wind	11-Nov-10
SOMA RES (BİLGİN Wind SAN.)(İlave)	30.00	0.00	0.00	Private	Wind	11-Nov-10
ULUABAT KUVVET TÜNELİ VE HES (İlave)	48.51	0.00	0.00	Private	Hydro	25-Nov-10
MARMARA PAMUKLU MENSUCAT (İlave)	26.19	203.45	203.45	Autoproducer	Natural Gas	25-Nov-10
FRİTOLAY GIDA SAN.VE TİC A.Ş. (İlave)	0.33	3.00	3.00	Autoproducer	Biogas	26-Nov-10
EGEMEN 1 HES (ENERSİS ELEKTRİK)	8.82	0.00	0.00	Private	Hydro	26-Nov-10
REŞADİYE 1 HES (TURKON MNG ELEKT.)	15.68	0.00	0.00	Private	Hydro	26-Nov-10
ALİAĞA ÇAKMAKTEPE ENERJİ (İlave)	69.84	557.92	557.92	Private	Natural Gas	26-Nov-10
YEDİGÖZE HES (YEDİGÖZE	155.33	474.00	268.00	Private	Hydro	2-Dec-10

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
ELEKTRİK)						
SÖNMEZ ENERJİ ÜRETİM (UŞAK) (İlave)	2.56	19.77	19.77	Private	Natural Gas	7-Dec-10
AK-ENERJİ (UŞAK OSB)(Uşak-Ak.en.)	-15.24	0.00	0.00	Private	Natural Gas	9-Dec-10
AK-ENERJİ(DG+N) (Deba-Denizli)	-15.60	0.00	0.00	Private	Natural Gas	9-Dec-10
KUYUCAK RES (ALİZE ENERJİ ÜR.) (İlave)	17.60	0.00	0.00	Private	Wind	9-Dec-10
UMUT III REG. VE HES (NİSAN ELEKTR.)	12.00	26.00	15.00	Private	Hydro	13-Dec-10
TÜPRAŞ RAFİNERİ (İZMİT) (İlave)	40.00	258.82	258.82	Autoproducer	Natural Gas	15-Dec-10
POLYPLEX EUROPA POLYESTER FİLM	7.81	61.00	61.00	Autoproducer	Natural Gas	16-Dec-10
ALTEK ALARKO ELEKTRİK SANTRALLARI	21.89	151.36	151.36	Private	Natural Gas	18-Dec-10
AKSA ENERJİ (Demirtaş/BURSA)	-1.40	0.00	0.00	Private	Waste	21-Dec-10
SARES RES (GARET ENERJİ ÜRETİM)	15.00	0.00	0.00	Private	Wind	22-Dec-10
FEKE 2 BARAJI VE HES (AKKUR ENERJİ)	69.34	0.00	0.00	Private	Hydro	24-Dec-10
EGEMEN 1B HES (ENERSİS ELEKTRİK)	11.10	0.00	0.00	Private	Hydro	28-Dec-10
EREN ENERJİ ELEKTRİK ÜR. A.Ş. (İlave)	600.00	4,005.88	4,005.88	Private	Coal	29-Dec-10
RASA ENERJİ (VAN) (İlave)	10.12	64.41	64.41	Private	Natural Gas	29-Dec-10
KALKANDERE REG. VE YOKUŞLU HES	14.54	0.00	0.00	Private	Hydro	30-Dec-10
TURGUTTEPE RES (SABAŞ ELEKTRİK ÜR.)	22.00	0.00	0.00	Private	Wind	30-Dec-10
AK TEKSTİL-1 (G.antep)	-13.04	0.00	0.00	Autoproducer	FUEL-OİL	31-Dec-10
SİLOPİ ELEKTRİK ÜR. A.Ş. (ESENBOĞA)	-44.78	0.00	0.00	Private	FUEL-OİL	31-Dec-10
INTERNATIONAL HOSPITAL İSTANBUL AŞ.	0.77	6.00	6.00	Autoproducer	Natural Gas	31-Dec-10

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
TÜPRAŞ RAFİNERİ (İZMİT) (Düzeltme)	-39.14	0.00	0.00	Autoproducer	Natural Gas	31-Dec-10
YALOVA ELYAF	-12.30	0.00	0.00	Autoproducer	Natural Gas	31-Dec-10

Table 6b: Net quantity of electricity generated and delivered to the grid by power unit m in year y (2012)

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
AKIM ENERJİ BAŞPINAR (SÜPER FİLM)	25.32	177.00	177.00	PRIVATE	NATURAL GAS	Unknown
AKSA AKRİLİK (İTHAL KÖM.+D.G)	25.00	175.00	175.00	PRIVATE	NATURAL GAS	Unknown
AKSA ENERJİ (Antalya)	300.00	1,800.00	1,800.00	PRIVATE	NATURAL GAS	Unknown
AKSA ENERJİ (Antalya) (İlave)	300.00	1,800.00	1,800.00	PRIVATE	NATURAL GAS	Unknown
ALDAŞ ALTYAPI YÖNETİM DANIŞMANLIK	1.95	15.00	15.00	AUTOPRODUCER	NATURAL GAS	Unknown
ALİAĞA ÇAKMAKTEPE ENERJİ (İlave)	130.95	986.25	986.25	PRIVATE	NATURAL GAS	Unknown
ALİAĞA ÇAKMAKTEPE ENERJİ (İlave)	8.73	67.76	67.76	PRIVATE	NATURAL GAS	Unknown
BEKİRLİ TES (İÇDAŞ ELEKTRİK EN.)	600.00	4.32	4.32	PRIVATE	IMPORTED COAL	Unknown
BOSEN ENERJİ ELEKTRİK ÜRETİM AŞ.	93.00	698.09	698.09	PRIVATE	NATURAL GAS	Unknown
BOYTEKS TEKSTİL SAN. VE TİC. A.Ş.	8.60	67.00	67.00	PRIVATE	NATURAL GAS	Unknown
CENGİZ ÇİFT YAKITLI K.Ç.E.S.	131.34	985.00	985.00	PRIVATE	NATURAL GAS	Unknown
CENGİZ ENERJİ SAN.VE TİC.A.Ş.	35.00	281.29	281.29	PRIVATE	NATURAL GAS	Unknown

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
ETİ BOR (Borik Asit)(Emet) (Düzeltme)	0.60	4.47	4.47	AUTOPRODUCER	NATURAL GAS	Unknown
FRAPORT IC İÇTAŞ ANTALYA HAVALİMANI	8.00	64.00	64.00	AUTOPRODUCER	NATURAL GAS	Unknown
GLOBAL ENERJİ (PELİTLİK)	4.00	29.91	29.91	PRIVATE	NATURAL GAS	Unknown
GORDİON AVM (REDEVCO ÜÇ EMLAK)	2.01	15.00	15.00	AUTOPRODUCER	NATURAL GAS	Unknown
GOREN-1 (GAZİANTEP ORGANİZE SAN.)	48.65	277.00	277.00	PRIVATE	NATURAL GAS	Unknown
GÜLLE ENERJİ(Çorlu) (İlave)	3.90	18.43	18.43	PRIVATE	NATURAL GAS	Unknown
HAMİTABAT (Lisans Tadili)	36.00	244.15	244.15	GOVERNMENT	NATURAL GAS	Unknown
HASIRCI TEKSTİL TİC. VE SAN. LTD. ŞTİ.	2.00	15.00	15.00	AUTOPRODUCER	NATURAL GAS	Unknown
HG ENERJİ ELEKTRİK ÜRET. SAN.TİC. A.Ş.	52.38	366.00	366.00	PRIVATE	NATURAL GAS	Unknown
ISPARTA MENSUCAT (Isparta)	4.30	33.00	33.00	AUTOPRODUCER	NATURAL GAS	Unknown
İSTANBUL SABİHA GÖKÇEN UL.AR. HAV.	4.00	32.00	32.00	AUTOPRODUCER	NATURAL GAS	Unknown
KARKEY (SİLOPİ 1)	100.44	697.67	697.67	PRIVATE	F.OIL	Unknown
KNAUF İNŞ. VE YAPI ELEMANLARI SN.	1.56	12.00	12.00	AUTOPRODUCER	NATURAL GAS	Unknown
LOKMAN HEKİM ENGÜRÜ SAĞ.(SİNCAN)	0.51	44.00	44.00	AUTOPRODUCER	NATURAL GAS	Unknown
MARDİN-KIZILTEPE (AKSA ENERJİ)	32.10	225.00	225.00	PRIVATE	F.OIL	Unknown
MOSB Enerji Elektrik Üretim Ltd. Şti.(İlave)	43.50	351.86	351.86	PRIVATE	NATURAL GAS	Unknown
NUH ENERJİ EL. ÜRT.A.Ş. (ENERJİ SANT.-2)	119.98	900.00	900.00	PRIVATE	NATURAL GAS	Unknown
ODAŞ DOĞALGAZ KÇS (ODAŞ ELEKTRİK)	54.96	415.00	415.00	PRIVATE	NATURAL GAS	Unknown

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
POLYPLEX EUROPA POLYESTER FİLM	3.90	31.45	31.45	AUTOPRODUCER	NATURAL GAS	Unknown
SAMSUN TEKKEKÖY EN. SAN. (AKSA EN.)	131.34	980.00	980.00	PRIVATE	NATURAL GAS	Unknown
SAMUR HALI A.Ş.	4.30	33.00	33.00	AUTOPRODUCER	NATURAL GAS	Unknown
SARAY HALI A.Ş.	4.29	33.00	33.00	AUTOPRODUCER	NATURAL GAS	Unknown
ŞANLIURFA OSB (RASA ENERJİ ÜR. A.Ş.)	116.76	800.00	800.00	PRIVATE	NATURAL GAS	Unknown
AKSU REG. VE HES (KALEN ENERJİ)	5.20	16.00	12.00	PRIVATE	HYDRO	Unknown
DEĞİRMENDERE (Kadirli) (KA-FNİH ELEK.)	0.50	1.20	0.80	OP.RIGHTS TRANSFER	HYDRO	Unknown
DERME (KAYSERİ VE CİVARI ENERJİ)	4.50	14.00	7.00	OP.RIGHTS TRANSFER	HYDRO	Unknown
ERKENEK (KAYSERİ VE CİVARI ENERJİ)	0.32	1.23	0.74	OP.RIGHTS TRANSFER	HYDRO	Unknown
BALKONDU I HES (BTA ELEKTRİK ENERJİ)	9.19	33.00	20.00	PRIVATE	HYDRO	Unknown
BATMAN	0.48	1.16	1.08	PRIVATE	HYDRO	Unknown
GİRLEVİK (BOYDAK ENERJİ)	3.04	21.00	19.00	OP.RIGHTS TRANSFER	HYDRO	Unknown
BERDAN	10.20	47.20	15.00	PRIVATE	HYDRO	Unknown
BOĞUNTU HES (BEYOBASI ENERJİ)	3.80	17.00	10.00	PRIVATE	HYDRO	Unknown
HAKKARİ (Otluca) (NAS ENERJİ A.Ş.)	1.28	6.00	5.00	OP.RIGHTS TRANSFER	HYDRO	Unknown
HASANLAR	9.35	39.90	29.60	GOVERNMENT	HYDRO	Unknown
BÜNYAN (KAYSERİ VE CİVARI EL. T.A.Ş)	1.16	3.40	3.20	PRIVATE	HYDRO	Unknown
ÇAKIRMAN REG. VE HES (YUSAKA EN.)	6.98	22.00	15.00	PRIVATE	HYDRO	Unknown
İNEGÖL(Cerrah) (KENT SOLAR ELEKTRİK)	0.27	1.00	0.80	OP.RIGHTS TRANSFER	HYDRO	Unknown

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
İZNİK (Dereköy) (KENT SOLAR ELEKTRİK)	0.24	1.00	0.90	OP.RIGHTS TRANSFER	HYDRO	Unknown
ÇAMARDI (KAYSERİ VE CİVARI EL. T.A.Ş)	0.07	0.01	0.01	PRIVATE	HYDRO	Unknown
KARAÇAY (Osmaniye) (KA-FNİH ELEKTRİK)	0.40	2.30	2.00	OP.RIGHTS TRANSFER	HYDRO	Unknown
ÇAMLICA III HES (ÇAMLICA ELEKTRİK)	27.62	43.00	25.00	PRIVATE	HYDRO	Unknown
ÇAMLIKAYA REG.VE HES (ÇAMLIKAYA EN)	2.82	6.71	3.88	PRIVATE	HYDRO	Unknown
ÇANAKÇI HES (CAN ENERJİ ENTEGRE)	4.63	19.43	10.96	PRIVATE	HYDRO	Unknown
ÇANAKÇI HES (CAN ENERJİ ENTEGRE)	4.63	19.43	10.96	PRIVATE	HYDRO	Unknown
ÇEŞMEBAŞI REG. VE HES (GİMAK EN.)	8.20	28.00	17.00	PRIVATE	HYDRO	Unknown
KAYADİBİ (BARTIN) (İVME ELEKTROMEK.)	0.46	2.30	2.00	OP.RIGHTS TRANSFER	HYDRO	Unknown
KERNEK (KAYSERİ VE CİVARI ENERJİ)	0.83	0.80	0.60	OP.RIGHTS TRANSFER	HYDRO	Unknown
ÇUKURÇAYI HES (AYDEMİR ELEKTRİK ÜR.)	1.80	8.00	4.00	PRIVATE	HYDRO	Unknown
DAREN HES ELEKTRİK (SEYRANTEPE)	49.70	181.13	140.88	PRIVATE	HYDRO	Unknown
DURU 2 REG. VE HES (DURUCASU ELEK.)	4.49	22.00	13.00	PRIVATE	HYDRO	Unknown
KOVADA-I (BATIÇİM ENERJİ ELEKTRİK)	8.25	4.10	1.60	OP.RIGHTS TRANSFER	HYDRO	Unknown
KOVADA-II (BATIÇİM ENERJİ ELEKTRİK)	51.20	36.20	24.40	OP.RIGHTS TRANSFER	HYDRO	Unknown
ERENKÖY REG. VE HES (NEHİR ENERJİ)	21.46	87.00	49.00	PRIVATE	HYDRO	Unknown
EŞEN-1 HES (GÖLTAŞ ENERJİ ELEKTRİK)	30.00	120.00	65.00	PRIVATE	HYDRO	Unknown
EŞEN-1 HES (GÖLTAŞ ENERJİ ELEKTRİK)	30.00	120.00	65.00	PRIVATE	HYDRO	Unknown

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
GÖKMEN REG. VE HES (SU-GÜCÜ ELEKT.)	2.87	13.00	8.00	PRIVATE	HYDRO	Unknown
KUZUCULU (Dörtyol) (KA-FNİH ELEKTRİK)	0.27	1.30	1.00	OP.RIGHTS TRANSFER	HYDRO	Unknown
M.KEMALPAŞA (Suuçtu) (KENT SOLAR)	0.47	1.50	1.30	OP.RIGHTS TRANSFER	HYDRO	Unknown
MALAZGİRT (MOSTAR ENERJİ ELEKTRİK)	1.22	4.00	3.00	OP.RIGHTS TRANSFER	HYDRO	Unknown
TEKİRDAĞ-ÇORLU TEKS.TES.(NİL ÖRME)	2.68	21.00	21.00	AUTOPRODUCER	NATURAL GAS	Unknown
TİRENDA TİRE ENERJİ ÜRETİM A.Ş.	58.38	410.00	410.00	PRIVATE	NATURAL GAS	Unknown
TOROS TARIM (MERSİN) (NAFTA+D.GAZ)	12.14	96.00	96.00	AUTOPRODUCER	NAPHTA	Unknown
TÜPRAŞ O.A. RAFİNERİ (Kırıkkale) (İlave)	12.00	84.78	84.78	AUTOPRODUCER	NAPHTA	Unknown
YENİ UŞAK ENERJİ ELEKTRİK SANTRALI	8.73	65.00	65.00	PRIVATE	NATURAL GAS	Unknown
ZORLU ENERJİ (B.Karıştıran)	7.20	54.07	54.07	PRIVATE	NATURAL GAS	Unknown
ADİLCEVAZ (MOSTAR ENERJİ ELEKTRİK)	0.39	0.80	0.50	OP.RIGHTS TRANSFER	HYDRO	Unknown
AHLAT (MOSTAR ENERJİ ELEKTRİK)	0.20	0.60	0.50	OP.RIGHTS TRANSFER	HYDRO	Unknown
HACININOĞLU HES (ENERJİ-SA ENERJİ)	71.14	180.00	102.00	PRIVATE	HYDRO	Unknown
HACININOĞLU HES (ENERJİ-SA ENERJİ)	71.14	180.00	102.00	PRIVATE	HYDRO	Unknown
HASANLAR HES (DÜZCE ENERJİ BİRLİĞİ)	4.68	21.00	12.00	PRIVATE	HYDRO	Unknown
İNCİRLİ REG. VE HES (LASKAR ENERJİ)	25.20	126.00	71.00	PRIVATE	HYDRO	Unknown
KARASU 4-3 HES (İDEAL ENERJİ ÜRETİMİ)	4.60	22.00	12.00	PRIVATE	HYDRO	Unknown
KARASU 5 HES (İDEAL ENERJİ ÜRETİMİ)	4.10	24.00	14.00	PRIVATE	HYDRO	Unknown

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
BAYBURT (BOYDAK ENERJİ)	0.40	1.90	1.70	OP.RIGHTS TRANSFER	HYDRO	Unknown
KARASU I HES (İDEAL ENERJİ ÜRETİMİ)	3.84	19.00	11.00	PRIVATE	HYDRO	Unknown
BESNİ KAYSERİ VE CİVARI ENERJİ)	0.27	0.50	0.20	OP.RIGHTS TRANSFER	HYDRO	Unknown
KAZANKAYA REG. VE İNCESU HES (AKSA)	15.00	48.00	27.00	PRIVATE	HYDRO	Unknown
KESME REG. VE HES (KIVANÇ ENERJİ)	2.31	8.02	4.51	PRIVATE	HYDRO	Unknown
KESME REG. VE HES (KIVANÇ ENERJİ)	2.31	8.02	4.51	PRIVATE	HYDRO	Unknown
ÇAĞ-ÇAĞ (NAS ENERJİ A.Ş.)	14.40	25.00	22.00	OP.RIGHTS TRANSFER	HYDRO	Unknown
KIRAN HES (ARSAN ENERJİ A.Ş.)	9.74	41.00	23.00	PRIVATE	HYDRO	Unknown
KORUKÖY HES (AKAR ENERJİ SAN. TİC.)	3.03	22.00	13.00	PRIVATE	HYDRO	Unknown
KÖYOBASI HES (ŞİRİKOĞLU ELEKTRİK)	1.07	5.00	3.00	PRIVATE	HYDRO	Unknown
KOZDERE HES (ADO MADENCİLİK ELKT.)	3.15	14.00	8.00	PRIVATE	HYDRO	Unknown
KULP I HES (YILDIZLAR ENERJİ ELK.ÜR.)	22.92	78.00	44.00	PRIVATE	HYDRO	Unknown
ÇEMİŞKEZEK (BOYDAK ENERJİ)	0.12	0.80	0.50	OP.RIGHTS TRANSFER	HYDRO	Unknown
MOLU ENERJİ (Zamantı-Bahçelik HES)	4.17	30.00	30.00	PRIVATE	HYDRO	Unknown
MURATLI REG. VE HES (ARMAHES EL.)	26.70	94.00	55.00	PRIVATE	HYDRO	Unknown
NARİNKALE REG. VE HES (EBD ENERJİ)	30.40	108.00	61.00	PRIVATE	HYDRO	Unknown
ÖREN REG. VE HES (ÇELİKLER ELEKTRİK)	6.64	29.00	16.00	PRIVATE	HYDRO	Unknown
OTLUCA II HES (BEYOBASI ENERJİ ÜR.)	6.36	27.00	15.00	PRIVATE	HYDRO	Unknown

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
PINARBAŞI (KAYSERİ VE CİVARI EL.T.A.Ş)	0.10	0.40	0.30	OP.RIGHTS TRANSFER	HYDRO	Unknown
POYRAZ HES (YEŞİL ENERJİ ELEKTRİK)	2.66	10.00	6.00	PRIVATE	HYDRO	Unknown
SARAÇBENDİ HES (ÇAMLICA ELEKTRİK)	25.48	101.00	57.00	PRIVATE	HYDRO	Unknown
SARIKAVAK HES (ESER ENERJİ YAT. AŞ.)	8.06	43.00	24.00	PRIVATE	HYDRO	Unknown
SAYAN HES (KAREL ELEKTRİK ÜRETİM)	14.90	47.00	27.00	PRIVATE	HYDRO	Unknown
SEFAKÖY HES (PURE ENERJİ ÜRETİM AŞ.)	33.11	121.00	68.00	PRIVATE	HYDRO	Unknown
SEYRANTEPE HES (Düzeltme))	7.14	26.02	20.24	PRIVATE	HYDRO	Unknown
SIZIR (KAYSERİ VE CİVARI EL. T.A.Ş)	5.76	46.00	35.00	OP.RIGHTS TRANSFER	HYDRO	Unknown
SÖĞÜTLÜKAYA (POSOF III) HES	6.13	31.00	18.00	PRIVATE	HYDRO	Unknown
TEFEN HES (AKSU MADENCİLİK SAN.)	11.00	47.00	26.67	PRIVATE	HYDRO	Unknown
TEFEN HES (AKSU MADENCİLİK SAN.)	22.00	94.00	53.33	PRIVATE	HYDRO	Unknown
TURUNÇOVA(Finike) (TURUNÇOVA EN.)	0.55	1.50	0.80	OP.RIGHTS TRANSFER	HYDRO	Unknown
TUZTAŞI HES (GÜRÜZ ELEKTRİK ÜR.)	1.61	10.00	6.00	PRIVATE	HYDRO	Unknown
ULUDERE (NAS ENERJİ A.Ş.)	0.64	3.20	2.60	OP.RIGHTS TRANSFER	HYDRO	Unknown
ÜZÜMLÜ HES (AKGÜN ENERJİ ÜRETİM)	11.36	41.00	23.00	PRIVATE	HYDRO	Unknown
VARTO (MOSTAR ENERJİ ELEKTRİK)	0.29	0.80	0.60	OP.RIGHTS TRANSFER	HYDRO	Unknown
YAMAÇ HES (YAMAÇ ENERJİ ÜRETİM A.Ş.)	5.46	17.00	10.00	PRIVATE	HYDRO	Unknown
YAPRAK II HES (NİSAN ELEKTROMEK.)	5.40	16.00	10.50	PRIVATE	HYDRO	Unknown
YAPRAK II HES (NİSAN	5.40	16.00	10.50	PRIVATE	HYDRO	Unknown

Unit Name	Capacity (MW)	Project Production Potential (GWh)	Firm Production (GWh)	Type	Fuel	Date of Commissioning
ELEKTROMEK.)						
YAŞIL HES (YAŞIL ENERJİ ELEKTRİK)	1.52	6.00	3.20	PRIVATE	HYDRO	Unknown
YAŞIL HES (YAŞIL ENERJİ ELEKTRİK)	2.28	9.00	4.80	PRIVATE	HYDRO	Unknown
YEDİGÖL REG. VE HES (YEDİGÖL HİDR.)	21.90	77.00	42.00	PRIVATE	HYDRO	Unknown
YEDİGÖZE HES (YEDİGÖZE ELEK.) (İlave)	155.33	474.83	133.95	PRIVATE	HYDRO	Unknown
AYRANCILAR HES (MURADİYE ELEKTRİK)	13.38	53.34	31.16	PRIVATE	HYDRO	Unknown
AYRANCILAR HES (MURADİYE ELEKTRİK)	18.72	74.64	43.73	PRIVATE	HYDRO	Unknown
BAYRAMHACILI BARAJI VE HES	47.00	175.00	95.00	PRIVATE	HYDRO	Unknown
CEVHER I-II REG. VE HES (ÖZCEVHER EN.)	16.36	65.00	32.00	PRIVATE	HYDRO	Unknown
KARASU II HES (İDEAL ENERJİ ÜRETİMİ)	3.08	13.00	8.00	PRIVATE	HYDRO	Unknown
BANDIRMA ENERJİ (BANDIRMA RES)	3.00	10.50	9.50	PRIVATE	WIND	Unknown

APPENDIX 3: THE MAP SHOWING THE RESERVOIR AREA OF THE PROJECT