



MURAT HEPP MONITORING REPORT

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Murat HEPP Energy Electricity Generation and Trade Inc. (hereafter referred as the “project owner”) installed a large-scale runoff river hydroelectric power plant (HEPP) with an installed capacity of 35.478 MWe on the Göksu River flowing through Besni, Adiyaman in Turkey’s South-eastern Region. The purpose of the project activity is to generate electricity and supply it into the public grid. The project activity reduces greenhouse gas (GHGs) emissions that would have otherwise occurred in the absence of the project activity by avoiding electricity generation from fossil fuel sources. Murat HEPP has been validated as a Voluntary Emission Reduction (VER) project. Due to its significant contribution in diminishing carbon emissions and protecting the climate as well as due to significant additionality issues discussed in the PDD, this project fulfilled the VCS standard and qualifies for carbon finance. In addition, the project highly supports the sustainable economic development in the region.

- General Directorate of State Hydraulic Works: Water use right agreement, 17/10/2008.
- Governorship of Adiyaman Provincial Directorate of Environment and Forestry: Confirmation of non requirement of EIA, 22/04/2009
- Fujian Nandian Co.LTD. and Hangzhou Yatai Hydro Equipment Completing Co. Ltd.; Turbine purchase contract, November 2009.
- Yolsu Engineering Services; Revised Feasibility Study Report, June 2009.
- Energy Market Regulatory Authority: Construction Licence for Murat HEPP Project, 29/01/2009
- Loan Agreement with Ayrupa Yatnim Bankasi for the project activity, document dated 13/11/2009.
- Newspaper Besni Ekspres: Stakeholder meeting invitation, 14/05/2010 and 25/05/2010.
- Turkey National Social Security Institution: Confirmation on start date of construction, 10/06/2010
- Teias; Interconnection Agreement 21/10/2010
- Verified Carbon Standard: List of projects registered in Turkey, 19/06/2012.
- The starting date of the project activity/start date of the crediting period is 05/10/2012. It has been verified by RINA that the starting date represents the start date of generation of electricity and supply to the electricity grid.
- Validated by RINA Services S.p.A. 23/04/2014.

In the baseline scenario of the project, Murat HEPP has an effect on power generation of existing power plants attached to the grid, the electricity generation from these existing generators are reduced. Since Turkey’s grid mainly consisting thermal power plants, this has a result in GHG emissions. This first monitoring period covers the dates between 05th Oct 2012 and 30st September 2014 (both days inclusive). Total Emission reductions achieved in this monitoring period is 154,879 tonnes CO₂e. However, in the project scenario, the project generated electricity from hydropower and resulting in emission reductions in parallel with its electricity generation figures. Implementation of the project included construction of the following main items:

Water from the river has been diverted by a diversion weir (516m thalveg elevation), and then carried by a 15,002m conveyance canal to a fore-bay. Accumulated water in the fore-bay released through 135 m penstock to the turbines at Murat I HEPP. Murat I HEPP’s tail-water carried to a fore-bay through 5,709 m long conveyance canal. Then accumulated water in the fore-bay released through 125 m penstock to the turbines and therefore electricity generated at Murat II HEPP. Finally water is released to the riverbed.

Main Technical Data			Value
Provider			Fujian Nandian Co.LTD.
MURAT I	Turbines	Quantity	3
		Capacity	8686 kW
		Type	Horizontal axis francis
	Generators	Quantity	3
		Capacity	8410 kW
		Rated voltage	10500V
		Rated current	50 Hz
		Type	Horizontal axis synchronized generator
MURAT II	Turbines	Quantity	3
		Capacity	3577 kW
		Type	Horizontal axis francis
	Generators	Quantity	3
		Capacity	3416 kW
		Rated voltage	10500 V
		Rated current	50 Hz
		Type	Horizontal axis synchronized generator

Table 1 The project's key technical specifications

1.2 Sectoral Scope and Project Type

This is a voluntary project, but it follows the CDM rules.

The approved baseline and monitoring methodology ACM0002-Version 13.0.0: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" ("ACM0002") is applied.

According to Annex A of the Kyoto Protocol, the Project fits in:

Sectoral Scope Number: 1

Sectoral Scope: Energy Industries -Renewable Energy

The project is not a grouped project.

1.3 Project Proponent

The project proponent is Murat HEPP Energy Electricity Generation and Trade Inc., which is a subsidiary of Mehmet Güneş Construction, Trading and Industry Co. Ltd.

Mehmet Güneş Construction Trading and Industry Co. Ltd is a family company owned by Mehmet Güneş and has been conducting both private and public construction works since 1970. For detailed information please visit the following web page: <http://www.mehmetgunesins.com/mg/index.php>

The following table shows the project proponent's contact information:

Organization name	Murat HEPP Energy Electricity Generation and Trade Inc. Co.
Contact person	Mahmut Doğanay
Title	General Coordinator
Address	Cinnah Caddesi No: 55/10 Çankaya / ANKARA
Telephone	+90 312 441 32 62 / +90 312 441 33 42
Email	mdoganay@mehmetgunesins.com

1.4 Other Entities Involved in the Project

The following table shows the Carbon consultant's contact information:

Organization name	Suen Ltd.
Role in the project	Consultant
Contact person	Mustafa Kanat Soysert
Title	Project coordinator
Address	Güllük Cad. Anafartalar Apt. No:97/1 K.1 D.1 Muratpaşa/ANTALYA
Telephone	+90 242 229 80 23
Email	mustafa@suenltd.com

1.5 Project Start Date

The project start date is 05th October 2012, the date of the six turbines in the plant commenced electricity generation.

1.6 Project Crediting Period

The carbon crediting period and therefore the monitoring started when the plant commenced electricity generation through the turbines in order to supply electricity to the grid on 05th October 2012.

The first crediting period is a maximum of ten years which may be renewed at once making a total crediting life of twenty years.

The start date of the first crediting period is 05th October 2012 ending on 04th October 2022 (both days included).

1.7 Project Location

The project activity is located at the Sambayat village of Adıyaman city in Turkey and geographical location coordinates are as follows;

- Diversion weir: 37°42'44.25"N, 38° 2'58.56"E
Power House:



Murat Diversion Weir.kmz

- Murat I HEPP: 37°36'51.99"N, 38° 5'36.76"E



MURAT HEPP I.kmz

- Murat II HEPP: 37°34'18.92"N, 38° 6'43.81"E



MURAT HEPP II.kmz

1.8 Title and Reference of Methodology

The CDM approved baseline and monitoring methodology ACM0002-Version13.0.0: *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"* ("ACM0002") is applied.

For the purpose of calculating the emission factor of the Turkish electricity grid, *"Tool to calculate emission factor for an electricity system"* (Version3.0.0) is employed. Whereas, in order to prove the

project's additionality, the *"Tool for the demonstration and assessment of additionality"* (Version 7.0.0) has been followed. Conservative options and data were selected during the implementation of the tools and methodology.

1.9 Other Programs

N/A. The GHG emissions reductions generated by the project will not be used for compliance with an emission trading program or to meet binding limits on GHG emissions.

The project has not created another form of Environmental Credit

N/A. The project has not been registered, or is seeking registration under any other GHG programs.

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

Starting date of the project activity is 05 October 2012, date of the six horizontal axis Francis Turbines in the plant commences electricity generation. The carbon crediting period and therefore the monitoring starts when the plant commences electricity generation through the turbines which started to supply electricity to the grid on 05 Oct 2012.

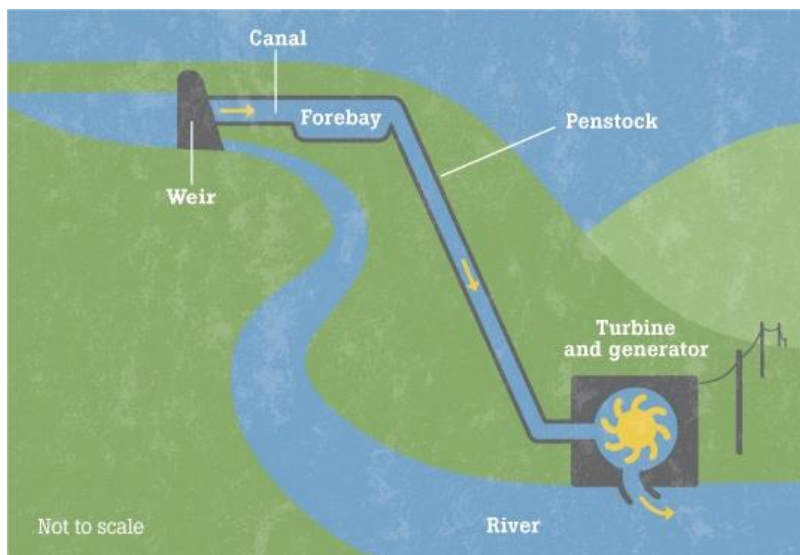


Figure 1 Schematic diagram of a channel type run-off-river HEPP

Murat HEPP Project flow diagram

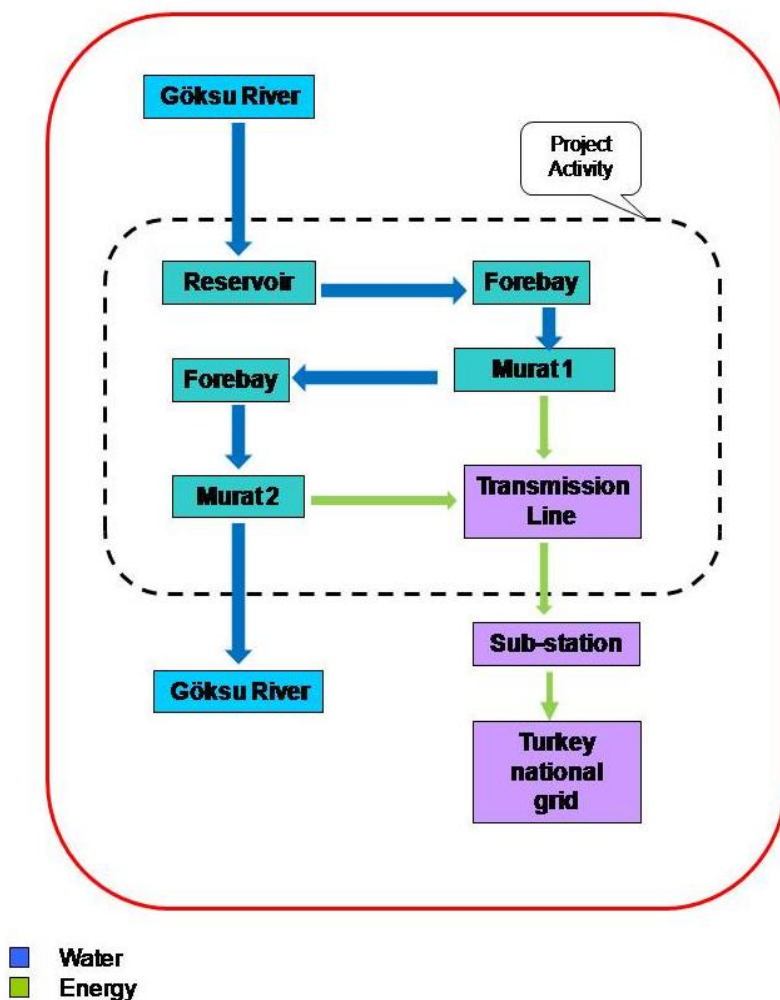


Figure 2 Murat Hepp Project flow diagram

MURAT I - Horizontal axis francis turbine-generator units	
Provider	Fufian Nandian Co. LTD.
Type	HLD267-LJ144
Rated output	8686 kW
Rated Head	57 m
Max. Head	59.72 m
Flow Rate	16.67m ³ /s

GENERATOR	
Provider	Fufian Nandian Co. LTD.
Type	SF8410-14/3250
Phase number/ Frequency	3 / 50 Hz
Product Number	ND2010029-01
Date of Manufacture	2010
Rated output	8410 kW

MURAT II - Horizontal axis francis turbine-generator units	
<i>Provider</i>	<i>Fufian Nandian Co. LTD.</i>
<i>Type</i>	<i>HLA551C-LJ-163</i>
<i>Rated output</i>	<i>3577 kW</i>
<i>Rated Head</i>	<i>23.4 m</i>
<i>Max. Head</i>	<i>25.46m</i>
<i>Flow Rate</i>	<i>16.67m3/s</i>
GENERATOR	
<i>Provider</i>	<i>Fufian Nandian Co. LTD.</i>
<i>Type</i>	<i>SF3416-24/3250</i>
<i>Phase number/ Frequency</i>	<i>3 / 50 Hz</i>
<i>Product Number</i>	<i>ND2010029-01</i>
<i>Date of Manufacture</i>	<i>2010</i>
<i>Rated output</i>	<i>3416 kW</i>

Table 2 The project's technology and equipment details

The project activity has been connected to the Turkish interconnected electricity grid; therefore the produced electricity has been transmitted to TEIAS as per the agreement signed with Murat HEPP Energy Electricity Generation and Trade Inc. During the first monitoring period **(05/10/2012 to 30/09/2014)**, no emergencies or abnormal situations have been experienced.

Power plant operated normally during this monitoring period. There have been no emergencies happened to the monitoring system in this monitoring period. No critical equipment exchange that was performed during the monitoring period. No faulty measurement or no measurement differences between the meters occurred. Therefore, no calibration happened.

2.2 Deviations

2.2.1 Methodology Deviations

During the monitoring plan, the following deviations are determined and the monitoring plan is revised:

- The source of the parameter “Quantity of net electricity generation supplied by the Project plant/unit to the grid in year *y*” was given as “Monthly Meter Reading Protocols” in the VCS PD. However, since TEIAS started to measure the produced electricity remotely, Monthly Meter Reading Protocols are not available. Therefore, the source of the parameter is defined as “Market Financial Settlement Center (PMUM) records which includes the exact electricity productions and tractions. PMUM records are the basis of the invoices made out to TEIAS.
- The source for the cross-check of the amount of produced electricity is also revised as “OSF Forms” which are prepared by TEIAS after the remote measurements of the meters and sent to the plant engineer by e-mail at the end of each month.

2.2.2 Project Description Deviations

The following project deviation is noticed during this monitoring period;
The installed power of the project is given in the PD as 37,22 MWe however the actual realized value of the installed power is 35,48 MWe because of the design requirements of the OEM company. At time of preparing the final field application projects of Murat Hepp due to the fields geographical reasons of the Project site such as slope and elevation amendment requirements the Project owner have need to revise the installed power in FSR report and on final application projects. Both of them (FSR and Project drawings) had been presented to DSI (General Directorate of State Hydraulic Works) and these have been reviewed and approved by DSI. After this approval the Project owner applied to EMRA for the amendment of the installed power on the license. Their request have been reviewed by EMRA and assessed to be approved for amendment, which is then the license have been amended according to the relevant request.

2.2.3 Outcome of project description deviations

Since the installed power is reduced from 37,22 MWe to 35,48 MWe the following checks are applied to this deviation whether if there is an impact on the applicability of the methodology, additionality or the appropriateness of the baseline scenario.

Applicability of methodology check : The methodology is applicable to grid-connected renewable power generation project activities under certain conditions. The applicability conditions of the approved consolidated methodology and how the project activity complies with them are described below:

Applicability condition in the ACM0002/Version 13.0.0	Compliance of the condition
This methodology is applicable to grid-connected renewable power generation project activities that: (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of (an) existing plant(s).	The project activity involves the installation of two Greenfield run-of-river hydroelectric power plant at the Göksu River flowing through Besni, Adıyaman in Turkey's South-eastern Region, with two power houses. At this site no renewable power plant was operated prior to the implementation of the project activity.
The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit.	The project activity is the installation of a run-of-river hydro power plant.
In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects which use Option 2: on page 11 to calculate the parameter $EG_{PJ,y}$): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	This condition is not applicable to the project activity as it involves the installation of a new hydroelectric power plant.
In case of hydro power plants, one of the following conditions must apply: - The project activity is implemented in an existing reservoir, with no change in the volume of reservoir; or - The project activity is implemented in an	This condition is not applicable to the project activity as it does not result in a new reservoir. However, the project does involve the construction of a regulation pond with a surface of 640,471.91 m². Power density (PD) for this regulation pond is:

Applicability condition in the ACM0002/Version 13.0.0	Compliance of the condition
existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the Project Emissions section, is greater than 4 W/m²; or - The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m².	PD= 35,478,000W/ 640,471.91 m²= 55.39 W/m² PD> 4 W/m². (see Figure 10 in Appendix-1)
This methodology is not applicable to project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site.	This condition is not applicable to the project activity as it does not involve switching from fossil fuel to renewable energy at the site of the project activity.
This methodology is not applicable to biomass fired power plants.	This condition is not applicable to the project activity as it does not involve the installation of a biomass fired power plant.
This methodology is not applicable to hydro power plants that result in new reservoirs or in the increase in existing reservoirs where the power density of the power plant is less than 4 W/m².	Even though the project activity involves the installation of an HPP it does not result in new reservoirs or in the increase in existing reservoirs. Therefore, this condition is not applicable.
In the case of retrofits, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance”.	This condition is not applicable to the project activity as it does not involve a capacity addition, retrofit or replacement of existing grid-connected renewable power plant/unit(s).

Baseline scenario check; According to the approved consolidated methodology ACM0002 (Version13.0.0), if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline is the following, “Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new

generation sources. This baseline scenario is still the same and installed power reduction does not have an impact to amend this base line.

Additionality check : As it was described in the related section of the validated PD and demonstrated in the sensitivity analysis even when the project electricity sales income is improved by 10% the equity IRR becomes 12,81 % and still could not reach to the benchmark of 15%.

With the installed power 35.478 MW there could be maximum (35.478 MW x 8760 hrs =) 310,787.28 MWh of electricity be generated. However this is the ideal case and in real life due to water flow fluctuations regarding the lower rainfalls and climate changes this is nearly impossible. And as per the FSR and license the expected capacity load factor is below 50% and the annual generation is expected to be realized as 150,390 MWh in average. In 2013, due to above explanation, the energy generation was realized 9.3 % more than expected average.

As it was monitored on site the first 9 month values of 2014 was 41,369 MWh (less than one third of the prev. yr.) while within the same period of 2013 it was 148,488 MWh. The change on installed capacity does not necessarily make a dramatic change on the output. It is the water flow rate that effects the energy generation.

As thoroughly discussed above it is obvious that the decrease of installed power has no impact on the applicability of the methodology, additionality or the appropriateness of the baseline scenario.

2.3 Grouped Project

The project activity is not a grouped project.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data / Parameter:	EGy
Data unit:	GWh
Description:	Net electricity generated and delivered to the grid by all power sources serving the system, excluding low-cost/must-run units/plants, in year y
Source of data used:	Annual development of installed capacity and generation in Turkey http://www.teias.gov.tr/istatistik2010/front%20page%202010-ççek%20kitap/kgucunkullanım(13-21)/13.xls http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2010/fro nt%20page%202010-ççek%20kitap/uretim%20tuketim(22-

	45)/29(06-2010).xls
Value applied:	Appendix 3 Table 4
Justification of choice of data or description of measurement methods and procedures applied:	According to "Turkish Statistics Law and Official Statistics Program" TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate Information available.
Purpose of the data	Calculation of baseline emissions
Any comment:	

Data / Parameter:	FC i, y
Data unit:	m3 / tons (m3 for gaseous fuels)
Description:	Amount of fossil fuel consumed in the project electricity system by generation sources in year y
Source of data used:	TEIAS (Turkish Electricity Transmission Company) Fuels consumed in thermal power plants in Turkey by the electric utilities for year y http://www.teias.gov.tr/istatistik2010/front%20page%202010-çiçek%20kitap/uretim%20tuketim(22-45)/40(06-10).xls
Value applied:	Appendix 3 Table 5
Justification of choice of data or description of measurement methods and procedures applied:	According to "Turkish Statistics Law and Official Statistics Program" TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Purpose of the data	Calculation of baseline emissions
Any comment:	

Data / Parameter:	Electricity Imports
Data unit:	MWh
Description:	Electricity transfers from connected electricity systems to the project electricity system by years (2008-2010)
Source of data used:	TEIAS (Turkish Electrical Transmission Company) Annual development of Turkey's gross electricity generation-importsexports and demand http://www.teias.gov.tr/istatistik2010/front%20page%202010-çiçek%20kitap/ithalat-ihracat(50-54)/52.xls
Value applied:	Appendix 3 Table 6
Justification of choice of data or description of measurement methods and procedures applied:	Data used for emission reduction estimation Net electricity generated and delivered to the grid by all power sources serving the system.
Purpose of the data	Calculation of baseline emissions
Any comment:	

Data / Parameter:	Heat Value
Data unit:	TJ
Description:	Amount of heat produced by the consumption of a unit quantity of fuel types consumed in thermal power plants.
Source of data used:	TEIAS (Turkish Electricity Transmission Company) Heating values of fuels consumed in thermal plants in Turkey by the electricity utilities (2010). http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2011/yak%C4%B1t46-49/49.xls

Value applied:	Appendix 3 Table 7-8
Justification of choice of data or description of measurement methods and procedures applied:	According to “Turkish Statistics Law and Official Statistics Program” TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available. Heat value is divided by FC to determine NCV.(The formula is taken from 2006 IPCC Guidelines for National Greenhouse Gas Inventories.
Purpose of the data	Calculation of baseline emissions
Any comment:	

Data / Parameter:	EF_{grid,OM,y}
Data unit:	tCO ₂ /MWh
Description:	Simple operating margin CO ₂ emission factor of the grid in year y
Source of data used:	Calculated value as per “Tool to calculate the emission factor for an electricity system” (Version 3.0.0)
Value applied:	0.657 (average of 3 years 2008, 2009 and 2010) Appendix 3 Table 8
Justification of choice of data or description of measurement methods and procedures applied:	The calculations follow the “Tool to calculate the emission factor for an electricity system” (Version 3.0.0). Fixed on the basis of 3-year generation-weighted average based on the most recent data available at the time of PDD submission (2008-2010)
Purpose of the data	Calculation of baseline emissions
Any comment:	Value is calculated ex-ante and is fixed during the crediting

	period.
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Data / Parameter:	NCV i, y
Data unit:	GJ/tonnes
Description:	Net calorific value (energy content) of fossil fuel type <i>i</i> in year <i>y</i>
Source of data used:	TEIAS (Turkish Electricity Transmission Company) Heating values of fuels consumed in thermal plants in Turkey by the electricity utilities http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2011/yak%C4%B1t46-49/46.xls
Value applied:	Appendix 3 Table 7-8
Justification of choice of data or description of measurement methods and procedures applied:	According to “Turkish Statistics Law and Official Statistics Program” TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available.
Purpose of the data	Calculation of baseline emissions
Any comment:	Value is calculated ex-ante and is fixed during the crediting period.

Data / Parameter:	EF C02,i,y
Data unit:	T CO2/GJ
Description:	CO2 emission factor of fossil fuel type <i>i</i> in year <i>y</i>
Source of data used:	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in Table 1.4 and Annex 1 for sub bituminous of Chapter 1 of Volume 2 (Energy) of the 2006 IPCC Guidelines for National Greenhouse Gas

	Inventory. http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.htm
Value applied:	Appendix 3 Table 9; Table 10
Justification of choice of data or description of measurement methods and procedures applied:	There is no information on the fuel specific default emission factor in Turkey, hence, IPCC values has been used as referred in the "Tool to calculate the emission factor for an electricity system, version 3.0.0".
Purpose of the data	Calculation of baseline emissions
Any comment:	

Data / Parameter:	EF_{grid,BM,y}
Data unit:	tCO ₂ /MWh
Description:	Build operating margin CO ₂ emission factor of the grid in year y
Source of data used:	Calculated value as per "Tool to calculate the emission factor for an electricity system" (Version 3.0.0)
Value applied:	0.643
Justification of choice of data or description of measurement methods and procedures applied:	Calculated <i>ex-ante</i> and comprised capacity addition of power plants between years 2006-2010 according to the "Tool to calculate emission factor for an electricity system, version 3.0.0."
Purpose of the data	Calculation of baseline emissions
Any comment:	

Data / Parameter:	Capacity additions
Data unit:	Name of the plant; Installed capacity (MW); Fuel type; Generation (GWh);
Description:	Capacity additions to the grid that comprises 20% of the total generation (2006-2010)
Source of data used:	Generation units put into operation in 2006;2007;2008;2009;2010 http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2011.pdf http://www.teias.gov.tr/projeksiyon/KAPASITE%20PROJEKSIYONU%202010.pdf http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2009.pdf http://www.teias.gov.tr/projeksiyon/KAPASITEPROJEKSIYONU2008.pdf http://www.teias.gov.tr/projeksiyon/KAPASITE%20PROJEKSIYONU%202007.pdf
Value applied:	Appendix 4 Baseline Information
Justification of choice of data or description of measurement methods and procedures applied:	According to "Turkish Statistics Law and Official Statistics Program" TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available. Since the summation of capacity additions between 2006 and 2010 are not sufficiently large, the capacity generation of 21 plants with latest starting date to operation at 2006 should be added to meet the %20 of total generation at 2010.
Purpose of the data	Calculation of baseline emissions
Any comment:	

Data / Parameter:	EF grid, CM, y
Data unit:	tCO ₂ /MWh
Description:	Combined margin CO2 emission factor in year y
Source of data used:	Calculated data applied to the equation 5
Value applied:	0.650
Justification of choice of data or description of measurement methods and procedures applied:	Calculated ex-ante according to the "Tool to calculate emission factor for an electricity system, version 3.0.0.", EB 70 Annex 22."
Purpose of the data	Calculation of baseline emissions
Any comment:	

3.2 Data and Parameters Monitored

Data / Parameter	$EG_{PJ,y}$
Data unit	MWh/yr
Description	Quantity of net electricity delivered to the grid in year y
Source of data	Market financial Settlement Center (PMUM) records
Description of measurement methods and procedures to be applied	Two sets of meters have been used continuously for measurement. Then the net electricity generation supplied by the project to grid has been calculated.
Frequency of monitoring/recording	Continuous monitoring and monthly recording
Value monitored:	2012 figure is (5) 32,434.152 MWh, 2013 figure is (6) 164,473.763 MWh and the 30 September

	2014 figure is (7) 41,369.531 MWh.																		
Monitoring equipment	Relevant information regarding the main meter and the control meter have been provided as follows: <table><tr><td>Meter</td><td>Main Meter</td><td>Back-up (Control) Meter</td></tr><tr><td>Brand</td><td>Elster</td><td>Elster</td></tr><tr><td>Type</td><td>A 1500</td><td>A 1500</td></tr><tr><td>Model Nr</td><td colspan="2">A1500-W043-741-OSL-1165X-V4H00</td></tr><tr><td>Serial Number</td><td>424740</td><td>424741</td></tr><tr><td>Accuracy class</td><td>0,2 S</td><td>0,2S</td></tr></table> All the measurements and calculations are done via tested meters. The calibration of the electricity meters are the responsibility of TEIAS and the project owner has no control over this calibration process. The meters were sealed by TEIAS personnel. The necessary maintenance and calibration are the responsibility of TEIAS.	Meter	Main Meter	Back-up (Control) Meter	Brand	Elster	Elster	Type	A 1500	A 1500	Model Nr	A1500-W043-741-OSL-1165X-V4H00		Serial Number	424740	424741	Accuracy class	0,2 S	0,2S
Meter	Main Meter	Back-up (Control) Meter																	
Brand	Elster	Elster																	
Type	A 1500	A 1500																	
Model Nr	A1500-W043-741-OSL-1165X-V4H00																		
Serial Number	424740	424741																	
Accuracy class	0,2 S	0,2S																	
QA/QC procedures to be applied	Murat HEPP Energy is responsible for providing the PMUM records which shows the monthly electricity generation of the company. In addition to the metering system, generation of Murat HEPP can be crosschecked from on-site measurement records. The PMUM records can provide both the net electricity generation less transmission loss and electricity generation deducted transmission loss. Manual Meter Reading Forms are the on-site records for cross check, and are provided to DOE during on-site visit. The production year of the meters are 2010 and the calibration of the meters have been carried out in September 2010 as stated on the calibration report provided by the manufacturer.Measurement And Measuring Instruments Inspection Regulation Article 9 clause b says that the periodical inspections of the electrical meters should be done every ten years. (http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.6381&sourceXmlSearch=&MevzuatIliski=0)																		
Purpose of the data	Calculation of baseline emissions																		

Calculation method	$EG_{PJ,y} = EG_{export,y} - EG_{import,y}$
Comments	-

Data / Parameter	Cap PJ
Data unit	W
Description	Installed Capacity of the hydropower plant after the implementation of the project activity
Source of data	Project site
Description of measurement methods and procedures to be applied	Supplier information on the equipment
Frequency of monitoring/recording	Annually
Value monitored:	35,478,000 W
Monitoring equipment	Name plates of the generators.
QA/QC procedures to be applied	Supplier information on the equipment and existence of the equipment will be checked.
Purpose of the data	Calculation of project emissions
Calculation method	N/A
Comments	-

Data / Parameter	A PJ
Data unit	m2
Description	Surface of the regulation pond after the implementation of the project activity, when the reservoir is full
Source of data	Project site
Description of measurement methods and procedures to be applied	The area was calculated by making coordinate readings around the border of the reservoir through topographical surveys or GPS readings. The technical drawing of the regulator area is based on topographical surveys. Based

	on the technical drawing, the reservoir area is calculated by a computer program.
Frequency of monitoring/recording	Annually
Value monitored:	640,471.91 m ² (The company record on the measurement of the reservoir area can be found in Appendix I)
Monitoring equipment	N/A
QA/QC procedures to be applied	The technical drawing of the regulator area obtained from final design of the project is computerized and the potential lake area for the flood discharge (possible maximum water level) is calculated. (The company record on the measurement of the reservoir area can be found in Appendix I)
Purpose of the data	Calculation of project emissions
Calculation method	N/A
Comments	-

3.3 Monitoring Plan

All relevant baseline emission factors are defined ex-ante. Hence, there are three sets of data to be monitored during the project activity.

The first one is the amount of electricity fed into the grid. There is already an electricity meter installation plan to provide the data that is required by the monthly invoicing process to TEIAS. Murat HEPP is a new electricity generation unit which did not replace a fossil fuel plant on the project site.

Murat HEPP Energy is responsible for providing the PMUM records which shows the monthly electricity generation of the company. In addition to the metering system, generation of Murat HEPP can be crosschecked from on-site measurement records. The PMUM records can provide both the net electricity generation less transmission loss and electricity generation deducted transmission loss.

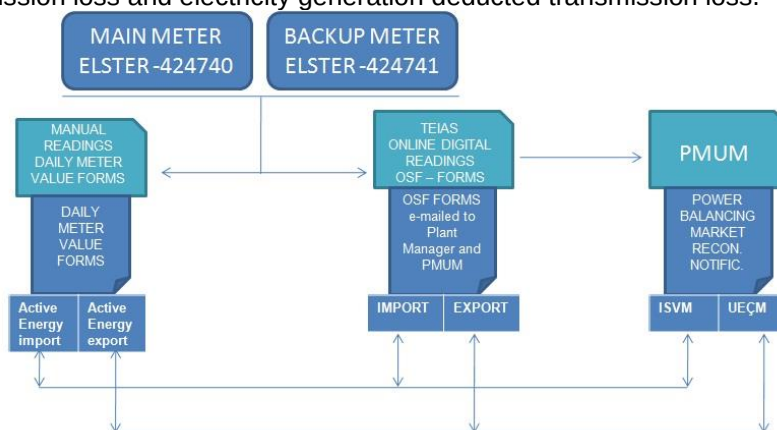


Figure 3 Murat HEPP invoicing and crosscheck of the meters

In order to check the datas of imported and exported electricity from the PMUM web page the following steps had been completed.;

At PMUM web page (<https://dgpys.pmum.gov.tr>) the monitoring team used the Murat HEPP account name and password and from the opened pages “İşlemler” tab has been clicked and then the “Uzlaştırma İşlemleri” was selected and from “Aylık Uzlaştırma Bildirimi” which is used to see the monthly reconciliations the related month is selected to make the cross check. From the opened monthly report the “ISVM” column is (*iletim sistemine veriş miktarı*) equal to exported electricity to the grid and “UEÇM” column is (*uzlaştırmaya esas çekiş miktarı*) equal to the imported electricity by the Murat HEPP. As a result the imported and exported energy quantities are found to be consistent with each other both for digital (OSF) and manual readings

The purpose of the monitoring plan is to ensure that the monitoring and calculation of emission reductions of the proposed Project within the crediting period is complete, consistent, clear and accurate. The project is operated by Murat HEPP Energy which ensures the overall site management in accordance with Turkish Laws and technology providers’ guidelines. The major quality assurance of the monitoring relies on the reporting system that has been regularly checked by the Board of Murat HEPP Energy Electricity Generation and Trade Inc. Co.

VER monitoring team members:

General Manager : Responsible for the general aspects of the plant and VER monitoring plan.

Operating Engineer: Responsible for the electrical matters and from the recording and monitoring of relevant data. Ensure that all the instrumentations and devices are working properly.

Suen Ltd. : Carbon consultant. Responsible for emission reduction calculations, monitoring reports verification process.

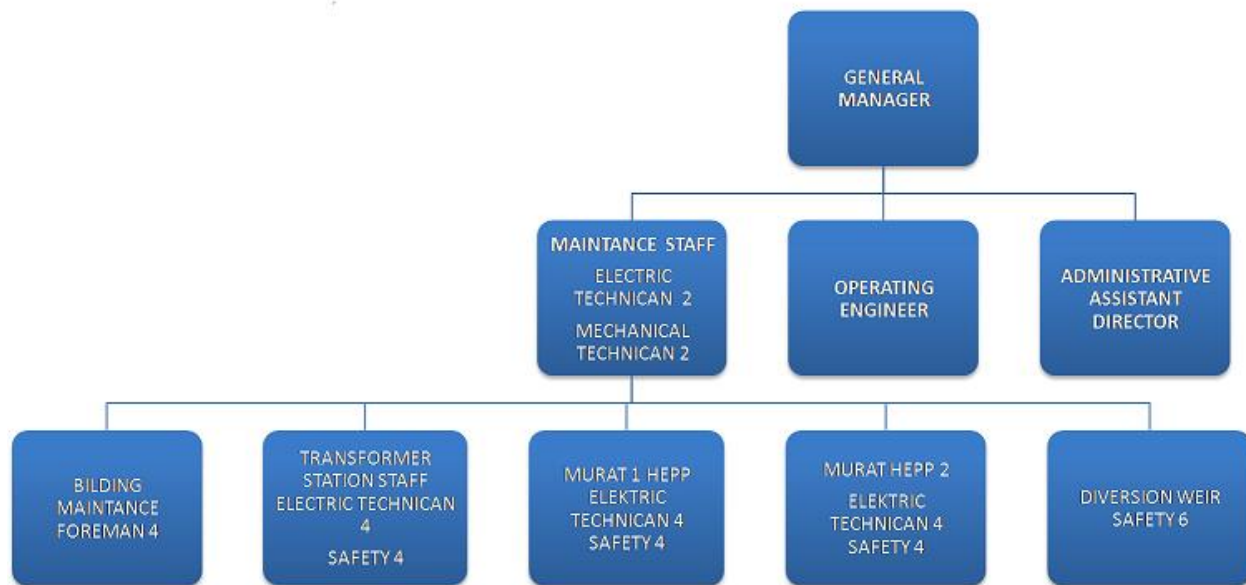


Figure 4 Organigram of the Murat HEPP Energy Electricity Generation and Trade Inc. Co.

General Manager is responsible for the control of the electricity supplied to the grid and imported from the grid with TEIAS. The electricity measurements are made by TEIAS remotely and the plant engineer is informed by TEIAS by e-mail regarding the electricity measurements by an e-mail each month. (An excel sheet called “OSF Form – Dengeleme Birimi Sayaç Değerleri Formu” (balancing unit energy meter readings table) which includes the hourly electricity supply and consumption values of the project is sent to the plant engineer from TEIAS.) The plant engineer checks these electricity readings records and reports to the Operations Manager of the plant. He is also the VER coordinator. He is in charge of:

- a. Ensuring that instrumentations and devices are available and properly suited to perform efficiently the monitoring.
- b. Communicating and coordinating the monitoring tasks of all business units.
- c. Developing, executing, analyzing and improving the VER Monitoring/Reporting Procedures. This includes the crosschecking and consolidation (with multiple sources whenever possible) of the data obtained from the electrical engineers and the accounting manager. He also recorded this operation properly to be able to provide it to the DOE during the verification process.
- d. Calculating and report the emission reductions,

Operating Engineers ensure that all the instrumentations and devices to perform the monitoring are working properly. Responsible for keeping datas which are used on electricity sales, invoicing and purchasing.

Carbon consultant , responsible for emission reduction calculations, preparing the monitoring report and managing the monitoring report verification process.

Please refer to Figure 4 where the site organizational chart is presented.

In order to verify the generated units of emission reductions, the Carbon consultant, has prepared an annual Report of Vigilance of the Project, in which the following important Aspects include:

- Year
- Net electricity supplied by the project activity to the grid (in MWh)
- Annual gross electricity generation (in MWh)
- Annual electricity consumption (in MWh)
- Calculation of the emissions reductions: ERs per year (in tCO₂e/yr) produced from the Activity of the Project

Each monitoring report will be submitted to DOE for the verification. The report covers the monitoring of grid-connected power generation, check report; report on calculation of the emission reductions and records of monitoring instrument repair and calibration, etc. Data will be recorded for each crediting period and maintained at least 2 years after its end. The company will establish a dedicated maintenance system to ensure the data availability for the required period.

In the powerhouse, there are two electricity meters in order to measure the produced electricity accurately. One is the main meter for measuring and the other is the check meter for control. Both of these meters are metering the energy in two directions (import and export) and are connected on-line to TEIAS via GSM line. If there is a measuring difference between these two meters and one of the parties (TEIAS or the company) requests for calibration of the meters, in this case, the meters will be calibrated without waiting for the periodic calibration date. (TEIAS System Usage Agreement, Art 3, B./2./b))¹ This calibration process is done by another third party under the control of TEIAS. The company is not responsible for calibration of the meters in Turkey according to the local standards.

¹ <http://eud.teias.gov.tr/SKAM/SKAornek.pdf>

The meters are first hand and the supplier company commits that these meters fully conforms or exceeds all relevant IEC standards including those dealing with electronic metering equipment for class 0.5S equipment. In addition, the company had the meters tested by a third party (Kesir Müh. Elekt) on 21 December 2011 to verify if the meters measure the electricity production accurately. The results show that the meters measure the electricity with a 0.268% error which is in line with the expected range. There is no possibility for human error in the measurement of the electricity. All the measurements and calculations are done via tested meters. If there is a measuring difference between these two meters and one of the parties (TEIAS or the company) requests for calibration of the meters, in this case, the meters will be calibrated without waiting for the periodic calibration date. (TEIAS System Usage Agreement, Art 3, B./2./b)² This calibration process is done by another third party under the control of TEIAS. The company is not responsible for calibration of the meters in Turkey according to the local standards. The monitoring of the power generation and recordings are done under the supervision of the plant manager. Every month, the measurement of electricity is made by TEIAS remotely and the plant engineer is informed by TEIAS by e-mail regarding the electricity measurements by an e-mail each month. *(An excel sheet called "OSF Form – Dengeleme Birimi Sayaç Değerleri Formu" which includes the hourly electricity generations and imports is sent to the plant engineer from TEIAS. If there is a network problem and it is not possible to measure the electricity remotely, a representative from TEIAS visits the project site and measures the electricity by connecting to the meters directly. However, since there was not a network problem during the Monitoring period, all measurements were made remotely).* In addition, all production figures which are subject to sales to the grid and are agreed with PMUM (Market Financial Reconciliation Centre), can be accessed from PMUM's web site by the seller.

Therefore, net electricity production figures³ announced by PMUM will be used in emission calculation figures. An excel file with the monthly and annual generation is attached to this monitoring report. The power generated and supplied is monitored continuously and is recorded on a daily basis and aggregated into monthly totals.

The second data to be monitored is the installed capacity of the project activity. The installed capacity only changes if the project design is changed. If there is any change in the installed capacity of the project, EMRA has to be informed about this change. The company will report the installed capacity changes in each monitoring period, if there is any and this information will be checked from EMRA website and the current license of the project. The plant manager will be responsible to provide the data. The installed capacity of the project is 35.478 MWe. The third data to be monitored is the reservoir area. This data is calculated from coordinate readings. The data is collected by the project owner during the period when the water flow is high. However, since determining the maximum water level is difficult, to be on the conservative side, this parameter is measured from technical drawings of the project. The technical drawing of the regulator area obtained from final design of the project is computerized and the potential lake area for the flood discharge (possible maximum water level) is projected. The reservoir area has been calculated as 640,471.91m² when the reservoir is at the fullest capacity. The drawing is obtained from the project plan prepared by Doğru Muhendislik which is the company's consultant for etude and design of this project.

The emission factors are calculated ex-ante for the period of ten years. The combined margin will be recalculated through ACM0002-Version 13.0.0, any time the crediting period is renewed. Please note that the project is a zero emission generating activity and no particularly sensitive or critical sustainable development indicator was identified.

Data	Uncertainty Level of Data (High/Medium)	Explain QA/QC Procedures Planned for this Data or why such procedures are not necessary
------	---	---

² <http://eud.teias.gov.tr/SKAM/SKAornek.pdf>

³ Net electricity production figure = Electricity generation (operation base) – Electricity traction from grid

	/Low)	
Quantity of net electricity delivered to the grid	Low	Two calibrated electricity meters (ammeters) will act as back-up for each other. Maintenance / calibration of the metering devices will be made by TEIAS periodically. If the difference between the readings of two devices exceeds 0.2%, maintenance will be done before waiting for periodical maintenance. According to the relevant national regulation : Measurement Equipment Inspection Regulation (http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.6381&sourceXmlSearch=&MevzuatIliski=0) article 9 (b) says that the mandatory periodical inspection frequency of ; electricity , water and gas measuring instruments (meters) are 10 years". Rules for meter accuracy are stated in the TEIAS connection agreement. In addition to the main meter, a redundant meter will be installed to exclude the possibility of data loss.
Installed capacity of the project after the implementation	Low	The installed capacity of the project is equal to the total installed capacities of the equipment implemented at the beginning of the project's life. The data is monitored from the electricity generation equipment on site (name plates of generators).
Area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full	Low	The area is calculated by making coordinate readings around the border of the reservoir. The technical drawing of the regulator area is based on topographical surveys. Based on the technical drawing, the reservoir area is calculated by a computer program. The technical drawing of the regulator area obtained from final design of the project is computerized and the potential lake area for the flood discharge (possible maximum water level) is calculated.

Table 3 Data to be monitored and the monitoring process

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

The baseline emissions BE_y have been calculated in the validated PD as follows

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants

and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

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

Where:

- BE_y = 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 CDM project activity in year y (MWh/yr)
- $EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO₂/MWh)

Calculation of $EG_{PJ,y}$

The calculation of $EG_{PJ,y}$ is different for:

- (a) greenfield plants,
- (b) retrofits and replacements; and
- (c) capacity additions.

Since Murat HEPP is a greenfield project we consider only option (a) and the calculation is as follows.

Greenfield renewable energy power plants If the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, then:

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

Where:

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

Therefore, the baseline emission for the (05 October 2012 – 30 September 2014) year production of the project is:

$$BE = 0.65 \text{ (tCO}_2\text{/MWh)} \times (238,277.45 \text{ (MWh)}) = 154,879 \text{ (tCO}_2\text{)}$$

4.2 Project Emissions

This consumption will be satisfied from the self electricity generation when the plants are in operation or from the grid when both plants are not operating. However, this will rarely occur. Therefore:

$PE_{FF,y} = 0$ According to the methodology, the project emissions shall be accounted using the following equation:

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

Where:

- PE_y Project emissions in year y (tCO₂e/yr)
- $PE_{FF,y}$ Project emissions from fossil fuel consumption in year y (tCO₂/yr)
- $PE_{GP,y}$ Project emissions from the operation of geothermal power plants due to the release of non-condensable gases in year y (tCO₂e/yr)
- $PE_{HP,y}$ Project emissions from water reservoirs of hydro power plants in year y (tCO₂e/yr)

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

For hydro power project activities that result in new single or multiple reservoirs and hydro power project activities that result in the increase of single or multiple existing reservoirs, project proponents shall account for CH₄ and CO₂ emissions from the reservoirs, estimated as follows:

(a) If the power density of the single or multiple reservoirs (PD) is greater than 4 W/m² and less than or equal to 10 W/m²

$$PE_{HP,y} = \frac{EF_{Res} \cdot TEG_y}{1000}$$

or equal to 10 W/m²

(b) If the power density of the project activity (PD) is greater than 10 W/m² : PE_{HP,y} = 0

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

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

Where:

- PD = Power density of the project activity (W/m²)
- Cap_{PJ} = Installed capacity of the hydro power plant after the implementation of the project activity (W)
- Cap_{BL} = Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero
- A_{PJ} = Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m²)
- A_{BL} = Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m²). For new reservoirs, this value is zero

For the proposed project activity;

The project activity is a Greenfield run-of-river hydropower project. The water is diverted using a diversion wall structure to power canal and then to the powerhouse. The water will be fed back to river through the tailrace canal. The diversion structure results in a regulation pond with a surface area of 640,471.91 m². (Appendix 1)

$$Cap_{pj} = 35,478,000 \text{ W}$$

$$Cap_{BL} = 0 \text{ (The Project is a new hydro power plant)}$$

$$A_{PJ} = 640,471.91 \text{ m}^2$$

$$A_{BL} = 0 \text{ (The Project is a new hydro power plant)}$$

$$PD = (35,478,000 - 0) / (640,471.91 - 0) = 55.39 \text{ W/m}^2$$

Therefore;

Since the Power Density of the Project is greater than 10 W/m² PEy is assumed to be 0 as suggested in ACM0002 / Version 13.0.0

Hence option (b) above should be applied and **PE_{HP,y} = 0**

As a result, the project emissions for MURAT HEPP is determined as zero.

4.3 Leakage

No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing and transport). These emissions sources are neglected.

4.4 Net GHG Emission Reductions and Removals

Last, according to the methodology Emission Reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

ER_y : Emission reductions in year y (tCO₂e/yr)

BE_y : Baseline Emissions in year y (tCO₂e/yr)

PE_y : Project Emissions in year y (tCO₂e/yr)

LE_y : Leakage Emissions in year y (tCO₂e/yr)

As demonstrated above, PE_y and LE_y values are “0” for the proposed project activity.

Therefore ER_y is equal to BE_y.

As a result;

ER = BE , and BE = EG_{facility} x EF_{grid,CM,y} SO,

ER = 238,277.45 (MWh) x 0.65 (tCO₂e/MWh)

ER= 154,879 tCO₂e

EF_{grid,CM,y} = (0,657x0,5) + (0,643x0,5) = 0.65 tCO₂/MWh

2012 Period	Gross Energy Generation(ISVM)	Self Consumption(UEÇM)	Net Electricity Generation	Emission Factor	Emission Reductions
Month	MWh	MWh	MWh	(tCO ₂ /MWh)	(tCO ₂)
January					
February					
March					
April					
May					
June					
July					
August					
September					
October	5.700,169	10,332	5.689,837	0.650	3.698
November	6.682,118	1,61	6.680,508	0.650	4.342
December	20.063,821	0,014	20.063,807	0.650	13.041
TOTAL	32.446,108	11,956	32.434,152	0.650	21.082

Figure 5 2012 Net Electricity Generation

2013 Period	Gross Energy Generation(ISVM)	Self Consumption(UEÇM)	Net Electricity Generation	Emission Factor	Emission Reductions
Month	MWh	MWh	MWh	((CO2/MWh)	((CO2)
January	23.712,139	0,117	23.712,022	0.650	15.413
February	22.721,420	0,028	22.721,392	0.650	14.769
March	25.161,520	0,000	25.161,520	0.650	16.355
April	23.834,686	0,208	23.834,478	0.650	15.492
May	23.237,179	0,000	23.237,179	0.650	15.104
June	12.477,110	7,985	12.469,125	0.650	8.105
July	7.075,581	18,903	7.056,678	0.650	4.587
August	4.809,640	28,359	4.781,281	0.650	3.108
September	5.532,906	18,038	5.514,868	0.650	3.585
October	5.598,943	18,439	5.580,504	0.650	3.627
November	5.165,175	17,648	5.147,527	0.650	3.346
December	5.276,752	19,563	5.257,189	0.650	3.417
TOTAL	164.603,051	129,288	164.473,763	0.650	106.907

Figure 6 2013 Net Electricity Generation

2014 Period	Gross Energy Generation(ISVM)	Self Consumption(UEÇM)	Net Electricity Generation	Emission Factor	Emission Reductions
Month	MWh	MWh	MWh	((CO2/MWh)	((CO2)
January	6.984,388	17,485	6.966,903	0.650	4.528
February	6.363,850	15,306	6.348,544	0.650	4.127
March	12.470,601	14,573	12.456,028	0.650	8.096
April	7.082,169	18,064	7.064,105	0.650	4.592
May	4.222,176	22,643	4.199,533	0.650	2.730
June	2.371,751	32,831	2.338,920	0.650	1.520
July	998,873	45,914	952,959	0.650	619
August	341,300	55,860	285,440	0.650	186
September	806,385	49,286	757,099	0.650	492
October					
November					
December					
TOTAL	41.641,493	271,962	41.369,531	0.650	26.890

Figure 7 2014 Net Electricity Generation

2012-2013-2014 Period	Gross Energy Generation(ISVM)	Self Consumption(UEÇM)	Net Electricity Generation	Emission Factor	Emission Reductions
05 October 2012 - 30 September 2014	238.691	413	238.277	0,650	154.879

Figure 8 Total Electricity Generation and Emission Reduction

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
5 October 2012- 31 December 2012	21,082	0	0	21,082
01 January 2013- 31 December 2013	106,907	0	0	106,907
01 January 2014 – 30 September 2014	26,890	0	0	26,890
Total	154,879	0	0	154,879

Table 4 Net total emission reductions or removals

APPENDIX-1

The following document explains that the reservoir area of Murat HEPP power plant. The reservoir area has been calculated as 640,471.91m² when the reservoir is at the fullest capacity. The drawing is obtained from the project plan prepared by Doğru Muhendislik which is the company's consultant for etude and design of this project.

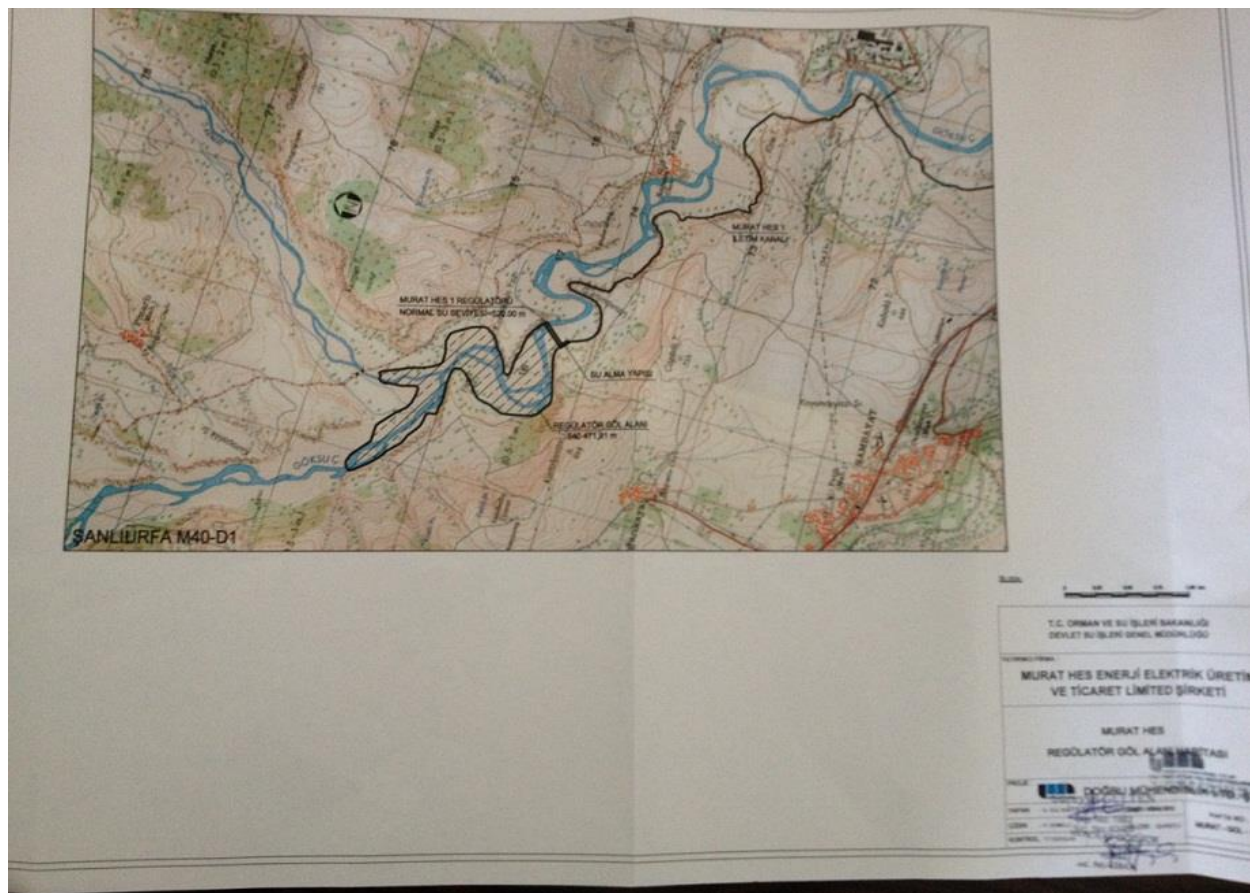


Figure 9 Surface area

APPENDIX-2

Social contributions of the Project Activity



Figure 10 Multipurpose service building for the Şambayat Municipality

MURAT HES . SOSYAL TESİS VE ALTYAPI ÇALIŞMALARI

BALKA KÖYÜ CAMİ MİNARESİ YAPIMI

Adıyaman Şambayat beldesi Balka köyü cami minaresi 2mt çapında 25 mt yüksekliğinde tek şerefeli.



Figure 11 Construction of Minaret of the Balka Village Mosque

BALKA KÖYÜ KÖY YOLU YAPIMI I

Adıyaman Şambayat beldesi Balka köyü köy yolu yapımı 6mt genişliğinde stabilize yol

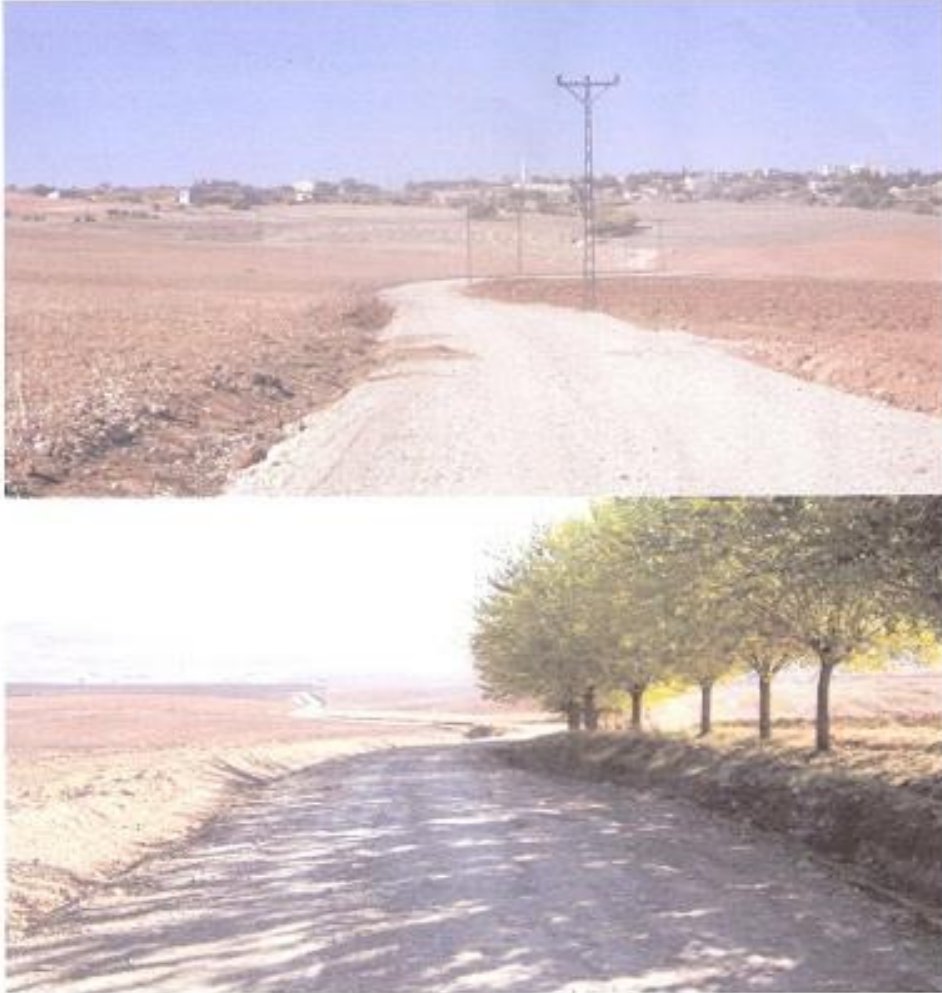


Figure 12 Road construction in Balka Village

Kime:98 312 4413342

12-KAG-2010 06:34 Kimd.

ALINDI BELGESİ

(EK - 17)

DEKNEK GEÇİRLERİ
ALINDI BELGESİ

SERİ NO : SERFA

Cik No

SIKA NO N° 000651

Dosya Adı ADYAMANSPOR KÜLTÜR DERNEĞİ

Merkizi ADYAMAN

Kesme No 02.001.069

Adı ve Soyadı (*): **Murat H.E. EBLENCİ**

T.C.KİMLİK No **626060694**

Yerleşim Yeri (*): **HİTİT / ÇANKAYA ANKARA**

(*) Neşre yasa dışı olarak yapıldığı iddia edilmiştir.

GELİRİN ÇEŞİDİ	TL - KR
Bazı	20.000

Yalnız TL 6 Kr

Fideliyette TL KK Tahsil

Adı ve Soyadı (*): **A.Fahri Pınar**

R.Yat. Kardeşler Ölüm & Form Matbaası ile Halibant Artan'la Birlikte Ziraat Bankası Şubesi

Figure 13 Donation to Adiyaman Sport Clup

Granting Scholarships to total 36 students the list and the details will be provided DOE at site the visit during verification.

APPENDIX-3

Electricity Generation (GWh)	Supplied to grid	Low -cost/ must -run	Thermal	Net generation (-) low-cost/ must-run	Import	EG y (GWh)
2008	189761.9	34278.70	164139.3	156978.6	789.40	157,768.028
2009	186619.3	37889.47	156923.4	150323.4	812.00	151,135.388
2010	203046.1	55380.1	155827.6	149806.0	1143.81	150,949.837
						459,853.25

Table 5 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 (GWh)⁴

Fuel Type	Total Fuel Consumption 2008-2010 (Tonne , 1000m3 for gas) ⁴⁹	Total Emissions 2008-2010 (tCO ₂)
Hard Coal+Imported Coal+Asphaltite	20,310,888	41,951,665
Lignite	186,684,030	115,302,396
Fuel Oil	4,659,474	14,041,053
Diesel Oil	332,417	1,028,378
LPG	111	318
Naphta	31,823	89,500
Natural Gas	64,369,089	129,543,267
Total		301,956,576

Table 6 Total Emissions from fuels consumed in Thermal Power Plants 2008-2010⁵

Electricity Generation	Supplied to grid	Low -cost/ must -run	Thermal	Net generation (-) low-cost/ must-	Import	EG y (GWh)
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⁴ [http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2010/front%20page%202010-çicek%20kitap/uretim%20tuketim\(22-45\)/29\(06-2010\).xls](http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2010/front%20page%202010-çicek%20kitap/uretim%20tuketim(22-45)/29(06-2010).xls)

⁵ <http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2010/front%20page%202010-çicek%20kitap/yakit46-49/47.xls>

n (GWh)				run		
2008	189761.9	34278.70	164139.3	156978.6	789.40	157,768.028
2009	186619.3	37889.47	156923.4	150323.4	812.00	151,135.388
2010	203046.1	55380.1	155827.6	149806.0	1143.81	150,949.837
						459,853.25

Table 7 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 (GWh)⁶

		Birim(Unit): Tcal			Birim(Unit):Ton/Gaz(gas) için 1000 m ³			NCV (Tj/Kt)			
		2008	2009	2010	2008	2009	2010	2008	2009	2010	Average
	Hard Coal+Imported Coal+Asphaltite	33.310,00	35.130,00	39.546,50	6.270.008,00	6.621.177,00	7.419.703	22,24	22,21	22,32	22,26
	Lignite	108.227,00	97.652,00	96.551,00	66.374.120,00	63.620.518,00	56.689.392	6,83	6,43	7,13	6,79
	Fuel Oil	20.607,00	15.160,00	8.569,13	2.173.371,00	1.594.321,00	891.782	39,70	39,81	40,23	39,91
TURKEY	Diesel Oil	1.328,00	1.830,00	209,48	131.206,00	180.857,00	20.354	42,38	42,36	43,09	42,61
	Lpg	0,00	1,00	0,00	0,00	111,00	0	0,00	37,72	0,00	12,57
	Naphta	113,00	84,00	105,13	10.606,00	8.077,00	13.140	44,61	43,54	33,50	40,55
	N.Gas	189.057,00	186.266,00	194.487,26	21.607.635,00	20.978.040,00	21.783.414	36,63	37,17	37,38	37,06
	TOTAL	352.642,00	336.123,00	339.468,49	96.566.946,00	93.003.101,00	86.817.785	192,38	229,25	183,65	201,76

Table 8 Total Emissions from fuels consumed in Thermal Power Plants 2008-2010⁷

			Birim(Unit): Tcal					
			2006	2007	2008	2009	2010	2011
TÜRKİYE TURKEY	Taşkömür+İthal kömür+Asfaltit	Hard Coal+Imported Coal+Asphaltite	29.504	32.115	33.310	35.130	39.546	57.567
	Linyit	Lignite	83.932	100.320	108.227	97.652	96.551	107.210
	TOPLAM	Total	113.436	132.435	141.537	132.781	136.097	164.777
	Fuel-Oil	Fuel Oil	16.769	21.434	20.607	15.160	8.569	5.280
	Motorin	Diesel Oil	627	517	1.328	1.830	209	155
	Lpg	Lpg	0	0	0	1	0	0
	Nafta	Naphta	141	118	113	84	105	0
	TOPLAM	TOTAL	17.537	22.069	22.048	17.076	8.884	5.435
	Doğal Gaz	Natural Gas	150.588	179.634	189.057	186.266	194.487	202.064
	TOPLAM	TOTAL	281.561	334.138	352.642	336.123	339.468	372.276

Table 9 Heating Values of Fuels Consumed in Thermal Power Plants in Turkey By The Electric Utilities⁸

⁶ [http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2010/front%20page%202010-çiçek%20kitap/ithalat-ihracat\(50-54\)/52.xls](http://www.teias.gov.tr/TürkiyeElektrikİstatistikleri/istatistik2010/front%20page%202010-çiçek%20kitap/ithalat-ihracat(50-54)/52.xls)

⁷ <http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/yak%C4%B1t46-49/47.xls>

⁸ <http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2010/front%20page%202010-%C3%A7i%C3%A7ek%20kitap/yak%C4%B1t46-49/49.xls>

Year	Gross generation	Net generation	All units are GWh NET/Gross	Gross Gen. Thermal	Net Gen Thermal	Import	Total
2008	198418,0	189761,9	0,96	164139,3	156978,6	789,44	157768,0658
2009	194812,9	186619,3	0,96	156923,443	150323,4	811,98	151135,4087
2010	211207,7	203046,1	0,96	155827,614	149806,0	1143,81	150949,8507
				Total Net Thermal Gen.	457108,1	2745,227691	459853,3252

OM 2008-2010 0,657 ktCO₂/MWh⁹

Table 10 EF Calculation excel study OM worksheet⁹

EF CO ₂ (t CO ₂ / GJ)						
Sub-Bituminous Coal	Lignite	Fuel-oil	Diesel-oil	LPG	Naphtha	Natural Gas
0.995	0.999	0.775	0.949	0.493	0.554	0.425

Table 11 Average CO₂ emission factor by fuel types (tCO₂/Gj)

Fuel Type	Electricity generation capacity addition (MWh)	EF,EL,m,y (tCO ₂ /MWh)	Emission by source (tCO ₂)
Coal	10,025,000	0.995	9,976,622
Lignite	6,675,000	0.999	6,667,665
Fuel Oil	3,355,000	0.775	2,600,197
Diesel oil	0	0.949	-
LPG	0	0.493	-
Naphtha	0	0.554	-
Natural Gas	20,945,685	0.425	8,906,814
Renewables and wastes	0	0.000	-
Solid	0	0.000	-
total Renewables	2,784,028	0.000	-
TURKEY'S TOTAL	43,784,713		28,151,298

Table 12 Total capacity additions considered in the BM emission factor calculation (2006-2010)

⁹ EF calculation excel study, OM worksheet

APPENDIX-4

BASELINE INFORMATION

Generation units put into operation in 2010

NO	PLANT NAME	INSTALLED POWER MW	GENERATION GWh	FUEL TYPE	START DATE
1	KIRKA BORAKS (Kırka)	18,2	120	FUELOIL	29.09.2010
2	TÜPRAŞ (İzmit-Yarımca)	85	550	FUELOIL	15.12.2010
3	ETİ SODA	24	144	LIGNITE	22.01.2010
4	AKBAŞLAR	10,2	80	N.GAS	18.02.2010
5	ALTINMARKA	8,2	66	N.GAS	28.01.2010
6	CAN TEKSTİL (Çorlu)	13	100	N.GAS	28.01.2010
7	FLOKSER TEKSTİL (ÇERKEZKÖY)	5,2	42	N.GAS	17.07.2010
8	FRİTOLEY GIDA	0,6	4	N.GAS	26.11.2010
9	INTERNATIONAL HOSPITAL (İstanbul)	0,8	6	N.GAS	31.12.2010
10	KURTOĞLU BAKIR KURŞUN	1,6	12	N.GAS	19.08.2010
11	KESKİNOĞLU TAVUKÇULUK	3,5	25	N.GAS	11.08.2010
12	MARMARA PAMUK	69,9	543	N.GAS	25.11.2010
13	POLYPLEX EUROPA	7,8	61	N.GAS	16.12.2010
14	RB KARESİ TEKS. (BURSA)	8,6	65	N.GAS	23.07.2010
15	ATAER ENERJİ (EBSO)	119,2	676	NAPHTA	05.05.2010
16	ALARKO ALTEK	164	1134	N.GAS	18.12.2010
17	ALİAĞA Çakmaktepe Enerji	104,7	836,4	N.GAS	26.11.2010
18	BİNATOM ELEKTRİK ÜRT. A.Ş.	2,0	13	N.GAS	17.08.2010
19	CAN ENERJİ ELEK. ÜR.A.Ş.(TEKİRDAĞ)	29,1	203	N.GAS	19.08.2010
20	CENGİZ ENERJİ (Tekkeköy/SAMSUN)	203,9	1604	N.GAS	31.07.2010
21	ENERJİ-SA (Bandırma)	930,8	7540	N.GAS	07.10.2010
22	GLOBAL ENERJİ (PELİTLİK)	23,8	181,7	N.GAS	26.02.2010
23	RASA ENERJİ (VAN)	114,9	731	N.GAS	29.12.2010
24	SÖNMEZ ELEKTRİK	70,7	545,1	N.GAS	07.12.2010
25	UĞUR ENERJİ (TEKİRDAĞ)	60,2	506	N.GAS	07.10.2010
26	AKSA ENERJİ (Antalya)	850	6545	N.GAS	01.07.2010

27	ITC-KA ENERJİ SİNCAN	4,2	33	WASTE	30.04.2010
28	ITC-KA ENERJİ ADANA (BİYOKÜTLE)	9,9	80	WASTE	02.09.2010
29	CEV EN.(GAZİANTEP ÇÖP)	1,1	8,6	WASTE	01.02.2010
30	ORTADOĞU ENERJİ (Oda yeri)	16,9	132,8	WASTE	24.02.2010
31	EREN ENERJİ ELEK.ÜR.A.Ş.	1360	9.080	IMPORTED COAL	29.12.2010
32	AKIM (CEVİZLİK HES)	91,4	187	HYDRO	28.05.2010
33	ASA EN.(KALE REG.)	9,6	18	HYDRO	19.02.2010
34	BAYBURT HES	14,6	24	HYDRO	28.01.2010
35	ALAKIR (YURT EN.)	2,1	4	HYDRO	29.01.2010
36	BEYTEK(ÇATALOLUK HES)	9,5	17	HYDRO	07.04.2010
37	BİRİM (ERFELEK HES)	6,5	11	HYDRO	14.05.2010
38	BULAM	7	19	HYDRO	10.08.2010
39	BURÇBENDİ (AKKUR EN.)	27,3	64	HYDRO	04.11.2010
40	CEYHAN HES (BERKMAN HES-ENOVA)	25,2	58	HYDRO	28.08.2010
41	CEYHAN HES (OŞKAN HES- ENOVA)	23,9	55	HYDRO	03.06.2010
42	CİNDERE DENİZLİ	28,2	50	HYDRO	21.01.2010
43	ÇAKIT HES	20,2	54	HYDRO	01.06.2010
44	ÇAMLIKAYA	5,6	11	HYDRO	30.06.2010
45	DAMLAPINAR(CENAY ELEK.)	16,4	52	HYDRO	08.07.2010
46	DİM HES (DİLER ELEK.)	38,3	70	HYDRO	08.07.2010
47	DİNAR HES (ELDA ELEK.)	4,4	9	HYDRO	03.07.2010
48	DOĞUBAY ELEK.(SARIMEHMET HES)	3,1	6	HYDRO	11.03.2010
49	EGEMEN 1 HES (ENERSİS ELEK.)	19,9	41	HYDRO	28.12.2010
50	ERENLER REG.(BME BİRLEŞİK EN.)	45	48	HYDRO	04.06.2010
51	ERENKÖY REG.(TÜRKERLER)	21,5	49	HYDRO	07.10.2010
52	ERİKLİ - AKOCAK REG.(AK EN.)	82,5	146	HYDRO	29.07.2010
53	FEKE 2 (AKKUR EN.)	69,3	126	HYDRO	24.12.2010
54	FIRTINA ELEK.(SÜMER HES)	21,6	39	HYDRO	16.04.2010
55	GÖK HES	10	24	HYDRO	06.08.2010
56	GÜDÜL I (YAŞAM EN.)	2,4	8	HYDRO	25.08.2010
57	GÜZELÇAY-I HES(İLK EN.)	8,1	24	HYDRO	11.11.2010

58	HETAŞ HACISALİHOĞLU (YILDIZLI HES)	1,2	3	HYDRO	23.02.2010
59	HİDRO KONTROL (SELİMOĞLU HES)	8,8	20	HYDRO	07.01.2010
60	KAHRAMAN REG.(KATIRCIOĞLU ELEK.)	1,4	3	HYDRO	30.09.2010
61	KAHTA I HES(ERDEMYILDIZ ELEK.)	7,1	20	HYDRO	14.10.2010
62	KALE HES	34,1	66	HYDRO	16.06.2010
63	KALKANDERE-YOKUŞLU HES(AKIM EN.)	14,5	36	HYDRO	30.12.2010
64	KARADENİZ ELEK.(UZUNDERE I HES)	62,2	93	HYDRO	07.11.2010
65	KAR-EN KARADENİZ ELEK.(ARALIK HES)	12,4	32	HYDRO	30.04.2010
66	KARŞIYAKA HES (AKUA EN.)	1,6	5	HYDRO	28.08.2010
67	KAYABÜKÜ HES (ELİTE ELEK.)	14,6	28	HYDRO	21.07.2010
68	ÖZGÜR ELEKTR. KİRPİLİK HES	6,2	13	HYDRO	11.07.2010
69	KOZAN HES (SER-ER EN.)	4	5	HYDRO	21.09.2010
70	KULP IV HES (YILDIZLAR EN.)	12,3	23	HYDRO	13.01.2010
71	MURGUL BAKIR	24,2	39	HYDRO	11.11.2010
72	NARİNKALE HES (EBD EN.)	3,1	6	HYDRO	30.09.2010
73	NİSAN EN.(BAŞAK HES)	6,9	12	HYDRO	09.04.2010
74	NURYOL EN.(DEFNE HES)	7,2	13	HYDRO	26.03.2010
75	ÖZGÜR ELEKTR.AZMAK II	6,3	11	HYDRO	01.04.2010
76	PAŞA HES(ÖZGÜR EL.)	8,7	19	HYDRO	11.06.2010
77	PETA EN. (MURSAL II HES)	4,5	11	HYDRO	19.02.2010
78	REŞADİYE I HES(TURKON MNG EL.	15,7	71	HYDRO	26.11.2010
79	REŞADİYE II HES(TURKON MNG EL.	26,1	119	HYDRO	17.09.2010
80	SABUNSUYU II HES (ANG EN.)	7,4	12	HYDRO	28.10.2010
81	SELEN EL.(KEPEZKAYA HES)	28	70	HYDRO	06.09.2010
82	TEKTUĞ-ANDIRIN	40,5	60	HYDRO	03.09.2010
83	UZUNÇAYIR	82	182	HYDRO	11.04.2010
84	YEDİGÖZE HES	155,3	268	HYDRO	02.12.2010

85	YAVUZ HES (MASAT EN.)	22,5	47	HYDRO	14.07.2010
86	ULUABAT KUVVET TÜN.(AK EN.)	97	210	HYDRO	25.11.2010
87	ALİZE ENERJİ (KELTEPE)	20,7	62	WIND	28.04.2010
88	AKDENİZ ELEK. MERSİN RES	33	50	WIND	19.03.2010
89	ASMAKİNSAN (BANDIRMA-3 RES)	24	45	WIND	26.03.2010
90	BAKRAS ELEK.ŞENBÜK RES	15	40	WIND	22.04.2010
91	BELEN HATAY	36	70	WIND	02.09.2010
92	BERGAMA RES (ALİAĞA RES)	90	302	WIND	16.06.2010
93	BORASKO BANDIRMA	57	143	WIND	30.06.2010
94	BOREAS EN.(ENEZ RES)	15	42	WIND	09.04.2010
95	MAZI 3	30	80	WIND	18.06.2010
96	KUYUCAK (ALİZE ENER.)	25,6	94	WIND	09.12.2010
97	ROTOR (OSMANİYE RES-GÖKÇEDAĞ RES)	135	435	WIND	15.10.2010
98	SARES (GARET ENER.)	15	51	WIND	22.12.2010
99	SEBENOBA (DENİZ ELEK.)SAMANDAĞ	30	96	WIND	12.03.2010
100	SOMA RES	79,2	200	WIND	20.08.2010
101	SOMA RES (BİLGİN ELEK.)	90	261	WIND	11.11.2010
102	TURGUTTEPE RES (SABAŞ ELEK.)	22	55	WIND	30.12.2010
103	ÜTOPIYA ELEKTRİK	30	60	WIND	03.09.2010
104	ZİYARET RES	35	119	WIND	13.10.2010
105	MENDERES JEOTERMAL DORA-2	9,5	73	GEO THERMAL	26.03.2010
106	TUZLA JEO.	7,5	55	GEO THERMAL	13.01.2010
	RENEWABLES (HYDRO + WIND)	606.80	1,106	1,106,000	
	IMPORTED COAL	1,360	9080	9,080,000	
	LIGNITE	24	144	144,000	
	N.GAS	1,254.1	10081	10,081,000	
	CDM REGISTERED PROJECTS AND CAPACITY ADDITIONS TO EXISTING PLANTS ARE EXLUDED				

Generation units put into operation in 2009

NO	PLANT NAME	INSTALLED POWER MW	GENERATION GWh	Fuel Type	START DATE
1	KISIK	9,60	20,00	HYDRO	2009
2	OBRUK I-II	212,40	337,00	HYDRO	2009
3	ALIAĞA PETKİM	222,00	1.554,00	FUELOIL	2009
4	SÜPER FİLM (G.Antep)	25,30	203,00	FUELOIL	2009
5	TİRE-KUTSAN (Tire)	8,00	37,00	FUELOIL	2009
6	ALKİM (ALKALİ KİMYA) (Konya)	0,40	3,00	LIGNITE	2009
7	AKGIDA PAMUKOVA	7,50	61,00	N.GAS	2009
8	MAURİ MAYA	2,30	19,00	N.GAS	2009
9	ÇELİKLER RIXOS ANKARA	2,00	16,00	N.GAS	2009
10	DALSAN ALÇI	1,20	9,00	N.GAS	2009
11	ERDEMİR	117,60	710,00	N.GAS	2009
12	KASAR DUAL TEKSTİL ÇORLU	5,70	38,00	N.GAS	2009
13	MARMARA PAMUK	43,70	340,00	N.GAS	2009
14	NUH ENERJİ 2 (Nuh Çimento)	120,00	840,00	N.GAS	2009
15	SELKASAN	9,90	73,00	N.GAS	2009
16	TAV İSTANBUL	9,80	82,00	N.GAS	2009
17	TESKO KİPA İZMİR	2,30	18,00	N.GAS	2009
18	TÜPRAŞ ALIAĞA	24,70	170,00	N.GAS	2009
19	CARGILL TARIM	0,10	0,70	BIOGAS	2009
20	ARENKO DENİZLİ	12,00	84,00	N.GAS	2009
21	AKSA AKRİLİK KİMYA (YALOVA)	70,00	539,00	N.GAS	2009
22	BİL ENERJİ (Ankara)	36,60	255,00	N.GAS	2009
23	EGE BİRLEŞİK ENERJİ	12,80	107,00	N.GAS	2009
24	CAM İŞ ELEKTRİK (Mersin)	252,20	2.016,00	N.GAS	2009
25	DELTA ENERJİ	60,00	467,00	N.GAS	2009
26	DESA ENERJİ	9,80	70,00	N.GAS	2009
27	GLOBAL ENERJİ (PELİTLİK)	20,30	155,00	N.GAS	2009
28	GÜL ENERJİ	24,30	170,00	N.GAS	2009
29	KEN KİPAŞ KAREN ELEKTRİK	41,80	180,00	N.GAS	2009
30	FALEZ ELEKTRİK	11,70	88,00	N.GAS	2009
31	MANİSA O.S.B.	84,80	434,00	N.GAS	2009
32	MAKSİ ENERJİ	7,70	55,00	N.GAS	2009

33	MODERN ENERJİ	96,80	680,00	N.GAS	2009
34	HABAŞ (Aliağa)	224,50	1.796,00	N.GAS	2009
35	HAYAT KAĞIT SAN.	7,50	56,00	N.GAS	2009
36	RASA ENERJİ VAN	78,60	500,00	N.GAS	2009
37	SÖNMEZ ELEKTRİK	34,90	269,00	N.GAS	2009
38	ŞAHİNLER ENERJİ(ÇORLU/TEKİRDAĞ)	26,00	185,00	N.GAS	2009
39	YURT BAY (Eskişehir)	6,90	50,00	N.GAS	2009
40	ZORLU ENERJİ (B. Karşıran)	115,30	920,00	N.GAS	2009
41	ESKİŞEHİR ENDÜSTRİ ENERJİ(OSB)	59,00	452,00	N.GAS	2009
42	AKSA ENERJİ (Antalya)	800,00	6.160,00	N.GAS	2009
43	AKSA ENERJİ (Manisa)	115,30	913,00	N.GAS	2009
44	ITC-KA ENERJİ MAMAK	22,60	170,00	WASTE	2009
45	ITC-KA ENERJİ SİNCAN	2,80	22,00	WASTE	2009
46	ORTADOĞU ENERJİ (Oda yeri)	12,70	100,00	WASTE	2009
47	ORTADOĞU ENERJİ (KÖMÜRCÜODA)	5,80	45,00	WASTE	2009
48	SİLOPİ ASFALTİT	135,00	945,00	ASPHALTİT	2009
49	HABAŞ (Bilecik)	18,00	144,00	FUELOIL	2009
50	HABAŞ (İzmir)	36,00	288,00	FUELOIL	2009
51	SİLOPİ ELEKT.ÜRETİM ESENBOĞA	44,80	315,00	FUELOIL	2009
52	İÇDAŞ ÇELİK	405,00	2.885,00	COAL	2009
53	AKÇAY	28,80	45,00	HYDRO	2009
54	ANADOLU ÇAKIRLAR	16,20	28,00	HYDRO	2009
55	CEYKAR BAĞIŞLI	29,60	47,00	HYDRO	2009
56	BEREKET (KOYULHISAR)	42,00	155,00	HYDRO	2009
57	BEYOBASI (SIRMA)	5,90	11,00	HYDRO	2009
58	AKUA KAYALIK	5,80	20,00	HYDRO	2009
59	CİNDERE DENİZLİ	19,10	30,00	HYDRO	2009
60	DEĞİRMENÜSTÜ (KAHRAMANMARAŞ)	38,60	52,00	HYDRO	2009
61	DENİZLİ EGE 1	0,90	2,00	HYDRO	2009
62	ELESTAŞ YAYLALBEL	5,10	10,00	HYDRO	2009
63	ELESTAŞ YAZI	1,10	3,00	HYDRO	2009
64	ERVA KABACA HES	8,50	15,00	HYDRO	2009
65	FİLYOS YALNIZCA HES	14,40	33,00	HYDRO	2009
66	KALEN ENER. (KALEN I-II)	31,30	47,00	HYDRO	2009
67	KAREL (PAMUKOVA)	9,30	40,00	HYDRO	2009

68	KAYEN KALETEPE HES	10,20	17,00	HYDRO	2009
69	TGT EN. LAMAS III-IV	35,70	71,00	HYDRO	2009
70	ÖZGÜR ELEKTR.AZMAK II	24,40	43,00	HYDRO	2009
71	ÖZTAY GÜNAYŞE	8,30	14,00	HYDRO	2009
72	ÖZYAKUT GÜNEŞLİ HES	1,80	4,00	HYDRO	2009
73	SARITEPE HES DİNAMİK	4,90	9,00	HYDRO	2009
74	ŞİRİKÇİOĞLU KOZAK	4,40	7,00	HYDRO	2009
75	TAŞOVA YENİDEREKÖY	2,00	6,00	HYDRO	2009
76	TEKTÜĞ-ERKENEK	12,50	30,00	HYDRO	2009
77	TURKON MNG REŞADİYE III	22,30	88,00	HYDRO	2009
78	UZUNÇAYIR	27,30	49,00	HYDRO	2009
79	YEŞİLBAŞ	14,00	26,00	HYDRO	2009
80	YAPISAN KARICA DARICA	97,00	154,00	HYDRO	2009
81	YPM GÖLOVA	1,10	2,00	HYDRO	2009
82	YPM SEVİNDİK	5,70	18,00	HYDRO	2009
83	YURT EN. TOCAK I	4,80	6,00	HYDRO	2009
84	TÜM EN. PINAR	30,10	65,00	HYDRO	2009
85	ALİZE ENERJİ (ÇAMSEKİ)	20,80	70,00	WIND	2009
86	ALİZE ENERJİ (KELTEPE)	18,90	55,00	WIND	2009
87	ALİZE ENERJİ (SARIKAYA ŞARKÖY)	28,80	82,00	WIND	2009
88	AK ENERJİ AYYILDIZ (BANDIRMA)	15,00	44,00	WIND	2009
89	AYEN ENERJİ (AKBÜK)	31,50	104,00	WIND	2009
90	BELEN HATAY	30,00	81,00	WIND	2009
91	BORASKO BANDIRMA	45,00	152,00	WIND	2009
92	MAZI 3	22,50	67,00	WIND	2009
93	KORES KOCADAĞ	15,00	48,00	WIND	2009
94	ROTOR OSMANİYE	57,50	185,00	WIND	2009
95	BAKİ ELEKTRİK ŞAMLI RÜZGAR	90,00	375,00	WIND	2009
96	DATÇA RES	29,60	71,00	WIND	2009
97	SAYALAR RÜZGAR (DOĞAL ENERJİ)	34,20	100,00	WIND	2009
98	SOMA RES	45,00	127,00	WIND	2009
99	ÜTOPYA ELEKTRİK	15,00	39,00	WIND	2009
100	GÜRMAT EN.	47,40	313,00	GEO THERM AL	2009

		MW	GWh/year	MWh/year	
	RENEWABLES (WIND-HYDRO-G.THER- WASTE-BIOGAS)	501,50	1.279,70	1.279.700,00	
	ASPHALTIT	135,00	945,00	945.000,00	
	FUELOIL	354,10	2.541,00	2.541.000,00	
	LIGNITE	0,40	3,00	3.000,00	
	N.GAS	936,20	6.654,00	6.654.000,00	
CDM REGISTERED PROJECTS AND CAPACITY ADDITIONS TO EXISTING PLANTS ARE EXCLUDED					

Generation units put into operation in 2008

NO	PLANT NAME	INSTALLED POWER MW	GENERATION MWh	FUEL TYP
1	MB ŞEKER NİŞASTA SAN. A.Ş. (Sultanhanı)	8,8	0	N.GAS
2	AKSA ENERJİ (Antalya)	183,8	133.736	N.GAS
3	AKSA ENERJİ (Manisa)	52,38	79.183	N.GAS
4	ANTALYA ENERJİ (ilave)	17,46	256.120	
5	ATAÇ İNŞAAT SAN. A.S.B.(ANTALYA)	5,4	10	N.GAS
6	BAHÇIVAN GIDA (LÜLEBURGAZ)	1,165	0	N.GAS
7	CAN ENERJİ (Çorlu-TEKİRDAĞ) (ilave)	52,38	274.260	
8	FOUR SEASONS OTEL (ATİK PASHA TUR.A.Ş)	1,165	0	N.GAS

9	FRİTOLAY GIDA SAN.VE TİC.AŞ.(İlave)	0,06	0	
10	ITC-KA Enerji Üretim A.Ş.(Mamak)(İlave)	14,13	95.832	
11	KARKEY(SİLOPİ-5) (154 kV) (İlave)	14,78	16.362	
12	MELİKE TEKSTİL (GAZİANTEP)	1,584	0	N.GAS
13	MİSİS APRE TEKSTİL BOYA EN. SAN.	2	5.324	N.GAS
14	MODERN ENERJİ (LÜLEBURGAZ)	13,4	508.942	N.GAS
15	ORTADOĞU ENERJİ (ODA YERİ) (Eyüp/İST.)	2,83	0	WASTE
16	POLAT TURZ. (POLAT RENAISSANCE İST.OT.)	1,6	490	N.GAS
17	SARAYKÖY JEOTERMAL (Denizli)	6,85	14.099	GEO
18	YILDIZ SUNTA (Uzunçiftlik- Köseköy)(Düzeltilme)	22,63	136.018	N.GAS
19	SÖNMEZ Elektrik (İlave)	8,73	61	
20	AKKÖY ENERJİ (AKKÖY I HES)	101,94	21.608	HYDRO
21	ALP ELEKTRİK (TINAZTEPE) ANTALYA	7,689	9.245	HYDRO
22	CANSU ELEKTRİK (Murgul/ARTVİN)	9,18	12.518	HYDRO
23	ÇALDERE ELK.(ÇALDERE HES)Dalaman-MUĞLA	8,74	11.153	HEPP
24	DAREN HES ELKT. (SEYRANTEPE BARAJI VE HES)	49,7	14.370	HYDRO
25	DEĞİRMENÜSTÜ EN. (KAHRAMANMARAŞ)	25,7	0	HEPP
26	GÖZEDE HES (TEMSA ELEKTRİK) BURSA	2,4	6.107	HYDRO

27	H.G.M. ENERJİ (KEKLİCEK HES) (Yeşilyurt)	8,674	120	HYDRO
28	HAMZALI HES (TURKON MNG ELEKTRİK)	16,7	2.934	HEPP
29	HİDRO KNT.(YUKARI MANAHOZ REG.VE HES)	22,4	13.772	HYDRO
30	İÇ-EN ELK.(ÇALKIŞLA REGÜLATÖRÜ VE HES)	7,66	3.364	HYDRO
31	KALEN ENERJİ (KALEN II REGÜLAT. VE HES)	15,65	10.281	HYDRO
32	MARAŞ ENERJİ (FIRNIS REGÜLATÖRÜ VE HES)	7,22	0	HYDRO
33	SARMAŞIK I HES (FETAŞ FETHİYE ENERJİ)	21,04	1.472	HYDRO
34	SARMAŞIK II HES (FETAŞ FETHİYE ENERJİ)	21,58	1.221	HYDRO
35	TORUL	105,6	18.551	HYDRO
36	YEŞİL ENERJİ ELEKTRİK (TAYFUN HES)	0,82	0	HYDRO
37	ZORLU ENERJİ (MERCAN) (Düzeltilme)	1,275	22.828	HEPP
38	BAKİ ELEKTRİK ŞAMLI RÜZGAR	21	60.943	WIND
39	DATÇA RES (Datça)	8,1	3.778	WIND
40	ERTÜRK ELEKTRİK Çatalca RES	60	65.961	WIND
41	İNNORES ELK YUNDAĞ RÜZG. (Aliağa)	42,5	98.058	WIND
42	LODOS RES (Taşoluk)(G.O.P./İSTANBUL)	24	25.714	WIND
43	SAYALAR RÜZGAR (Doğal Enerji)	30,6	53.925	WIND
44	SEBENOBA (DENİZ ELK.) (Samandağ- HATAY)	31,2	46.919	WIND

		MW	MWh/year	
	N.GAS	271,29	727.685,00	
	RENEWABLES (WASTE - GEOTHERMAL- HYDRO)	391,23	126.728,00	
CDM REGISTERED PROJECTS AND CAPACITY ADDITIONS TO EXISTING PLANTS ARE EXCLUDED				

Generation units put into operation in 2007

NO	PLANT NAME	INSTALLED POWER (MW)	GENERATION (GWh)	FUEL TYPE
1	MOBİL TOPLAM	-462,30		
2	HABAŞ (Aliağa-ilave)	9,10	1.796,00	N.GAS
3	BOSEN	-123,50		N.GAS
4	MODERN ENERJİ	5,20	650,00	N.GAS
5	ARENKO	0,70	101,00	N.GAS
6	ALTINMARKA GIDA	0,10	29,00	N.GAS
7	TEKBOY ENERJİ	0,10	16,00	N.GAS
8	VELSAN AKRİLİK	0,10	0,00	N.GAS
9	AKBAŞLAR	-0,10		N.GAS
10	ORS RULMAN	-0,30		N.GAS
11	Acıbadem Sağlık Hiz.ve Tic.A.Ş.(Kadıköy Hast.)(İstanbul/Kadıköy)	0,50	4,00	N.GAS
12	Acıbadem Sağlık Hiz.ve Tic.A.Ş.(Kozyatağı Hast.)(İstanbul/Kadıköy)	0,60	5,00	N.GAS
13	Acıbadem Sağlık Hiz.ve Tic.A.Ş.(Nilüfer/BURSA)	1,30	11,00	N.GAS
14	AKATEKS Tekstil Sanayi ve Ticaret A.Ş.	1,80	14,00	N.GAS
15	FLOKSER TEKSTİL SAN.A.Ş.(Çatalca/İstanbul)(Poliser Tesisi)	2,10	17,00	N.GAS
16	FLOKSER TEKSTİL SAN.A.Ş.(Çatalca/İstanbul)(Süetser Tesisi)	2,10	17,00	N.GAS

17	FRİTOLAY GIDA SAN.VE TİC. AŞ.	0,50	4,00	N.GAS
18	KIVANÇ TEKSTİL SAN.ve TİC.A.Ş.	3,90	33,00	N.GAS
19	KİL-SAN KİL SAN.VE TİC. A.Ş	3,20	25,00	N.GAS
20	SÜPERBOY BOYA SAN.ve Tic.Ltd.Şti.(Büyüçekmece/İstanbul)	1,00	8,00	N.GAS
21	SWISS OTEL(Anadolu Japan Turizm A.Ş (İstanbul)	1,60	11,00	N.GAS
22	TAV Esenboğa Yatırım Yapım ve İşetme AŞ./ANKARA	3,90	33,00	N.GAS
23	STARWOOD	-17,30		N.GAS
24	NUH ENERJİ-2(Nuh Çim.)	73,00	514,00	N.GAS
25	KAREN	-24,30		FUELOIL
26	AKTEKS	1,80	14,00	FUELOIL
27	TÜPRAŞ İZMİT RAFİNERİ	-0,90		FUELOIL
28	AKBAŞLAR	-3,80		FUELOIL
29	UŞAK ŞEKER (NURİ ŞEKER)	1,70		LIGNITE
30	BOR ŞEKER	-0,60		LIGNITE
31	SUSURLUK ŞEKER	-0,60		LIGNITE
32	AFYON ŞEKER	-0,80		GASOIL
33	AĞRI ŞEKER	-1,00		GASOIL
34	ALPULLU ŞEKER	-0,90		GASOIL
35	BURDUR ŞEKER	-0,80		GASOIL
36	ÇARŞAMBA ŞEKER	-0,80		GASOIL
37	ÇORUM ŞEKER	-0,80		GASOIL
38	ELAZIĞ ŞEKER	-0,50		GASOIL
39	ELBİSTAN ŞEKER	-0,80		GASOIL
40	ERCİŞ ŞEKER	-0,80		GASOIL
41	EREĞLİ ŞEKER	-0,80		GASOIL
42	KASTAMONU ŞEKER	-0,20		GASOIL
43	KÜTAHYA ŞEKER (BAHA ESAD TEKAND)	-0,70		GASOIL
44	MALATYA ŞEKER	-0,50		GASOIL
45	BOĞAZLIYAN ŞEKER	16,40		N.GAS
46	KARTONSAN ilave	24,00	192,00	N.GAS
47	ESKİŞEHİR END.ENERJİ	3,50		N.GAS
48	ESKİŞEHİR ŞEKER (KAZIM TAŞKENT)	2,90		N.GAS
49	İGSAŞ	2,20	76,00	N.GAS
50	DESA ilave	0,70	70,00	NAPHTA
51	DENTAŞ ilave	0,30	38,00	NAPHTA
52	SÜPER FİLMCİLİK ilave	0,10	203,00	N.GAS

53	ATAER ENERJİ ilave	0,10	398,00	NAPHTA
54	BİL ENERJİ ilave	0,10	255,00	N.GAS
55	EDİP İPLİK	-0,10		N.GAS
56	EGE BİRLEŞİK ENERJİ	-0,30		LPG
57	İSKO	-1,80		N.GAS
58	ITC-KA Enerji Üretim A.Ş.(Mamak)(İlave)	1,40	45,00	BIOGAS
59	BİS Enerji Üretim A.Ş.(Bursa)(İlave)	43,00		N.GAS
60	Aliağa Çakmaktepe Enerji A.Ş.(Aliağa/İZMİR)	34,80	278,00	N.GAS
61	BİS Enerji Üretim A.Ş.(Bursa)(Düzeltilme))	28,30	3.383,00	N.GAS
62	BİS Enerji Üretim A.Ş.(Bursa)(İlave)	48,00		N.GAS
63	BOSEN ENERJİ ELEKTRİK A.Ş.	142,80	1.071,00	N.GAS
64	Mamara Elektrik Üretim A.Ş.	-8,70		N.GAS
65	NUH ENERJİ-2(Nuh Çim.)	-73,00		N.GAS
66	SAYENERJİ ELEKTRİK ÜRETİM A.Ş. (Kayseri/OSB)	5,90	47,00	N.GAS
67	T. ENERJİ ÜRETİM A.Ş.(İSTANBUL)	1,60		N.GAS
68	ZORLU EN.Kayseri (İlave 1 GT)	7,20		N.GAS
69	SİİRT	25,60	190,00	FUELOIL
70	Mardin Kızıltepe	34,10	250,00	FUELOIL
71	KAREN	24,30	180,00	FUELOIL
72	İDİL 2 (PS3 A- 2)	24,30	180,00	FUELOIL
73	İSKUR TEKSTİL (SÜLEYMANLI HES)	-4,60		HYDRO
74	BORÇKA HES	300,60	600,00	HYDRO
75	TEKTÜĞ(Keban Deresi)	5,00	20,00	HYDRO
76	YPM Ener.Yat.A.Ş.(Altıntepe Hidro.)(Sivas/Suğehir)	4,00	10,00	HYDRO
77	YPM Ener.Yat.A.Ş.(Beypınar Hidro.)(Sivas/Suğehir)	3,60	9,00	HYDRO
78	YPM Ener.Yat.A.Ş.(Konak Hidro.)(Sivas/Suğehir)	4,00	10,00	HYDRO
79	KURTEKS Tekstil A.Ş./Kahramanmaraş(KARASU HES-Andırın)	2,40	19,00	HYDRO
80	İSKUR TEKSTİL (SÜLEYMANLI HES)	4,60	4,00	HYDRO
81	ÖZGÜR ELK.A.Ş.(K.MARAŞ)(Tahta)	6,30	54,00	HYDRO
82	ÖZGÜR ELK.A.Ş.(K.MARAŞ)(Tahta)(İlave)	6,30		HYDRO
83	ANEMON EN.ELEK.ÜRETİM.A.Ş.	8,00	83,00	WIND
84	ANEMON EN.ELEK.ÜRETİM.A.Ş.(İlave)	15,20		WIND
85	ANEMON EN.ELEK.ÜRETİM.A.Ş.(İlave)	7,20		WIND

86	BURGAZ RES (Doğal Enerji Üretim A.Ş.)	4,00	48,00	WIND
87	BURGAZ RES (Doğal Enerji Üretim A.Ş.)	10,90		WIND
88	DENİZ ELEK. ÜRETİM Ltd.Şti.(karakurt)	10,80	24,00	WIND
89	MARE MANASTIR RÜZGAR ENERJİ(ilave)	11,20	129,00	WIND
90	MARE MANASTIR RÜZGAR ENERJİ(ilave)	20,00		WIND
		MW	GWh/year	MWh/year
	RENEWABLES	26,60	102,00	102.000,00
	FUELOIL	110,10	814,00	814.000,00
	LIGNITE	1,70	0,00	0,00
	N.GAS	123,20	1.568,00	1.568.000,00
CDM REGISTERED PROJECTS AND CAPACITY ADDITIONS TO EXISTING PLANTS ARE EXCLUDED				

Generation units put into operation in 2006

NO	PLANT NAME	INSTALLED POWER (MW)	GENERATION (GWh)	FUEL TYPE
1	AKMAYA (Lüleburgaz) GR I	6,91	50,00	N.GAS
2	BURGAZ (Lüleburgaz) GR I	6,91	54,00	N.GAS
3	ERTÜRK ELEKTRİK Tepe RES GR I	0,85	2,00	WIND
4	BEREKET EN.(Mentaş Reg) GR III	13,30	140,00	HYDRO
5	MARE MANASTIR RÜZGAR (X GRUP)	8,00	12,00	WIND
6	ÇIRAĞAN SARAYI GR I	1,32	11,00	N.GAS
7	TEKTUĞ(Kalealtı) GR I - II	15,00	11,00	HYDRO
8	ERE(AKSU REG.ve ŞAHMALLAR HES) GR I-II	14,00	6,60	HYDRO
9	ELBİSTAN B GR IV	360,00		LIGNITE
10	ENTEK (Köseköy) GR V	37,00		N.GAS
11	ITC-KA EN. MAMAK TOP.M. GR I-II-III	4,24	30,00	BIOGAS

12	ÇERKEZKÖY ENERJİ GR I	49,16	390,00	N.GAS
13	YILDIZ ENT. AĞAÇ (Kocaeli) GR I	6,18	40,00	N.GAS
14	ELBİSTAN B GR II	360,00		LIGNITE
15	CAM İŞ ELEKTRİK (Mersin) GR I	126,10	1008,00	N.GAS
16	ERE(Sugözü rg. Kızıldüz hes) GR I - II	15,43	7,90	HYDRO
17	EKİN (Başaran Hes) (Nazilli)	0,60	2,90	HYDRO
18	EROĞLU GİYİM (Çorlu) GR I	1,17	9,00	N.GAS
19	EKOLOJİK EN. (Kemerburgaz) GR I	0,98	6,00	BIOGAS
20	BEREKET EN.(Mentaş Reg) GR I - II	26,60		HYDRO
21	HAYAT TEM. VE SAĞLIK GR I - II	15,04	108,00	N.GAS
22	ANTALYA ENERJİ GR I - II - III - IV	34,92	245,00	N.GAS
23	SU ENERJİ (Balıkesir) GR I - II	4,60	4,20	HYDRO
24	ELBİSTAN B GR III	360,00	6528,00	LIGNITE
25	ŞIK MAKAS (Çorlu) GR I	1,58	13,00	N.GAS
26	BOZ ENERJİ GR I	8,73	70,00	N.GAS
27	ADANA ATIK SU ARITMA TESİSİ	0,80	6,00	BIOGAS
28	AMYLUM NIŞASTA (ADANA)	-6,20		FUELOIL
29	AMYLUM NIŞASTA (ADANA)	14,25	34,00	N.GAS
30	MOLU EN. Zamantı Bahçelik GR I - II	4,22	10,70	HYDRO
31	KASTAMONU ENTEGRE (Balıkesir) GR I	7,52	54,00	N.GAS

32	ÇIRAĞAN SARAYI(Bakanlık çıkardı)	-1,36		N.GAS
33	MENDERES ELEKTRİK GR I	7,95	56,00	GEOTHERMAL
34	BEREKET ENERJİ GÖKYAR HES 3 Grup	11,62	28,00	HYDRO
35	DENİZLİ ÇİMENTO(DÜZELTME)	0,45		N.GAS
36	SÖNMEZ ELEKTRİK (Çorlu) GR I - II	17,46	126,00	N.GAS
37	BARES IX GRUP	13,50	95,00	WIND
38	ELSE TEKSTİL (Çorlu) GR I - II	3,16	25,00	N.GAS
39	ENTEK (Köseköy) GR IV	47,62	931,00	N.GAS
40	MARMARA ELEKTRİK (Çorlu) GR I	8,73	63,00	N.GAS
41	MARMARA PAMUK (Çorlu) GR I	8,73	63,00	N.GAS
42	NUH ENERJİ-2 GR II	26,08	504,00	N.GAS
43	ŞANLIURFA GR I-II	51,80	0,00	HYDRO
44	AYDIN ÖRME GR-I	7,52	60,00	N.GAS
45	ALARKO ALTEK GR-III	21,89	420,00	N.GAS
46	KARACAÖREN-II	-0,80		HYDRO
47	SEYHAN I-II ilave	0,30		HYDRO
48	EKOTEN TEKSTİL GR-I	1,93	14,00	N.GAS
49	ERAK GİYİM GR-I	1,37	10,00	N.GAS
50	VAN-2	-24,70		
		MW	GWh/year	
	TOTAL	1.441,08	8.612,60	
	RENEWABLES (HYDRO-	76,37	169,60	

	WIND-BIOGAS)			
	LIGNITE	1.080,00	6.528,00	
	N.GAS	284,72	1.915,00	
CDM REGISTERED PROJECTS AND CAPACITY ADDITIONS TO EXISTING PLANTS ARE EXLUDED				