



**Project design document form  
(Version 10.1)**

*Complete this form in accordance with the instructions attached at the end of this form.*

**BASIC INFORMATION**

|                                                                   |                                                                                         |
|-------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| <b>Title of the project activity</b>                              | Bolu Landfill Gas to Energy Project, Turkey                                             |
| <b>Scale of the project activity</b>                              | <input type="checkbox"/> Large-scale<br><input checked="" type="checkbox"/> Small-scale |
| <b>Version number of the PDD</b>                                  | Version 12                                                                              |
| <b>Completion date of the PDD</b>                                 | 20/12/2017                                                                              |
| <b>Project participants</b>                                       | CEV Marmara Enerji Üretim San. ve Tic. Ltd. Şti.                                        |
| <b>Host Party</b>                                                 | Turkey                                                                                  |
| <b>Applied methodologies and standardized baselines</b>           | Small Scale Methodology AMS-III.G "Landfill Methane Recovery" version 09                |
| <b>Sectoral scopes linked to the applied methodologies</b>        | Sectoral Scope 13, Waste Handling and Disposal<br>Sectoral Scope 1, Energy Industries   |
| <b>Estimated amount of annual average GHG emission reductions</b> | 19,399 tCO <sub>2</sub> eq/year                                                         |

## SECTION A. Description of project activity

### A.1. Purpose and general description of project activity

>>

#### Document History:

the project activity has been registered as a Gold Standard Voluntary Emission Reduction (GS VER) Project Activity under with the ID GS764 and has been issuing GS VER credits since 12/08/2011. In line with the requirements of Gold Standard, the Project Participant wishes to renew the crediting period. The following sections of this PDD is based on the PDD version 4, with revised information on baseline, the evaluation of emission reductions and the monitoring plan. Also, revisions due to upgrade of methodology, tool or format version does apply.

#### Project Summary:

The Bolu Landfill Gas to Energy Project, developed and operated by CEV Marmara Enerji Üretim San. Ve Tic. Ltd. Şti. (hereafter referred to as the "project participant"), which is the regional office of the Korea-based company CEV Clean Energy & Vehicle. The proposed activity involves the collection and utilization of the LFG with an electricity component with a maximum installed capacity reaching 1.131 MWe. The location of the proposed activity is the Bolu landfill site, Turkey. The Bolu landfill is the main landfill of the Bolu city, which has more than 150,000 inhabitants. It started operations in 1992 and its official operation in 1994. The landfill currently holds more than 2 million tons of waste. In 2008, the disposed waste amount reached 42,926 tones, corresponding to 160-180 t/day on average. In the baseline scenario, the landfill has 8 venting pipes with the release of the LFG to the atmosphere without any flaring or utilization activity. The Project activity does not only aim at utilizing the already existing waste but it will also make use of the new waste, which will be stored until 2018. The Project has started with construction on 11.11.2010 and the operation has started as of 12.08.2011.

| Generation Units Installed                 | Total Installed Capacity | Commissioning Date |
|--------------------------------------------|--------------------------|--------------------|
| 1 generation unit of 1.131 MW <sub>e</sub> | 1.131 MW <sub>e</sub>    | 12.08.2011         |

The important milestones of the project activity could be summarized as follows.

| Date       | Milestone                                                                                                                           |
|------------|-------------------------------------------------------------------------------------------------------------------------------------|
| 20.01.2009 | Bolu Municipality organizes a tender for managing the waste on its landfill.                                                        |
| 09.02.2009 | The Project owner wins the tender and concludes a contract with the Municipality. Carbon consideration is included in the contract. |
| 17.02.2009 | The Municipality issues site access permit to the Project owner.                                                                    |
| 22.08.2009 | Technical experts from Korea make a site visit to carry out various gas tests and measurements.                                     |
| 06.03.2009 | An informative meeting is organized in Bolu to inform stakeholders about the Project.                                               |
| 15.04.2009 | Bolu Provincial Directorate of Environment and Forestry issues the "EIA is not required" document to the Project                    |
| 07.2009    | Feasibility study contract is signed                                                                                                |
| 17.06.2010 | Electricity generation license obtained.                                                                                            |
| 25.11.2010 | Equipment order is signed.                                                                                                          |
| 12.08.2011 | Start date of electricity generation                                                                                                |
| 12.08.2011 | Start of first crediting period                                                                                                     |

As of now the project activity is operational with a total of 1 gas engine with a total installed capacity of 1.131 MW. The activity generates approximately 3887 MWh/year of energy and

delivered to the national grid<sup>1</sup>. The Project activity have resulted in 44,180 tCO<sub>2</sub>eq actual emission reductions throughout the monitoring period between 12/08/2011 – 31/07/2016 and is estimated to reduce 135,790 tCO<sub>2</sub>eq emission reductions during the second crediting period.

**The expected social and environmental impacts of the proposed Project are:**

- It will promote integration of environmental infrastructure (e.g. after-care for landfill sites, etc.)
- The active LFG collection and flaring system will minimize off-site LFG migration and thus prevent potential explosions resulting from subsurface gas migration
- LFG flaring and combusting will dispose of the hazardous constituents safely. At the same time, it will reduce odor nuisance and health risks
- It will promote sustainable development by reducing greenhouse gas emissions and their impact on climate change

The Project Activity is expected to continue to provide contribution in the above areas also in the second crediting period.

**A.2. Location of project activity**

>>

Republic of Turkey

**A.3. Technologies/measures**

>>

The Project mainly consists of the following components: Landfill cover, LFG collection system, electricity generation unit and other controlling / measurement equipment.

**Landfill Cover:**

The waste will be covered with soil to block methane emissions to the atmosphere to provide sufficient containment and prevent air or rainwater to get into the waste. This cover will include clay, sand and soil layers for erosion control and plant growth.

**LFG Collection:**

The Project aims at efficiently collecting LFG generated at the landfill site by using vertical wells, which are easy to maintain. The technical properties of this system are as follows;

- Considering the inclination and landfill depth, there will be several units of vertical gas wells covering the landfill.
- The gas will go through: Vertical collection well → Horizontal collection pipe → Manifold Station → Connecting pipe → Header pipe → Pre-treatment facility.
- A modular piping network will connect groups of gas wells to a couple of manifolds. The manifolds are connected to the main pipe which delivers the gas to the extraction plant; and have the following properties:
- The manifold station will control collection pressure, flow rate and properties of each vertical well, prevent condensation in pipes and keeps balance of pressure between individual pipes with automatic gas pressure control valves.

---

<sup>1</sup> Based on the latest verified monitoring report, the project activity has generated 3887 MWh electricity within year 2015.

- The condensate in the horizontal LFG collection lines will be returned to the landfill by collecting condensates at dewatering traps at lower points of the LFG collection system.

The LFG will be drawn from the landfill with the help of one or more blower(s) and delivered to the flare or electricity generation unit. The system will be operated at a pressure slightly lower than the atmospheric pressure.

#### **Electricity Generation:**

The Project will generate electricity from LFG to cover its own electricity consumption and to feed the rest to the national power grid. The Project employs a single gas engines with a total capacity of 1.131MW. The generator is driven by a turbocharged gas engine with 16 cylinders. The installed gas engine is JGC 416 GS-L.L with a rated power of 1.131 MWe and electrical efficiency of 41.6%.

Electricity will be generated in container type engine generation system and transmitted to national grid after being consumed within the site. Each engine/alternator unit will contain a transformer, switch gear, synchronization system and system protection device. The mechanical energy will be converted into electrical power.

An electrical sub-station contains all suitable switching gear and metering equipment to facilitate a proper connection to the national grid network. Parallel to the gas production rate, engine unit will be operated depending on the need. Engine unit will be fitted with an internet-based remote monitoring and controlling feature which allows engine to be monitored, started and stopped remotely to be used for emergency cases or maintenance purposes.

#### **Project Instrumentation**

The Project will include sophisticated instrumentation that will allow for the accurate measurement of captured and destroyed LFG, including the following components:

- Flow meters will be installed to measure and monitor accurately the flow of the LFG through the system. The measurement points will be: the main delivery pipe, the pipe going to the flare and the pipes going to each of the generation units. These flow meters will also be able to accurately measure various parameters such as pressure, temperature and the gas contents (e.g. methane, carbon dioxide and oxygen). The measurement sampling intervals of the flow meters will agree with the UNFCCC requirements.
- The measurement system will be able to store the measured data electronically. The control and monitoring system will allow these readings to be obtained remotely.

#### **A.4. Parties and project participants**

| Parties involved | Project participants                             | Indicate if the Party involved wishes to be considered as project participant (Yes/No) |
|------------------|--------------------------------------------------|----------------------------------------------------------------------------------------|
| Turkey (host)    | CEV Marmara Enerji Üretim San. Ve Tic. Ltd. Şti. | No                                                                                     |

#### **A.5. Public funding of project activity**

>>

No public funding is obtained for the project.

#### **A.6. History of project activity**

>>

The project activity has been registered as a Gold Standard Voluntary Emission Reduction (GS VER) Project Activity under with the ID GS764 and has been issuing GS VER credits since

12/08/2011. In line with the requirements of Gold Standard, the Project Participant wishes to renew the crediting period. The following sections of this PDD is based on the PDD version 4, with revised information on baseline, the evaluation of emission reductions and the monitoring plan. Also, revisions due to upgrade of methodology, tool or format version does apply.

## A.7. Debundling

>>

The proposed project activity is not a de-bundled component of a larger project activity in line with the definitions and requirements of EB 54 Annex 13.

## SECTION B. Application of selected methodologies and standardized baselines

### B.1. Reference to methodologies and standardized baselines

>>

- AMS-III.G Small Scale Methodology for Landfill Methane Recovery version 09.0
- AMS-I.D Small Scale Methodology for “Grid connected renewable electricity generation” version 18.0

AMS-III.G version 09.0 also refers to the following methodology and tools where applicable:

- “Emissions from solid waste disposal sites” version 08
- “Tool to calculate baseline, project or leakage CO<sub>2</sub> emissions from electricity consumption” version 02

AMS-I.D version 18.0 also refers to the following methodology and tools where applicable:

- “Tool to calculate the emission factor for an electricity system” version 5.0

### B.2. Applicability of methodologies and standardized baselines

>>

The project activity involves several waste management technologies including LFG extraction, and utilization of the produced LFG for electricity generation. The applicability of the methodology and tools has been discussed in the guidance of the document “Gold Standard Procedures for the renewal of a crediting Period”. According to the referred document the Project participants shall update all sections of the project documentation using the latest approved baseline and monitoring methodology, applied in the original PDD of the registered GS project.

A side by side comparison of the used methodology and tools between the registered version and renewed versions are presented as follows:

Applicable methodology and tools for 1<sup>st</sup> and 2<sup>nd</sup> crediting periods.

| Methodology applied in the registered original PDD (applicable to 1 <sup>st</sup> crediting period) | Methodology applied in the revised PDD (applicable to 2 <sup>nd</sup> crediting period)            | Explanation                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AMS-III.G “Landfill Methane Recovery” version 6                                                     | AMS-III.G “Landfill Methane Recovery” version 9                                                    | The methodology is still applicable to the project activity.                                                                                                                        |
|                                                                                                     | AMS-I.D Small Scale Methodology for “Grid connected renewable electricity generation” version 18.0 | As per AMS-III.G project emissions from electricity consumption are determined as per the procedures described in the “Tool to calculate baseline, project and/or leakage emissions |

|                                                                                                               |                                                                                                                                                                                                                | from electricity consumption”, “AMS-I.D.: Grid connected renewable electricity generation”.                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tools applied in the registered original PDD (applicable to 1 <sup>st</sup> crediting period)                 | Tools applied in the revised PDD (applicable to 2 <sup>nd</sup> Crediting Period)                                                                                                                              | Explanation                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| “Tool for the demonstration and assessment of additionality” version 5.2                                      | “Gold Standard Procedures for the renewal of a crediting Period”, and;<br><br>“Tool to assess the validity of the original / current baseline and to update the baseline at the renewal of a crediting period” | According to “Gold Standard Procedures for the renewal of a crediting Period” the project participants have provided an assessment on the validity of the original baseline or update through and assessment carried out as per the “Tool to assess the validity of the original / current baseline and to update the baseline at the renewal of a crediting period”. In line with the requirements, there is no need to update the current baseline or additionality. |
| “Tool to determine project emissions from flaring gases containing methane” version 01.                       | n.a.                                                                                                                                                                                                           | The flare system has not been used during the first crediting period and will not be used during the second monitoring period. The PP will not claim any emission reduction credits due from flaring and therefore methodological tools related with flaring have been excluded from the PDD.                                                                                                                                                                          |
| “Tool to determine methane emission avoided from disposal of waste at a solid waste disposal site” version 04 | “Emissions from solid waste disposal sites” version 08                                                                                                                                                         | At EB 65, the title of the tool changed from “Tool to determine project emissions from flaring gases containing methane” to “Emissions from solid waste disposal sites”. The tool is applicable to the project activity.                                                                                                                                                                                                                                               |
| “Tool to calculate the emission factor for an electricity system” version 02                                  | “Tool to calculate the emission factor for an electricity system” version 05.0                                                                                                                                 | The tool is still applicable to the project activity.                                                                                                                                                                                                                                                                                                                                                                                                                  |
| “Tool to calculate the baseline, project and/or leakage emissions from electricity consumption” version 01    | “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” version 02                                                                                                         | There has been no change to the tool. The tool is still applicable to the project activity.                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                                               | “Assessment of the validity of the original / current baseline and update of the baseline at                                                                                                                   | Since the project is at the renewal process, “Assessment of the validity of                                                                                                                                                                                                                                                                                                                                                                                            |

|  |                                                     |                                                                                                                                           |
|--|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|  | the renewal of the crediting period" version 03.0.1 | the original / current baseline and update of the baseline at the renewal of the crediting period" is applicable to the project activity. |
|--|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|

The applicability of the methodologies and tools has been discussed below.

### Applicability of AMS-III.G

| Ref. | Applicability Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Justification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.   | Different options to utilize the recovered landfill gas as detailed in paragraph 3 of "AMS-III.H.: Methane recovery in wastewater treatment" (version 16.0) are eligible for use under this methodology. The relevant procedures in AMS-III.H. shall be followed in this regard.                                                                                                                                                                                                                                                                                                                        | Although AMS III.H is referred in the methodology, this should not automatically result in applicability of III.H to the project activity. AMS III.H describes methodology where recovery of biogas resulting from anaerobic decay of organic matter in wastewaters through introduction of an anaerobic treatment system <b><u>for wastewater and/or sludge treatment with biogas recovery</u></b> . The project activity does not include a waste water treatment service neither accepts wastewater or sludge. Therefore AMS III.H is not applicable and there is no ground to follow the methodology.<br>A more thorough explanation has been included in the PDD. |
| 2.   | Measures are limited to those that result in aggregate emission reductions of less than or equal to 60 kt CO <sub>2</sub> equivalent annually from all Type III components of the project activity.                                                                                                                                                                                                                                                                                                                                                                                                     | It is estimated that the proposed project activity will result in 15,121 tCO <sub>2</sub> eq emission reductions average annually from type III components.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 3.   | The proposed project activity does not reduce the amount of organic waste that would have been recycled in the absence of the project activity.                                                                                                                                                                                                                                                                                                                                                                                                                                                         | There are no recycling activities in the baseline scenario.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 4.   | This methodology is not applicable if the management of the solid waste disposal site (SWDS) in the project activity is deliberately changed in order to increase methane generation compared to the situation prior to the implementation of the project activity (e.g. other than to meet a technical or regulatory requirement). Such changes may include, for example, the addition of liquids to a SWDS, pre-treating waste to seed it with bacteria for the purpose of increasing the rate of anaerobic degradation of the SWDS or changing the shape of the SWDS to increase methane production. | No changes or intervene has been made deliberately to increase generation compared to situation prior to the implementation of the project activity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

The project activity comprises also renewable energy generation units supplying electricity to the Turkish national grid and therefore emission reductions from renewable electricity generation has been calculated based on AMS I.D. AMS-I.D version 18.0 is considered applicable to the project activity. This methodology is applicable to project activities that:

- a) Install a Greenfield plant;
- b) Involve a capacity addition;
- c) Involve a retrofit of (an) existing plant(s);
- d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or
- e) Involve a replacement of (an) existing plant(s)

The proposed project activity is a greenfield renewable energy power plant which is constructed and operated at a site where no renewable energy power plant was operated prior to the implementation, and therefore applicable to the proposed project activity.

#### **Applicability of “Emissions from solid waste disposal sites”:**

This tool provides procedures to calculate baseline, project or leakage emissions of the methane from solid waste disposed or prevented from disposal at a SWDS. The applicability of the tool “Emissions from solid waste disposal sites” is discussed as follows:

| Ref                                                                                  | Applicability Criteria                                                              | Justification                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The tool can be used to determine emissions for the following types of applications: |                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Application A</b>                                                                 | The CDM project activity mitigates methane emissions from a specific existing SWDS. | Since the methane emissions are mitigated by capturing and flaring or combusting the methane, “Application A” implies to the proposed project activity. The methane is generated from waste disposed in the past, including prior to the start of the CDM project activity. In line with the requirements, this tool is only applied for an <i>ex-ante</i> estimation of emissions in the CDM-PDD. The emissions will be monitored during the crediting period using the applicable approaches in the relevant methodologies. |
| <b>Application B</b>                                                                 | The CDM project activity avoids or involves the disposal of waste at a SWDS.        | Since the MSW is not treated with an alternative option such as composting or anaerobic digestion, “Application B” is not relevant to the proposed project activity.                                                                                                                                                                                                                                                                                                                                                          |

The tool “Emissions from solid waste disposal sites” is applicable since the proposed project activity mitigates methane emissions from a specific existing SWDS.

#### **Applicability of “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”:**

This tool provides procedures to estimate the baseline, project and/or leakage emissions associated with the consumption of electricity. The tool is only applicable if certain scenario applies to the sources of electricity consumption. Three possible scenarios have been discussed as follows:

| Ref | Applicability Criteria                                                                                                                                                                                                                                                                                                                                                                                 | Justification                                                                                                                                                     |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| a   | <b>Electricity consumption from the grid.</b> The electricity is purchased from the grid only. Either no captive power plant is installed at the site of electricity consumption or, if any on-site captive power plant exists, it is not operating or it can physically not provide electricity to the source of electricity consumption.                                                             | In the proposed project activity, the electricity is purchased from the grid only and no captive power plant is installed at the site of electricity consumption. |
| b   | <b>Electricity consumption from (an) off-grid fossil fuel fired captive power plant(s).</b> One or more fossil fuel fired captive power plants are installed at the site of electricity consumption source and supply the source with electricity. The captive power plant(s) is/are not connected to the electricity grid.                                                                            | Not relevant to the project activity since there are no captive power plants installed at the site of electricity consumption source.                             |
| c   | <b>Electricity consumption from the grid and (a) fossil fired captive power plant(s).</b> One or more fossil fuel fired captive power plants operate at the site of electricity consumption source. The captive power plant(s) is/are also connected to the electricity grid. Hence, the electricity consumption source can be provided with electricity from the captive power plant(s) and the grid. | Not relevant to the project activity since there are no captive power plants installed at the site of electricity consumption source.                             |

Based on the above arguments it can be concluded that the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” is applicable to the project activity.

#### **Applicability of “Tool to calculate the emission factor for an electricity system”:**

This methodological tool determines the CO<sub>2</sub> emission factor for displacement of electricity generated by power plants in an electricity system, by calculating the “combined margin” emission factor (CM) of the electricity system. This tool maybe applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity. As the proposed project activity supplies electricity to the national grid, the “Tool to calculate the emission factor for an electricity system” is applicable to the project activity.

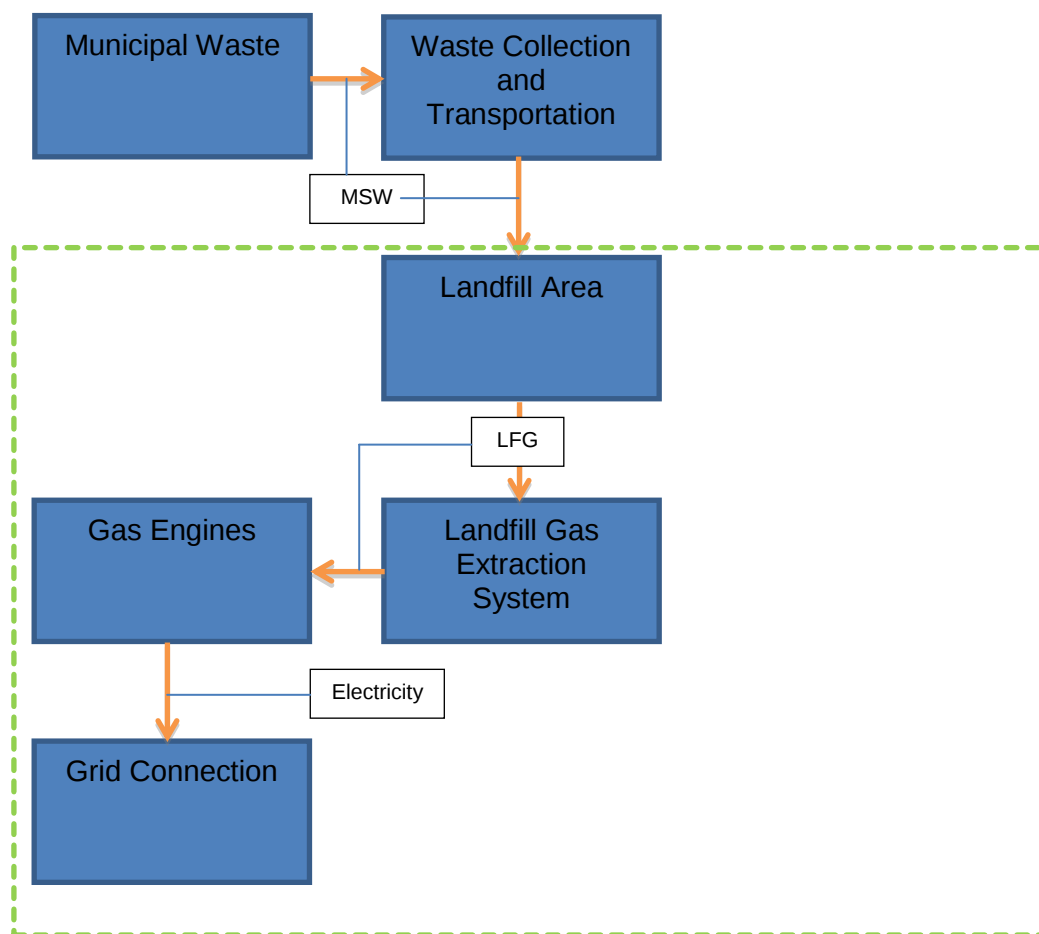
#### **B.3. Project boundary, sources and greenhouse gases (GHGs)**

>>

| Source            |                                                   | GHGs             | Included? | Justification/Explanation                                                                                                                                  |
|-------------------|---------------------------------------------------|------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Baseline scenario | Emissions from decomposition of waste at the SWDS | CO <sub>2</sub>  | No        | CO <sub>2</sub> emissions from the decomposition of organic waste are not accounted.                                                                       |
|                   |                                                   | CH <sub>4</sub>  | Yes       | The major source of emissions in the baseline                                                                                                              |
|                   |                                                   | N <sub>2</sub> O | No        | N <sub>2</sub> O emissions are small compared to CH <sub>4</sub> emissions from landfills. Exclusion of this gas is conservative.                          |
|                   |                                                   | ...              |           |                                                                                                                                                            |
|                   | Emissions from electricity generation             | CO <sub>2</sub>  | Yes       | Major emission source                                                                                                                                      |
|                   |                                                   | CH <sub>4</sub>  | No        | Excluded for simplification. This is conservative                                                                                                          |
|                   |                                                   | N <sub>2</sub> O | No        | Excluded for simplification. This is conservative                                                                                                          |
|                   |                                                   | ...              |           |                                                                                                                                                            |
| Project scenario  | Emissions from on-site electricity use            | CO <sub>2</sub>  | Yes       | This may be an important source of emissions in the project activity                                                                                       |
|                   |                                                   | CH <sub>4</sub>  | No        | Excluded for simplification. This emission source is assumed to be very small                                                                              |
|                   |                                                   | N <sub>2</sub> O | No        | Excluded for simplification. This emission source is assumed to be very small                                                                              |
|                   |                                                   | ...              |           |                                                                                                                                                            |
|                   | Direct emissions from the waste treatment process | CO <sub>2</sub>  | No        | CO <sub>2</sub> emissions are not considered since the project activity does not involve combustion of fossil based waste.                                 |
|                   |                                                   | CH <sub>4</sub>  | Yes       |                                                                                                                                                            |
|                   |                                                   | N <sub>2</sub> O | No        | N <sub>2</sub> O emissions are not considered since the project activity does not involve composting, incineration, syngas produced and RDF/SB combustion. |
|                   |                                                   | ...              |           |                                                                                                                                                            |

The project boundary is the physical, geographical site of the landfill where the gas is captured and used and all power plants connected physically to the electricity system that the proposed project power plant is connected to. The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available as required by the "Tool to calculate the emission factor for an electricity system". The electricity produced on-site will be delivered to the Turkish national grid<sup>2</sup>. The project activity does not involve other emission sources, which contribute by more than 1% emissions compared to the baseline emissions.

<sup>2</sup> Reference: Turkish National Grid Line Diagram <http://www.teias.gov.tr/4grupmd/atcharita.htm>



#### B.4. Establishment and description of baseline scenario

>>

The establishment and description of the baseline scenario is discussed the guidance of the document “Gold Standard Procedures for the renewal of a crediting Period”. According to the referred document the Project participants shall provide an assessment on the validity of the original baseline or update through and assessment carried out as per the “Tool to assess the validity of the original / current baseline and to update the baseline at the renewal of a crediting period”.

The “Tool to assess the validity of the original / current baseline and to update the baseline at the renewal of a crediting period” provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period, as required by paragraph 49 (a) of the modalities and procedures of the clean development mechanism.

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

##### **Step 1. Assess the validity of the current baseline for the next crediting period**

The procedures for the renewal of the crediting period of a registered CDM project activity approved by the CDM Executive Board require assessing the impact of new relevant national and/or sectoral policies and circumstances on the baseline.

The validity of the current baseline is assessed using the following Sub-steps:

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

An assessment on whether the current baseline complies with all relevant mandatory national and/or sectoral policies which have come into effect after the submission of the project activity for validation and if they are applicable at the time of requesting renewal of the crediting period must be provided.

A side by side comparison of relevant mandatory national and/or sectoral policies between the registered version and renewed versions are presented as follows:

| Relevant mandatory national and/or regional sectoral policies applicable to the registered original PDD (applicable to 1 <sup>st</sup> crediting period) | Relevant mandatory national and/or regional sectoral policies applicable to the revised PDD (applicable to 2 <sup>nd</sup> crediting period) | Explanation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| "Environmental Law" <sup>3</sup> [Law Number: 2827 Ratification Date: 09.08.1983 Enactment Date: 11.08.1983]                                             | "Environmental Law" [Law Number: 2827 Ratification Date: 09.08.1983 Enactment Date: 11.08.1983]                                              | This law outlines Turkey's environmental policy in general terms. It aims to protect the environment and Turkey's natural resources for the benefit of future generations. It includes the polluter pays principle. Regulations have been issued on air quality protection, water pollution control, environmental impact assessment, waste control, noise control, and the control of hazardous materials. The Environmental Law is one of the main legislations regarding the project activity as it relates to waste management activities.<br><br>The Law is still valid and applicable to the project activity. |
| "Electricity Market Law" <sup>4</sup> [Law Number: 4628 Enactment Date: 03.03.2001]                                                                      | "Electricity Market Law" [Law Number: 4628 Enactment Date: 03.03.2001]                                                                       | The purpose of this Law is to ensure the development of financially sound and transparent electricity market operating in a competitive environment under provisions of civil law and the delivery of                                                                                                                                                                                                                                                                                                                                                                                                                |

<sup>3</sup> Reference: The official web page of the Ministry of Environment and Forestry; <http://www2.cevreorman.gov.tr/yasa/k/2872.doc>

<sup>4</sup> Reference: The official web page of EMRA; <http://www.epdk.gov.tr/documents/10157/351a7a0c-52a9-40d5-8e12-f8e61afe7247>

|                                                                                                                                                                       |                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                       |                                                                                                                                                           | <p>sufficient, good quality, low cost and environment-friendly electricity to consumers and to ensure the autonomous regulation and supervision of this market. Among others, the scope of the law also covers generation of electricity. As one of the important aspects of the proposed project activity is electricity generation, the Electricity Market Law is one of the regulating legislations regarding the project activity.</p> <p>The Law is still valid and applicable to the project activity.</p>                                                                                                                                                                                                                           |
| <p>“Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy”<sup>5</sup> [Law Number: 5346; Enactment Date: 18.05.2005]</p> | <p>“Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy” [Law Number: 5346; Enactment Date: 18.05.2005]</p> | <p>The purpose of this Law is to expand the utilization of renewable energy resources for generating electrical energy, to benefit from these resources in secure, economic and qualified manner, to increase the diversification of energy resources, to reduce greenhouse gas emissions, to assess waste products, to protect the environment and to develop the related manufacturing sector for realizing these objectives. As one of the important aspects of the proposed project activity is electricity generation from renewable energy sources the “Renewable Energy Law” is one of the regulating legislations regarding the project activity.</p> <p>The Regulation is still valid and applicable to the project activity.</p> |
| <p>“Regulation on Solid Waste Management/Control”<sup>6</sup> [Regulation number: 20814]</p>                                                                          | <p>“Regulation on Solid Waste Management/Control” [Regulation number: 20814]</p>                                                                          | <p>The regulation mentions the obligation of the party undertaking the solid waste</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

<sup>5</sup> Reference: The official web page of EMRA; <http://www.epdk.gov.tr/documents/10157/4b360128-53aa-4174-8104-a6c10434ac9c>

<sup>6</sup> Reference: The official web page of the Ministry of Environment and Forestry; <http://www.cygm.gov.tr/CYGM/Files/mevzuat/yonetmelik/kaky.doc>

|                             |                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Enactment Date: 14/03/1991] | Enactment Date: 14/03/1991]                                                                                               | <p>management to respect the human health and welfare of the society. However, it doesn't prescribe any technology to achieve this (article 5 and article 27) nor does it mention any sanction or penalty if solid waste management projects are implemented otherwise. As such the regulation is instructive on the issue of solid waste management rather than normative. It does not mandate the destruction of methane. Although semi-controlled release of landfill gas to the air (a.k.a. 'venting') occurs at several landfills, the law and regulations does not mandate the destruction of methane.</p> <p>The Regulation is still valid and applicable to the project activity.</p>                                                      |
| n.a.                        | <p>Regulation on Managed Waste Land Filling <sup>7</sup><br/>[Regulation number 27533<br/>Enactment Date: 26.03.2010]</p> | <p>The newly enacted regulation (26.03.2010) on sanitary waste landfilling aims to (1) minimize the impact of leachate and LFG on soil, air and water quality; (2) regulate waste acceptance to the landfill area; and (3) provide procedures for opening and closure of a landfill area.</p> <p>In summary: although solid waste management regulation is being implemented in Turkey, it is neither compiled to nor enforced. The regulations don't define sanctions or penalties. In practice, none of the landfill areas comply with these regulations, as indicated in statistics on landfill areas. Most landfill areas in Turkey are actually 'waste dumps' where no waste management (including covering of the landfill) implemented.</p> |

<sup>7</sup> Reference: The official web page of the Ministry of Environment and Forestry;  
[http://www.cygm.gov.tr/CYGM/Files/mevzuat/yonetmelik/Duzenli\\_Depolama.doc](http://www.cygm.gov.tr/CYGM/Files/mevzuat/yonetmelik/Duzenli_Depolama.doc)

|  |  |                                                                                                                                                                                                                                            |
|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  |  | This regulation was enacted after the registration of the original PDD, however does not include any enforcement towards destruction or utilization of the LFG that would have an impact on the baseline scenario of the project activity. |
|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

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

### **Step 1.2: Assess the impact of circumstances**

In accordance with the “Tool to assess the validity of the original / current baseline and to update the baseline at the renewal of a crediting period”, the impact of circumstances existing at the time of requesting renewal of the crediting period on the current baseline emissions should be assessed, without reassessing the baseline scenario.

At the time of registration, the baseline scenario has been defined as;

- P2: Generation of grid-connected power, which would have otherwise been generated by the operation of already existing grid-connected power plants and by the addition of new generation sources; and,
- LFG2: Maintaining the status quo, where LFG is emitted into the atmosphere without conducting any management, collection or utilization on the landfill site.

In other words; “Disposal of the waste at a landfill without the capture of landfill gas. The electricity is generated by existing grid connected power plants”.

There has been no identified circumstance that has an impact on the validity of the baseline scenario.

There are 2,950 municipalities in Turkey, out of which 2,879 have a municipal waste service, covering 83% of the total population of Turkey. The amount of waste collected in 2010 was 25,277,000 tonnes. Out of 2,879 municipalities providing landfill services, only 52 of these landfills are classified as “controlled landfills”. From these controlled landfills only 5 have a composting plant and 2 of them have an incineration plant for medical waste.

|                                                                           |                                       | 2006    | 2008    | 2010    |
|---------------------------------------------------------------------------|---------------------------------------|---------|---------|---------|
| # of municipalities receiving solid waste services                        |                                       | 3,115   | 3,129   | 2,879   |
| Rate of population receiving solid waste services in total population (%) |                                       | 81      | 82      | 83      |
| Solid waste collected (1000 t/year)                                       |                                       | 25,280  | 24,361  | 25,277  |
| Solid waste per capita (kg/capita-day)                                    |                                       | 1.21    | 1.15    | 1.14    |
| <b>Solid waste disposal plants</b>                                        |                                       |         |         |         |
| Controlled Landfill                                                       | Number                                | 22      | 37      | 52      |
|                                                                           | Capacity                              | 376,974 | 390,478 | 423,142 |
|                                                                           | Solid waste disposed of (1000 t/year) | 9,942   | 10,037  | 14,377  |
| Composting                                                                | Number                                | 4       | 4       | 5       |

|                                                                              |                                                  |     |     |     |
|------------------------------------------------------------------------------|--------------------------------------------------|-----|-----|-----|
| Incineration plant                                                           | Capacity                                         | 605 | 551 | 556 |
|                                                                              | Waste received by composting plant (1000 t/year) | 268 | 276 | 216 |
|                                                                              | Number                                           | 3   | 2   | 2   |
|                                                                              | Capacity                                         | 44  | 44  | 44  |
|                                                                              | Medical waste incinerated (1000 t/year)          | 6   | 8   | 6   |
| Rate of population served by solid waste disposal plants in total population |                                                  | 34  | 39  | 47  |

From the above it can be concluded that treatment of waste in controlled landfills is not common practice.

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

This sub step is not applicable to the proposed project activity since the baseline scenario is identified as “Disposal of the waste at a landfill without the capture of landfill gas and the electricity generated by existing grid connected power plants” at the time of validation.

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

In accordance with the “Tool to assess the validity of the original / current baseline and to update the baseline at the renewal of a crediting period”, an assessment on whether data and parameters that were determined at the start of the crediting period and not monitored during the crediting period are still valid or whether they should be updated should be conducted.

Updates should undertake the following cases:

- Where IPCC default values are used, the values should be updated if any new default values have been adopted and published by the IPCC.
- Where emission factors, values or emission benchmarks are used and determined only once for the crediting period, they should be updated.

Under the registered PDD the Global Warming Potential ( $GWP_{CH_4}$ ) has been considered as 21 for ex-ante calculations, which was applicable during the first commitment period of Kyoto. The  $GWP_{CH_4}$  value has been revised to 25 for the second commitment period of Kyoto. Therefore, the baseline emission reductions have been revised accordingly.

In line with the requirements of the “Tool to assess the validity of the original / current baseline and to update the baseline at the renewal of a crediting period”, also the emission factor of calculated ex-ante and fixed for the first crediting period have been revised accordingly.

**Step 2. Update the current baseline and the data and parameters**

**Step2.1 Update the current baseline**

In line with the requirements of “Tool to assess the validity of the original / current baseline and to update the baseline at the renewal of a crediting period”, there is no need to update the current baseline. The identified baseline for the second crediting period is “Disposal of the waste at a landfill without the capture of landfill gas. The electricity is generated by existing grid connected power plants.”.

**Step2.1 Update the data and parameters.**

In line with the requirements of “Tool to assess the validity of the original / current baseline and to update the baseline at the renewal of a crediting period”, data and parameters that are not monitored during the crediting period have been updated for the second crediting period.

**B.5. Demonstration of additionality**

&gt;&gt;

The additionality of the project activity has been demonstrated and validated under the registered original PDD at the start of first crediting period. The additionality has been demonstrated based on barrier analysis. All values, data and information are valid at the time of investment decision. The demonstration of the additionality under the original PDD has been summarized as follows;

**Step 1: Identification of alternatives to the project activity consistent with current laws and regulations**

Realistic and credible alternatives to the project activity(s) are defined through the following Sub-steps;

**Sub-step 1a: Define alternatives to the project activity:**

The following realistic and credible alternatives are identified that are available to the project participants or similar project developers that provide outputs or services comparable with the proposed Project activity;

**Alternatives to the Landfill Gas Component:**

- **LFG1:** The Project activity (capture of landfill gas and its flaring) undertaken without being registered as a VER project activity. This scenario assumes that the Project owner will realize the Project activity even in the lack of revenues stemming from Project's emission reductions. In this scenario, the Project would operate a LFG facility which would capture and reduce methane emissions from the landfill site, without any VER sales. The inclusion of this scenario is required under ACM0001.
- **LFG2:** Atmospheric release of the landfill gas. This scenario corresponds to the current practice on the landfill site by maintaining the status quo, where methane is directly emitted to the atmosphere, without any type of collection, recovery, processing or destruction. The inclusion of this scenario is required under ACM0001.
- **LFG3:** The Project activity is realized using the VER revenues. This scenario corresponds to the Project activity, where the Project only becomes feasible with the use of VERs. Under this alternative, the Project will partially capture the LFG emissions from the landfill site and use it for power generation. The rest will be flared to minimize GHG emissions and safety risks, which were present in the scenario LFG2.

**Alternatives to the Power Generation Component:**

- **P1:** Power generated from landfill gas undertaken without being registered as VER project activity. This scenario assumes that the Project owner would realize the Project activity even in the lack of VER revenues and generate power from the collected LFG to feed it to the national grid. The inclusion of this scenario is required under ACM0001.
- **P2:** Existing and/or new grid-connected power plants. This scenario corresponds to the current practice for electricity generation by maintaining the status quo. Under this scenario,

the Project will not be undertaken, the existing and new power plants will generate all the power and the national electricity will remain unaffected. The inclusion of this scenario is required under ACM0001.

- **P3:** The Project activity is realized using the VER revenues. This scenario corresponds to the Project activity, where the Project only becomes feasible with the use of VERs. Under this alternative, the Project will generate power and feed it to the national grid, thereby replacing electricity partially generated by thermal power plants.

The alternative scenario is defined as the combination of both Landfill Gas and Power Generation components, since the Project has both components. Realistic and credible alternative scenarios to the Project activity are identified.

### **Sub-step 1b: Consistency with mandatory laws and regulations:**

The Environment Law does not require a tipping fee for accepting municipal solid waste at the sanitary solid waste disposal sites. There is an “environment tax” and another “waste water surcharge” collected by municipalities from households for waste management activities. The collected taxes are mostly used for maintenance of city parks and gardens and managing waste. Municipalities generally subsidize waste collection and dumping activities from the municipal budgets. Under these circumstances, municipalities or households are not familiar with additional costs of proper waste management. Therefore, waste management is one of the everlasting problems of municipalities and is an unattractive field for private companies.

The “Metropolitan Municipalities Law” sets out the legal framework of solid waste management in metropolises. Accordingly, the Gaziantep Metropolitan Municipality is responsible for the collection, management and proper disposal of municipal waste and shall build and operate the necessary facilities or let 3rd parties do so. In agreement with this law, a tender shall be organized for certain types of goods and services the municipalities purchase. Therefore, the Municipality has organized a tender and the Project owner has won it by offering landfill site management with *no* cost to the Municipality.

The Project is a voluntary investment managed by a special contract between the Gaziantep Metropolitan Municipality and the Project owner. Therefore, the Project has to be in compliance with all relevant legislation. The Project is licensed and permitted by public authorities. All scenarios are valid according to national laws, regulations and communiqués.

For scenario LFG2, the most relevant regulation governing landfill sites is the “Control of Solid Waste Regulation”. According to its Article 27, landfill sites are *not* enforced to capture and/or to destroy LFG emissions. This regulation does not set any obligations or penalties but only suggests the reduction of GHG emissions. Therefore, this alternative reflects current practice and agrees with current laws and regulations.

For scenario P2, maintaining the status quo, without the realization of the Project activity, agrees with the relevant legislation.

As a result, it is shown that these realistic and credible alternative scenarios to the Project activity follow mandatory legislation

### **Step 2: Investment analysis**

According to the Additionality Tool, this step involves the determination whether the proposed Project activity is not:

- (a) The most economically or financially attractive; or

(b) Economically or financially feasible, without the revenue from the sale of emission reductions.

### Sub-step 2a: Determine appropriate analysis method

According to the Additionality Tool, one of three options must be selected:

- I. Simple cost analysis (where no benefits other than CDM income exist for the project)
- II. Investment comparison analysis (where comparable alternatives to the project exist)
- III. Benchmark analysis

Because the Project will receive additional revenues other than VERs from electricity sales, and since there are no comparable investment alternatives to the proposed project, option (iii) benchmark analysis is selected. In this case, the most likely alternative to the Project would be simply not to install flaring and electricity generation equipment on the landfill site.

### Sub-step 2b: Option III. Apply benchmark analysis

The likelihood of the development of this Project will be determined by analyzing its **Project IRR** based on the scenarios with and without the sales of carbon credits.

IRR is a measure of investment profitability. According to the Additionality Tool, the assessment of the financial performance of the Project with and without carbon revenues shall be carried out according to benchmarks. The chosen benchmark for the Project is the discount rate. This means that the Project would be attractive only if the IRR exceeds the discount rate. The "Guidelines on the Assessment of Investment Analysis" v.3, EB51 ("Guidelines") has been followed.

### Sub-step 2c: Calculation and comparison of financial indicators

The following parameters are used for calculations;

| Parameter          | Unit      | Figure | Sorce             | Jusitfication                                                                               |
|--------------------|-----------|--------|-------------------|---------------------------------------------------------------------------------------------|
| Investment Horizon | Years     | 28     | Assumption        | The agreement between the Municipality of Bolu and the project owner is valid for 28 years. |
| Corporate Tax      | %         | 20     | www.invest.gov.tr | This is the financial corporate tax rate in the host country.                               |
| Discount rate      | %         | 12.9   | WACC calculations | Pre-tax WACC is suggested by the guidelines                                                 |
| Electricity price  | €cent/kWh | 6.1    | Assumption        | Historical average market price                                                             |
| Initial investment | 1000 Euro | 1,234  | Feasibility Study | This figure is adjusted for 1.1 MW capacity used in the investment                          |

|                               |            |     |                   |                                                |
|-------------------------------|------------|-----|-------------------|------------------------------------------------|
|                               |            |     |                   | decision.                                      |
| Operation & maintenance costs | 1000 Euros | 175 | Feasibility Study | This figure is used in the investment decision |

According to the agreement between the Municipality and the Project owner, the Project owner does not receive any revenues from the Municipality.

### Scenario LFG1 & P1: Project without Carbon Credits

Since the Project involves no disposal fee paid by the Municipality, its revenue sources are limited to electricity sales (when VERs are not considered). Based on these data, the Project's IRR is calculated for the case where the Project would have been realized without carbon revenues. This corresponds to the scenario combination LFG1 & P1. The results are the following;

| Indicator | Unit | Source       | IRR      | Benchmark | Result     |
|-----------|------|--------------|----------|-----------|------------|
| Results   | %    | Calculations | Negative | 12.9%     | Unfeasible |

In this scenario, the Project IRR calculations are carried out *without* considering carbon credit sales. The calculations conservatively assume that the revenues from electricity sales are obtained without delay (which may not reflect the actual case), that there are no major unforeseen malfunctions or other unforeseen expenses, and that the LFG generation occurs as expected.

The results indicate that without carbon credits, the Project is not feasible. Under these circumstances, the Project would not be attractive for a private investor.

### Proposed Project Activity: Project with Carbon Credits

The proposed Project is realized with the additional inflow of revenues from carbon credit sales, the Project's profitability improves considerably;

| Indicator | Unit | Source       | IRR   | Benchmark | Result   |
|-----------|------|--------------|-------|-----------|----------|
| Results   | %    | Calculations | 22.1% | 12.9%     | Feasible |

In this case, it is observed that the IRR improves considerably with the inclusion of the carbon credit component and thus exceed the benchmarks. The Project IRR reaches investment levels because it exceeds the benchmarks.

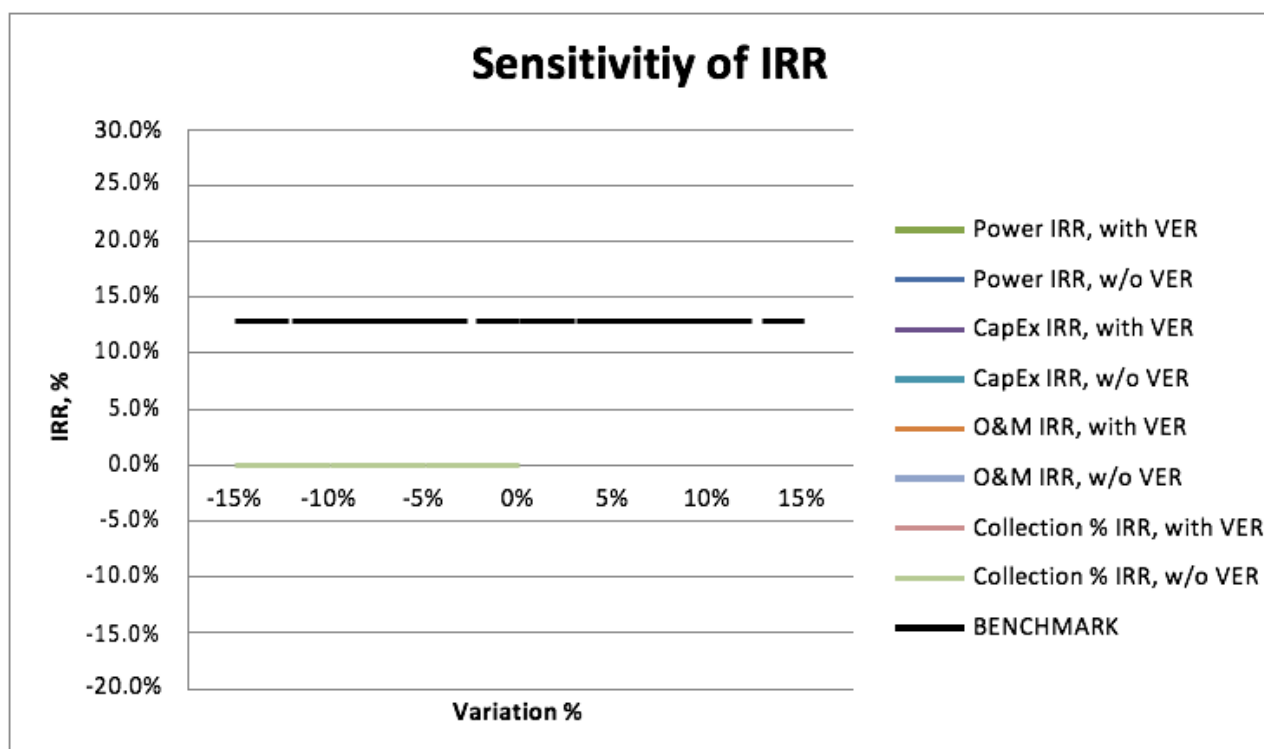
Outcome of Sub-step 2c: Financial indicators are calculated and compared.

### Sub-step 2d: Sensitivity analysis

The purpose of the sensitivity analysis is to check how much the Project's financial performance depends on main variables of the investment analysis. The Additionality Tool requires including those financial parameters in the analysis, that have 20% or more impact on the results. The following parameters are identified which satisfy this condition;

- Electricity Prices (impact on revenues)
- Capital expenditures (impact on costs)
- LFG Collection ratio (impact on revenues)
- Operation and Maintenance Costs (impact on costs)

Both parameters are changed in the negative and positive directions to check how far they affect the Project profitability. The Additionality Tool suggests to at least cover an interval from -10% to +10% when varying the chosen input parameters. To assess the behavior of the Project feasibility to a wider range of variations, an interval from -15% to +15% is chosen, with steps of 5% change. The results are as the following;



The figure above depicts the reaction of the financial viability of the Project to the most important changing input parameters. Accordingly, the following conclusions can be made:

- Impact of electricity prices on Project IRR ("Power IRR"):** There are two Power IRR lines in the Figure above, the lower one representing the baseline scenario (LFG1&P1) without carbon revenues, and the upper line representing the proposed Project activity, including carbon revenues. The figure shows that the Project is quite sensitive to electricity prices. It furthermore shows that it is highly unlikely that the Project becomes feasible, even if the electricity prices would pick up significantly.
- Impact of capital expenditures on Project IRR ("Capex IRR"):** The figure shows that as Capex increases the IRR decreases (and vice versa) and that it is unlikely the Project becoming feasible even if Capex would drop at significant amounts.
- Impact of LFG collection ratio ("Collection %IRR"):** The figure shows that the collection ratio of LFG significantly influences the IRR. As the collection ratio increases the irr also increases considerably (and vice versa), but does not reach investment levels.
- Impact of Operation and Maintenance Costs ("O&M IRR"):** The figure shows that as O&M costs increases the IRR decreases (and vice versa) and that it is unlikely the Project becoming feasible even if O&M costs would drop at significant levels.

As the feasibility study of the project has been prepared for a capacity of 0.64 MW, this alternative of building 0.64 MW has also been considered in the sensitivity analysis. In this case the IRR of the Project is still under the benchmark, even when parameters are varied by an interval from -15% to +15%. This scenario is not realistic, since the Project is already in operation with 1.1 MW.

The calculations in the PDD are based on AMS-III.G, the UNFCCC “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”; v.4, and the “Tool to determine project emissions from flaring gases containing methane”; EB28, Annex 13. Therefore, the LFG amounts are different than in the Feasibility Study of the Project owner. The compatibility of CDM and Feasibility Study are checked to ensure that the results in the PDD are applicable. The investment analysis based on Feasibility Study shows that the calculations and IRR values in the PDD are conservative.

**Conclusion:** It is seen that in case the parameters change in positive direction, the Project does not exceed the benchmark threshold.

Outcome of Sub-step 2d: The sensitivity of financial indicators to input parameters is assessed.

Outcome of Step 2: The sensitivity analysis clearly demonstrates that the proposed Project activity is unlikely to be most financially/economically attractive and LFG1 & P1 is not a plausible alternative. According to the Additionality Tool, this satisfies the requirement of Step 2.

### Step 3: Barrier analysis

This step is skipped.

### Demonstration of additionality

Due to some time constraints, macroeconomic conditions and ongoing talks with the Gaziantep Metropolitan Municipality, there have been some delays in the development of carbon project. Since banks refused to fund the Project, the Project owner had to devote its scarce resources to meeting its deadlines. However, the Project has been designed and planned from the beginning by considering carbon credits. The feasibility study of the Project activity clearly suggests that emission reductions and carbon revenues have been an integral part of the Project from the start. The project owner has considered carbon revenues earlier than project implementation, demonstrating early consideration of VER revenues.

| Date       | Action                                                                                          |
|------------|-------------------------------------------------------------------------------------------------|
| 20.01.2009 | Bolu Municipality organizes a tender for managing the waste on its landfill.                    |
| 09.02.2009 | The Project owner wins the tender and concludes a contract with the Municipality.               |
| 17.02.2009 | The Municipality issues site access permit to the Project owner.                                |
| 22.08.2009 | Technical experts from Korea make a site visit to carry out various gas tests and measurements. |
| 07.2009    | Feasibility study contract                                                                      |
| 17.06.2010 | Electricity generation license obtained.                                                        |
| 11.11.2010 | Mobilisation start date                                                                         |
| 25.11.2010 | Equipment order signed                                                                          |
| 11.11.2010 | Start day of site preparations                                                                  |
| 26.08.2011 | Start date of electricity generation                                                            |

The identified barriers and results of the investment analysis are sufficient grounds for demonstration of additionality since they prevent potential project proponents from carrying out the proposed project activity undertaken without being registered as a VER project activity. The waste-to-energy concept constitutes a very limited portion of the Turkish electricity market and the Project Activity goes beyond of “business as usual” scenario and cannot be considered as a common practice.

The regulations in the host country regarding landfill gas capture or destruction are not mandatory and there is a distinct lack of policies promoting efficient use of LFG (e.g. production of renewable

energy, processing of organic waste etc.). Landfill site operators are not required to capture or destroy LFG; therefore, the Project would have reduced GHG emissions compared to the case where it would not be realized at all. As a result, the Project is additional.

Outcome of Sub-step 4b: Other similar options are discussed and the additionality of the Project is demonstrated.

## B.6. Estimation of emission reductions

### B.6.1. Explanation of methodological choices

>>

The emission reductions resulting from the proposed project activity are calculated according to AMS-III.G and AMS-I.D.

According to the referred methodology the emission reductions are calculated with the following equation:

$$ER_y = BE_y - PE_y$$

Where:

|        |                                                         |
|--------|---------------------------------------------------------|
| $ER_y$ | Emission reductions in year y (tCO <sub>2</sub> e/year) |
| $BE_y$ | Baseline emissions in year y (tCO <sub>2</sub> e/year)  |
| $PE_y$ | Project emissions in year y (tCO <sub>2</sub> e/year)   |

### Baseline emissions

In accordance with the applicable methodologies the baseline is estimated as follows:

$$BE_y = (\eta_{pj} \cdot BE_{CH_4,SWDS,y} - (1 - OX) \cdot F_{CH_4,BL,y} \cdot GWP_{CH_4}) + BE_{electricity,y}$$

Where:

|                      |                                                                                                                                                                                     |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $BE_{CH_4,SWDS,y}$   | Methane emission potential of a solid waste disposal site (in tCO <sub>2</sub> e/year), calculated using the methodological tool “Emissions from solid waste disposal sites”.       |
| OX                   | Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste)(dimensionless). A default value of 0.1 may be used. |
| $\eta_{pj}$          | Efficiency of the LFG capture system that will be installed in the project activity. It is used for ex ante estimation only. A default value of 50 percent may be used.             |
| $F_{CH_4,BL,y}$      | Methane emissions that would be captured and destroyed to comply with national or local safety requirements or legal regulations in the year y (tCH <sub>4</sub> ).                 |
| $GWP_{CH_4}$         | Global Warming Potential for methane                                                                                                                                                |
| $BE_{electricity,y}$ | Baseline emissions from electricity generation in power plants that are displaced due to project activity.                                                                          |

### Actual Emission Reductions

In line with the requirements of AMS-III.G, the actual emission reduction achieved by the project activity during the crediting period will be calculated using the amount of methane recovered and destroyed/gainfully used by the project activity, calculated as:

$$ER_{y,calculated} = ((1 - OX) \cdot (F_{CH_4,PJ,y} - F_{CH_4,BL,y}) \cdot GWP_{CH_4}) + BE_{electricity,y} - PE_y$$

Where:

$F_{CH_4,PJ,y}$  Methane captured and destroyed/gainfully used by the project activity in the year y (tCH<sub>4</sub>)

Since there are no legal requirements in Turkey to destroy methane and the LFG was not captured prior to the proposed project activity. Therefore:

$$F_{CH_4,BL,y}=0$$

In accordance with applicable methodology,  $F_{CH_4,PJ,y}$  will be calculated based on the amount of monitored electricity generation, without monitoring methane flow and concentration as follows:

$$F_{CH_4,pj,y} = \frac{EG_y \times 3600}{NCV_{CH_4} \times EE_y} \times D_{CH_4} \times GWP_{CH_4}$$

Where:

$EG_y$  Electricity generation in year y (MWh)  
 3600 Conversion factor (1MWh=3600MJ)  
 $D_{CH_4,y}$  Density of methane at the temperature and pressure of the landfill gas in year y (tonnes/m<sup>3</sup>). If  $LFG_{i,y}$  is reported at normal conditions of temperature and pressure, the density of methane is also determined at normal conditions.  
 $NCV_{CH_4}$  NCV of methane (MJ/Nm<sup>3</sup>). A default value : 35.9 MJ/Nm<sup>3</sup> is used.  
 $EE_y$  Energy Conversion Efficiency of the project equipment determined as 40% default.

In accordance with AMS-I.D baseline missions include only CO<sub>2</sub> emissions from electricity generation in 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:

$$BE_{y,electricity} = EG_{PJ} \times EF_{grid,y}$$

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)  
 $EF_{grid,y}$  Combined margin CO<sub>2</sub> emission factor of grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO<sub>2</sub>/MWh)

In line with the requirements of AMS-I.D;

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

Where:

$EG_{PJ,facility,y}$  Quantity of net electricity generation that is produced by the project plant to the grid in year y (MWh)

### Determination of the emission factor for electricity generation ( $EF_{grid,y}$ )

The emission factor for the electricity generation  $EF_{grid,y}$  will be determined in accordance with Scenario A (Electricity consumption from the grid) as defined under the "Tool to calculate baseline, project and leakage emissions from electricity consumption" version 1 and as described under section B.2 "Applicability of the tool" of the PDD.

According to the tool, the project participants can either calculate the combined margin emission factor of the applicable electricity system (Option A1), or could use conservative default values (Option A2). The project participant chooses Option A1, which the combined margin emission factor of the applicable electricity system will be calculated using the procedures in the “Tool to calculate the emission factor for an electricity system”, ( $EF_{grid,y}=EF_{grid,CM,y}$ ).

This tool provides the following steps to calculate combined margin (CM) emission factor:

- STEP (1): Identify the relevant electricity system;
- STEP (2): Choose whether to include off-grid power plants in the project electricity system (optional);
- STEP (3): Select a method to determine the operating margin (OM);
- STEP (4): Calculate the operating margin emission factor according to the selected method;
- STEP (5): Calculate the build margin (BM) emission factor;
- STEP (6): Calculate the combined margin (CM) emission factor.

### ***STEP 1: Identify the relevant electricity system***

According to the applicable methodology, the relevant project electricity system has to be identified. A project electricity system is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity and that can be dispatched without significant transmission constraints.

Similarly, a **connected electricity system**, e.g. national or international, is defined as an electricity system that is connected by transmission lines to the project electricity system. Power plants within the connected electricity system can be dispatched without significant transmission constraints but transmission to the project electricity system has significant transmission constraint.

The transmission lines in Turkey are operated by TEİAŞ (Turkish Electricity Transmission CO), which is a state owned company. The grid is 48.871 km long and constitutes of 632 transformer stations with a total transformer capacity of 108,378 MVA and 10 interconnections to neighbour countries<sup>8</sup>. The interconnected grid system is operated continuously and there are no electricity price differences throughout the regions<sup>9</sup>. Therefore the relevant electric power system is defined as the national grid system of Turkey.

### ***STEP 2: Choose whether to include off-grid power plants in the project electricity system (optional)***

According to the applicable tool, Project Participants may choose between the following two options to calculate the operating margin and build margin emission factor:

**Option I:** Only grid power plants are included in the calculation.

**Option II:** Both grid power plants and off-grid power plants are included in the calculation.

The Project Participant chooses Option I and therefore only grid power plants are included in the calculation.

### ***STEP 3: Select a method to determine the operating margin (OM)***

According to the applicable methodological tool, the operating margin emission factor ( $EF_{grid, OM, y}$ ) is based on one of the following methods:

- a) Simple OM; or

<sup>8</sup> Reference: [http://www.turek2012.info/pdf/sunumlar/ercument\\_ozdemirci.pdf](http://www.turek2012.info/pdf/sunumlar/ercument_ozdemirci.pdf)

<sup>9</sup> Reference: TEİAŞ (Turkish Electricity Transmission Co) official webpage <http://www.teias.gov.tr/>

- b) Simple adjusted OM; or
- c) Dispatch data analysis OM; or
- d) Average OM.

The project participant has selected option (a) Simple OM method for calculation of the operating margin emission factor. This choice is applicable since

A) Only annual data from each power plant on power generation and fuel type and consumption is available (if available) low-cost/must-run resources constitute less than 50% of total grid generation in average of five most recent years. The low-cost/must-run resources include hydro, geothermal, wind, low-cost biomass, nuclear, and solar power generation.

The total share of renewable energy resources add up to an average of 26.6% over the five most recent year, which is below the threshold for applicability of the simple OM method. There is no indication that coal is used as a must-run and no nuclear energy plants are located in Turkey. Therefore the requirements for the use of the Simple OM calculations are satisfied.

**Table 1.** Annual development of Turkey's electricity generation by share of Primary energy resources<sup>10</sup>

| Years                                     | Total Thermal [GWh] | Total Renewable (hydro, geothermal, wind, low-cost biomass, and solar power) [GWh] | Total [GWh] | Average Share of LCMR |
|-------------------------------------------|---------------------|------------------------------------------------------------------------------------|-------------|-----------------------|
| 2011                                      | 171,638.3           | 57,756.8                                                                           | 229,395.1   | %25.1                 |
| 2012                                      | 174,871.7           | 64,625.1                                                                           | 239,496.8   | %26.9                 |
| 2013                                      | 171,812.5           | 68,341.5                                                                           | 240,154.0   | %28.4                 |
| 2014                                      | 200,416.6           | 51,546.2                                                                           | 251,962.8   | %20.4                 |
| 2015                                      | 179,366.4           | 82,416.9                                                                           | 261,783.3   | %31.4                 |
| <b>Average Share of LCMR<sup>11</sup></b> |                     |                                                                                    |             | <b>%26.44</b>         |

For the simple OM, the emission factor can be calculated using either of the two following data vintages:

- **Ex ante option:** If the *ex ante* option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required. For grid power plants a 3-year generation-weighted average, based on the most recent data available at the time of submission of the VER-PDD to the DOE for validation.

<sup>10</sup>

Reference:

<https://teias.gov.tr/sites/default/files/2017-06/Grafik%20III.I%20-%202015%20Y%C4%B1%C4%B1%20T%C3%BCrkiye%20Elektrik%20Enerjisi%20C3%9Cretiminin%20Kaynaklara%20G%C3%B6re%20Da%C4%9F%C4%B1%C4%B1m%C4%B1%20.docx>

<sup>11</sup> Calculated in accordance with Approach 1 of par. 37 of Tool to calculate the emission factor for an electricity system

- **Ex post option:** If the *ex post* option is chosen, the emission factor is determined for the year in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

For the proposed project activity the **ex-ante option** is selected. Data for calculating the three year average is obtained from the period 2013 – 2015 which are the most recent data available at the time of submission of the PDD to DOE.

#### **STEP 4: Calculating the operating margin emission factor according to the selected method**

The simple OM emission factor is calculated as the generation-weighted average CO<sub>2</sub> emissions per unit net electricity generation (tCO<sub>2</sub>e/MWh) of all generating power plants serving the system, not including low-cost / must-run power plants / units. It may be calculated:

Option A: Based on the net electricity generation and a CO<sub>2</sub> emission factor of each power unit; or

Option B: Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

As the fuel consumption and the average efficiency data for each power plant / unit is not available Option B is used for simple OM calculation.<sup>12</sup>

*Option B: Calculation based on total fuel consumption and electricity generation of the system*

As Option B is used, the simple OM emission factor is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost/must run power plants/units, and based on the fuel type(s) and total fuel consumption of the project electricity system as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO_2,i,y}}{EG_y} \quad (10)$$

Where:

|                        |                                                                                                                                                                  |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $EF_{grid,OMsimple,y}$ | Simple operating margin CO <sub>2</sub> emission factor in year y (tCO <sub>2</sub> /MWh)                                                                        |
| $FC_{i,y}$             | Amount of fossil fuel type i consumed in the project electricity system in year y (mass or volume unit)                                                          |
| $NCV_{i,y}$            | Net calorific value (energy content) of fossil fuel type i in year y (GJ / mass or volume unit)                                                                  |
| $EF_{CO_2,i,y}$        | CO <sub>2</sub> emission factor of fossil fuel type i in year y (tCO <sub>2</sub> /GJ)                                                                           |
| $EG_y$                 | 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 (MWh) |
| i                      | All fossil fuel types combusted in power sources in the project electricity system in year y                                                                     |
| y                      | The three most recent years for which data is available at the time of submission of the PDD to the DOE for validation (ex-ante option)                          |

For this approach (simple OM) to calculate the operating margin, subscript m refers to the power plants/units delivering electricity to the grid, not including low-cost/must run power plants/units, and including electricity imports to the grid.

#### **STEP 5. Calculation of the build margin emission factor**

<sup>12</sup> Only renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known.

In terms of vintage of data, project participants can choose between one of the following two options:

**Option 1:** For the first crediting period, calculate the build margin emission factor ex ante based on the most recent information available on units already built for sample group m at the time of VER PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

**Option 2:** For the first crediting period, the build margin emission factor shall be updated annually, ex post, including those units built up to the year of registration of the project activity or, if information up to the year of registration is not yet available, including those units built up at the latest year for which information is available. For the second crediting period, the built margin emission factor shall be calculated ex ante, as described in Option 1 above. For the third crediting period, the built margin emission factor calculated for the second crediting period should be used.

For the proposed project activity the Project Participant chooses **Option 1** in terms of vintage of data.

The sample group of power units m used to calculate the build margin should be determined as per the following procedure, consistent with the data vintage selected above:

- (a) Identify the set of five power units, excluding power units registered as VER project activities, that started to supply electricity to the grid most recently ( $SET_{5-units}$ ) and determine their annual electricity generation ( $AEG_{SET_{5-units}}$ , in MWh).
- (b) Determine the annual electricity generation of the project electricity system, excluding power units registered as VER project activities ( $AEG_{total}$ , in MWh). Identify the set of power units, excluding power units registered as VER project activities, that started to supply electricity to the grid most recently and that comprise 20% of total  $AEG_{total}$  (if 20% falls on part of the generation of a unit, the generation of that unit is fully included in the calculation) ( $SET_{>20\%}$ ) and determine their annual electricity generation ( $AEG_{SET_{>20\%}}$ , in MWh);
- (c) From  $SET_{5-units}$  and  $SET_{>20\%}$  select the set of power units that comprise the larger annual electricity generation ( $SET_{sample}$ );

Identify the date when the power units in  $SET_{sample}$  started to supply electricity to the grid. If none of the power units in  $SET_{sample}$  started to supply electricity to the grid more than 10 years ago, then use the  $SET_{sample}$  to calculate the build margin.

The most recent information available belongs to 2015 and based on TEİAŞ statistics which is the official information source for the grid. According to TEİAŞ figure, the annual electricity generation of the project electricity system ( $AEG_{total}$ ) is 249,899,500 MWh. Based on the  $AEG_{total}$ , the set of power units, excluding power units registered as VER project activities, that started to supply electricity to the grid most recently and that comprise 20% of total  $AEG_{total}$ , have been defined and the  $AEG_{SET_{>20\%}}$  is determined as 49,376,817 MWh and includes over 300 units of power plants under  $SET_{>20\%}$ . Without the need of any further assessment it can be concluded that the  $SET_{5-units} \ll SET_{>20\%}$  and therefore the  $SET_{>20\%}$  is selected as  $SET_{sample}^{13}$  for the calculation of the build margin (BM). The 20% of  $AEG_{TOTAL}$  cover power plants commissioned in year 2009-2012 since there are no plant specific electricity generation data for year 2013 and 2014. Also all power plants commissioned in 2009 has been included to the  $SET_{20\%}$  since there was no commissioning date information available.

<sup>13</sup> None of the power units in  $SET_{sample}$  started to supply electricity to the grid more than 10 years ago.

The built margin (BM) emission factor is the generation-weighted average emission factor (tCO<sub>2</sub>/MWh) of all power units  $m$  during the most recent year  $y$  for which power generation data is available<sup>14</sup>, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad (11)$$

Where:

|                  |                                                                                                     |
|------------------|-----------------------------------------------------------------------------------------------------|
| $EF_{grid,BM,y}$ | Build margin CO <sub>2</sub> emissions factor in year $y$ (tCO <sub>2</sub> /MWh)                   |
| $EG_{m,y}$       | Net quantity of electricity generated and delivered to the grid by power unit $m$ in year $y$ (MWh) |
| $EF_{EL,m,y}$    | CO <sub>2</sub> emission factor of the power unit $m$ in year $y$ (tCO <sub>2</sub> /MWh)           |
| $m$              | Power units included in the build margin                                                            |
| $y$              | Most recent historical year for which power generation data is available                            |

As per the “Tool to calculate the emission factor for an electricity system”, the CO<sub>2</sub> emission factor of each power unit  $m$  ( $EF_{EL,m,y}$ ) should be determined as per the guidance from the tool in step 4 for simple OM, using options A1, A2 or A3, using for  $y$  the most recent historical year for which power generation data is available, where  $m$  is the power units included in the build margin.

As plant specific fuel consumption data is not available for Turkey, option A2 has been selected for the calculation of the CO<sub>2</sub> emission factor of each power unit  $m$  ( $EF_{EL,m,y}$ ) as follows:

$$EF_{EL,m,y} = \frac{EF_{CO_2,i,y} \cdot 3.6}{\eta_{m,y}} \quad (12)$$

Where:

|                   |                                                                                                                                                       |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|
| $EF_{EL,m,y}$     | CO <sub>2</sub> emission factor of the power unit $m$ in year $y$ (tCO <sub>2</sub> /MWh)                                                             |
| $EF_{CO_2,m,i,y}$ | Average CO <sub>2</sub> emission factor of fuel type $i$ used in power unit $m$ in year $y$ (tCO <sub>2</sub> /GJ)                                    |
| $\eta_{m,y}$      | Average net energy conversion efficiency of power unit $m$ in year $y$ (ratio)                                                                        |
| $m$               | All power units serving the grid in year $y$ except low-cost/must-run power units                                                                     |
| $y$               | The most recent year for which power generation data is available at the time of submission of the VER-PDD to the DOE for validation (ex-ante option) |

#### STEP 6: Calculation of the combined margin emission factor

According to the applicable methodological tool, the calculation of the combined margin (CM) emission factor ( $EF_{grid,CM}$ ) is based on one of the following methods:

- (a) Weighted average CM; or
- (b) Simplified CM.

In line with the requirements of the applicable tool, the Project Participant chooses option (a), weighted average CM.

The combined margin emissions factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \cdot w_{OM} + EF_{grid,BM,y} \cdot w_{BM} \quad (13)$$

<sup>14</sup> The most recent year for which power generation data is available is 2012.

Where:

|                  |                                                          |
|------------------|----------------------------------------------------------|
| $EF_{grid,CM,y}$ | Combined Margin emission factor (tCO <sub>2</sub> /MWh)  |
| $EF_{grid,OM,y}$ | Operating margin emission factor (tCO <sub>2</sub> /MWh) |
| $EF_{grid,BM,y}$ | Build margin emission factor (tCO <sub>2</sub> /MWh)     |
| $w_{OM}$         | Weight of the operating margin emission factor           |
| $w_{BM}$         | Weight of the build margin emission factor               |

As stated in the “Tool to calculate the emission factor for an electricity system”, the default weights for the operating margin and build margin emission factors for the proposed project type is defined as:

$$w_{OM}=0.25$$

$$w_{BM}=0.75$$

for the second crediting period<sup>15</sup>.

### Changes required for the methodology implementation in 3<sup>rd</sup> crediting periods

At the start of the second and third crediting period the Project Proponents will address two issues as required by the applicable methodology:

- Assess the continued validity of the baseline; and
- Update the baseline as defined above

### Project Emissions

In line with the requirements of AMS-III.G and AMS-I.D, project emissions are calculated as follows:

Where:

|                |                                                                                                         |
|----------------|---------------------------------------------------------------------------------------------------------|
| $PE_{power,y}$ | Emission from consumption of electricity due to the project activity in year y (tCO <sub>2</sub> e/yr). |
|----------------|---------------------------------------------------------------------------------------------------------|

The project emissions from consumption of electricity by the project activity  $PE_{power,y}$  (also referred as  $PE_{EC,y}$ ) shall be calculated using the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”. When applying the tool, electricity sources j in the tool corresponds to the sources of electricity consumed due to the project activity.

$PE_{EC,y}$  is calculated as follows:

$$PE_{EC,y} = \sum_j EC_{PJ,y} * EF_{EL,j,y} * (1 + TDL_{j,y}) \quad (15)$$

Where:

|               |                                                                                                        |
|---------------|--------------------------------------------------------------------------------------------------------|
| $PE_{EC,y}$   | Project emissions from electricity consumption in year y (tCO <sub>2</sub> e/year)                     |
| $EC_{PJ,y}$   | Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/year)  |
| $EF_{EL,j,y}$ | Emission factor for electricity generation for source j in year y (tCO <sub>2</sub> e/MWh)             |
| $TDL_{j,y}$   | Average technical transmission and distribution losses for providing electricity to source j in year y |

<sup>15</sup> For the second and third crediting period,  $w_{OM}=0.25$  and  $w_{BM}=0.75$  will be used unless otherwise specified in the methodology. Project participant may submit alternative weights if the weightage does not reflect their situation.

The combined margin emission factor of the applicable electricity system, has been determined as emission factor for the electricity system ( $EF_{\text{power},y}$ ), in line with Option A1 of scenario A (Electricity consumption from grid) under the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”.

### Leakage

In accordance with AMS-III.G and AMS-I.D no leakage effects are accounted.

### B.6.2. Data and parameters fixed ex ante

(Copy this table for each piece of data and parameter.)

|                                                      |                                                                                         |
|------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Data / Parameter                                     | ID.1 / OX                                                                               |
| Unit                                                 | Dimensionless                                                                           |
| Description                                          | Fraction of methane that would be oxidized in the top layer of the SWDS in the baseline |
| Source of data                                       | AMS-III.G                                                                               |
| Value(s) applied                                     | 0.1                                                                                     |
| Choice of data or Measurement methods and procedures | As referred under AMS-III.G                                                             |
| Purpose of data                                      | Calculation of baseline emissions                                                       |
| Additional comment                                   | n.a.                                                                                    |

|                                                      |                                                                                                   |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Data / Parameter                                     | ID.2 / $GWP_{CH_4}$                                                                               |
| Unit                                                 | $tCO_2e/tCH_4$                                                                                    |
| Description                                          | Global Warming Potential of $CH_4$                                                                |
| Source of data                                       | IPCC                                                                                              |
| Value(s) applied                                     | 25 for the second commitment period. Shall be updated accordingly to any future COP/MOP decision. |
| Choice of data or Measurement methods and procedures | As referred under AMS-III.G                                                                       |
| Purpose of data                                      | Calculation of baseline emission                                                                  |
| Additional comment                                   | n.a.                                                                                              |

|                                                      |                                                                                     |
|------------------------------------------------------|-------------------------------------------------------------------------------------|
| Data / Parameter                                     | ID.3 / $n_{PJ}$                                                                     |
| Unit                                                 | %                                                                                   |
| Description                                          | Efficiency of the LFG capture system that will be installed in the project activity |
| Source of data                                       | AMS-III.G                                                                           |
| Value(s) applied                                     | 50%                                                                                 |
| Choice of data or Measurement methods and procedures | Default value under AMS-III.G                                                       |
| Purpose of data                                      | Calculation of baseline emissions                                                   |
| Additional comment                                   | Only applicable to ex-ante estimations of the baseline emissions                    |

|                  |                   |
|------------------|-------------------|
| Data / Parameter | ID.4 / $D_{CH_4}$ |
|------------------|-------------------|

|                                                      |                                             |
|------------------------------------------------------|---------------------------------------------|
| Unit                                                 | Tonnes/m <sup>3</sup>                       |
| Description                                          | Density of methane under normal conditions. |
| Source of data                                       | IPCC Volume 2 Energy                        |
| Value(s) applied                                     | 0.67 kg/m <sup>3</sup> <sup>16</sup>        |
| Choice of data or Measurement methods and procedures | As referred under AMS-III.G                 |
| Purpose of data                                      | Calculation of baseline emissions           |
| Additional comment                                   |                                             |

|                                                      |                                                                                  |
|------------------------------------------------------|----------------------------------------------------------------------------------|
| Data / Parameter                                     | ID.5 / $\varphi_{\text{default}}$                                                |
| Unit                                                 | -                                                                                |
| Description                                          | Default value for the model correction factor to account for model uncertainties |
| Source of data                                       | Emissions from solid disposal sites                                              |
| Value(s) applied                                     | 0.75                                                                             |
| Choice of data or Measurement methods and procedures | As referred under "Emissions from solid disposal sites"                          |
| Purpose of data                                      | Calculation of baseline emissions                                                |
| Additional comment                                   | The proposed project activity falls under Application A                          |

|                                                      |                                                                                               |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Data / Parameter                                     | ID.6 / F                                                                                      |
| Unit                                                 | -                                                                                             |
| Description                                          | Fraction of methane in the SWDS gas (volume fraction)                                         |
| Source of data                                       | IPCC 2006 Guidelines for National Greenhouse Gas Inventories                                  |
| Value(s) applied                                     | 0.5                                                                                           |
| Choice of data or Measurement methods and procedures | Emissions from solid disposal sites                                                           |
| Purpose of data                                      | Calculation of baseline emissions                                                             |
| Additional comment                                   | Upon biodegradation, organic material is converted to a mixture of methane and carbon dioxide |

|                                                      |                                                                                                         |
|------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| Data / Parameter                                     | ID.7 / $\text{DOC}_{f,\text{default}}$                                                                  |
| Unit                                                 | Weight fraction                                                                                         |
| Description                                          | Default value for the fraction of degradable organic carbon (DOC) in MSW that can decompose in the SWDS |
| Source of data                                       | IPCC 2006 Guidelines for National Greenhouse Gas Inventories                                            |
| Value(s) applied                                     | 0.5                                                                                                     |
| Choice of data or Measurement methods and procedures | Emissions from solid disposal sites                                                                     |
| Purpose of data                                      | Calculation of baseline emissions                                                                       |
| Additional comment                                   | The proposed project activity falls under Application A                                                 |

|                  |                                      |
|------------------|--------------------------------------|
| Data / Parameter | ID.8 / $\text{MCF}_{\text{default}}$ |
| Unit             | -                                    |

<sup>16</sup> [http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2\\_Volume2/V2\\_4\\_Ch4\\_Fugitive\\_Emissions.pdf](http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_4_Ch4_Fugitive_Emissions.pdf) page 4.12 page 4.12

|                                                      |                                                                                    |
|------------------------------------------------------|------------------------------------------------------------------------------------|
| Description                                          | Methane correction factor                                                          |
| Source of data                                       | IPCC 2006 Guidelines for National Greenhouse Gas Inventories                       |
| Value(s) applied                                     | 0.8                                                                                |
| Choice of data or Measurement methods and procedures | Emissions from solid disposal sites                                                |
| Purpose of data                                      | Calculation of baseline emissions                                                  |
| Additional comment                                   | The baseline falls under the definition “unmanaged solid waste disposal site-deep” |

| Data / Parameter                                     | ID.9 / DOC <sub>j</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------|------------------------|----|---------------------------|----|-----------------------------------------|----|----------|----|-----------------------------|----|------------------------------------|---|
| Unit                                                 | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Description                                          | Fraction of degradable organic carbon in waste type j (weight fraction)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Source of data                                       | IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Table 2.4 and Table 2.5)                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Value(s) applied                                     | <p>The following values for the different waste types have been applied:</p> <table border="1"> <thead> <tr> <th>Waste type j</th><th>DOC<sub>j</sub><br/>(% wet waste)</th></tr> </thead> <tbody> <tr> <td>Wood and wood products</td><td>43</td></tr> <tr> <td>Pulp, paper and cardboard</td><td>40</td></tr> <tr> <td>Food, food waste, beverages and tobacco</td><td>15</td></tr> <tr> <td>Textiles</td><td>24</td></tr> <tr> <td>Garden, yard and park waste</td><td>20</td></tr> <tr> <td>Glass, plastic, metal, other inert</td><td>0</td></tr> </tbody> </table> | Waste type j | DOC <sub>j</sub><br>(% wet waste) | Wood and wood products | 43 | Pulp, paper and cardboard | 40 | Food, food waste, beverages and tobacco | 15 | Textiles | 24 | Garden, yard and park waste | 20 | Glass, plastic, metal, other inert | 0 |
| Waste type j                                         | DOC <sub>j</sub><br>(% wet waste)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Wood and wood products                               | 43                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Pulp, paper and cardboard                            | 40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Food, food waste, beverages and tobacco              | 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Textiles                                             | 24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Garden, yard and park waste                          | 20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Glass, plastic, metal, other inert                   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Choice of data or Measurement methods and procedures | Emissions from solid disposal sites                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Purpose of data                                      | Calculation of baseline emissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Additional comment                                   | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |

|                  |                                                                                    |
|------------------|------------------------------------------------------------------------------------|
| Data / Parameter | ID.10 / k <sub>j</sub>                                                             |
| Unit             | 1/yr                                                                               |
| Description      | Decay rate for the waste type j                                                    |
| Source of data   | IPCC 2006 Guidelines for National Greenhouse Gas Inventories (Volume 5, Table 3.3) |

|                                                            |                                                                       |                                                                  |                                                 |
|------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------|
| Value(s) applied                                           | The following values for the different waste types have been applied: |                                                                  |                                                 |
|                                                            | <b>Waste type j</b>                                                   |                                                                  | <b>Boreal and Temperate<br/>(MAT &lt; 20°C)</b> |
|                                                            |                                                                       |                                                                  | <b>WET(MAP/PET &lt;1)</b>                       |
|                                                            | Slowly<br>degrading                                                   | Pulp, paper, cardboard                                           | 0.04                                            |
|                                                            |                                                                       | Wood, wood products and straw                                    | 0.02                                            |
|                                                            | Moderately<br>degrading                                               | Other (non-food) organic<br>putrescible garden and park<br>waste | 0.05                                            |
|                                                            | Rapidly<br>degrading                                                  | Food, food waste, sewage<br>sludge, beverages and tobacco        | 0.06                                            |
| Choice of data or<br>Measurement methods<br>and procedures | Emissions from solid disposal sites                                   |                                                                  |                                                 |
| Purpose of data                                            | Calculation of baseline emissions                                     |                                                                  |                                                 |
| Additional comment                                         |                                                                       |                                                                  |                                                 |

|                                                            |                                                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                           | ID.11 / EG <sub>m,y</sub>                                                                                                                                                                                                                                                                                                |
| Unit                                                       | MWh                                                                                                                                                                                                                                                                                                                      |
| Description                                                | Net electricity generated by power plant/unit m                                                                                                                                                                                                                                                                          |
| Source of data                                             | TEIAS (Turkish Electricity Transmission Company)<br><a href="https://www.teias.gov.tr/tr/turkiye-elektrik-uretim-iletim-istatistikleri/2015">https://www.teias.gov.tr/tr/turkiye-elektrik-uretim-iletim-istatistikleri/2015</a>                                                                                          |
| Value(s) applied                                           | Please refer to Section B.6.3 table 9                                                                                                                                                                                                                                                                                    |
| Choice of data or<br>Measurement methods<br>and procedures | According to "Turkish Statistics Law and Official Statistics Program" <sup>17</sup> TEIAS, the 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 data                                            | Used to calculate the combined margin emission factor                                                                                                                                                                                                                                                                    |
| Additional comment                                         | Since TEİAŞ provides gross amounts, a conversion factor has been applied derived from the total gross / net amount for the same year.<br>( <a href="https://www.teias.gov.tr/tr/turkiye-elektrik-uretim-iletim-istatistikleri/2015">https://www.teias.gov.tr/tr/turkiye-elektrik-uretim-iletim-istatistikleri/2015</a> ) |

|                  |                                                                                                                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter | ID.12 / FC <sub>i,y</sub>                                                                                                                                                                                                       |
| Unit             | tonnes (m <sup>3</sup> for gaseous fuels)                                                                                                                                                                                       |
| Description      | Amount of fossil fuel type i consumed in the project electricity system by generation sources in year y (2009-2011)                                                                                                             |
| Source of data   | TEIAS (Turkish Electricity Transmission Company)<br><a href="https://www.teias.gov.tr/tr/turkiye-elektrik-uretim-iletim-istatistikleri/2015">https://www.teias.gov.tr/tr/turkiye-elektrik-uretim-iletim-istatistikleri/2015</a> |
| Value(s) applied | Please refer to Section B.6.3 table 9                                                                                                                                                                                           |

<sup>17</sup> TEIAS 2005: <http://rega.basbakanlik.gov.tr/Eskiler/2005/11/20051118-1.htm>

|                                                      |                                                                                                                                                                                                                                                |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Choice of data or Measurement methods and procedures | According to "Turkish Statistics Law and Official Statistics Program" TEIAS, the 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 data                                      | Used to calculate the combined margin emission factor                                                                                                                                                                                          |
| Additional comment                                   | -                                                                                                                                                                                                                                              |

|                                                      |                                                                                                                                                                                                                                                |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                     | ID.13 / $NCV_{i,y}$                                                                                                                                                                                                                            |
| Unit                                                 | GJ/tonnes ( $m^3$ for gaseous fuels)                                                                                                                                                                                                           |
| Description                                          | Net calorific value (energy content) of fossil fuel type $i$ in year $y$                                                                                                                                                                       |
| Source of data                                       | TEIAS (Turkish Electricity Transmission Company)<br><a href="https://www.teias.gov.tr/tr/turkiye-elektrik-uretim-iletim-istatistikleri/2015">https://www.teias.gov.tr/tr/turkiye-elektrik-uretim-iletim-istatistikleri/2015</a>                |
| Value(s) applied                                     | Please refer to Section B.6.3 table 9                                                                                                                                                                                                          |
| Choice of data or Measurement methods and procedures | According to "Turkish Statistics Law and Official Statistics Program" TEIAS, the 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 data                                      | Used to calculate the combined margin emission factor                                                                                                                                                                                          |
| Additional comment                                   | -                                                                                                                                                                                                                                              |

|                                                      |                                                                                                                                                                                                                                                                                                                                                        |
|------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                     | ID.14 / $EF_{CO_2,i,y}$                                                                                                                                                                                                                                                                                                                                |
| Unit                                                 | tCO <sub>2</sub> /GJ                                                                                                                                                                                                                                                                                                                                   |
| Description                                          | CO <sub>2</sub> emission factor of fossil fuel type $i$ used in power unit $m$ 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 Chapter 1 of Volume 2 (Energy) of the 2006 IPCC Guidelines for National Greenhouse Gas Inventory<br><a href="http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.htm">http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.htm</a> |
| Value(s) applied                                     | Please refer to Section B.6.3 table 11                                                                                                                                                                                                                                                                                                                 |
| Choice of data or Measurement methods and procedures | There is no information on the fuel specific default emission factor in Turkey, hence, IPCC values has been used.                                                                                                                                                                                                                                      |
| Purpose of data                                      | Used to calculate the combined margin emission factor                                                                                                                                                                                                                                                                                                  |
| Additional comment                                   | -                                                                                                                                                                                                                                                                                                                                                      |

| Data / Parameter                                     | ID.15 / $n_{m,y}$                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                                            |             |                                              |         |                                      |      |                                      |          |                                              |
|------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------|-------------|----------------------------------------------|---------|--------------------------------------|------|--------------------------------------|----------|----------------------------------------------|
| Unit                                                 | %                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                                            |             |                                              |         |                                      |      |                                      |          |                                              |
| Description                                          | Average net energy conversion efficiency of power unit $m$ in year $y$                                                                                                                                                                                                                                                                                                                                                                                            |  |                                            |             |                                              |         |                                      |      |                                      |          |                                              |
| Source of data                                       | "Tool to calculate the emission factor for an electricity system",                                                                                                                                                                                                                                                                                                                                                                                                |  |                                            |             |                                              |         |                                      |      |                                      |          |                                              |
| Value(s) applied                                     | <table border="1"> <thead> <tr> <th></th><th>Average conversion efficiency <math>\eta_{m,y}</math></th></tr> </thead> <tbody> <tr> <td>Natural Gas</td><td>IPCC default value of 60% for combined cycle</td></tr> <tr> <td>Lignite</td><td>IPCC default value of 41.4% for PFBS</td></tr> <tr> <td>Coal</td><td>IPCC default value of 41.4% for PFBS</td></tr> <tr> <td>Fuel Oil</td><td>IPCC default value of 46% for combined cycle</td></tr> </tbody> </table> |  | Average conversion efficiency $\eta_{m,y}$ | Natural Gas | IPCC default value of 60% for combined cycle | Lignite | IPCC default value of 41.4% for PFBS | Coal | IPCC default value of 41.4% for PFBS | Fuel Oil | IPCC default value of 46% for combined cycle |
|                                                      | Average conversion efficiency $\eta_{m,y}$                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                                            |             |                                              |         |                                      |      |                                      |          |                                              |
| Natural Gas                                          | IPCC default value of 60% for combined cycle                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                            |             |                                              |         |                                      |      |                                      |          |                                              |
| Lignite                                              | IPCC default value of 41.4% for PFBS                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                            |             |                                              |         |                                      |      |                                      |          |                                              |
| Coal                                                 | IPCC default value of 41.4% for PFBS                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                            |             |                                              |         |                                      |      |                                      |          |                                              |
| Fuel Oil                                             | IPCC default value of 46% for combined cycle                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                            |             |                                              |         |                                      |      |                                      |          |                                              |
| Choice of data or Measurement methods and procedures | Default values have been used .                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                            |             |                                              |         |                                      |      |                                      |          |                                              |
| Purpose of data                                      | Used to calculate the combined margin emission factor                                                                                                                                                                                                                                                                                                                                                                                                             |  |                                            |             |                                              |         |                                      |      |                                      |          |                                              |
| Additional comment                                   | Where available Plant specific efficiencies are used instead of default values where available. Please refer to emission reduction calculation sheet for more details.                                                                                                                                                                                                                                                                                            |  |                                            |             |                                              |         |                                      |      |                                      |          |                                              |

|                                                      |                                                                                                                                                |
|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                     | ID.16 / $F_{CH_4,BL,y}$                                                                                                                        |
| Unit                                                 | tCH <sub>4</sub>                                                                                                                               |
| Description                                          | Methane emissions that would be captured and destroyed to comply with national or local safety requirements or legal regulations in the year y |
| Source of data                                       | National laws and regulations ( <a href="http://mevzuat.basbakanlik.gov.tr">http://mevzuat.basbakanlik.gov.tr</a> )                            |
| Value(s) applied                                     | 0                                                                                                                                              |
| Choice of data or Measurement methods and procedures | Fixed value has been applied                                                                                                                   |
| Purpose of data                                      | Calculation of baseline emissions                                                                                                              |
| Additional comment                                   |                                                                                                                                                |

|                                                      |                                                       |
|------------------------------------------------------|-------------------------------------------------------|
| Data / Parameter                                     | ID.17 / $EE_y$                                        |
| Unit                                                 | %                                                     |
| Description                                          | Energy Conversion Efficiency of the project equipment |
| Source of data                                       | Applicable methodology                                |
| Value(s) applied                                     | 40%                                                   |
| Choice of data or Measurement methods and procedures | determined as 40% default.                            |
| Purpose of data                                      | Calculation of baseline emissions                     |
| Additional comment                                   |                                                       |

### B.6.3. Ex ante calculation of emission reductions

>>

The ex-ante emission reductions are calculated using the formulas as described under section B.6.1. In the following section, the assumptions made and the results from the calculations are presented<sup>18</sup>.

#### Emission Reductions

Emission reductions are calculated as follows:

| Year | Parameter                               |                                         |                                         |
|------|-----------------------------------------|-----------------------------------------|-----------------------------------------|
|      | ER <sub>y</sub> (tCO <sub>2</sub> e/yr) | BE <sub>y</sub> (tCO <sub>2</sub> e/yr) | PE <sub>y</sub> (tCO <sub>2</sub> e/yr) |
| 2018 | 6,113                                   | 6,114                                   | 1                                       |
| 2019 | 18,649                                  | 18,650                                  | 2                                       |
| 2020 | 18,946                                  | 18,948                                  | 2                                       |
| 2021 | 19,233                                  | 19,235                                  | 2                                       |
| 2022 | 19,510                                  | 19,512                                  | 2                                       |
| 2023 | 19,778                                  | 19,780                                  | 2                                       |
| 2024 | 20,036                                  | 20,038                                  | 2                                       |
| 2025 | 13,524                                  | 13,525                                  | 1                                       |

#### Baseline emissions

<sup>18</sup> As a general approach; the startin65,853g date of the crediting period has not been taken into account under this section.

Baseline emissions are calculated as follows:

| Year | Parameter                               |                                                        |                                            |
|------|-----------------------------------------|--------------------------------------------------------|--------------------------------------------|
|      | BE <sub>y</sub> (tCO <sub>2</sub> e/yr) | BE <sub>CH<sub>4</sub>,y</sub> (tCO <sub>2</sub> e/yr) | BE <sub>EC,y</sub> (tCO <sub>2</sub> e/yr) |
| 2018 | 18,342                                  | 14,113                                                 | 4,228                                      |
| 2019 | 18,650                                  | 14,422                                                 | 4,228                                      |
| 2020 | 18,948                                  | 14,720                                                 | 4,228                                      |
| 2021 | 19,235                                  | 15,007                                                 | 4,228                                      |
| 2022 | 19,512                                  | 15,284                                                 | 4,228                                      |
| 2023 | 19,780                                  | 15,551                                                 | 4,228                                      |
| 2024 | 20,038                                  | 15,809                                                 | 4,228                                      |
| 2025 | 20,287                                  | 16,059                                                 | 4,228                                      |

### Baseline emissions of methane from SWDS

Baseline emissions of methane from SWDS are calculated as follows. A default value of 0.1 has been applied for  $OX_{top-layer}$ , and 25 for  $GWP_{CH_4}$  within the calculation.

| Year | Parameter                                           |                                                           |                                                         |
|------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------|
|      | BE <sub>CH<sub>4</sub></sub> (tCO <sub>2</sub> /yr) | FE <sub>CH<sub>4</sub>,P,J,y</sub> (tCH <sub>4</sub> /yr) | F <sub>CH<sub>4</sub>,BL,y</sub> (tCH <sub>4</sub> /yr) |
| 2018 | 14,113                                              | 627                                                       | 0                                                       |
| 2019 | 14,422                                              | 641                                                       | 0                                                       |
| 2020 | 14,720                                              | 654                                                       | 0                                                       |
| 2021 | 15,007                                              | 667                                                       | 0                                                       |
| 2022 | 15,284                                              | 679                                                       | 0                                                       |
| 2023 | 15,551                                              | 691                                                       | 0                                                       |
| 2024 | 15,809                                              | 703                                                       | 0                                                       |
| 2025 | 16,059                                              | 714                                                       | 0                                                       |

### Amount of methane in the LFG which is flared and or used in the project activity

Amount of methane in the LFG which is flared and or used in the project activity in year y has been estimated ex-ante through FOD model. The following default values have been applied to the FOD model:

|                    |                      |                                                            |                                   |
|--------------------|----------------------|------------------------------------------------------------|-----------------------------------|
| $\phi_y$           | 0.75                 |                                                            |                                   |
| OX                 | 0.1                  |                                                            |                                   |
| F                  | 0.5                  |                                                            |                                   |
| DOC <sub>f,y</sub> | 0.5                  |                                                            |                                   |
| MCF <sub>y</sub>   | 1.0                  |                                                            |                                   |
| k <sub>j</sub>     | Waste type j         |                                                            | Boreal and Temperate (MAT < 20°C) |
|                    |                      |                                                            | WET(MAP/PET >1)                   |
|                    | Slowly degrading     | Pulp, paper, cardboard                                     | 0.04                              |
|                    |                      | Wood, wood products and straw                              | 0.02                              |
|                    | Moderately degrading | Other (non-food) organic putrescible garden and park waste | 0.05                              |

|                                         | Rapidly degradable                                                                                                                                                                                                                                                                                                                                                                                                              | Food, food waste, sewage sludge, beverages and tobacco | 0.06 |  |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
|-----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|------|--|--------------|-----------------------------------|------------------------|----|---------------------------|----|-----------------------------------------|----|----------|----|-----------------------------|----|------------------------------------|---|
| DOC <sub>j</sub>                        | <table><tr><th>Waste type j</th><th>DOC<sub>j</sub><br/>(% wet waste)</th></tr><tr><td>Wood and wood products</td><td>43</td></tr><tr><td>Pulp, paper and cardboard</td><td>40</td></tr><tr><td>Food, food waste, beverages and tobacco</td><td>15</td></tr><tr><td>Textiles</td><td>24</td></tr><tr><td>Garden, yard and park waste</td><td>20</td></tr><tr><td>Glass, plastic, metal, other inert</td><td>0</td></tr></table> |                                                        |      |  | Waste type j | DOC <sub>j</sub><br>(% wet waste) | Wood and wood products | 43 | Pulp, paper and cardboard | 40 | Food, food waste, beverages and tobacco | 15 | Textiles | 24 | Garden, yard and park waste | 20 | Glass, plastic, metal, other inert | 0 |
| Waste type j                            | DOC <sub>j</sub><br>(% wet waste)                                                                                                                                                                                                                                                                                                                                                                                               |                                                        |      |  |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Wood and wood products                  | 43                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                        |      |  |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Pulp, paper and cardboard               | 40                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                        |      |  |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Food, food waste, beverages and tobacco | 15                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                        |      |  |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Textiles                                | 24                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                        |      |  |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Garden, yard and park waste             | 20                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                        |      |  |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| Glass, plastic, metal, other inert      | 0                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                        |      |  |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| f <sub>y</sub>                          | 0                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                        |      |  |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |
| n <sub>P1</sub>                         | 50%                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                        |      |  |              |                                   |                        |    |                           |    |                                         |    |          |    |                             |    |                                    |   |

Amount of solid waste type j disposed or prevented from disposal in the SWDS.

| Waste Type                                                 | Fraction (%) |
|------------------------------------------------------------|--------------|
| Pulp, paper, cardboard (other than sludge)                 | 0            |
| Wood, wood products and straw                              | 23%          |
| Textiles                                                   | 1%           |
| Other (non-food) organic putrescible garden and park waste | 0%           |
| Food, food waste, sewage sludge, beverages and tobacco     | 44%          |
| Glass, plastic, metal, other inert                         | 32%          |

Based on the above parameters the amount of methane in the LFG used in the project activity in year y has been estimated ex-ante as follows:

| Year | FE <sub>CH4,PJ,y</sub> (tCH <sub>4</sub> /yr) |
|------|-----------------------------------------------|
| 2018 | 627                                           |
| 2019 | 641                                           |
| 2020 | 654                                           |
| 2021 | 667                                           |
| 2022 | 679                                           |
| 2023 | 691                                           |
| 2024 | 703                                           |
| 2025 | 714                                           |

### Baseline emissions associated with electricity generation

Baseline emissions associated with electricity generation are calculated based on the assumption that the generator will operate 7500 h per year.

| Year | Parameter                                    |                          |                                             |                      |
|------|----------------------------------------------|--------------------------|---------------------------------------------|----------------------|
|      | BE <sub>EL,PJ,y</sub> (tCO <sub>2</sub> /yr) | EC <sub>BL,y</sub> (MWh) | EF <sub>EL,y</sub> (tCO <sub>2</sub> e/MWh) | TDL <sub>y</sub> (%) |
| 2018 | 4,228                                        | 8,483                    | 0.484                                       | 3%                   |
| 2019 | 4,228                                        | 8,483                    | 0.484                                       | 3%                   |
| 2020 | 4,228                                        | 8,483                    | 0.484                                       | 3%                   |

|      |       |       |       |    |
|------|-------|-------|-------|----|
| 2021 | 4,228 | 8,483 | 0.484 | 3% |
| 2022 | 4,228 | 8,483 | 0.484 | 3% |
| 2023 | 4,228 | 8,483 | 0.484 | 3% |
| 2024 | 4,228 | 8,483 | 0.484 | 3% |
| 2025 | 4,228 | 8,483 | 0.484 | 3% |

### Calculating the CO<sub>2</sub> emission factor of the grid

The CO<sub>2</sub> emission factor of the grid ( $EF_{CO_2,grid,y}$ ) is calculated as the combined margin emission factor ( $EF_{grid,CM,y}$ ) as followed:

| Combined Margin Emission Factor ( $EF_{grid,CM,y}$ ) | Operating Margin Emission Factor ( $EF_{grid,OM,y}$ ) | Build Margin Emission Factor ( $EF_{grid,BM,y}$ ) | Weight of operating margin emission factor ( $w_{OM}$ ) | Weight of build margin emission factor ( $w_{BM}$ ) |
|------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------|
| tCO <sub>2</sub> e/MWh                               | tCO <sub>2</sub> e/MWh                                | tCO <sub>2</sub> e/MWh                            | %                                                       | %                                                   |
| 0.484                                                | 0.630                                                 | 0.435                                             | 25                                                      | 75                                                  |

The operating margin emission factor ( $EF_{grid,OM,y}$ ) is calculated as the simple operating margin as followed:

Simple operating emission factor

| Simple Operating Margin Emission Factor ( $EF_{grid,OM,y}$ ) |      | 0.630 tCO <sub>2</sub> /MWh          |                                     |                                                                    |                                                            |
|--------------------------------------------------------------|------|--------------------------------------|-------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------|
| Fuel Type                                                    |      | Amount of Fossil Fuel ( $FC_{i,y}$ ) | Net Calorific Value ( $NCV_{i,y}$ ) | CO <sub>2</sub> Emission Factor of Fossil Fuel ( $EF_{CO_2,i,y}$ ) | Electricity Generated and Delivered to the Grid ( $EG_y$ ) |
|                                                              |      | Tons <sup>19</sup>                   | GJ/tons <sup>20</sup>               | tCO <sub>2</sub> /GJ                                               | MWh                                                        |
| Natural Gas                                                  | 2013 | 22,909,746                           | 37,145                              | 0.0540                                                             | 100,224,085                                                |
|                                                              | 2014 | 25,426,014                           | 37,488                              |                                                                    | 114,587,465                                                |
|                                                              | 2015 | 20,914,868                           | 37,838                              |                                                                    | 94,714,611                                                 |
| Lign                                                         | 20   | 47,120,306                           | 7,258                               | 0.0909                                                             | 28,853,577                                                 |

<sup>19</sup> 1000 m<sup>3</sup> in case for natural gas.

<sup>20</sup> GJ/1000m<sup>3</sup> in case for natural gas.

|                 |                  |            |        |        |            |
|-----------------|------------------|------------|--------|--------|------------|
| ite             | 1<br>3           |            |        |        |            |
|                 | 2<br>0<br>1<br>4 | 57,696,139 | 7,106  |        | 34,796,857 |
|                 | 2<br>0<br>1<br>5 | 49,940,131 | 7,161  |        | 29,913,198 |
| Co<br>al        | 2<br>0<br>1<br>3 | 12,105,930 | 23,790 | 0.0928 | 31,963,761 |
|                 | 2<br>0<br>1<br>4 | 14,501,934 | 23,927 |        | 37,678,175 |
|                 | 2<br>0<br>1<br>5 | 16,629,492 | 24,076 |        | 42,794,821 |
| Fu<br>el<br>Oil | 2<br>0<br>1<br>3 | 702,893    | 42,889 | 0.0565 | 1,657,875  |
|                 | 2<br>0<br>1<br>4 | 874,271    | 41,613 |        | 2,038,751  |
|                 | 2<br>0<br>1<br>5 | 755,299    | 44,082 |        | 2,122,945  |

Imports to the grid are also considered calculating the electricity generated and delivered to the grid (EG<sub>y</sub>). CO<sub>2</sub> emission factor of the net electricity imports from a connected electricity system is determined as 0 tCO<sub>2</sub>/MWh.

Electricity imports from a connected electricity system

|                                    | Year      |           |           |
|------------------------------------|-----------|-----------|-----------|
|                                    | 2013      | 2014      | 2015      |
| <b>Electricity Imports (MWh/y)</b> | 7,429,400 | 7,953,300 | 7,135,500 |

The build margin emission factor (EF<sub>grid,BM,y</sub>) is calculated as followed:

Build margin emission factor

|                                                              |                                  |                                                       |                                      |
|--------------------------------------------------------------|----------------------------------|-------------------------------------------------------|--------------------------------------|
| <b>Build Margin Emission Factor (EF<sub>grid,BM,y</sub>)</b> | 0.435 tCO <sub>2</sub> /MWh      |                                                       |                                      |
| <b>Fuel Type</b>                                             | <b>Electricity Generated and</b> | <b>Average CO<sub>2</sub> Emission Factor of Fuel</b> | <b>Average Net Energy Conversion</b> |

|                |                  | delivered to<br>the Grid<br>(EG <sub>m,y</sub> ) | (EF <sub>CO2,m,i,y</sub> ) | Efficiency<br>(η <sub>m,y</sub> ) |
|----------------|------------------|--------------------------------------------------|----------------------------|-----------------------------------|
|                |                  | MWh                                              | tCO <sub>2</sub> /GJ       | %                                 |
| Natural<br>Gas | 2<br>0<br>0<br>9 | 13,602,509                                       | 0.0543                     | Combined<br>Cycle                 |
|                | 2<br>0<br>1<br>0 | 1,063,909                                        |                            |                                   |
|                | 2<br>0<br>1<br>1 | 12,316,264                                       |                            | 60                                |
|                | 2<br>0<br>1<br>2 | 9,573,773                                        |                            |                                   |
| Lignite        | 2<br>0<br>0<br>9 | 3,000                                            | 0.0909                     | PFBS                              |
|                | 2<br>0<br>1<br>0 | 0                                                |                            |                                   |
|                | 2<br>0<br>1<br>1 | 0                                                |                            | 41.5                              |
|                | 2<br>0<br>1<br>2 | 40000                                            |                            |                                   |
| Coal           | 2<br>0<br>0<br>9 | 1,923,333                                        | 0.0928                     | PFBS                              |
|                | 2<br>0<br>1<br>0 | 8,01,765                                         |                            |                                   |
|                | 2<br>0<br>1<br>1 | 4,320,000                                        |                            | 41.5                              |
|                | 2<br>0<br>1<br>2 | 726,784                                          |                            |                                   |
| Fuel Oil       | 2<br>0<br>0<br>9 | 4,331,777                                        | 0.0565                     | Combined<br>Cycle                 |

|                 |                  |           |   |      |
|-----------------|------------------|-----------|---|------|
|                 | 2<br>0<br>1<br>0 | 258,824   |   |      |
|                 | 2<br>0<br>1<br>1 | 1,026,592 |   |      |
|                 | 2<br>0<br>1<br>2 | 483,753   |   | 46   |
|                 | 2<br>0<br>0<br>9 | 1,402,961 |   |      |
|                 | 2<br>0<br>1<br>0 | 818,760   |   |      |
| Hydro           | 2<br>0<br>1<br>1 | 2,879,578 | 0 | n.a  |
|                 | 2<br>0<br>1<br>2 | 4,997,738 |   |      |
|                 | 2<br>0<br>0<br>9 | 1,094,986 |   |      |
|                 | 2<br>0<br>1<br>0 | 51,000    |   |      |
|                 | 2<br>0<br>1<br>1 | 715,474   | 0 | n.a. |
| Other Renewable | 2<br>0<br>1<br>2 | 561,315   |   |      |

Power plants under SET<sub>20%</sub> are listed under Appendix 4 of this PDD.

### ***Project Emissions***

The project emissions of the proposed project activity are calculated as follows. For ex-ante purposes the electricity consumption of the proposed project activity is estimated to be approximately 3 MWh/yr.

Project emissions from electricity consumption

| Year | Parameter |
|------|-----------|
|------|-----------|

|      | PE <sub>EC,y</sub> (tCO <sub>2</sub> /yr) | EC <sub>PJ,y</sub> (MWh) | EF <sub>EL,y</sub> (tCO <sub>2</sub> e/MWh) | TDL <sub>y</sub> (%) |
|------|-------------------------------------------|--------------------------|---------------------------------------------|----------------------|
| 2018 | 2                                         | 3                        | 0.484                                       | 20%                  |
| 2019 | 2                                         | 3                        | 0.484                                       | 20%                  |
| 2020 | 2                                         | 3                        | 0.484                                       | 20%                  |
| 2021 | 2                                         | 3                        | 0.484                                       | 20%                  |
| 2022 | 2                                         | 3                        | 0.484                                       | 20%                  |
| 2023 | 2                                         | 3                        | 0.484                                       | 20%                  |
| 2024 | 2                                         | 3                        | 0.484                                       | 20%                  |
| 2025 | 2                                         | 3                        | 0.484                                       | 20%                  |

#### B.6.4. Summary of ex ante estimates of emission reductions

| Year                                            | Baseline emissions (t CO <sub>2</sub> e) | Project emissions (t CO <sub>2</sub> e) | Leakage (t CO <sub>2</sub> e) | Emission reductions (t CO <sub>2</sub> e) |
|-------------------------------------------------|------------------------------------------|-----------------------------------------|-------------------------------|-------------------------------------------|
| 2018                                            | 6,114                                    | 1                                       | 0                             | 6,113                                     |
| 2019                                            | 18,650                                   | 2                                       | 0                             | 18,649                                    |
| 2020                                            | 18,948                                   | 2                                       | 0                             | 18,946                                    |
| 2021                                            | 19,235                                   | 2                                       | 0                             | 19,233                                    |
| 2022                                            | 19,512                                   | 2                                       | 0                             | 19,510                                    |
| 2023                                            | 19,780                                   | 2                                       | 0                             | 19,778                                    |
| 2024                                            | 20,038                                   | 2                                       | 0                             | 20,036                                    |
| 2025                                            | 13,525                                   | 1                                       | 0                             | 13,524                                    |
| <b>Total</b>                                    | 135,802                                  | 12                                      | 0                             | 135,790                                   |
| <b>Total number of crediting years</b>          | 7                                        |                                         |                               |                                           |
| <b>Annual average over the crediting period</b> | 19,400                                   | 2                                       | 0                             | 19,399                                    |

#### B.7. Monitoring plan

##### B.7.1. Data and parameters to be monitored

|                                    |                                                                                                                                                                                                   |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                   | ID.18 / EC <sub>PJ,y</sub>                                                                                                                                                                        |
| Unit                               | MWh                                                                                                                                                                                               |
| Description                        | Quantity of electricity consumed by the project activity.                                                                                                                                         |
| Source of data                     | Electricity meters                                                                                                                                                                                |
| Value(s) applied                   | Estimated as 3MWh/year for ex-ante calculations.                                                                                                                                                  |
| Measurement methods and procedures | The quantity of electricity consumed by the project plant will be monitored based on the main meter (also referred as TEİAŞ meters) readings and/or through protocols where and when appropriate. |
| Monitoring frequency               | Continuous and monthly recording.                                                                                                                                                                 |

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| QA/QC procedures   | The electricity meters are used to measure the net electricity exported to the grid and used for billing purposes. Therefore the meters are sealed by TEİAŞ (Turkish Electricity Transmission CO). The grid company is responsible for maintenance and calibration of the device. In accordance with the "Regulation on "Measurement and Measuring Tools", electricity meters have to be calibrated within a frequency of once per 10 years <sup>21</sup> . The accuracy class of the device is 0.5s |
| Purpose of data    | Calculation of project emissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Additional comment | The quantity of electricity consumed is monitored by the same equipment, which monitors the net amount of electricity generated by the project activity.                                                                                                                                                                                                                                                                                                                                             |

|                                    |                                                                      |
|------------------------------------|----------------------------------------------------------------------|
| Data / Parameter                   | ID.19 / TDL <sub>y</sub>                                             |
| Unit                               | %                                                                    |
| Description                        | Average technical transmission and distribution losses               |
| Source of data                     | Recent, accurate and reliable data available within the host country |
| Value(s) applied                   | TDL <sub>j,y</sub> : 20%                                             |
| Measurement methods and procedures | Default value                                                        |
| Monitoring frequency               | Fixed for the crediting period                                       |
| QA/QC procedures                   | -                                                                    |
| Purpose of data                    | Calculation of baseline and project emissions                        |
| Additional comment                 | -                                                                    |

|                                    |                                                                                                                           |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                   | ID.20 / F <sub>CH4,PJ,y</sub>                                                                                             |
| Unit                               | m <sup>3</sup>                                                                                                            |
| Description                        | Methane captured and destroyed/gainfully used by the project activity in the year y                                       |
| Source of data                     | Flow meter                                                                                                                |
| Value(s) applied                   | n.a.                                                                                                                      |
| Measurement methods and procedures | The amount of landfill gas utilized shall be monitored ex post, using continuous flow meters.                             |
| Monitoring frequency               | Continuous                                                                                                                |
| QA/QC procedures                   | Calibration and frequency of calibration is according to manufacturer's specifications or applicable law and regulations. |
| Purpose of data                    | Calculation of baseline emissions                                                                                         |
| Additional comment                 |                                                                                                                           |

|                                    |                                                                                                                                                                          |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                   | ID.21 / EG <sub>PJ,facility,y</sub>                                                                                                                                      |
| Unit                               | MWh                                                                                                                                                                      |
| Description                        | Electricity Generation in year y                                                                                                                                         |
| Source of data                     | Electricity meters                                                                                                                                                       |
| Value(s) applied                   | Estimated as 8,483 MWh/year for ex-ante calculations. The estimation is based on an estimate of 7500h load of 1.131 MW installed capacity.                               |
| Measurement methods and procedures | The quantity of net electricity generation supplied to the grid by the project plant will be monitored based on the main meter (also referred as TEİAŞ meters) readings. |
| Monitoring frequency               | Continuous monitoring and monthly recording.                                                                                                                             |

21

Reference:

<http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.6381&MevzuatIliski=0&sourceXmlSearch=>  
(Article 9.b)

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| QA/QC procedures   | The electricity meters are used to measure the net electricity exported to the grid and used for billing purposes. Therefore the meters are sealed by TEİAŞ (Turkish Electricity Transmission CO) and/or through protocols where and when appropriate. The grid company is responsible for maintenance and calibration of the device. In accordance with the "Regulation on "Measurement and Measuring Tools", electricity meters have to be calibrated within a frequency of once per 10 years <sup>22</sup> . The accuracy class of the device is 0.5s. |
| Purpose of data    | Calculation of baseline emissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Additional comment | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

### B.7.2. Sampling plan

>>

No sampling plan is required.

### B.7.3. Other elements of monitoring plan

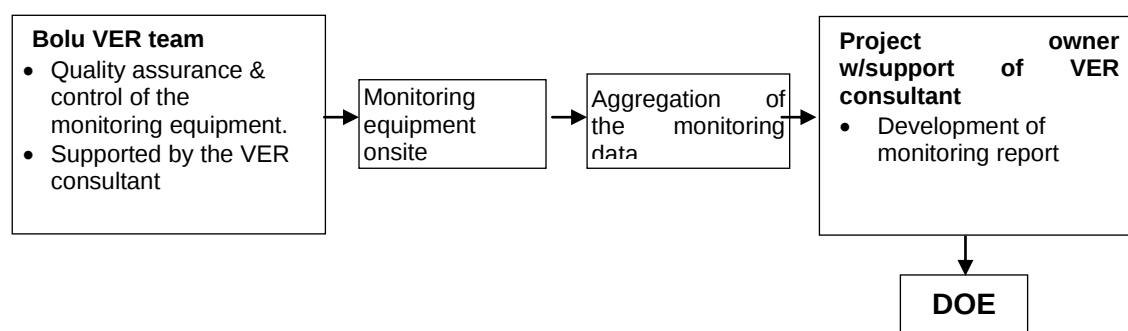
>>

Monitoring will be carried out following the procedures set by applicable methodology and all applicable tools of the above explained parameters. The monitoring consists of:

#### Responsibilities for monitoring

The project owner is responsible for the operation and maintenance of the landfill and the installed equipment<sup>23</sup>. The project owner is also responsible for the administration of the data, setting up a VER team who will be responsible for monitoring all data required to estimate emission reductions.

In the diagram below the organization of monitoring management and data application is presented.



#### Registration of the monitored data

The Bolu VER-Team will be responsible for quality assurance and quality control of the monitoring equipment. The data measured by the monitoring equipment will be stored and will be processed into a monitoring report, which will be submitted by the project owner. All the monitored data will be stored during the crediting period and for at least two years after the end of the crediting period, whichever occurs later.

<sup>22</sup>

Reference:

<http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.6381&MevzuatIliski=0&sourceXmlSearch=>  
(Article 9.b)

<sup>23</sup> Except for the electricity meter that monitors both electricity imports and exports, since the monitoring device is sealed by TEİAŞ (Turkish Electricity Transmission Company) and the Project Participant cannot interfere with the device.

## **Corrective actions and emergency preparedness**

The VER-Team will regularly check the monitoring system on errors. In the case of errors, corrective actions will be undertaken by the VER-Team, or if required, by the supplier of the monitoring equipment.

## **QA/QC procedure**

Strong quality assurance and quality control procedure will be taken to monitor the equipment and data

collection. Equipment and facilities will be subject to a regular maintenance and testing regime to ensure accuracy following supplier's manual. In case of data deficiency or in correct data reading, the data will be crosschecked with other parameters and data leading to the most conservative emission reductions will be considered for the calculation of the emission reductions.

## **Measuring of exported and imported electricity**

The main meter for the monitoring of the electricity import and export is at grid connection. Monthly protocols based on the readings, that are confirmed by both TEİAŞ and the project participant are prepared by the end of each month and stored. These protocols are also the basis of invoicing for the electricity sales from the proposed project activity. The electricity meters are bi directional and will measure both the imported and exported electricity from and to the grid.

## **SECTION C. Start date, crediting period type and duration**

### **C.1. Start date of project activity**

>>

The starting date of a project activity is the earliest date at which either the implementation or construction or real action of a project activity begins. The loan agreement is signed on 03.06.2010. The mobilization has started on 11.11.2010. The main equipment order (generator set) is signed on 25.11.2010. The electricity generation has started on 26.08.2011. Therefore, the starting date of the project activity shall be considered as 03.06.2010.

### **C.2. Expected operational lifetime of project activity**

>>

The project is designed for an operational lifetime of 15 years.

### **C.3. Crediting period of project activity**

#### **C.3.1. Type of crediting period**

>>

Renewable

#### **C.3.2. Start date of crediting period**

>>

#### **C.3.3. Duration of crediting period**

>>

1<sup>st</sup> crediting period: 12.08.2011

2<sup>nd</sup> crediting period: 12.08.2018

## **SECTION D. Environmental impacts**

### **D.1. Analysis of environmental impacts**

>>

The Project activity has been exempted by the Ministry of Forest and Environment from the requirement to carry out an Environmental Impact Assessment. The Project is fully in line with national laws and regulations, including those involving environment, health and safety.

Current practice on the site is a managed landfill with no methane recovery. The Project has several environmental benefits:

- It will cover the landfill area with soil, reducing the adverse visual impacts.
- The cover and an effective landfill gas collection system will reduce odour from the landfill
- The LFG recovery will reduce GHG emissions and help in tackling with global warming
- It will set a good example for proper waste management with improved health and safety impacts
- It will minimize explosion and fire risks by decreasing gas accumulation
- It will feed clean energy to the grid, thereby reducing emissions from power generation

As one of the sustainable renewable energy generation technologies, the Project poses reduces the environmental impacts of the current practice on the landfill site considerably.

### **D.2. Environmental impact assessment**

>>

Please refer to GS Passport regarding environmental impacts of the project activity

## **SECTION E. Local stakeholder consultation**

### **E.1. Modalities for local stakeholder consultation**

>>

The Project was acquired by the Project owner with a tender, which was organized by the Bolu Municipality. The Project and its conditions are clearly set with an agreement and the Municipality is satisfied with the Project.

Following the tender, there have been several newspaper announcements about the Project that positively commented on the Project.

A meeting organized by the Project owner on 06.03.2009 has hosted several stakeholders and the opinions declared during that meeting were very positive and encouraging. There have been no negative comments from any stakeholder about the Project.

### **E.2. Summary of comments received**

>>

Stakeholders are supportive towards the Project

### **E.3. Consideration of comments received**

>>

Stakeholders did not raise any critical issues which would require the project desing to be revisited.

## **SECTION F. Approval and authorization**

>>

## Appendix 1. Contact information of project participants

|                   |                                                                                 |
|-------------------|---------------------------------------------------------------------------------|
| Organization name | CEV Enerji Üretim San. Ve Tic. Ltd. Şti.                                        |
| Country           | Turkey                                                                          |
| Address           | Bağlarbaşı mah. 105200 Nolu KM. Evl. Katı atık Deposu 103 1 Şahinbey, Gaziantep |
| Telephone         | 0342 485 1012                                                                   |
| Fax               |                                                                                 |
| E-mail            | <a href="mailto:info@cev-tr.com">info@cev-tr.com</a>                            |
| Website           | <a href="http://www.cev-tr.com">www.cev-tr.com</a>                              |
| Contact person    | Mr. Doomin Ko                                                                   |

## Appendix 2. Affirmation regarding public funding

## Appendix 3. Applicability of methodologies and standardized baselines

## Appendix 4. Further background information on ex ante calculation of emission reductions

### List of SET<sub>20%</sub> Power Units

| 2012           |             |                                                              |                               |                                                  |                                    |
|----------------|-------------|--------------------------------------------------------------|-------------------------------|--------------------------------------------------|------------------------------------|
| Plant Name     | Fuel Type   | Add<br>ed<br>Inst<br>alle<br>d<br>Cap<br>acit<br>y<br><br>MW | Gen<br>erati<br>on<br>MW<br>h | Total<br>Install<br>ed<br>Capac<br>ity<br><br>MW | Total<br>Gener<br>ation<br><br>MWh |
| Acarsoy Termik | Natural Gas | 50,0                                                         | 375.000                       | 50,0                                             | 375.000                            |
| Afyon DGKÇ     | Natural Gas | 126,1                                                        | 945.000                       | 126,1                                            | 945.000                            |
| Age Doğalgaz   | Natural Gas | 94,0                                                         | 704.667                       | 141,0                                            | 1.057.000                          |
| Age Doğalgaz   | Natural Gas | 47,0                                                         | 352.333                       | 141,0                                            | 1.057.000                          |
| Akdeniz Kimya  | Natural Gas | 2,0                                                          | 15.000                        | 4,0                                              | 30.000                             |
| Akdeniz Kimya  | Natural Gas | 2,0                                                          | 15.000                        | 4,0                                              | 30.000                             |
| Ales Doğalgaz  | Natural Gas | 49,0                                                         | 370.000                       | 49,0                                             | 370.000                            |
| Altinyıldız    | Natural Gas | 5,5                                                          | 38.000                        | 5,5                                              | 38.000                             |
| Asaş Alüminyum | Natural Gas | 8,6                                                          | 65.000                        | 8,6                                              | 65.000                             |

|                       |         |      |      |       |        |
|-----------------------|---------|------|------|-------|--------|
|                       | Gas     |      | 00   |       |        |
| BALSUYU MENSUCAT      | Natural |      | 68.0 |       |        |
| SAN. VE TİC. A.Ş.     | Gas     | 9,7  | 00   | 9,7   | 68.000 |
| BAMEN KOJENERASYON    |         |      |      |       |        |
| (BAŞYAZICIOĞLU        | Natural |      | 14.0 |       |        |
| TEKSTİL)              | Gas     | 2,1  | 00   | 2,1   | 14.000 |
| Beypi Beypazarı       | Natural |      | 63.0 |       |        |
|                       | Gas     | 8,6  | 00   | 8,6   | 63.000 |
| Bilecik Doğalgaz      | Natural |      | 190. |       | 190.00 |
|                       | Gas     | 25,8 | 000  | 25,8  | 0      |
| Bilecik Doğalgaz      | Natural |      | 145. |       | 945.00 |
|                       | Gas     | 19,4 | 385  | 126,1 | 0      |
| Bilecik Doğalgaz      | Natural | 107, | 801. |       | 945.00 |
|                       | Gas     | 0    | 864  | 126,1 | 0      |
| Bilkur Tekstil        | Natural |      | 14.0 |       |        |
|                       | Gas     | 2,0  | 00   | 2,0   | 14.000 |
| Binatom Elektrik      | Natural |      | 13.6 |       |        |
|                       | Gas     | 2,1  | 50   | 2,0   | 13.000 |
| Binatom Elektrik      | Natural |      | 15.7 |       |        |
|                       | Gas     | 2,1  | 50   | 10,4  | 78.000 |
| Binatom Elektrik      | Natural |      | 30.0 |       |        |
|                       | Gas     | 4,0  | 00   | 10,4  | 78.000 |
| Binatom Elektrik      | Natural |      | 15.0 |       |        |
|                       | Gas     | 2,0  | 00   | 10,4  | 78.000 |
| Bis Enerji            | Natural |      | 361. |       | 3.450. |
|                       | Gas     | 48,0 | 572  | 458,0 | 000    |
| Bosen Enerji          | Natural |      | 210. |       | 1.980. |
|                       | Gas     | 28,0 | 159  | 263,8 | 000    |
| Çıldır                | Natural |      | 20.0 |       |        |
|                       | Gas     | 15,4 | 00   | 15,4  | 20.000 |
| Dumrazlar Makina      | Natural |      | 10.0 |       |        |
|                       | Gas     | 1,3  | 00   | 1,3   | 10.000 |
| Durum Gıda Termik     | Natural |      | 29.0 |       |        |
|                       | Gas     | 3,6  | 00   | 3,6   | 29.000 |
| Ege Seramik           | Natural |      | 90.0 |       |        |
|                       | Gas     | 13,1 | 00   | 13,1  | 90.000 |
| Enerji Sa Çanakkale   | Natural |      | 7.20 |       | 520.00 |
|                       | Gas     | 0,9  | 0    | 65,0  | 0      |
| Enerji Sa Köseköy     | Natural | 120, | 930. |       | 930.00 |
|                       | Gas     | 0    | 000  | 120,0 | 0      |
| Enerji Sa Mersin      | Natural |      | 11.8 |       | 520.00 |
|                       | Gas     | 1,5  | 18   | 66,0  | 0      |
| Ennerji Sa Adana      | Natural |      | 5.60 |       | 917.00 |
|                       | Gas     | 0,8  | 0    | 131,0 | 0      |
| Erzurum Meydan AVM    | Natural |      | 16.0 |       |        |
|                       | Gas     | 2,4  | 00   | 2,4   | 16.000 |
| Gürteks İplik         | Natural |      | 53.0 |       |        |
|                       | Gas     | 6,7  | 00   | 6,7   | 53.000 |
| Hatipoğlu Plastik     | Natural |      | 14.0 |       |        |
|                       | Gas     | 2,0  | 00   | 2,0   | 14.000 |
| İşbirliği Enerji      | Natural |      | 146. |       | 146.00 |
|                       | Gas     | 19,5 | 000  | 19,5  | 0      |
| İzmir Büyük Efes      | Natural |      | 9.00 |       |        |
|                       | Gas     | 1,2  | 0    | 1,2   | 9.000  |
| JTI Torbalı           | Natural |      | 30.0 |       |        |
|                       | Gas     | 4,0  | 00   | 4,0   | 30.000 |
| Keskinoğlu Tavukçuluk | Natural |      | 44.8 |       |        |
|                       | Gas     | 6,0  | 42   | 9,5   | 71.000 |
| Kıvanç Tekstil        | Natural |      | 5.95 |       |        |
|                       | Gas     | 1,1  | 1    | 6,1   | 33.000 |
| MUTLU MAKARNACILIK    | Natural |      | 16.0 |       |        |
|                       | Gas     | 2,0  | 00   | 2,0   | 16.000 |
| NAKSAN ENERJİ         | Natural |      | 60.0 |       |        |
|                       | Gas     | 8,0  | 00   | 8,0   | 60.000 |
| NAKSAN ENERJİ         | Natural |      | 60.0 |       |        |
|                       | Gas     | 8,0  | 00   | 8,0   | 60.000 |
| ODAŞ DOĞALGAZ         | Natural |      | 414. |       | 966.00 |
|                       | Gas     | 55,0 | 431  | 128,2 | 0      |
| ODAŞ DOĞALGAZ         | Natural |      | 137. |       | 966.00 |
|                       | Gas     | 18,3 | 892  | 128,2 | 0      |
| OFİM ENERJİ           | Natural |      | 16.0 |       |        |
|                       | Gas     | 2,1  | 00   | 2,1   | 16.000 |
| ÖZMAYA SAN            | Natural |      | 40.0 |       |        |
|                       | Gas     | 5,4  | 00   | 5,4   | 40.000 |
| PANCAR ELEKTRİK       | Natural |      | 130. |       | 260.00 |
|                       | Gas     | 17,5 | 372  | 34,9  | 0      |

|                  |                        |         |             |         |           |
|------------------|------------------------|---------|-------------|---------|-----------|
| PANCAR ELEKTRİK  | Natural Gas            | 17,5    | 130.372     | 34,9    | 260.000   |
| PİSA TEKSTİL     | Natural Gas            | 1,0     | 7.000       | 1,0     | 7.000     |
| SELÇUK İPLİK     | Natural Gas            | 8,6     | 65.000      | 8,6     | 65.000    |
| SELVA GIDA       | Natural Gas            | 1,7     | 14.000      | 1,7     | 14.000    |
| SODA SANAYİ      | Natural Gas            | 252,2   | 1.765.000   | 252,2   | 1.765.000 |
| ŞANLIURFA OSB    | Natural Gas            | 11,7    | 81.946      | 128,5   | 900.000   |
| TEKİRDAĞ ÇORLU   | Natural Gas            | 2,0     | 15.000      | 2,0     | 15.000    |
| YENİÜŞAK ENERJİ  | Natural Gas            | 8,7     | 63.486      | 18,5    | 135.000   |
| YENİÜŞAK ENERJİ  | Natural Gas            | 1,0     | 7.297       | 18,5    | 135.000   |
| YONGAPAN         | Natural Gas            | 15,0    | 112.348     | 24,7    | 185.000   |
| ZORLU ENERJİ     | Natural Gas            | 25,7    | 192.837     | 148,2   | 1.112.000 |
|                  | Natural Gas 2012 Total | 1.305,9 | 9.573.772,7 |         |           |
| Erdemir          | Fuel Oil               | 53,9    | 351.154     | 127,4   | 830.000   |
| Goodyear         | Fuel Oil               | 5,2     | 42.792      | 9,6     | 79.000    |
| MOSB             | Fuel Oil               | 12,0    | 89.808      | 140,3   | 1.050.000 |
|                  | Fuel Oil 2012 Total    | 71,1    | 483.753,1   |         |           |
| KÜÇÜKER TEKSTİL  | Lignite                | 5,0     | 40.000      | 5,0     | 40.000    |
|                  | Lignite 2012 Total     | 5,0     | 40.000,0    |         |           |
| Aksa Akrilik     | Coal                   | 75,0    | 525.000     | 100,0   | 700.000   |
| Eren Enerji      | Coal                   | 30,0    | 195.971     | 1.390,0 | 9.080.000 |
| Göknur Gıda      | Coal                   | 1,6     | 5.813       | 1,6     | 6.000     |
|                  | Coal 2012 Total        | 106,6   | 726.783,7   |         |           |
| Akköprü Dalaman  | Hydro                  | 57,5    | 88.000      | 115,0   | 176.000   |
| Akköprü Dalaman  | Hydro                  | 57,5    | 88.000      | 115,0   | 176.000   |
| Akköy II HES     | Hydro                  | 114,8   | 253.978     | 229,7   | 508.000   |
| Akköy II HES     | Hydro                  | 114,8   | 253.978     | 229,7   | 508.000   |
| Akköy Espiye HES | Hydro                  | 8,9     | 22.030      | 8,9     | 22.000    |
| Alabalık Rewg    | Hydro                  | 13,8    | 22.064      | 13,8    | 22.000    |
| Alpaslan         | Hydro                  | 80,0    | 209.000     | 160,0   | 418.000   |
| Alpaslan         | Hydro                  | 80,0    | 209.000     | 160,0   | 418.000   |
| Anak HES         | Hydro                  | 3,8     | 8.905       | 3,8     | 9.000     |

|                                                     |       |           |             |       |             |
|-----------------------------------------------------|-------|-----------|-------------|-------|-------------|
| Araklı REG                                          | Hydro | 10,2      | 21.8<br>08  | 13,1  | 28.000      |
| Araklı REG                                          | Hydro | 13,1      | 27.9<br>29  | 13,1  | 28.000      |
| Arca HES                                            | Hydro | 5,5       | 13.2<br>93  | 16,4  | 40.000      |
| Arca HES                                            | Hydro | 10,9      | 26.5<br>85  | 16,4  | 40.000      |
| Arpa REG                                            | Hydro | 32,4      | 44.0<br>16  | 32,4  | 44.000      |
| Ataköy                                              | Hydro | 5,5       | 11.0<br>50  | 5,5   | 11.000      |
| Avcılar HES                                         | Hydro | 16,7      | 28.0<br>72  | 16,7  | 28.000      |
| AYANCIK HES (İLK<br>ELEKTRİK ENERJİ<br>ÜRETİMİ SN.) | Hydro | 15,6      | 37.0<br>00  | 15,6  | 37.000      |
| AYRANCILAR HES<br>(MURADIYE ELEKTRİK<br>ÜRETİM)     | Hydro | 9,4       | 21.6<br>50  | 41,5  | 96.000      |
| BAĞIŞTAŞ II HES<br>(AKDENİZLİ ELEKTRİK<br>ÜRETİM)   | Hydro | 32,4      | 69.0<br>00  | 32,4  | 69.000      |
| BALKUSAN BARAJI VE<br>HES 1 NOLU SANT.<br>(KAREN)   | Hydro | 13,0      | 23.0<br>00  | 13,0  | 23.000      |
| BALKUSAN BARAJI VE<br>HES 2 NOLU SANT.<br>(KAREN)   | Hydro | 25,0      | 46.0<br>00  | 25,0  | 46.000      |
| BANGAL REG. VE KUŞLUK<br>HES (KUDRET ENERJİ)        | Hydro | 17,0      | 32.0<br>00  | 17,0  | 32.000      |
| BEKTEMUR HES (DİZ-EP<br>ELEKTRİK ÜRETİM LTD.)       | Hydro | 3,5       | 10.9<br>75  | 3,5   | 11.000      |
| Beyköy                                              | Hydro | 16,8      | 87.0<br>00  | 16,8  | 87.000      |
| Büyükdüz HES                                        | Hydro | 68,9      | 108.<br>940 | 68,9  | 109.00<br>0 |
| Can 1 HES                                           | Hydro | 1,8       | 6.14<br>7   | 1,8   | 6.000       |
| Ceyhna HES                                          | Hydro | 12,6      | 31.3<br>46  | 37,8  | 94.000      |
| Cuniş REG                                           | Hydro | 2,9       | 7.12<br>5   | 8,4   | 21.000      |
| Cuniş REG                                           | Hydro | 5,6       | 14.0<br>00  | 8,4   | 21.000      |
| Çağlayan HES                                        | Hydro | 6,0       | 12.0<br>00  | 6,0   | 12.000      |
| Çarşamba                                            | Hydro | 11,3      | 36.0<br>32  | 11,3  | 36.000      |
| Cınar HES                                           | Hydro | 9,3       | 18.9<br>18  | 9,3   | 19.000      |
| Çukurçayı HES                                       | Hydro | 1,8       | 2.00<br>0   | 3,6   | 4.000       |
| Demirciler HES                                      | Hydro | 3,1       | 7.43<br>8   | 8,4   | 20.000      |
| Demirciler HES                                      | Hydro | 5,3       | 12.6<br>60  | 8,4   | 20.000      |
| Doğankaya HES                                       | Hydro | 20,6      | 55.8<br>64  | 20,6  | 56.000      |
| Dumlu HES                                           | Hydro | 4,0       | 4.97<br>8   | 4,0   | 5.000       |
| Eger HES                                            | Hydro | 1,9       | 6.06<br>3   | 1,9   | 6.000       |
| Erik HES                                            | Hydro | 6,5       | 20.9<br>35  | 6,5   | 21.000      |
| Ermenek                                             | Hydro | 151,<br>2 | 408.<br>500 | 302,4 | 817.00<br>0 |
| Ermenek                                             | Hydro | 151,<br>2 | 408.<br>500 | 302,4 | 817.00<br>0 |
| Esendurak HES                                       | Hydro | 9,3       | 24.0<br>77  | 9,3   | 24.000      |
| Feke 1 HES                                          | Hydro | 29,4      | 67.0<br>00  | 29,4  | 67.000      |
| Feke 2 Barajı                                       | Hydro | 69,3      | 126.<br>073 | 69,3  | 126.00<br>0 |
| Fındık I Hes                                        | Hydro | 11,3      | 26.8<br>81  | 11,3  | 27.000      |

|                  |       |      |             |      |             |
|------------------|-------|------|-------------|------|-------------|
| Gemciler REG     | Hydro | 8,0  | 19.9<br>50  | 8,0  | 20.000      |
| GökGedik HES     | Hydro | 20,5 | 63.2<br>41  | 24,3 | 75.000      |
| GökGedik HES     | Hydro | 3,8  | 11.6<br>54  | 24,3 | 75.000      |
| Güdülk 2 HES     | Hydro | 4,9  | 14.9<br>39  | 4,9  | 15.000      |
| Güllübağ Barajı  | Hydro | 96,0 | 280.<br>000 | 96,0 | 280.00<br>0 |
| Günder REG       | Hydro | 28,2 | 48.0<br>34  | 28,2 | 48.000      |
| Günder REG       | Hydro | 0,0  | 0           | 28,2 | 48.000      |
| Horu REG         | Hydro | 4,2  | 12.4<br>71  | 8,5  | 25.000      |
| Horu REG         | Hydro | 4,2  | 12.4<br>71  | 8,5  | 25.000      |
| Horyan HES       | Hydro | 5,7  | 14.9<br>47  | 5,7  | 15.000      |
| İkizdere         | Hydro | 18,6 | 100.<br>000 | 18,6 | 100.00<br>0 |
| Kartalkaya HES   | Hydro | 8,0  | 15.0<br>00  | 8,0  | 15.000      |
| Kayaköprü 2 HES  | Hydro | 10,2 | 36.0<br>00  | 10,2 | 36.000      |
| Kılavuzlu HES    | Hydro | 40,5 | 100.<br>000 | 40,5 | 100.00<br>0 |
| Kırıkdağ HES     | Hydro | 16,9 | 39.9<br>05  | 16,9 | 40.000      |
| Kozdere HES      | Hydro | 6,1  | 5.26<br>5   | 9,3  | 8.000       |
| Kökнар HES       | Hydro | 8,0  | 15.0<br>45  | 8,0  | 15.000      |
| KUZGUN           | Hydro | 20,9 | 0           | 20,9 | 0           |
| KÜRCE REG        | Hydro | 12,0 | 36.1<br>38  | 12,0 | 36.000      |
| Menge Barajı HES | Hydro | 44,7 | 58.0<br>13  | 89,4 | 116.00<br>0 |
| MERCAN           | Hydro | 20,4 | 48.0<br>00  | 20,4 | 48.000      |
| MİDİLLİ REG      | Hydro | 21,0 | 44.9<br>36  | 21,0 | 45.000      |
| MURAT I II REG   | Hydro | 35,6 | 107.<br>084 | 35,6 | 107.00<br>0 |
| MURATLI REG      | Hydro | 11,0 | 16.0<br>48  | 37,7 | 55.000      |
| MURSAL I HES     | Hydro | 4,2  | 12.9<br>38  | 4,2  | 13.000      |
| NİKSAR HES       | Hydro | 20,1 | 69.9<br>30  | 40,2 | 140.00<br>0 |
| NİKSAR HES       | Hydro | 20,1 | 69.9<br>30  | 40,2 | 140.00<br>0 |
| ÖREN REG         | Hydro | 19,9 | 11.9<br>89  | 26,6 | 16.000      |
| PAPART HES       | Hydro | 22,0 | 66.1<br>65  | 26,6 | 80.000      |
| PAPART HES       | Hydro | 4,6  | 13.8<br>35  | 26,6 | 80.000      |
| POLAT HES        | Hydro | 3,3  | 9.93<br>9   | 6,6  | 20.000      |
| POLAT HES        | Hydro | 3,3  | 9.93<br>9   | 6,6  | 20.000      |
| SANCAR REG       | Hydro | 0,7  | 2.11<br>4   | 0,7  | 2.000       |
| SARİHİDR HES     | Hydro | 6,0  | 18.0<br>00  | 6,0  | 18.000      |
| SEYRANTEPE HES   | Hydro | 56,8 | 161.<br>113 | 56,8 | 161.00<br>0 |
| SIRAKONAKLAR HES | Hydro | 18,0 | 39.0<br>00  | 18,0 | 39.000      |
| SULUKÖY HES      | Hydro | 6,9  | 16.0<br>56  | 6,9  | 16.000      |
| ŞİFRİN REG       | Hydro | 6,7  | 10.0<br>66  | 6,7  | 10.000      |
| TELEME REG       | Hydro | 1,6  | 5.88<br>8   | 1,6  | 6.000       |

|                       |            |      |            |      |             |
|-----------------------|------------|------|------------|------|-------------|
| TELLİ II HES          | Hydro      | 8,7  | 18.0<br>41 | 8,7  | 18.000      |
| TERCAN                | Hydro      | 15,0 | 28.0<br>00 | 15,0 | 28.000      |
| TUĞRA REG             | Hydro      | 4,9  | 10.0<br>00 | 4,9  | 10.000      |
| TUNA HES              | Hydro      | 37,2 | 51.9<br>86 | 37,2 | 52.000      |
| TUZYÖY HES            | Hydro      | 8,4  | 38.1<br>81 | 8,4  | 38.000      |
| TUZYÖY SERGE          | Hydro      | 7,1  | 14.0<br>79 | 7,1  | 14.000      |
| UMUT I REG            | Hydro      | 5,8  | 12.0<br>00 | 5,8  | 12.000      |
| ÜÇKAYA HES            | Hydro      | 1,0  | 3.12<br>0  | 1,0  | 3.000       |
| VİZARA REG            | Hydro      | 8,6  | 14.9<br>62 | 8,6  | 15.000      |
| YAĞMUR REG            | Hydro      | 8,9  | 18.0<br>93 | 8,9  | 18.000      |
| YAMANLI III HES       | Hydro      | 28,5 | 60.0<br>84 | 28,5 | 60.000      |
| YAMANLI III HES       | Hydro      | 27,0 | 55.9<br>59 | 27,0 | 56.000      |
| YAVUZ HES             | Hydro      | 5,8  | 8.00<br>0  | 5,8  | 8.000       |
| YEDİSU HES            | Hydro      | 15,1 | 27.3<br>45 | 22,7 | 41.000      |
| YEDİSU HES            | Hydro      | 7,6  | 13.6<br>73 | 22,7 | 41.000      |
| YILDIRIM HES          | Hydro      | 7,1  | 14.6<br>35 | 10,7 | 22.000      |
| YILDIRIM HES          | Hydro      | 3,6  | 7.31<br>8  | 10,7 | 22.000      |
| YOKUŞLU KALENDERE HES | Hydro      | 5,2  | 12.9<br>35 | 40,2 | 100.00<br>0 |
| ZEYTİN BENDİ HES      | Hydro      | 5,2  | 10.0<br>00 | 5,2  | 10.000      |
| ZEYTİNBENDİ HES       | Hydro      | 0,0  | 0          | 5,2  | 10.000      |
|                       |            |      | 4.99       |      |             |
|                       | Hydro      | 2.15 | 7.73       |      |             |
|                       | 2012 Total | 6,2  | 8,2        |      |             |
|                       |            |      |            |      |             |
|                       |            |      |            |      |             |
| Arel Enerji           | Biogas     | 1,2  | 9.00<br>0  | 2,4  | 18.000      |
| Arel Enerji           | Biogas     | 1,2  | 9.00<br>0  | 2,4  | 18.000      |
| Bereket Enerji        | Biogas     | 0,6  | 5.29<br>2  | 0,6  | 5.000       |
| Ekim Biyogaz          | Biogas     | 1,2  | 10.0<br>00 | 1,2  | 10.000      |
| ES ES Eskişehir       | Biogas     | 2,0  | 15.3<br>15 | 2,0  | 15.000      |
| ITC Adana             | Biogas     | 4,2  | 31.8<br>38 | 15,6 | 117.00<br>0 |
| ITC Bursa             | Biogas     | 7,0  | 57.1<br>43 | 9,8  | 80.000      |
| ITC Bursa             | Biogas     | 1,4  | 11.4<br>29 | 9,8  | 80.000      |
| ITC Bursa             | Biogas     | 1,4  | 11.4<br>29 | 9,8  | 80.000      |
| İzaydaş               | Biogas     | 0,3  | 2.22<br>0  | 5,5  | 37.000      |
| Kayseri Katı Atık     | Biogas     | 1,3  | 9.90<br>0  | 2,9  | 22.000      |
| Kocaeli Çöp           | Biogas     | 1,2  | 9.39<br>1  | 2,3  | 18.000      |
| Kocaeli Çöp           | Biogas     | 1,1  | 8.31<br>9  | 2,3  | 18.000      |
| ORTADOĞU ENERJİ       | Biogas     | 2,8  | 22.0<br>48 | 8,6  | 67.000      |
| ORTADOĞU ENERJİ       | Biogas     | 4,1  | 31.8<br>80 | 8,6  | 67.000      |
| PAMUKOVA YEN          | Biogas     | 1,4  | 10.0<br>00 | 1,4  | 10.000      |

|                                             |            |      |         |       |         |
|---------------------------------------------|------------|------|---------|-------|---------|
| SAMSUN KATI ATIK                            | Biogas     | 2,4  | 18.000  | 2,4   | 18.000  |
| SEZER BİOENERJİ                             | Biogas     | 0,5  | 4.000   | 0,5   | 4.000   |
| TRAKYA YENİŞEHİR CAM                        | Biogas     | 6,0  | 45.000  | 6,0   | 45.000  |
| Denizli Jeotermal                           | Geothermal | 15,0 | 105.000 | 15,0  | 105.000 |
| SİNEM JEOTERMAL                             | Geothermal | 24,0 | 191.000 | 24,0  | 191.000 |
| Aksu RES                                    | Wind       | 36,0 | 72.000  | 72,0  | 144.000 |
| Aksu Res                                    | Wind       | 30,0 | 60.000  | 72,0  | 144.000 |
| Aksu RES                                    | Wind       | 6,0  | 12.000  | 72,0  | 144.000 |
| BALIKESİR RES (BARES ELEKTRİK ÜRETİM A.Ş.)  | Wind       | 13,8 | 45.102  | 112,8 | 370.000 |
| BALIKESİR RES (BARES ELEKTRİK ÜRETİM A.Ş.)  | Wind       | 16,5 | 54.122  | 112,8 | 370.000 |
| BALIKESİR RES (ENERJİSA ENERJİ ÜRETİM A.Ş.) | Wind       | 24,8 | 81.184  | 112,8 | 370.000 |
| BALIKESİR RES (ENERJİSA ENERJİ ÜRETİM A.Ş.) | Wind       | 16,5 | 54.122  | 112,8 | 370.000 |
| BALIKESİR RES (ENERJİSA ENERJİ ÜRETİM A.Ş.) | Wind       | 19,3 | 63.143  | 112,8 | 370.000 |
| BALIKESİR RES (ENERJİSA ENERJİ ÜRETİM A.Ş.) | Wind       | 22,0 | 72.163  | 112,8 | 370.000 |
| BANDIRMA RES (YAPISAN ELEKTRİK ÜRETİM A.Ş.) | Wind       | 5,0  | 15.000  | 35,0  | 105.000 |
| Bozyaka RES                                 | Wind       | 12,0 | 32.000  | 12,0  | 32.000  |
| Dağpazarı RES                               | Wind       | 36,0 | 94.154  | 39,0  | 102.000 |
| Dağpazarı RES                               | Wind       | 3,0  | 7.846   | 39,0  | 102.000 |
| Dinar RES                                   | Wind       | 16,1 | 51.000  | 16,1  | 51.000  |
| Günaydın RES                                | Wind       | 10,0 | 34.000  | 10,0  | 34.000  |
| İnnores                                     | Wind       | 5,0  | 13.826  | 57,5  | 159.000 |
| Karadağ RES                                 | Wind       | 10,0 | 29.000  | 10,0  | 29.000  |
| Kayadüzü RES                                | Wind       | 7,5  | 21.154  | 39,0  | 110.000 |
| Kayadüzü RES                                | Wind       | 25,0 | 70.513  | 39,0  | 110.000 |
| Kayadüzü RES                                | Wind       | 6,5  | 18.333  | 39,0  | 110.000 |
| Kozbeyli RES                                | Wind       | 20,0 | 60.000  | 20,0  | 60.000  |
| MATRİSTEPE RES                              | Wind       | 27,5 | 51.474  | 39,0  | 73.000  |
| MATRİSTEPE RES                              | Wind       | 11,5 | 21.526  | 39,0  | 73.000  |
| POYRAZ RES                                  | Wind       | 14,0 | 54.880  | 50,0  | 196.000 |
| POYRAZ RES                                  | Wind       | 20,0 | 78.400  | 50,0  | 196.000 |
| POYRAZ RES                                  | Wind       | 16,0 | 62.720  | 50,0  | 196.000 |
| SAMURLU RES                                 | Wind       | 12,0 | 32.727  | 22,0  | 60.000  |
| SAMURLU RES                                 | Wind       | 10,0 | 27.273  | 22,0  | 60.000  |
| SOMA RES                                    | Wind       | 24,0 | 66.809  | 140,1 | 390.000 |
| SOÖKE ÇATALBÜK RES                          | Wind       | 18,0 | 55.800  | 30,0  | 93.000  |
| SÖKE ÇATALBÜK RES                           | Wind       | 12,0 | 37.200  | 30,0  | 93.000  |

|            |                      |         |              |      |        |
|------------|----------------------|---------|--------------|------|--------|
| ŞENKÖY RES | Wind                 | 26,0    | 74.000       | 26,0 | 74.000 |
|            | Renewable 2012 Total | 164,6   | 561.315,0    |      |        |
| 2012 TOTAL |                      | 3.809,4 | 16.383.362,7 |      |        |

| 2011                                         |             |                                     |                      |                                  |                          |
|----------------------------------------------|-------------|-------------------------------------|----------------------|----------------------------------|--------------------------|
| Plant Name                                   | Fuel Type   | Add ed Inst alle d Cap acit y<br>MW | Gen erati on<br>MW h | Total Install ed Capac ity<br>MW | Total Gener ation<br>MWh |
| Akım Enerji Başpınar (Süper Film)            | Natural Gas | 25,32                               | 177.000              | 25,32                            | 177.000                  |
| Aksa Akriklik                                | Natural Gas | 25,00                               | 189.076              | 59,50                            | 450.000                  |
| Aksa Enerji (Antalya)                        | Natural Gas | 300,00                              | 1.800.000            | 1.450,00                         | 8.700.000                |
| Aksa Enerji (Antalya) İlave                  | Natural Gas | 300,00                              | 1.800.000            | 1.450,00                         | 8.700.000                |
| Aldaş Altyapı Yönetim Danışmanlık            | Natural Gas | 1,95                                | 15.000               | 1,95                             | 15.000                   |
| Aliağa Çakmaktepe Enerji (İlave)             | Natural Gas | 130,95                              | 985.876              | 244,40                           | 1.840.000                |
| Aliağa Çakmaktepe Enerji (İlave)             | Natural Gas | 8,73                                | 65.725               | 244,40                           | 1.840.000                |
| Bosen Enerji Elektrik Üretim A.Ş.            | Natural Gas | 93,00                               | 698.092              | 235,80                           | 1.770.000                |
| Boyteks Tekstil San ve Tic. A.Ş.             | Natural Gas | 8,60                                | 67.000               | 8,60                             | 67.000                   |
| Cengiz Çift Yakıtlı K.Ç.E.S.                 | Natural Gas | 131,34                              | 985.000              | 131,34                           | 985.000                  |
| Cengiz Enerji San ve Tic A.Ş.                | Natural Gas | 35,00                               | 281.289              | 238,90                           | 1.920.000                |
| Fraport IC İçtaş Antalya Havalimanı          | Natural Gas | 8,00                                | 64.000               | 8,00                             | 64.000                   |
| Global Enerji (Çorlu) (İlave)                | Natural Gas | 4,00                                | 29.909               | 24,30                            | 181.700                  |
| Gordion AVM (Redevco Üç Emlak)               | Natural Gas | 2,01                                | 15.030               | 2,01                             | 15.000                   |
| Goren-1 (Gaziantep Organize San)             | Natural Gas | 48,65                               | 277.000              | 48,65                            | 277.000                  |
| Gülle Enerji (Çorlu) (İlave)                 | Natural Gas | 3,90                                | 17.989               | 10,20                            | 47.000                   |
| Hamitabat (Lisans Tadili)                    | Natural Gas | 36,00                               | 211.889              | 1.156,00                         | 6.804.000                |
| Hasırcı Tekstil Tic ve San Ltd Şti           | Natural Gas | 2,00                                | 15.000               | 2,00                             | 15.000                   |
| HG Enerji Elektrik Üret. San. Tic. A.Ş.      | Natural Gas | 52,38                               | 366.000              | 52,38                            | 366.000                  |
| Isparta Mensucat (Isparta)                   | Natural Gas | 4,30                                | 33.000               | 4,30                             | 33.000                   |
| İstanbul Sabiha Gökçen Ul. Ar. Hav.          | Natural Gas | 4,00                                | 32.000               | 4,00                             | 32.000                   |
| Knauf İnş. Ve Yapı Elemanlar Sn.             | Natural Gas | 1,56                                | 12.000               | 1,56                             | 12.000                   |
| Lokman Hekim Engürü Sağ. (Sincan)            | Natural Gas | 0,51                                | 4.031                | 0,51                             | 4.000                    |
| MOSB Enerji Elektrik Üretim Ltd. Şti (İlave) | Natural Gas | 43,50                               | 347.864              | 128,30                           | 1.026.000                |
| Nuh Enerji El. Ürt. A.Ş. (İlave)             | Natural Gas | 119,98                              | 900.000              | 119,98                           | 900.000                  |
| ODAŞ Doğalgaz KÇS (Odaş Elektrik)            | Natural Gas | 54,96                               | 415.000              | 54,96                            | 415.000                  |

|                                          |                               |                 |                      |        |         |
|------------------------------------------|-------------------------------|-----------------|----------------------|--------|---------|
| Polyplex Europa Polyester Film           | Natural Gas                   | 3,90            | 30.6<br>98           | 11,70  | 92.000  |
| Samsun Tekeköy En. San. (Aksa En.)       | Natural Gas                   | 131,34          | 979.963              | 131,34 | 980.000 |
| Samur Halı A.Ş.                          | Natural Gas                   | 4,30            | 33.000               | 4,30   | 33.000  |
| Sarah Halı A.Ş.                          | Natural Gas                   | 4,29            | 33.000               | 4,29   | 33.000  |
| Şanlıurfa OSB (Rasa Enerji Ür. A.Ş.)     | Natural Gas                   | 116,76          | 800.000              | 116,76 | 800.000 |
| Tekirdağ - Çorlu Teks. Tes (Nil Örne)    | Natural Gas                   | 2,68            | 20.976               | 2,68   | 21.000  |
| Tirenda Tire Enerji Üretim A.Ş.          | Natural Gas                   | 58,38           | 410.000              | 58,38  | 410.000 |
| Tüpraş O.A. Rafineri (Kırıkkale) (İlave) | Natural Gas                   | 12,00           | 84.783               | 46,00  | 325.000 |
| Yeni uşak Enerji Elektrik Santrali       | Natural Gas                   | 8,73            | 65.000               | 8,73   | 65.000  |
| Zorlu Enerji (B. Karıştırıcı)            | Natural Gas                   | 7,20            | 54.073               | 122,50 | 920.000 |
|                                          | <b>Natural Gas 2011 Total</b> | <b>1.795,22</b> | <b>12.316.263,87</b> |        |         |

|                                         |                            |               |                     |        |           |
|-----------------------------------------|----------------------------|---------------|---------------------|--------|-----------|
| Eti Bor (Borik Asit) (Emet)(Düzeltilme) | Fuel Oil                   | 0,60          | 4.473               | 11,00  | 82.000    |
| Karkey (Silopi 1)                       | Fuel Oil                   | 100,44        | 701.152             | 171,90 | 1.200.000 |
| Mardin-Kızıltepe (Aksa Enerji)          | Fuel Oil                   | 32,10         | 225.000             | 32,10  | 225.000   |
| Toros Tarım (Mersin) (Nafta+Doğalgaz)   | Fuel Oil                   | 12,14         | 95.968              | 12,14  | 96.000    |
|                                         | <b>Fuel Oil 2011 Total</b> | <b>145,28</b> | <b>1.026.592,93</b> |        |           |

|                                  |                        |               |                  |        |           |
|----------------------------------|------------------------|---------------|------------------|--------|-----------|
| Bekirli TES (İçdaş Elektrik En.) | Coal                   | 600,00        | 4.320.000        | 600,00 | 4.320.000 |
|                                  | <b>Coal 2011 Total</b> | <b>600,00</b> | <b>4.320.000</b> |        |           |

|                                        |       |       |         |        |         |
|----------------------------------------|-------|-------|---------|--------|---------|
| Çeşmebaşı REG ve HES (Gimak En.)       | Hydro | 8,20  | 17.000  | 8,20   | 17.000  |
| Çukurçayı HES (Aydemir Elektrik Ür.)   | Hydro | 1,80  | 4.000   | 1,80   | 4.000   |
| Darca HES (Bükör Elektrik Üretim)      | Hydro | 8,91  | 35.000  | 8,91   | 35.000  |
| Değirmendere (Kadirli) (KA-FNİH Elek.) | Hydro | 0,50  | 800     | 0,50   | 800     |
| Derme (Kayseri ve Civarı Enerji)       | Hydro | 4,50  | 7.000   | 4,50   | 7.000   |
| Duru 2 REG ve HES (Durucasu Elektrik)  | Hydro | 4,49  | 13.000  | 4,49   | 13.000  |
| Erenköy REG ve HES (Nehir Enerji)      | Hydro | 21,46 | 48.991  | 21,46  | 49.000  |
| Erkenek (Kayseri ve Civarı Enerji)     | Hydro | 0,32  | 500     | 0,32   | 500     |
| Eşen 1 HES (Göllaş Enerji Elektrik)    | Hydro | 30,00 | 65.000  | 60,00  | 130.000 |
| Eşen 1 HES (Göllaş Enerji Elektrik)    | Hydro | 30,00 | 65.000  | 60,00  | 130.000 |
| Girlevik (Boydak Enerji)               | Hydro | 3,04  | 19.000  | 3,04   | 19.000  |
| Gökmen REG ve HES (Su-Gücü Elektrik)   | Hydro | 2,87  | 7.997   | 2,87   | 8.000   |
| Hacıninoğlu HES (Enerji SA Enerji)     | Hydro | 71,14 | 101.986 | 142,30 | 204.000 |
| Hacıninoğlu HES (Enerji SA Enerji)     | Hydro | 71,14 | 101.986 | 142,30 | 204.000 |

|                                        |       |            |             |        |             |
|----------------------------------------|-------|------------|-------------|--------|-------------|
| Hakkari (Otluca) (NAS Enerji A.Ş.)     | Hydro | 1,28       | 8.10<br>7   | 3,00   | 19.000      |
| Hasanlar                               | Hydro | 9,35       | 29.6<br>00  | 9,35   | 29.600      |
| Hasanlar HES (Düzce Enerji Birliği)    | Hydro | 4,68       | 12.0<br>00  | 4,68   | 12.000      |
| İncirli REG ve HES (Laskar Enerji)     | Hydro | 25,2<br>0  | 71.0<br>00  | 25,20  | 71.000      |
| İnegöl (Cerrah) (Kent Solar Elektrik)  | Hydro | 0,27       | 806         | 0,27   | 800         |
| İznik (Dereköy) (Kent Solar Elektrik)  | Hydro | 0,24       | 900         | 0,24   | 900         |
| Kalkandere REG ve Yokuşlu HES          | Hydro | 23,3<br>6  | 61.6<br>36  | 37,90  | 100.00<br>0 |
| Karaçay (Osmaniye)(KA-FNİH) Elektrik   | Hydro | 0,40       | 2.00<br>0   | 0,40   | 2.000       |
| Karasu 4-2 HES (İdeal Enerji Üretim)   | Hydro | 10,3<br>5  | 33.0<br>00  | 10,35  | 33.000      |
| Karasu 4-3 HES (İdeal Enerji Üretim)   | Hydro | 4,60       | 12.0<br>00  | 4,60   | 12.000      |
| Karasu 5 HES (İdeal Enerji Üretim)     | Hydro | 4,10       | 14.0<br>00  | 4,10   | 14.000      |
| Karasu I HES (İdeal Enerji Üretim)     | Hydro | 3,84       | 11.0<br>00  | 3,84   | 11.000      |
| Karasu II HES (İdeal Enerji Üretim)    | Hydro | 3,08       | 8.00<br>0   | 3,08   | 8.000       |
| Kayadibi (Bartın) (İvme Elektromek.)   | Hydro | 0,46       | 2.01<br>7   | 0,46   | 2.000       |
| Kazankaya REG ve İncesuyu HES (Aksa)   | Hydro | 15,0<br>0  | 27.0<br>00  | 15,00  | 27.000      |
| Kernek (Kayseri ve Cıvırı Enerji)      | Hydro | 0,83       | 6.01<br>4   | 0,83   | 6.000       |
| Kesme REG ve HES (Kıvanç Enerji)       | Hydro | 2,31       | 4.51<br>0   | 4,60   | 9.000       |
| Kesme REG ve HES (Kıvanç Enerji)       | Hydro | 2,31       | 4.51<br>0   | 4,60   | 9.000       |
| Kıran HES (Arşan Enerji A.Ş.)          | Hydro | 9,74       | 23.0<br>00  | 9,74   | 23.000      |
| Koruköy HES (Akar Enerji San ve Tic)   | Hydro | 3,03       | 13.0<br>00  | 3,03   | 13.000      |
| Kovada I (Batiçim Enerji Elektrik)     | Hydro | 8,25       | 1.60<br>0   | 8,25   | 1.600       |
| Kovada II (Batiçim Enerji Elektrik)    | Hydro | 51,2<br>0  | 24.4<br>00  | 51,20  | 24.400      |
| Kozdere HES (Ado Madencilik Elekt.)    | Hydro | 3,15       | 7.98<br>7   | 3,15   | 8.000       |
| Köyobaşı HES (Şirikoğlu Elektrik)      | Hydro | 1,07       | 3.00<br>0   | 1,07   | 3.000       |
| Kulp I HES (Yıldızlar Enerji Elk. Ür.) | Hydro | 22,9<br>2  | 44.0<br>00  | 22,92  | 44.000      |
| Kumköy HES (AES-İC İçtaş Enerji)       | Hydro | 17,4<br>9  | 55.0<br>00  | 17,49  | 55.000      |
| Kuzuculu (Dörtöy) (Ka-FNİH Elektrik)   | Hydro | 0,27       | 1.00<br>7   | 0,27   | 1.000       |
| M. Kemalpaşa (Suutçu) (Kent Solar)     | Hydro | 0,47       | 1.30<br>6   | 0,47   | 1.300       |
| Malazgirt (Mostar Enerji Elektrik)     | Hydro | 1,22       | 2.99<br>0   | 1,22   | 3.000       |
| Adilcevaz(Mostar Enerji Elektrik)      | Hydro | 0,39       | 505         | 0,39   | 500         |
| Ahlat (Mostar Enerji Elektrik)         | Hydro | 0,20       | 503         | 0,20   | 500         |
| Aksu REG. Ve HES (Kalen Enerji)        | Hydro | 5,20       | 12.0<br>00  | 5,20   | 12.000      |
| Alkumru Barajı ve HES (Limak Hid.)     | Hydro | 174,<br>18 | 311.<br>368 | 261,80 | 468.00<br>0 |
| Alkumru Barajı ve HES (Limak Hid.)     | Hydro | 87,0<br>9  | 155.<br>684 | 261,80 | 468.00<br>0 |
| Ayrancılar HES (Muradiye Elektrik)     | Hydro | 18,7<br>2  | 43.7<br>34  | 32,10  | 75.000      |
| Ayrancılar HES (Muradiye Elektrik)     | Hydro | 13,3<br>8  | 31.2<br>55  | 32,10  | 75.000      |
| Balkondu I HES (BTA Elektrik Enerji)   | Hydro | 9,19       | 20.0<br>02  | 9,19   | 20.000      |
| Batman                                 | Hydro | 0,48       | 1.07<br>7   | 198,50 | 450.00<br>0 |
| Bayburt (Boydak Enerji)                | Hydro | 0,40       | 1.68        | 0,40   | 1.700       |

|                                         |       |           | 3           |        |             |
|-----------------------------------------|-------|-----------|-------------|--------|-------------|
| Bayramhacılı Barajı ve HES              | Hydro | 47,0<br>0 | 95.0<br>00  | 47,00  | 95.000      |
| Berdan                                  | Hydro | 10,2<br>0 | 15.0<br>00  | 10,20  | 15.000      |
| Besni (Kayseri ve Civarı Enerji)        | Hydro | 0,27      | 201         | 0,27   | 200         |
| Boğuntu HES (Beyobası Enerji)           | Hydro | 3,80      | 10.0<br>03  | 3,80   | 10.000      |
| Bünyan (Kayseri ve Civarı El. Taş.)     | Hydro | 1,16      | 3.20<br>0   | 1,16   | 3.200       |
| Cevheri I II REG ve HES (Özcevhner En.) | Hydro | 16,3<br>6 | 32.0<br>00  | 16,36  | 32.000      |
| Çağ Çağ (NAAS Enerji A.Ş.)              | Hydro | 14,4<br>0 | 22.0<br>00  | 14,40  | 22.000      |
| Çakırman REG ve HES (Yusaka En.)        | Hydro | 6,98      | 15.0<br>00  | 6,98   | 15.000      |
| Çamardı (Kayseri ve Civarı Elek. Taş.)  | Hydro | 0,07      | 100         | 0,07   | 100         |
| Çamlıca III HES (Çamlıca Elektrik)      | Hydro | 27,6<br>2 | 24.9<br>98  | 27,62  | 25.000      |
| Çamlıkaya REG ve HES (Çamlıkaya En)     | Hydro | 2,82      | 3.65<br>5   | 8,50   | 11.000      |
| Çanakçı HES (Can Enerji Entegre)        | Hydro | 4,63      | 10.9<br>60  | 9,30   | 22.000      |
| Çanakçı HES (Can Enerji Entegre)        | Hydro | 4,63      | 10.9<br>60  | 9,30   | 22.000      |
| Çemişkezek (Boydak Enerji)              | Hydro | 0,12      | 500         | 0,12   | 500         |
| Menge Barajı ve HES (EnerjiSA Enerji)   | Hydro | 44,7<br>1 | 58.0<br>00  | 44,71  | 58.000      |
| Molu Enerji (Zamanlı Bahçelik HES)      | Hydro | 4,17      | 30.0<br>00  | 4,17   | 30.000      |
| Muratlı REG ve HES (Armahes El.)        | Hydro | 26,7<br>0 | 55.0<br>00  | 26,70  | 55.000      |
| Narinkale REG ve HES (EBD Enerji)       | Hydro | 30,4<br>0 | 55.3<br>55  | 33,50  | 61.000      |
| Otluca I HES (Beyobası Enerji Ür)       | Hydro | 37,5<br>4 | 99.9<br>97  | 37,54  | 100.00<br>0 |
| Otluca II HES (Beyobası Enerji Ür)      | Hydro | 6,36      | 15.0<br>00  | 6,36   | 15.000      |
| Ören REG ve HES (Çelikler Elektrik)     | Hydro | 6,64      | 16.0<br>00  | 6,64   | 16.000      |
| Pınarbaşı (Kayseri ve Civarı El. Taş)   | Hydro | 0,10      | 297         | 0,10   | 300         |
| Poyraz HES (Yeşil Enerji Elektrik)      | Hydro | 2,66      | 6.00<br>0   | 2,66   | 6.000       |
| Saraçbendi HES (Çamlıca Elektrik)       | Hydro | 25,4<br>8 | 57.0<br>00  | 25,48  | 57.000      |
| Sarıkavak HES (Eser Enerji Yat. A.Ş.)   | Hydro | 8,06      | 24.0<br>00  | 8,06   | 24.000      |
| Sayan HES (Karel Elektrik Üretim)       | Hydro | 14,9<br>0 | 26.9<br>93  | 14,90  | 27.000      |
| Sefaköy HES (Püre Enerji Üretim A.Ş.)   | Hydro | 33,1<br>1 | 68.0<br>00  | 33,11  | 68.000      |
| Daren HES Elektrik (Seyrantepe)         | Hydro | 49,7<br>0 | 140.<br>875 | 56,80  | 161.00<br>0 |
| Seyrantepe HES (Düzeltilme)             | Hydro | 7,14      | 20.2<br>38  | 56,80  | 161.00<br>0 |
| Sızır (Kayseri ve Civarı Elek. Taş.)    | Hydro | 5,76      | 35.0<br>00  | 5,76   | 35.000      |
| Söğütlükaya (Posof III) HES             | Hydro | 6,13      | 18.0<br>00  | 6,13   | 18.000      |
| Tefen HES (Aksu Madencilik San.)        | Hydro | 22,0<br>0 | 53.3<br>33  | 33,00  | 80.000      |
| Tefen HES (Aksu Madencilik San.)        | Hydro | 11,0<br>0 | 26.6<br>67  | 33,00  | 80.000      |
| Tektuğ (Erkenek)                        | Hydro | 0,51      | 1.18<br>6   | 13,00  | 30.000      |
| Turunçova (Finike) (Turunçova En.)      | Hydro | 0,55      | 80          | 55,00  | 8.000       |
| Tuztaşı HES (Gürüz Elek. Üretim)        | Hydro | 1,61      | 5.98<br>1   | 1,61   | 6.000       |
| Uluabat Kuv. Tün. Ve HES (Düzeltilme)   | Hydro | 2,98      | 6.85<br>4   | 100,00 | 230.00<br>0 |
| Uludure (Nas Enerji A.Ş.)               | Hydro | 0,64      | 2.60<br>0   | 0,64   | 2.600       |

|                                       |                         |                      |                               |        |             |
|---------------------------------------|-------------------------|----------------------|-------------------------------|--------|-------------|
| Üzümlü HES (Akgün Enerji Üretim)      | Hydro                   | 11,3<br>6            | 22.9<br>96                    | 11,36  | 23.000      |
| Varto (Mostar Enerji Elektrik)        | Hydro                   | 0,29                 | 604                           | 0,29   | 600         |
| Yamaç HES (Yamaç Enerji Üretim A.Ş.)  | Hydro                   | 5,46                 | 10.0<br>00                    | 5,46   | 10.000      |
| Yapısan (Karıca REG ve Darıca I HES)  | Hydro                   | 13,3<br>2            | 24.5<br>15                    | 110,30 | 203.00<br>0 |
| Yaprak II HES (Nisan Elektromek)      | Hydro                   | 5,40                 | 10.5<br>00                    | 10,80  | 21.000      |
| Yaprak II HES (Nisan Elektromek)      | Hydro                   | 5,40                 | 10.5<br>00                    | 10,80  | 21.000      |
| Yaşıl HES (Yaşıl Enerji Elektrik)     | Hydro                   | 1,52                 | 3.19<br>6                     | 3,80   | 8.000       |
| Yaşıl HES (Yaşıl Enerji Elektrik)     | Hydro                   | 2,28                 | 4.79<br>2                     | 3,80   | 8.000       |
| Yedigöl REG. Ve HES (Yedigöl Hidr.)   | Hydro                   | 21,9<br>0            | 42.0<br>00                    | 21,90  | 42.000      |
| Yedigöze HES (Yedigöze Elek.) (İlave) | Hydro                   | 155,<br>33           | 133.<br>983                   | 310,70 | 268.00<br>0 |
|                                       | <b>Hydro 2011 Total</b> | <b>1.50<br/>9,22</b> | <b>2.87<br/>9.57<br/>8,98</b> |        |             |

|                                           |                |           |             |        |             |
|-------------------------------------------|----------------|-----------|-------------|--------|-------------|
| Bolu Belediyesi Çöp Top. Tes. Biyogaz     | Biogas         | 1,13      | 7.50<br>0   | 1,13   | 7.500       |
| CEV Enerji Üretim (Gaziantep Çöp Biyogaz) | Biogas         | 4,52      | 29.3<br>66  | 5,70   | 37.000      |
| ITC Adana Enerji Üretim (İlave)           | Biogas         | 1,42      | 83.0<br>00  | 1,42   | 83.000      |
| ITC-Ka En (Aslım Biyokütle) Konya         | Biogas         | 4,25      | 33.1<br>41  | 5,70   | 44.500      |
| ITC-Ka En (Aslım Biyokütle) Konya         | Biogas         | 1,42      | 11.0<br>47  | 5,70   | 44.500      |
| ITC-Ka Enerji (Sincan) (İlave)            | Biogas         | 1,42      | 11.0<br>55  | 5,70   | 44.500      |
| ITC-Ka Enerji Mamak Katı Atık Top.        | Biogas         | 2,83      | 18.9<br>14  | 25,40  | 170.00<br>0 |
| Kayseri Katı Atık Deponi Sahası           | Biogas         | 1,56      | 12.0<br>00  | 1,56   | 12.000      |
| Aydın/Germencik Jeotermal                 | Geotherm<br>al | 20,0<br>0 | 150.<br>000 | 20,00  | 150.00<br>0 |
| Akres (Akhisar Rüzgar En. Elekt.)         | Wind           | 20,0<br>0 | 64.3<br>84  | 43,80  | 141.00<br>0 |
| Akres (Akhisar Rüzgar En. Elekt.)         | Wind           | 20,0<br>0 | 64.3<br>84  | 43,80  | 141.00<br>0 |
| Akres (Akhisar Rüzgar En. Elekt.)         | Wind           | 3,75      | 12.0<br>72  | 43,80  | 141.00<br>0 |
| Ayvacak RES (Ayres Ayvacık Rüzgar)        | Wind           | 5,00      | 15.0<br>00  | 5,00   | 15.000      |
| Baki Elektrik Şamlı Rüzgar (İlave)        | Wind           | 24,0<br>0 | 78.9<br>47  | 114,00 | 375.00<br>0 |
| Bandırma Enerji (Bandırma RES)            | Wind           | 3,00      | 5.62<br>5   | 24,00  | 45.000      |
| Çanakkale RES (Enerji-SA Enerji)          | Wind           | 25,3<br>0 | 66.0<br>00  | 29,90  | 78.000      |
| Çanakkale RES (Enerji-SA Enerji)          | Wind           | 4,60      | 12.0<br>00  | 29,90  | 78.000      |
| Çataltepe RES (Alize Enerji Elektrik)     | Wind           | 16,0<br>0 | 44.0<br>00  | 16,00  | 44.000      |
| Innores Elektrik Yuntdağ Rüzgar           | Wind           | 10,0<br>0 | 27.6<br>19  | 52,50  | 145.00<br>0 |
| Killik RES (Pem Enerji A.Ş.)              | Wind           | 20,0<br>0 | 36.5<br>00  | 40,00  | 73.000      |
| Killik RES (Pem Enerji A.Ş.)              | Wind           | 15,0<br>0 | 27.3<br>75  | 40,00  | 73.000      |
| Killik RES (Pem Enerji A.Ş.)              | Wind           | 5,00      | 9.12<br>5   | 40,00  | 73.000      |
| Sares RES (Garet Enerji Üretim)           | Wind           | 7,50      | 17.0<br>00  | 22,50  | 51.000      |
| Seyitali RES (Doruk Enerji Elektrik)      | Wind           | 30,0<br>0 | 94.0<br>00  | 30,00  | 94.000      |
| Soma RES (Soma Enerji) (İlave)            | Wind           | 20,0<br>0 | 55.6<br>42  | 116,10 | 323.00<br>0 |
| Soma RES (Soma Enerji) (İlave)            | Wind           | 16,9<br>0 | 47.0<br>17  | 116,10 | 323.00<br>0 |

|                                       |      |                    |                             |       |             |
|---------------------------------------|------|--------------------|-----------------------------|-------|-------------|
| Susurluk RES (Alantek Enerji Üret.)   | Wind | 12,5<br>0          | 26.6<br>67                  | 45,00 | 96.000      |
| Susurluk RES (Alantek Enerji Üret.)   | Wind | 10,0<br>0          | 21.3<br>33                  | 45,00 | 96.000      |
| Susurluk RES (Alantek Enerji Üret.)   | Wind | 12,5<br>0          | 26.6<br>67                  | 45,00 | 96.000      |
| Susurluk RES (Alantek Enerji Üret.)   | Wind | 10,0<br>0          | 21.3<br>33                  | 45,00 | 96.000      |
| Şah RES (Galata Wind Enerji Ltd. Şti) | Wind | 63,0<br>0          | 231.<br>000                 | 93,00 | 341.00<br>0 |
| Şah RES (Galata Wind Enerji Ltd. Şti) | Wind | 27,0<br>0          | 99.0<br>00                  | 93,00 | 341.00<br>0 |
| Şah RES (Galata Wind Enerji Ltd. Şti) | Wind | 3,00               | 11.0<br>00                  | 93,00 | 341.00<br>0 |
| Turguttepe RES (Sabaş Elektrik)       | Wind | 3,00               | 6.87<br>5                   | 24,00 | 55.000      |
| Ziyaret RES (Ziyaret RES Elektrik)    | Wind | 2,00               | 6.33<br>0                   | 57,50 | 182.00<br>0 |
| <b>Renewabl<br/>e 2011<br/>Total</b>  |      | <b>213,<br/>37</b> | <b>715.<br/>474,<br/>13</b> |       |             |

|                   |  |                   |                             |
|-------------------|--|-------------------|-----------------------------|
| <b>2011 TOTAL</b> |  | <b>4.26<br/>3</b> | <b>21.2<br/>57.9<br/>10</b> |
|-------------------|--|-------------------|-----------------------------|

| 2010                                       |             |                                                              |                               |                                                  |                                    |
|--------------------------------------------|-------------|--------------------------------------------------------------|-------------------------------|--------------------------------------------------|------------------------------------|
| Plant Name                                 | Fuel Type   | Add<br>ed<br>Inst<br>alle<br>d<br>Cap<br>acit<br>y<br><br>MW | Gen<br>erati<br>on<br>MW<br>h | Total<br>Install<br>ed<br>Capac<br>ity<br><br>MW | Total<br>Gener<br>ation<br><br>MWh |
| Can Tekstil (Çorlu/Tekirdağ)               | Natural Gas | 7,83<br>2                                                    | 60.2<br>46                    | 13                                               | 100.00<br>0                        |
| Altınmarka                                 | Natural Gas | 4,6                                                          | 37.0<br>24                    | 8,2                                              | 66.000                             |
| Akbaşlar (İlave)                           | Natural Gas | 1,54                                                         | 12.0<br>78                    | 10,2                                             | 80.000                             |
| Global Enerji (Pelitlik)                   | Natural Gas | 3,54<br>4                                                    | 27.0<br>57                    | 23,8                                             | 181.70<br>0                        |
| Rasa Enerji (Van)                          | Natural Gas | 26,1<br>9                                                    | 166.<br>622                   | 114,9                                            | 731.00<br>0                        |
| Aksa Enerji (Antalya)                      | Natural Gas | 25                                                           | 192.<br>500                   | 850                                              | 6.545.<br>000                      |
| Yıldız Entegre Ağaç (Kocaeli)              | Natural Gas | 12,3<br>68                                                   | 79.7<br>94                    | 18,6                                             | 120.00<br>0                        |
| Ataer Enerji Elektrik Üretim A.Ş.          | Natural Gas | 49                                                           | 277.<br>886                   | 119,2                                            | 676.00<br>0                        |
| Cengiz Enerji San ve Tic A.Ş. (Tekkeköy)   | Natural Gas | 101,<br>95                                                   | 802.<br>000                   | 203,9                                            | 1.604.<br>000                      |
| Uğur Enerji Üretim San ve Tic A.Ş.         | Natural Gas | 48,2                                                         | 405.<br>136                   | 60,2                                             | 506.00<br>0                        |
| Aksa Enerji (Antalya)                      | Natural Gas | 25                                                           | 192.<br>500                   | 850                                              | 6.545.<br>000                      |
| Altek Alarko Elektrik Santralleri          | Natural Gas | 60,1                                                         | 415.<br>570                   | 164                                              | 1.134.<br>000                      |
| Flokser Tekstil (Çerkezköy/Tekirdağ)       | Natural Gas | 5,2                                                          | 42.0<br>00                    | 5,2                                              | 42.000                             |
| RB Karesi İthalat İhracat Tekstil          | Natural Gas | 8,6                                                          | 65.0<br>00                    | 8,6                                              | 65.000                             |
| Cengiz Enerji San ve Tic A.Ş. (Tekkeköy)   | Natural Gas | 101,<br>95                                                   | 802.<br>000                   | 203,9                                            | 1.604.<br>000                      |
| Keskinoğlu Tavukçuluk ve Dam. İşl.         | Natural Gas | 3,5                                                          | 25.0<br>00                    | 3,5                                              | 25.000                             |
| Binatom Elektrik Üretim A.Ş.               | Natural Gas | 2                                                            | 13.0<br>00                    | 2                                                | 13.000                             |
| Can Enerji Elektrik Üretim A.Ş. (Tekirdağ) | Natural Gas | 29,1                                                         | 203.<br>000                   | 29,1                                             | 203.00<br>0                        |
| Kurtoğlu Bakır Kurşun San                  | Natural     | 1,6                                                          | 12.0                          | 1,6                                              | 12.000                             |

|                                              |                               |            |                                        |       |        |
|----------------------------------------------|-------------------------------|------------|----------------------------------------|-------|--------|
| ve A.Ş.                                      | Gas                           |            | 00                                     |       |        |
| Sönmez Enerji Üretim (Uşak)                  | Natural Gas                   | 33,2       | 256.                                   |       | 545.10 |
|                                              |                               | 42         | 297                                    | 70,7  | 0      |
| Kırka Boraks (Kırka) (Eti Maden İşl) (İlave) | Natural Gas                   | 10         | 65.9                                   |       | 120.00 |
|                                              |                               |            | 34                                     | 18,2  | 0      |
| Enerji SA (Bandırma)                         | Natural Gas                   | 930,8      | 7.54                                   |       | 7.540. |
|                                              |                               |            | 0.00                                   | 930,8 | 000    |
| Uğur Enerji Üretim San ve Tic A.Ş. (İlave)   | Natural Gas                   | 12         | 100.                                   |       | 506.00 |
|                                              |                               |            | 864                                    | 60,2  | 0      |
| Marmara Pamuklu Mensucat (İlave)             | Natural Gas                   | 26,1       | 203.                                   |       | 543.00 |
|                                              |                               | 9          | 450                                    | 69,9  | 0      |
| Aliağa Çakmaktepe Enerji (İlave)             | Natural Gas                   | 69,8       | 557.                                   |       | 836.40 |
|                                              |                               | 4          | 920                                    | 104,7 | 0      |
| Sönmez Enerji Üretim (Uşak) (İlave)          | Natural Gas                   | 2,56       | 19.7                                   |       | 545.10 |
|                                              |                               | 4          | 69                                     | 70,7  | 0      |
| Polyplex Europa Polyester Film               | Natural Gas                   | 7,8        | 61.0                                   |       | 61.000 |
|                                              |                               |            | 00                                     | 7,8   |        |
| Altek Alarko Elektrik Santralleri            | Natural Gas                   | 21,8       | 151.                                   |       | 1.134. |
|                                              |                               | 9          | 361                                    | 164   | 000    |
| Rasa Enerji (Van) (İlave)                    | Natural Gas                   | 10,1       | 64.4                                   |       | 731.00 |
|                                              |                               | 24         | 09                                     | 114,9 | 0      |
| International Hospital İstanbul A.Ş.         | Natural Gas                   | 0,8        | 6.00                                   |       | 6.000  |
|                                              |                               |            | 0                                      | 0,8   |        |
|                                              | <b>Natural Gas 2010 Total</b> | <b>139</b> | <b>1.06</b><br><b>3.90</b><br><b>9</b> |       |        |

|                                 |                            |           |                           |    |        |
|---------------------------------|----------------------------|-----------|---------------------------|----|--------|
| Tüpraş Rafineri (İzmit) (İlave) | Fuel Oil                   | 40        | 258.                      | 85 | 550.00 |
|                                 |                            |           | 824                       |    | 0      |
|                                 | <b>Fuel Oil 2010 Total</b> | <b>40</b> | <b>258.</b><br><b>824</b> |    |        |

|                                            |                           |          |          |       |        |
|--------------------------------------------|---------------------------|----------|----------|-------|--------|
| Eti Soda Üre. Paz. Nak. Ve Elek. Üre. San. | Lignite                   | 24       | 144.     | 24    | 144.00 |
|                                            |                           |          | 000      |       | 0      |
| Konya Şeker San. Ve Tic. A.Ş.              | Lignite                   | 6        | 11.5     | 147,5 | 285.00 |
|                                            |                           |          | 93       |       | 0      |
|                                            | <b>Lignite 2010 Total</b> | <b>0</b> | <b>0</b> |       |        |

|                                          |                        |             |                                        |      |        |
|------------------------------------------|------------------------|-------------|----------------------------------------|------|--------|
| Eren Enerji Elektrik Üretim A.Ş.         | Coal                   | 160         | 1.06                                   |      | 9.080. |
|                                          |                        |             | 8.23                                   | 1360 | 000    |
|                                          |                        |             | 5                                      |      |        |
| Eren Enerji Elektrik Üretim A.Ş. (İlave) | Coal                   | 600         | 4.00                                   |      | 9.080. |
|                                          |                        |             | 5.88                                   | 1360 | 000    |
|                                          |                        |             | 2                                      |      |        |
| Eren Enerji Elektrik Üretim A.Ş. (İlave) | Coal                   | 600         | 4.00                                   |      | 9.080. |
|                                          |                        |             | 5.88                                   | 1360 | 000    |
|                                          |                        |             | 2                                      |      |        |
|                                          | <b>Coal 2010 Total</b> | <b>1200</b> | <b>8.01</b><br><b>1.76</b><br><b>5</b> |      |        |

|                                           |       |      |      |      |        |
|-------------------------------------------|-------|------|------|------|--------|
| Kulp IV HES (Yıldızlar En. Elk. Ür. A.Ş.) | Hydro | 12,3 | 23.0 | 12,3 | 23.000 |
|                                           |       |      | 00   |      |        |
| Cindere Hes (İlave)                       | Hydro | 9,06 | 16.0 |      | 50.000 |
|                                           |       | 5    | 73   | 28,2 |        |
| Bayburt HES (Bayburt Enerji Üret.)        | Hydro | 14,6 | 24.0 | 14,6 | 24.000 |
|                                           |       |      | 00   |      |        |
| Uzunçayır HES (Tunceli) (İlave)           | Hydro | 27,3 | 60.6 |      | 182.00 |
|                                           |       | 3    | 59   | 82   | 0      |
| Alakır HES (Yurt Enerji Üretim)           | Hydro | 2,1  | 4.00 | 2,1  | 4.000  |
|                                           |       |      | 0    |      |        |
| Peta Mühendislik En. (Mursal II Hes)      | Hydro | 4,5  | 11.0 | 4,5  | 11.000 |
|                                           |       |      | 00   |      |        |
| Asa Enerji (Kale Reg ve HES)              | Hydro | 9,6  | 18.0 | 9,6  | 18.000 |
|                                           |       |      | 00   |      |        |
| Hetaş Hacısalıhoğlu (Yıldızlı)            | Hydro | 1,2  | 3.00 | 1,2  | 3.000  |

|                                           |       |      |         |      |         |
|-------------------------------------------|-------|------|---------|------|---------|
| HES)                                      |       |      | 0       |      |         |
| Doğubey Elektrik (Sarimehmet Hes)         | Hydro | 3,1  | 6.00    | 3,1  | 6.000   |
| Nuryol Enerji (Defne Reg ve Hes)          | Hydro | 7,2  | 13.00   | 7,2  | 13.000  |
| Özgür Elektrik (Azmak I Reg. Ve Hes)      | Hydro | 5,91 | 12.0    | 11,8 | 24.000  |
| Birim Hidr. Üretim. AŞ. (Erfelek Hes)     | Hydro | 3,22 | 5.45    | 6,5  | 11.000  |
| Beytel Elek. Ür. A.Ş. (Çataloluk Hes)     | Hydro | 9,5  | 17.00   | 9,5  | 17.000  |
| Nisan E. Mekanik. En. (Başak Reg. HES)    | Hydro | 6,9  | 12.00   | 6,9  | 12.000  |
| Uzunçayır HES (Tunceli) (İlave)           | Hydro | 27,3 | 60.6    | 82   | 182.00  |
| Fırtına Elektrik Ür. A.Ş. (Sümer HES)     | Hydro | 21,6 | 39.00   | 21,6 | 39.000  |
| Karen Karadeniz El. A.Ş. Aralık Hes       | Hydro | 12,4 | 32.00   | 12,4 | 32.000  |
| Birim Hidr. Üretim. AŞ. (Erfelek Hes)     | Hydro | 3,22 | 3.00    | 11,8 | 11.000  |
| Karadeniz El. Üretim (Uzundere 1 Hes)     | Hydro | 31   | 46.3    | 62,2 | 93.000  |
| Akım Enerji (Cevizlik Reg. Ve Hes)        | Hydro | 91,4 | 187.000 | 91,4 | 187.000 |
| Çakıt HES (Çakıt Enerji A.Ş.)             | Hydro | 20,2 | 54.00   | 20,2 | 54.000  |
| Erenler Reg ve Hes (BME Bir Müt. En)      | Hydro | 45   | 48.00   | 45   | 48.000  |
| Paşa Reg ve Hes (Özgür Elektrik)          | Hydro | 8,7  | 19.00   | 8,7  | 19.000  |
| Güzel Çay I HES (İlk Elektrik Enerji)     | Hydro | 3,14 | 9.30    | 8,1  | 24.000  |
| Kale Reg ve Hes (Kale Enerji Üretim A.Ş.) | Hydro | 34,1 | 66.00   | 34,1 | 66.000  |
| Erikli Akocak Reg ve Akocak Hes           | Hydro | 41,2 | 73.00   | 82,5 | 146.00  |
| Çamlıkaya Reg ve Hes                      | Hydro | 5,6  | 11.00   | 5,6  | 11.000  |
| Dinar Hes (Elda Elektrik Üretim)          | Hydro | 4,4  | 9.00    | 4,4  | 9.000   |
| Damlapınar Hes (Cenay Elektrik Üretim)    | Hydro | 16,4 | 52.00   | 16,4 | 52.000  |
| Dim Hes (Diler Elektrik Üretim)           | Hydro | 38,3 | 70.00   | 38,3 | 70.000  |
| Kırpılık Reg. Ve Hes (Özgür Elektrik)     | Hydro | 6,2  | 13.00   | 6,2  | 13.000  |
| Özgür Elektrik (Azmak I Reg. Ve Hes)      | Hydro | 5,91 | 12.0    | 11,8 | 24.000  |
| Yavuz Reg. Ve Hes (Masat Enerji)          | Hydro | 22,5 | 47.00   | 22,5 | 47.000  |
| Kayabükü Reg. Ve Hes (Elite Elek.)        | Hydro | 14,6 | 28.00   | 14,6 | 28.000  |
| Erikli Akocak Reg ve Akocak Hes           | Hydro | 41,2 | 73.00   | 82,5 | 146.00  |
| Gök Reg. Ve Hes (Gök Enerji El. San.)     | Hydro | 10   | 24.00   | 10   | 24.000  |
| Bulam Reg ve Hes (Mem Enerji Elk)         | Hydro | 7    | 19.00   | 7    | 19.000  |
| Karşıyaka Hes (Akua Enerji Üret)          | Hydro | 1,6  | 5.00    | 1,6  | 5.000   |
| Ceyhan Hes (Berkman Hes) (Enova En)       | Hydro | 12,6 | 29.00   | 25,2 | 58.000  |
| Güdü 1 Reg ve Hes (Yaşam Enerji)          | Hydro | 2,4  | 8.00    | 2,4  | 8.000   |
| Ceyhan Hes (Berkman Hes) (Enova En)       | Hydro | 12,6 | 29.00   | 25,2 | 58.000  |
| Tektaş Elektrik (Andırın Hes)             | Hydro | 40,5 | 60.00   | 40,5 | 60.000  |
| Selen Elektrik (Kepezkaya Hes)            | Hydro | 28   | 70.00   | 28   | 70.000  |
| Reşadiye 2 Hes (Turkon Mng Elekt)         | Hydro | 26,1 | 119.000 | 26,1 | 119.000 |
| Kozan Hes (SerEr Enerji)                  | Hydro | 4    | 5.00    | 4    | 5.000   |
| Kahraman Reg ve                           | Hydro | 1,4  | 3.00    | 1,4  | 3.000   |

|                                               |                         |            |                |       |         |
|-----------------------------------------------|-------------------------|------------|----------------|-------|---------|
| Hes(Katırcıoğlu)                              |                         |            | 0              |       |         |
| Narinkale Reg ve HES (EBD Enerji)             | Hydro                   | 3,1        | 6.000          | 3,1   | 6.000   |
| Erenköy Reg ve Hes (Türkerler)                | Hydro                   | 21,5       | 49.000         | 21,5  | 49.000  |
| Kahta I Hes (Erdemyıldız Elek. Ürt)           | Hydro                   | 7,1        | 20.000         | 7,1   | 20.000  |
| Uluabat Kuvvet Tüneli ve Hes                  | Hydro                   | 48,5       | 105.000        | 97    | 210.000 |
| Sabunsuyu II Hes (Ang Enerji Elk)             | Hydro                   | 7,4        | 12.000         | 7,4   | 12.000  |
| Burç Bendi ve Hes (Akkur Enerji)              | Hydro                   | 27,3       | 64.000         | 27,3  | 64.000  |
| Karadeniz El. Üretim (Uzundere 1 Hes) (İlave) | Hydro                   | 31         | 46.350         | 62,2  | 93.000  |
| Murgul Bakı (Ç. Kaya) (İlave)                 | Hydro                   | 19,6       | 31.587         | 24,2  | 39.000  |
| Güzel Çay II HES (İlk Elektrik Enerji)        | Hydro                   | 4,96       | 14.696         | 8,1   | 24.000  |
| Uluabat Kuvvet Tüneli ve Hes (İlave)          | Hydro                   | 48,5       | 105.000        | 97    | 210.000 |
| Reşadiye 1 Hes (Turkon Mng Elekt)             | Hydro                   | 15,6       | 71.126         | 26,1  | 119.000 |
| Egemen 1 Hes (Enersis Elektrik)               | Hydro                   | 8,8        | 18.131         | 19,9  | 41.000  |
| Yedigöze Hes (Yedigöze Elektrik)              | Hydro                   | 155,3      | 268.000        | 155,3 | 268.000 |
| Umut III Reg ve Hes (Nisan Elek)              | Hydro                   | 12         | 15.000         | 12    | 15.000  |
| Feki 2 Barajı (Akkur Enerji)                  | Hydro                   | 69,3       | 126.000        | 69,3  | 126.000 |
| Egemen 1B Hes (Enersis Elektrik)              | Hydro                   | 11,1       | 22.869         | 19,9  | 41.000  |
| Kalkandere Reg ve Yokuşlu Hes                 | Hydro                   | 14,5       | 36.000         | 14,5  | 36.000  |
|                                               | <b>Hydro 2010 Total</b> | <b>418</b> | <b>818.760</b> |       |         |

|                                            |            |       |         |      |         |
|--------------------------------------------|------------|-------|---------|------|---------|
| CEV Enerji Üretim (Gaziantep Çöp Biyogazı) | Biogas     | 1,1   | 8.600   | 1,1  | 8.600   |
| Ortadoğu Enerji (Odayeri) (Eyüp İst)       | Biogas     | 4,245 | 33.357  | 16,9 | 132.800 |
| ITC KA Enerji Sincan                       | Biogas     | 1,416 | 11.126  | 4,2  | 33.000  |
| ITC Adana Biokütle Sant                    | Biogas     | 11,32 | 91.475  | 9,9  | 80.000  |
| Tuzla Jeotermal                            | Geothermal | 7,5   | 55.000  | 7,5  | 55.000  |
| Menderes Geotermal Dora - 2                | Geothermal | 9,5   | 73.000  | 9,5  | 73.000  |
| Rotor Elektrik (Osmaniye RES)              | Wind       | 20    | 64.444  | 135  | 435.000 |
| Asmakinsan (Bandırma 3 RES)                | Wind       | 20    | 37.500  | 24   | 45.000  |
| Soma Enerji Üretim (Soma RES)              | Wind       | 4,5   | 11.364  | 79,2 | 200.000 |
| Rotor Elektrik (Osmaniye RES)              | Wind       | 17,5  | 56.389  | 135  | 435.000 |
| Deniz Elektrik (Sebanoba RES)              | Wind       | 10    | 32.000  | 30   | 96.000  |
| Akdeniz Elektrik (Mersin RES)              | Wind       | 33    | 50.000  | 33   | 50.000  |
| Asmakinsan (Bandırma 3 RES)                | Wind       | 4     | 7.500   | 24   | 45.000  |
| Boreas Enerji (Boreas I Enez RES)          | Wind       | 15    | 42.000  | 15   | 42.000  |
| Rotor Elektrik (Osmaniye RES)              | Wind       | 17,5  | 56.389  | 135  | 435.000 |
| Bergama RES En. Ür. A.Ş. Aliaga RES        | Wind       | 52,5  | 176.167 | 90   | 302.000 |
| Bakras En. Elkt. Ür. A.Ş. Şenbük RES       | Wind       | 15    | 40.000  | 15   | 40.000  |
| Alize Enerji (Keltepe RES)                 | Wind       | 1,8   | 5.391   | 20,7 | 62.000  |

CDM-PDD-FORM

|                                              |      |      |         |      |         |
|----------------------------------------------|------|------|---------|------|---------|
| Rotor Elektrik (Gökçedağ RES)                | Wind | 20   | 64.44   | 135  | 435.000 |
| Soma Enerji Üretim (Soma RES)                | Wind | 7,2  | 18.182  | 79,2 | 200.000 |
| Bergama RES En. Ür. A.Ş. Aliğa RES           | Wind | 37   | 124.156 | 90   | 302.000 |
| Mazi 3 RES Elektrik (Mazi 3 RES)             | Wind | 7,5  | 20.000  | 30   | 80.000  |
| Borasko Enerji (Bandırma RES)                | Wind | 12   | 30.105  | 57   | 143.000 |
| Ziyaret RES (Ziyaret RES Elektrik)           | Wind | 12,5 | 42.500  | 35   | 119.000 |
| Soma Enerji Üretim (Soma RES)                | Wind | 7,2  | 18.182  | 79,2 | 200.000 |
| Soma RES (Bilgin Rüzgar San. En. Ür)         | Wind | 32   | 92.800  | 90   | 261.000 |
| Soma Enerji Üretim (Soma RES)                | Wind | 6,3  | 15.909  | 79,2 | 200.000 |
| Belen Elektrik (Belen RES) (İlave)           | Wind | 6    | 11.667  | 36   | 70.000  |
| Ütopya Elektrik (Düzova RES) (İlave)         | Wind | 15   | 30.000  | 30   | 60.000  |
| Soma RES (Bilgin Rüzgar San. En. Ür) (İlave) | Wind | 27,5 | 79.750  | 90   | 261.000 |
| Soma Enerji Üretim (Soma RES) (İlave)        | Wind | 9    | 22.727  | 79,2 | 200.000 |
| Ziyaret RES (Ziyaret RES Elektrik) (İlave)   | Wind | 22,5 | 76.500  | 35   | 119.000 |
| Rotor Elektrik (Gökçedağ RES) (İlave)        | Wind | 2,5  | 8.056   | 135  | 435.000 |
| Soma RES (Bilgin Rüzgar San) (İlave)         | Wind | 30   | 87.000  | 90   | 261.000 |
| Kuyucak RES (Alize Enerji Üret)              | Wind | 8    | 29.375  | 25,6 | 94.000  |
| Kuyucak RES (Alize Enerji Üret) (İlave)      | Wind | 17,6 | 64.625  | 25,6 | 94.000  |
| Sares RES (Garet Enerji Üretim)              | Wind | 15   | 51.000  | 15   | 51.000  |
| Turguttepe RES (Sabaş Elektrik Ür)           | Wind | 22   | 55.000  | 22   | 55.000  |
| Renewable 2010 Total                         |      | 15   | 51.000  |      |         |

|            |  |       |            |
|------------|--|-------|------------|
| 2010 TOTAL |  | 1.812 | 10.204.257 |
|------------|--|-------|------------|

| 2009                                  |             |                             |                |
|---------------------------------------|-------------|-----------------------------|----------------|
| Plant Name                            | Fuel Type   | Added Installed Capacity MW | Generation MWh |
| Ak Gıda San. Ve Tic. A.Ş. (Pamukova)  | Natural Gas | 7,50                        | 61.000         |
| Aksa Akrilik Kimya San. A.Ş. (Yalova) | Natural Gas | 70,00                       | 539.000        |
| Aksa Enerji (Antalya)                 | Natural Gas | 16,20                       | 124.740        |
| Aksa Enerji (Antalya)                 | Natural Gas | 300,00                      | 2.310.000      |
| Aksa Enerji (Antalya)                 | Natural Gas | 300,00                      | 2.310.000      |
| Aksa Enerji (Manisa)                  | Natural Gas | 10,50                       | 83.144         |
| Antalya Enerji                        | Natural Gas | 41,80                       | 302.096        |
| Arenko Elektrik Üretim A.Ş. (Denizli) | Natural Gas | 12,00                       | 84.000         |
| Bil Enerji (DG+M)(Balgat)             | Natural Gas | 36,60                       | 255.000        |
| Cam İş Elektrik                       | Natural Gas | 126,10                      | 1.008.000      |
| Çelikler Taah. İnş. (Rixox Grand)     | Natural Gas | 2,00                        | 16.000         |
| Dalsan Alçı San. Ve Tic A.Ş.          | Natural Gas | 1,20                        | 9.000          |

CDM-PDD-FORM

|                                           |             |                 |                   |
|-------------------------------------------|-------------|-----------------|-------------------|
| Delta Enerji Üretim ve Tic. A.Ş.          | Natural Gas | 47,00           | 365.817           |
| Delta Enerji Üretim ve Tic. A.Ş.          | Natural Gas | 13,00           | 101.183           |
| Desa Enerji Elektrik Üretim A.Ş.          | Natural Gas | 9,80            | 70.000            |
| E. Şehir. End. Enerji (DG+M)(Eskişehir-2) | Natural Gas | 59,00           | 452.000           |
| Ege Birleşik Enerji (LPG+DG+M)(Aliağa)    | Natural Gas | 12,80           | 107.000           |
| Entek Köseköy (İztek)                     | Natural Gas | 0,80            | 6.366             |
| Entek Köseköy (İztek)                     | Natural Gas | 36,30           | 288.876           |
| Falez Elektrik Üretim A.Ş.                | Natural Gas | 11,70           | 88.000            |
| Global Enerji (Pelitlik)                  | Natural Gas | 8,60            | 65.665            |
| Gül Enerji Elkt. Üret. Sn. Ve Tic. A.Ş.   | Natural Gas | 24,30           | 170.000           |
| Habaş Aliağa                              | Natural Gas | 224,50          | 1.796.000         |
| Hayat Kağıt                               | Natural Gas | 7,50            | 56.000            |
| Kasar Dual Tekstil San. A.Ş. (Çorlu)      | Natural Gas | 5,70            | 38.000            |
| Ken Kipaş Elektrik Üretim (Karen)         | Natural Gas | 41,80           | 180.000           |
| Ken Kipaş Elkt. Ür. (Karen) (K.Maraş)     | Natural Gas | 17,50           | 75.359            |
| Maksi Enerji EeLEKTRİK Üretim A.Ş.        | Natural Gas | 7,70            | 55.000            |
| Marmara Pamuklu Mens. Sn. Tic. A.Ş.       | Natural Gas | 34,90           | 271.533           |
| Mauri Maya San A.Ş.                       | Natural Gas | 0,30            | 2.478             |
| Mauri Maya San A.Ş.                       | Natural Gas | 2,00            | 16.522            |
| Modern Enerji (B. Karıştırılan)           | Natural Gas | 96,80           |                   |
| MOSB Enerji Elektrik Üretim Ltd. Şti.     | Natural Gas | 84,80           | 595.702           |
| Nuh Çimento San. Tic. A.Ş.                | Natural Gas | 47,00           | 329.000           |
| Rasa Enerji (VAN)                         | Natural Gas | 78,60           | 500.000           |
| Selkasan Kağıt Paketleme                  | Natural Gas | 9,90            | 73.000            |
| Sönmez Elektrik (Uşak)                    | Natural Gas | 8,70            | 67.057            |
| Şahinler Enerji (Çorlu/Tekirdağ)          | Natural Gas | 26,00           | 185.000           |
| TAV İstanbul Terminal İşletme A.Ş.        | Natural Gas | 3,30            | 27.612            |
| TAV İstanbul Terminal İşletme A.Ş.        | Natural Gas | 6,50            | 54.388            |
| Tesko Kipa Kitle Paz. Tic. Ve Gıda A.Ş.   | Natural Gas | 2,30            | 18.000            |
| Yurtbay Elektrik Üretim A.Ş.(DG+M)        | Natural Gas | 6,90            | 50.000            |
| Zorlu Enerji (B. Karıştırılan)            | Natural Gas | 49,50           | 394.970           |
| <b>Natural Gas 2009 Total</b>             |             | <b>1.909,40</b> | <b>13.602.509</b> |

|                                  |          |               |                  |
|----------------------------------|----------|---------------|------------------|
| Erdemir (Ereğli-Zonguldak)       | Fuel Oil | 39,20         | 240.000          |
| Habaş Bilecik Paşalar            | Fuel Oil | 18,00         | 144.000          |
| Habaş İzmir Habaş                | Fuel Oil | 36,00         | 288.000          |
| Petkim (Aliağa)                  | Fuel Oil | 222,00        | 1.554.000        |
| Petkim (Aliağa)                  | Fuel Oil | 52,00         | 364.000          |
| Silopi Elektrik Üretim A.Ş.      | Fuel Oil | 44,80         | 315.000          |
| Süper Film (G. Antep)            | Fuel Oil | 25,30         | 203.000          |
| Tire Kutsan (Tire)               | Fuel Oil | 8,00          | 37.000           |
| Tüpraş Rafineri (Aliağa/İzmir)   | Fuel Oil | 24,70         | 171.777          |
| Tüpraş O.A. Rafineri (Kırıkkale) | Fuel Oil | 10,00         | 70.000           |
| Silopi Elektrik Üretim A.Ş.      | Fuel Oil | 135           | 945000           |
| <b>Fuel Oil 2009 Total</b>       |          | <b>615,00</b> | <b>4.331.777</b> |

|                           |         |             |              |
|---------------------------|---------|-------------|--------------|
| Alkim Alkali Kimya        | Lignite | 0,40        | 3.000        |
| <b>Lignite 2009 Total</b> |         | <b>0,40</b> | <b>3.000</b> |

|             |      |        |         |
|-------------|------|--------|---------|
| İçdaş Çelik | Coal | 135,00 | 961.667 |
|-------------|------|--------|---------|

## CDM-PDD-FORM

|             |                        |               |                  |
|-------------|------------------------|---------------|------------------|
| İçdaş Çelik | Coal                   | 135,00        | 961.667          |
|             | <b>Coal 2009 Total</b> | <b>270,00</b> | <b>1.923.333</b> |

|                                       |                         |               |                  |
|---------------------------------------|-------------------------|---------------|------------------|
| Akçay Hes Elektrik Üretim (Akçay HES) | Hydro                   | 28,80         | 45.000           |
| Akua Enerji (Kayalık Reg ve HES)      | Hydro                   | 5,80          | 20.000           |
| Anadolu Elektrik (Çakırlar HES)       | Hydro                   | 16,20         | 28.000           |
| Bağışlı REG ve HES (Ceykar Elekt.)    | Hydro                   | 9,90          | 15.720           |
| Bağışlı REG ve HES (Ceykar Elekt.)    | Hydro                   | 19,70         | 31.280           |
| Bereket Enerji (Koyul Hisar)          | Hydro                   | 42,00         | 155.000          |
| Beyobası En. Ür. A.Ş. (Sırma HES)     | Hydro                   | 5,90          | 11.000           |
| Cindere HES (Denizli)                 | Hydro                   | 19,10         | 30.000           |
| Değirmenüstü En (Kahramanmaraş)       | Hydro                   | 12,90         | 17.378           |
| Denizli Elektrik (EGE I HES)          | Hydro                   | 0,90          | 2.000            |
| Elestaş Elektrik (Yaylabel HES)       | Hydro                   | 5,10          | 10.000           |
| Elestaş Elektrik (Yazı HES)           | Hydro                   | 1,10          | 3.000            |
| Erva Enerji (Kabaca Reg ve HES)       | Hydro                   | 4,20          | 7.412            |
| Erva Enerji (Kabaca Reg ve HES)       | Hydro                   | 4,20          | 7.412            |
| Filyos Enerji (Yalnızca Reg ve HES)   | Hydro                   | 14,40         | 33.000           |
| Kalen Enerji (Kalen I II HES)         | Hydro                   | 15,70         | 23.575           |
| Karel Enerji (Pamukova)               | Hydro                   | 9,30          | 40.000           |
| Kayen Alfa Enerji (Kaletepe HES)      | Hydro                   | 10,20         | 17.000           |
| Kısık                                 | Hydro                   | 9,60          | 20.000           |
| Lamas II IV HES (TGT Enerji Üretim)   | Hydro                   | 35,70         | 71.000           |
| Obruk HES                             | Hydro                   | 212,40        | 337.000          |
| Özgür Elektrik (Azmaç II Reg ve HES)  | Hydro                   | 24,40         | 43.000           |
| Öztay Enerji (Günayşe Reg ve HES)     | Hydro                   | 8,30          | 14.000           |
| Özyakut Elek. Ür. A.Ş. (Güneşli HES)  | Hydro                   | 0,60          | 1.333            |
| Özyakut Elek. Ür. A.Ş. (Güneşli HES)  | Hydro                   | 1,20          | 2.667            |
| Reşadiye 3 HES (Turkon MNG Elekt.)    | Hydro                   | 22,30         | 88.000           |
| Sarıtepe HES (Genel Dinamik Sis. El)  | Hydro                   | 2,50          | 4.592            |
| Sarıtepe HES (Genel Dinamik Sis. El)  | Hydro                   | 2,50          | 4.592            |
| Şirikçioğlu El. (Kozak Bendi ve HES)  | Hydro                   | 4,40          | 7.000            |
| Taşova Yenidereköy HES (Hameka A.Ş.)  | Hydro                   | 2,00          | 6.000            |
| Tektuğ (Erkenek)                      | Hydro                   | 6,00          | 14.400           |
| Tektuğ (Erkenek)                      | Hydro                   | 6,50          | 15.600           |
| Tocak I HES (Yurt Enerji Üretim Sn.)  | Hydro                   | 4,80          | 6.000            |
| Tüm Enerji (Pinar Reg ve HES)         | Hydro                   | 30,10         | 65.000           |
| Uzunçayır HES (Tunceli)               | Hydro                   | 27,30         | 49.000           |
| Yapısan (Karıca Reg ve Darıca HES)    | Hydro                   | 48,50         | 77.000           |
| Yapısan (Karıca Reg ve Darıca HES)    | Hydro                   | 48,50         | 77.000           |
| Yeşilbaş Enerji (Yeşilbaş HES)        | Hydro                   | 14,00         | 26.000           |
| ypm Gölova HES (Suşehri / Sivas)      | Hydro                   | 1,10          | 2.000            |
| YPM Sevindik HES (Suşehri / Sivas)    | Hydro                   | 5,70          | 18.000           |
|                                       | <b>Hydro 2009 Total</b> | <b>719,40</b> | <b>1.402.961</b> |

|                                         |            |       |         |
|-----------------------------------------|------------|-------|---------|
| Datça RES (Datça)                       | Wind       | 0,80  | 2.270   |
| Datça RES (Datça)                       | Wind       | 8,90  | 25.257  |
| Datça RES (Datça)                       | Wind       | 11,80 | 33.486  |
| Gürmat Elektrik (Gürmat Jeotermal)      | Geothermal | 47,40 | 313.000 |
| ITC KA Enerji (Sincan)                  | Waste      | 2,80  | 22.000  |
| ITC KA Enerji Mamak Katı Atık Top. Merk | Waste      | 2,80  | 21.062  |
| Kores Kocadağ RES (Urla / İzmir)        | Wind       | 15,00 | 56.000  |

CDM-PDD-FORM

|                                        |                                 |                 |                     |
|----------------------------------------|---------------------------------|-----------------|---------------------|
| Mazı 3 RES Elekt. Ür. A.Ş.(Mazı 3 RES) | Wind                            | 10,00           | 35.111              |
| Mazı 3 RES Elekt. Ür. A.Ş.(Mazı 3 RES) | Wind                            | 12,50           | 43.889              |
| Akenerji (Ayyıldız RES)                | Wind                            | 15,00           | 51.000              |
| Alize Enerji (Çamseki RES)             | Wind                            | 20,80           | 82.000              |
| Alize Enerji (Keltepe RES)             | Wind                            | 18,90           | 65.000              |
| Alize Enerji (Sarıkaya RES) (Şarköy)   | Wind                            | 28,80           | 96.000              |
| Ayen Enerji (Akbük RES)                | Wind                            | 16,80           | 65.600              |
| Ayen Enerji (Akbük RES)                | Wind                            | 14,70           | 57.400              |
| Baki Elektrik (Şamlı Rüzgar)           | Wind                            | 36,00           | 176.000             |
| Baki Elektrik (Şamlı Rüzgar)           | Wind                            | 33,00           | 161.333             |
| Belen Elektrik Belen Rüzgar-Hatay      | Wind                            | 15,00           | 47.500              |
| Belen Elektrik Belen Rüzgar-Hatay      | Wind                            | 15,00           | 47.500              |
| Borasko Enerji (Bandırma RES)          | Wind                            | 21,00           | 83.533              |
| Borasko Enerji (Bandırma RES)          | Wind                            | 24,00           | 95.467              |
| Cargill Tarım ve Gıda San. Tic. A.Ş.   | Biogas                          | 0,10            | 700                 |
| Ortadoğu Enerji (Kömürcüoda)           | Waste                           | 5,80            | 45.000              |
| Ortadoğu Enerji (Oda Yeri)             | Waste                           | 4,20            | 33.071              |
| Ortadoğu Enerji (Oda Yeri)             | Waste                           | 5,70            | 44.882              |
| Rotor Elektrik (Osmaniye RES)          | Wind                            | 17,50           | 66.348              |
| Rotor Elektrik (Osmaniye RES)          | Wind                            | 17,50           | 66.348              |
| Rotor Elektrik (Osmaniye RES)          | Wind                            | 22,50           | 85.304              |
| Sayalar Rüzgar (Doğal Enerji)          | Wind                            | 3,60            | 11.368              |
| Soma Enerji Üretim (Soma RES)          | Wind                            | 18,00           | 60.000              |
| Soma Enerji Üretim (Soma RES)          | Wind                            | 10,80           | 36.000              |
| Soma Enerji Üretim (Soma RES)          | Wind                            | 16,20           | 54.000              |
| Ütopya Elektrik (Düzova RES)           | Wind                            | 15,00           | 46.000              |
|                                        | <b>Renewable 2009<br/>Total</b> | <b>221,00</b>   | <b>1.094.986,09</b> |
| <b>2009 Total</b>                      |                                 | <b>3.735,20</b> | <b>22.358.566</b>   |

**Appendix 5. Further background information on monitoring plan**

**Appendix 6. Summary report of comments received from local stakeholders**

**Appendix 7. Summary of post-registration changes**

-----

## Document information

| <i>Version</i> | <i>Date</i>   | <i>Description</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 10.1           | 28 June 2017  | Revision to make editorial improvement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 10.0           | 7 June 2017   | Revision to: <ul style="list-style-type: none"> <li>• Improve consistency with the “CDM project standard for project activities” and with the PoA-DD and CPA-DD forms;</li> <li>• Make editorial improvement.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 09.0           | 24 May 2017   | Revision to: <ul style="list-style-type: none"> <li>• Ensure consistency with the “CDM project standard for project activities” (CDM-EB93-A04-STAN) (version 01.0);</li> <li>• Incorporate the “Project design document form for small-scale CDM project activities” (CDM-SSC-PDD-FORM);</li> <li>• Make editorial improvement.</li> </ul>                                                                                                                                                                                                                                                                                                                |
| 08.0           | 22 July 2016  | EB 90, Annex 1<br>Revision to include provisions related to automatically additional project activities.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 07.0           | 15 April 2016 | Revision to ensure consistency with the “Standard: Applicability of sectoral scopes” (CDM-EB88-A04-STAN) (version 01.0).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 06.0           | 9 March 2015  | Revision to: <ul style="list-style-type: none"> <li>• Include provisions related to statement on erroneous inclusion of a CPA;</li> <li>• Include provisions related to delayed submission of a monitoring plan;</li> <li>• Provisions related to local stakeholder consultation;</li> <li>• Provisions related to the Host Party;</li> <li>• Make editorial improvement.</li> </ul>                                                                                                                                                                                                                                                                      |
| 05.0           | 25 June 2014  | Revision to: <ul style="list-style-type: none"> <li>• Include the Attachment: Instructions for filling out the project design document form for CDM project activities (these instructions supersede the "Guidelines for completing the project design document form" (Version 01.0));</li> <li>• Include provisions related to standardized baselines;</li> <li>• Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the project activity in B.7.4 and Appendix 1;</li> <li>• Change the reference number from F-CDM-PDD to CDM-PDD-FORM;</li> <li>• Make editorial improvement.</li> </ul> |
| 04.1           | 11 April 2012 | Editorial revision to change version 02 line in history box from Annex 06 to Annex 06b.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 04.0           | 13 March 2012 | Revision required to ensure consistency with the “Guidelines for completing the project design document form for CDM project activities” (EB 66, Annex 8).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 03.0           | 26 July 2006  | EB 25, Annex 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 02.0           | 14 June 2004  | EB 14, Annex 06b                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |

| <i>Version</i>                                                                                                                                | <i>Date</i>    | <i>Description</i>                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------|------------------------------------------|
| 01.0                                                                                                                                          | 03 August 2002 | EB 05, Paragraph 12<br>Initial adoption. |
| Decision Class: Regulatory<br>Document Type: Form<br>Business Function: Registration<br>Keywords: project activities, project design document |                |                                          |