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**Emission reductions from grid connected
electricity generation from renewable sources:
Yuntdağ Wind Power Project, Turkey**

VOLUNTARY OFFSET PROJECTS**PROJECT DESIGN DOCUMENT FORM (GS-VER-PDD)
VERSION 01 - IN EFFECT AS OF: JANUARY 2006)****CONTENTS**

- A. General description of project activity
- B. Application of a baseline methodology
- C. Duration of the project activity / Crediting period
- D. Application of a monitoring methodology and plan
- E. Estimation of GHG emissions by sources
- F. Environmental impacts
- G. Stakeholders' comments

Annexes

- Annex 1: Contact information on participants in the project_activity
- Annex 2: Baseline information
- Annex 3: Sustainable Development Assessment Matrix
- Annex 4: Monitoring plan

SECTION A. General description of project activity

A.1 Title of the project activity

Grid-connected electricity generation from renewable sources:

Yuntdağ Wind Power Project, Turkey

Document version: 08

Date of completion: 17/02/2016

Version 08 from 17/02/2016 replaces with version 07 from 19/01/2016 with an aim of crediting period renewal according to the changes requested by the DOE team.

Version 07 from 19/01/2016 replaces with version 06 from 16/12/2015 with an aim of crediting period renewal according to the changes requested by the DOE team.

Version 06 from 16/12/2015 replaces with version 05 from 11/05/2015 with an aim of crediting period renewal.

Version 05 from 11/05/2015 replaces with version 04 from 03/05/2011 with an aim of design change according to the request demanded by Gold Standard Procedure on Approval of Design Change. The revision of the document has been mainly focused on capacity increase and parameter related with this.

Replaces Version 03 from 28/07/2008 with an aim of application for design change according to the request demanded by Gold Standard Procedure on Approval of Design Change. The revision of the version has been focused on capacity increase and parameter related with this.

Version 03 from 12/11/2007 replaces version 02 with amendments mainly in the sustainable development matrix in Section A.2 according to the requests raised during the 6 weeks review by the Gold Standard.

Version 02 replaces Version 01 from 09/08/2007 with the following adjustments/amendments:

Nr.	Ref. to Finding Nr.	Ref. to Chapter	Comment
1	1	D.2.1.2.	Indicators for the monitoring of sustainable development are amended
2	2, 5	F	Formulation and documentation of environmental impacts, description of road construction are amended
3	3, 4	D.3, D.4	Details regarding data handling, data quality, processes and structure of staff at the plant are amended
4	7	B.2	BM calculation is revised. All accordant numbers in the PDD are adjusted
5		G	Description of main stakeholder process is amended
6		B.3, G	Formal adjustments following a comment by the ministry of environment and forestry

A.2. Description of the project activity

Innores Elektrik Üretim AŞ (in the following: Innores) installed a wind power plant in Yuntdağ/Bergama/İzmir in Turkey. Initial project capacity was 42.5 MW consists of 17 turbines with 2.5 MW each, which is planned to increase by 15 MW. Revised license for 57.5 MW is granted by EMRA to Innores on 09/06/2010. Finally, capacity is increased of 2.5 MW with an additional turbine. Revised licence for 60.0 MW is granted by EMRA to Innores on 24/05/2013.

The purpose of the project is to generate electricity and to feed it into the public grid. Yuntdağ WPP shall be registered as a Voluntary Emission Reduction project in order to enable the project implementation by means of financial inflows coming from the credits sale. Because of its significant contribution to climate protection and to sustainable development in the region, this project is expected to fulfil the requirements of the Gold Standard.

The project will help Turkey to stimulate and commercialise the use of grid connected renewable energy technologies and markets. Furthermore the project will demonstrate the viability of grid connected wind farms which can support improved energy security, improved air quality, alternative sustainable energy futures, improved local livelihoods and sustainable renewable energy industry development. The specific goals of the project are to:

- reduce greenhouse gas emissions in Turkey compared to the business-as-usual scenario,
- help to stimulate the growth of the wind power industry in Turkey,
- create local employment during the construction and the operation phase of the wind farm,
- reduce other pollutants resulting from power generation industry in Turkey, compared to a business-as-usual scenario,
- help to reduce Turkey's increasing energy deficit and
- differentiate the electricity generation mix and reduce import dependency.

The emission reductions will be generated by substituting electricity produced from the conventional mix representing electricity generation for the Turkish grid, which to a relevant extent depends on fossil fuels. The emission reductions will be calculated based on the Combined Margin (CM) emission factor.

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

- Wind energy presents various environmental benefits compared to other primary energy sources: wind energy does not result in emissions of pollutants into the atmosphere nor does it emit residuals that can have a negative impact on soil, water etc. As a renewable energy source wind energy can be used without putting the supply of primary energy sources into danger for future generations. The proposed project will also contribute to a reduction in other emissions than GHG emissions related to conventional electricity generation, like emissions of sulphur dioxide, nitrogen oxides and particulates.
- The project of Yuntdağ WPP will result in extra employment – the realisation of the wind project will result in increased jobs in the local area, especially during the construction phase. Construction materials for foundations, cables and access roads will be sourced locally.

Innores as the project owner from the very beginning was convinced of the positive influence of the project on the environment as well as to certain extent on social and economic situation in Turkey. The stakeholder meeting from 25/07/2007 and the gathered opinions of local people and of experts confirmed its positive impact. The collected opinions and also the information from other sources, like external surveys or experts opinions are included in the Sustainable Development Assessment Matrix. Results from the matrix confirm the favourable effects on all discussed domains and lead to an overall score of +9.

Components • Indicators	Score (-2 to 2)	Rationale
Local / regional / global environment		
• Water quality and quantity	0	As compared to the baseline, no significant changes with regard to both, ground and surface are expected. The project does not have any positive or negative impacts on water quality and quantity. This result can be judged generally valid for wind power projects, as wind turbines do not need nor release water. This was confirmed by the stakeholders (cf. questions 5 and 9 of stakeholder survey).

		consultation checklist, Appendix 8 of Initial Stakeholder Consultation Report) in the registration procedure at the beginning of the project activity. According to the explanations of the plant manager, there is no artesian well. Water to be used in the plant is being purchased from the villagers. Municipal water is transferred with the tanker trucks. Waste water is collected in the cesspool and transferred with sewage trucks. This situation will be monitored during verification. Drinking water is supplied with purchase of bottled waters.																						
• *Air quality (emissions other than GHGs)	+2	Besides Greenhouse Gases, all other air pollutants, particle and VOC emissions generally avoided by fossil fuelled electricity generation are avoided by the use of wind power. This is considered a very positive effect by the stakeholders and project participants. A report by ECW¹ confirms this, as well as the discussion with the stakeholders (cf. question 3 of the stakeholder consultation checklist). Every kilowatt hour of electricity produced by the wind farm does not have to be generated by a thermal power plant, which have a relevant share in the Turkish generation mix (especially lignite, Fuel share in electricity generation 2011 Total 251.96 GWh <table><tr><th>Fuel Type</th><th>Share (%)</th></tr><tr><td>Natural Gas</td><td>47,86%</td></tr><tr><td>Coal</td><td>15,74%</td></tr><tr><td>Lignite</td><td>14,53%</td></tr><tr><td>Hydro</td><td>16,13%</td></tr><tr><td>Geot. and Wind</td><td>4,32%</td></tr><tr><td>Fuel Oil</td><td>0,66%</td></tr><tr><td>Motor Oil</td><td>0,19%</td></tr><tr><td>Naphtha</td><td>0,00%</td></tr><tr><td>LPG</td><td>0,00%</td></tr><tr><td>Renew. and Wastes</td><td>0,57%</td></tr></table> Figure 1 on page 11). For the new crediting period, the positive scoring will be monitored during verification. For this purpose, amount of avoided CO₂ and NMVOC will be calculated. Due to the avoidance of fossil fuel combustion, these emissions will be reduced in parallel to reduced CO₂.	Fuel Type	Share (%)	Natural Gas	47,86%	Coal	15,74%	Lignite	14,53%	Hydro	16,13%	Geot. and Wind	4,32%	Fuel Oil	0,66%	Motor Oil	0,19%	Naphtha	0,00%	LPG	0,00%	Renew. and Wastes	0,57%
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Renew. and Wastes	0,57%																							
• Other pollutants (including, where relevant, toxicity, radioactivity, POPs, stratospheric ozone layer depleting gases)	0	Possible impacts during the construction phase are considered to be negligible, do not involve hazardous materials that are deemed pollutants and do also occur with any other energy project (baseline). Noise generation by the turbines is not a problem as the distance to the next village is 1 km (cf. project's micro-siting report, available for validation/verification). Also, for the site visit conducted during the crediting period renewal, no negative comments are received from the villagers about the electricity generation. These issues are confirmed by the stakeholders (cf. question 2 and 4 of the stakeholder consultation checklist). The operation of a wind power plant does generally not lead to any pollutants. A score of 0 is rather an understatement, as fossil fuelled (part of the baseline, cf. question above) and thermal power plants do lead to further pollutants and radioactivity, other than wind. However, this is harder to describe and thus scored with 0 for conservativeness.																						

¹ See Energy Center Wisconsin, <http://www.ecw.org/prod/433-3.pdf>, accessed in June 2008

		Thus, for the new crediting period, there is not a change in this situation and scoring is not changed.
Soil condition (quality and quantity)	0	For the first crediting period, during validation, the situation was as below: As compared to the baseline, no significant changes are expected. No trees have to be cut for the project, neither for the turbine sites nor for the infrastructure. Both road construction works take place on empty and unused land without the need for tree removal and thus do not have any negative influence on the soil quality, while the reduction of soil is not due to the unfertile character of the soil. Pictures from the site are available and were checked at validation. The project developers' impression that the impact on soil condition is negligible was confirmed by the stakeholders' (see question 1 of the stakeholder consultation checklist, Appendix 8 of the Initial Stakeholder Consultation report) For the current situation; garbage is being collected by the municipality. Nordex is responsible for the hazardous service and maintenance waste oils. If required, documents from the municipality Nordex can be provided. There is not a negative feedback from the stakeholders also. Thus, the situation is not changed. But still, this parameter will be monitored.
Biodiversity (species and habitat conservation)	0	Due to the experiences with other wind power plants in Turkey and according to the discussion at the stakeholder meeting (cf. question 1 of the stakeholder consultation checklist), no impacts on biodiversity are expected, especially as the ground cover on site consists of dry, rocky scrubland and some low lying vegetation (cf. micro-siting report). This is confirmed by the certificate from the environmental authority, which, according to the environmental law², states that no EIA is necessary for this project. The stakeholders who attended the LSC meeting did also not mention any impacts on biodiversity (cf. question 8 of the stakeholder consultation checklist). There are no known bird migration corridors crossing the project site. However, as no detailed studies of bird migration exist for the project, this issue is included in the project's monitoring plan by observing bird strikes and reporting for verification (cf. section D.2.1.2). For the new crediting period, there is not a change in this situation. Thus, scoring is not changed.
<i>Sub total</i>	+2	
Social sustainability and development		
*Quality of employment (including job quality, fulfilment of labour standards)	+2	In the first crediting period, it was stated that installation of the wind farm will provide employment for local people, who will assist in the building phase as well as in the maintenance of the wind farm. Within this project the stakeholder processes gives fulfilment of labour standards a public site. Consultations like this are not common in Turkey and therefore this case enhances though the project including job quality and fulfilment of labour standards. The positions at the wind farm require skilled workers, which will be achieved by adequate training (cf. job description in section D.4). Employment is part of the monitoring of the project (Local job creation, cf. section D.2.1.2) and thus be documented and reported for the periodic verification. For the new crediting period, technically required trainings regarding the increment of the job of the employees will continue to be carried out. Information about the newly added trainings will be provided at each verification. This indicator will be monitored. Thus, scoring is not changed.
Livelihood of the poor (including poverty alleviation, distributional)	0	Generating electricity from resources that were not used before in this region, and with this new resources that are created, leads to an additional income for the local community. The use of local resources for electricity generation tends to have a positive effect on the balance of trade compared to the import of fuels and leaves the margins of the value chain as well as accordant taxes within the country. The project activity positively affects the regional economic and infrastructural development.

² Gazette No. 25318 from 16 December 2003 regulates the applicability of Environmental Impact Assessments for proposed projects.

equity, and access to essential services)		However, the discussed issues do either overlap with other indicators (employment) or are difficult to monitor and verify, why this indicator is scored with zero. For the new crediting period, there is not a change in this situation. Thus, scoring is not changed.
Access to energy services	0	As a local energy source, wind power helps to mitigate Turkey's high import dependency and improves the access to energy services, especially in the scenarios of import stops or energy price hikes. The International Energy Agency criticises dependency on oil and gas imports and demands expansion of renewable energy in Turkey (cf. IEA: Energy Policies, Turkey 2005 review, 2005, p. 85, 100 and 129). However, as the improved access to energy services does not affect the local public (as the electricity is delivered to the grid) and cannot be assigned to specific consumers, it therefore not be monitored, a conservative score of zero is applied. For the new crediting period, there is not a change in this situation. Thus, scoring is not changed.
* Human and institutional capacity (including empowerment, education, involvement, gender)	+1	During the validation in the first crediting period, it was stated that operation of the plant includes distinct education and skills improvement for local people who will be employed at the site. A list of the expected jobs and accordant trainings is presented in D.4. The training of the staff is monitored by presenting training plans and certificates for verification (see parameter "Local capacity creation" in section D.2.1.2). The local public is intensively involved in the development and decision-making regarding the wind power plant within the stakeholder consultation processes, thus forming a new kind of institutional capacity on the local level. For the second crediting period, similar situation is valid. All training records for the local employees including security, health and safety trainings will be provided at each verification. This indicator will be monitored with the parameter of training records of the local employees. Thus, scoring is not changed.
Sub total	+3	
Economic and technological development		
*Quantitative Employment (numbers)	+2	During the first crediting period, since there was also construction works, required employee numbers were larger. However, it is different in the current situation. Still, there are job creations but not as in the starting of the project. Therefore, in the ongoing situation, there will be minimum number of workers but the exact number may change. The project developer considers this as a positive effect of the project. Employment is part of the monitoring of the project and can thus be documented at the verification. Parameter will be used for employment records for the second crediting period. Thus, scoring is not changed and monitoring of the parameter will continue.
Balance of payments (sustainability)	0	In the first crediting period, when the project started operation, it was a one of its kind project and these types of projects show increase. But still, the project is in a sustainable sector of electricity generation in Turkey and contributes to mitigation of import dependency, which is an important factor for Turkey, as fuel dependency reaches values of more than 70 percent of total primary energy in the last years ³ . Electricity generation from wind power is completely independent from any fuel and thus helps to save outflow of capital. However, as this topic does not directly affect the local public and cannot be assigned to specific consumers, it will not be monitored in the second crediting period and a conservative score of zero is applied.
Technological self-reliance (including project)	0	As the project developer is a Turkish company using the returns from the GS VER project for the realisation of the wind farm, the Turkish capabilities, competencies and self-reliance regarding the introduction of innovative technologies are strengthened. In the first crediting period, the

³ See IEA (International Energy Agency): Energy Policies, Turkey 2005 Review, 2005, p. 28.

replicability, hard currency liability, skills development, institutional capacity, technology transfer)		activity was first of its kind project and this indicator was scored as positive. Although these projects show increase, they are still not common practice in Turkey and this is comprehended in section B.3. of the PDD. For the second crediting period, again, since this topic does not directly affect the local public, it will not be monitored and a conservative score of zero is applied.
Sub total	+2	
TOTAL	+7	

Table 1: Sustainable development assessment matrix (* the asterisk denotes indicators that are covered by the future monitoring of the project)

Yuntdağ WPP consists of 24 wind turbines Nordex N90 of the 2.5 MW output, 90m diameter and 80m hub height. The wind turbines will be connected to the wind farm substation through 34.5 kV underground cables. The voltage is 154 kV and is transferred to the National Electricity System (Alosbi Transformer Station) via a 26 km long transmission line for 60.0 MW installed capacity.

The entire estimated annual net electricity production is 203,900 MWh.

A.3. Project participants:

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
Turkey (host)	İnnores Elektrik Üretim A. Ş.	No

İnnores Elektrik Üretim AŞ: Project developer and owner. The project proponent is a private entity.

Republic of Turkey: Host country. Turkey has not yet ratified the Kyoto Protocol. Turkish National Focal Point to the UNFCCC is the Ministry of Environment and Forestry⁴. Regional Environmental Center Country Office Turkey (REC Turkey) acts as the National Focal Point for UNFCCC Article 6 – Education, Training and Public Awareness.

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

A.4.1.1. Host Party(ies):

Republic of Turkey

A.4.1.2. Region/State/Province etc.:

Izmir region, Aliağa province

⁴ UNFCCC, list of the National Focal Points <http://maindb.unfccc.int/public/nfp.pl?mode=wim> (accessed in August 2007)

A.4.1.3. City/Town/Community etc:

The site is located between the villages of Yuntdağ, Balaban and Koyuneli

A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

Project site is located approx. 60 km north of Izmir, 1 km west from the Bababan village, 2 km northwest from Yuntdağ and 1 km southeast from Koyuneli. The site is located on two ridgelines at the elevation between 490m and 530m.

Location of the project site is presented on the Picture 1.



Picture 1: Map of the project area

The geographical coordinates (coordinate system ED50, Zone 35) of the project activity are presented in the table below.

Turbine	East	North
T01	516633	4313956
T02	516615	4313686
T03	516642	4313426
T04	516697	4313168
T05	516744	4312913
T06	516757	4312647
T07	516772	4312389
T08	516786	4312100

T09	516846	4311849
T10	516854	4311595
T11	516936	4311349
T12	517036	4311122
T13	515532	4311741
T14	515563	4311485
T15	515585	4311081
T16	515533	4310674
T17	515431	4310288
T18	516495	4314214
T19	515390	4311954
T20	516120	4311545
T21	516410	4311460
T22	515318	4309878
T23	515573	4309771
T24	517209	4311030

Table 2: Coordinates of the turbines⁵

A.4.2. Size of the project:

With an electrical capacity of 60.0 MW, the project comes under the large-scale project category.

A.4.3. Category(ies) of project activity:

The 60.0 MW Wind Power Project falls in the category A.1., Renewable Energy, according to the Gold Standard VER Project Developer's Manual

A.4.4. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed project activity, including why the emission reductions would not occur in the absence of the proposed project activity, taking into account national and/or sectoral policies and circumstances:

Emission reductions will be calculated based on the calculated Combined Margin (for details see B.2.). With the assumed yearly electricity generation of approximately **203,900 MWh for the following years**, over the period of 7 years the project activity will generate overall approx. **788,074 tCO₂e** emission reductions. The emission reductions will be generated by substituting the energy produced from conventional sources, namely from fossil fuels. The following figures show the shares of the different fuels to the overall Turkish installed electric capacity and generation in the year 2014:

⁵ See Generation license, page 7

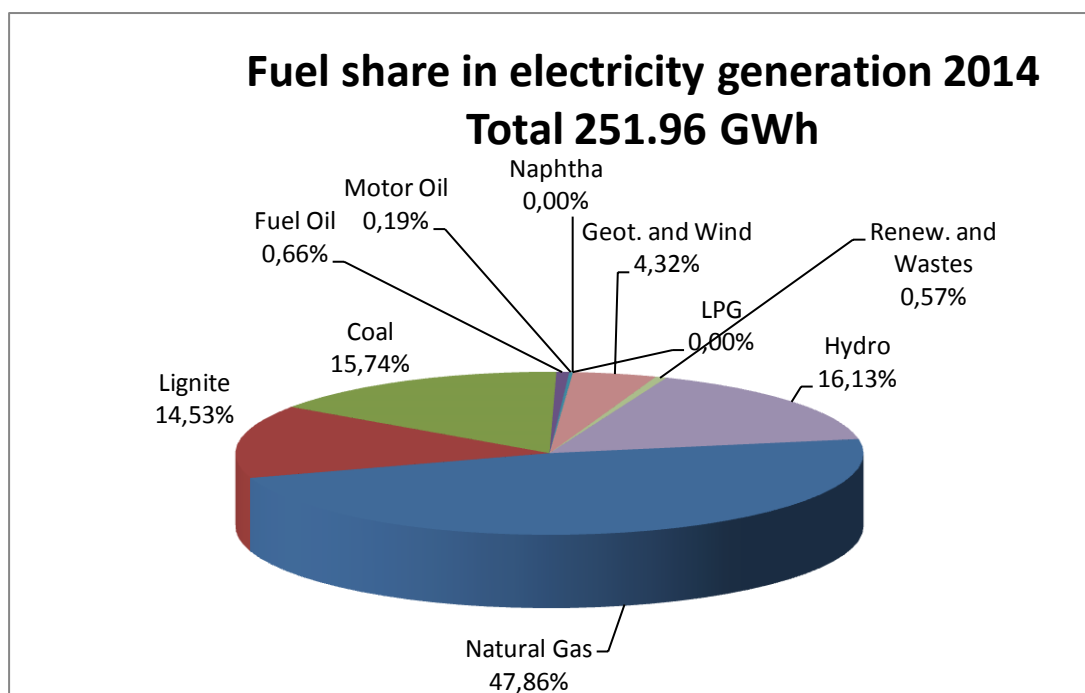


Figure 1: Fuel share in electricity generation in 2014⁶

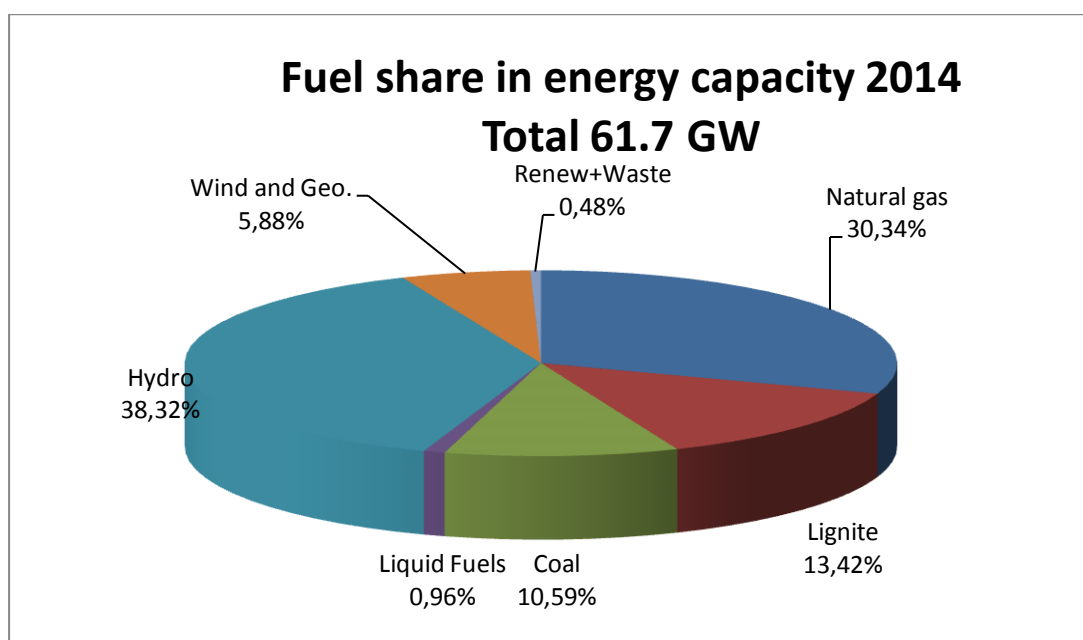


Figure 2: Fuel share in energy capacity in 2014⁷

Although Turkey has a very good wind resource, substantial space, a reasonably good electrical infrastructure and an approaching shortage of electricity; it uses negligible capacity (less than 5%) of its onshore potential, which is

⁶ See, Annual Development of Turkey's Gross Electricity Generation of Primary Energy Resources (2006-2014): <http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/istatistik2014.htm> , excel file number 38

⁷ See, The Distribution of Installed Capacity by Primary Energy Resources and The Electricity Utilities in Turkey (2014): <http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/istatistik2014.htm> , excel file number 4

estimated as 53,000 MW by Ministry of Energy and Natural Resources (MENR).⁸ Lack of attractive incentives and tax advantages, limited grid access and restricted turbine supply constitutes the major barriers in front of the wind energy.

Renewable energy law, enacted in 2005, which had amendments in end of 2010 regarding feed-in tariffs, stipulates a purchase obligation by the retail companies for 10 years with a purchase price 7.3 USDc/kWh (~5.5 €/kWh) for the power plants put in operation by end of 2015⁹. This tariff is much below the average remuneration in the leading wind markets and does not constitute a sufficient incentive for investments in little experienced wind energy sector of Turkey. The revenues calculated according to these regulations are considered in the investment planning of the projects and does not lead to returns that let the project be profitable or attractive for capital investors and lenders.

These numbers and figures show the contribution of a wind power project like Yuntdag WPP to the development of environmental friendly electricity generation instead of above described Turkish mix of hydroelectric and fossil fuelled power plants, which are better known and financially more attractive from an investor's point of view. The emission reductions would not occur in the absence of the proposed project activity because of various real and perceived risks that impede the provision of financing.

Yuntdag WPP, as a large wind power plant project, will serve as a perfect project to demonstrate long-term potential of wind energy as a means to efficiently reducing GHG emissions as well as to diversifying and increasing security of the local energy supply and contributing to a sustainable development. Wind driven turbines will rotate in generators and electricity generated here will be transferred to the grid for consumer without any greenhouse gas emissions. The Gold Standard certification shall help to realize this seminal technology by providing an adequate compensation for the lacking financial incentives in the Turkish renewable energy market.

In comparison with emissions arising from electricity generation representing the Turkish generation mix, some 788,074 tCO₂ are avoided by the wind power plant over the second seven year crediting period presumably from 01/04/2016 to 31/03/2023. Yuntdağ WPP demonstrates a long-term potential of wind energy as a tool to efficiently reducing greenhouse gas emissions as well as to diversifying and increasing security of the local energy supply and contributing to a sustainable development.

A.4.4.1. Estimated amount of emission reductions over the crediting period:

The first crediting period had started with the commissioning of the plant, exactly with the first day of documented electricity supply to the grid in 07/03/2008. The second crediting period will presumably start on 01/04/2016. The expected yearly net electricity generation is 203,900 MWh¹⁰, what leads to emission reductions of **788,074 tCO₂e** over the period of 7 years, as indicated in the table below. The estimated emission reductions from the first and last year of the crediting period sum up to the amount of the estimated yearly reductions.

Years	Annual estimation of emission reductions [tonnes of CO ₂ e]
2016*	84,437
2017	112,582
2018	112,582
2019	112,582
2020	112,582
2021	112,582

⁸ See, Presentation of Zeynep Günaydın from MENR, http://www.senternovem.nl/mmfiles/MENR_tcm24-287950.pdf page 9

⁹ See : http://www.epdk.org.tr/documents/elektrik/mevzuat/kanun/Elk_Kanun_Yek_Kanun.doc (List I in page 10)

¹⁰ See Energy Yield Assessment Report, Page 4, Table 1

2022	112,582
2023**	28,146
Total emission reductions (tonnes of CO₂e)	788,074
Total number of crediting years	7
Annual average over the crediting period of estimated reductions (tonnes of CO₂e)	112,582

* 01 April 2016

**31 March 2023

Table 3: Expected annual emission reductions

SECTION B. Application of a baseline methodology

B.1. Title and reference of the approved baseline methodology applied to the project activity:

For the determination of the baseline, the official methodology ACM0002 version 16.0, "Large-scale Consolidated baseline methodology for grid-connected electricity generation from renewable sources"¹¹, is applied, using conservative options and data as presented in the following section. This methodology refers to four Tools, which are:

1. Tool to calculate the emission factor for an electricity system (Version 04.0.0)¹²;
2. Tool for the demonstration and assessment of additionality (Version 07.0.0)¹³;
3. Combined tool to identify the baseline scenario and demonstrate additionality (version 06.0.0)¹⁴
4. Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion (Version 02.0.0)¹⁵
5. Tool to determine the remaining lifetime of the equipment¹⁶

For baseline calculation the first tool, for additionality assessment the second tool is used. As third tool is the combination of the first and second tool, it is not used. Since no project emission or leakage calculation is required for wind power project fourth tool is not used, either. And finally to determine the remaining lifetime of the equipment fifth tool is used.

B.1.1. Justification of the choice of the methodology and why it is applicable to the project activity:

The choice of methodology ACM0002, Version 16, is justified as the proposed project activity meets its applicability criteria:

Applicability Conditions in the ACM002/Version16.0	Applicability to this project activity
This methodology is applicable to grid-connected renewable energy power generation project activities	The project activity consists of installation of Greenfield power plant at a site where no

¹¹ <https://cdm.unfccc.int/methodologies/DB/EY2CL7RTEHRC9V6YQHLAR6MJ6VEU83>

¹² See; <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf>

¹³ See; <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

¹⁴ See; <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v5.0.0.pdf>

¹⁵ See; <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf>

¹⁶ See; <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf>

that: (a) Install a Greenfield power plant; (b) Involve a capacity addition to (an) existing plant(s); (c) Involve a retrofit of (an) existing operating plants/units; (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) Involve a replacement of (an) existing plant(s)/unit(s).	renewable power plant was operated prior to the implementation of the project activity. Thus, it meets the said applicability condition.
The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit.	The project activity is the installation of 24 wind turbine generators (WTGs). Hence, meets this criterion.
In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	The project activity does not involve capacity additions, retrofits, rehabilitations or replacements. Hence this criterion is not applicable to the project activity.
In case of hydro power plants, one of the following conditions shall apply: (a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or (b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3), is greater than 4 W/m²; or (c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m²; or (d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m², all of the following conditions shall apply: (i) The power density calculated using the total installed capacity of the integrated project, as per equation (4),	The project activity is not a hydro power plant. Hence this applicability criterion is not relevant to the project activity.

is greater than 4 W/m²; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be: a. Lower than or equal to 15 MW; and b. Less than 10 per cent of the total installed capacity of integrated hydro power project.	
In the case of integrated hydro power projects, project proponent shall: (a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or (b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.	The project activity is not a hydro power plant. Hence this applicability criterion is not relevant to the project activity.
The methodology is not applicable to: (a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;	Project activity does not involve: • Switching from fossil fuels to renewable energy sources at the site of the project activity. • Biomass fired plants. Hence this criterion is not applicable.

(b) Biomass fired power plants/units	
In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	The project is not a retrofit, rehabilitations, replacements or capacity addition; hence this applicability criterion is not relevant.
In addition, the applicability conditions included in the tools referred to above apply.	Applicability conditions of the applied tool are justified

From the above it is concluded that the project activity meets all the applicability conditions of the methodology ACM0002 version 16.0 "Grid connected electricity generation from renewable sources".

The project activity also meets the following applicability conditions of "Tool to calculate the emission factor for an electricity system".

SI No	Applicability condition	Applicability to this project activity
1	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity, i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	The project activity substitutes grid electricity by supplying renewable power to grid. Hence this criterion is applicable.
2	In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	Project electricity system is not located in an Annex I country.

The project activity also meets the applicability conditions given in "Tool for the demonstration and assessment of additionality".

Other tools mentioned in the methodology are not applicable for this project activity.

B.2. Description of how the methodology is applied in the context of the project activity:

The Baseline Methodology specifies how the baseline is described and calculated. It particularly refers to the consolidated tool for the demonstration and assessment of additionality, provided by the CDM Executive Board. In the context of the baseline determination, the project boundary and the Operating and Build Margin have to be established following the specifications set by ACM0002. In the following the derivation of the emission factor is described.

The baseline scenario is formulated in ACM0002 as follows:

“Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.

To describe the baseline and its development for the project activity, long-term electricity demand and supply projections for Turkey are assessed.

Demand for electricity in Turkey is growing rapidly with average 5.87%¹⁷ for previous ten years. TEİAŞ, who is responsible from the grid reliability has prepared an electricity demand projection for next ten years period (2014-2023) for Turkey and announced on June 2014, given in Hata! Başvuru kaynağı bulunamadı. and **Figure 3**, reflecting the continuation of current demand growth¹⁸.

Table 4: Low and High Demand Projection Scenarios for Ten Years Period (TWh)

Scenarios	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
High Scenario	273.97	291.5	309.87	329.08	349.15	370.1	391.94	414.67	438.3	462.85
Low Scenario	251.32	263.23	275.81	287.1	301.68	317.29	333.31	348.84	364.6	380.63

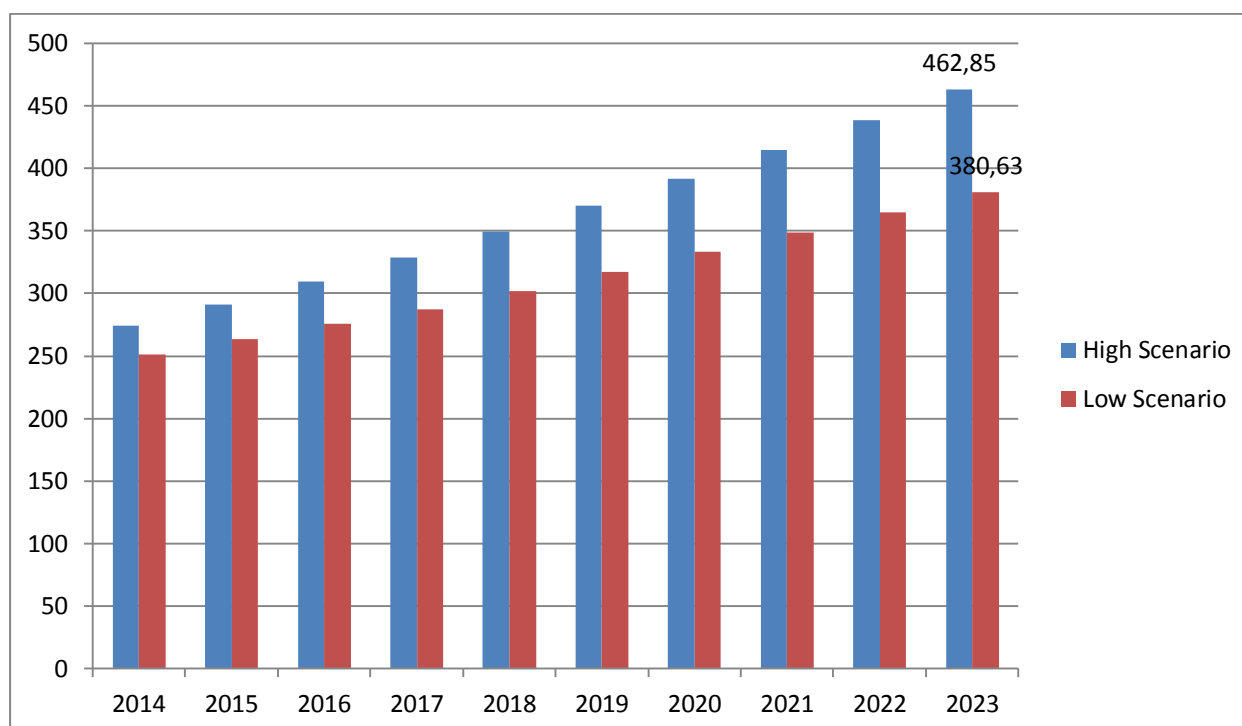


Figure 3: Electricity Demand Projections for Ten Years

In this projection, electricity supplies are also forecasted taking into account all power plants, which are operational, under construction and newly licensed. Generation projection based on project generation is given in:

¹⁷ See, <http://www.teias.gov.tr/YayinRapor/APK/projeksiyon/index.htm> (2014 report, page 6, Table 1)

¹⁸ See, <http://www.teias.gov.tr/YayinRapor/APK/projeksiyon/index.htm> (page 18-19, Table 5 for High and Table 6 for Low Scenarios)

Table 5: Projection of Total Generation Capacity by Fuel Types (GWh)¹⁹

YEARS	2012	2013	2014	2015	2016	2017	SHARE IN 2017 (%)
LIGNITE	52,712	52,715	52,939	56,143	60,470	61,870	14.55%
HARDCOAL	3,967	3,967	3,967	4,969	7,020	8,070	1.90%
IMPORTED COAL	26,827	26,827	26,786	29,697	33,356	42,567	10.01%
NATURAL GAS	149,344	166,022	177,262	180,853	186,092	187,249	44.02%
GEO THERMAL	1,184	1,294	1,702	2,206	2,410	2,410	0.57%
FUEL OIL	9,604	9,604	9,604	9,604	10,009	10,414	2.45%
DIESEL	148	148	148	148	148	148	0.03%
NUCLEER	0	0	0	0	0	0	0.00%
OTHER	1,373	1,373	1,373	1,373	1,373	1,373	0.32%
THERMAL TOTAL	245,157	261,948	273,780	284,991	300,879	314,102	73.85%
BIOGAS+WASTE	1,136	1,260	1,404	1,481	1,538	1,538	0.36%
HYDRO	62,413	66,805	80,483	87,269	96,097	98,335	23.12%
WIND	7,950	8,153	8,677	9,724	10,902	11,356	2.67%
TOTAL	316,657	338,166	364,344	383,465	409,416	425,331	100.0%

According to the 5-year projection it is clear that fossil fuels will remain the main sources for electricity generation (73.85 % in 2017). Natural gas will continue to dominate the market. Hydro will account for 23.12% of the mix whereas all non-hydro renewable combined (geothermal/biogas/waste/wind) will only account for 3.03% of all electricity generation. This projection is consistent with continuing fossil fuel dependent characteristics of Turkish electricity sector, which is given in

Figure 4. The share of fossil fuels in the mix has been continuously increasing since the 1970s, reaching 71.6% in 2013.

¹⁹ See, <http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2013.pdf> (page 44, Table 26)

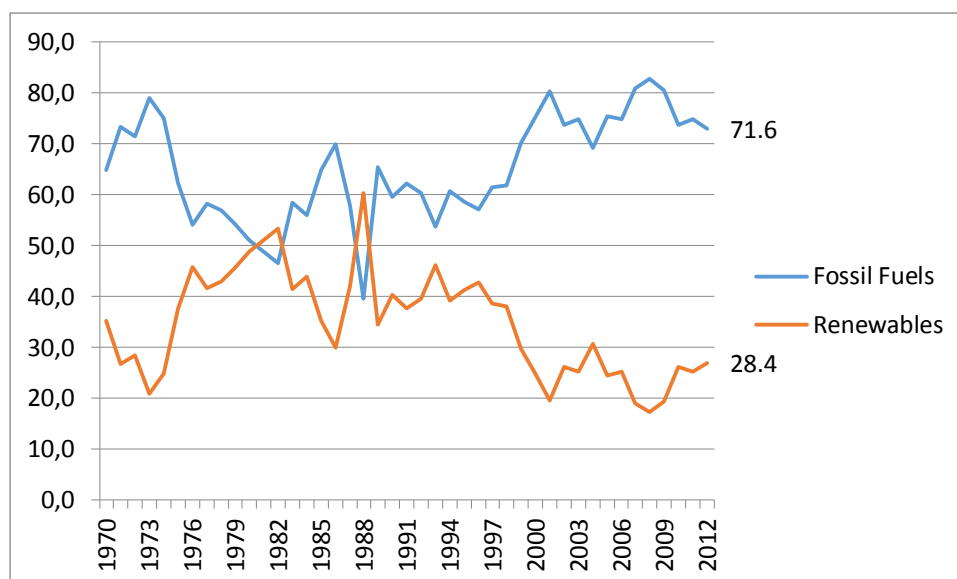


Figure 4: Fossil Fuels and Renewable in Turkish Electricity Mix (1970-2013)²⁰

In the shed of above analysis for the baseline scenario (continuation of current situation) it can be concluded that:

- **Conclusion-1:** Energy demand in Turkey has been increasing with significant rates since ten years, and it is expected to continue at least for next ten years.
- **Conclusion-2:** Even all operational plants, construction phase plants and licensed ones are taken into account lack of supply is projected after five operational years²¹. So, there is significant need for electricity generation investments to satisfy demand, which means electricity to be generated by the project activity would otherwise be generated by new power plants to avoid power shortage in coming years
- **Conclusion-3:** Fossil fuels will hold the dominance in generation mix till the end of 2021 with 73.85% share. Hydro included renewable will remain low with 23.12% share and non-hydro energy contribution will stay negligible with only 3.03% of total share by the end of that period. This also shows that most of new capacity additions will be fossil fuel fired power plants.

The combination of aforementioned trends indicates that if Yuntdag WPP would not be built, power from a new grid-connected thermal plant would be the most likely scenario.

Emission reductions

Explanation of methodological choices

Baseline scenario is identified and described in B.4. Emission reductions due to project activity will be calculated according to "Tool to calculate the emission factor for an electricity system"(v4) (Tool)²² as indicated in ACM0002 ver. 16.0.0.

A brief explanation of this methodology is given in Tool as (page 4):

²⁰ See, <http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/istatistik2014.htm> (excel file number 38)

²¹ See, <http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2013.pdf> (page 72)

²² See, <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf> (version 04)

This methodological tool determines the CO₂ emission factor for the displacement of electricity generated by power plants in an electricity system, by calculating the “combined margin” emission factor (CM) of the electricity system.

Data and parameters fixed ex ante

Data / Parameter	EG_y
Unit	MWh
Description	Net electricity generated by power plant/unit m, k or n (or in the project electricity system in case of EG _y) in year y or hour h
Source of data	Turkish Electricity Transmission Company (TEIAS), Annual Development of Electricity Generation- Consumption and Losses in Turkey (1984-2014) TEIAS, see http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/istatistik2014.htm (excel file number 35, 38, 28 are used for the calculation of the net electricity generated by relevant sources)
Value(s) applied	See Table 8 Table 9, Hata! Başvuru kaynağı bulunamadı.
Choice of data or Measurement methods and procedures	TEIAS is the national electricity transmission company, which makes available the official data of all power plants in Turkey. Thus, for reliability, TEIAS data is used. Net electricity generation is calculated using gross and net production for all fuel types. This data is used to find relation between the gross and net electricity delivered to the grid by fossil fuel fired power plants (Table 9) Also, gross and net electricity production for related fuel types and Import and Export data are used to find total net electricity fed into the grid in the years of 2012, 2013 and 2014 (Hata! Başvuru kaynağı bulunamadı.)
Purpose of data	Data used for emission reduction calculation
Additional comment	

Data / Parameter	HV_{i,y}
Unit	Mass or volume unit
Description	Heating Values of fuels consumed for electricity generation in the years of 2012, 2013 and 2014
Source of data	Heating Values Of Fuels Consumed In Thermal Power Plants In Turkey By The Electric Utilities, TEİAŞ. See: http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/istatistik2014.htm (excel file 52)
Value(s) applied	See Table 18

Choice of data or Measurement methods and procedures	TEİAŞ is the national electricity transmission company, which makes available the official data of all power plants in Turkey. There is no national NVC data in Turkey. However, TEİAŞ announces Heating values of fuels. This data is used to calculate annual NCVs for each fuel type.
Purpose of data	data used for emission reduction calculation
Additional comment	

Data / Parameter	FC _{i,y}																																																																
Unit	Mass or volume unit																																																																
Description	Amount of fuel type i consumed in the project electricity system in year y																																																																
Source of data	Annual Development of Fuels Consumed In Thermal Power Plants In Turkey by The Electric Utilities, TEİAŞ. See: http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/istatistik2014.htm (excel file 50)																																																																
Value(s) applied	See <table><tr><th>Energy Sources</th><th>2012</th><th>2013</th><th>2014</th></tr><tr><td>Hard Coal+Imported Coal</td><td>71.270</td><td>68.785</td><td>82.874</td></tr><tr><td>Lignite</td><td>93.587</td><td>81.676</td><td>97.916</td></tr><tr><td>Fuel Oil</td><td>5.625</td><td>5.837</td><td>7.444</td></tr><tr><td>Diesel Oil</td><td>1.884</td><td>1.363</td><td>1.245</td></tr><tr><td>Lpg</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Naphta</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Natural Gas</td><td>203.766</td><td>203.244</td><td>227.649</td></tr></table> Table 19 <table><tr><th>Energy Sources</th><th>2012</th><th>2013</th><th>2014</th></tr><tr><td>Hard Coal+Imported Coal</td><td>71.270</td><td>68.785</td><td>82.874</td></tr><tr><td>Lignite</td><td>93.587</td><td>81.676</td><td>97.916</td></tr><tr><td>Fuel Oil</td><td>5.625</td><td>5.837</td><td>7.444</td></tr><tr><td>Diesel Oil</td><td>1.884</td><td>1.363</td><td>1.245</td></tr><tr><td>Lpg</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Naphta</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Natural Gas</td><td>203.766</td><td>203.244</td><td>227.649</td></tr></table> Table 19	Energy Sources	2012	2013	2014	Hard Coal+Imported Coal	71.270	68.785	82.874	Lignite	93.587	81.676	97.916	Fuel Oil	5.625	5.837	7.444	Diesel Oil	1.884	1.363	1.245	Lpg	0	0	0	Naphta	0	0	0	Natural Gas	203.766	203.244	227.649	Energy Sources	2012	2013	2014	Hard Coal+Imported Coal	71.270	68.785	82.874	Lignite	93.587	81.676	97.916	Fuel Oil	5.625	5.837	7.444	Diesel Oil	1.884	1.363	1.245	Lpg	0	0	0	Naphta	0	0	0	Natural Gas	203.766	203.244	227.649
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Purpose of data	Data used for emission reduction calculation																																																																
Additional comment																																																																	

Data / Parameter	NCV_{i,y}
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Unit	GJ/mass or volume unit
Description	Net Calorific Value of fuel types in the years of 2012, 2013 and 2014
Source of data	Calculated by using HVi,y to FCi,y as Net Calorific Values of fuel types are not directly available in Turkey.
Value(s) applied	See

Data / Parameter	Sample Group for BM emission factor
Unit	Name of the plants, MW capacities, fuel types, annual electricity generations and dates of commissioning.
Description	Most recent power plants which compromise 20% of total generation
Source of data	Annual Development Of Fuels Consumed In Thermal Power Plants In Turkey By The Electric Utilities, TEİAŞ: http://www.teias.gov.tr/YayinRapor/APK/projeksiyon/KAPASITEPROJEKSIYONU2011.pdf http://www.teias.gov.tr/YayinRapor/APK/projeksiyon/KAPASITEPROJEKSIYONU2012.pdf http://www.teias.gov.tr/YayinRapor/APK/projeksiyon/KAPASITEPROJEKSIYONU2013.pdf

Value(s) applied	See Hata! Başvuru kaynağı bulunamadı.
Choice of data or Measurement methods and procedures	TEIAS is the national electricity transmission company, which makes available the official data of all power plants in Turkey. The latest data available during PDD preparation was for 2012 please find information as: http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2012.pdf
Purpose of data	
Additional comment	

Data / Parameter	$EF_{CO_2,i,y}$
Unit	tCO_2/GJ
Description	CO ₂ emission factor of fuel type i in year y
Source of data	IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the IPCC Guidelines on National GHG Inventories. http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
Value(s) applied	See Table 21
Choice of data or Measurement methods and procedures	No plant specific and national emission factor data is available in Turkey. So, IPCC default data is used.
Purpose of data	
Additional comment	

Data / Parameter	$\eta_{m,y}$
Unit	-
Description	Average energy conversion efficiency of power unit m in year y
Source of data	Annex I the "Tool to calculate the emission factor for an electricity system"(v.4)
Value(s) applied	See Table 13
Choice of data or Measurement methods and procedures	For efficiency rates of Coal and Lignite Power Plants See Annex-1 of the Tool (highest rate is applied to be conservative) For Natural Gas and Oil plants efficiencies, default value given in the tool is applied: http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v2.pdf
Purpose of data	
Additional comment	

Ex ante calculation of emission reductions

Stepwise approach of „Tool to calculate the emission factor for an electricity system” version 04.0.0²³ is used to find this combined margin (emission coefficient) as described below:

Step 1. Identify the relevant electric systems

There are 21 regional distribution regions in Turkey but no regional transmission system is defined. In Article 20 of License Regulation it is stated that:

“TEİAŞ shall be in charge of all transmission activities to be performed over the existing transmission facilities and those to be constructed as well as the activities pertaining to the operation of national transmission system via the National Load Dispatch Center and the regional load dispatch centers connected to this center and the operation of Market Financial Reconciliation Center²⁴”.

As it can be understood from this phrase, only one transmission system, which is national transmission system is defined and only TEİAŞ is in the charge of all transmission system related activities. Moreover, a communication with representative of TEİAŞ, which indicates that: *“There are not significant transmission constraints in the national grid system which is preventing dispatch of already connected power plants”* is submitted to the DOE. Therefore, the national grid is used as electric power system for project activity. The national grid of Turkey is connected to the electricity systems of neighboring countries. Complying with the rules of the tool, the emission factor for imports from neighboring countries is considered 0 (zero) tCO₂/MWh for determining the OM.

There is no information about interconnected transmission capacity investments, as TEİAŞ, who operates the grid, also didn't take into account imports-exports for electricity capacity projections.²⁵ Because of that, for BM calculation transmission capacity is not considered.

Step 2. Choose whether to include off-grid power plants in the Project electricity system (optional)

According to 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

For this project Option I is chosen.

Step 3: Select a method to determine the operating margin (OM);

The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

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

²³ See, <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf>

²⁴ See, <http://www.ongurergan.av.tr/en-EN/mevzuat/Electric%20Market%20Licensing%20Regulation.doc> (page 21)

²⁵ See, <http://www.teias.gov.tr/KAPASITEPROJEKSIYONU2013.pdf>

The Simple Operating Margin (OM) emission factor ($EF_{grid, OM, y}$) is calculated as the generation weighted average CO₂ emissions per unit net electricity generation (tCO₂/MWh) of all the generating plants serving the system, excluding low-cost/must-run power plants. As electricity generation from solar and low cost biomass facilities is insignificant and there are no nuclear plants in Turkey, the only low cost /must run plants considered are hydroelectric, wind and geothermal facilities.

The Turkish electricity mix does not comprise nuclear energy. Also there is no obvious indication that coal is used as must run resources. Therefore, the only low cost resources in Turkey, which are considered as must-run, are Hydro, Renewables and Waste, Geothermal and Wind (according to statistics of TEIAS).

Table 6: Share of Low Cost Resource (LCR) Production 2010-2014 (Production in GWh)²⁶

Share of Low Cost Resource (LCR) Production 2010-2014 (Production in GWh)					
	2010	2011	2012	2013	2014
Gross production	211.207,7	229.395,1	239.496,8	240.153,95	251.962,82
TOTAL LCR Production	55.837,6	58.226,0	65.345,8	69.512,7	52.961,42
Hydro	51.795,5	52.338,6	57.865,0	59.420,47	40.644,70
Renewables and Waste	457,5	469,2	720,7	1.171,20	1.432,59
Geothermal and Wind	3.584,6	5.418,2	6.760,1	8.921,04	10.884,12
Share of LCRs	26,44%	25,38%	27,28%	28,95%	21,02%
Average of last five years	25,81%				

As average share of low cost resources for the last five years is far below 50% (25.81%), the simple OM method is applicable to calculate the operating margin emission factor ($EF_{grid, OM, y}$)

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

- Ex ante option: A 3-year generation-weighted average, based on the most recent data available at the time of submission of the CDM-PDD to the DOE for validation, or
- Ex post option: The year, in which the project activity displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

The ex-ante option is selected for Simple OM method, with the most recent data for the baseline calculation stemming from the years 2012 to 2014.

Step 4. Calculate the operating margin emission factor according to the selected method

The simple OM emission factor is calculated as the generation-weighted average CO₂ emissions per unit net electricity generation (tCO₂/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants. The calculation of the simple OM emission factor can be based on

- Option A: data on net electricity generation a CO₂ emission factor of each power unit, or
- Option B: data 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.

Option B is chosen to calculate the Simple OM, as there is no power plant specific data available, renewable power generation are considered as low-cost power sources and amount of electricity supplied to the grid by these sources is known.

Where 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, and based on the fuel type(s) and total fuel consumption of the project electricity system, as follows:

²⁶ See: <http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/istatistik2014.htm> (excel file number 38)

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO_2,i,y}}{EG_y} \quad (1)$$

Where:

- EF_{grid,OMsimple,y}** = Simple operating margin CO₂ emission factor in year y (tCO₂/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 (of fossil fuel type i in year y (GJ / mass or volume unit)
- EF_{CO₂,i,y}** = CO₂ emission factor of fossil fuel type i in year y (tCO₂/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** = three most recent years for which data is available at the time of submission of the PDD to the DOE for validation

For the calculation of the OM the consumption amount and heating values of the fuels for each sources used for the years 2012, 2013 and 2014, is taken from the TEİAŞ annual statistics, which holds data on annual fuel consumption by fuel types as well as electricity generation amounts by sources and electricity imports. All the data needed for the calculation, including the emission factors and net calorific values (NCVs), are provided in Annex 2. Total CO₂ emission due to electricity generation in Turkey for the years of 2012, 2013 and 2014 are given in

Table 7.

Table 7: CO₂ emissions from electricity production 2012-2014 (ktCO₂)

	2012	2013	2014
CO₂-Emissions	110,931	105,254	122,336

Table 8 presents the gross electricity production data by all the relevant energy sources. Low-cost/must run resources like hydro, wind, geothermic and biomass do not emit fossil CO₂ and thus are not taken into account in calculations.

Table 8: Gross electricity production by fossil energy sources 2012-2014 (GWh)²⁷

Gross Electricity Production by Energy Source 2012-2014 [GWh]			
Natural Gas	104,499.2	105,116.3	120,576.0
Lignite	34,688.9	30,262.0	36,615.4
Coal	33,324.2	33,524.0	39,647.3
Fuel Oil	981.3	1,192.5	1,662.9

²⁷ See; <http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/istatistik2014.htm> excel file 38

Motor Oil	657.4	546.3	482.4
Naphtha	0.0	0.0	0.0
LPG	0.0	0.0	0.0
Total fossil fuels	174,151.0	170,641.2	198,984.0

Above table shows gross data, but EG_y in the above described formula means electricity delivered to the grid, i.e. net generation, the following table shall help to derive net data by calculating the net/gross proportion on the basis of overall gross and net production numbers.

Table 9: Net/gross electricity production 2012-2014 (GWh)²⁸

Relation Net/Gross Electricity Production 2012-2014			
Gross Production [GWh]	239,496.80	240,153.95	251,962.82
Net Production [GWh]	227,707.30	228,977.00	239,448.83
Relation	95.08%	95.35%	95.03%

Multiplying these overall gross/net relation percentages with the fossil fuels generation amount does in fact mean an approximation. However this is a conservative approximation as the consumption of plant auxiliaries of fossil power plants is higher than for the plants that are not included in the baseline calculation. In the end this would lead to a lower net electricity generation and therefore to a higher OM emission factor and higher emission reductions. Table 10 shows the resulting net data for fossil fuel generation and adds electricity imports.

Table 10: Electricity supplied to the grid, relevant for OM (GWh)

Net El. Production by fossil fuels and Import 2012-2014 [GWh]			
Net El. Prod. by fossil fuels	165.578,2	162.699,4	189.101,3
Electricity Import	5.826,7	7.429,4	7.953,5
Electricity supplied to grid by relevant sources	171.404,9	170.128,8	197.054,8

Electricity import is added to the domestic supply in order to fulfill the Baseline Methodology requirements. Imports from connected electricity systems located in other countries are weighted with an emission factor of 0 (zero) tCO₂/MWh.

The last step is to calculate $EF_{grid,OMsimple,y}$:

Table 11: Calculation of Weighted $EF_{grid,OMsimple,y}$ (ktCO₂/GWh)

²⁸ For Net Production See, <http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/istatistik2014.htm> excel file number 35

	2012	2013	2014
CO ₂ -Emissions (ktCO ₂)	110,931	105,254	122,336
Net Electricity Supplied to Grid by relevant sources (GWh)	171,404.9	170,128.8	197,054.8
EF _{grid,OMsimple,y} (ktCO ₂ /GWh)	0.6472	0.6187	0.6208
3-year Generation Weighted Average EF _{grid,OMsimple,y} (ktCO ₂ /GWh)	0.6285		



$$EF_{grid,OMsimple,y} = 0.6285(ktCO_2/GWh)$$

Step 5. Calculate the build margin (BM) emission factor

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 CDM-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 to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated *ex ante*, as described in Option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

Again, the project proponents can choose between two options according to the calculation tool: calculate the BM *ex-ante* based on the latest available data or update the BM each year *ex post*. Option 1, the *ex-ante* approach, is again chosen.

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. The last plant of the sample group is built in 2010 and until the end of the 2013 which is the latest year for official statistics published for plants put in operation. VER plants are excluded from sample group. While identifying the sample group dismantled, revised, retrofits are not included. Only new capacity additions (power plants / units) are taken into account. All power plants in operation by 2013 are given in Annex 4.

Total electricity generation in 2013 is 240,153.953 GWh and 20% of this generation is 48,030.8 (AEG_{SET->20%}) GWh. Total electricity generation of last five power plants in operation is 369 GWh (AEG_{SET-5-units}) which is lower than 20% total generation in 2013. Since AEG_{SET->20%} is bigger than AEG_{SET-5-units}, SET->20% is chosen as SET_{sample}. Also in the sample group there is no power plant started supply electricity to grid more than 10 years ago, steps d, e and f are ignored.

Sample group for BM emission factor is given below table. The derivation of the values presented in Table 12 is contained in a separate excel file which is available for validation.

Table 12: Sample group generation for BM emission factor calculation (GWh)

Energy Source	2010	2011	2012	Sample Group Total Generation (GWh)
Natural Gas	1,056.3	11,815.1	10,540.0	23,411.4
Lignite	0	0.0	40.0	40.0

Coal	8,012.0	4,320.0	201.0	12,533.0
Fuel Oil	0	701.2	0.0	701.2
Hydro	3,336.8	3,730.4	5,354.0	12,421.2
Renewable	2.4	150.0	677.0	829.4
TOTAL	12,407.5	20,716.7	16,812.0	49,936.2

The build margin emissions factor is the generation-weighted average emission factor (tCO₂/MWh) of all power units m during the most recent year y for which power generation data is available, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad (2)$$

Where:

- $EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/MWh)
- $EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)
- $EF_{EL,m,y}$ = CO₂ emission factor of power unit m in year y (tCO₂/MWh)
- m = Power units included in the build margin
- y = Most recent historical year for which power generation data is available

Because of only fuel types and electricity generation data are available for the sample group, *Option B2* of Simple OM method is used to calculate emission factor. The formulation of emission factor is given below:

$$EF_{EL,m,y} = \frac{EF_{CO2,m,i,y} \times 3.6}{\eta_{m,y}} \quad (3)$$

Where:

- $EF_{EL,m,y}$ = CO₂ emission factor of power unit m in year y (tCO₂/MWh)
- $EF_{CO2,m,i,y}$ = Average CO₂ emission factor of fuel type i used in power unit m in year y (tCO₂/GJ)
- $\eta_{m,y}$ = Average net energy conversion efficiency of power unit m in year y (%)
- y = Three most recent years for which data is available at the time of submission of the PDD to the DOE for validation

BM emission factor calculation and resulted BM factor is given in Table 13. For BM factor calculation, since no official emission factors for different fuel types are available, lower confidence default values of IPCC Guidelines are applied. Explanation of emission factor selection for each energy sources and references are given in Annex.2 of the PDD.

Table 13: BM emission factor calculation using equation (2) and (3)

Energy Source	Sample Group Total Generation (GWh)	Effective emission (tCO ₂ /TJ)	CO ₂ factor	Average Efficiency ($\eta_{m,y}$)	CO ₂ Emission (ktCO ₂)
---------------	-------------------------------------	---	------------------------	-------------------------------------	---

Natural Gas	23,411.4	54.3	60.00%	7,627.4
Lignite	40.0	90.9	50.00%	26.2
Coal	12,533.0	89.5	50.00%	8,076.3
Fuel Oil	701.2	72.6	46.00%	398.4
Hydro	12,421.2	0.0	0.00%	0.0
Renewables	829.4	0.0	0.00%	0.0
Total	49,936.2			16,128.3
EF_{grid,BM,y} (tCO₂/MWh)	0.3230			



$$EF_{grid,BM,y} = 0.3230 \text{ tCO}_2/\text{MWh}$$

Step 6. Calculate the combined margin emission factor

The calculation of the combined margin (CM) emission factor ($EF_{grid,CM,y}$) is based on one of the following methods:

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

The combined margin emission factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} * w_{OM} + EF_{grid,BM,y} * w_{BM} \quad (4)$$

Where:

- $EF_{grid,BM,y}$ = Build margin CO₂ emission factor in year y (tCO₂/MWh)
- $EF_{grid,OM,y}$ = Operating margin CO₂ emission factor in year y (tCO₂/MWh)
- w_{OM} = Weighting of operating margin emissions factor (%)
- w_{BM} = Weighting of build margin emissions factor (%)

According to the Tool for wind power generation project activities: $w_{OM} = 0.75$ and $w_{BM} = 0.25$. Then:

$$EF_{grid,CM,y} = 0.6285 \text{ tCO}_2/\text{MWh} * 0.75 + 0.3230 \text{ tCO}_2/\text{MWh} * 0.25$$

$$= 0.5521 \text{ tCO}_2/\text{MWh}$$



$$EF_{grid,CM,y} = 0.5521 \text{ tCO}_2/\text{MWh}$$

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered VER project activity:

For the explanation of how and why the project activity leads to emission reductions that are additional to what would have occurred in the absence of the project activity, the Baseline Methodology refers to the consolidated "Tool for the demonstration and assessment of additionality"²⁹ version 7.0.0 (Tool), which defines a step-wise approach to be applied to the proposed project.

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

Sub-step 1a. Alternatives to the project activity

To identify the realistic and credible alternative scenario(s) for project participants, scenarios in the Tool are assessed:

a) The proposed project activity undertaken without being registered as a GS VER project activity

This alternative is realistic and credible as Yuntdag may undertake project activity if he sees no risk for project and/or if the project turns out to be financially attractive without GS VER credit income. However, barrier analysis shows that the project is not economically feasible without GS VER credit income. Detailed information is given in Step-3.

b) Other realistic and credible alternative scenario(s) to the proposed GS VER project activity scenario that deliver electricity with comparable quality, properties and application areas, taking into account, where relevant, examples of scenarios identified in the underlying methodology;

The project activity is power generation activity without any greenhouse gas emission harnessing the energy of the wind. Being a private entity, Yuntdag doesn't have to invest power investments even proposed project activity. Also, since Yuntdag has licence only for wind power investment and since in the proposed project area there is no hydro or other sources for electricity generation, other project activities delivering same electricity in the same project area is *not* realistic for project participant.

c) Continuation of the current situation, i.e. Yuntdag WPP is not built

The decision in favour or against a project investment depends on the expected revenues and risks, like for every other private investment. Investment decisions other than Yuntdag WPP are independent from the question whether Yuntdag WPP is built or not. This alternative is also realistic and credible.

According to baseline scenario, there is a need for energy investment to satisfy increasing demand and if the Yuntdag WPP is not built, the same amount of energy will be supplied by other private investors to the grid. Forecasts shows that electricity supplied in the absence of Yuntdag WPP will be mainly based on fossil fuels as the projections for the year of 2017 forecasts 73.85% share for fossil fuels in the energy mix.

In the absence of the project the power will be produced by new and existing power plants in accordance with the baseline in ACM0002 version 16.

Outcome of Step 1.a:

Therefore, two realistic and credible alternative scenarios are identified for the project activity:

a) The proposed project activity undertaken without being registered as a GS VER project activity.

b) Continuation of the current situation, i.e. Yuntdag WPP is not built.

Sub-step 1b. Consistency with mandatory laws and regulations

²⁹ Version 7, <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf> (page 6)

Both alternatives are (building or not building the project activity) in compliance with the following identified applicable mandatory laws and regulations:

- (1) Electricity Market Law³⁰
- (2) Law on Utilization of Renewable Energy Resources for the Purpose of Generating Electricity Energy³¹
- (3) Environment Law³²

Table 14: Project Implementation Schedule

Date	Milestone
25/07/2007	Initial Stakeholder Consultation in Koyuneli Village
07/03/2008	Commissioning of the first 6 turbines: Start of the first crediting period and first monitoring period
18/03/2008	Final Validation Report
04/06/2008	Commissioning of 11 Turbines.
31/07/2008	Gold Standard Registration
30/04/2009	End of the first monitoring period
31/03/2010	End of the second monitoring period
09/06/2010	License granted by EMRA for capacity extension (for 57.5 MW)
31/12/2010	End of the third monitoring period
01/04/2011	Start date of construction for capacity extension
13/07/2011	Registration of capacity extension under Gold Standard
27/09/2011	Commissioning of 4 turbines which is belongs to capacity extension
31/12/2011	End of fourth monitoring period
18/01/2012	Date of the commissioning of 2 Turbines
31/12/2012	End of fifth monitoring period
24/05/2013	License granted by EMRA for capacity extension (for 60.0 MW)
05/12/2013	Date of replacement of the meters due to failure of both meters
31/12/2013	End of sixth Monitoring period
29/01/2014	Commissioning of 1 turbine which belongs to capacity extension
06/03/2015	End of the seventh Monitoring period
07/08/2015	Registration of capacity extension under Gold Standard
01/04/2016	Estimated start date of the second crediting period

Aforementioned project implementation schedule shows us that Innores started to consideration of VER from the beginning of the project implementation and VER Revenue has decisive impact on decision of proceeding to the project.

In the following, the barrier analysis is applied to clearly demonstrate that the project activity is unlikely to be financially/economically attractive without the revenue from the sale of VERs.

Step 2. Investment analysis

³⁰ See: http://www.epdk.gov.tr/documents/elektrik/mevzuat/kanun/Elk_Kanun_6446.doc (Enactment Date:2013)

³¹ See: http://www.epdk.org.tr/documents/elektrik/mevzuat/kanun/Elk_Kanun_Yek_Kanun.doc (Enactment Date: 2005)

³² See: <http://www2.cevreorman.gov.tr/yasa/k/2872.doc> (Enactment Date: 1983)

Investment analysis is not applied.

Step 3. Barrier analysis

Sub-step 3a. Barriers that would prevent the implementation of the proposed GS-VER project activity

The main barriers for renewable energy investments in Turkey are the lacking financial incentives, uncertainty about the future national policy, currency risks, lacking experience and disadvantages compared to conventional technologies with view to the regulatory framework. The carbon market turns out to be an innovative and effective element of an “enabling environment” for new renewable sources for electricity generation in Turkey. While the national policy can concentrate on the manifold aspects how to support the rapidly developing economy, funds from international credit buyers help the simultaneously fast growing electricity market to pursue a sustainable path by alleviating barriers which project developers face. The following barriers partly apply in general to all wind power projects, partly to projects in the specific regions and again partly are project specific.

System usage fee

Wind projects do especially suffer from the regulation concerning fees for the public grid system usage. The system usage fee, that has to be paid to TEİAŞ, is calculated on the basis of the installed capacity of a power plant. For conventional power plants, which use their installed capacity to some 80 to 85 percent to generate electricity, this means a much lower relative burden than for wind power plants, which use their capacity only to some 40%. Demands for calculation of system usage fee on the basis of actual output are rejected by TEİAŞ.³³ This shows the barrier for scenario 2, the investment into a wind farm that scenario 1 does not face. Quite the contrary, the system usage fee's design privileges conventional power sources, as they generally use their installed capacities to a relevantly higher degree than wind and other renewable sources.

Moreover, the height of the system usage fee is unevenly regionally distributed over Turkey. Wind farms again suffer from the fact that the system usage fee in the Turkish western, where most of the wind sites are located due to the good wind conditions, is among the highest in Turkey. This leads again to financial advantage of conventional power plants that are less dependent on site specific characteristics. Location of Yuntdağ WPP is classified as Region 1 within the TEİAŞ system tariff. The second highest usage fee is applied in this region, which is 218 times higher than the lowest usage fee of other regions (e.g. Region 7 and 10).³⁴

Situation with respect to market liberalisation

Wind power can hardly profit from electricity market liberalisation. Though they have the possibility to close contracts with private electricity buyers, who would pay higher prices than the state owned electricity distributor TEİAŞ, but then face the risk that they have to supply electricity also in times where the wind farm does not produce. This means they have to buy the contractual amounts on the market, most probably for a higher price than they sell it to their customer, thus producing financial losses with every kilowatt hour that has to be delivered without the wind farm producing. As this risk is hardly calculable, wind power producers rely to the very low, but guaranteed prices TEİAŞ pays. Operators of conventional power plants can profit from liberalisation, as they can more flexibly adapt generation to actual demand.

Price cap for renewable electricity

³³ See speech by Mr. Tolga Bilgin, chairman of Ressiad (Wind Power and Hydro Power Plants Businessmen's Association) on March 9th, 2007 in Istanbul. Internet: <http://www.ressiad.org.tr/makaleler.php?ID=62> (accessed on July 2nd, 2007)

³⁴ See TEİAŞ Committee decision <http://www.epdk.org.tr/tarife/elektrik/iletim/1029/1029.html> (accessed on August 1st, 2007)

Concerning the guaranteed feed-in tariff for renewable electricity, with Law of Utilization of Renewable Energy Resources for the purpose of energy generation, it is defined as a minimum price of 5 Eurocent per kWh for 10 years for the plants put in operation before the year of 2012. However there is also a maximum price of 5.5 Eurocent per kWh which has to be paid to the producer. This regulation does not exist in other incentive schemes for renewable electricity in Europe. Anyway, since some 50 percent of electricity generation in Turkey is by the state, any competition above the 5 Cent threshold is limited, as the state can regulate the electricity supply and with this influence the prices.

Privatisation of electricity distribution

While the ongoing privatisation activities do not bring any chances for wind power producers, they rather contain the risk of rising distribution fees. All these uncertainties have to be considered within the financial and investment planning of the project and complicate access to equity and loans for wind power investments.

High financing costs due to perceived risks in the international market

Turkish project developers face high costs when they try to obtain export credit insurance due to high perceived country risk of Turkey in the international market. With the perceived risks of an investment into the newly applied technology (Yuntdağ is still one of the first private investments into wind power) in Turkey, the costs for export credit insurance would have been prohibitive, so that DOST had to abandon it. Without export credit insurance, conditions for credit financing included additional burdens and commitments for DOST. Instead of a 15 year pure project financing loan, DOST only got a loan with 10 years duration and right of recourse for the lender.

Availability of debt financing

The barriers described above contribute to the largest barrier being the low attractiveness of the project to investors and therefore the difficulties in obtaining debt funding. This was the major problem in project development due to the low IRR combined with the high risks involved with implementation of a not common project type in Turkey. Generally investment in Turkey is associated with relatively high risks – especially after the economic crisis in 2001 – which makes access to international capital markets difficult. Beside the generally high perceived country risks in Turkey, the disadvantages and risks associated with the inexperienced wind market and technology in Turkey lead to difficulties in finding a reasonable offer for debt financing. This kind of investment barrier is also getting obvious by analysing the Turkish wind power development. Despite good wind conditions, some 40 wind licenses are waiting for implementation into a project since years, most of them untouched, some of them offered for sale, some soon running out, all because of lacking financing for wind power projects. The letter from 23 January 2007 by Garanti bank confirms that the application of the carbon credit concept, in this case the international market for VERs (Voluntary Emission Reductions), positively influenced the financing decision for Yuntdağ Wind Farm.³⁵ The advantage of the VER generation and sale is the long term sale agreements and the quotation of the income in a hard currency, in Euro.

Sub-step 3b. The identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity)

As the above presented barriers are largely specific to wind power projects, they do not – or at least less – affect the alternatives that are included in the baseline scenario of ACM0002, namely the electricity generation by existing grid-connected power plants and the addition of new – and in this case especially conventional, thus GHG emitting – generation sources.

Alleviation of the identified barriers by the GS VER income

³⁵ See letter by Garanti bank, January 23rd 2007

The major problem in project development being the availability of debt financing, the identified barriers and economic and financial hurdles described above will be overcome by additional revenues from generation and selling of Gold Standard Voluntary Emission Reductions (GS-VERs).

As for corporate decisions, financial ratios are a relevant basis, the effect of GS-VER registration shall be analysed on the basis of the internal rate of return (IRR). For electricity sales, the numbers from the internal calculations of DOST/Innores, taken from a conservative approach of the feasibility assessment and micro-siting, are used. The columns show the IRR values for one and two crediting periods, respectively. This approach is still conservative, as the project proponent assumes to re-validate and continue the project for two more periods, thus for the maximum period of 21 years.

Assumptions:

- Electricity generation: 160,834 MWh p.a. for first 3.5 years and 207,558 for the next 2.5 years and 203,900 MWh for the following years
- Emission reductions: 113,964 tCO₂e p.a. for first 3.5 years and 147,076 for the next 2.5 years and 144,484 tCO₂e for the following years
- GS-VER price of 6 Euro, alternative price for official Kyoto credits 15 Euro
- One or two crediting periods

	IRR without GS-VER project	IRR with GS-VER price of 6 EUR/ton 1 crediting period (7 years)	IRR with GS-VER price of 6 EUR/ton 2 crediting periods (14 years)	IRR with CER/ERU price 15 EUR/ton 1 crediting period (7 years)	IRR with CER/ERU price 15 EUR/ton 2 crediting periods (14 years)
10 th year	7.05 %	8.38 %	8.72 %	10.32 %	11.06 %
20 th year	13.67 %	14.47 %	14.88 %	15.68 %	16.65 %

Table 15: Impact of GS-VER sale on IRR

The impact of integrating GS-VER sales into the project calculations is already getting evident by only considering the first 7 year crediting period. It is getting even more obvious when also the second crediting period is taken into account, assuming the same values for electricity generation and emission reductions as in the first period. For a potential investor or lender, not only the added value to the IRR is an important argument for investing into the project but also the fact, that the project developer considered all possible sources of income, thus showing a responsible and careful handling of investment projects.

In case Turkey ratifies the Kyoto Protocol and becomes a JI or CDM host country, the project developer intends to upgrade the Yuntdağ GS-VER project to be registered as a JI or CDM project activity. Appropriate provisions will be made in any Emission Reduction Purchase Agreements closed by the project developer.

Step 4. Common practice analysis

The section below provides the analysis as per step 4 of the "Tool for the demonstration and assessment of additionality", version 7.0.0 and according to the Guidelines on Common Practice version 02.0

Step 1. Calculate applicable capacity or output range as +/-50%: The proposed project has a capacity of 60 MWm/60 MWe consisting of 24 turbines with 2.5 MWe capacity each. Per the guideline of +/-50%, the applicable output range for the project is 30 MWe to 90 MWe.

Step 2. Identify similar projects (both CDM and non-CDM) which fulfil all of the following conditions:

- The project are located in the applicable geographical area: **Turkey**
- The projects apply the same measure as the proposed project activity: **Renewable energy**
- The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity; **Wind Energy**
- The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g. clinker) as the proposed project plant: **Energy**
- The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;
- The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

The projects within the host country, applying same measures, using same energy source, produce same goods and the output range that have started commercial operation and are connected to the national grid system are shown in the excel file Named Common Practice_Yuntdag_v2.xlsx.

Step 3: within the projects identified in Step 2, identified projects that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. The number of all projects according to step 3 is **0** which is Nall.

Step 4: within similar projects identified in Step 3, identified projects that apply technologies that are different to the technology applied in the proposed project activity. The number of all projects according to step 4 is **0** which is Ndiff.

Step 5. Calculation of factor F:

$$F = 1 - N_{diff}/N_{all}$$

Factor F is therefore undefined. Since $N_{all} - N_{diff}$ (0) is lower than 3, the proposed is not a common practice as per the guidelines.

The proposed project activity is therefore additional under common practice analysis. An Excel sheet is provided for the calculation.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the project activity:

The project consists of the 24 wind turbines that are connected to the grid via a 26 km transmission line. The wind power project does not comprise any emission sources.

The project spatial extend of Yuntdag WPP is the project power plant and all power plants connected physically to the electricity system which is discussed and applied with calculation of combined margin in accordance of "Tool to calculate the emission factor for an electricity system"

The project uses wind energy to produce electricity. Kinetic power of the wind is converted to electrical energy, which then will be transferred to the grid. Back-up power generators in the wind farm will only be used when the wind farm is out of service and power cannot be supplied from grid. Hence, emissions due to usage of back-up power generation are expected to be very low and are taken to be zero complying with the "Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion" (v.2).

A general operation diagram of the project is given in Figure 3.

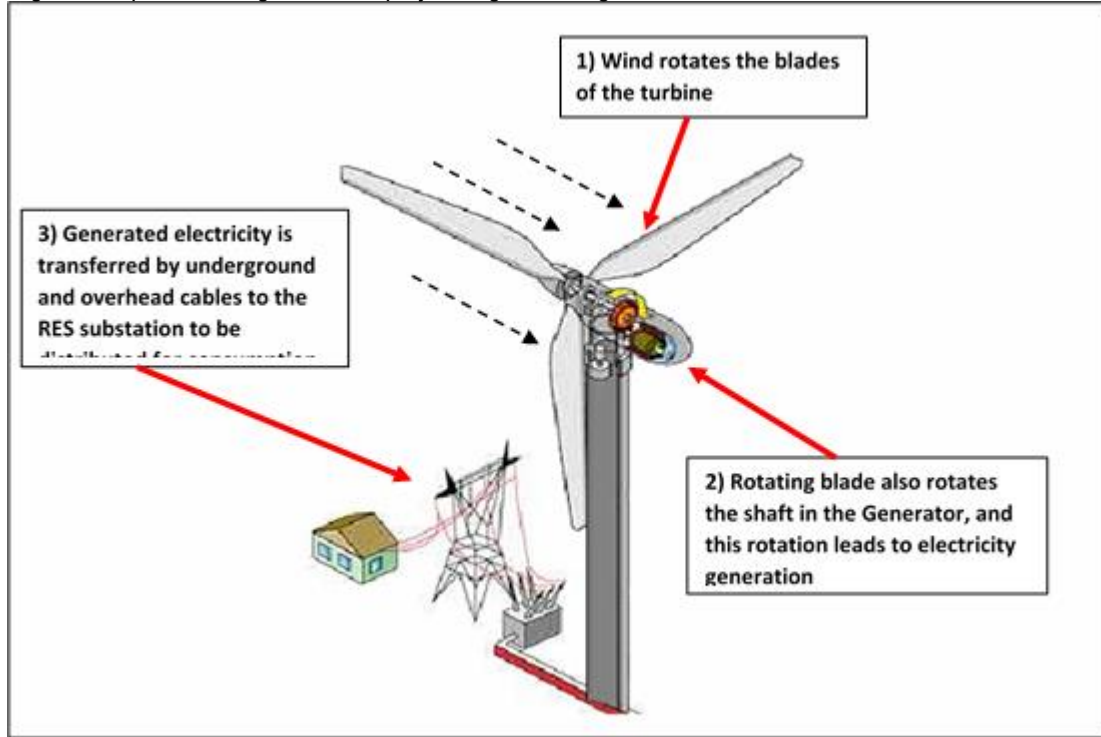


Figure 5: Operation diagram of the project

Based on the above operation diagram, the baseline and project activity related greenhouse gases which are considered in baseline calculation is given below, in **Hata! Yer işareti başvurusu geçersiz.:**

Table 16: Emissions sources included in or excluded from the project boundary

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	CO ₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO ₂	Yes	<i>Main emission source:</i> Fossil fuels fired for electricity generation cause CO ₂ emissions. It is included to baseline calculation to find the displaced amount by the project activity.
		CH ₄	No	<i>Minor emission sources:</i> Even though there may be some CH ₄ and N ₂ O emissions during electricity generation, these emissions are negligible and not included in baseline calculation to be conservative and comply with Table-1 of the methodology (page 5).
		N ₂ O	No	
Project scenario	Emissions during construction and operation of	CO ₂	No	<i>Minor emission source</i>
		CH ₄	No	<i>Minor emission source</i>

	the project activity	N ₂ O	No	Minor emission source
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B.5. Details of baseline information, including the date of completion of the baseline study and the name of person (s)/entity (ies) determining the baseline:

Date of completion: 19/01/2016

Name of entity determining the baseline:

Lifenerji Ltd. Şti., Turkey (project consultant)
Tel: +90 312 481 21 42
Fax: +90 312 480 88 10 Email: info@lifenerji.com
Contributor: İnnores Elektrik Üretim AŞ

Lifenerji is not a project participant.

SECTION C. Duration of the project activity / Crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

Construction works were expected to start in November 2007. With this, the project activity had begun in November 2007.

C.1.2. Expected operational lifetime of the project activity:

The expected lifetime of the Yuntdağ WPP project is 25 years³⁶. Turbine lifetime is expected to be minimum of 20 years³⁷.

C.2 Choice of the crediting period and related information:

A renewable crediting period has been selected for the project.

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

The first crediting period started with commissioning of the wind power plant on 07/03/2008. The first day of the crediting period will be documented in the initial monitoring report, as it is the same as the first day of electricity delivery to the grid, stated by meter reading records signed by TEIAS.

C.2.1.2. Length of the first crediting period:

7 years, 0 months.

C.2.1.3. Starting date of the second crediting period:

Second crediting period will expectedly start on 01/04/2016.

C.2.1.4. Length of the second crediting period:

7 years, 0 months.

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

Not applicable

C.2.2.2. Length:

³⁶ <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf>

³⁷ http://www.nordex-online.com/fileadmin/MEDIA/Gamma/Nordex_Gamma_en.pdf

Not applicable

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SECTION D. Application of a monitoring methodology and plan

D.1. Name and reference of approved monitoring methodology applied to the project activity:

Approved Monitoring Methodology ACM0002 (Version 16), which is the consolidated monitoring methodology for grid-connected electricity generation from renewable sources, is applied.

D.2. Justification of the choice of the methodology and why it is applicable to the project activity:

Application of this methodology to Yuntdağ WPP is justified because:

- the approved methodology ACM0002 for baseline determination is used,
- the project activity is connected to the grid and information on its characteristics is available,
- electricity generation from the wind energy sources,
- this is not a fuel-switch project.

D.2.1. OPTION 1: Monitoring of the emissions in the project scenario and the baseline scenario

As the necessary baseline emission factors are all defined ex ante (Operating and Built Margin, see baseline description), the only information to be monitored is the amount of electricity fed into the grid by Yuntdağ WPP. This value will be monitored continuously by redundant metering devices, one of them being the main one in the Yuntdağ substation, which provides the data for the monthly invoicing to TEİAŞ.

The collected data will be kept by Innorec during the crediting period and until two years after the last issuance of VERs for the Yuntdağ WPP project activity for that crediting period.

Given a data vintage based on ex ante monitoring and selection of a renewable 7 year crediting period, the Combined Margin will be recalculated at any renewal of the crediting period using the valid baseline methodology ACM0002.

D.2.1.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:

ID number (Please use numbers to ease cross- referencing to D.3)	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

Left blank on purpose, as the proposed project activity does not lead to any project emissions.

D.2.1.2. Data to be collected in order to monitor project performance on the most sensitive sustainable development indicators:

The Gold Standard requires to include those indicators into the monitoring plan that are either crucial for an overall positive impact on sustainable development or particularly sensitive to changes in the framework conditions and/or where the public consultation has yielded concerns of stakeholders. The project's overall positive impact on sustainable development is the fact that greenhouse gas emissions from electricity generation are reduced as well as the implementation of the environmental sound technology in Turkey. Both aspects are naturally part of the monitoring: emission reductions are monitored and can only happen when the plant is built and operating. Further particularly sensitive indicators were not identified and no concerns have been raised by stakeholders. Because of this, no requirements emerge from the Gold Standard rules to include additional indicators into the monitoring plan.

However, in order to take up and support the philosophy of the Gold Standard and as a result of the discussion during the on-site validation meeting, the following specific indicators, which seem to be suitable to represent the project's social and environmental impacts, were identified and included into the monitoring plan.

Sustainable Development Indicator	Data type	Data variable	Data unit	Measured (m), calculated (c) or estimated (e)	Rationale
Water quality and quantity		Amount of wastewater transferred by sewage trucks		m	Waste water is collected in the cesspool and then transferred with sewage trucks. How: Records of transfer of waste water from the plant by sewage truck, if it was performed, will be used to demonstrate proper waste water management When: At each verification period

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Air quality (emissions other than GHGs)		Amount of avoided CO ₂ , NMVOC	c	By who: Assigned technician by Plant Manager or assigned carbon consultant Due to avoidance of fossil fuel combustion, these emissions will be reduced in parallel to reduced CO₂. According to latest official data CO and NMVOC emissions due to electricity generation in 2012 are: 0.160 tons/GWh and 0.034 tons/ GWh respectively³⁸. Reductions of proportionate amount in described emissions during operational life of the project activity. When electricity generation amount (203.9 GWh/y) is considered for the project activity then expected annual emission avoidances with project implementation becomes 32.7 and 7.0 tons/year respectively for each parameter. (for detailed calculations, please see CM_Yuntdag_09 12 2015 excel file) How: Amount of annual net electricity generation, which is calculated by monthly settlement notifications of PMUM based on monthly meter readings, will be used to calculate estimated CO and NMVOC emission reductions by project activity When: At each verification period By who: Assigned technician by Plant Manager or assigned carbon consultant
Soil condition		Waste collection	m	Garbage is being collected by the municipality. How: Letter from the municipality for the waste collection will be provided. When: At each verification By who: Assigned technician by Plant Manager or assigned carbon consultant
Biodiversity		Number of observed bird strikes	m	Letter from the muhtar will be collected at each verification. Also, ornithology reports will be prepared. How: Letter from the muhtar and ornithology reports will be provided. When: Annually By who: Assigned technician by Plant Manager or assigned carbon consultant
Quality of employment (including job quality,		Training records for all employees	m	All employees will be trained according to the requirements. How: Newly added training attendance list and/or certificates.

³⁸ <http://www.tuik.gov.tr/PreHaberBultenleri.do?id=16174> Table 7-cell H9

fulfilment of labour standards)					When: At each verification. By who: Assigned technician by Plant Manager or assigned carbon consultant
Human and institutional capacity (including empowerment, education, involvement, gender)		Training records for local employees		m	How: Training records for the local workers will be provided such as occupational health and safety trainings, security training renewal cards etc. When: At each verification, newly added records will be provided. By who: Assigned technician by Plant Manager or assigned carbon consultant
Quantitative Employment (numbers)		Number of employees		m	There will be minimum of about 13 workers but the exact number may change. How: Employment records When: At each verification, newly added employees' records will be provided. By who: Assigned technician by Plant Manager or assigned carbon consultant

D.2.1.3. Description of formulae used to estimate project emissions (for each gas, source, formulae/algorithm, emissions units of CO2 equ.)

Project emissions are zero.

D.2.1.3. Relevant data necessary for determining the baseline of anthropogenic emissions by sources of GHGs within the project boundary and how such data will be collected and archived :

ID number (Please use numbers to ease cross-referencing to table D.3)	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment

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1. EG _{facility,y}	Quantity of net electricity generation supplied by the project plant to the grid in year y	Electricity meter and PMUM data	MWh/yr	m	Continuous measurement and at least monthly recording	100%	Electronic and paper	Two electricity meters will be placed (one main and one reserve) at the substation. These meters are sealed by TEIAS and intervention by project proponent is not possible. The fact that two meters are installed in a redundant manner keeps the uncertainty level of the only parameter for baseline calculation low. High data quality of this parameter is not only in the interest of the emission reduction monitoring, but paramount for the business relation between the plant operator and the electricity buyers. PMUM (Piyasa Mali Uzlaştırma Merkezi) readings will be used as a base. The above described measurement method follows Article 81 of the official regulation "Electricity Market Balancing And Settlement Regulation"³⁹
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D.2.1.4. Description of formulae used to estimate baseline emissions (for each gas, source, formulae/algorithm, emissions units of CO2 equ.)

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y \quad (5)$$

³⁹ See, http://www.epdk.gov.tr/documents/elektrik/mevzuat/yonetmelik/elektrik/dengeleme_uzlastirma/DUYson.doc page 55

Where:

ER_y = Emission reductions in year y (t CO₂/yr).

BE_y = Baseline emissions in year y (t CO₂/yr).

PE_y = Project emissions in year y (t CO₂/yr).

LE_y = Leakage emissions in year y (t CO₂/yr).

Project emissions

The proposed project activity involves the generation of electricity by development of a wind farm. The generation of electricity does not result in greenhouse gas emissions and therefore is taken as 0 tCO₂/year.

Leakage

LE_y is 0, as it is not considered according to ACM0002 (page 17). PE_y is 0 because project is a wind power generation activity (Only for geothermal and hydro project activities, it should be considered according to ACM0002 page 12).

Then: $ER_y = BE_y$

Baseline emissions

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity, calculated as follows:

$$BE_y = (EG_y - EG_{baseline}) \times EF_{grid,CM,y} \quad (6)$$

Where:

BE_y = Baseline emissions in year y (tCO₂/yr).

EG_y = Electricity supplied by the project activity to the grid (MWh).

$EG_{baseline}$ = Baseline electricity supplied to the grid in the case of modified or retrofit facilities (MWh). For new power plants this value is taken as zero.

$EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system".

The project activity is the installation of a new grid-connected renewable power plant so, $EG_{baseline} = 0$

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Then:

$$ER_y = BE_y = EG_y * EF_{grid,CM} = 203,900 \text{ MWh/year} * 0.5521 \text{ tCO}_2/\text{MWh} = 112,582 \text{ tCO}_2/\text{year}$$

D.2.2. OPTION 2: Direct monitoring of emission reductions from the project activity (values should be consistent with those in section E).

D.2.2.1. Data to be collected in order to monitor emissions from the project activity, and how this data will be archived:

ID number (Please use numbers to ease cross-referencing to table D.3)	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e),	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment

Not applicable

D.2.2.2. Description of formulae used to calculate project emissions (for each gas, source, formulae/algorithm, emissions units of CO₂ equ.):

Not applicable

D.2.3. Treatment of leakage in the monitoring plan

Potential leakage emissions in the context of power sector projects are emissions arising due to activities such as power plant construction, fuel handling and land inundation. However, according to the Methodology, those emission sources do not need to be taken into account.

D.2.3.1. If applicable, please describe the data and information that will be collected in order to monitor leakage effects of the project activity

ID number (Please use numbers to ease cross-referencing to table D.3)	Data variable	Source of data	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/paper)	Comment

Not applicable

D.2.3.2. Description of formulae used to estimate leakage (for each gas, source, formulae/algorithm, emissions units of CO₂ equ.)

Not applicable

D.2.4. Description of formulae used to estimate emission reductions for the project activity (for each gas, source, formulae/algorithm, emissions units of CO₂ equ.)

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y \quad (5)$$

Where:

ER_y = Emission reductions in year y (t CO₂/yr).

BE_y = Baseline emissions in year y (t CO₂/yr).

PE_y = Project emissions in year y (t CO₂/yr).

LE_y = Leakage emissions in year y (t CO₂/yr).

Transmission line losses are not included in the calculations as they are negligible, do also occur in the baseline scenario (construction of alternative, fossil fuelled power plants) and are not under the control of the project proponent.

D.3. Quality control (QC) and quality assurance (QA) procedures are being undertaken for data monitored

Data (Indicate table and ID number e.g. 3.-1.; 3.2.)	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
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Quantity of net electricity generation supplied by the project plant to the grid in year y (D.2.1.3.; 1. $EG_{facility,y}$)	Low	According to the Article 2 of the Communiqué of Meters in Electricity Sector⁴⁰: ‘The meters to be used in the electricity market shall be compliant with the standards of Turkish Standards Institute or IEC and have obtained “Type and System Approval” certificate from the Ministry of Trade and Industry.’ Therefore, Ministry of Trade and Industry (Ministry) is responsible from control and calibration of the meters. Also according to Article 11 of this Communiqué, meters shall be in class of 0.5s, which means error interval for measuring is in $\pm 0.5\%$ range which is well acceptable according to rules. Paragraph b) of the Article 9 of the 'Regulation of Metering and Testing of Metering Systems'⁴¹ (Regulation) of Ministry states that: ‘ b) Periodic tests of meters of electricity, water, coal gas, natural gas and current and voltage transformers are done every 10 years.’ Therefore periodic calibration of the meters will be done every 10 years. 1st calibration date for the meters is 05/12/2013 which is the installation date. Also according to Article 67 (page 20) of this regulation, the calibration shall be done in calibration stations which have been tested and approved by Ministry of Trade and Industry. Article 10 d) of Communiqué requires the meters shall be three phase four wire and Article 64 of Regulation clearly states how calibration shall be performed for this kind of meters. As above mentioned, the data acquisition and management and quality assurance procedures that are anyway in place, no additional procedures have to be established for the monitoring plan. The Turkish Electricity Market Regulation Agency (EPDK) sets rules on the accuracy of electricity meters that are used by power plants feeding into the grid. The rules are part of the EPDK regulation 25056 from 22 March 2003. The table in Article 11 of the regulation specifies the use of electricity meters of the accuracy class 0.5S for power plants between 10 MW and 100 MW and refers to compliance with International Electrotechnical Commission's norm EN 60687. TEIAS, who's employees will monthly visit the plant for the meter readings, is in charge of ensuring the adherence to these rules. The annual maintenance control is carried out by TEIAS. Since the meters are sealed by TEIAS, no other control or calibration is conducted beside the annual TEIAS controls. As the measuring devices are sealed by TEIAS, Innorec cannot intervene with the devices. In case of unforeseen problems or failures of the meters or if any differences occur between primary and secondary devices TEIAS has to be informed for necessary maintenance and calibration. There is an agreement between Innorec and TEIAS that in case of problems or failures of the meters TEIAS reacts as fast as possible to solve the problem. On 05/12/2013, there was need for replacement of the meter due to failure of both main and back up meters. The specification of meters were provided below:
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⁴⁰ See, http://www.epdk.gov.tr/documents/elektrik/mevzuat/teblig/elektrik/sayaclar_hakkinda/Elk_Tblg_Sayaclar.doc

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Name	Serial Number	Brand –Model	Year of Manufacture
New main Meter	4364955	EMH –LZQ-XC	2013

⁴¹ See, <http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.6381&MevzuatIliski=0&sourceXmlSearch=>

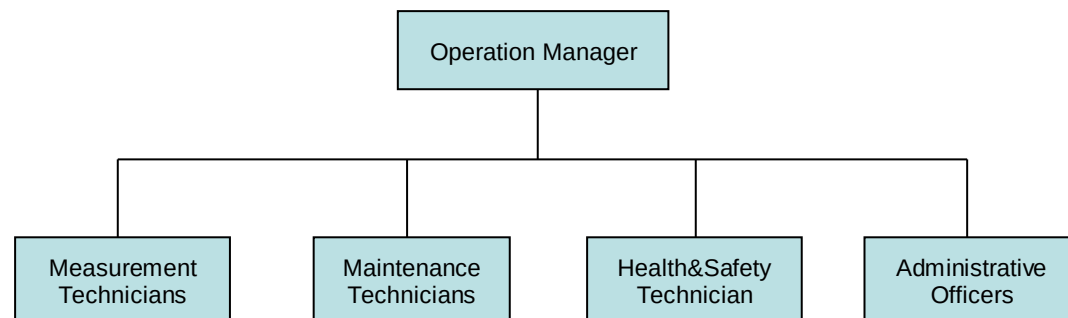
This template shall not be altered. It shall be completed without modifying/adding headings or logo, format or font.

D.4. Please describe the operational and management structure that the project operator will implement in order to monitor emission reductions and any leakage effects, generated by the project activity

As described above, the only relevant data that has to be monitored is the net electricity generation ($EG_{facility,y}$) per year. These data are subject to the accounting quality systems of both parties to the power purchase agreement, TEİAŞ and İnnores. With this, no additional structures or processes have to be implemented to insure the availability and high quality of the necessary data for monitoring.

At the end of each monitoring period, which is planned to generally last one year, the data from the monthly meter reading records will be added up to the yearly net electricity generation and multiplied with the combined margin emission factor with the help of an excel spreadsheet that also contains the combined margin calculation. Thus, the complete baseline approach is always transparent and traceable. For the elaboration and quality assurance of the monitoring report, Lif Enerji, who already supported in the project design, is assigned.

For the operation stage, the following hierarchy is planned:



The following table contains the job descriptions and requirements as defined by the project developer for the employees search:

Job name	Job description	Graduation Level	Staff quantity	Prescribed trainings
Measurement Technician	Measuring the electricity generation through the proper methods and instruments. Data storing and reporting to Operational Manager and Grid Operator (TEİAŞ)	Technical high school (electricity division)	1 prs/shift (2 shifts/day)	Grid Operator's Trainings
Maintenance Technician	Making periodical and failure maintenances	Technical high school (electricity	1 prs/shift	Electrical Maintenance Trainings by

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	programmes and activities. Following and fulfilling the guarantee procedures.	or mechanical divisions)	(2 shifts/day)	Nordex Mechanical Maintenance Trainings by Nordex
Health & Safety Technician	Fulfilling Occupational safety and health necessities. Responding to Environmental issues. For the issues, provide the proper data flow between the company and the stakeholders. Reporting to Operational managers.	Technical high school	1 prs/shift (1shift/day)	Occupational safety and health trainings for Chamber of Mechanical Engineers. First aid trainings from Local Authority of the Ministry of Health.
Administrative Officer	Small local procurements and arrange daily transportation. Controlling and managing the safety guards activities.	High school	1 prs/shift (3 shifts/day)	Effective team work, Time management trainings from consultancy firms and associations.

Table 17: Description of jobs at the Yuntdağ wind farm

All the data needed for the calculation of emission reductions will be kept by İnnores during the crediting period and until two years after the last issuance of GS-VERs for Yuntdağ WPP.

Quality of data handling and storage is assured by the business processes between İnnores and TEIAS. The monthly meter reading documents are stored by İnnores and TEIAS, the settlement notification, which is issued by TEIAS and includes the meter reading data, is stored on a TEIAS file server and accessible for İnnores via a secured website. The meters themselves can always be read as plausibility check for verification.

Because of the data acquisition and management and quality assurance procedures that are anyway in place, no additional procedures have to be established for the monitoring plan. Dedicated emergency procedures are not provided, as there is no possibility of overstating emission reductions due to emergency cases.

D.5 Name of person/entity determining the monitoring methodology:

Esra Koç
Lifenerji Ltd. Şti., Turkey (project consultant)
Tel: +90 312 481 21 42
Fax: +90 312 480 88 10
Email: info@lifenerji.com
Contributor: İnnores Elektrik Üretim A.Ş.

Lifenerji is not a project participant.

SECTION E. Estimation of GHG emissions by sources

E.1. Estimate of GHG emissions by sources:

There are no emissions associated with the production of electricity using wind energy.

E.2. Estimated leakage:

No leakage is identified.

E.3. The sum of E.1 and E.2 representing the project activity emissions:

The total project activity emissions are zero.

E.4. Estimated anthropogenic emissions by sources of greenhouse gases of the baseline:

The estimation of the anthropogenic baseline emissions is based on the expected electricity generation, which amounts to 203,900 MWh p.a. and the above calculated baseline emission factor (for formula description see D.2.1.4). The yearly average baseline emission amount is **112,582 tCO₂e p.a.** over the period of 7 years **778,074 tCO₂ eq.**

E.5. Difference between E.4 and E.3 representing the emission reductions of the project activity:

As project emissions and leakage emissions equal zero, only baseline emissions are relevant (BE_y). Therefore, amount of the emission reductions equals the amount of the baseline emissions.

E.6. Table providing values obtained when applying formulae above:

Year	Estimation of project activity emission reductions (ton CO ₂ e)	Estimation of baseline emission reduction (ton CO ₂ e)	Estimation of leakage (ton CO ₂ e)	Estimation of emission reductions (ton CO ₂ e)
2016*	0	84,437	0	84,437
2017	0	112,582	0	112,582
2018	0	112,582	0	112,582
2019	0	112,582	0	112,582
2020	0	112,582	0	112,582
2021	0	112,582	0	112,582
2022	0	112,582	0	112,582
2023**	0	28,146	0	28,146
Total	0	788,074	0	788,074

*01 April 2016

**31 March 2022

SECTION F. Environmental impacts

F.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

It was confirmed by the regional environmental authority with a certificate from 12 Jan 2005 and 11 December 2012 that an official Environmental Impact Assessment (EIA) is not required for the proposed project. The need for an EIA is checked by the regional authority on a project specific base and considers the local conditions. For the 26 km transmission line however, an Environmental Impact Assessment has been carried out. The authority approved its construction as no critical negative environmental impacts have been identified and all requirements are fulfilled.

The works on the infrastructure include some road extensions and constructions:

- an existing road from Yunttag village to the plant site has to be widened by 2.5 meters on a 150 meter section
- a new 1700 meter road has to be built as bypass around the village, as the road through the village is too narrow. The local authorities and the headman of Yunttag were involved into the planning process and chose the route

Both road construction works take place on empty and unused land without the need for tree cuttings and thus do not have any negative influence on the soil quality, while the reduction of soil is negligible due to the unfertile character of the soil. Building of the new road is welcomed by the villagers and their representatives, as it will reduce the traffic through the village not only for the time of construction works, but also permanently. At the stakeholder meeting, the villagers especially welcomed the fact that the new road will be asphalted and thus mark a real improvement of the infrastructure of the village.

All potential environmental issues were discussed in detail on the stakeholder consultation, however no objections or critical opinions were received. The evaluation of social and environmental indicators within the Sustainable Development Assessment Matrix (see section A.2.) builds on the findings and experiences of the stakeholder consultation meeting as well as on common sense regarding the wind power plant technology. This analysis confirmed that no EIA is necessary. No negative or critical indicators were identified, which means that no additional indicators have to be included into the monitoring plan. The total score of the Sustainable Development Assessment Matrix is +7.

F.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

There have not been identified any significant environmental impacts of the project.

SECTION G. Stakeholders' comments

G.1. Brief description how comments by local stakeholders have been invited and compiled:
--

For the crediting period renewal, no additional LSC is conducted. However, during site visit on 20/11/2015, 3 closest villages has been visited and villagers' opinions were asked about the project. There were no negative comments. In fact, they gave very positive feedbacks. Records from the previous LSC periods have been stated below:

The local stakeholders' comments invitation and compilation process applied in the first crediting period was as follows:

Initial Stakeholder Consultation

The initial stakeholder meeting took place on the 25/07/ 2007 in a village nearby the future project site – Koyuneli.

In order to analyse the project impacts in detail including environmental, social and economic aspects, participants from the following four groups took part in the meeting:

- local people from neighbouring villages
- local and national representatives of various NGOs
- university deputies
- authorities of the related ministries

Additionally representatives of the REC Turkey (Yunus Arkan) and of the Turkish Focal Point (Mustafa Şahin) were invited but could not attend. Altogether 25 official invitations were send including a short explanation of the Gold Standard proceedings and a brief description of the Yuntdağ WPP project. At the end the stakeholders were called in order to confirm the participation in the meeting. In order to prove that the wide range of stakeholders were invited, on enquiry the courier mail receipts will be made available.

Local people were invited a week before the meeting by announcements in the local and national newspapers and via public notes, amongst others in the village central coffee house (Figure 6), which locally is the most frequently visited tavern.



Figure 6: Announcement in the window of the village central coffee house

The meeting itself took place in the above mentioned coffee house. Altogether 57 participants attended the meeting, among them the following officials:

- 1 observer from the Ministry of Environment and Forestry (representative of the National Focal Point)
- 3 deputies from the İzmir division of Ministry of Agriculture
- 1 deputy of İzmir division of Ministry of Health
- Mayor of the Koyuneli Village
- Mayor of the Ismaili village

At the beginning the non-technical PDD was distributed to all participants along with the meeting agenda and the attendance list.

The first speaker Mr. Doğrusoy, who is the general manager of Innores, presented the project idea including its characteristics such as generation of clean energy and contribution to the sustainable development in Turkey. Mr. Doğrusoy also shared his belief that this project will be a good example for other companies developing wind power projects.

Afterwards a comprehensive presentation was made, which comprehended the following information:

- details regarding project developer
- technology description of the implemented project
- estimated volumes of emission reductions
- size of revenues from GS-VERs sale
- characteristics of Gold Standard
- project features, which differentiate Yuntdağ WPP from other wind parks in Turkey

Environmental and social aspects influencing the project were analysed using the Gold Standard Checklist (defined in the Gold Standard VER Manual for Project Developers⁴², Appendix E). Results are summarised in the Sustainable Development Assessment Matrix.

Main Stakeholder Consultation

For the main stakeholder consultation process, the following documents were made publicly available:

- The original and complete PDD (English language)
- A non-technical summary of the PDD (Turkish language)

The English version of the non-technical summary as well as the report on the initial stakeholder consultation were available on enquiry.

The PDD was made available

- on the Gold Standard website from 10/08/2007 on.
- on the Website of the DOE (SGS) from 10/08/2007 on.

The PDD and the Turkish non-technical summary were made available

- on the website of the project "Promoting Climate Change Policies in Turkey" of REC Turkey and the Turkish ministry of environment and forestry from 22/08/2007 on,
- as hardcopy at the central coffeehouse in Koyuneli village from 21/08/2007 to 22/11/2007.

Stakeholders comments were actively invited by

- posting an email on the internationally diffused and well-known 'Climate-L' news and announcement list by IISD reporting services⁴³ in an email from 22/08/2007,
- sending letters to the list of "official stakeholders" who have already been identified and invited for the initial stakeholder consultation meeting,
- displaying announcements at the central coffeehouse at Koyuneli village and
- announcing the invitation for comments in the newspaper on 27/08/2007,

all referring to the above listed opportunities to read the PDD and the non-technical summary and to give comments over the different channels. The list of addressees of the invitation letter includes observers from different official authorities, NGOs and the Ministry of Environment and REC Turkey, who represent the Turkish Focal Point according to UNFCCC article 6.

With the last activities initiated on 22/08/2007 (publication of PDD on the Turkish Climate Change website and the posting of the Climate-L announcement), the two month period required by the Gold Standard rules for the main stakeholder consultation ended on 22/11/2007.

G.2. Summary of the comments received:

Initial Stakeholder Consultation

The overall feedback to the organized consultation, and what follows to the project, was very positive.

⁴² CDM Gold Standard http://www.cdmgoldstandard.org/uploads/file/GS-VER_Proj_Dev_manual_final%20.pdf (accessed on August 1st 2007)

⁴³ See <http://www.iisd.ca/email/climate-L.htm> (accessed in October 2007)

The questions asked during the meeting were related to direct project benefits for the villagers, amongst others the employment possibilities. Mr. Doğrusoy specified in detail the new positions which will be created and stressed the importance of the additional source of electricity, from which all the inhabitants will profit.

Villagers also asked about the possible negative effects on health in terms of e.g. radiation comparable with the cell phone radiation. Health impacts of wind park were in detail explained and it was assured that no radiation will be generated.



Figure 7: General Manager of İnnores, Mr. Doğrusoy answering the stakeholder questions

There have not been raised any critical comments nor objections for the project implementation. Positive feedback was received in regard to the additional employment possibilities for the local people.

Main Stakeholder Consultation

One comment from the ministry of environment and forestry was received concerning two formal aspects in the PDD formulation.

G.3. Report on how due account was taken of any comments received:

Initial Stakeholder Consultation

All the comments, as well as questions and answers were written down during the meeting, which was finally signed by the mayor of Koyuneli and the general manager of İnnores. The document "Questions, answers and proposals for project", which was prepared during the meeting in Turkish is available also in English version as a separate appendix to the PDD at hand.

The Gold Standard checklist was completed by the organizers of the meeting during the discussion. All received comments regarding each point included in the checklist were written down. After the list was completed, mayor of

Koyuneli and the general manager of İnnores signed the prepared document. Similarly to the above mentioned documented comments, the checklist is also available in English as a separate appendix to the PDD at hand.

Main Stakeholder Consultation

Adjustments have been carried out.

Considering the abovementioned stakeholder meetings carried out, and on the site visits conducted for verifications seeing that the stakeholders do not have negative feedbacks for the project implementation; there is no need for a new stakeholder consultation. In addition, the last on-site visit was not very long time ago. On the site visit, the DOE would report if there were negative feedbacks but there was not such comments received.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

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Annex 2

BASELINE INFORMATION

DATA BASIS NEEDED FOR CALCULATION OF THE COMBINED MARGIN EMISSION FACTOR

Calculation of Total CO₂ from OM Power Plants:

Table 18⁴⁴: HV_{i,y} (Heating Values for Fossil Fuels for Electricity Generation (Tcal)

Energy Sources	2012	2013	2014
Hard Coal+Imported Coal	71.270	68.785	82.874
Lignite	93.587	81.676	97.916
Fuel Oil	5.625	5.837	7.444
Diesel Oil	1.884	1.363	1.245
Lpg	0	0	0
Naphta	0	0	0
Natural Gas	203.766	203.244	227.649

Table 19: FC_{i,y} (Fuel Consumptions for Fossil Fuels for Electricity Generation (million m³ for Natural Gas and ton for others)⁴⁵

Energy Sources	2012	2013	2014
Hard Coal+Imported Coal	12.258.462	12.105.930	14.501.934
Lignite	55.742.463	47.120.306	57.696.139
Fuel Oil	564.796	573.534	754.283
Diesel Oil	176.379	129.359	119.988
LPG	0	0	0
Naphta	0	0	0
Natural Gas	23.090.121	22.909.746	25.426.014

1	Tcal	=	4.1868	TJ
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⁴⁴ See; <http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/istatistik2014.htm> excel file 52

⁴⁵ See; <http://www.teias.gov.tr/T%C3%BCrkiyeElektrik%C4%B0statistikleri/istatistik2014/istatistik2014.htm> excel file 50

Table 20: NCV_{i,y} (Average Net Calorific Values for Fossil Fuels for Electricity Generation (TJ/million m³ for Natural Gas and TJ/kt for others) and EF_i (Emission Factor of Fossil Fuels)

Energy Sources	NCVi 2012 (TJ/Gg)	NCVi 2013 (TJ/Gg)	NCVi 2014 (TJ/Gg)	EFCO ₂ , I (kg/TJ)
Hard Coal+Imported Coal	24,34	23,79	23,93	89,50
Lignite	7,03	7,26	7,11	90,90
Fuel Oil	41,70	42,61	41,32	72,60
Diesel Oil	44,71	44,12	0,00	72,60
LPG	0,00	0,00	0,00	61,60
Naphta	0,00	0,00	0,00	69,30
Natural Gas	36,95	37,14	37,49	54,30

Table 21: CO₂ Emission by each Fossil Fuels Types (ktCO₂e)

Energy Sources	2012	2013	2014
Hard Coal+Imported Coal	26.706	25.775	31.054
Lignite	35.617	31.084	37.265
Fuel Oil	1.710	1.774	2.263
Diesel Oil	573	414	0
Lpg	0	0	0
Naphta	0	0	0
Natural Gas	46.325	46.206	51.754
TOTAL	110.931	105.254	122.336

RECENT POWER PLANTS: CAPACITY AND FUEL TYPE

Identification of Sample Group

Table 22: Sample Group PPs for BM Emission Factor Calculation

No	Information to clearly identify the Plant (Name of the Plant)	Date of Commissioning	Capacity in MW	Fuel Type	Annual Generation (GWh)
1	Eren Enerji (Addition)	2010	600.0	Imported coal	4006.00
2	Eren Enerji (Addition)	2010	600.0	Imported coal	4006.00
3	MARMARA PAMUKLU MENS. SN.TİC.A.Ş. (Addition)	2010	26.2	Natural Gas	203.76
4	Aliağa Çakmaktepe Enerji A.Ş.(Aliağa/İZMİR) (Addition)	2010	69.8	Natural Gas	556.00
5	FRİTOLAY GIDA SAN.VE TİC. AŞ. (Addition)	2010	0.3	Biogas	2.40
6	Sönmez Enerji Üretim (Uşak) (Addition)	2010	2.6	Natural Gas	19.77
7	Ak-Enerji (Uşak OSB)	2010	-	Liqued Fuel +	0.00

			15.2	N.Gas	
8	Ak-Enerji (DG+N) (Deba-Denizli)	2010	- 15.6	Liqued Fuel + N.Gas	0.00
9	Polyplex Europa Polyester Film	2010	7.8	Natural Gas	61.00
10	ALTEK ALARKO Elektrik Santralleri	2010	21.9	Natural Gas	151.36
11	Aksa Enerji (Demirtaş/Bursa)	2010	- 1.1	Natural Gas	0.00
12	RASA ENERJİ (VAN) (Addition)	2010	10.1	Natural Gas	64.41
13	SİLOPİ ELEKTRİK ÜRETİM A.Ş.(ESENBOĞA)	2010	- 44.8	Fuel Oil	0.00
14	International Hospital Istanbul	2010	0.8	Natural Gas	6.00
15	Tuzla Jeotermal	2010	7.5	Geothermal	0.00
16	Menderes Jeotermal Dora-2	2010	9.5	Geothermal	0.00
17	Selimoğlu Reg. Ve Hes	2010	8.0	Hydro (run of river)	0.00
18	Kulp IV HES	2010	12.3	Hydro (run of river)	46.00
19	Cindere HES (Denizli) (Addition)	2010	9.1	Hydro (With Dam)	28.29
20	Bayburt Hes	2010	14.6	Hydro (run of river)	51.00
21	UZUNÇAYIR HES (Tunceli) (Addition)	2010	27.3	Hydro (With Dam)	105.00
22	Alakır Hes.	2010	2.1	Hydro (run of river)	6.00
23	Peta Müh. En. (Mursal II Hes.)	2010	4.5	Hydro (run of river)	19.00
24	Asa Enerji (Kale Reg. Ve Hes.)	2010	9.6	Hydro (run of river)	0.00
25	Hetaş Hacısalihoğlu (Yıldızlı Hes)	2010	1.2	Hydro (run of river)	5.00
26	Doğubay Elektrik (Sarımehmet Hes)	2010	3.1	Hydro (run of river)	10.00
27	Nuryol Enerji (Defne Reg. Ve hes.)	2010	7.2	Hydro (run of river)	22.00
28	ÖZGÜR ELEKTRİK (AZMAK I REG.VE HES)	2010	5.9	Hydro (run of river)	0.00
29	Birim Hidr. Üretim A.Ş. (Erfelek Hes)	2010	3.2	Hydro (run of river)	19.00
30	Beytek El. Ür. A.Ş. (Çataloluk Hes.)	2010	9.5	Hydro (run of river)	0.00
31	Nisan E. Mekanik En. (Başak Reg. Hes.)	2010	6.9	Hydro (run of river)	22.00

32	UZUNÇAYIR HES (Tunceli) (Addition)	2010	27.3	Hydro (With Dam)	105.00
33	Fırtına Elektrik Üretim A.Ş. (Sümer Hes)	2010	21.6	Hydro (run of river)	70.00
34	KAR-EN Karadeniz El. A.Ş. Aralık Hes	2010	12.4	Hydro (run of river)	0.00
35	Birim Hidr. Üretim A.Ş. (Erfelek Hes)	2010	3.2	Hydro (run of river)	19.00
36	Karadeniz El. Üret. (Uzundere-1 Hes)	2010	62.2	Hydro (run of river)	165.00
37	Akım Enerji (Cevizli Reg. Ve Hes.)	2010	91.4	Hydro (run of river)	330.00
38	Çakıt Hes. (Çakıt Enerji)	2010	20.2	Hydro (run of river)	0.00
39	Ceyhan Hes. (Oşkan Hes.) (Enova En.)	2010	23.9	Hydro (run of river)	98.00
40	Erenler Reg. Ve Hes. (BME Bir. Müt. En.)	2010	45.0	Hydro (run of river)	85.00
41	Paşa Reg. Ve Hes (Özgür Elektrik)	2010	8.7	Hydro (run of river)	0.00
42	Güzelçay-I-II Hes (İlk Elektrik Enerji)	2010	8.1	Hydro (run of river)	0.00
43	Kale Reg. Ve Hes (Kale Enerji Ür.)	2010	34.1	Hydro (run of river)	116.00
44	Erikli-Akocak Reg. Ve Hes	2010	82.5	Hydro (run of river)	0.00
45	Çamlıkaya Reg. Ve Hes	2010	5.6	Hydro (run of river)	19.00
46	Dinar Hes. (Elda Elektrik Üretim)	2010	4.4	Hydro (run of river)	15.00
47	Damlapınar Hes. (Cenay Elektrik Üretim)	2010	16.4	Hydro (run of river)	0.00
48	Dim Hes (Diler Elektrik Üretim)	2010	38.3	Hydro (run of river)	123.00
49	ÖZGÜR ELEKTRİK (AZMAK I REG.VE HES)	2010	5.9	Hydro (run of river)	0.00
50	Kirpilik Reg. Ve Hes (Özgür Elektrik)	2010	6.2	Hydro (run of river)	22.00
51	Yavuz Reg. Ve Hes (Masat Enerji)	2010	22.5	Hydro (run of river)	83.00
52	Kayabükü Reg. Ve Hes (Elite Elektrik)	2010	14.6	Hydro (run of river)	0.00
53	Gök Reg. Ve Hes (Gök Enerji El. San.)	2010	10.0	Hydro (run of river)	43.00
54	Bulam Reg. Ve Hes (MEM Enerji ELK.)	2010	7.0	Hydro (run of river)	0.00
55	Karşıyaka HES (Akua Enerji Üret.)	2010	1.6	Hydro (run of river)	8.00
56	Ceyhan Hes. (Berkman Hes) (Enova En.)	2010		Hydro (run of river)	103.00

			25.2	river)	
57	Güdül I Reg. Ve HES (Yaşam Enerji)	2010	2.4	Hydro (run of river)	14.00
58	Tektuğ Elektrik (Andırın Hes)	2010	40.5	Hydro (run of river)	106.00
59	Selen Elektrik (Kepezkaya Hes)	2010	28.0	Hydro (run of river)	0.00
60	REŞADİYE 2 HES (TURKON MNG ELEKT.)	2010	26.1	Hydro (run of river)	0.00
61	Kozan Hes (Ser-Er Enerji)	2010	4.0	Hydro (run of river)	9.00
62	Kahraman Reg. Ve Hes (Katırcıoğlu)	2010	1.4	Hydro (run of river)	6.00
63	Narinkale Reg. Ve Hes (EBD Enerji)	2010	3.1	Hydro (run of river)	10.00
64	Erenköy Reg. Ve Hes (Türkerler)	2010	21.5	Hydro (run of river)	87.00
65	Kahta I HES (Erdem Yıldız Elektrik Üretim)	2010	7.1	Hydro (run of river)	35.00
66	Azmak II Reg. Ve Hes	2010	- 18.1	Hydro (run of river)	0.00
67	Ulubat Kuvvet Tüneli ve Hes	2010	97.0	Hydro (With Dam)	372.00
68	REŞADİYE 1 HES (TURKON MNG ELEKT.)	2010	15.7	Hydro (run of river)	0.00
69	Egemen 1 HES (Enersis Elektrik)	2010	19.9	Hydro (run of river)	0.00
70	Sabunsuyu II HES (Ang Enerji Elk.)	2010	7.4	Hydro (run of river)	21.00
71	Burç Bendi ve Hes (Akkur Enerji)	2010	27.3	Hydro (run of river)	113.00
72	Murgul Bakır (Ç.kaya) (Addition)	2010	19.6	Hydro (run of river)	40.50
73	Güzelçay II Hes (İlk Elektrik Enerji) (Addition)	2010	5.0	Hydro (run of river)	0.00
74	REŞADİYE 1 HES (TURKON MNG ELEKT.)	2010	15.7	Hydro (run of river)	0.00
75	Egemen 1 HES (Enersis Elektrik)	2010	8.8	Hydro (run of river)	0.00
76	Yedigöze HES (Yedigöze Elektrik)	2010	155.3	Hydro (With Dam)	474.00
77	Umut III Reg. Ve HES (Nisan Elek.)	2010	12.0	Hydro (run of river)	26.00
78	FEKE 2 Barajı ve HES (Nisan Elek.)	2010	69.3	Hydro (With Dam)	223.00
79	Egemen 1B HES (Enersis Elektrik)	2010	11.1	Hydro (run of river)	0.00
80	Kalkandere Reg. Ve Yokuşlu HES.	2010	14.5	Hydro (run of river)	63.00

81	ROTOR ELEKTRİK (OSMANİYE RES)	2010	55.0	Wind	0.00
82	Asmakinsan (Bandırma 3 RES)	2010	24.0	Wind	0.00
83	Soma Enerji Üretim (Soma Res)	2010	34.2	Wind	0.00
84	Deniz Elektrik (Sebenoba Res)	2010	10.0	Wind	0.00
85	Akdeniz Elektrik (Mersin Res)	2010	33.0	Wind	0.00
86	Boreas Enerji (Boreas I Enez Res)	2010	15.0	Wind	0.00
87	Bergama Res En. Ür. A.Ş. Aliğa Res	2010	90.0	Wind	0.00
88	Bakras En. Elek. Ür. A.Ş. Şenbük Res	2010	15.0	Wind	0.00
89	ALİZE ENERJİ (KELTEPE RES)	2010	1.8	Wind	0.00
90	ROTOR ELEKTRİK (Gökçedağ Res)	2010	22.5	Wind	0.00
91	MAZI-3 RES ELEKT.ÜR. A.Ş. (MAZI-3 RES)	2010	7.5	Wind	0.00
92	BORASKO ENERJİ (BANDIRMA RES)	2010	12.0	Wind	0.00
93	Ziyaret Res (Ziyaret Res Elektirk)	2010	35.0	Wind	0.00
94	Soma Res (Bilgin Rüzgar San. En. Ür.)	2010	90.0	Wind	0.00
95	Belen ELEKTRİK BELEN Res (Addition)	2010	6.0	Wind	0.00
96	ÜTOPYA ELEKTRİK (DÜZOVA RES) (Addition)	2010	15.0	Wind	0.00
97	Kuyucak Res (Alize Enerji Ür.)	2010	25.6	Wind	0.00
98	Sares Res (Garet Enerji Üretim)	2010	15.0	Wind	0.00
99	Turguttepe Res (Sabaş Elektrik Ür.)	2010	22.0	Wind	0.00
100	AKIM ENERJİ BAŞPINAR (SÜPER FİLM)	2011	25.3	Natural Gas	177.00
101	AKSA AKRİLİK (İTHAL KÖM.+D.G)	2011	25.0	Natural Gas	189.08
102	AKSA ENERJİ (Antalya)	2011	600.0	Natural Gas	3600.00
103	ALİAĞA ÇAKMAKTEPE ENERJİ (İlave)	2011	139.7	Natural Gas	1051.60
104	BEKİRLİ TES (İÇDAŞ ELEKTRİK EN.)	2011	600.0	Imported coal	4320.00
105	BOLU BELEDİYESİ ÇÖP TOP. TES. BİYOGAZ	2011		Landfill Gas	0.00

			1.1		
106	BOSEN ENERJİ ELEKTRİK ÜRETİM AŞ.	2011	93.0	Natural Gas	698.49
107	CENGİZ ÇİFT YAKITLI K.Ç.E.S.	2011	131.3	Natural Gas	985.00
108	CENGİZ ENERJİ SAN.VE TİC.A.Ş.	2011	35.0	Natural Gas	281.29
109	CEV ENERJİ ÜRETİM(GAZİANTEP ÇÖP BİOGAZ)	2011	5.7	Landfill Gas	0.00
110	FRAPORT IC İÇTAŞ ANTALYA HAVALİMANI	2011	8.0	Natural Gas	64.00
111	GLOBAL ENERJİ (PELİTLİK)	2011	4.0	Natural Gas	29.91
112	GORDİON AVM (REDEVCO ÜÇ EMLAK)	2011	2.0	Natural Gas	15.00
113	GOREN-1 (GAZİANTEP ORGANİZE SAN.)	2011	48.7	Natural Gas	277.00
114	GÜLLE ENERJİ(Çorlu) (İlave)	2011	3.9	Natural Gas	17.97
115	HASIRCI TEKSTİL TİC. VE SAN. LTD. ŞTİ.	2011	2.0	Natural Gas	15.00
116	HG ENERJİ ELEKTRİK ÜRET. SAN.TİC. A.Ş.	2011	52.4	Natural Gas	366.00
117	ISPARTA MENSUCAT (Isparta)	2011	4.3	Natural Gas	33.00
118	ITC ADANA ENERJİ ÜRETİM (İlave)	2011	1.4	Landfill Gas	0.00
119	ITC-KA EN. (ASLIM BİYOKÜTLE) KONYA	2011	5.7	Landfill Gas	0.00
120	ITC-KA ENERJİ (SİNCAN) (İlave)	2011	1.4	Landfill Gas	0.00
121	ITC-KA ENERJİ MAMAK KATI ATIK TOP.	2011	2.8	Landfill Gas	0.00
122	İSTANBUL SABİHA GÖKÇEN UL.AR. HAV.	2011	4.0	Natural Gas	32.00
123	KARKEY (SİLOPİ 1)	2011	100.4	Fuel Oil	701.15
124	KAYSERİ KATI ATIK DEPONİ SAHASI	2011	1.6	Landfill Gas	0.00
125	KNAUF İNŞ. VE YAPI ELEMANLARI SN.	2011	1.6	Natural Gas	12.00
126	LOKMAN HEKİM ENGÜRÜ SAĞ.(SİNCAN)	2011	0.5	Natural Gas	4.00
127	MARDİN-KIZILTEPE (AKSA ENERJİ)	2011	32.1	Natural Gas	225.00
128	NUH ENERJİ EL. ÜRT.A.Ş. (ENERJİ SANT.-2)	2011	120.0	Natural Gas	900.00
129	ODAŞ DOĞALGAZ KÇS (ODAŞ ELEKTRİK)	2011	55.0	Natural Gas	415.00

130	POLYPLEX EUROPA POLYESTER FİLM	2011	3.9	Natural Gas	30.70
131	SAMSUN TEKKEKÖY EN. SAN. (AKSA EN.)	2011	131.3	Natural Gas	980.00
132	SAMUR HALI A.Ş.	2011	4.3	Natural Gas	33.00
133	SARAY HALI A.Ş.	2011	4.3	Natural Gas	33.00
134	TEKİRDAĞ-ÇORLU TEKS.TES.(NİL ÖRME)	2011	2.7	Natural Gas	21.00
135	TİRENDİ TİRE ENERJİ ÜRETİM A.Ş.	2011	58.4	Natural Gas	410.00
136	YENİ UŞAK ENERJİ ELEKTRİK SANTRALI	2011	8.7	Natural Gas	65.00
137	ZORLU ENERJİ (B.Karıştırıran)	2011	7.2	Natural Gas	54.07
138	ŞANLIURFA OSB (RASA ENERJİ ÜR. A.Ş.)	2011	116.8	Natural Gas	800.00
139	AYDIN/GERMENCİK JEOTERMAL	2011	20.0	Geothermal	150.00
140	ÇEŞMEBAŞI REG. VE HES (GİMAK EN.)	2011	8.2	Hydro (run of river)	39.00
141	ÇUKURÇAYI HES (AYDEMİR ELEKTRİK ÜR.)	2011	1.8	Hydro (run of river)	8.00
142	DARCA HES (BÜKÖR ELEKTRİK ÜRETİM)	2011	8.9	Hydro (run of river)	0.00
143	DERME (KAYSERİ VE CİVARI ENERJİ)	2011	4.5	Hydro (run of river)	14.00
144	DURU 2 REG. VE HES (DURUCASU ELEK.)	2011	4.5	Hydro (run of river)	22.00
145	ERENKÖY REG. VE HES (NEHİR ENERJİ)	2011	21.5	Hydro (run of river)	87.00
146	ERKENEK (KAYSERİ VE CİVARI ENERJİ)	2011	0.3	Hydro (run of river)	0.00
147	EŞEN-1 HES (GÖLTAŞ ENERJİ ELEKTRİK)	2011	60.0	Hydro (run of river)	240.00
148	GİRLEVİK (BOYDAK ENERJİ)	2011	3.0	Hydro (run of river)	21.00
149	GÖKMEN REG. VE HES (SU-GÜCÜ ELEKT.)	2011	2.9	Hydro (run of river)	13.00
150	HACININOĞLU HES (ENERJİ-SA ENERJİ)	2011	142.3	Hydro (run of river)	360.00
151	HAKKARİ (Otluca) (NAS ENERJİ A.Ş.)	2011	1.3	Hydro (run of river)	6.00
152	HASANLAR	2011	9.4	Hydro (run of river)	39.00
153	HASANLAR HES (DÜZCE ENERJİ BİRLİĞİ)	2011	4.7	Hydro (run of river)	0.00
154	İNCİRLİ REG. VE HES (LASKAR ENERJİ)	2011		Hydro (run of river)	126.00

			25.2	river)	
155	KALKANDERE REG. VE YOKUŞLU HES	2011	23.4	Hydro (run of river)	0.00
156	KARASU 4-2 HES (İDEAL ENERJİ ÜRETİMİ)	2011	10.4	Hydro (run of river)	0.00
157	KARASU 4-3 HES (İDEAL ENERJİ ÜRETİMİ)	2011	4.6	Hydro (run of river)	0.00
158	KARASU 5 HES (İDEAL ENERJİ ÜRETİMİ)	2011	4.1	Hydro (run of river)	0.00
159	KARASU I HES (İDEAL ENERJİ ÜRETİMİ)	2011	3.8	Hydro (run of river)	0.00
160	KARASU II HES (İDEAL ENERJİ ÜRETİMİ)	2011	3.1	Hydro (run of river)	13.00
161	KAZANKAYA REG. VE İNCESU HES (AKSA)	2011	15.0	Hydro (run of river)	48.00
162	KESME REG. VE HES (KIVANÇ ENERJİ)	2011	4.6	Hydro (run of river)	16.00
163	KIRAN HES (ARSAN ENERJİ A.Ş.)	2011	9.7	Hydro (run of river)	0.00
164	KORUKÖY HES (AKAR ENERJİ SAN. TİC.)	2011	3.0	Hydro (run of river)	22.00
165	KOVADA-I (BATIÇİM ENERJİ ELEKTRİK)	2011	51.2	Hydro (run of river)	36.20
166	KOVADA-II (BATIÇİM ENERJİ ELEKTRİK)	2011	8.3	Hydro (run of river)	4.10
167	KOZDERE HES (ADO MADENCİLİK ELKT.)	2011	3.1	Hydro (run of river)	0.00
168	KÖYOBASI HES (ŞİRİKOĞLU ELEKTRİK)	2011	1.1	Hydro (run of river)	5.00
169	KULP I HES (YILDIZLAR ENERJİ ELK.ÜR.)	2011	22.9	Hydro (run of river)	78.00
170	KUMKÖY HES (AES-İC İÇTAŞ ENERJİ)	2011	17.5	Hydro (run of river)	98.00
171	AKSU REG. VE HES (KALEN ENERJİ)	2011	5.2	Hydro (run of river)	16.00
172	ALKUMRU BARAJI VE HES (LİMAK HİD.)	2011	261.3	Hydro (run of river)	828.00
173	AYRANCILAR HES (MURADIYE ELEKTRİK)	2011	32.1	Hydro (run of river)	0.00
174	BALKONDU I HES (BTA ELEKTRİK ENERJİ)	2011	9.2	Hydro (run of river)	33.00
175	BAYRAMHACILI BARAJI VE HES	2011	47.0	Hydro (run of river)	175.00
176	BERDAN	2011	10.2	Hydro (run of river)	47.20
177	BOĞUNTU HES (BEYOBASI ENERJİ)	2011	3.8	Hydro (run of river)	17.00
178	CEVHER I-II REG. VE HES (ÖZCEVHER EN.)	2011	16.4	Hydro (run of river)	0.00

179	ÇAKIRMAN REG. VE HES (YUSAKA EN.)	2011	7.0	Hydro (run of river)	22.00
180	ÇAMLIKAYA REG.VE HES (ÇAMLIKAYA EN)	2011	2.8	Hydro (run of river)	0.80
181	ÇANAKÇI HES (CAN ENERJİ ENTEGRE)	2011	9.3	Hydro (run of river)	39.00
182	MENGE BARAJI VE HES (ENERJİSA ENERJİ)	2011	44.7	Hydro (run of river)	0.00
183	MOLU ENERJİ (Zamanlı-Bahçelik HES)	2011	4.2	Hydro (run of river)	30.00
184	MURATLI REG. VE HES (ARMAHES EL.)	2011	26.7	Hydro (run of river)	94.00
185	NARINKALE REG. VE HES (EBD ENERJİ)	2011	30.4	Hydro (run of river)	108.00
186	OTLUCA I HES (BEYOBASI ENERJİ ÜR.)	2011	37.5	Hydro (run of river)	0.00
187	OTLUCA II HES (BEYOBASI ENERJİ ÜR.)	2011	6.4	Hydro (run of river)	0.00
188	ÖREN REG. VE HES (ÇELİKLER ELEKTRİK)	2011	6.6	Hydro (run of river)	16.00
189	POYRAZ HES (YEŞİL ENERJİ ELEKTRİK)	2011	2.7	Hydro (run of river)	10.00
190	SARAÇBENDİ HES (ÇAMLICA ELEKTRİK)	2011	25.5	Hydro (run of river)	0.00
191	SARIKAVAK HES (ESER ENERJİ YAT. AŞ.)	2011	8.1	Hydro (run of river)	0.00
192	SAYAN HES (KAREL ELEKTRİK ÜRETİM)	2011	14.9	Hydro (run of river)	0.00
193	SEFAKÖY HES (PURE ENERJİ ÜRETİM AŞ.)	2011	33.1	Hydro (run of river)	0.00
194	DAREN HES ELEKTRİK (SEYRANTEPE)	2011	49.7	Hydro (run of river)	181.13
195	SIZIR (KAYSERİ VE CİVARI EL. T.A.Ş)	2011	5.8	Hydro (run of river)	46.00
196	SÖĞÜTLÜKAYA (POSOF III) HES	2011	6.1	Hydro (run of river)	31.00
197	TEFEN HES (AKSU MADENCİLİK SAN.)	2011	33.0	Hydro (run of river)	141.00
198	TUZTAŞI HES (GÜRÜZ ELEKTRİK ÜR.)	2011	1.6	Hydro (run of river)	10.00
199	ÜZÜMLÜ HES (AKGÜN ENERJİ ÜRETİM)	2011	11.4	Hydro (run of river)	41.00
200	YAMAÇ HES (YAMAÇ ENERJİ ÜRETİM A.Ş.)	2011	5.5	Hydro (run of river)	0.00
201	YAPISAN (KARICA REG. ve DARICA I HES)	2011	13.3	Hydro (run of river)	0.00
202	YAPRAK II HES (NİSAN ELEKTROMEK.)	2011	10.8	Hydro (run of river)	32.00
203	YAŞIL HES (YAŞIL ENERJİ ELEKTRİK)	2011		Hydro (run of river)	15.00

			3.8	river)	
204	YEDİGÖL REG. VE HES (YEDİGÖL HİDR.)	2011	21.9	Hydro (run of river)	77.00
205	YEDİGÖZE HES (YEDİGÖZE ELEK.) (İlave)	2011	155.3	Hydro (run of river)	425.00
206	SARES RES (GARET ENERJİ ÜRETİM)	2011	7.5	Wind	0.00
207	SEYİTALİ RES (DORUK ENERJİ ELEKTRİK)	2011	30.0	Wind	0.00
208	SOMA RES (SOMA ENERJİ) (İlave)	2011	36.9	Wind	0.00
209	SUSURLUK RES (ALANTEK ENERJİ ÜRET.)	2011	45.0	Wind	0.00
210	ŞAH RES (GALATA WİND ENERJİ LTD. ŞTİ)	2011	93.0	Wind	0.00
211	TURGUTTEPE RES (SABAŞ ELEKTRİK)	2011	2.0	Wind	0.00
212	ZİYARET RES (ZİYARET RES ELEKTRİK)	2011	22.5	Wind	0.00
213	AKRES (AKHİSAR RÜZGAR EN. ELEKT.)	2011	43.8	Wind	0.00
214	AYVACIK RES (AYRES AYVACIK RÜZG.)	2011	5.0	Wind	0.00
215	BAKİ ELEKTRİK ŞAMLI RÜZGAR (İlave)	2011	24.0	Wind	0.00
216	ÇANAKKALE RES (ENERJİ-SA ENERJİ)	2011	29.2	Wind	0.00
217	ÇATALTEPE RES (ALİZE ENERJİ ELEKTRİK)	2011	16.0	Wind	0.00
218	İNNORES ELEKTRİK YUNTDAG RÜZGAR	2011	10.0	Wind	0.00
219	KİLLİK RES (PEM ENERJİ A.Ş.)	2011	40.0	Wind	0.00
220	ACARSOY TERMİK KOM.ÇEV.SANT. (ACARSOY EN.)	2012	50.0	Natural Gas	375.00
221	AFYON DGKÇ (DEDELİ DOĞALGAZ ELEKTRİK ÜR.)	2012	126.1	Natural Gas	945.00
222	AGE DOĞALGAZ KOM. ÇEV. SANT. (AGE DENİZLİ)	2012	141.0	Natural Gas	1057.00
223	AKDENİZ KİMYA SAN. VE TİC. A.Ş.	2012	4.0	Natural Gas	30.00
224	AKKÖPRÜ (DALAMAN)	2012	115.0	Hydro (run of river)	176.00
225	AKKÖY II HES (AKKÖY ENERJİ A.Ş.)	2012	229.7	Hydro (run of river)	508.00
226	AKKÖY-ESPIYE HES (KONİ İNŞAAT SAN. A.Ş.)	2012	8.9	Hydro (run of river)	40.00
227	AKSA AKRİLİK KİMYA SAN. A.Ş. (İTHAL KÖM.+D.G)	2012	42.5	Natural Gas	298.00

228	AKSU RES (AKSU TEMİZ ENERJİ ELEKTRİK ÜRETİM)	2012	72.0	Wind	0.00
229	ALABALIK REG. VE HES SANTRALI I-II (DARBOĞAZ ELK. ÜR. SAN.)	2012	13.8	Hydro (run of river)	0.00
230	ALES DOĞALGAZ KOM. ÇEV. SANT. (ALES ELEKT.)	2012	49.0	Natural Gas	370.00
231	ALPASLAN I (ELEKTRİK ÜRETİM A.Ş.)	2012	80.0	Hydro (run of river)	0.00
232	ALTINYILDIZ MENSUCAT VE KONF. FAB. (Tekirdağ)	2012	5.5	Natural Gas	38.00
233	ANAK HES (KOR-EN KORKUTELİ ELEK. ÜRET. SAN.)	2012	3.8	Hydro (run of river)	9.00
234	ARAKLI-1 REG. VE HES(YÜCEYURT ENERJİ ÜRETİM)	2012	13.1	Hydro (run of river)	0.00
235	ARCA HES (GÜRSU TEMİZ ENERJİ ÜRETİM A.Ş.)	2012	5.5	Hydro (run of river)	0.00
236	AREL ENERJİ BİYOKÜTLE TESİSİ (AREL ÇEVRE)	2012	2.4	Biomass	0.00
237	ARPA REG. VE HES (MCK ELEKTRİK ÜRETİM A.Ş.)	2012	32.4	Hydro (run of river)	44.00
238	ASAŞ ALÜMİNYUM SANAYİ VE TİCARET A.Ş.	2012	8.6	Natural Gas	65.00
239	ATAKÖY (ZORLU DOĞAL ELEKTRİK ÜRETİM A.Ş.)	2012	5.5	Hydro (run of river)	11.00
240	AVCILAR HES (AVCILAR ENERJİ ELEKTRİK ÜRET.)	2012	16.7	Hydro (run of river)	28.00
241	AYANCIK HES (İLK ELEKTRİK ENERJİ ÜRETİMİ SN.)	2012	15.6	Hydro (run of river)	37.00
242	AYRANCILAR HES (MURADIYE ELEKTRİK ÜRETİM)	2012	9.3	Hydro (run of river)	0.00
243	BAĞIŞTAŞ II HES (AKDENİZLİ ELEKTRİK ÜRETİM)	2012	32.4	Hydro (run of river)	69.00
244	BALIKESİR RES (BARES ELEKTRİK ÜRETİM A.Ş.)	2012	30.3	Wind	0.00
245	BALIKESİR RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	2012	82.5	Wind	0.00
246	BALKUSAN BARAJI VE HES 1 NOLU SANT. (KAREN)	2012	13.0	Hydro (run of river)	0.00
247	BALKUSAN BARAJI VE HES 2 NOLU SANT. (KAREN)	2012	25.0	Hydro (run of river)	0.00
248	BALSUYU MENSUCAT SAN. VE TİC. A.Ş.	2012	9.7	Natural Gas	68.00
249	BAMEN KOJENERASYON (BAŞYAZICIOĞLU TEKSTİL)	2012	2.1	Natural Gas	14.00
250	BANDIRMA RES (YAPISAN ELEKTRİK ÜRETİM A.Ş.)	2012	5.0	Wind	0.00
251	BANGAL REG. VE KUŞLUK HES (KUDRET ENERJİ)	2012	17.0	Hydro (run of river)	32.00
252	BEKTEMUR HES (DİZ-EP ELEKTRİK ÜRETİM)	2012		Hydro (run of river)	11.00

	LTD.)		3.5	river)	
253	BEREKET ENERJİ ÜRETİM A.Ş. (BİOGAZ)	2012	0.6	Biogas	5.00
254	BEYKÖY (ZORLU DOĞAL ELEKTRİK ÜRETİMİ A.Ş.)	2012	16.8	Hydro (run of river)	87.00
255	BEYPI BEYPAZARI TARIMSAL ÜRETİM PZ. SN. A.Ş.	2012	8.6	Natural Gas	63.00
256	BİLECİK DOĞALGAZ ÇS. (TEKNO DOĞALGAZ ÇEV.)	2012	25.8	Natural Gas	190.00
257	BİLECİK DOĞALGAZ KÇS. (DEDELI DOĞALGAZ EL.)	2012	126.1	Natural Gas	945.00
258	BİLKUR TEKSTİL BOYA TİC. A.Ş.	2012	2.0	Natural Gas	14.00
259	BİNATOM ELEKTRİK ÜRETİM A.Ş. (Emet/KÜTAHYA)	2012	10.4	Natural Gas	78.00
260	BİS ENERJİ(Sanayi/ Bursa)	2012	48.0	Natural Gas	361.00
261	BOSEN ENERJİ ELEKTRİK ÜRETİM A.Ş.(Bursa)	2012	27.9	Natural Gas	210.00
262	BOYABAT BARAJI VE HES (BOYABAT ELEKTRİK)	2012	513.0	Hydro (run of river)	830.00
263	BOZYAKA RES (KARDEMİR HADDECİLİK VE ELEKT.)	2012	12.0	Wind	32.00
264	BÜYÜKDÜZ HES (AYEN ENERJİ A.Ş.)	2012	68.9	Hydro (run of river)	192.00
265	CAN 1 HES (HED ELEKTRİK ÜRETİM A.Ş.)	2012	1.8	Hydro (run of river)	6.00
266	CEYHAN HES (BERKMAN HES) (ENOVA EN ÜRET.)	2012	12.6	Hydro (run of river)	31.00
267	CUNİŞ REG. VE HES (RİNERJİ RİZE ELEKTRİK ÜR.)	2012	8.4	Hydro (run of river)	21.00
268	ÇAĞLAYAN HES (ÇAĞLAYAN HES ENERJİ ÜRETİM)	2012	6.0	Hydro (run of river)	12.00
269	ÇARŞAMBA HES (ÇARŞAMBA ENERJİ ELEKTRİK)	2012	11.3	Hydro (run of river)	36.00
270	ÇILDIR (ZORLU DOĞAL ELEKTRİK ÜRETİMİ A.Ş.)	2012	15.4	Natural Gas	20.00
271	ÇINAR-1 HES (AYCAN ENERJİ ÜRETİM TİC. VE SN.)	2012	9.3	Hydro (run of river)	19.00
272	ÇUKURÇAYI HES (AYDEMİR ELEKTRİK ÜRETİM A.Ş.)	2012	1.8	Hydro (run of river)	2.00
273	DAĞPAZARI RES (ENERJİSA ENERJİ ÜRETİM A.Ş.)	2012	39.0	Wind	0.00
274	DEMİRCİLER HES (PAK ENERJİ ÜRETİMİ SAN.)	2012	8.4	Hydro (run of river)	0.00
275	DENİZ JEOTERMAL (MAREN MARAŞ ELEKTRİK)	2012	24.0	Geothermal	0.00
276	DENİZLİ JEOTERMAL (ZORLU DOĞAL ELEK. ÜR.A.Ş.)	2012	15.0	Geothermal	105.00

277	DİNAR RES (OLGU ENERJİ YATIRIM ÜRETİM)	2012	16.1	Wind	51.00
278	DOĞANKAYA HES (MAR-EN ENERJİ ÜRET. TİC.)	2012	20.6	Hydro (run of river)	56.00
279	DUMLU HES (DUMLU ENERJİ ELEKTRİK ÜRETİM)	2012	4.0	Hydro (run of river)	5.00
280	DURMAZLAR MAKİNA SANAYİ VE TİCARET A.Ş.	2012	1.3	Natural Gas	10.00
281	DURUM GIDA TERMİK KOJEN. SANT. (DURUM GIDA)	2012	3.6	Natural Gas	29.00
282	EGE SERAMİK ENERJİ SANTRALI	2012	13.1	Natural Gas	90.00
283	EGER HES (EGER ELEKTRİK ÜRETİM LTD. ŞTİ.)	2012	1.9	Hydro (run of river)	6.00
284	EKİM BİYOGAZ (EKİM GRUP ELEKTRİK ÜRETİM)	2012	1.2	Biogas	10.00
285	ENERJİ-SA (ÇANAKKALE)	2012	0.9	Wind	0.00
286	ENERJİ-SA (KÖSEKÖY)	2012	120.0	Natural Gas	930.00
287	ENERJİ-SA (MERSİN)	2012	1.4	Natural Gas	11.00
288	ERDEMİR(F.O+K.G+Y.F.G+DG)(Ereğli-Zonguldak)	2012	53.9	Natural Gas	355.00
289	EREN ENERJİ ELEKTRİK ÜRETİM A.Ş.	2012	30.0	Imported coal	195.00
290	ERİK HES (ELEKTRİK ÜRETİM A.Ş.)	2012	6.5	Hydro (run of river)	21.00
291	ERMENEK (ELEKTRİK ÜRETİM A.Ş.)	2012	302.4	Hydro (run of river)	1187.00
292	ERZURUM MEYDAN AVM (REDEVKO BİR EMLAK)	2012	2.4	Natural Gas	16.00
293	ES ES ESKİŞEHİR ENERJİ SAN. VE TİC. A.Ş.	2012	2.0	Biogas	15.00
294	ESENDURAK HES (MERAL ELEKTRİK ÜRETİM)	2012	9.3	Hydro (run of river)	0.00
295	FEKE 1 HES (AKKUR ENERJİ ÜRETİM TİC. VE SAN.)	2012	29.4	Hydro (run of river)	0.00
296	FEKE 2 BARAJI VE HES (AKKUR ENERJİ ÜRETİM)	2012	69.3	Hydro (run of river)	0.00
297	FINDIK I HES (ADV ELEKTRİK ÜRETİM LTD. ŞTİ.)	2012	11.3	Hydro (run of river)	27.00
298	GOODYEAR (İzmit/Köseköy)	2012	5.2	LPG	35.00
299	GÖKGEDİK HES (UHUD ENERJİ ÜRETİM TİC.)	2012	24.3	Hydro (run of river)	75.00
300	GÖKNUR GIDA MAD. EN. İM. İT. İH. TİC. VE SAN. AŞ.	2012	1.6	Imported coal	6.00
301	GÜDÜL 2 HES (YAŞAM ENERJİ ELEKTRİK)	2012		Hydro (run of river)	15.00

	ÜRETİM)		4.9	river)	
302	GÜLLÜBAĞ BARAJI VE HES (SENENERJİ ENERJİ)	2012	96.0	Hydro (run of river)	280.00
303	GÜNAYDIN RES (MANRES ELEKTRİK ÜRETİM A.Ş.)	2012	10.0	Wind	0.00
304	GÜNDER REG. VE HES (ARIK ENERJİ ÜRETİM A.Ş.)	2012	28.2	Hydro (run of river)	0.00
305	GÜRTEKS İPLİK SANAYİ VE TİCARET A.Ş.	2012	6.7	Natural Gas	53.00
306	HATİPOĞLU PLASTİK YAPI ELEMANLARI SAN.	2012	2.0	Natural Gas	14.00
307	HORU REG. VE HES (MARAŞ ENERJİ YATIRIM SN.)	2012	8.5	Hydro (run of river)	25.00
308	HORYAN HES (HORYAN ENERJİ A.Ş.)	2012	5.7	Hydro (run of river)	15.00
309	ITC ADANA ENERJİ ÜRETİM (ADANA BİOKÜTLE SNT)	2012	4.2	Waste	35.00
310	ITC BURSA ENERJİ ÜRETİM SAN. VE TİC. A.Ş.	2012	9.8	Waste	37.00
311	İKİZDERE (ZORLU DOĞAL ELEKTRİK ÜRETİMİ A.Ş.)	2012	18.6	Hydro (run of river)	100.00
312	İNNORES ELEKTRİK YUNTDAĞ RÜZGAR (Aliağa-İZMİR)	2012	5.0	Wind	0.00
313	İŞBİRLİĞİ ENERJİ ÜRETİM SAN. VE TİC. A.Ş.	2012	19.5	Natural Gas	146.00
314	İZAYDAŞ (İZMİT ÇÖP)(Köseköy)	2012	0.3	Waste	2.00
315	İZMİR BÜYÜK EFES OTELİ KOJENERASYON TES.	2012	1.2	Natural Gas	9.00
316	JTI TORBALI KOJENERASYON SANTR. (JTI TÜTÜN)	2012	4.0	Natural Gas	30.00
317	KARADAĞ RES (GARET ENERJİ ÜRETİM)	2012	10.0	Wind	0.00
318	KARTALKAYA HES (SİR ENERJİ ÜRETİM SAN.)	2012	8.0	Hydro (run of river)	15.00
319	KAYADÜZÜ RES (BAKTEPE ENERJİ A.Ş.)	2012	39.0	Wind	0.00
320	KAYAKÖPRÜ 2 HES (ARSAN ENERJİ A.Ş.)	2012	10.2	Hydro (run of river)	36.00
321	KAYSERİ KATI ATIK DEPONİ SAHASI (HER ENERJİ)	2012	1.4	Waste	10.00
322	KESKİNOĞLU TAVUKÇULUK VE DAMIZLIK İŞLET.	2012	6.0	Natural Gas	45.00
323	KILAVUZLU HES (ELEKTRİK ÜRETİM A.Ş.)	2012	40.5	Hydro (run of river)	150.00
324	KIRIKDAĞ HES (ÖZENİR ENERJİ ELEKTRİK ÜRET.)	2012	16.9	Hydro (run of river)	40.00
325	KIVANÇ TEKSTİL SAN.ve TİC.A.Ş.	2012	2.1	Natural Gas	11.00

326	KOCAELİ ÇÖP BİYOGAZ (LFG) (KÖRFEZ ENERJİ)	2012	2.3	Waste	18.00
327	KOZBEYLİ RES (DOĞAL ENERJİ ELEKTRİK ÜRETİM)	2012	20.0	Wind	60.00
328	KOZDERE HES (ADO MADENCİLİK ELEKTRİK ÜR.)	2012	6.1	Hydro (run of river)	5.00
329	KÖKNAR HES (AYCAN ENERJİ ÜRETİM TİC.)	2012	8.0	Hydro (run of river)	15.00
330	KUZGUN (ZORLU DOĞAL ELEKTRİK ÜRETİMİ A.Ş.)	2012	20.9	Hydro (run of river)	0.00
331	KÜÇÜKER TEKSTİL SAN. VE TİC. A.Ş.	2012	5.0	Lignite	40.00
332	KÜRCE REG. VE HES (DEDEGÖL ENERJİ)	2012	12.0	Hydro (run of river)	36.00
333	MENGE BARAJI VE HES (ENERJİSA ENERJİ)	2012	44.7	Hydro (run of river)	58.00
334	MERCAN (ZORLU DOĞAL ELEKTRİK ÜRETİMİ A.Ş.)	2012	20.4	Hydro (run of river)	78.00
335	METRİSTEPE RES (CAN ENERJİ ENTEGRE ELEKT.)	2012	39.0	Wind	0.00
336	MİDİLLİ REG. VE HES (MASAT ENERJİ ELEKTRİK)	2012	20.9	Hydro (run of river)	45.00
337	MURAT I-II REG. VE HES (MURAT HES ENERJİ EL.)	2012	35.6	Hydro (run of river)	107.00
338	MURATLI REG. VE HES (ARMAHES ELEKTRİK ÜR.)	2012	11.0	Hydro (run of river)	17.00
339	MURSAL I HES (PETA MÜHENDİSLİK ENERJİ)	2012	4.2	Hydro (run of river)	13.00
340	MUTLU MAKARNACILIK SANAYİ VE TİCARET A.Ş.)	2012	2.0	Natural Gas	18.00
341	NAKSAN ENERJİ ELEKTRİK ÜRETİM A.Ş.	2012	16.0	Natural Gas	120.00
342	NİKSAR HES (NİKSAR ENERJİ ÜRETİM LTD. ŞTİ.)	2012	40.2	Hydro (run of river)	140.00
343	ODAŞ DOĞALGAZ KÇS (ODAŞ ELEKTRİK ÜRETİM)	2012	128.2	Natural Gas	450.00
344	OFİM ENERJİ SANTRALI (OSTİM FİNANS VE İŞ MER.)	2012	2.1	Natural Gas	16.00
345	ORTADOĞU ENERJİ (KÖMÜRCÜODA) (Şile/İSTANBUL)	2012	2.8	Waste	17.00
346	ORTADOĞU ENERJİ (ODA YERİ) (Eyüp/İSTANBUL)	2012	4.1	Waste	22.00
347	ÖREN REG. VE HES (ÇELİKLER ELEKTRİK ÜRETİM)	2012	19.9	Hydro (run of river)	12.00
348	ÖZMAYA SANAYİ A.Ş.	2012	5.4	Hydro (run of river)	40.00
349	PAMUKOVA YEN. EN. VE ELEK. ÜR. A.Ş.	2012	1.4	Waste	0.00
350	PANCAR ELEKTRİK ÜRETİM A.Ş.	2012		Natural Gas	731.00

			34.9		
351	PAPART HES (ELİTE ELEKTRİK ÜRETİM)	2012	26.6	Hydro (run of river)	80.00
352	PİSA TEKSTİL VE BOYA FABRİKALARI (İstanbul)	2012	1.0	Natural Gas	7.00
353	POLAT HES (ELESTAŞ ELEKTRİK ÜRETİM A.Ş.)	2012	6.6	Hydro (run of river)	20.00
354	POYRAZ RES (POYRAZ ENERJİ ELEKTRİK ÜRETİM)	2012	50.0	Wind	0.00
355	SAMSUN AVDAN KATI ATIK (SAMSUN AVDAN EN.)	2012	2.4	Waste	18.00
356	SAMURLU RES (DOĞAL ENERJİ ELEKTRİK ÜRET.)	2012	22.0	Hydro (run of river)	60.00
357	SARIHIDIR HES (MOLU ENERJİ ÜRETİM A.Ş.)	2012	6.0	Hydro (run of river)	18.00
358	SELÇUK İPLİK SAN. VE TİC. A.Ş.	2012	8.6	Natural Gas	65.00
359	SELVA GIDA SAN. A.Ş.	2012	1.7	Natural Gas	14.00
360	SEYRANTEPE HES (SEYRANTEPE ELEKT. ÜRET.)	2012	56.8	Hydro (run of river)	161.00
361	SEZER BİO ENERJİ (KALEMİRLER ENERJİ ELEKTR.)	2012	0.5	Waste	4.00
362	SIRAKONAKLAR HES (2M ENERJİ ÜRETİM A.Ş.)	2012	18.0	Hydro (run of river)	39.00
363	SİNEM JEOTERMAL (MAREN MARAŞ ELEKTRİK)	2012	24.0	Geothermal	191.00
364	SODA SANAYİ A.Ş. (Mersin)	2012	252.2	Natural Gas	1765.00
365	SOMA RES (SOMA ENERJİ ELEKTRİK ÜRETİM A.Ş.)	2012	24.0	Wind	0.00
366	SÖKE-ÇATALBÜK RES (ABK ENERJİ ELEKTRİK)	2012	18.0	Wind	0.00
367	SÖKE-ÇATALBÜK RES (ABK ENERJİ ELEKTRİK)	2012	12.0	Wind	0.00
368	SULUKÖY HES (DU ELEKTRİK ÜRETİM A.Ş.)	2012	6.9	Hydro (run of river)	18.00
369	ŞANLIURFA OSB (RASA ENERJİ ÜRETİM A.Ş.)	2012	11.7	Natural Gas	82.00
370	ŞENKÖY RES (EOLOS RÜZGAR ENERJİSİ ÜRETİM)	2012	26.0	Wind	0.00
371	ŞİFRİN REG. VE HES (BOMONTİ ELK. MÜH. MÜŞ.)	2012	6.7	Hydro (run of river)	10.00
372	TELEME REG. VE HES (TAYEN ELEKTRİK ÜRET.)	2012	1.6	Hydro (run of river)	6.00
373	TELLİ I-II HES (FALANJ ENERJİ ELEKTRİK ÜRET.)	2012	8.7	Hydro (run of river)	18.00
374	TERCAN (ZORLU DOĞAL ELEKTRİK ÜRETİMİ A.Ş.)	2012	15.0	Hydro (run of river)	28.00

375	TRAKYA YENİŞEHİR CAM SAN. A.Ş.	2012	6.0	Biogas	45.00
376	TUĞRA REG. VE HES (VİRA ELEKTRİK ÜRETİM A.Ş.)	2012	4.9	Hydro (run of river)	10.00
377	TUNA HES (NİSAN ELEKTROMEKANİK ENERJİ)	2012	37.2	Hydro (run of river)	0.00
378	TUZKÖY HES (BATEN ENERJİ ÜRETİMİ A.Ş.)	2012	8.4	Hydro (run of river)	0.00
379	TUZLAKÖY-SERGE REG. VE HES (TUYAT ELEKT.)	2012	7.1	Hydro (run of river)	0.00
380	UMUT I REG. VE HES (NİSAN ELEKTROMEKANİK)	2012	5.8	Hydro (run of river)	0.00
381	ÜÇKAYA HES (ŞİRİKÇİOĞLU ELEKTRİK ÜRETİM A.Ş.)	2012	1.0	Hydro (run of river)	3.00
382	VİZARA REG. VE HES (ÖZTÜRK ELEKT. ÜRET. LTD.)	2012	8.6	Hydro (run of river)	0.00
383	YAĞMUR REG. VE HES (BT BORDO ELK. ÜR.)	2012	8.9	Hydro (run of river)	0.00
384	YAMANLI III KAPS. GÖKKAYA HES (MEM ENERJİ)	2012	28.5	Hydro (run of river)	0.00
385	YAMANLI III KAPS. HİMMETLİ HES (MEM ENERJİ)	2012	27.0	Hydro (run of river)	0.00
386	YAVUZ HES (AREM ENERJİ ÜRETİM A.Ş.)	2012	5.8	Hydro (run of river)	0.00
387	YEDİSU HES (ÖZALTIN ENERJİ ÜRETİM VE İNŞAAT)	2012	22.7	Hydro (run of river)	41.00
388	YENİ UŞAK ENERJİ ELEKTRİK SANTRALI	2012	9.7	Natural Gas	62.00
389	YILDIRIM HES (BAYBURT ENERJİ ÜRETİM VE TİC.)	2012	10.7	Hydro (run of river)	22.00
390	YOKUŞLU KALKANDERE HES (SANKO ENERJİ)	2012	5.2	Hydro (run of river)	0.00
391	YONGAPAN (KASTAMONU ENTEGRE)(D.İskelesi)	2012	15.0	Natural Gas	90.00
392	ZORLU ENERJİ (B.Karıştıran)	2012	25.7	Natural Gas	195.00
393	YAĞMUR REG. VE HES (BT BORDO ELK. ÜR.)	2012	8.9	Hydro (run of river)	0.00
394	YAMANLI III KAPS. GÖKKAYA HES (MEM ENERJİ)	2012	28.5	Hydro (run of river)	0.00
395	YAMANLI III KAPS. HİMMETLİ HES (MEM ENERJİ)	2012	27.0	Hydro (run of river)	0.00
396	YAVUZ HES (AREM ENERJİ ÜRETİM A.Ş.)	2012	5.8	Hydro (run of river)	0.00
397	YEDİSU HES (ÖZALTIN ENERJİ ÜRETİM VE İNŞAAT)	2012	22.7	Hydro (run of river)	41.00
398	YENİ UŞAK ENERJİ ELEKTRİK SANTRALI	2012	9.7	Natural Gas	62.00
399	YILDIRIM HES (BAYBURT ENERJİ ÜRETİM	2012		Hydro (run of	22.00

	VE TİC.)		10.7	river)	
400	YOKUŞLU KALKANDERE HES (SANKO ENERJİ)	2012	5.2	Hydro (run of river)	0.00
401	YONGAPAN (KASTAMONU ENTEGRE)(D.İskelesi)	2012	15.0	Natural Gas	90.00
402	ZORLU ENERJİ (B.Karıştıran)	2012	25.7	Natural Gas	195.00

DATA SOURCES OF ALL THE PARAMETERS USED IN THE PDD AT HAND**Annex 3****MONITORING PLAN****1. The Monitoring Plan**

This Monitoring Plan (MP), describes how the performance of the proposed Yuntdağ WPP Project will be monitored and verified in terms of its greenhouse gas emission reductions (ERs) and conformance with all relevant Clean Development Mechanism criteria.

The MP builds on the baseline scenario identified in the main text of the Project Design Document (PDD) of the proposed project and is fully consistent with it.

The MP is based on the approved methodology ACM0002, "Consolidated monitoring methodology for zero-emissions grid-connected electricity generation from renewable sources" (Version 16). The MP will be used by the Project Entity, Innorecs, and possibly by appointed consultants.

The MP's instructions should be followed to successfully measure and track the project impacts and prepare for the periodic audit and verification process that will have to be undertaken to certify the achieved GS-VERs.

Specifically, the MP provides the requirements and instructions for:

- Establishing and maintaining the appropriate monitoring system, including spreadsheets for the calculation of GS-VERs;
- Implementing the necessary measurement and management operations;
- Preparing for the requirements of independent, third party verification and audits.

The project owner can update and adjust the MP to meet operational requirements, provided the Verifier approves these modifications during the process of initial or periodic verification.

Data and parameters to be monitored

Data and parameters to be monitored are already stated in the above sections, in Section D of this PDD.

Sampling plan

There is no sampling method applied.

Other elements of monitoring plan

As the necessary baseline emission factors are all defined ex ante (Operating and Built Margin, see baseline description), the most important information to be monitored is the amount of electricity fed into the grid by Yuntdag WPP. This value will be monitored continuously by redundant metering devices, one of them being the main one in the substation, which provides the data for the monthly invoicing to TEİAŞ.

The collected data will be kept by Innorecs during the crediting period and until two years after the last issuance of VERs for the Yuntdag WPP activity for that crediting period.

Given a data vintage based on ex ante monitoring and selection of a renewable 7 year crediting period, the Combined Margin is recalculated at any renewal of the crediting period using the valid baseline methodology.

A backup power generator will be installed in power plant. In case, emissions from back-up power generator exceed 1% of the total emission reductions, they will be accounted as project emissions in each verification period. Operating hours of back-up power generator will be monitored with that purpose.

Potential leakage emissions in the context of power sector projects are emissions arising due to activities such as power plant construction, fuel handling and land inundation. However, according to the methodology, those emission sources do not need to be taken into account.

2. Calculating Emission Reductions

The emission reductions from the project result from the electricity which is generated from the Yuntdag WPP. This electricity will displace power generated by other sources of power and fed into the national Turkish grid. The only data to be monitored is the net electricity production of the wind farm.

3. Operational and Monitoring Obligations

The overall responsibility for monitoring and reporting issues is with İnnores. This includes:

- data collection in electronic and paper form
- the data correctness is assured, as the monthly electricity data are separately stored at İnnores and TEİAŞ
- monitoring, measurements and reporting
- records handling
- dealing with possible monitoring data adjustments and uncertainties
- review of reported results/data
- review of project performance
- internal audits of GHG project compliance with operational requirements as applicable

All of the data needed for the calculation of emission reductions will be kept by İnnores during the crediting period and until two years after the last issuance of GS-VER for Yuntdağ WPP project activity.

Details of the Monitoring Plan are described under section D.