

# KINIK WIND POWER PLANT, TURKEY

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|                          |                                                                                                                                                                                      |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Project Title</b>     | Kınık Wind Power Plant                                                                                                                                                               |
| <b>Version</b>           | 04                                                                                                                                                                                   |
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| <b>Project ID</b>        | 1732                                                                                                                                                                                 |
| <b>Monitoring Period</b> | 05-12-2016 to 28-02-2019                                                                                                                                                             |
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## 1 PROJECT DETAILS

### 1.1 Summary Description of the Project

The project of **Esinti Enerji Üretim Ticaret ve Sanayi Anonim Şirketi** (hereafter referred to as “**Esinti**”), **Kınık Wind Power Plant** (hereafter referred to as the “Project” or “**Kınık WPP**”), involves installation and operation of 54.4 MWm/50 MWe<sup>1</sup> large-scale wind power plant by Energy Market Regulatory Authority (EMRA) and this licence was issued on 8<sup>th</sup> of March 2012.

The aim of the project is to generate electricity by the efficient utilization of the available wind energy by project activity replace the grid electricity, which is constituted of different fuel sources, mainly fossil fuels. The electricity produced by project activity result in emission reduction. Thus, the project has a significant contribution to climate protection and to sustainable development in the region.

The project activity contributed further dissemination of wind energy and extension of national power generation. Construction agreement is dated as 20/10/2015 and construction is started on 13/11/2015.<sup>2</sup> Operation of the plant started on 5<sup>th</sup> December 2016 and have an operational life of 49 years<sup>3</sup>. The main 1<sup>st</sup> phased implementation of the 16 wind turbines was on 05/12/2016, 2<sup>nd</sup> phased implementation of the Turbine No. 2 was on 10/05/2018.

First crediting period was started on 05/12/2016. End date of the first monitoring period is on 28/02/2019.

Total emission reduction achieved during this monitoring period is 198,388 tCO<sub>2</sub>e (for 05/12/2016-28/02/2019, 816 days). Generated net electricity during this monitoring period is 362,639.60 MWh.

Project has 16 turbines with unit capacity of 3 MWe and 1 turbine with unit capacity of 2 MWe. The key parameters about the technical design of the selected model Siemens SWT-3.2-108 are listed below in table.

**Table 1:** Technical specifications of Siemens SWT-3.2-108 Turbines<sup>4</sup>

| Specifications             | Siemens SWT-3.2-108 |
|----------------------------|---------------------|
| Rated Power (MWm)          | 3.2                 |
| Rotor Diameter (m)         | 108                 |
| Num. of Blades             | 3                   |
| Reference Wind Speed (m/s) | 42.5                |

### 1.2 Sectoral Scope and Project Type

The respective sectoral scope is scope 1: “Energy Industry – Renewable/Non-renewable Sources”. The installed capacity of the project is 50 MWe, thus it falls into a large scale project activity.

The project is not a grouped or a bundled project.

<sup>1</sup> See; Provisional Acceptance Certificates

<sup>2</sup> See, Site Delivery Protocol

<sup>3</sup> See, Kınık Generation License

<sup>4</sup> See, Provisional Acceptance Certificates

### 1.3 Project Proponent

Esinti is the developer and owner of the Project.

|                   |                                                                                  |
|-------------------|----------------------------------------------------------------------------------|
| Organization name | Esinti Enerji Üretim Ticaret ve Sanayi Anonim Şirketi                            |
| Contact person    | Cengiz Sarıkaya                                                                  |
| Title             | Project Manager                                                                  |
| Address           | Eski Kuyumcular Mah. Yeşilyol Sok. No: 4/2 Karesi,<br>Balıkesir/Turkey           |
| Telephone         | +90 266 244 13 00                                                                |
| Email             | <a href="mailto:c.sarikaya@esintienenerji.com">c.sarikaya@esintienenerji.com</a> |

### 1.4 Other Entities Involved in the Project

The project documentation at hand was defined by Esinti in cooperation with Life İklim ve Enerji (Verification-Monitoring Report consultancy). Registration of the project to VCS was carried out by another company (Rüzgar Danışmanlık).

|                     |                                                                                |
|---------------------|--------------------------------------------------------------------------------|
| Organization name   | Life İklim ve Enerji Ltd. Şti.                                                 |
| Role in the project | Carbon Consultant                                                              |
| Contact person      | Kerem Ziya Akdemir                                                             |
| Title               | Assistant Expert                                                               |
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### 1.5 Project Start Date

The main 1<sup>st</sup> phased implementation of the 16 wind turbines was on 05/12/2016. Therefore, the project start date was 5<sup>th</sup> of December 2016 which the project began generating GHG emission reductions or removals.

### 1.6 Project Crediting Period

A two times renewable crediting period of 10 years 0 month shall apply. First, verifiable emission reductions achieved on 5<sup>th</sup> of December 2016. Thus, the first crediting period shall last from 5<sup>th</sup> of December 2016 until 4<sup>th</sup> of December 2026.

### 1.7 Project Location

The project is located at Kınık district, İzmir province, Turkey. The nearest residential area to the plant is Kodukburun village. Project location is shown in Figure 1 and Figure 2.

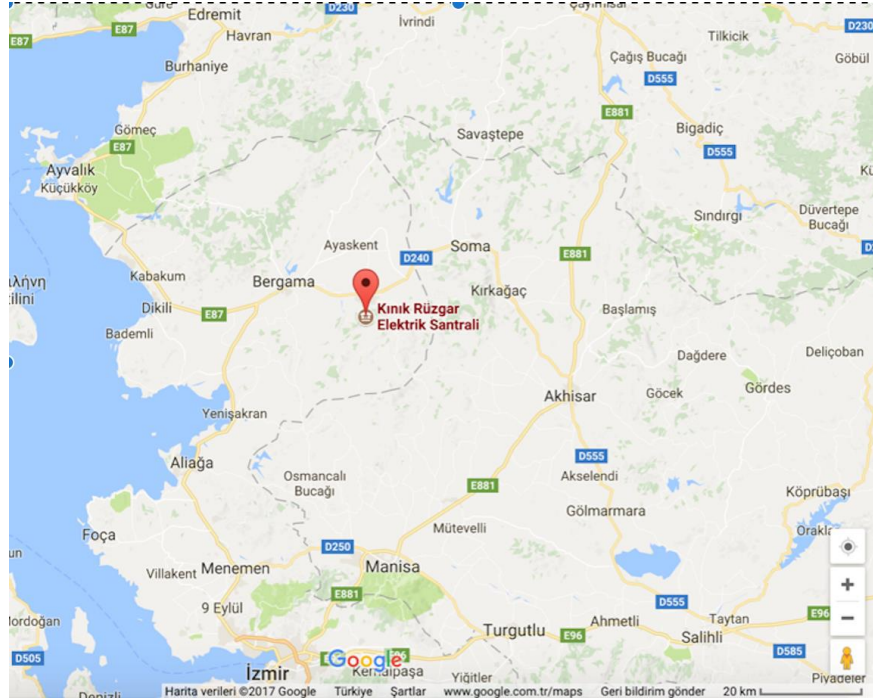


**Figure 1:** Location of Kınık Wind Power Plant Project<sup>5</sup>

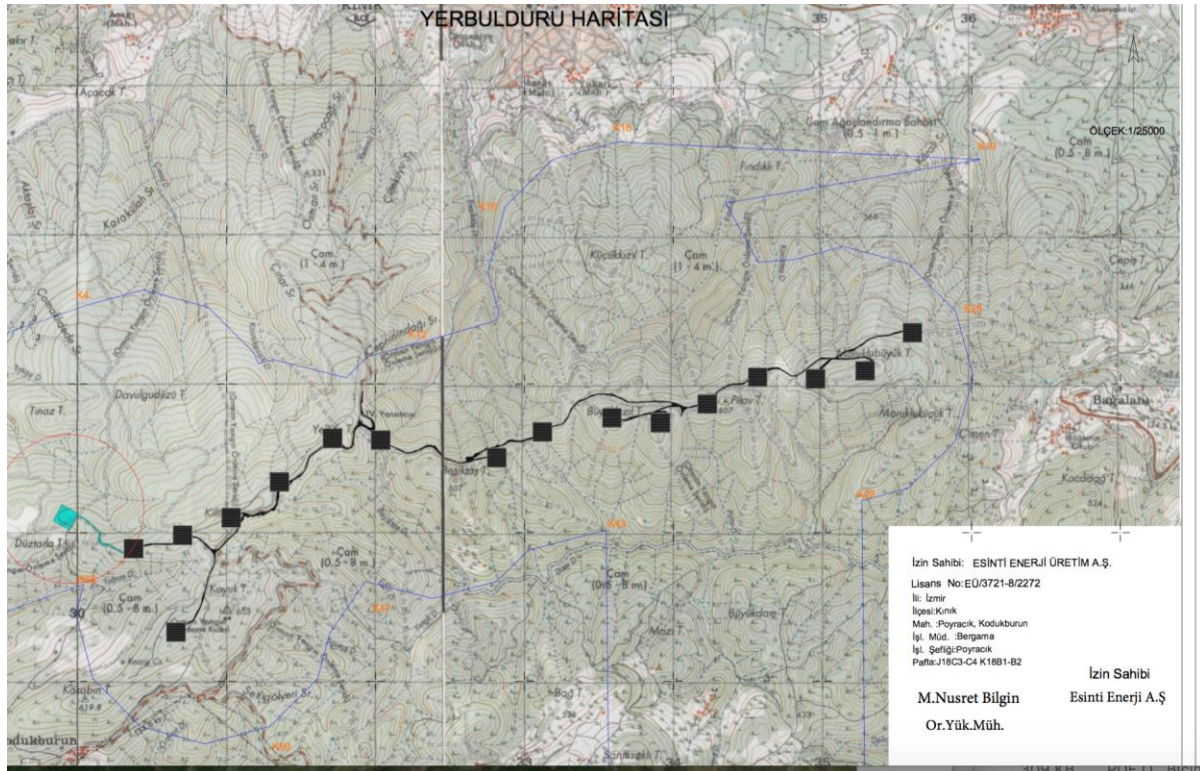


**Figure 2:** Location of Kınık Wind Power Plant Project<sup>6</sup>

<sup>5</sup> See; Registered Project Description Document of Kınık WPP

<sup>6</sup> See; Registered Project Description Document of Kınık WPP

**Table 2:** Geographical coordinates of the wind turbines of the project activity<sup>7</sup>

| <b>Turbine No.</b> | <b>Latitude (N)</b> | <b>Longitude (E)</b> |
|--------------------|---------------------|----------------------|
| T1                 | 39° 02' 58.2504''   | 27° 21' 15.6004''    |
| T2                 | 39° 03' 23.4180''   | 27° 20' 44.8536''    |
| T3                 | 39° 03' 16.4844''   | 27° 21' 03.8338''    |
| T4                 | 39° 03' 19.3644''   | 27° 21' 17.5366''    |
| T5                 | 39° 03' 23.1804''   | 27° 21' 31.1197''    |
| T6                 | 39° 03' 30.9240''   | 27° 21' 44.6401''    |
| T7                 | 39° 03' 40.3200''   | 27° 21' 59.5013''    |
| T8                 | 39° 03' 39.9204''   | 27° 22' 12.9809''    |
| T9                 | 39° 03' 35.9892''   | 27° 22' 45.3325''    |
| T10                | 39° 03' 41.5584''   | 27° 22' 58.0950''    |
| T11                | 39° 03' 44.5752''   | 27° 23' 17.5435''    |
| T12                | 39° 03' 43.4592''   | 27° 23' 31.0192''    |
| T13                | 39° 03' 47.5020''   | 27° 23' 44.1907''    |
| T14                | 39° 03' 53.2944''   | 27° 23' 58.2464''    |
| T15                | 39° 03' 52.8480''   | 27° 24' 14.4310''    |
| T16                | 39° 03' 54.5544''   | 27° 24' 28.2976''    |
| T17                | 39° 04' 02.8128''   | 27° 24' 41.5367''    |

## 1.8 Title and Reference of Methodology

For the determination of the baseline, the official methodology ACM0002 version 17.0.0, “Grid-connected electricity generation from renewable sources”<sup>8</sup>, 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 06.0)<sup>9</sup>;
2. Tool for the demonstration and assessment of additionality (Version 07.0.0)<sup>10</sup>;
3. Combined tool to identify the baseline scenario and demonstrate additionality (Version 06.0.0)<sup>11</sup>;
4. Tool to determine the remaining lifetime of the equipment (Version 01)<sup>12</sup>

For baseline calculation the first tool, for additionality assessment, the second tool is used. As the third tool is the combination of the first and second tool, it is not used. Finally, to determine the remaining lifetime of the equipment fourth tool is used.

## 1.9 Other Programs

- The project does not participate/has not participated in any Emission Trading Programs and Other Binding Limits.
- The project does not participate/has not participated in any other GHG program.

<sup>7</sup> See, Generation License for Kink WPP and <http://www.rcn.montana.edu/Resources/Converter.aspx> for the conversion.

<sup>8</sup> See, <https://cdm.unfccc.int/methodologies/DB/8W400U6E7LFHHYH2C4JR1RJWWO4PVN/view.html>

<sup>9</sup> See; <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v6.pdf>

<sup>10</sup> See; <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v7.0.0.pdf>

<sup>11</sup> See; <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-02-v6.0.pdf>

<sup>12</sup> See; <http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf>

### 1.10 Sustainable Development

The project helps Turkey to stimulate and commercialise the use of grid-connected renewable energy technologies and markets. Furthermore, the project demonstrates 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;
- differentiate the electricity generation mix and reduce import dependency;
- contribute to the development of landscaping, reforestation, making investments, such as roads, various supports for village schools.

As the project developer, **Esinti** believes that efficient utilization of all kinds of natural resources with a harmony coupled with responsible environmental considerations is vital for the sustainable development of Turkey and the World. This has been a guiding factor for the shareholders towards the concept of designation and installation of a wind power project. Other than the objective of climate change mitigation through a significant reduction in greenhouse gas (GHG) emissions, the project has been carried out to provide a social and economic contribution to the region in a sustainable way. The benefits that are gained by the realization of the project compared to the business-as-usual scenario can be summarized under some main indicators.

- For Environmental aspect, the project activities replace the grid electricity and avoid the greenhouse gas emissions (CO<sub>2</sub>, CH<sub>4</sub>) and other pollutants (SOX, NOX, particulate matters).
- In addition, the project helps to develop the wind power industry and encouraged to the investment in the industry. Thus, for economical aspect, Turkey's increasing energy deficit and import dependency are reduced.
- For social aspect, during the construction and operation of the wind farm, local employment is enhanced and local poverty and unemployment can be partially eliminated by increasing job opportunities and project business activities.
- Implementation of the project contributes to wider deployment and acceleration of the wind technology in local and national level.

## 2 IMPLEMENTATION STATUS

### 2.1 Implementation Status of the Project Activity

Kınık WPP started to generate and provide electricity to the Turkish National Grid on 5<sup>th</sup> of December 2016. During the monitoring period, there was no event or situation that occurred, which may impact the

applicability of the methodology. Registration of Kınık WPP was carried out by Rüzgar Danışmanlık. However, for the verification processes, Carbon Consultant of the project has changed as Life İklim ve Enerji Ltd. Şti..

**Table 3: Project Milestones<sup>13</sup>**

| Date(DD.MM.YYYY) | Milestone                                                                           |
|------------------|-------------------------------------------------------------------------------------|
| 08.03.2012       | Licence received from EMRA                                                          |
| 23.05.2014       | Turbine Contract                                                                    |
| 20.04.2015       | Bank Loan Agreement                                                                 |
| 20.10.2015       | Construction Agreement                                                              |
| 05.12.2016       | Start date of generating electricity/start date of the first crediting period       |
| 05.12.2016       | Provisional Acceptance Date of Turbines No. 1,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17 |
| 23.11.2017       | Final Licence Amendment from EMRA                                                   |
| 10.05.2018       | Provisional Acceptance Date of Turbine No. 2                                        |
| 28.02.2019       | End of the first monitoring period                                                  |

## 2.2 Deviations

For Kınık WPP, there are not methodology deviations. However, there is a single deviation from the project description which is elaborated in Section 2.2.2.

### 2.2.1 Methodology Deviations

N/A

### 2.2.2 Project Description Deviations

At validation report of the Kınık WPP, there is a single FAR which states “During validation site visit T2 turbine was not installed and constructed. During verification T2 actual location should be check by the DOE”. When Kınık WPP is registered to VCS, Turbine T2 has not been constructed yet. Location of Turbine T2 was different in registered VCS-PD and Validation report. There is a forest fire watchtower located near 60 m to the Turbine T2’s former planned location. Officials granted preliminary permission for the former location of the Turbine T2. However, after projects is registered, officials changed their decision and did not grant permission to construct Turbine T2 to the formerly proposed place. Officials stated that Turbine T2’s location could interfere the watchtower by reducing field of vision. Therefore, Turbine T2’s location is changed and this change can be validated by checking the amendment dated 12.09.2017 on generation licence of the project.<sup>14</sup> For the change in location of Turbine T2, a new “EIA not required” decision was taken.<sup>15</sup> Since necessary permits are taken from the officials and change in location of Turbine T2 is negligible, no additional procedures or actions are needed to be taken.

Moreover, on 01/09/2015, PMUM was renamed as EPIAŞ. In this sense, main source is the monthly meter readings records (EPIAŞ data, also known as PMUM). Data from remote automatic meter reading

<sup>13</sup> Please see Registered Project Description Document of Kınık WPP

<sup>14</sup> Please see generation licence of Kınık WPP

<sup>15</sup> Please see official letter on the “EIA not required” decision

system (OSOS) is used for crosschecking. Invoicing of the electricity production is carried out according to EPIAŞ data; thus, rendering the EPIAŞ data official source of electricity generation.

## 2.3 Grouped Project

N/A

## 2.4 Safeguards

### 2.4.1 No Net Harm

N/A

### 2.4.2 Local Stakeholder Consultation

A site visit including the stakeholder engagement procedure was conducted at the Kınık Wind Power Plant administration building with the Kodukburun Village head (muhtar) and the local stakeholders on 14<sup>th</sup> of March 2019. Verification team also paid a visit to the Kodukburun Village in order to interview local women. Nine person including Kodukburun Village muhtar, two Kınık WPP employees and six local stakeholders were interviewed.<sup>16</sup> All of these people are from either Kodukburun village or local villages around the plant.

There were not any negative feedbacks from the locals. Locals stated that they are happy with the project since Kınık WPP and its security officers made the region more secure from animal theft incidents, and Kınık WPP provided employment opportunities for local people.<sup>17</sup>

Since there were no negative feedbacks from the locals, there is no need to take any further action. Although there were no negative feedbacks, at the stakeholder engagement meeting, locals stated that if additional turbines will be constructed in the future, no turbine should be constructed beyond Turbine T1. They stated if there will be a construction of a new turbine beyond Turbine T1, noise problems may arise in the future since the new turbine would be closer to the Kodukburun village. However, project manager stated that area beyond Turbine T1 does not belong to Esinti; thus, rendering this concern unnecessary. For now, no additional turbine will be constructed closer to the Kodukburun village than Turbine T1. This concern is settled by the project manager of Esinti. All in all, there were no negative feedbacks on the project activity.

Muhtars (head of the village) of Kodukburun and Mustaklar villages had already taken the contact information of Plant Manager of the company so that the local stakeholders will be able to reach Plant Manager whenever they have any complaints, suggestions or ideas about the project. Since muhtar is the head of the village, he will be the main contact person between the project owner and the local stakeholders. Muhtar will make sure that there's continuous communication between the two parties.

## 3 DATA AND PARAMETERS

### 3.1 Data and Parameters Available at Validation

|                  |                                                                       |
|------------------|-----------------------------------------------------------------------|
| Data / Parameter | EGgross                                                               |
| Data unit        | MWh                                                                   |
| Description      | Gross electricity production by fossil fuel power sources (2013-2015) |

<sup>16</sup> Please see on-site attendance form

<sup>17</sup> Please see the examples of social security records of the current employees.

|                                                                                              |                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Source of data                                                                               | TEIAS (Turkish Electricity Transmission Company) <a href="http://www.teias.gov.tr">www.teias.gov.tr</a> . The distribution of gross electricity generation by primary energy resources and the electricity utilities in Turkey (2013, 2014, 2015). |
| Value applied                                                                                | See Validated VCS-PD, Section 3.1.                                                                                                                                                                                                                 |
| Justification of choice of data or description of measurement methods and procedures applied | TEIAS, the Turkish Electricity Transmission Company is the official source for the related data, thus providing the most up-to-date and accurate information available.                                                                            |
| Purpose of the data                                                                          | Calculation of baseline emissions                                                                                                                                                                                                                  |
| Comments                                                                                     | -                                                                                                                                                                                                                                                  |

|                                                                                              |                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | <b>FC<sub>i,y</sub></b>                                                                                                                                                                             |
| Data unit                                                                                    | ton (m3 for Natural Gas)                                                                                                                                                                            |
| Description                                                                                  | Amount of fossil fuel type i consumed in the project electricity system by generation sources in year y (2013-2015)                                                                                 |
| Source of data                                                                               | TEIAS (Turkish Electricity Transmission Company) <a href="http://www.teias.gov.tr">www.teias.gov.tr</a> . Fuels consumed in thermal power plants in Turkey by the electricity utilities (2013-2015) |
| Value applied:                                                                               | See Section 3.1 in Validated VCS-PD.                                                                                                                                                                |
| Justification of choice of data or description of measurement methods and procedures applied | TEIAS, Turkish Electricity Transmission Company is the official source for the related data, hence providing the most up-to-date and accurate information available                                 |
| Purpose of Data                                                                              | Calculation of baseline emissions                                                                                                                                                                   |
| Comments                                                                                     | -                                                                                                                                                                                                   |

|                                                   |                                                                                                                                                                                                                                     |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                  | <b>NCV<sub>i,y</sub></b>                                                                                                                                                                                                            |
| Data unit                                         | TJ/kt ( $10^6 \text{ m}^3$ for gaseous fuels)                                                                                                                                                                                       |
| Description                                       | Net calorific value (energy content) of fossil fuel type i in year y                                                                                                                                                                |
| Source of data                                    | Calculated based on TEIAS (Turkish Electricity Transmission Company) <a href="http://www.teias.gov.tr">www.teias.gov.tr</a> . Heating values of fuels consumed in thermal plants in Turkey by the electricity utilities (2013-2015) |
| Value applied:                                    | See Section 3.1 in Validated VCS-PD.                                                                                                                                                                                                |
| Justification of choice of data or description of | TEIAS (Turkish Electricity Transmission Company) is the official source for this data, providing the most up-to-date and accurate information available.                                                                            |

|                                            |                                   |
|--------------------------------------------|-----------------------------------|
| measurement methods and procedures applied |                                   |
| Purpose of Data                            | Calculation of baseline emissions |
| Comments                                   | -                                 |

|                                                                                              |                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | <b>EF<sub>CO2,i,y</sub></b>                                                                                                                                                                                                                                                                                                                              |
| Data unit                                                                                    | tCO2/TJ                                                                                                                                                                                                                                                                                                                                                  |
| Description                                                                                  | CO2 emission factor of fossil fuel type i used in power unit m in year y                                                                                                                                                                                                                                                                                 |
| Source of data                                                                               | IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Volume 2 (Energy) of the 2006 IPCC Guidelines for National Greenhouse Gas Inventory<br><br><a href="http://www.ipccnggip.iges.or.jp/public/2006gl/index.htm">http://www.ipccnggip.iges.or.jp/public/2006gl/index.htm</a> |
| Value applied:                                                                               | See Section 3.1 in VCS-PD                                                                                                                                                                                                                                                                                                                                |
| Justification of choice of data or description of measurement methods and procedures applied | There is no information on the fuel specific default emission factor in Turkey, hence, IPCC values has been used as referred in the "Tool to calculate the emission factor for an electricity system".                                                                                                                                                   |
| Purpose of Data                                                                              | Calculation of baseline emissions                                                                                                                                                                                                                                                                                                                        |
| Comments                                                                                     | -                                                                                                                                                                                                                                                                                                                                                        |

|                                                                                              |                                                                                                                                                                             |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | <b>EG<sub>m,y</sub></b>                                                                                                                                                     |
| Data unit                                                                                    | MWh                                                                                                                                                                         |
| Description                                                                                  | Net electricity generated by power plant/unit m                                                                                                                             |
| Source of data                                                                               | TEIAS (Turkish Electricity Transmission Company) <a href="http://www.teias.gov.tr">www.teias.gov.tr</a> . Generation units put into operation in 2013, 2014, 2015           |
| Value applied:                                                                               | See Validated VCS-PD, section 3.1 Summary of GHG Emission Reductions and Removals.                                                                                          |
| Justification of choice of data or description of measurement methods and procedures applied | Once for each crediting period using the most recent three historical years for which the data is available at the time of submission of the PDD to the DOE for validation. |
| Purpose of Data                                                                              | Calculation of baseline emissions                                                                                                                                           |
| Comments                                                                                     | -                                                                                                                                                                           |

|                                                                                              |                                                                                                                                                |
|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | $\eta_{m,y}$                                                                                                                                   |
| Data unit                                                                                    | %                                                                                                                                              |
| Description                                                                                  | Average net energy conversion efficiency of power unit m in year y                                                                             |
| Source of data                                                                               | "Appendix 1, Default efficiency factors for power plants" of "Tool to calculate the emission factor for an electricity system" version 05.0.0. |
| Value applied:                                                                               | See Section 3.1 in VCS-PD.                                                                                                                     |
| Justification of choice of data or description of measurement methods and procedures applied | The average values of thermal plants in Turkey are taken from Tool to calculate the emission factor for an electricity system" version 06.0.   |
| Purpose of Data                                                                              | Calculation of baseline emissions                                                                                                              |
| Comments                                                                                     | -                                                                                                                                              |

### 3.2 Data and Parameters Monitored

|                                                                 |                                                                                                                                                                                                                                                                                                                                 |                                    |                                    |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------------|
| Data / Parameter                                                | $EG_{\text{facility},y}$                                                                                                                                                                                                                                                                                                        |                                    |                                    |
| Data unit                                                       | MWh/y                                                                                                                                                                                                                                                                                                                           |                                    |                                    |
| Description                                                     | Quantity of net electricity supplied to the grid in year y                                                                                                                                                                                                                                                                      |                                    |                                    |
| Source of data                                                  | Main source is the monthly meter readings records (EPIAŞ data, also known as PMUM). Data from remote automatic meter reading system (OSOS) is used for crosschecking. Invoicing of the electricity production is carried out according to EPIAŞ data; thus, rendering the EPIAŞ data official source of electricity generation. |                                    |                                    |
| Description of measurement methods and procedures to be applied | The net electricity generation supplied to the grid is measured continuously by meters (both main and spare) and recorded monthly.                                                                                                                                                                                              |                                    |                                    |
| The frequency of monitoring/recording                           | The produced and consumed electricity is continuously measured by the meters attached to the power plant. This continuous measurement is recorded on a monthly basis. As a result, net electricity supplied to the grid is calculated.                                                                                          |                                    |                                    |
| Value applied:                                                  | 362,639.60 MWh                                                                                                                                                                                                                                                                                                                  |                                    |                                    |
| Monitoring equipment                                            | Continuous measurement and at least monthly recording. Information of the meters are listed as followed <sup>18</sup> :                                                                                                                                                                                                         |                                    |                                    |
|                                                                 |                                                                                                                                                                                                                                                                                                                                 | <b>Electricity Meter (Primary)</b> | <b>Electricity Meter (Back-up)</b> |
|                                                                 | Manufacturer                                                                                                                                                                                                                                                                                                                    | ITRON                              | ITRON                              |

<sup>18</sup> See; Registered Project Description Document of Kınık WPP and First Index Protocols of Kınık WPP

|                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |            |
|-------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|
|                                                 | Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | SL761      | SL761      |
|                                                 | Serial number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 73055353   | 73055354   |
|                                                 | Date of installation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 27.10.2016 | 27.10.2016 |
|                                                 | Date of initial calibration <sup>19</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 29.06.2016 | 29.06.2016 |
| The accuracy of meters is given as 0.2 S class. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |            |
| QA/QC procedures to be applied                  | <ul style="list-style-type: none"> <li>Measurements are undertaken using energy meters.</li> <li>Concerning metering system accuracy, project participants have to comply with relevant national legislation According to b) paragraph of the 9th Article of the Regulation of Metering and Testing of Metering Systems “periodic tests of meters of electricity, water, coal gas, natural gas and current and voltage transformers are done every 10 years.”<sup>20</sup></li> <li>The net electricity export/supplied to a grid is the difference between the measured quantities of the grid electricity export and the import. Main source is the monthly meter readings records (EPIAŞ data, also known as PMUM). Data from remote automatic meter reading system (OSOS) is used for crosschecking. Invoicing of the electricity production is carried out according to EPIAŞ data; thus, rendering the EPIAŞ data official source of electricity generation.</li> </ul> |            |            |
| Purpose of data                                 | Calculation of baseline emissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |            |
| Comments                                        | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |            |

### 3.3 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 Kınık WPP. This value will be monitored continuously by metering devices, one of them being the main one in the substation, which provides the data for the monthly invoicing to TEİAŞ.

The Project Owner will be responsible to implement the monitoring report according to the UNFCCC rules and procedures. According to the Turkish Law and Regulations, the methods of monitoring the net electricity fed to the grid and quality control and assures are explained below:

Monitoring data is collected in accordance with the agreement done between the project owner and Turkish Electricity Transmission Company (TEİAŞ) which provides the infrastructure for the connection to the national grid. The metering system is defined in the agreement as two groups: main meter and spare meter. The design of the metering system is checked and approved by TEİAŞ before commissioning of

<sup>19</sup> Please see the Calibration certificate of the meters

<sup>20</sup> See, <http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.6381&MevzuatIliski=0&sourceXmlSearch=>

the plant. The technical specifications of the power meters should be in line with Measure and Metering Devices Regulation by Ministry of Industry and Trade. In addition, the Communiqué for Power Meters announced by Energy Market Regulations Authority (EMRA) requires all meters to be in line with either Turkish Standards Institution or International Electro technical Commissions Standards. The meters are placed at the point the electricity is fed to the grid and sealed on behalf of the both parties. This prevents any intervention and assures the accuracy and quality of the measurements. Concerning metering system accuracy, project participants have to comply with relevant national legislation According to b) paragraph of the 9th Article of the Regulation of Metering and Testing of Metering Systems “periodic tests of meters of electricity, water, coal gas, natural gas and current and voltage transformer are done every 10 years.

Data will be stored electronically, during the crediting period and at least two years after the last issuance of credits for the wind farm project activity in the concerning crediting period. The Project Proponent will be responsible for storage of data received from the measuring devices.

The main and spare meter readings are recorded monthly-remote automatic meter reading system and cross-checked whether calibration is required. The capacity of the transmission line connected is medium voltage of 154 kVA, the accuracy class for power meters have been defined in the Communiqué for Power Meters as 0.2S class. The calibration will be implemented in accordance with the related standard procedures. The periodical maintenance is under the responsibility of TEIAS and has been fixed as once in 10 years as mentioned above.

The Project aims to create local employment opportunities in the project region in a sustainable way. The Project proponent prefers to prioritize personnel from the project region. The proposed project provides employment both during the construction and operational phases. Project owner provides 14 permanent employee's during the operation of the plant. Project Manager is responsible for all issues related to project and operation of the plant. On the other hand, plant manager is responsible for daily operational processes of the plant, management of the plant personnel, and other technical and management issues for the plant. Operator technicians are responsible for monitoring of the plant and turbines for all day and night in the control room. They are responsible for recording data hourly and manage the turbines of the plant. Plant securities are responsible for monitoring the field from cameras for all day and night and they tour the plant site in every two hours. Lastly, kitchen service is responsible for managing the kitchen and providing meal for the plant personnel. Roles and responsibilities have been summarized in the following chart.

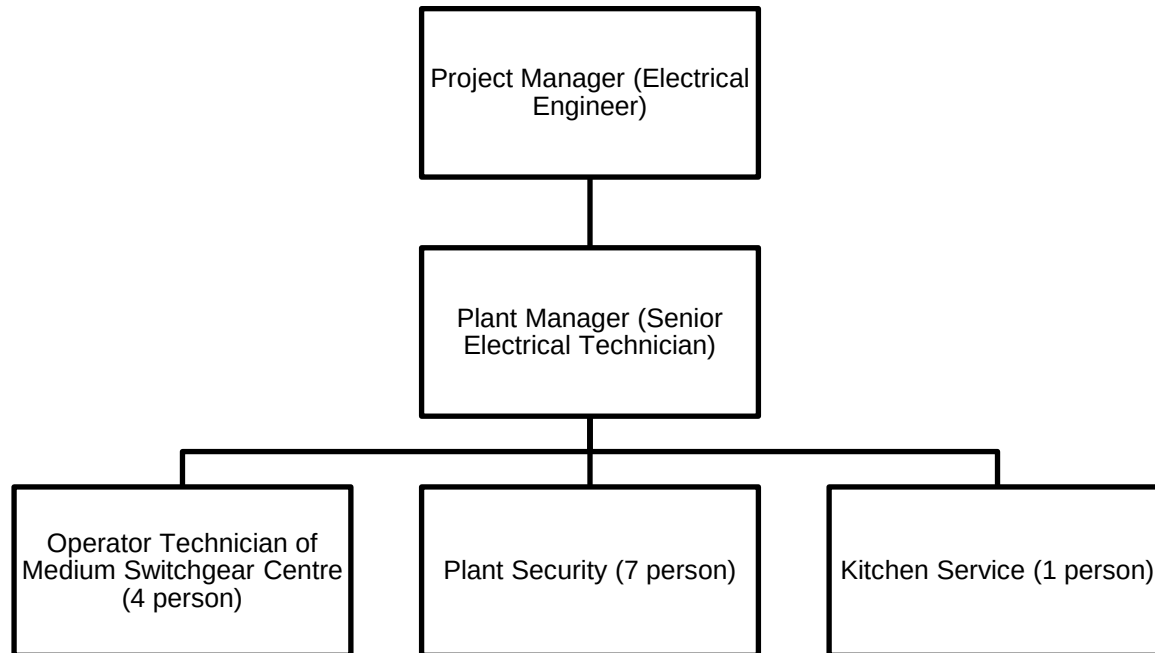


**Figure 3:** Organization Diagram of Kınık WPP

Kınık WPP is works with a private occupational health and safety (OHS) company and is audited in every two months. Moreover, personnel at the plant has documentation on permission to work under high voltage.<sup>21</sup> Finally, plant site is protected and inspected by local gendarmerie.

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.

## 4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

### 4.1 Baseline Emissions

The baseline scenario is identified according to the “Baseline Methodology Procedure” of ACM0002 ver.17 (page 10). The project activity is the installation of a new grid-connected wind farm with 17 turbines and is not modification/retrofit of an existing grid-connected power plant. So, the first identification of this procedure is selected for proposed project activity.

The total emission reductions can be calculated with the results of the below described equations. The emission reduction is equal to the baseline emissions minus project emissions and leakage emissions. Leakage emissions in this project are considered to be negligible. There are no project emissions in this kind of project. The general equation is as follows:

$$ER_y = BE_y - PE_y - L_y \quad (1)$$

Where:

$ER_y$  = Emission reduction

$BE_y$  = Baseline emissions

<sup>21</sup> Please see, permission to work under high voltage documentations of the personnel

$PE_y$  = Project emissions  
 $L_y$  = Leakage  
 $y$  = Refers to a given period

The electricity meters are measuring two parameters: The electricity supplied to the grid (EGexport) and the electricity consumption from the grid (EGimport). To achieve the net amount of supplied electricity, the difference has to be calculated:

$$GEN_y = EG_{export} - EG_{import} \quad (2)$$

Where:

$GEN_y$  = Net electricity supplied to the Grid in MWh  
 $EG_{export}$  = Electricity supplied to the Grid in MWh  
 $EG_{import}$  = Electricity consumption from the Grid in MWh

According to the applied methodology version the emission reduction is the baseline emissions calculated as the net electricity supplied to the grid multiplied by the grid emission factor.

$$BE_y = GEN_y * EF \quad (3)$$

Where:

$BE_y$  = Baseline emissions in tonnes CO<sub>2</sub>e  
 $EF$  = Grid emission factor for the electricity displaced due to the project activity during the year y [tCO<sub>2</sub>e/MWh].  
 $GEN_y$  = Net electricity supplied to the Grid in MWh (ID 1)  
 $y$  = Refers to a given period

## 4.2 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 tCO<sub>2</sub>/year

## 4.3 Leakage

LE<sub>y</sub> is 0, as it is not considered according to ACM0002. PE<sub>y</sub> is 0 because project is a wind power generation activity (Only for geothermal and Hydro project activities, it should be considered according to ACM0002).

## 4.4 Net GHG Emission Reductions and Removals

| Year            | Baseline emissions or removals (tCO <sub>2</sub> e) | Project emissions or removals (tCO <sub>2</sub> e) | Leakage emissions (tCO <sub>2</sub> e) | Net GHG emission reductions or removals (tCO <sub>2</sub> e) |
|-----------------|-----------------------------------------------------|----------------------------------------------------|----------------------------------------|--------------------------------------------------------------|
| Dec.16*         | 7,605                                               | 0                                                  | 0                                      | 7,605                                                        |
| <b>Sum 2016</b> | 7,605                                               | 0                                                  | 0                                      | 7,605                                                        |
| Jan.17          | 7,842                                               | 0                                                  | 0                                      | 7,842                                                        |

| Year            | Baseline emissions or removals (tCO <sub>2</sub> e) | Project emissions or removals (tCO <sub>2</sub> e) | Leakage emissions (tCO <sub>2</sub> e) | Net GHG emission reductions or removals (tCO <sub>2</sub> e) |
|-----------------|-----------------------------------------------------|----------------------------------------------------|----------------------------------------|--------------------------------------------------------------|
| Feb.17          | 7,452                                               | 0                                                  | 0                                      | 7,452                                                        |
| Mar.17          | 5,344                                               | 0                                                  | 0                                      | 5,344                                                        |
| Apr.17          | 3,650                                               | 0                                                  | 0                                      | 3,650                                                        |
| May.17          | 5,997                                               | 0                                                  | 0                                      | 5,997                                                        |
| Jun.17          | 3,779                                               | 0                                                  | 0                                      | 3,779                                                        |
| Jul.17          | 11,581                                              | 0                                                  | 0                                      | 11,581                                                       |
| Aug.17          | 14,490                                              | 0                                                  | 0                                      | 14,490                                                       |
| Sep.17          | 4,781                                               | 0                                                  | 0                                      | 4,781                                                        |
| Oct.17          | 6,729                                               | 0                                                  | 0                                      | 6,729                                                        |
| Nov.17          | 3,553                                               | 0                                                  | 0                                      | 3,553                                                        |
| Dec.17          | 8,000                                               | 0                                                  | 0                                      | 8,000                                                        |
| <b>Sum 2017</b> | 83,198                                              | 0                                                  | 0                                      | 83,198                                                       |
| Jan. 18         | 7,551                                               | 0                                                  | 0                                      | 7,551                                                        |
| Feb. 18         | 6,463                                               | 0                                                  | 0                                      | 6,463                                                        |
| Mar.18          | 6,659                                               | 0                                                  | 0                                      | 6,659                                                        |
| Apr.18          | 5,237                                               | 0                                                  | 0                                      | 5,237                                                        |
| May.18          | 6,107                                               | 0                                                  | 0                                      | 6,107                                                        |
| Jun.18          | 5,438                                               | 0                                                  | 0                                      | 5,438                                                        |
| Jul.18          | 5,223                                               | 0                                                  | 0                                      | 5,223                                                        |
| Aug.18          | 13,455                                              | 0                                                  | 0                                      | 13,455                                                       |

| Year               | Baseline emissions or removals (tCO <sub>2</sub> e) | Project emissions or removals (tCO <sub>2</sub> e) | Leakage emissions (tCO <sub>2</sub> e) | Net GHG emission reductions or removals (tCO <sub>2</sub> e) |
|--------------------|-----------------------------------------------------|----------------------------------------------------|----------------------------------------|--------------------------------------------------------------|
| Sep.18             | 8,648                                               | 0                                                  | 0                                      | 8,648                                                        |
| Oct.18             | 8,000                                               | 0                                                  | 0                                      | 8,000                                                        |
| Nov.18             | 11,097                                              | 0                                                  | 0                                      | 11,097                                                       |
| Dec.18             | 6,617                                               | 0                                                  | 0                                      | 6,617                                                        |
| <b>Sum 2018</b>    | 90,495                                              | 0                                                  | 0                                      | 90,495                                                       |
| Jan. 19            | 8,103                                               | 0                                                  | 0                                      | 8,103                                                        |
| Feb. 19            | 8,987                                               | 0                                                  | 0                                      | 8,987                                                        |
| <b>Sum 2019</b>    | 17,090                                              | 0                                                  | 0                                      | 17,090                                                       |
| <b>TOTAL SUM**</b> | 198,388                                             | 0                                                  | 0                                      | 198,388                                                      |

\* There is an inconsistency between PMUM readings and monthly meter readings data for December 2016. Kınık WPP has a first index protocol dated 27.10.2016. However, on this date, plant could not started operation. Therefore, a second visit is conducted to prepare and sign the valid first index protocol dated 06.12.2016. Between these two dates (41 days), Kınık WPP generated electricity; however, they could not get the payment for the electricity they produced. On the other hand, they paid for the electricity they consumed and first index of the meters were calibrated accordingly. Since monthly meter readings data includes generation between 01.12.2016 and 31.12.2016, it presents electricity production as if it was more than value on the PMUM. However, PMUM data contains generation between 06.12.2016 and 31.12.2016 and thus showing less electricity production value. To conclude, due to the difference of these two indexes of meters, “electric supplied to the grid” data for December 2016 is different between PMUM and monthly meter readings. Since PMUM data is the official data which is correct and the primary data for emission reduction calculations, emission reduction amounts are correct.

\*\* All emission reduction values (including monthly values) are rounded down.