HEBEI YUXIAN SECOND PHASE 49.5MW WIND POWER PROJECT

Document Prepared by Demeter Venture Uk Limited

Project Title	**Hebei Yuxian Kongzhongcaoyuan 49.5MW Wind Farm Project**
Version	03
Report ID	/
Date of Issue	16/06/2022
Project ID	413
Monitoring Period	01/01/2017 to 30/11/2021 (1795 days)
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CONTENTS

1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Hebei Yuxian Kongzhongcaoyuan 49.5MW Wind Farm Project (hereinafter referred to as the project) is developed by Hebei Construction Investment Yuzhou Wind Energy Co., Ltd. It is located in Xiagongcun Village of Yuxian County, Zhangjiakou City, Hebei Province, P.R.China. The project installs 33 sets of wind turbine, each of which has a rated installed capacity of 1,500 kW, providing a total installed capacity of 49.5 MW. The annual output of the project is estimated to be 111,610 MWh and the electricity will be exported to the North China Power Grid (NCPG).

The scenario existing prior to the start of the implementation of the project is: The same electricity output by the proposed project activity would have otherwise been generated by the operation of NCPG connected power plants and by the addition of new generation sources. That is the same as the baseline scenario.

When the proposed project is operated, the electricity generated will displace part of the electricity from fossil fuel-fired plants connected to the NCPG, and thus greenhouse gas (GHG) generated by coal-fired power plants could be reduced. The estimated annual GHG emission reductions in the first crediting period (from 17/07/2008 to 16/07/2018) are 118,735 tCO_2e/yr, and the 93,802 tCO_2e/yr during the second crediting period (from 17/07/2018 to 16/07/2028).

The construction of the project began on 20/05/2007, and the first turbine was put into operation on 17/07/2008. And the project was put into full commercial operation on 27/09/2008.

The first crediting period is from 17/07/2008 to 16/07/2018 while the second crediting period is from 17/07/2018 to 16/07/2028. This monitoring period is from 01/01/2017 to 30/11/2021 (1795 days), in which the period from 01/01/2017 to 16/07/2018 (562 days, hereinafter referred as "P1") belongs to the first crediting period, and the period from 17/07/2018 to 30/11/2021(1233 days, hereinafter referred as "P2") belongs to the second crediting period. The emission reductions in P1 is 171,563 tCO_2, the emission reductions in P2 is 337,171 tCO_2. Hence, the emission reductions in this monitoring period is 508,734 tCO_2.

1.2 Sectoral Scope and Project Type

This category would fall within sectoral scope 1: energy industries (Renewable sources).

Project type: wind power project.

This project is not grouped project.

1.3 Project Proponent

Organization name	**Hebei Construction Investment Yuzhou Wind Energy Co., Ltd**
Contact person	Zhang Ling
Title	Manager
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1.4 Other Entities Involved in the Project

Organization name	**Demeter Venture Uk Limited**
Role in the Project	Project participant
Contact person	Teng Haipeng
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1.5 Project Start Date

17/07/2008 (operation date, which means the date that started to generate GHG emission reductions)

1.6 Project Crediting Period

As per the renewed VCS PD, the first crediting period is from 17/07/2008 to 16/07/2018 while the second crediting period is from 17/07/2018 to 16/07/2028.

This monitoring period is from 01/01/2017 to 30/11/2021 (1795 days), in which the period from 01/01/2017 to 16/07/2018 (562 days, hereinafter referred as "P1") belongs to the first crediting period, and the period from 17/07/2018 to 30/11/2021(1233 days, hereinafter referred as "P2") belongs to the second crediting period.

1.7 Project Location

The project site is located in the southwest of Yuxian County, Zhangjiakou City of Hebei Province. The site location's approximate coordinates are East Longitude of 114°30'45''～114°32'25'' and North Latitude of 39°36'32''～ 39°33'58.6'' The project site is about 30 kilometers far away from the town of Yuxian County. Figure 1 shows the location of the project.

Figure 1. The location of the project

1.8 Title and Reference of Methodology

For P1, the project applies the approved consolidated baseline and monitoring methodology ACM0002 during the first crediting period.

- Grid-connected electricity generation from renewable sources (version 6.0).

  The methodology also refers to the following tools:

- Tool for the demonstration and assessment of additionality (Version 5.0).

For P2, the project applies the approved consolidated baseline and monitoring methodology ACM0002 during the second crediting period.

- Consolidated methodology for grid-connected electricity generation from renewable sources" (version 20.0)[1].

  The methodology also refers to the following tools:

- -Tool to calculate the emission factor for an electricity system (version 07.0)
- - Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (Version 03.0)
- -Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period (version 03.0.1)

1.9 Participation under other GHG Programs

The Project has been registered as a CDM project on 23/02/2009 with registration number of 2088. The credits from 23/02/2009 to 24/10/2012 have been issued under CDM mechanism. The credits from 25/10/2012 to 22/02/2016 and 23/02/2016 to 31/12/2016 are waiting for issuance under CDM.

The credits in this monitoring period (01/01/2017 to 30/11/2021) has not been counted and will not be counted under other kind of GHG programs.

1.10 Other Forms of Credit

The Project has been registered as a CDM project on 23/02/2009 with registration number of 2088. The credits from 23/02/2009 to 24/10/2012 have been issued under CDM mechanism. The credits from 25/10/2012 to 22/02/2016 and 23/02/2016 to 31/12/2016 are waiting for issuance under CDM.

The Project has not created another form of environmental credit, and the Project will not create other environmental credit in the future.

1.11 Sustainable Development

The project makes contribution to the sustainable development as follows:

1. GHG emission reduction

The project will help reduce the greenhouse gas GHG emissions versus the high-growth, coal-dominated business-as-usual scenario in the NCPG by reducing the electricity generation from the fossil-fuel fired power plants.

Thus, the project achieved **SDG 13 Climate Action**[2].

[1] https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG

[2] https://sdgs.un.org/goals/goal13

- Reduction of fossil fuel use and provide clean energy

The Project Activity will reduce reliance on imported fossil fuels, which will contribute to increasing China's energy security, and will also improve local air quality as it reduces the emissions of SO2, and NOx associated with fossil fuel use.

Thus, the project achieved **SDG 7 Affordable and Clean Energy**[3].

3. Employment opportunities

The conducting of the project will create employment opportunities during the construction phase and operational period.

4. Economic Improvement

The construction of the wind farm will promote local economy by contributing to local government with more tax revenues through selling power generation.

Thus, the project achieved **SDG 8 Decent Work and Economic Growth**[4].

2 SAFEGUARDS

2.1 No Net Harm

The Environmental Impact Assessment of the proposed project was completed by the College of Resource and Environmental Sciences, Hebei Normal University, and approved by the Environment Protection Bureau of Hebei Province on 21th August,2006(decree number: [2006]133). Main contents of the Environmental Impact Assessment are summarized as follows: Ecological impact Construction Phase

1) Impact on Foliage

① The impact of Booster Station, Temporary Construction Field, The main Approach Road, the waste disposal area (WDA) and the road to WDA. The area of the buildings stated above will be all the shrub-grassland. The original vegetation will be uprooted for the construction. So, constructing the buildings stated above have some adverse impact on vegetation during construction phase.

② Impact of the wind turbine's zone and the cable chutes

The area of the wind turbine's zone and the cable chutes will be all the grassland. The greensward in the area under construction will be divided into pieces (30×30cm) before construction. The pieces of greensward will be replanted in the construction field and maintained by special personnel. The surface soil from permanent occupation and part of the construction field will be piled up in the construction field. The surface soil will be backfilled and then replanted the pieces of greensward after the construction. Therefore, the wind turbine's zone and the cable chutes have little impact on vegetation during construction phase.

[3] https://sdgs.un.org/goals/goal7

[4] https://sdgs.un.org/goals/goal8

③Impact of construction road

The folding-road laying system will be used as the construction road. When constructs finished, the laying device will be removed and the grassland will be recovery after a period of time. Hence, the construction road has little impact on vegetation during construction phase. In a word, there is little impact on vegetation during construction phase.

2) Impact on other animals

No big mammal has been found in the local area. There are only small mammals just like hare and mice. The small animals disturbed by the construction (like the snail, the angleworm, the ant) will migrate the similar habitat conditions nearby due to their strong ability of migration. So, the species diversity and population size in the area will not be obviously influenced by the proposed project during the construction phase. To conclude, the ecological impact of the proposed project during construction phase is insignificant.

Operation Phase

1) Impact on the Vegetation

The area occupied by the proposed wind farm will be 339,822m^2, in which there will be 26,372 m^2 for permanent occupation and 313,450 m^2 for temporary occupation. The original ecological system will be recovery from the third year after the construction period. Additionally, the project owner will plant 2 hm^2 Sea buck thorn and other shrub to make the afforestation rate over 15%. Hence, the impact of the proposed project on the vegetation during operation phase will be minimal.

2) Impact on the animal

No big mammal has been found in the local area. There are only small mammals just like hare and mice. They will migrate to the former address after the construction period. Moreover, there is no rare birds in the project site and the project site is not the thoroughfare of migratory birds. Therefore, the impact of the proposed project on the animal during operation phase will be minimal.

3) Visual Impact

The wind turbines installed in the grassland will enhance the visual value of the grassland and demonstrate the harmonious relation between human and nature. So, the proposed project has little impact on the local scene. In a word, the ecological impact of the proposed project during the operation phase will be insignificant.

Environmental Impact

Construction phase

The distance between the temporary construction field and Xiushuipen village is 50m. The shortest distance between the wind turbine and the village is 3500m. The periodic sprinkling will be done during the construction phase and the transport truck will be covered by canvas. The construction will be prohibited from 12:00 to 14:00 and night. So the dust and the noise generated by construction activities will have less impact on local residents.

The main solid waste generated from the site will be construction waste as well as the household waste from the personnel at the site. The solid waste will be carried to the landfill. The waste water is the sewage from the workers. The sewage will be sprinkled on the site ground. Because of the spot construction manner, the sewage can't be collected. The little

sewage will be absorbed into soil or vaporized and will not form the runoff. So the waste water will not damage the water environment.

Operation Phase

1) Sewage

The waster water from the proposed project during operation phase will only be sewage. The sewage processed by the biological septic tank will in compliance with the second level standards in the Table 4 of 'Integrated Wastewater discharge Standard' and will be discharged into the collecting pond. The processed sewage will be utilize to irrigate plant in the project site without discharge because it will in compliance with the standards of dry land in the Standards for irrigation water quality (GB5084-1992). Therefore, the sewage from the proposed project during the operation phase will have less impact on the environment.

2) Noise

It is predicted that the noise contribution of the wind turbines is 43db (A) with a distance of 400m to the wind turbines. The project is located in the rural area which has a lower geoenvironmental background value. So the noise will have less impact on the residents if the distance is over 400m. The closest village to the proposed wind farm is Guoshitang village and the shortest distance between them is 3500m. Hence, the proposed project will have less impact on the residents during the operation phase.

3) Solid waste

The solid waste will be mainly composed of the household garbage generated from the workers in the 110 kV booster station. The yield of the solid waste will be about 3.0t/a. The solid waste will be carried termly to the landfill nearby. Therefore, impact of solid waste on the environment is considered to be insignificant.

Conclusion

The proposed project does not have any major adverse impacts on the environment during its construction and operation phase.

Conclusion

The project does not have any major adverse impacts on the environment during its construction and operation phase. Therefore, this project does not do harm to local environment.

2.2 Local Stakeholder Consultation

Hebei Construction Investment Yuzhou Wind Energy Co., Ltd carried out on-site surveys on the local government agencies, local villagers and residents, the representative of investor and project owner in Yuxian County during June in 2007. The survey was conducted through distributing and collecting responses to a questionnaire which was designed by project owner. Questionnaire were designed to be easily filled in the following sections:

1) Project introduction

2) Respondent's basic information and education level

3) Questions on:

- Does the proposed project has positive/negative impact on your livelihoods?

- Do you agree with the construction of the proposed project?

- What is your opinion on developing wind farm projects in the local area?

- Does the proposed project has positive/negative impact on the local environment?

- Do you think that the proposed project will accelerate the developing of local economy?

4) Space for the respondents' signature and date.

In addition, a questionnaire was advertised in Yuxian County TV Station on 29/01/2008. Besides the content mentioned above, the following question was added in the advertisement.

- What other comments and suggestions do the respondents have for the company regarding the Project?

The on-site survey had 88.8% response rate (40questionnaires returned out of 45) and the survey results are shown as follows:

Survey Result of Stakeholders			
Does the proposed project have positive/negative impact on your livelihoods?	positive	negative	Do not care
	90%	0	10%
Do you agree with the construction of the proposed project?	Yes	No	Do not care
	100%	0	0
What is your opinion on developing wind farm projects in the local area?	Good	Normal	Bad
	87.5%	7.5%	5%
Does the proposed project has positive/negative impact on the local environment?	positive	negative	Do not care
	95%	0	5%
Do you think that the proposed project will accelerate the developing of local economy?	Yes	No	Do not care
	82.5%	0	17.5%

Conclusion:

The stakeholders are all supportive of this project and no negative comments have been received.

For continuous communication with local stakeholders, the project owner public its office telephone to local people and put a guest's book in the office of the company. Anyone who have comments on the project could write on the book or leave messages by phone. And after these years' operation, no negative comments were received from local people.

2.3 AFOLU-Specific Safeguards

This project is not an AFOLU project. Therefore, this section is not applicable.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

Based on the public bidding, the project owner has signed a 33×1500kW wind power equipment purchase agreement with the winner of the wind generator supplier company, i.e.Dongfang Turbine Co., Ltd., which is a domestic manufacturer. The type of wind generator is determined as FD70B. Key technical specifications of FD70B turbines are listed as the table below.

Table 1. Main technical parameters of key equipment in the Project

Parameters Name	Unit	Value
Type of Turbine		FD70B
Nominal output	kW	1500
Diameter	m	70
Hub height	m	65
Rated voltage	V	690
Nominal wind speed	m/s	13

The simplified flow diagram and the meters that will be installed within the project activity are shown in the following figure 2:

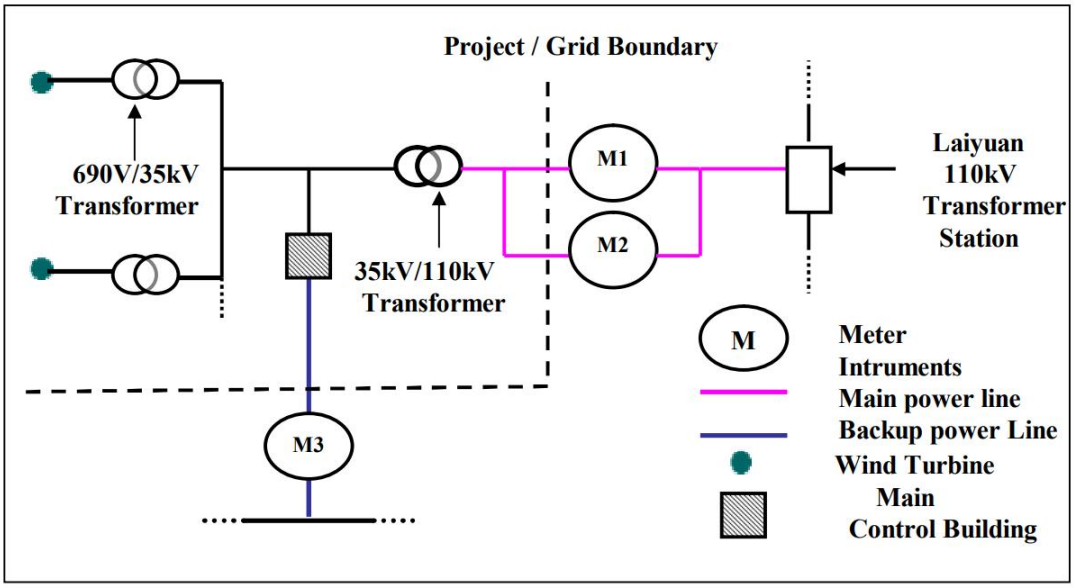

Figure 2 The simplified flow diagram of the project

The electricity generated by the project will be transmitted to an on-site transformer station that increases the voltage to 110 kV, and then be delivered to Laiyuan transformer station which connected to the Hebei Sourthern Power Grid.

The Project started construction on 20/05/2007 and the first turbine was put into operation on 17/07/2008 and the project was put into full operation on 27/09/2008.

During this monitoring period, the monitoring system of the Project was implemented in line with the monitoring plan. The wind farm operated normally. No equipment is overhauled or

replaced in this monitoring period. No emergencies which may impact the methodology application and monitoring occurred during the monitoring period.

3.2 Deviations

2.3.1 Methodology Deviations

There is no methodology deviation in this monitoring period.

2.3.2 Project Description Deviations

The project was registered under VCS version 3. In the Verification Report of initial VCS monitoring period, it was mentioned that the project started operation since 17/07/2008. As per UNFCCC website, it was confirmed that the project activity was registered as CDM project activity on 23/02/2009. Therefore, the VCS crediting period was determined as 17/07/2008 to 23/02/2009. As per VCS scheme under which the project was registered, the project crediting period is allowable for 10 years and could be renewed twice. Therefore, the total VCS crediting period was determined from 17/07/2008-16/07/2029 (considering 3*7 years CDM crediting period), of which the first crediting period is from 17/07/2008 to 16/07/2018, while the second crediting period is from 17/07/2018-16/07/2028.

3.3 Grouped Projects

Not applicable because this is not a grouped project.

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

For monitoring period belongs to the first crediting period:

Data / Parameter	EF_y
Data unit	tCO_2e/MWh
Description	Baseline emission factor: the combined emission factor of the project grid system in year y. EF_y was not directly available at validation but calculated based on other parameters in the PDD available at validation, therefore in the MR, only EF_y is included and the rest of the parameters are either used to calculate EF_{CM} or not used in the MR.
Source of data	Registered VCS PD
Value applied	1.0755
Justification of choice of	$EF_{grid,CM,y}$ was not directly available at validation but calculated

data or description of measurement methods and procedures applied	based on other parameters in the VCS PD available at validation, therefore in the MR, only $EF_{grid,CM,y}$ is included and the rest of the parameters used to calculate $EF_{grid,CM,y}$ are used in the MR.
Purpose of Data	Calculation of baseline emissions
Comments	The emission factor of the Project was ex-ante determined and is fixed during the first crediting period. All data and parameters had been determined at registration.

For monitoring period belongs to the second crediting period:

Data / Parameter	**$EF_{grid,OM,y}$**
Data unit	tCO_2/MWh
Description	Simple operating margin CO_2 emission factor in year y
Source of data	"2017 Baseline Emission Factors for Regional Power Grids in China" issued by China DNA[5]
Value applied	0.9680
Justification of choice of data or description of measurement methods and procedures applied	Official public data from NDRC
Purpose of Data	Calculation of baseline emissions
Comments	/

Data / Parameter	**$EF_{grid,BM,y}$**
Data unit	tCO_2/MWh
Description	Simple operating margin CO_2 emission factor in year y
Source of data	"2017 Baseline Emission Factors for Regional Power Grids in China" issued by China DNA[6]
Value applied	0.4578
Justification of choice of data or description of measurement methods and procedures applied	Official public data from NDRC
Purpose of Data	Calculation of baseline emissions
Comments	/

[5] http://www.mee.gov.cn/ywgz/ydqhbh/wsqtkz/201812/P020181220579925103092.pdf

[6] http://www.mee.gov.cn/ywgz/ydqhbh/wsqtkz/201812/P020181220579925103092.pdf

Data / Parameter	w_{OM}
Data unit	%
Description	Weighting of operating margin emissions factor
Source of data	"Tool to calculate the emission factor for an electricity system" (Version 07.0)
Value applied	75
Justification of choice of data or description of measurement methods and procedures applied	Based on the requirements of "Tool to calculate the emission factor for an electricity system" (Version 07.0)
Purpose of Data	Calculation of baseline emissions
Comments	/

Data / Parameter	w_{BM}
Data unit	%
Description	Weighting of operating margin emissions factor
Source of data	"Tool to calculate the emission factor for an electricity system" (Version 07.0)
Value applied	25
Justification of choice of data or description of measurement methods and procedures applied	Based on the requirements of "Tool to calculate the emission factor for an electricity system" (Version 07.0)
Purpose of Data	Calculation of baseline emissions
Comments	/

4.2 Data and Parameters Monitored

Data / Parameter	$EG_{facility,y}$
Data unit	MWh/yr
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Measured by electricity meter
Description of measurement methods and procedures to be applied	This value is calculated as the difference of exported electricity and imported electricity. $EG_{facility,y} = EG_{s,y} - (EG_{c,y}+EG_{backupline,y})$ $EG_{s,y}$: Electricity supplied to the grid by the project. $EG_{c,y}$: Electricity consumed from the grid by the project through the

	main power line (the 1st crediting period); Electricity consumed from the grid by the project (the 2nd crediting period). $EG_{backupline,y}$: Electricity consumed from the grid by the project. through the backup line (the 1st crediting period); Electricity consumed by the project through the backup line (the 2nd crediting period). It is continuously measured by the bi-directional meters. M1 is the main meter, M2 is the backup meter, which are both managed, operated and maintained by the project owner. The accuracy of the meters is 0.2S. In case blackout in the main power line, the project will consume the electricity through the backup power line. Power delivered to the project through the backup power line ($EG_{backupline,y}$) is metered by instruments at M3. The cut-off time of recording of all meters is at 24:00 on the end of each month.
Frequency of monitoring/recording	Continuously measurement and monthly recording
Value monitored	560702.162
Monitoring equipment	The information of the electricity meter is in the following table.
QA/QC procedures to be applied	The electricity meters are calibrated by qualified entity according to national standards. The electricity records are crosschecked with electricity receipts. The main information of the meters are shown in following table.
Purpose of the data	Calculation of baseline emissions
Calculation method	$EG_{facility,y}=EG_{s,y}-(EG_{c,y}+EG_{backupline,y})$
Comments	/

Data / Parameter	**$EG_{s,y}$**
Data unit	MWh
Description	Electricity supplied to the grid by the project
Source of data	Measured by electricity meter
Description of measurement methods and procedures to be applied	It is continuously measured by the bi-directional meters. M1 and M2 are installed at the high voltage side of 35kV/110kV transformer. M1 is the main meter, M2 is the backup meter, which are both managed, operated and maintained by the project owner. The accuracy of the meters is 0.2S.

<table>
<tr><td></td><td>The cut-off time of recording of all meters is at 24:00 on the end of each month.</td></tr>
<tr><td>Frequency of monitoring/recording</td><td>Continuously measured and monthly recorded</td></tr>
<tr><td>Value monitored</td><td>561316.332</td></tr>
<tr><td>Monitoring equipment</td><td>The information of the electricity meter is in the following table.</td></tr>
<tr><td>QA/QC procedures to be applied</td><td>The electricity meters are calibrated by qualified entity according to national standards. The electricity records are crosschecked with electricity receipts. The main information is shown below:
<table>
<tr><th>Name</th><th>Type</th><th>Serial No.</th><th>Accuracy</th><th>Calibration Date and valid date</th></tr>
<tr><td rowspan="5">M1</td><td rowspan="5">ZMD402</td><td rowspan="5">94827518</td><td rowspan="5">0.2S</td><td>22/12/2016-21/12/2017</td></tr>
<tr><td>22/12/2017-21/12/2018</td></tr>
<tr><td>22/12/2018-21/12/2019</td></tr>
<tr><td>22/12/2019-21/12/2020</td></tr>
<tr><td>22/12/2020-21/12/2021</td></tr>
<tr><td rowspan="5">M2</td><td rowspan="5">ZMD402</td><td rowspan="5">95411208</td><td rowspan="5">0.2S</td><td>22/12/2016-21/12/2017</td></tr>
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<tr><td>22/12/2018-21/12/2019</td></tr>
<tr><td>22/12/2019-21/12/2020</td></tr>
<tr><td>22/12/2020-21/12/2021</td></tr>
</table></td></tr>
<tr><td>Purpose of the data</td><td>Calculation of baseline emissions</td></tr>
<tr><td>Calculation method</td><td>/</td></tr>
<tr><td>Comments</td><td>/</td></tr>
</table>

Data / Parameter	$EG_{c,y}$
Data unit	MWh
Description	Electricity consumed from the grid by the project through the main power line (the 1st crediting period); Electricity consumed from the grid by the project (the 2nd crediting period)
Source of data	Measured by electricity meter
Description of measurement methods and procedures to be applied	It is continuously measured by the bi-directional meters. M1 and M2 are installed at the high voltage side of 35kV/110kV transformer. M1 is the main meter, M2 is the backup meter, which are both managed, operated and maintained by the project owner. The accuracy of the meters is 0.2S. The cut-off time of recording of all meters is at 24:00 on the end of each month.
Frequency of monitoring/recording	Continuously measured and monthly recorded

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<tr><td>Value monitored</td><td>614.170</td></tr>
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<table>
<tr><th>Name</th><th>Type</th><th>Serial No.</th><th>Accuracy</th><th>Calibration Date and valid date</th></tr>
<tr><td rowspan="5">M1</td><td rowspan="5">ZMD402</td><td rowspan="5">94827518</td><td rowspan="5">0.2S</td><td>22/12/2016-21/12/2017</td></tr>
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<tr><td>22/12/2019-21/12/2020</td></tr>
<tr><td>22/12/2020-21/12/2021</td></tr>
<tr><td rowspan="5">M2</td><td rowspan="5">ZMD402</td><td rowspan="5">95411208</td><td rowspan="5">0.2S</td><td>22/12/2016-21/12/2017</td></tr>
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<tr><td>22/12/2019-21/12/2020</td></tr>
<tr><td>22/12/2020-21/12/2021</td></tr>
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<tr><td>Purpose of the data</td><td>Calculation of baseline emissions</td></tr>
<tr><td>Calculation method</td><td>/</td></tr>
<tr><td>Comments</td><td>/</td></tr>
</table>

<table>
<tr><td>Data / Parameter</td><td>$EG_{backupline,y}$</td></tr>
<tr><td>Data unit</td><td>MWh</td></tr>
<tr><td>Description</td><td>Electricity consumed from the grid by the project. through the backup line (the 1st crediting period);

Electricity consumed by the project through the backup line (the 2nd crediting period).</td></tr>
<tr><td>Source of data</td><td>Measured by electricity meter</td></tr>
<tr><td>Description of measurement methods and procedures to be applied</td><td>M3 is installed at the 10kV backup line. In case blackout in the main power line, the project will consume the electricity through the backup power line. Power delivered to the project through the backup power line ($EG_{backupline,y}$) is metered by instruments at M3.

The cut-off time of recording of all meters is at 24:00 on the end of each month.</td></tr>
<tr><td>Frequency of monitoring/recording</td><td>Continuously measured and monthly recorded</td></tr>
<tr><td>Value monitored</td><td>0</td></tr>
<tr><td>Monitoring equipment</td><td>The information of the electricity meter is in the following table.</td></tr>
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<table>
<tr><td>QA/QC procedures to be applied</td><td>The electricity meters are calibrated by qualified entity according to national standards. The electricity records are crosschecked with electricity receipts. The main information is shown below:
<table><tr><th>Name</th><th>Type</th><th>Serial No.</th><th>Accuracy</th><th>Calibration Date and valid date</th></tr><tr><td rowspan="6">M3</td><td rowspan="6">DSSD331</td><td rowspan="6">20070130030114</td><td rowspan="6">0.5S</td><td>11/04/2016-10/04/2017</td></tr><tr><td>11/04/2017-10/04/2018</td></tr><tr><td>11/04/2018-10/04/2019</td></tr><tr><td>11/04/2019-10/04/2020</td></tr><tr><td>11/04/2020-10/04/2021</td></tr><tr><td>11/04/2021-10/04/2022</td></tr></table></td></tr>
<tr><td>Purpose of the data</td><td>Calculation of baseline emissions</td></tr>
<tr><td>Calculation method</td><td>/</td></tr>
<tr><td>Comments</td><td>/</td></tr>
</table>

4.3 Monitoring Plan

1. Monitoring data

The following parameters were measured directly by the onsite meters while the net electricity ($EG_{facility,y}$) supplied to the grid by the project will be calculated from the following parameters.

$EG_{facility,y}=EG_{s,y}-(EG_{c,y}+EG_{backupline,y})$

$EG_{s,y}$: Electricity supplied to the grid by the project by main meter M1 and backup meter M2.
$EG_{c,y}$: electricity consumed by the project through the main power line by main meter M1 and backup meter M2.
$EG_{backupline,y}$: electricity imported from the grid through the backup Line by meter M3.

2. Organization Chart

This monitoring plan will be implemented by, Hebei Construction Investment Yuzhou Wind Energy Co., Ltd, the project owner, and by consultants appointed by the project owner.

The monitoring activity involves 8 employments which include 1 project manager. The project manager is responsible for the implementation and monitoring of the monitoring activity. There are 3 departments organized for data report, quality control and training. There is 1 manager responsible for data report and quality control department by 1 of each. There are also 4 staffs work in these two departments by 2 of each. The manager takes charge of the employment administration, as well as the operation implementation and monitoring; staffs carry on the concrete assignment based on the guide of their manager. The training department has 1 manager who is responsible for the entire training process of the project. The monitoring system flowchart of this project is shown in figure 3.

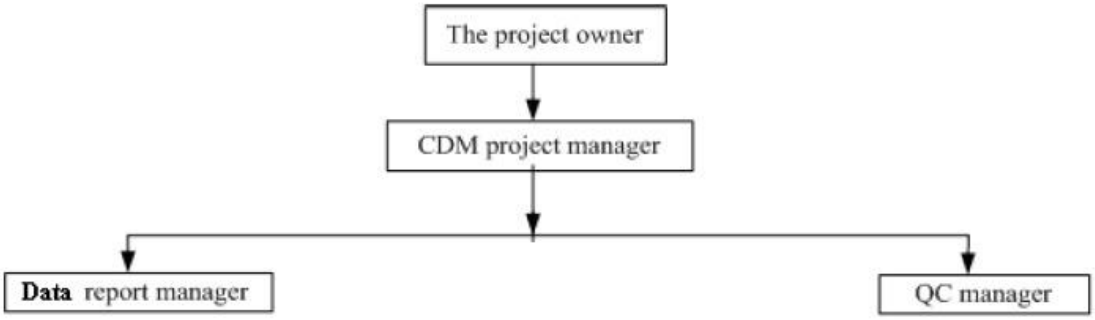

Figure 3. Monitoring structure

3. Metering System

The electricity generated by the project are transmitted to an on-site transformer station that increases the voltage to 110 kV, then be delivered to Laiyuan transformer station which connected to the Hebei Southern Power Grid. The simplified electrical grid connection diagram is shown in the following figure 4.

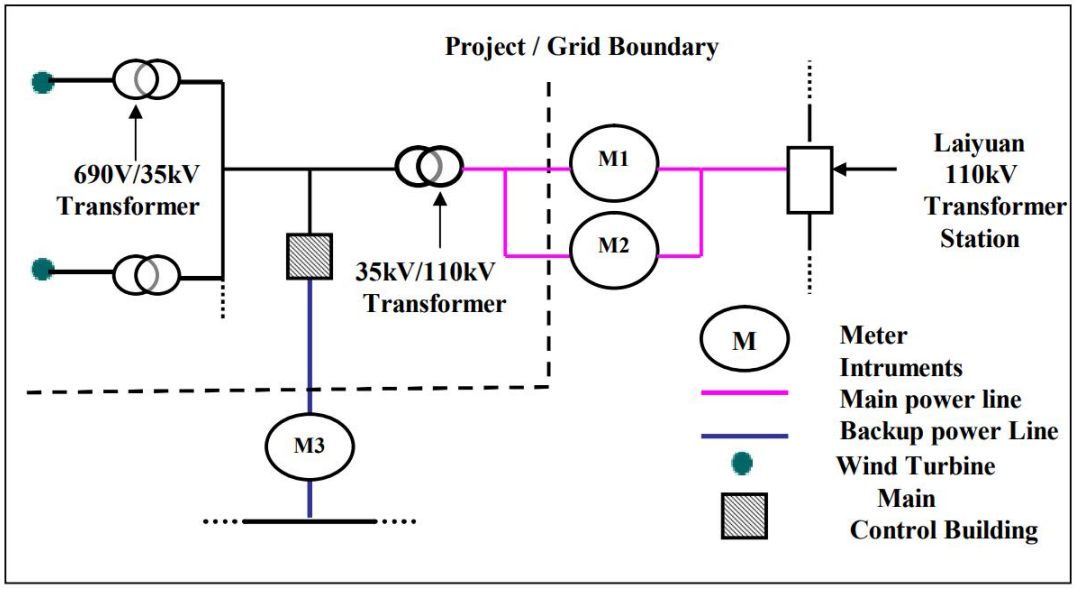

Figure 4. Simplified electrical grid connection diagram

The power line supplying electric power to the grid can also deliver power from the grid to the wind farm in case of emergencies and when the wind farm does not produce enough power for auxiliary power use. The metering equipment runs in two directions and will record two readings, i.e. electricity supplied to the grid ($EG_{s,y}$) and electricity consumed from the grid ($EG_{c,y}$).

The metering system indicated by the meter instruments at M1 in Figure 4 is the main meter, the metering system indicated by the meter instruments at M2 in Figure 4 is the backup meter, which are both managed, operated and maintained by the project owner. The main meter and the backup one are as like as two peas.

The grid company will monitor the main meter M1. The invoice, electricity receipts and accounting vouchers for receipt of payment for power supplied to the grid will serve as a cross-check. The project owner will read and record the main (M1) and backup (M2) instruments monthly.

In case blackout in the main power line, the project will consume the electricity through the backup power line. Power delivered to the project through the backup power line ($EG_{backupline,y}$) is metered by instruments at M3 in figure 4 which are operated by the grid company but can also be read by the project owner. The project owner records the readings in electronic and manual form. The project owner receives monthly billing receipts from the grid company which serve as a cross-check of the accuracy of the record of the readings of meter M3.

Net electricity supplied to the grid by the project is calculated on a monthly basis as:

$$EG_{facility,y}=EG_{s,y}-(EG_{c,y}+EG_{backupline,y})$$

With:

$EG_{s,y}$: Electricity supplied to the grid by the project by main meter M1 and backup meter M2.
$EG_{c,y}$: electricity consumed by the project through the main power line by main meter M1 and backup meter M2.
$EG_{backupline,y}$: electricity imported from the grid through the backup Line by meter M3.

4. Quality Assurance and Quality Control Procedure

The metering equipments are properly calibrated and checked annually according to national standard to ensure its accuracy. The metering equipment shall have sufficient accuracy so that any error resulting from such equipment shall not exceed 0.5% of full-scale rating.

The main calibration is implemented by Hebei Northern Power Grid and relative recording files are supplied to the project owner. These recording files are preserved by the project owner and provide to DOE in Verification

The main meters must be fulfilled calibration in 10 days by both parties in such conditions:

- The error resulting from such equipments exceed allowable scale.

- The operation of one or more elements does not accord with the request of rules.

There is a maintenance schedule programmed at the start of the operation and is refreshed according to the plants performance requirement.

In case metering equipment is damaged and no reliable readings can be recorded the project owner will estimate net supply by the project activity according to the following procedure:

1) In case the main meter is damaged only:

By reading the backup meter.

2) In case both the main meter and the backup one are damaged:

The project owner and the grid company will jointly calculate a conservative estimate of power supplied to the grid. A statement will be prepared indicating the background to the damage to metering equipment.

The assumptions used to estimate net supply to the grid for the days for which no record could be recorded the estimation of power supplied to the grid.

The statement will be signed by both a representative of the project entity as well as a representative of the grid company.

The project entity will furthermore document all efforts taken to restore normal monitoring procedures.

5. Information collection and management

All physical documents including the readings in electronic and manual form of the Meters, electricity receipts will be stored by the project owner and kept one copy in order to facilitate the verification of DOE.

The monthly records of power supplied to the grid and received from the grid, relevant accounting documents and electricity receipts and the results of calibration shall be collected in a central place by the project owner. All data collected as part of monitoring will be kept at least for 2 years after the end of the last crediting period by the project owner.

6. Procedure of emergency handling

In case of emergencies, the project entity will not claim emission reductions due to the project activity for the duration of the emergency. The project entity will follow the following procedure for declaring the emergency period to be over:

The project entity will ensure that all requirements for monitoring of emission reductions have been re-established.

The monitoring officer and the head of operations of the wind farm will both sign a statement declaring the emergency situation to have ended and normal operations to have resumed.

7. Monitoring Report

The Project owner will annually prepare a monitoring report which will include among others a summary of metering values of power supplied to and received from the grid, copies of sales/billing receipts, a report on calibration and a calculation of emission reductions.

All the data shall be kept until two years after the end of the first crediting period.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

According to ACM0002, the baseline emission during this verification period is calculated as

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

Where:

BE_y is the baseline emissions (tCO_2e)

$EG_{facility,y}$ is the net electricity supplied to the grid by the project in year y (MWh);

$EF_{grid,\ CM,y}$ is the CO_2 emission factor of the NCPG, which is fixed in the first crediting period (tCO_2e/MWh)

On the basis of these weights for the first crediting period, the combined margin emission factor is calculated, and are fixed ex-ante for the duration of the **first crediting period** as 1.0755 tCO_2/MWh.On the basis of these weights for the second crediting period, the combined margin emission factor is calculated, and are fixed ex-ante for the duration of the **second crediting period** as follows:

	CO_2 emission factor (tCO_2/MWh)	Weighting
Simple operating Margin Emissions Factor ($EF_{grid,OM\ simple,y}$)	0.9680	0.75
Build Margin Emissions Factor ($EF_{grid,\ BM,y}$)	0.4578	0.25
Baseline Emissions Factor ($EF_{grid,CM,y}$)	0.84045	

The yearly electricity volume and baseline emissions are listed in following table 2.

Table 2. Baseline emissions

Period	$EG_{s,y}$ (MWh)	$EG_{c,y}$ (MWh)	$EG_{backupline,y}$ (MWh)[7]	EG_y / $EG_{facility,y}$ (MWh)	$EF_{grid,CM,y}$ (tCO_2/yr)	Baseline Emissions (tCO_2e)
01/01/2017-31/12/2017 (P1)	100554.436	133.400	0.00	100421.036	1.0755	108,002
01/01/2018-16/07/2018 (P1) [8]	59181.036	81.700	0.00	59099.336	1.0755	63,561
17/07/2018-31/12/2018 (P2)	54259.120	50.720	0.00	54208.400	0.84045	45,559
01/01/2019-31/12/2019	113553.170	132.200	0.00	113420.970	0.84045	95,324

[7] There is no electricity imported from the grid through the 10kV line during 01/01/2017 to 30/11/2021.

[8] According to Electric Quantity Confirmation issued by the Grid Company, Electricity supplied to the grid and Electricity imported from the grid is 59181.036 MWh and 81.700MWh during 01/01/2018 to 16/07/2018, and Electricity supplied to the grid and Electricity imported from the grid is 54259.120 MWh and 50.720MWh during 17/07/2018 to 31/12/2018.

(P2)						
01/01/2020-31/12/2020 (P2)	119928.500	111.830	0.00	119816.670	0.84045	100,699
01/01/2021-30/11/2021 (P2)	113840.070	104.320	0.00	113735.750	0.84045	95,589
Total in this monitoring period	561316.332	614.170	0.000	560702.162	/	508,734

The monthly data are shown in appendix 1.

5.2 Project Emissions

According to the ACM0002, the emission of wind power project activity is zero, i.e. PEy=0.

5.3 Leakage

According to ACM0002, the leakage of wind power project is not needed to be considered.

5.4 Net GHG Emission Reductions and Removals

In according with the registered PD, ERy=BEy – PEy

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
01/01/2017-31/12/2017 (P1)	108,002	0	0	108,002
01/01/2018-16/07/2018 (P1)	63,561	0	0	63,561
17/07/2018-31/12/2018 (P2)	45,559	0	0	45,559
01/01/2019-31/12/2019 (P2)	95,324	0	0	95,324
01/01/2020-31/12/2020 (P2)	100,699	0	0	100,699
01/01/2021-30/11/2021 (P2)	95,589			95,589
Total	**508,734**	**0**	**0**	**508,734**

Crediting Period	Baseline emissions or	Project emissions or	Leakage emissions	Net GHG emission

	removals (tCO_2e)	removals (tCO_2e)	(tCO_2e)	reductions or removals (tCO_2e)
01/01/2017-31/12/2017	108,002	0	0	108,002
01/01/2018-31/12/2018	109,120	0	0	109,120
01/01/2019-31/12/2019	95,324	0	0	95,324
01/01/2020-31/12/2020	100,699	0	0	100,699
01/01/2021-30/11/2021	95,589	0	0	95,589
Total	**508,734**	0	0	**508,734**

The estimated annual GHG emission reductions in the first crediting period are 118,735 tCO_2e/yr, and the 93, 802 tCO_2e/yr during the second crediting period. This monitoring period is from 01/01/2017 to 30/11/2021 (1795 days, 562 days in the first crediting period and 1233 days in the second crediting period), covers the first crediting period and the second crediting period.

The emission reductions claimed are 508,734 tCO_2e in this monitoring period (i.e. 1795 days). Compared with expected emission reductions 499,690 tCO_2e (calculated as 118,735/365*562+93, 802/365*1233) in the approved CDM PDD and renewed VCS PD, the reported emission reductions in this monitoring period are 1.81% larger than the expected, which is considered to be in the reasonable variation range.

This will not impact the additionally of the project activity as the sensitivity analysis of the project activity shows that the IRR will not exceeds benchmark until an 12.2% increase in Grid-connected electricity. The main reason for the electricity generation increase is that the wind flow in this monitoring period are larger than the designing value in the FSR, the management skills of the plant improves gradually and the wind power accommodation capacity of the grid is increasing.

APPENDIX: < MONTHLY AND YEARLY ELECTRICTY SUPPLY>

period	$EG_{s,y}$ (MWh)			$EG_{c,y}$ (MWh)			$EG_{backupline,y}$ (MWh)	EG_y / $EG_{facility,y}$ (MWh)
	Monthly Meter reading records (MWh)	electricity receipts (MWh)	Conservative value (MWh)	Monthly Meter reading records (MWh)	electricity receipts (MWh)	Conservative value (MWh)	value for ER calculation (MWh)	
	A	D	G=Min(E,F)	H	K	N=Max(L,M)	Q	R=G-N-Q
01/01/2017-31/01/2017	10529.160	10529.160	10529.160	10.880	10.880	10.880	0.000	10518.280
01/02/2017-28/02/2017	10790.310	10790.310	10790.310	13.760	13.760	13.760	0.000	10776.550
01/03/2017-31/03/2017	9722.880	9722.880	9722.880	9.250	9.250	9.250	0.000	9713.630
01/04/2017-30/04/2017	8755.320	8755.320	8755.320	16.310	16.310	16.310	0.000	8739.010
01/05/2017-31/05/2017	7387.160	7387.160	7387.160	10.050	10.050	10.050	0.000	7377.110
01/06/2017-30/06/2017	6340.400	6340.400	6340.400	11.320	11.320	11.320	0.000	6329.080
01/07/2017-31/07/2017	6530.170	6530.170	6530.170	10.920	10.920	10.920	0.000	6519.250
01/08/2017-31/08/2017	6021.546	6021.546	6021.546	9.620	9.620	9.620	0.000	6011.926
01/09/2017-30/09/2017	7510.520	7510.520	7510.520	10.930	10.930	10.930	0.000	7499.590
01/10/2017-31/10/2017	8401.930	8401.930	8401.930	6.650	6.650	6.650	0.000	8395.280
01/11/2017-30/11/2017	8880.250	8880.250	8880.250	8.020	8.020	8.020	0.000	8872.230

01/12/2017-31/12/2017	9684.790	9684.790	9684.790	15.690	15.690	15.690	0.000	9669.100
Total in 2017 (P1)	**100554.436**	**100554.436**	**100554.436**	**133.400**	**133.400**	**133.400**	**0.000**	**100421.036**
01/01/2018-31/01/2018	10320.640	10320.640	10320.640	12.880	12.880	12.880	0.000	10307.760
01/02/2018-28/02/2018	9988.310	9988.310	9988.310	10.760	10.760	10.760	0.000	9977.550
01/03/2018-31/03/2018	8790.250	8790.250	8790.250	13.180	13.180	13.180	0.000	8777.070
01/04/2018-30/04/2018	9628.190	9628.190	9628.190	8.190	8.190	8.190	0.000	9620.000
01/05/2018-31/05/2018	8510.280	8510.280	8510.280	12.730	12.730	12.730	0.000	8497.550
01/06/2018-30/06/2018	8320.190	8320.190	8320.190	18.040	18.040	18.040	0.000	8302.150
01/07/2018-16/07/2018	3623.176	3623.176	3623.176	5.920	5.920	5.920	0.000	3617.256
Total in 2018 (P1)	**59181.036**	**59181.036**	**59181.036**	**81.700**	**81.700**	**81.700**	**0.000**	**59099.336**
17/07/2018-30/07/2018	4560.230	4560.230	4560.230	4.190	4.190	4.190	0.000	4556.040
01/08/2018-31/08/2018	7223.660	7223.660	7223.660	11.280	11.280	11.280	0.000	7212.380
01/09/2018-30/09/2018	9038.520	9038.520	9038.520	9.400	9.400	9.400	0.000	9029.120
01/10/2018-31/10/2018	9892.140	9892.140	9892.140	4.810	4.810	4.810	0.000	9887.330
01/11/2018-30/11/2018	13924.060	13924.060	13924.060	7.380	7.380	7.380	0.000	13916.680
01/12/2018-31/12/2018	9620.510	9620.510	9620.510	13.660	13.660	13.660	0.000	9606.850
Total in 2018 (P2)	**54259.120**	**54259.120**	**54259.120**	**50.720**	**50.720**	**50.720**	**0.000**	**54208.400**
01/01/2019-31/01/2019	12209.660	12209.660	12209.660	9.280	9.280	9.280	0.000	12200.380
01/02/2019-28/02/2019	11487.290	11487.290	11487.290	10.220	10.220	10.220	0.000	11477.070

01/03/2019-31/03/2019	10922.740	10922.740	10922.740	12.650	12.650	12.650	0.000	10910.090
01/04/2019-30/04/2019	10923.110	10923.110	10923.110	13.870	13.870	13.870	0.000	10909.240
01/05/2019-31/05/2019	7046.270	7046.270	7046.270	10.390	10.390	10.390	0.000	7035.880
01/06/2019-30/06/2019	6693.470	6693.470	6693.470	6.280	6.280	6.280	0.000	6687.190
01/07/2019-31/07/2019	8025.160	8025.160	8025.160	9.920	9.920	9.920	0.000	8015.240
01/08/2019-31/08/2019	9902.170	9902.170	9902.170	14.220	14.220	14.220	0.000	9887.950
01/09/2019-30/09/2019	8120.350	8120.350	8120.350	18.040	18.040	18.040	0.000	8102.310
01/10/2019-31/10/2019	7092.760	7092.760	7092.760	8.170	8.170	8.170	0.000	7084.590
01/11/2019-30/11/2019	10097.550	10097.550	10097.550	9.230	9.230	9.230	0.000	10088.320
01/12/2019-31/12/2019	11032.640	11032.640	11032.640	9.930	9.930	9.930	0.000	11022.710
Total in 2019 (P2)	**113553.170**	**113553.170**	**113553.170**	**132.200**	**132.200**	**132.200**	**0.000**	**113420.970**
01/01/2020-31/01/2020	11902.870	11902.870	11902.870	10.880	10.880	10.880	0.000	11891.990
01/02/2020-28/02/2020	11509.250	11509.250	11509.250	9.050	9.050	9.050	0.000	11500.200
01/03/2020-31/03/2020	11823.470	11823.470	11823.470	6.320	6.320	6.320	0.000	11817.150
01/04/2020-30/04/2020	9272.880	9272.880	9272.880	6.680	6.680	6.680	0.000	9266.200
01/05/2020-31/05/2020	8034.790	8034.790	8034.790	12.330	12.330	12.330	0.000	8022.460
01/06/2020-30/06/2020	8327.190	8327.190	8327.190	11.320	11.320	11.320	0.000	8315.870
01/07/2020-31/07/2020	7802.660	7802.660	7802.660	10.810	10.810	10.810	0.000	7791.850

01/08/2020-31/08/2020	7092.160	7092.160	7092.160	10.220	10.220	10.220	0.000	7081.940
01/09/2020-30/09/2020	9903.150	9903.150	9903.150	9.400	9.400	9.400	0.000	9893.750
01/10/2020-31/10/2020	9320.740	9320.740	9320.740	8.020	8.020	8.020	0.000	9312.720
01/11/2020-30/11/2020	12034.460	12034.460	12034.460	8.630	8.630	8.630	0.000	12025.830
01/12/2020-31/12/2020	12904.880	12904.880	12904.880	8.170	8.170	8.170	0.000	12896.710
Total in 2020 (P2)	**119928.500**	**119928.500**	**119928.500**	**111.830**	**111.830**	**111.830**	**0.000**	**119816.670**
01/01/2021-31/01/2021	11083.110	11083.110	11083.110	10.220	10.220	10.220	0.000	11072.890
01/02/2021-28/02/2021	12021.290	12021.290	12021.290	13.040	13.040	13.040	0.000	12008.250
01/03/2021-31/03/2021	9870.360	9870.360	9870.360	8.630	8.630	8.630	0.000	9861.730
01/04/2021-30/04/2021	9908.230	9908.230	9908.230	7.920	7.920	7.920	0.000	9900.310
01/05/2021-31/05/2021	9265.480	9265.480	9265.480	10.440	10.440	10.440	0.000	9255.040
01/06/2021-30/06/2021	8703.550	8703.550	8703.550	8.530	8.530	8.530	0.000	8695.020
01/07/2021-31/07/2021	8824.840	8824.840	8824.840	10.570	10.570	10.570	0.000	8814.270
01/08/2021-31/08/2021	9013.470	9013.470	9013.470	7.690	7.690	7.690	0.000	9005.780
01/09/2021-30/09/2021	12321.700	12321.700	12321.700	10.820	10.820	10.820	0.000	12310.880
01/10/2021-31/10/2021	11804.580	11804.580	11804.580	8.250	8.250	8.250	0.000	11796.330
01/11/2021-30/11/2021	11023.460	11023.460	11023.460	8.210	8.210	8.210	0.000	11015.250
Total in 2021 (P2)	**113840.070**	**113840.070**	**113840.070**	**104.320**	**104.320**	**104.320**	**0.000**	**113735.750**
Total	**561316.332**	**561316.332**	**561316.332**	**614.170**	**614.170**	**614.170**	**0.000**	**560702.162**