



**Verified Carbon  
Standard**

# HUIZHOU LANDFILL GAS POWER GENERATION PHASE III AND IV PROJECT

Document Prepared by Goldchina Consultancy International Co., Ltd.

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# 1 PROJECT DETAILS

## 1.1 Summary Description of the Implementation Status of the Project

Huizhou Landfill Gas Power Generation Phase III and IV Project (hereafter referred to as the project) is invested and owned by Shenzhen PhasCon Technologies Co., Ltd. (hereafter referred to as the project owner). The project captures the landfill gas that would have been released to the atmosphere in the absence of the project and generates electricity with the landfill gas (LFG). The electricity is supplied to the China Southern Power Grid (CSPG) to replace the electricity generated from coal-fired power plants of CSPG.

Huizhou landfill site is located in Gongmaliandong, Huicheng District, Huizhou City, Guangdong Province, China. The climate condition of Huizhou is that the average temperature is 22°C, mean annual precipitation is 1770 mm and potential evapotranspiration is 1269 mm. The landfill site started operation in 2000 with an operational lifespan of 25 years. Now the landfill handles an average of 2,000 tonnes Municipal Solid Waste (MSW) per day which is mainly from the Huizhou City.

The purpose of the project is to use LFG, which consists mainly of methane, for electricity generation. It includes LFG collection system, LFG pre-treatment system, a flare system, and electricity generation system. The total installed capacity of the project will be 9.42MW with two phases. Phase III is 3.5MW consisting of 5 sets of 700kW generator and Phase IV is 5.92MW consisting of 16 sets of 370kW generator. The monitoring system was shared by both phases and cannot be separated. LFG collected is used for electricity generation with internal combustion generators to generate about 361,544 MWh supplying to CSPG during the first 7 years crediting period. The expected average annual emission reductions are 273,134 tCO<sub>2e</sub> and the total emission reductions are 1,911,935 tCO<sub>2e</sub> during the first 7-year crediting period.

The project started construction on 16/07/2020. And Phase III was operated since 14/12/2020, and Phase IV was operated on 01/03/2021. For this monitoring period, the net electricity delivered to CSPG were 115,303MWh, and the total GHG emission reduction was 610,764 tCO<sub>2e</sub>.

Audit Type	Period	Program	VVB Name	Number of years
Validation	19/04/2023	VCS	APPLUS+ LGAI TECHNOLOGICAL CENTER S.A.	7
Verification	14/12/2020 - 31/12/2022	VCS	APPLUS+ LGAI TECHNOLOGICAL CENTER S.A.	2 years and 18 days

Total	14/12/2020 - 31/12/2022	VCS	APPLUS+ LGAI TECHNOLOGICAL CENTER S.A.	2 years and 18 days
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## 1.2 Sectoral Scope and Project Type

Sectoral scope 1: energy industries and sectoral scope 13: Waste handling and disposal.

The project is not a grouped project.

## 1.3 Project Proponent

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<b>Contact person</b>	Tony You
<b>Title</b>	Vice General Manager
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## 1.4 Other Entities Involved in the Project

<b>Organization name</b>	Goldchina Consultancy International Co., Ltd.
<b>Role in the Project</b>	Consultancy
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## 1.5 Project Start Date

14/12/2020 (commercial operation started date)

## 1.6 Project Crediting Period

7 years \*3 renewable crediting period is adopted by the project activity.

The first 7 years VCS project crediting period started on 14/12/2020 and will be expired on 13/12/2027 (the start and end dates included).

## 1.7 Project Location

The project is located in Gongmaliandong, Huicheng district, Huizhou city, Guangdong Province, China. The project's geographical coordinates are longitude 114°20'52.62" E and latitude 23°06'32.87" N. The physical locations are shown in Figures below.

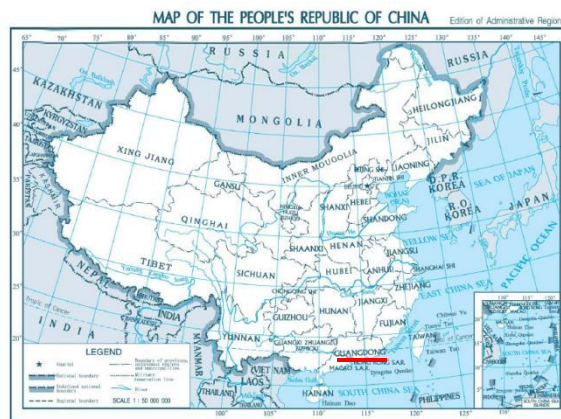


Figure1.1. Location of Guangdong Province in China



Figure 1.2. Huizhou City in Guangdong



Figure 1.3. Location of Project Activity at Huizhou



Figure 1.4. Location of Different Phases of Project Activity at Huizhou

## 1.8 Title and Reference of Methodology

Title: ACM0001 Flaring or use of landfill gas --- Version 19.0

Reference: <https://cdm.unfccc.int/methodologies/PAMethodologies/approved>

The methodology also refers to the latest approved versions of the following tools:

“Combined tool to identify the baseline scenario and demonstrate additionality” (Version 07.0);

“Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (Version 03.0);

“Emissions from solid waste disposal sites” (Version 08.0);

“Tool to calculate the emission factor for an electricity system” (Version 07.0);

“Tool to determine the mass flow of a greenhouse gas in a gaseous stream”(Version 03.0);

“Positive lists of technologies” (Version 04.0).

For more detail information about the tools, please reference to the following link:

<https://cdm.unfccc.int/methodologies/PAMethodologies/tools>.

## 1.9 Participation under other GHG Programs

The project has not been registered/or is seeking registration under other GHG Program(s).

The project has not been rejected by other GHG programs.

### 1.10 Other Forms of Credit and Supply Chain (Scope 3) Emissions

The project does not reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading.

The project has not sought or received another form of GHG-related environmental credit or renewable energy certificate. The project is not part of any emission trading program. The net GHG emission reductions from the project will not be used for compliance with emission trading programs or to meet binding limits on GHG emissions. The project activity has not participated in any other GHG programs.

China has a national emissions trading scheme only cover the high-emission industries, such as thermal power generation, petrochemical, chemical, building materials, iron and steel, non-ferrous, paper, aviation and other key emission industries that emitted at least 26,000 tons of CO<sub>2</sub>e/year. And the project activity is not included the mandatory emission control scheme and there is no emission cap enforced for the project owner according to the enforced company list in public information. Hence, it is confirmed that the emission reductions will not be double counted. The project will not seek to generate or has received any form of environmental credits, and the GHG emission removals generated by the project will not be used for compliance under such programs or mechanisms.

The project does not involve specific goods procurement supply chain emissions, so supply Chain (Scope 3) Emissions section is not applicable.

### 1.11 Sustainable Development Contributions

#### Landfill safety

If methane concentration in the air is in the range of 5-15% in volume within the confined space of a building, the risk of explosion is very high. With the project, a modern gas extraction system has been installed to ensure the effective collection of LFG, and also minimize the risk of landfill explosions.

#### Odour reduction

Odour from landfill negatively impacts on residents around the landfill. Implementation of the project will reduce odour through LFG collection and will thus mitigate the impact of landfill odour on people's daily lives.

#### Energy potential

The project makes use of LFG to generate electricity, which will supplement the energy supply of Huizhou city.

#### Provide employment

The project was designed and technically supported by experts. Temporary job opportunities were created during the construction period and 20 permanent jobs during the operation time.

As a whole, the project will contribute to the sustainable development, not only by mitigating global warming, but also increasing the availability of electricity from renewable sources. It will also minimize the explosion risk at the landfill site and will increase job availability through the management, operation and maintenance of the LFG capture system and the power units.

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	7.2	MWh of renewable energy generated	Implemented activities to increase	During this monitoring period, 115,303 MWh of renewable electricity was delivered to CSPG.	From the operation start date of the project to the end of this monitoring period, 115,303 MWh of renewable electricity was delivered to CSPG.
2)	8.5	Number of jobs created	Implemented activities to increase	The project creates 20 long-term employment opportunities.	The project creates 20 long-term employment opportunities.
3)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	The project has prevented the release of 610,764 tonnes of CO <sub>2e</sub> into the atmosphere during this monitoring period	Prevented the release of 610,764 tonnes CO <sub>2e</sub> into the atmosphere during this monitoring period.

## 2 SAFEGUARDS

### 2.1 No Net Harm

For the phase III project, the Environmental Impact Assessment (EIA) Report for the project was compiled by Guangzhou Fanyu Environmental Science Research Institute Ltd. Combined with the EIA report, the influences of the project on the environment are summarized. The EIA Report for the Project has been approved by the Environmental Protection Bureau of Huicheng District on 08/06/2019, with approval No. "Huicheng Huanjian [2019] No.75". For the phase IV project, the Environmental Impact Assessment (EIA) Report for the project was compiled by Chongqing Darun Environmental Science Research Institute Ltd, which is a grade A environment impact assessment entity certified by the Ministry of Ecology and Environment, China. Combined with the EIA report, the influences of the project on the environment are summarized. The EIA Report for the Project has been approved by the Environmental Protection Bureau of Huicheng District on 31/12/2020, with approval No. "Huicheng Huanjian [2020] No.164". According to the approval comments of the EIA Report by the Environmental Protection Bureau of Huicheng district, Huizhou city, the environmental impacts likely to be caused by the project are considered insignificant and conforming to the laws and regulations. Therefore, there is no net harm.

### 2.2 Local Stakeholder Consultation

#### **Local stakeholder consultation before the Project construction**

On 06/06/2019, the project owner carried out a survey on the local residents and comments received from the survey are summarized as follows. The survey was conducted through distributing and collecting responses to a questionnaire.

The following questions are from the questionnaires:

1. What do you know about the LFG power station?
2. What is your attitude to the construction of this LFG power station?
3. Do you think the implementation of the project will cause positive effect on living of local residents?
4. Do you think the implementation of the project will cause negative effect?
5. As a whole, what is your opinion on this LFG power station to the living of local residents?

The project is away from the residence, so, only 10 families live around the project and the landfill site. Each family was distributed a questionnaire. In total 10 out of 10 questionnaires were returned with a 100% response rate. The survey shows the stakeholders believe that the

project will have positive impacts on the local ecology and employment. All stakeholders expressed their support to the project and were pleased with the development of the project, and no negative comments have been received. The project would actually facilitate the development of the local economy and increase the income of local residents.

During this monitoring period, there was no negative comment received by the project owner.

### 2.3 AFOLU-Specific Safeguards

The project is not an AFOLU project.

## 3 IMPLEMENTATION STATUS

### 3.1 Implementation Status of the Project Activity

The project is implemented in accordance with the description of the PD.

The total installed capacity of the project is 9.42MW with two phases. Phase III is 3.5MW consisting of 5 sets of 700kW generator, which was operated since 14/12/2020. Phase IV is 5.92MW consisting of 16 sets of 370kW generator, which was operated since 01/03/2021. Phase III was approved in 12/04/2020, and phase IV was approved on 04/08/2020. Phase III and IV shared an LFG collection system and monitoring system. And the LFG collection system was not connected with phase I and Phase II project<sup>1</sup>. As it has been showed in the PD Figure 1.6, the CDM project 3201 and the VCS project have separate LFG collection system and separate power generators, and they are operated independently of each other.

The timeline of the project is shown below:

Project	The phase III	The phase IV
Start date of construction	16/07/2020	
Start date of commissioning	14/12/2020	01/03/2021
Start date of the crediting period	14/12/2020	01/03/2021

<sup>1</sup> Phase I (2MW) and Phase II (1MW) is the CDM project called Huizhou Landfill Gas Recovery and Utilization Project (CDM ref no. 3201). Phase I is at Gongmaliandong of Huicheng district with 12km apart of Huizhou city center, with project's geographical coordinates 114°20'52.62" E and latitude 23°06'32.8"N; Phase II located at Longweikeng village of Danshui street of Huiyang district with 45km apart of Huizhou city center, with project's geographical coordinates 114°27'52.28"E and latitude 22°49'39.38"N. The torch of phase I project was put into since 08/02/2010, 10 years before the operation of the project. The pipeline of the project has no connection with the Phase I project, so the torch belongs to phase I project only.

The project uses LFG for electricity generation. It includes an LFG collection system, an LFG pre-treatment system, a flare system, an electricity generation plant, and grid connection system. The electricity generated is exported to CSPG to replace equivalent amount of electricity from those fossil fuel power plants connected to CSPG.

**LFG collection system**

The landfill gas collecting system is a gas pipeline network, consisting of gas collecting wells, gas collecting pipelines, and gas collection blower. LFG is extracted by gas collection blower and transported by pipeline from gas collection wells.

**LFG pre-treatment system**

Prior to electricity generation, LFG must be pre-treated to remove its impurities and moisture, etc., to prevent corrosion in the generators. According to the EIA, the pre-treatment system consists of six types of equipment:

- 1) Impurity Filter to remove the impurity in LFG primarily;
- 2) Condenser to remove the water in LFG;
- 3) Gas-liquid Separator to remove the liquid in LFG further;
- 4) Fan Blower to boost the LFG;
- 5) Heat Exchanger to cool down the gas;
- 6) Advanced Impurity Filter to remove the impurity thoroughly.

The LFG pre-treatment procedure and the main equipment are shown as the following chart:

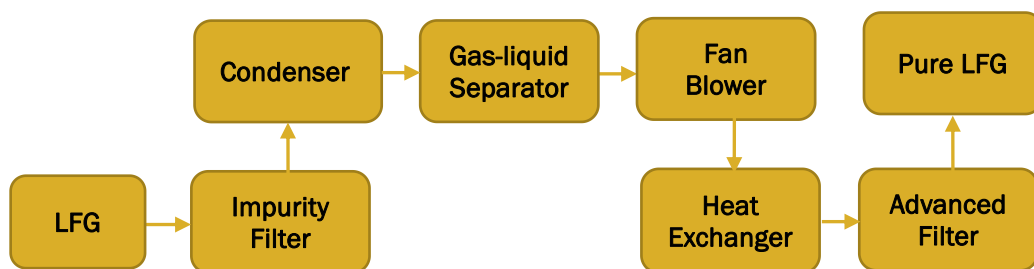


Figure 3.1 The flow chart of the LFG pre-treatment system

**A flare system**

The landfill gas would be sent to be burned in the flare device when the plant totally stopped. An enclosed flare is installed in the project. Meanwhile, the flare will only be involved when the electricity generation system is not in operation, hence, the project developer determined that

VERs from flare will not be claimed, even if any methane is destroyed by flare during the crediting period.

#### Power generation and grid connection system

A power plant is installed in order to generate electricity with the LFG captured. It adopts internal combustion engine generating sets. The number of engines to be installed will depend on the amount of LFG collected, but project owner foresaw to install a total capacity of 9.42MW. The electricity generated using LFG, except small portion for on-site usage, is exported to CSPG.

This is a well-known and high reliable technology for biogas utilization. Furthermore, internal combustion engine generating sets have modular design and are available in many different sizes permitting the installation of power plant step by step as the LFG flow increases. High performance and reliability are guaranteed for the equipment.

The detailed information about the technology of the project is shown in the table below.

Table 3.1 Key technical parameters of internal combustion engine generating set of phase III

Type	Gas-fired Engine and generator
Manufacture	Shengli Oil Field Shengli Power Machinery Group Co., Ltd
Model	700GFZ-RZ-TEM2-4
Units	5
Rated Voltage	400V
Rated capacity	700kW
Lifetime	20 years

Table 3.2 Key technical parameters of internal combustion engine generating set of phase IV

Type	Gas-fired Engine and generator
Manufacture	Dongying Huiying Industry and Trade Co., Ltd
Model	370GF1-1RZ
Units	16
Rated Voltage	400V
Rated capacity	370kW
Lifetime	20 years

In this monitoring period from 14/12/2020 to 31/12/2022, the project operated smoothly. All equipment worked well and no error or accident occurred. There were no events or situation that may impact the applicability of the methodology. The net electricity exported to the CSPG is 115,303 MWh, and the total GHG emission reduction was 610,764 tCO<sub>2e</sub>.

## 3.2 Deviations

### 3.2.1 Methodology Deviations

There is no methodology deviation applied during this monitoring period.

### 3.2.2 Project Description Deviations

There is no project description deviation applied during this monitoring period.

## 3.3 Grouped Projects

The project is not a group project.

# 4 DATA AND PARAMETERS

## 4.1 Data and Parameters Available at Validation

The parameter of methane generation from the landfill in the absence of the project ( $BE_{CH4,SWDS,y}$ ) is used for ex ante estimation of relevant parameter  $F_{CH4,PJ,y}$ . For  $F_{CH4,PJ,y}$ , there is an ex post determination method. Thus, in this monitoring period,  $BE_{CH4,SWDS,y}$  and the relevant basic parameters ( $\varphi_y$ ,  $OX$ ,  $F$ ,  $DOC_f$ ,  $MCF_f$ ,  $K_j$ ,  $W_{j,x}$ ,  $DOC_j$ ,  $f_y$ ,  $\eta_{PJ}$ ) for calculation of  $BE_{CH4,SWDS,y}$  are not included here.

Data / Parameter	$OX_{top\_layer}$
Data unit	-
Description	Fraction of methane that would be oxidized in the top layer of the SWDS in the baseline
Source of data	"Emission from the solid waste disposal sites" (version 8.0)
Value applied	0.1
Justification of choice of data or description of measurement methods and procedures applied	-

<b>Purpose of Data</b>	Calculation of baseline emissions
<b>Comments</b>	-

<b>Data / Parameter</b>	$GWP_{CH_4}$
<b>Data unit</b>	tCO <sub>2</sub> e/tCH <sub>4</sub>
<b>Description</b>	Global warming potential of CH <sub>4</sub>
<b>Source of data</b>	IPCC Fifth Assessment Report
<b>Value applied</b>	Default value of 28. Shall be updated according to any future COP/CMP decisions
<b>Justification of choice of data or description of measurement methods and procedures applied</b>	As per VCS Standard v4.3, for GHG emission reductions occurring on or after 01/01/2021, all ex-ante estimates and ex-post calculations shall be converted to CO <sub>2</sub> e using GWP values from the IPCC Fifth Assessment Report (AR5); The Project applies value from AR5 for both ex ante estimates and ex post calculations and for GHG emission reductions occurring both before and after 01/01/2021. According to AR5, the 100-year GWP of methane is 28 tCO <sub>2</sub> e/CH <sub>4</sub> .
<b>Purpose of Data</b>	Calculation of baseline emissions
<b>Comments</b>	-

<b>Data / Parameter</b>	$\rho_{CH_4}$
<b>Data unit</b>	t/m <sup>3</sup>
<b>Description</b>	Density of methane gas at Normal Conditions
<b>Source of data</b>	-
<b>Value applied</b>	0.0007168 (Normal Conditions: 0°C and 101.325kPa)
<b>Justification of choice of data or description of measurement methods and procedures applied</b>	-

<b>Purpose of Data</b>	Calculation of baseline emissions
<b>Comments</b>	-

<b>Data / Parameter</b>	$EF_{grid,OM,y}$
<b>Data unit</b>	tCO <sub>2</sub> /MWh
<b>Description</b>	Operation margin emission factor of CSPG
<b>Source of data</b>	2019 China baseline emission factor of regional power grid.
<b>Value applied</b>	0.8042
<b>Justification of choice of data or description of measurement methods and procedures applied</b>	The value is published by Ministry of Ecology and Environment of the People's Republic of China on 29/12/2020, which is the latest available source in China.
<b>Purpose of Data</b>	Calculation of baseline emissions Calculation of project emissions
<b>Comments</b>	-

<b>Data / Parameter</b>	$EF_{grid,BM,y}$
<b>Data unit</b>	tCO <sub>2</sub> /MWh
<b>Description</b>	Build margin emission factor of CSPG
<b>Source of data</b>	2019 China baseline emission factor of regional power grid.
<b>Value applied</b>	0.2135
<b>Justification of choice of data or description of measurement methods and procedures applied</b>	The value is published by Ministry of Ecology and Environment of the People's Republic of China on 29/12/2020, which is the latest available source in China.
<b>Purpose of Data</b>	Calculation of baseline emissions Calculation of project emissions
<b>Comments</b>	-

<b>Data / Parameter</b>	TDL <sub>j,y</sub> and TDL <sub>k,y</sub>
<b>Data unit</b>	%
<b>Description</b>	Average technical transmission and distribution losses for providing electricity to source j, k in year y
<b>Source of data</b>	Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (version 03.0).
<b>Value applied</b>	Use as default values of 20% for project consumption sources; Use as default values of 3% for baseline electricity consumption sources.i.e.: TDL <sub>j,y</sub> = 20%, TDL <sub>k,y</sub> = 3%
<b>Justification of choice of data or description of measurement methods and procedures applied</b>	The Project is applicable to Scenario A defined in TOOL05 (version 03.0), which requires the default value of 20% for project emissions, and 3% for baseline emissions.
<b>Purpose of Data</b>	Calculation of baseline emissions Calculation of project emissions
<b>Comments</b>	The parameter will be updated according to the latest version of TOOL05.

## 4.2 Data and Parameters Monitored

<b>Data / Parameter</b>	F <sub>CH4,BL,R,y</sub>
<b>Data unit</b>	tCH <sub>4</sub> /y
<b>Description</b>	Amount of methane in the LFG which is flared due to a requirement in year y
<b>Source of data</b>	Information of the host country's regulatory requirements relating to LFG, contractual requirements, or requirements to address safety and odour concerns.
<b>Description of measurement methods and procedures to be applied</b>	-

<b>Frequency of monitoring/recording</b>	Annually	
<b>Value applied</b>	Monitoring period	$F_{CH_4, BL, R, y}$ (tCH <sub>4</sub> )
	14/12/2020-31/12/2020	49.43
	01/01/2021-31/12/2021	2,537.82
	01/01/2022-31/12/2022	2,872.42
	Total	5,459.67
<b>Monitoring equipment</b>	-	
<b>QA/QC procedures to be applied</b>	-	
<b>Purpose of data</b>	Calculation of baseline emissions	
<b>Calculation method</b>	-	
<b>Comments</b>	Applicable to Case 4 of section 5.4.1.3 of ACM0001 “Flaring or use of landfill gas” (version 19.0)	

<b>Data / Parameter</b>	$P_{reg, y}$
<b>Data unit</b>	Dimensionless
<b>Description</b>	Fraction of LFG that is required to be flared due to a requirement in year y
<b>Source of data</b>	Information of the host country’s regulatory requirements relating to LFG, contractual requirements, or requirements to address safety and odour concerns.
<b>Description of measurement methods and procedures to be applied</b>	-
<b>Frequency of monitoring/recording</b>	Annually
<b>Value applied</b>	20%

<b>Monitoring equipment</b>	-
<b>QA/QC procedures to be applied</b>	-
<b>Purpose of data</b>	Calculation of baseline emissions
<b>Calculation method</b>	-
<b>Comments</b>	Applicable to Case 4 of section 5.4.1.3 of ACM0001 “Flaring or use of landfill gas” (version 19.0)

<b>Data / Parameter</b>	EG <sub>PJ,y</sub>	
<b>Data unit</b>	MWh	
<b>Description</b>	Amount of net electricity generated using LFG by the project activity supplied to the grid in year y	
<b>Source of data</b>	Project participant	
<b>Description of measurement methods and procedures to be applied</b>	Measured continuously by electricity meter (bi-directional) installed at the project site. All data will be monitored and archived electronically. Double check by receipt of electricity sales.	
<b>Frequency of monitoring/recording</b>	The recording frequency will be hourly measured and record, and monthly aggregated.	
<b>Value applied</b>	Monitoring period	Electricity generated by landfill gas (MWh)
	14/12/2020-31/12/2020	1,033.0
	01/01/2021-31/01/2021	2,006.6
	01/02/2021-28/02/2021	2,115.0
	01/03/2021-31/03/2021	4,156.7
	01/04/2021-30/04/2021	4,239.1
	01/05/2021-31/05/2021	4,914.6
	01/06/2021-30/06/2021	5,459.1
	01/07/2021-31/07/2021	5,606.6

	01/08/2021-31/08/2021	5,702.3													
	01/09/2021-30/09/2021	5,502.7													
	01/10/2021-31/10/2021	4,831.5													
	01/11/2021-30/11/2021	4,365.9													
	01/12/2021-31/12/2021	4,196.6													
	01/01/2022-31/01/2022	4,803.1													
	01/02/2022-28/02/2022	4,831.5													
	01/03/2022-31/03/2022	4,956.6													
	01/04/2022-30/04/2022	5,156.4													
	01/05/2022-31/05/2022	5,317.9													
	01/06/2022-30/06/2022	5,462.0													
	01/07/2022-31/07/2022	5,305.1													
	01/08/2022-31/08/2022	5,216.9													
	01/09/2022-30/09/2022	5,132.6													
	01/10/2022-31/10/2022	5,031.7													
	01/11/2022-30/11/2022	4,963.6													
	01/12/2022-31/12/2022	4,996.2													
	<b>Total</b>	<b>115,303.3</b>													
<b>Monitoring equipment</b>	Electricity meter E1 shown in the monitoring system as below.														
	<table border="1"> <thead> <tr> <th>Model</th> <th>Serial number</th> <th>Accuracy class</th> <th>Date of calibration</th> <th>Validity</th> </tr> </thead> <tbody> <tr> <td rowspan="3">DSSD718</td> <td rowspan="3">03001SG00 000311700 001117</td> <td rowspan="3">0.5S</td> <td>10/12/2020</td> <td>09/12/2021</td> </tr> <tr> <td>09/12/2021</td> <td>08/12/2022</td> </tr> <tr> <td>08/12/2022</td> <td>07/12/2023</td> </tr> </tbody> </table>	Model	Serial number	Accuracy class	Date of calibration	Validity	DSSD718	03001SG00 000311700 001117	0.5S	10/12/2020	09/12/2021	09/12/2021	08/12/2022	08/12/2022	07/12/2023
Model	Serial number	Accuracy class	Date of calibration	Validity											
DSSD718	03001SG00 000311700 001117	0.5S	10/12/2020	09/12/2021											
			09/12/2021	08/12/2022											
			08/12/2022	07/12/2023											

<b>QA/QC procedures to be applied</b>	The calibration should be done once a year by a qualified third party. Data from the main electricity meter are recorded remotely and digitally by the grid company with the cut-off time of 24:00 o'clock on the last day of every month. The grid company incorporates the downloaded electric data into the monthly Electricity Transaction Notes (ETN) and sends to the project owner for confirmation on the electricity amount. The project owner confirms the electricity amount on the ETNs with the monthly reading records and keeps the ETNs. When the emergency occurred to the main meter, the measurement result of back-up meter will be used. The meters are calibrated and maintained by the grid company. The calibration of meters, including the frequency of calibration, is done in accordance with national standards or requirements set by the meter supplier or requirements set by the grid operators. The accuracy class of the meters is in accordance with the stipulation of the meter supplier and/or as per the requirements set by the grid operators or national requirements.
<b>Purpose of data</b>	Calculation of baseline emissions
<b>Calculation method</b>	-
<b>Comments</b>	Phase III and Phase IV shares the monitoring system, so, the measured data can not be separated respectively.

<b>Data / Parameter</b>	$EG_{EC,y}$
<b>Data unit</b>	MWh
<b>Description</b>	Amount of electricity consumed by the project activity in year y from CSPG
<b>Source of data</b>	Project participant
<b>Description of measurement methods and procedures to be applied</b>	Measured continuously by electricity meter(bi-directional) installed at the project site. All data will be monitored and archived electronically. Double check by receipt of electricity sales.
<b>Frequency of monitoring/recording</b>	The recording frequency will be hourly measured and record, and monthly aggregated.
<b>Value applied</b>	0 MWh during this monitoring period

Monitoring period	Electricity consumed by the project activity (MWh)
14/12/2020-31/12/2020	0
01/01/2021-31/01/2021	0
01/02/2021-28/02/2021	0
01/03/2021-31/03/2021	0
01/04/2021-30/04/2021	0
01/05/2021-31/05/2021	0
01/06/2021-30/06/2021	0
01/07/2021-31/07/2021	0
01/08/2021-31/08/2021	0
01/09/2021-30/09/2021	0
01/10/2021-31/10/2021	0
01/11/2021-30/11/2021	0
01/12/2021-31/12/2021	0
01/01/2022-31/01/2022	0
01/02/2022-28/02/2022	0
01/03/2022-31/03/2022	0
01/04/2022-30/04/2022	0
01/05/2022-31/05/2022	0
01/06/2022-30/06/2022	0
01/07/2022-31/07/2022	0
01/08/2022-31/08/2022	0

	01/09/2022-30/09/2022	0																
	01/10/2022-31/10/2022	0																
	01/11/2022-30/11/2022	0																
	01/12/2022-31/12/2022	0																
	Total	0																
<b>Monitoring equipment</b>	Electricity meter E2 shown in the monitoring system as below.																	
	<table border="1"> <thead> <tr> <th>Model</th> <th>Serial number</th> <th>Accuracy class</th> <th>Date of calibration</th> <th>Validity</th> </tr> </thead> <tbody> <tr> <td rowspan="3">DSSD718</td> <td>03001SG00</td> <td rowspan="3">0.5S</td> <td>10/12/2020</td> <td>09/12/2021</td> </tr> <tr> <td>000311700</td> <td>09/12/2021</td> <td>08/12/2022</td> </tr> <tr> <td>001118</td> <td>08/12/2022</td> <td>07/12/2023</td> </tr> </tbody> </table>	Model	Serial number	Accuracy class	Date of calibration	Validity	DSSD718	03001SG00	0.5S	10/12/2020	09/12/2021	000311700	09/12/2021	08/12/2022	001118	08/12/2022	07/12/2023	
Model	Serial number	Accuracy class	Date of calibration	Validity														
DSSD718	03001SG00	0.5S	10/12/2020	09/12/2021														
	000311700		09/12/2021	08/12/2022														
	001118		08/12/2022	07/12/2023														
<b>QA/QC procedures to be applied</b>	The calibration should be done once a year by a qualified third party.																	
<b>Purpose of data</b>	Calculation of baseline emissions																	
<b>Calculation method</b>	-																	
<b>Comments</b>	Since there are 21 generators, no electricity are consumed by the project activity from CSPG .																	

<b>Data / Parameter</b>	$V_{t,db}$
<b>Data unit</b>	m <sup>3</sup> dry gas/h
<b>Description</b>	Volumetric flow of the gaseous stream in time interval t on a dry basis at normal conditions
<b>Source of data</b>	Monitored by project participant
<b>Description of measurement methods and procedures to be applied</b>	Volume flow measurement always refer to the actual pressure and temperature.
<b>Frequency of</b>	Measured continuously by a flow meter F (average hourly value)

<b>monitoring/recording</b>	should be used in the calculations of baseline emission reductions). Data to be aggregated monthly.														
<b>Value applied</b>	4,205.60 (hourly average for this monitoring period at normal conditions)														
<b>Monitoring equipment</b>	Flow meter <table border="1" data-bbox="618 472 1364 724"> <thead> <tr> <th>Model</th> <th>Serial number</th> <th>Accuracy class</th> <th>Date of calibration</th> <th>Validity</th> </tr> </thead> <tbody> <tr> <td rowspan="3">FFM61s3 50</td> <td rowspan="3">F61-1706- 0098</td> <td rowspan="3">0.5</td> <td>10/12/2020</td> <td>09/12/2021</td> </tr> <tr> <td>09/12/2021</td> <td>08/12/2022</td> </tr> <tr> <td>08/12/2022</td> <td>07/12/2023</td> </tr> </tbody> </table>	Model	Serial number	Accuracy class	Date of calibration	Validity	FFM61s3 50	F61-1706- 0098	0.5	10/12/2020	09/12/2021	09/12/2021	08/12/2022	08/12/2022	07/12/2023
Model	Serial number	Accuracy class	Date of calibration	Validity											
FFM61s3 50	F61-1706- 0098	0.5	10/12/2020	09/12/2021											
			09/12/2021	08/12/2022											
			08/12/2022	07/12/2023											
<b>QA/QC procedures to be applied</b>	Flow meter should be subject to a regular maintenance and testing regime to ensure accuracy according to manufacturer's specifications.														
<b>Purpose of data</b>	Calculation of project emissions														
<b>Calculation method</b>	-														
<b>Comments</b>	Phase III and Phase IV shares the monitoring system, so, the measured data can not be separated respectively.														

<b>Data / Parameter</b>	$V_{i,t,db}$
<b>Data unit</b>	m <sup>3</sup> gas CH <sub>4</sub> /m <sup>3</sup> dry gas
<b>Description</b>	Volumetric fraction of greenhouse gas I in a time interval t on dry basis
<b>Source of data</b>	Monitored by project participant
<b>Description of measurement methods and procedures to be applied</b>	Continuous gas analyzer operating in operating in dry-basis. Volumetric flow measurement should always refer to the actual pressure and temperature.
<b>Frequency of monitoring/recording</b>	Continuous if not specified in the underlying methodology
<b>Value applied</b>	50.44% (hourly average for this monitoring period)

<b>Monitoring equipment</b>	Gas analyzer				
	Model	Serial number	Accuracy class	Date of calibration	Validity
	GTR 196	60977/2	2%	10/12/2020	09/12/2021
				09/12/2021	08/12/2022
08/12/2022				07/12/2023	
<b>QA/QC procedures to be applied</b>	Gas analyzer should be subject to a regular maintenance and testing regime to ensure accuracy				
<b>Purpose of data</b>	Calculation of baseline emissions				
<b>Calculation method</b>	Hourly average for this monitoring period				
<b>Comments</b>	-				

<b>Data / Parameter</b>	Management of SWDS
<b>Data unit</b>	-
<b>Description</b>	Management of SWDS
<b>Source of data</b>	Use different sources of data: (a) Original design of the landfill; (b) Technical specifications for the management of the SWDS; (c) Local or national regulations
<b>Description of measurement methods and procedures to be applied</b>	There is no change in the management of the SWDS after the implementation of the project activity.
<b>Frequency of monitoring/recording</b>	Annually
<b>Value applied</b>	-
<b>Monitoring equipment</b>	-
<b>QA/QC procedures to be applied</b>	Management of SWDS is under the control of the local government.
<b>Purpose of data</b>	-
<b>Calculation method</b>	-

<b>Comments</b>	Since the implementation of the project activity, no changes have taken place in the management of the landfill.
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<b>Data / Parameter</b>	Op <sub>j,h</sub>					
<b>Data unit</b>	-					
<b>Description</b>	Operation of the equipment that consumes the LFG					
<b>Source of data</b>	Project participant					
<b>Description of measurement methods and procedures to be applied</b>	The captured LFG is consumed by gas generators. Operation of the gas generators is automatically monitored and recorded in the daily records.					
<b>Frequency of monitoring/recording</b>	Hourly					
<b>Value applied</b>	Phase III Generator		Phase IV Generator			
	No.	Time (hour)	No.	Time (hour)	No.	Time (hour)
	1	14,524	6	12,956	14	12,140
	2	13,899	7	12,170	15	11,943
	3	13,769	8	12,824	16	12,302
	4	14,565	9	11,316	17	12,118
	5	14,734	10	12,343	18	11,703
			11	12,501	19	11,595
			12	12,475	20	12,427
			13	12,020	21	11,505

<b>Monitoring equipment</b>	Flow meter				
	Model	Serial number	Accuracy class	Date of calibration	Validity
	FFM61s3 50	F61-1706- 0098	0.5	10/12/2020	09/12/2021
				09/12/2021	08/12/2022
08/12/2022				07/12/2023	
<b>QA/QC procedures to be applied</b>	Flow meter should be subject to a regular maintenance and testing regime to ensure accuracy				
<b>Purpose of data</b>	Calculation of baseline emissions				
<b>Calculation method</b>	-				
<b>Comments</b>	Phase III and Phase IV shares the monitoring system, so, the measured data can not be separated respectively. For the project, operation of the gas generators is automatically monitored and recorded in the daily records, and aggregated monthly.				

<b>Data / Parameter</b>	CAPEX and OPEX
<b>Data unit</b>	CNY
<b>Description</b>	Total investment to implement the project and total cost to operate the project
<b>Source of data</b>	Engineering, procurement and construction contracts; and maintenance contracts
<b>Description of measurement methods and procedures to be applied</b>	-
<b>Frequency of monitoring/recording</b>	At the first issuance request after each phase of the project is fully implemented
<b>Value applied</b>	CAPEX: Phase III 12,601,101, Phase IV 17,904,515 Total : 30,505,616  OPEX: Phase III 3,782, 563, Phase IV 4,019,648 Total: 8,802,211

<b>Monitoring equipment</b>	-
<b>QA/QC procedures to be applied</b>	Audited by professional, independent financial auditors. The Designated Operational Entity (DOE) should only verify that the data provided corresponds to the data from independent financial auditors
<b>Purpose of data</b>	The monitoring of this parameter is only required for projects applying the simplified procedures to identify the baseline scenario and demonstrate additionality
<b>Calculation method</b>	-
<b>Comments</b>	<p>The information provided for CAPEX indicates the investment made:</p> <ul style="list-style-type: none"> <li>(i) In the collection system;</li> <li>(ii) In the power plant and connection to the grid.</li> </ul> <p>The information supplied for OPEX indicates the costs for:</p> <ul style="list-style-type: none"> <li>(i) Staff and maintenance involved in the operation of the collection system; and</li> <li>(ii) Staff and maintenance involved in the operation of the collection and power generation system.</li> </ul> <p>The monitoring of this parameter is only required for projects applying the simplified procedures to identify the baseline scenario and demonstrate additionality.</p>

<b>Data / Parameter</b>	Tariff of electricity exported
<b>Data unit</b>	CNY
<b>Description</b>	Tariff of the electricity exported
<b>Source of data</b>	Power purchase agreement
<b>Description of measurement methods and procedures to be applied</b>	-
<b>Frequency of monitoring/recording</b>	At the first issuance request after each phase of the project is fully implemented
<b>Value applied</b>	0.689
<b>Monitoring equipment</b>	-
<b>QA/QC procedures to be</b>	Audited by professional, independent financial auditors. The Designated Operational Entity (DOE) should only verify that the

applied	data provided corresponds to the data from independent financial auditors.
Purpose of data	Identify the baseline scenario and demonstrate additionality
Calculation method	-
Comments	This parameter is sourced from Power purchase agreement of the project.

### 4.3 Monitoring Plan

The monitoring plan presented in this MR assures that real, measurable, long term GHG emission reductions can be monitored, recorded and reported. It is a crucial procedure to identify the final VCUs of the project. This monitoring plan will be implemented by the project owner during the project operation. A Monitoring Manual will be provided to each member of the monitoring team with a specific explanation to make sure they fully understand all the monitoring process and issues concerned. The monitoring activities will be arranged before each verification and the detailed plan for the certain monitoring activities and the draft monitoring results will be reviewed by the experts who come from Goldchina Consultancy International Co., Ltd., to make sure the monitoring activity is implemented in line with monitoring plan. If there are non-conformances founded, expert group will ask the monitoring team to take necessary compensation measures (redo some of the monitoring activities or calculation) until all the non-conformances been corrected. If the registered monitoring plan is unable to be implemented, or the monitoring would permanently deviate from the applied methodologies, the applied standardized baselines, or the other applied methodological regulatory documents, the project participants shall describe the nature and extent of the non-conforming monitoring in a revised monitoring plan and submitted to Verra to request a change of the monitoring plan. The details of the monitoring plan are specified as follows:

#### 1. The requirement of monitoring plan

According to the “Monitoring Methodology ACM0001(Version 19.0)”, the project participants will monitor the emission reductions (ERs) by methods, indicators, and frequency to ensure project ERs are measurable and real. The monitoring methodology is based on direct measurement of the amount of LFG captured and destroyed by the project and electricity generating units.

#### 2. Responsibilities of operational and management structure

The project participant will implement this monitoring plan. The plan could be revised according to suggestions from Designated Operational Entity (DOE) and the practical circumstances, in order to keep it consistent, transparent and conservative during the monitoring process.

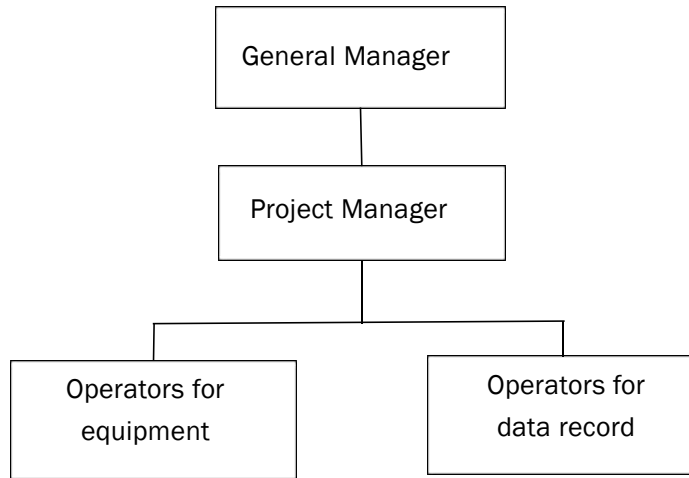


Figure 4.1 Operational and management structure

(1) Principal of the monitoring procedure

The general manager of the project is the leader of the monitoring tasks who sets out the responsibility of everyone in the monitoring system and establishes the related documents. The general manager ensures that staffs in the monitoring system has the ability to deal with the assigned tasks.

The Project manager will be responsible for aggregating the monitored data monthly and yearly, archiving and keeping data during the crediting period and two years after.

Operators will be in charge of data supervision, checking and inspecting the system. If necessary, they will have the responsibility for executing the emergency plan and drafting emergency situation reports.

(2) Executive person of the monitoring procedure

**Project Manager:** A Project Manager is appointed who is specifically responsible for training, checking the daily operation, reporting forms and archiving emergency situation reports. The Project Manager reports monthly to the General Manager (GM) about the project performance and monitored data. In the event that non-conformance in the performance to the mentioned procedures and/or functioning problems of the monitoring equipment are identified, the Project manager will inform the GM about the situation and work out relevant measures to be taken. The Project manager will also be responsible for aggregating the monitored data monthly and yearly, archiving and keeping data during the crediting period and two years after.

(3) Operators of the monitoring procedure

Operators will take turns to work in the control center 24 hours a day, 7 days a week. They will be in charge of data supervision, filling operation report forms and, checking and inspecting

the system. If necessary, they will have the responsibility for executing the emergency plan and drafting emergency situation reports.

### 3. Monitoring system

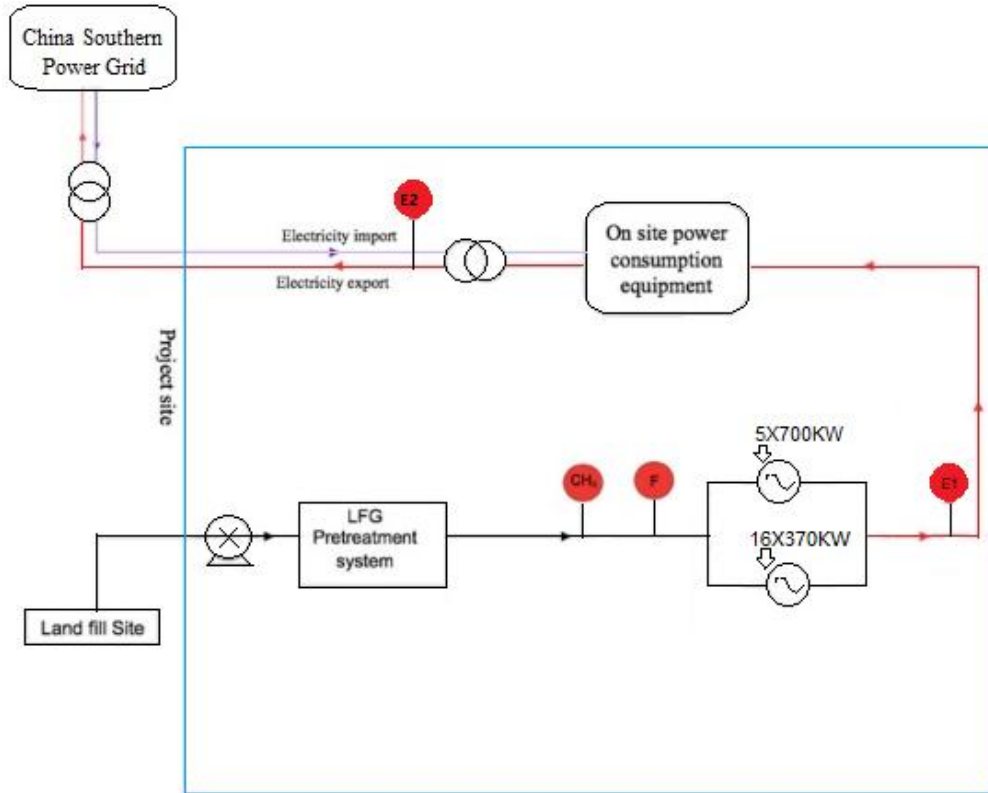


Figure 4.2 The monitoring flow chart

CH<sub>4</sub> - Gas analyzer to continuously measure methane fraction in LFG fed to the power plant

F - Flow meter to continuously measure flow of LFG fed to the Power Plant

E1 - Electricity meter to continuously measure the electricity produced by generators

E2 - Bi-directional electricity meter to continuously measure the net electricity exported to CSPG and electricity imported from CSPG

### 4. Data collection procedures

The data are fully recorded and archived by DCS automatically and shown in the control system. The data are recorded once per hour. DCS of a historian database, primarily to provide data backup to the sheet of excel. Ultimately it forms the Monitoring Operating Record. All data are kept 2 years after the end of the crediting period.

### 5. QA/QC

In order to ensure monitoring plan with high quality, QA/QC measures are carried out in monitoring data recording and checking, equipment calibrating and staff training.

All the monitoring devices listed above (flow meter, gas analyzer and electricity meter) will be chosen in accordance with VCS requirements and will be calibrated regularly for accuracy by qualified party according to the national regulations.

Data recording: all data collected are recorded in electronic files which are regularly backed up. The data are checked by the specific staff every day and reported to General Manager by Project manager monthly.

Equipment calibration and maintenance: Flow meters, gas analyzer, other critical project equipment are subject to regular maintenance and testing according to technical specifications from the manufactures to ensure accuracy and good performance.

According to the Chinese national standard (Technical Management Code for Electricity Metering, DL/T448-2016), the electricity meter was properly configured and checked by both the project owner and the grid company before the project is in operation. The accuracy should not be less than 0.5S. The installation of flow meters and gas analyzers will fulfill the national standard (JJG640-2016 and JJG693-2011).

To assist in future verification, the calibration records, along with the data files of project monitoring will be kept in the archives by the project owner, and checked by Project Manager. When the data is not available from the main monitoring devices, the data measured by the back-up devices will be used.

## **6. Data Management**

Specific staff will be appointed by the project owner to take the overall responsibility for monitoring GHG emission reductions and keeping all monitored data collected as part of monitoring archived electronically and be kept at least for 2 years after the end of the last crediting period.

Electronic data and documents will be regularly copied and archived via hard disk, and kept at least two years after the end of the last crediting period.

All written data and documents, including electricity receipts for cross-checking, will be copied and archived and kept at least two years after the end of the last crediting period.

## **7. Procedure in case of failure**

In the case of a meter in fault, it shall be immediately repaired or replaced with another calibrated meter by a professional engineer, and the LFG or electricity generated during the period of erroneous measurement and replacement of the fault meter shall not be accounted for conservative consideration.

# 5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

## 5.1 Baseline Emissions

The baseline emissions are calculated as follows:

$$BE_y = BE_{CH_4,y} + BE_{EC,y} \quad \text{Equation (1)}$$

Where:

$BE_y$  = Baseline emissions in year y (t CO<sub>2</sub>e/yr)

$BE_{CH_4,y}$  = Baseline emissions of methane from the SWDS in year y (t CO<sub>2</sub>e/yr)

$BE_{EC,y}$  = Baseline emissions associated with electricity generation in year y (t CO<sub>2</sub>/yr)

Monitoring period	$BE_{CH_4,y}$ (tCO <sub>2</sub> e)	$BE_{EC,y}$ (tCO <sub>2</sub> e)	$BE_y$ (tCO <sub>2</sub> e)
14/12/2020 -31/12/2020	4,982	541	5,523
01/01/2021-31/12/2021	255,812	27,828	283,640
01/01/2022-31/12/2022	289,539	32,062	321,601
Total	550,333	60,431	610,764

$$BE_{EC,y} = \sum_k EC_{BL,k,y} \times EF_{EF,k,y} \times (1 + TDL_{k,y}) \quad \text{Equation (2)}$$

Where:

$BE_{EC,y}$  = Baseline emission from electricity generation in year y (tCO<sub>2</sub>/yr)

$EC_{BL,k,y}$  = Quantity of electricity that would be consumed by the baseline electricity consumer k in year y (MWh/yr)

- $EF_{EF,k,y}$  = Emission factor for electricity generation for source k in year y (t CO<sub>2</sub>/MWh)
- $TDL_{k,y}$  = Average technical transmission and distribution losses for providing electricity to source k in year y
- $k$  = Sources of electricity consumption in the baseline

Monitoring period	EG <sub>PJ,y</sub> (MWh)	EF <sub>grid,CM,y</sub> (tCO <sub>2</sub> /MWh)	TDL <sub>k,y</sub> (%)	BE <sub>EC,y</sub> (tCO <sub>2</sub> e)
14/12/2020-31/12/2020	1,033	0.50885	3	541
01/01/2021-31/12/2021	53,096.7	0.50885	3	27,828
01/01/2022-31/12/2022	61,173.6	0.50885	3	32,062
Total	115,303.3	0.50885	3	60,431

$$BE_{CH_4,y} = \left( (1 - OX_{top\_layer}) \times F_{CH_4,PJ,y} - F_{CH_4,BL,y} \right) \times GWP_{CH_4} \quad \text{Equation (3)}$$

Where:

- $BE_{CH_4,y}$  = Baseline emissions of methane from the SWDS in year y (t CO<sub>2</sub>e/yr)
- $OX_{top\_layer}$  = Fraction of methane in the LFG that would be oxidized in the top layer of the SWDS in the baseline (dimensionless)
- $F_{CH_4,PJ,y}$  = Amount of methane in the LFG which is flared and/or used in the project activity in year y (t CH<sub>4</sub>/yr)
- $F_{CH_4,BL,y}$  = Amount of methane in the LFG that would be flared in the baseline in year y (t CH<sub>4</sub>/yr)
- $GWP_{CH_4}$  = Global warming potential of CH<sub>4</sub> (t CO<sub>2</sub>e/t CH<sub>4</sub>)

Monitoring period	F <sub>CH<sub>4</sub>,PJ,y</sub> (tCH <sub>4</sub> )	OX <sub>top-layer</sub> (Dimensionless)	F <sub>CH<sub>4</sub>,BL,y</sub> (tCH <sub>4</sub> )	BE <sub>CH<sub>4</sub>,y</sub> (tCO <sub>2</sub> e)
14/12/2020-31/12/2020	247.2	0.1	44.5	4,982

01/01/2021-31/12/2021	12,689.1	0.1	2,284.0	255,812
01/01/2022-31/12/2022	14,362.1	0.1	2,585.2	289,539
Total	27,298	0.1	4,913.7	550,333

$$F_{CH_4, PJ, y} = F_{CH_4, EL, y} \quad \text{Equation (4)}$$

Parameter	Description	14/12/2020-31/12/2020	2021	2022	Total
$F_{CH_4, PJ, y}$ (tCH <sub>4</sub> )	Amount of methane in the LFG which is flared and/or used in the project activity	247.2	12,689.1	14,362.1	27,298
$F_{CH_4, EL, y}$ (tCH <sub>4</sub> )	Amount of methane in the LFG which is used for electricity generation (tCH <sub>4</sub> )	247.2	12,689.1	14,362.1	27,298

$$F_{i, t} = V_{t, db} \times v_{i, t, db} \times \rho_{i, t} \quad \text{Equation (5)}$$

$$\rho_{i, t} = \frac{P_t \times MM_i}{R_u \times T_t} \quad \text{Equation (6)}$$

Where:

$F_{i, t}$  = Mass flow of greenhouse gas i in the gaseous stream in time interval t (kg gas/h)

$V_{t, db}$  = Volumetric flow of the gaseous stream in time interval t on a dry basis (m<sup>3</sup> dry gas/h)

$v_{i, t, db}$  = Volumetric fraction of greenhouse gas i in the gaseous stream in a time interval t on a dry basis (m<sup>3</sup> gas i/m<sup>3</sup> dry gas)

$\rho_{i, t}$  = Density of greenhouse gas i in the gaseous stream in time interval t (kg gas i/m<sup>3</sup> dry gas)

$P_t$  = Absolute pressure of the gaseous stream in time interval t (101,325 Pa)

$MM_i$  = Molecular mass of greenhouse gas i (16.04 kg/kmol)

$R_u$  = Universal ideal gases constant (8,314 Pa.m<sup>3</sup>/kmol.k)

$T_t$  = Temperature of the gaseous stream in time interval t (273.15K)

## 5.2 Project Emissions

Project emissions  $PE_y$  are calculated as follows:

$$PE_y = PE_{EC,y} \quad \text{Equation (7)}$$

$$PE_{EC,y} = \sum_j EC_{PJ,j,y} \times EF_{EF,j,y} \times (1 + TDL_{j,y}) \quad \text{Equation (8)}$$

Where:

$PE_{EC,y}$  = Project emissions from electricity consumption in year y (tCO<sub>2</sub>/yr)

$EC_{PJ,j,y}$  = Quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr)

$EF_{EF,j,y}$  = Emission factor for electricity generation for source j in year y (tCO<sub>2</sub>/MWh)

$TDL_{j,y}$  = Average technical transmission and distribution losses for providing electricity to source j in year y

Monitoring period	$EC_{PJ,j,y}$ (MWh)	$EF_{grid,CM,y}$ (tCO <sub>2</sub> /MWh)	$TDL_{j,y}$ (%)	$PE_y$ (tCO <sub>2</sub> e)
14/12/2020-31/12/2020	0	0.50885	20	0
2021	0	0.50885	20	0
2022	0	0.50885	20	0
Total	0	0.50885	20	0

## 5.3 Leakage

No leakage effects are accounted for under this methodology.

## 5.4 Net GHG Emission Reductions and Removals

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Equation (9)

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)
14/12/2020-31/12/2020	5,523	0	0	5,523
01/01/2021-31/12/2021	283,640	0	0	283,640
01/01/2022-31/12/2022	321,601	0	0	321,601
Total	610,764	0	0	610,764

#### Comparison of actual emission reductions with estimates during validation:

The monitoring period covers from 14/12/2020 to 31/12/2022. Based on the registered VCS PD, the amount of estimated emission reductions for this monitoring period would be 617,960tCO<sub>2</sub>e. The actual emission reductions in this monitoring period are 610,764tCO<sub>2</sub>e, which is 1.16% less than the estimation in the registered VCS PD and in the normal range of fluctuation. Therefore, the net GHG emission reduction during this monitoring period is considered to be reasonable and acceptable for LFG power project.

Monitor period	Ex-ante emissions reductions/ removals (tCO <sub>2</sub> e)	Achieved emissions reductions/ removals (tCO <sub>2</sub> e)	Percent difference	Justification for the difference
14/12/2020-31/12/2020	5,460	5,523	1.15%	The difference is in the normal range of fluctuation
01/01/2021-31/12/2021	284,942	283,640	-0.46%	The difference is in the normal range of fluctuation
01/01/2022-31/12/2022	327,558	321,601	-1.82%	The difference is in the normal range of fluctuation
Total	617,960	610,764	-1.16%	The difference is in the normal range of fluctuation

# APPENDIX: THE EMPLOYEE ROSTER

## 深圳相控科技有限公司惠州分公司员工花名册

序号	姓名	部门	职位
1	白鉴余	综合部	总经理
2	陈红	综合部	行政兼出纳
3	张雪	综合部	财务
4	刘子鹏	生产部	生产部长
5	赵小飞	生产部	组长
6	王佳鑫	生产部	技术员
7	刘胜利	生产部	技术员
8	张强	生产部	技术员
9	李宇峰	生产部	技术员
10	肖国庆	生产部	技术员
11	黄建国	生产部	技术员
12	梁永益	生产部	技术员
13	陆定国	生产部	技术员
14	陈航	生产部	技术员
15	潘伟	生产部	技术员
16	陈智勇	生产部	技术员
17	周强	监测部	组长
18	马资溪	监测部	监测员
19	高子瑜	监测部	监测员
20	邹振华	监测部	监测员

特此说明!

深圳相控有限公司  
惠州分公司



电话: 0752-2372779

时间: 2023年2月1日