ANHUI ZHUJIXI CMM UTILIZATION PROJECT

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Project Title	Anhui Zhujixi CMM Utilization Project
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CONTENT

1 PROJECT DETAILS

1.1 Summary Description of the Project

Anhui Zhujixi CMM Utilization Project (hereinafter referred to as the Project) utilizes the low concentration coal mine methane (CMM) from Zhujixi coal mine to generate hot air to dry coal slime provided by Zhujixi coal mine. The Project is located in Hetuan Town, Panji District, Huainan City, Anhui Province, China. The Project Owner is Huainan Huamei Pushi New Energy Technology Co., Ltd.

Prior to the implementation of the project, Zhujixi coal mine was equipped with CMM extraction facilities and all extracted CMM was vented into the atmosphere directly without utilization. Baseline scenario is the same as the condition prior the implementation of the project.

The purpose of the Project is to utilize the extracted CMM with low concentration methane concentration to generate hot air to dry the coal slime. The project applies flameless oxidation process. Four sets of regenerative thermal oxidizers (RTOs), each with a treatment capacity of around 30,000 Nm^3/h[1] are installed, able to destroy 10.368 million Nm^3 of methane annually and dry 400,000 tonnes of wet coal slime ideally. The thermal energy contained in the hot air generated from RTOs is hard to monitor, so only emission reductions resulting from methane capturing and destruction is claimed for the project.

The emissions reductions of the Project come from methane (CH_4) emission reductions resulting from captured and destroyed CMM in the project scenario, which would have been vented to atmosphere. It is estimated that in the 10 years of crediting period of the project (from 14-December-2021 to 13-December-2031), the expected average annual GHG emission reduction will be 151,095 tCO_2e, with the total emission reduction of 1,510,950 tCO_2e in the 10-year of crediting period.

Audit Type	Period	Program	VVB Name	Number of Years
Validation	To be determined	VCS	China Classification Society Certification Co., Ltd.	To be determined
Total	To be determined	-	-	To be determined

[1] Nm^3 is the unit of gas volume under the condition of 273.15K (temperature) and 101,325pa (pressure).

1.2 Sectoral Scope and Project Type

Sectoral Scope 1: Energy industries (renewable - / non-renewable sources)

Sectoral Scope 8: Mining/mineral production,

The project is not a grouped project.

1.3 Project Eligibility

The scope of the VCS Program includes:

1) The seven Kyoto Protocol greenhouse gases: The emission reductions of the project come from capturing and destruction of methane (CH_4) emissions that would have been vented to the atmosphere. Thus, the project applicable to this scope.

2) Ozone-depleting substances: NA

3) Project activities supported by a methodology approved under the VCS Program through the methodology approval process: NA

4) Project activities supported by a methodology approved under a VCS approved GHG program, unless explicitly excluded under the terms of Verra approval: The methodology ACM0008 (Version 08) of the project utilized is a methodology approved under CDM Program, that is a VCS approved GHG program.

5) Jurisdictional REDD+ programs and nested REDD+ projects as set out in the VCS Program document Jurisdictional and Nested REDD+ (JNR) Requirements: this project does nothing with REDD+ programs.

6) The project is not assumed to have generated GHG emissions primarily for the purpose of their subsequent reduction, removal, or destruction. Hence the project aligns with VCS standard 4.4, para 2.1.2: The scope of the VCS Program excludes projects that can reasonably be assumed to have generated GHG emissions primarily for the purpose of their subsequent reduction, removal, or destruction.

Meanwhile, the project does not belong to the projects excluded in Table 1 of VCS Standard 4.4.

Thus, the project is eligible under the scope of VCS program.

1.4 Project Design

The project includes a single location or installation only. The project is not a grouped project.

Eligibility Criteria

Not applicable as the project is not a grouped project.

1.5 Project Proponent

Organization name	Huainan Huamei Pushi New Energy Technology Co., Ltd
Contact person	ZHEN Long
Title	General Manager
Address	Northwestern Corner of Zhujixi Coal Mine, Hetuan Town, Panji District, Huainan City, Anhui Province, China
Telephone	+86 21 6246 2036
Email	3542346576@qq.com

1.6 Other Entities Involved in the Project

Organization name	Climate Bridge (Shanghai) Ltd.
Role in the project	Consultancy
Contact person	Gao Zhiwen
Title	General Manager
Address	Block B, Level 24, Jiangong Mansion, 33 Fushan Road, Pudong New Area, Shanghai, China 200120
Telephone	+86-2162462036
Email	gao.zhiwen@climatebridge.com

1.7 Ownership

The project owner of the project is Huainan Huamei Pushi New Energy Technology Co., Ltd. The approval of Environmental Impact Assessment (EIA), Feasibility Study Report (FSR), and the business license of the project owner are evidence for legislative right.

1.8 Project Start Date

14-December-2021 (Operation start date)

1.9 Project Crediting Period

This project adopts fixed crediting periods of 10 years, from 14-December-2021 to 13-December-2031 (both days included).

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	✓
Large project	

Year	Estimated GHG emission reductions or removals (tCO_2e)
14- December -2021 to 31-December-2021	7,452[2]
01- January -2022 to 31-December-2022	151,095
01- January -2023 to 31-December-2023	151,095
01- January -2024 to 31-December-2024	151,095
01- January -2025 to 31-December-2025	151,095
01- January -2026 to 31-December-2026	151,095
01- January -2027 to 31-December-2027	151,095
01- January -2028 to 31-December-2028	151,095
01- January -2029 to 31-December-2029	151,095
01- January -2030 to 31-December-2030	151,095
01- January -2031 to 13-December-2031	143,643[3]
Total estimated ERs	1,510,950
Total number of crediting years	10
Average annual ERs	151,095

1.11 Description of the Project Activity

[2] It is covering 18 days from 14-December-2021 to 31-December-2021, thus the estimated emission reduction in the period is 7,452 tCO_2e, ie.7,452 tCO_2e = 151,095 tCO_2e x 18days/365days.

[3] It is covering 347 days from 01-January-2031 to 13-December-2031, thus the estimated emission reduction in the period is 143,643 tCO_2e, ie.143,643 tCO_2e = 151,095 tCO_2e x 347days/365days.

The project is expected to operate 7200 hours annually, in consideration of necessary repairs. And the lifespan of the Project is planned to be 10 years (excluded the construction phase).

Within the lifespan, four sets of RTOs, each with a gas treatment capacity around 30,000Nm^3/h, is supposed to destruct 10.368 million Nm^3 of methane per year.

The technical process of the Project is shown in Figure 1. The low concentration CMM is delivered by methane extraction pumps to oxidation system, mainly including automatic control cabinet, ventilators and RTOs. The system adjusts methane content in the gas flow to the appropriate concentration for subsequent oxidation, and then the gas flow goes into the main installations of the oxidation system, RTOs, for hot air generation. The oxidation system can control the whole process under safety level. After that, the gas flow with high temperature goes into coal slime dryer.

As shown in Figure 1, the Project installs gas analysers and flow meters to respectively monitor the methane concentration and CMM volume extracted from Zhujixi coal mine. Detailed monitoring information can be found in section 5.3.

Actually, the emission reductions of the project come from two sources: 1) Methane (CH_4) destroyed in the project scenario, which would have been vented without utilization in baseline scenario; 2) CO_2 emission reductions from producing equivalent amount of hot air replaced by the Project that would otherwise have been generated by coal-fired hot blast stove. However, the thermal energy contained in the hot air is hard to monitor. As result, the emission reductions from source 2 is not claimed for conservative consideration. Only ERs from capturing and destroying methane are claimed.

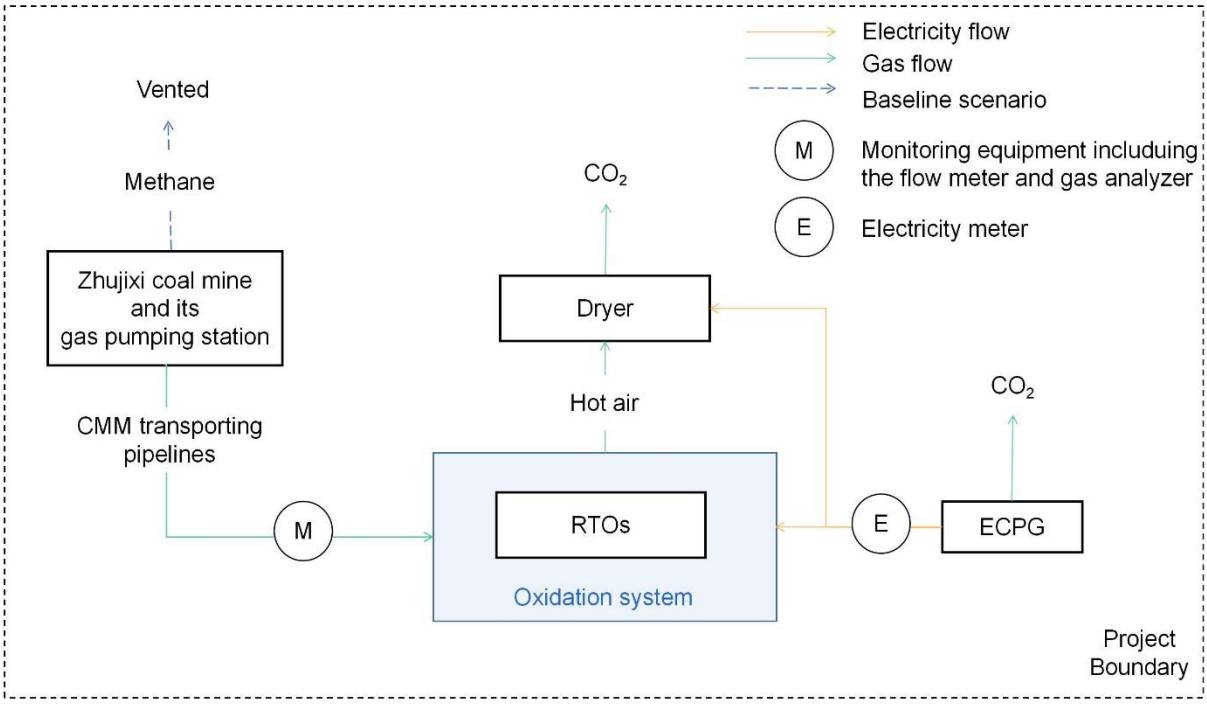


Figure 1 Technical flow chart of the project activity

Table 1 RTO Specifications

Product model	2001.0030
Supplier	Shandong ComeRiver Power Technology Company Ltd.
Quantity	4
Gas treatment capacity (Nm^3/h)	30000～33000Nm^3/h
Gas concentration for stable working (%)	1.0~1.1%
Power supply requirement	380V/50Hz, 110kW
Oxidation rate (%)	>=95

1.12 Project Location

The Project is located in Hetuan Town, Panji District, Huainan City, Anhui Province in P.R.China. The geographical coordinates for the project site are 116°42'35.32''E, and north latitude 32°54'48.59". The geographic location of the project is shown in Figure 2.

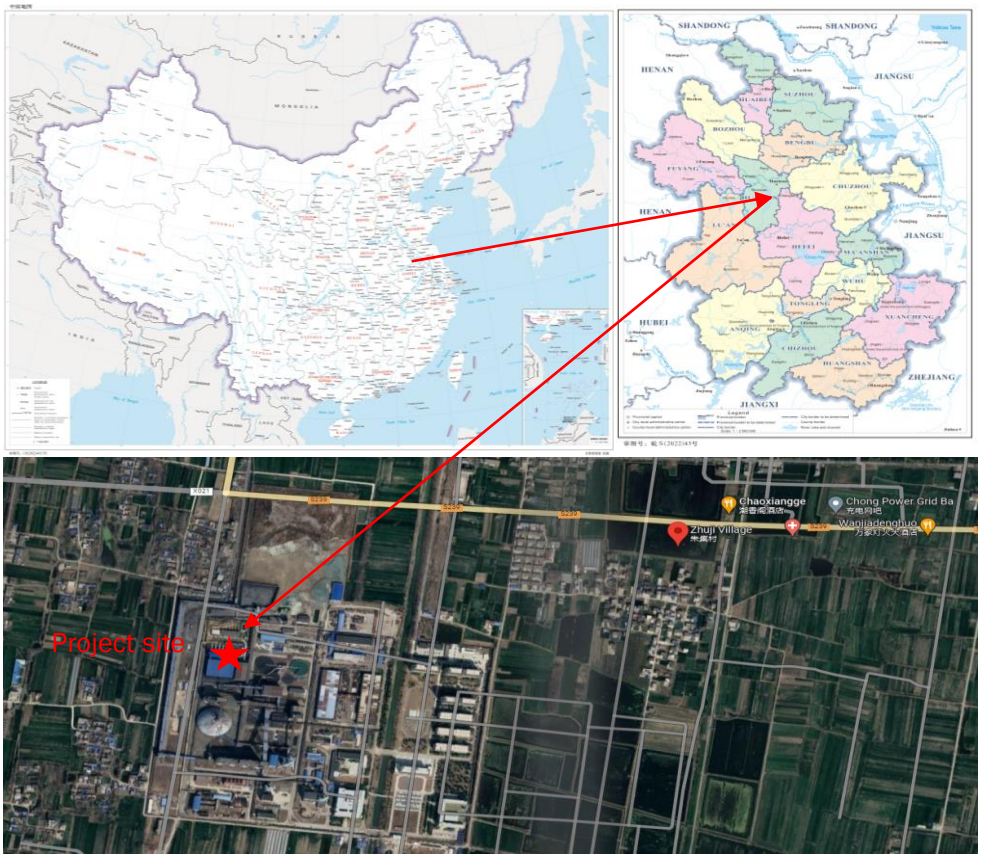


Figure 2 Location of the project

1.13 Conditions Prior to Project Initiation

The scenario existing prior to the start of the implementation of the project activity is:

All the low concentration CMM extracted from the coal mines in the Project would be vented into the atmosphere without utilization.

The baseline scenario is the same as the scenario existing prior to the implementation of the project activity.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

The project complies with all Chinese relevant laws and regulations. Mainly include:

1. Opinions of the General Office of the State Council on Further Accelerating the Extraction and Utilization of Coalbed Methane (Coal Mine Gas)[4];

According to the paragraph 3 article 8 of this regulation, in order to adapt to the new situation of coal mine gas prevention and control and the development of coalbed methane

[4] http://www.gov.cn/zhengce/content/2013-09/18/content_2540.htm

industrialization, State encourage the CMM utilization for energy generation. Thus, this project belongs to the field encouraged by the State and complies with this regulation.

2. Chinese National Coalmine Safety Regulation[5];

In order to reduce the occurrence of major accidents in coal mines, the government has formulated these regulations. This project uses coal mine gas to generate energy, effectively utilizes coal mine gas and reduces the risk of coal mine explosion, so the project complies with this regulation.

3. Notice of the National Development and Reform Commission on the issuance of the twelfth Five-Year Plan for The Development and Utilization of Coalbed Methane (Coal Mine Gas)[6].

In order to speed up the development and utilization of coalbed methane (coal mine gas), ensure the safe production of coal mines, increase the supply of clean energy, promote energy conservation and emission reduction, this Notice was published. This project utilizes the coal mine gas for energy generation, which complies with this Notice.

The project obtained the approval letters from governmental authorities: Huainan City Panji district Development and Reform Commission, as well as Huainan City Environmental Protection Department. The two approvals well demonstrate that local government permits the construction of the project. Consequently, the project is compliance with laws, status and other regulatory frameworks.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The project has neither been registered nor seeking registration under any other GHG programs.

The project is seeking registration only in VCS program.

1.15.2 Projects Rejected by Other GHG Programs

The project hasn't been rejected by any other GHG project.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

Does the project reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading?

[5] https://www.mem.gov.cn/fw/flfgbz/gz/

[6] https://www.ndrc.gov.cn/xxgk/zcfb/ghwb/201112/t20111231_962121.html

☐ Yes ☒ No

1.16.2 Other Forms of Environmental Credit

Has the project sought or received another form of GHG-related credit, including renewable energy certificates?

☐ Yes ☒ No

The project hasn't sought or received another form of environmental credits.

Supply Chain (Scope 3) Emissions

Not applicable.

As per CLARIFICATION TO VCS PROGRAM RULES AND REQUIREMENTS, published on 31 MAY 2023[7], the following demonstration is effective:

"Sections 3.23.7 through 3.23.9 have been added to require public statements to help avoid double claiming of emissions reductions and removals in Scope 3 emissions inventories. These sections will be revised in the next version of the VCS Standard, with an effective date of 1 January 2024."

1.17 Sustainable Development Contributions

A summary description of project activities that result in sustainable development (SD) contributions:

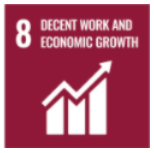
Project is to utilize the extracted CMM with low concentration methane concentration to generate hot air to dry coal slime, which has positive impact to climate and also provide jobs.

The Project will contribute to sustainable development in the following ways:

- The project will achieve a GHG emission reduction of 151,095 tCO_2e/year during the whole crediting period. Thus, the project will achieve Target 13.2 under SDG 13"Take urgent action to combat climate change and its impacts".
- This project will increase income of local residences and accelerate economy development in rural areas. During the crediting period, direct and indirect employment opportunities will be generated. Thus, the project will achieve Target 8.5 under SDG 8 "Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all".

How the project contributes to achieving Chinese sustainable development priorities is described in the table below:

[7] https://verra.org/verra-issues-clarification-on-effective-date-of-vcs-scope-3-requirements/

SDG Goal	Target	Chinese sustainable development priorities	Project activity contribution
	13.2 Integrate climate change measures into national policies, strategies and planning [8].	Published in October 2022, China's Climate Change Policy and Action 2022 Annual Report[9] pointed out that China will actively control non-carbon dioxide greenhouse gas emissions from energy, agriculture, waste and other major sources of emissions. The central government is editing "Methane emission control action scheme"	The project utilizes the extracted CMM with low concentration methane concentration to produce hot air to avoid methane emissions. This contributes to methane emission control.
	8.5 By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value[10].	China continuously improves the quality and efficiency of development. In-depth implementation of the innovation-driven development strategy, the rapid development of small and medium-sized enterprises. Adhering to the policy of giving priority to employment, the unemployment rate has remained at a low level. By coordinating epidemic prevention and control and economic and social development, it has become the only major economy to achieve positive growth in	The project activity can provide employment opportunities for the operation of the project activity. This contributes to one of China's actions for promoting sustainable developing: "by 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities, and equal pay for work of equal value".

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

[9] https://www.mee.gov.cn/ywgz/ydqhbh/syqhbh/202210/W020221027551216559294.pdf

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

		2020 and has made positive contributions to the recovery of the global economy.	

1.18 Additional Information Relevant to the Project

Leakage Management

According to the methodology, the leakage of the project is zero, thus the leakage management is not applicable to the project.

Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description.

Further Information

No further information.

2 SAFEGUARDS

2.1 No Net Harm

The project started construction on 01-June-2021 and operated on 14-December-2021. The Project owner entrusted a third party, Anhui Sike Environmental System Engineering Technology Co., Ltd. to conduct the Environmental Impact Assessment (EIA) of the project. The EIA report was completed in April 2021 and was approved by Huainan City Panji District Environmental Protection Bureau on 25-May-2021, with approval Panhuanshenfu[2021] No.5. Every aspect of environmental impact has been considered in the EIA report with corresponding measures during project development, and no net harm has been detected. Meanwhile, the implementation of the project will improve local socio-economic development through creating career opportunities and paying taxes.

2.2 Local Stakeholder Consultation

The Project owner collected comments by local stakeholders on the project activity. Survey questionnaires were distributed to relevant personnel of Zhujixi coal mine, local villagers and government officials by the Project owner on 23-April-2021. The survey questionnaire was designed to assess the project impacts on the local environment and social economic development. The structure of the survey respondents is listed in Table 2 below.

Table 2 Structure of stakeholder surveyed

Item \ Distribution		Quantity	Percentage
Amount of stakeholders surveyed	Male	25	50%
	Female	25	50%
Age	<25	6	12%
	25-45	22	44%
	45-55	17	34%
	>55	5	10%
Education	Junior high school or below	22	44%
	Senior high school	20	40%
	College or above	8	16%
Occupation	Worker	15	30%
	Farmer	20	40%
	Management personnel	5	10%
	Expert	3	6%
	Unspecified	7	14%

Fifty questionnaires were distributed to local stakeholders, and all questionnaires have been recollected. Comments from these questionnaires are summarized below:

No.	Questions	Attitude or Opinion	Amount	Percentage
1	Do you know about the project?	Quite much	25	50%
		Heard of	20	40%
		Nothing	5	10%
2	What is your attitude towards the project construction?	Supportive	45	90%
		Against	0	0%
		Indifferent	5	10%
3	What is the most probable environmental impact do you think the project will cause after the construction finish (multiple choice)?	None	40	80%
		Air pollution	0	0%
		Water pollution	2	4%
		Noise pollution	3	6%
		Harm to indigenous animals and plants	0	0%
		No idea	5	10%
4	Do you think the project operation will bring about more benefits than loss?	Yes	50	100%
		No	0	0%
		About the same	0	0%
5	Are you willing to participate in the project construction or operation?	Yes	40	80%
		No	5	10%
		Indifferent	5	10%
6	What influence do you think the project will bring about to you and your family?	Positive	40	80%
		None	10	20%
		Negative	0	0%

7	Do you think the project operation will affect the production safety of the coal mine?		Positive effect	40	80%
			None	10	20%
			Negative effect	0	0%
8	What impact do you think the project will bring to local community? (multiple choice)	Employment	50	100%	100%
			0	0%	0
			0	0%	0
		Economy	46	92%	98%
			0	0%	0
			4	8%	2%

The survey shows that the Project is well known by local residents. Most of respondents know or hear about the Project. Most of them are supportive of the project construction and think the Project will bring more benefit than loss. 80% of the respondents are willing to participate in the construction and operation of the Project.

80% of the respondents believe that the Project will not have any environmental impact, but there are a few respondents who show their concern about the potential noise pollution and water pollution caused by the Project. For both issues, the project owner will adopt some measures to mitigate the pollution. For the noise pollution: The noise mainly comes from the noise generated by the drying system, including twin-shaft crushing feeder, dryer and cyclone dust collector. The project will use sound insulation walls to reduce the impact of noise on the surrounding area. Noise emission from the project operation complies with the standard requirements of Category 2 of "Emission standard for industrial enterprise noise at boundary" (GB12348-2008), and the environmental noise at the residential settlement satisfies Category 2 of "Environmental quality standard for noise" (GB3096-2008). For the water pollution: The wastewater mainly comes from ground washing wastewater, and the generated wastewater is mainly SS, which is treated in the concentration tank and recycled without being discharged.

80% of the respondents recognize the positive impact of the Project on individuals and families. They think the Project will improve the local employment and increasing the residential income, thus greatly reducing family burden. No one thinks that the Project will have a negative impact on the local life. In the aspect of coal mine production safety, 20% of the respondents believe the Project will not have any impact on coal mine safety, and 80% of the respondents consider the Project improve the operational safety of the coal mines to some extent.

In general, local stakeholders are supportive of the project construction. The survey shows that a majority of local stakeholders think the Project will help improve the life of local people and promote local economic development without much adverse environmental impact. The survey shows that almost all of the stakeholders are supportive to the proposed project, believing that the Project will provide more employment opportunities, help local economic development. Therefore, the implementation of the Project is regarded as beneficial by most of the local stakeholders.

In order to understand the opinions of various stakeholders during the project operation period, the project owner will set up an on-going communication mechanism to regularly holds stakeholder meetings every year to issue questionnaires and to answer the questions from various stakeholders.

2.3 Environmental Impact

The Project owner entrusted the qualified third-party Anhui Sike Environmental System Engineering Technology Co., Ltd. to complete the Environmental Impact Assessment (EIA) report in April 2021. The EIA report was approved by Huainan City Panji District Environmental Protection Bureau on 25-May-2021. The environmental impacts of the project in construction period and in operation period are summarized as follows.

Construction period

Air pollution

Air pollution is mainly dust from transporting and handling of materials, and placement of equipment. The generated dust is very small. The vehicles for transporting materials are covered by cloth. There is temporary fencing around the project cite to limit the expansion of the dust. After such dust reduction measures are taken, the dust has little impact on the environment.

Wastewater pollution

The wastewater mainly comes from concrete mixing wastewater. After the concrete mixing wastewater is settled in the sedimentation tank, all the wastewater is reused as construction wastewater and is not discharged.

Noise pollution

Sound pollution is mainly caused by the operation of equipment. The project will take the following measures to control construction noise: select low-noise construction equipment; build walls to provide sound insulation; the project is only scheduled for construction during the day and does not affect the lives of surrounding residents.

Solid waste pollution

Solid waste mainly comes from construction waste, such as concrete blocks, broken bricks, wood, and domestic waste. Construction waste is backfilled in the empty space of the industrial site, and then hardened after backfilling; the generated domestic waste is collected in a special trash bin and transported to the designated location.

Operation Period

Air pollution

Air pollution comes from the dust generated by drying wet slime. The drying system of this project is in a negative pressure state to prevent dust leakage, and the dried exhaust gas is treated with a cyclone dust collector to treat the particulate matter, and the generated exhaust gas is exhausted through a 15-meter exhaust.

Wastewater pollution

The wastewater mainly comes from ground washing wastewater, and the generated wastewater is mainly SS, which is treated in the concentration tank and recycled without being discharged.

Noise pollution

The noise mainly comes from the noise generated by the twin-shaft crushing feeder, dryer and cyclone dust collector. The project will use sound insulation walls to reduce the impact of noise on the surrounding area.

Solid waste pollution

The solid waste is mainly the dust collected by the dust collector and domestic wastes generated by staff. A storage room is set up in this project to classify the wastes.

In conclusion, through the above measures by the project owner, there are no negative environmental impacts due to the project.

2.4 Public Comments

This project will open for public comment on the verra website.

2.5 AFOLU-Specific Safeguards

The project is not a AFOLU project.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

The approved consolidated methodology applied in the project activity is ACM0008 “Abatement of methane from coal mines” (version 08.0).

This methodology also refers to the latest approved version of the following tools:

TOOL02 “Combined tool to identify the baseline scenario and demonstrate additionality” (version 07.0);

TOOL05 "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0);

TOOL07 "Tool to calculate the emission factor for an electricity system" (version 07.0);

TOOL08 "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 3.0)

TOOL24 "Common practice" (version 3.1);

TOOL27 "Investment analysis" (version 12).

For more information regarding the proposed new methodologies and the tools as well as their consideration by the Executive Board please refer to:

https://cdm.unfccc.int/methodologies/PAmethodologies/approved

3.2 Applicability of Methodology

The project satisfies all the applicability criteria of the methodology ACM0008 (Version 08.0), of which the detailed description is listed in Table 3 below:

Table 3 Applicability of ACM0008

No.	Applicability	Condition of the Project and Conclusion
1	This methodology applies to project activities that aim for the use and/or destruction of the methane extracted/obtained from a working or abandoned coal mine(s). The project activities include any of the following methods to treat the methane captured: (a) The methane is destroyed without energy production, for example through flaring; (b) The methane is used to produce energy. This may include electricity, heat, vehicle fuel, etc.	Applicable. The project uses the low concentration coal mine methane (CMM) from Zhujixi coal mine for hot air generation to dry coal slime. Therefore, the project is applicable to condition (b).
2	Emission reductions can be claimed for displacing or avoiding energy from other sources	Applicable. The emissions reduction of the project comes from two sources: 1) Methane (CH_4) destroying in the project scenario, which would have been

		vented without utilization in baseline scenario; 2) CO_2 emission reductions from producing equivalent amount of hot air replaced by the Project that would otherwise have been generated by coal-fired hot blast stove. However, the emission reduction from source 2 is not claimed. Only ERs from destroying methane are claimed.
3	Methane used in the project activities shall be extracted using the following techniques: (a) Surface drainage boreholes to capture coal bed methane (CBM) or methane from open cast mines; (b) Underground boreholes in the mine, surface goaf wells, underground boreholes, gas drainage galleries or other goaf gas capture techniques, including gas from sealed areas, to capture coal mine methane (CMM); (c) Mine ventilation system to dilute and remove ventilation air methane (VAM); (d) Surface drainage boreholes in the case of sealed abandoned mines or ventilation system in the case of ventilated mines to capture abandoned mine methane (AMM).	Applicable. The project uses CMM from 'Underground boreholes in the mine to capture pre mining CMM' and 'surface goaf well, underground boreholes, gas drainage galleries or other goaf gas capture techniques, including gas from sealed areas, to capture coal mine methane (CMM)'. The Project activity does not involve the extraction or utilization of CBM, VAM or AMM. Therefore, the project is applicable to condition (b).
4	The remaining share of the methane, to be diluted for safety reason, may still be vented.	Applicable. The project involves the capture and utilization of CMM for energy use at the operational Zhujixi coal mine where the baseline is the total atmospheric release of the methane. The remaining unused share of the methane is vented for safety reasons.
5	In the case of open cast mines, in addition to the conditions listed above, project activities should meet the following requirements: (a) The mines should have had a working	Not relevant. The Zhujixi coal mine the project involved is not a case of open cast mine.

	mining concession for at least three years prior to the start of project; (b) Only pre-mining drainage from wells placed within the area to be mined are eligible for crediting; (c) For the calculation of emission reductions, all provisions for CBM should be followed for the open cast mine methane.	
6	The methodology does not apply to project activities with any of the following features: (a) Capture/use of virgin coal bed methane, e.g. methane extracted from coal seams for which there is no valid coal mining concession; (b) Use CO_2 or any other fluid/gas to enhance CBM drainage before mining takes place; (c) Methane extraction from abandoned mines that are flooded due to regulation.	Not relevant. The project does not involve the extraction or utilization of CBM. The project does not use CMM from open cast mining, or abandoned mines.
7	The methodology does not apply to project activities that involve use and/or destruction of CBM or OCM if the baseline scenario identification resulted in partial use and/or destruction of CBM or OCM.	Not relevant. The project does not involve use and/or destruction of CBM or OCM.
8	Emission reductions due to the use and/or destruction of CBM or OCM cannot be claimed if surface drainage to capture CBM or methane from open cast mine(s) is used within the project boundaries prior to the implementation of the project activity.	Not relevant. The project does not involve use and/or destruction of CBM or OCM.

Besides, the project also applies to the applicability conditions included in the tools referred to methodology ACM0008 (version08.0) as follows:

Table 4 Applicability of applied tools

Tool	Applicability	Condition of the Project and Conclusion
Combined tool to identify the baseline	The tool is applicable to all types of proposed project activities. However, in some cases, methodologies referring to this tool may	Applicable. The project is a CMM utilization project. And

scenario and demonstrate additionality (version 07.0)	require adjustments or additional explanations as per the guidance in the respective methodologies. This could include, inter alia, a listing of relevant alternative scenarios that should be considered in Step 1, any relevant types of barriers other than those presented in this tool and guidance on how common practice should be established	ACM0008 (version08.0) refers to this tool.
Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (version 03.0)[11]	If emissions are calculated for electricity consumption, the tool is only applicable if one out of the following three scenarios applies to the sources of electricity consumption: (a) Scenario A: Electricity consumption from the grid. The electricity is purchased from the grid only, and either no captive power plant(s) is/are installed at the site of electricity consumption or, if any captive power plant exists on site, it is either not operating or it is not physically able to provide electricity to the electricity consumer; (b) Scenario B: Electricity consumption from (an) off-grid fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants are installed at the site of the electricity consumer and supply the consumer with electricity. The captive power plant(s) is/are not connected to the electricity grid; or (c) Scenario C: Electricity consumption from the grid and (a) fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants operate at the site of the electricity consumer. The captive power plant(s) can provide electricity to the electricity consumer. The captive power plant(s) is/are also connected to the electricity grid. Hence, the electricity consumer can be provided with electricity from the captive power plant(s) and the grid.	Applicable. The electricity is purchased from the grid only, and no captive power plant(s) is/are installed at the site of electricity consumption. So the project is in accordance with scenario A.
	This tool can be referred to in methodologies	Not relevant.

[11] The latest version of "Tool to calculate baseline, project and/or leakage emissions from electricity consumption", as referred by ACM0008 (version08.0)

	to provide procedures to monitor amount of electricity generated in the project scenario, only if one out of the following three project scenarios applies to the recipient of the electricity generated: (a) Scenario I: Electricity is supplied to the grid; (b) Scenario II: Electricity is supplied to consumers/electricity consuming facilities; or (c) Scenario III: Electricity is supplied to the grid and consumers/electricity consuming facilities.	This tool is used to calculate the emission of electricity consumption in project scenario, not to monitor amount of electricity generated.
	This tool is not applicable in cases where captive renewable power generation technologies are installed to provide electricity in the project activity, in the baseline scenario or to sources of leakage. The tool only accounts for CO_2 emissions.	No captive renewable power generation technologies are installed to provide electricity in the project activity, in the baseline scenario or to sources of leakage.
Tool to calculate the emission factor for an electricity system (version 07.0)	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects)	Emission factor of grid shall be used to determined project emission from electricity consumption. Tool 5 stipulates that the emission factor shall be calculated as per this tool.
	Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option II a and option II b. If option II a is chosen, the conditions specified in "Appendix 1: Procedures related to off-grid power generation" should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity	Emission factor of grid shall be used to calculated project emission from electricity consumption. Tool 5 stipulates that the emission factor shall be determined as per this tool.

	generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	
	In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	Applicable. The project consumes electricity from an electricity system which is located in a non-Annex I country.
	Under this tool, the value applied to the CO_2 emission factor of biofuels is zero.	Not relevant. The project does not involve biofuels.
Common practice (version 03.1)	This methodological tool is applicable to project activities that apply the methodological tool "Tool for the demonstration and assessment of additionality", the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality", or baseline and monitoring methodologies that use the common practice test for the demonstration of additionality.	Since the project activity is using "Combined tool to identify the baseline scenario and demonstrate additionality", the tool is applicable.
	In case the applied approved baseline and monitoring methodology defines approaches for the conduction of the common practice test that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	Applicable. The baseline and monitoring methodology refers to "Combined tool to identify the baseline scenario and demonstrate additionality". It required that the latest version of the "Methodological tool: Common practice" available on the UNFCCC website shall be applied. Therefore, this tool is applicable.
Investment analysis" (version 12)	This methodological tool is applicable to project activities that apply the methodological tool "Tool for the demonstration and	Applicable. Since the project activity is

	assessment of additionality", the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality", the guidelines "Non-binding best practice examples to demonstrate additionality for SSC project activities", or baseline and monitoring methodologies that use the investment analysis for the demonstration of additionality and/or the identification of the baseline scenario.	using "Combined tool to identify the baseline scenario and demonstrate additionality", the tool is applicable.
	In case the applied approved baseline and monitoring methodology contains requirements for the investment analysis that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail.	Applicable. The baseline and monitoring methodology refers to "Combined tool to identify the baseline scenario and demonstrate additionality". Therefore, this tool is applicable.
Tool to determine the mass flow of a greenhouse gas in a gaseous stream (version 03.0)	Typical applications of this tool are methodologies where the flow and composition of residual or flared gases or exhaust gases are measured for the determination of baseline or project emissions.	Applicable. The volumetric flow of the gaseous stream and volumetric fraction of greenhouse gas CH_4 will be measured by the project.
	Methodologies where CO_2 is the particular and only gas of interest should continue to adopt material balances as the means of flow determination and may not adopt this tool as material balances are the cost-effective way of monitoring flow of CO_2	Not relevant. For the project, CO_2 is not the particular and only gas. The CH_4 is the main gas in the landfill gas for the project
	The underlying methodology should specify: (a) The gaseous stream the tool should be applied to; (b) For which greenhouse gases the mass flow should be determined; (c) In which time intervals the flow of the gaseous stream should be measured; and (d) Situations where the simplification offered	Applicable. The methodology has specified (a) to (d).

	for calculating the molecular mass of the gaseous stream (equations (3) or (17)) is not valid (such as the gaseous stream is predominantly composed of a gas other than N_2).	

3.3 Project Boundary

As per ACM0008 (08.0) The spatial extent of the project boundary comprises:

(a) The coal mine from where the methane is extracted;

For the project, Zhujixi coal mine is the coal mine from where the methane extracted.

(b) All equipment installed and used for the extraction, purification, compression, and storage of methane and transport to an off-site user;

For the project, there is no equipment for compression, CMM storage and transport to off-site user. Facilities for CMM drainage and extraction were installed prior to the implementation of the project activity. They are owned by the coal mine and are used primarily to maintain underground mining safety. Since they are not installed and used as part of the project activity, they are not considered in both the investment analysis and baseline calculations.

(c) Facilities that are installed and used as part of the project activity for flaring, flameless oxidation, captive power and heat generation, gas production and transportation;

For the project, CMM delivery system, RTOs installed and used in the Project.

(d) Power plants connected to the electricity grid, where the project activity exports power to the grid and emission reductions are claimed for the displacement of grid emissions, as per the definition of project electricity system and connected electricity system given in the latest version of the "Tool to calculate the emission factor for an electricity system".

For the project, ECPG supply electricity to the project, thus power plants connected to ECPG were included in the project boundary.

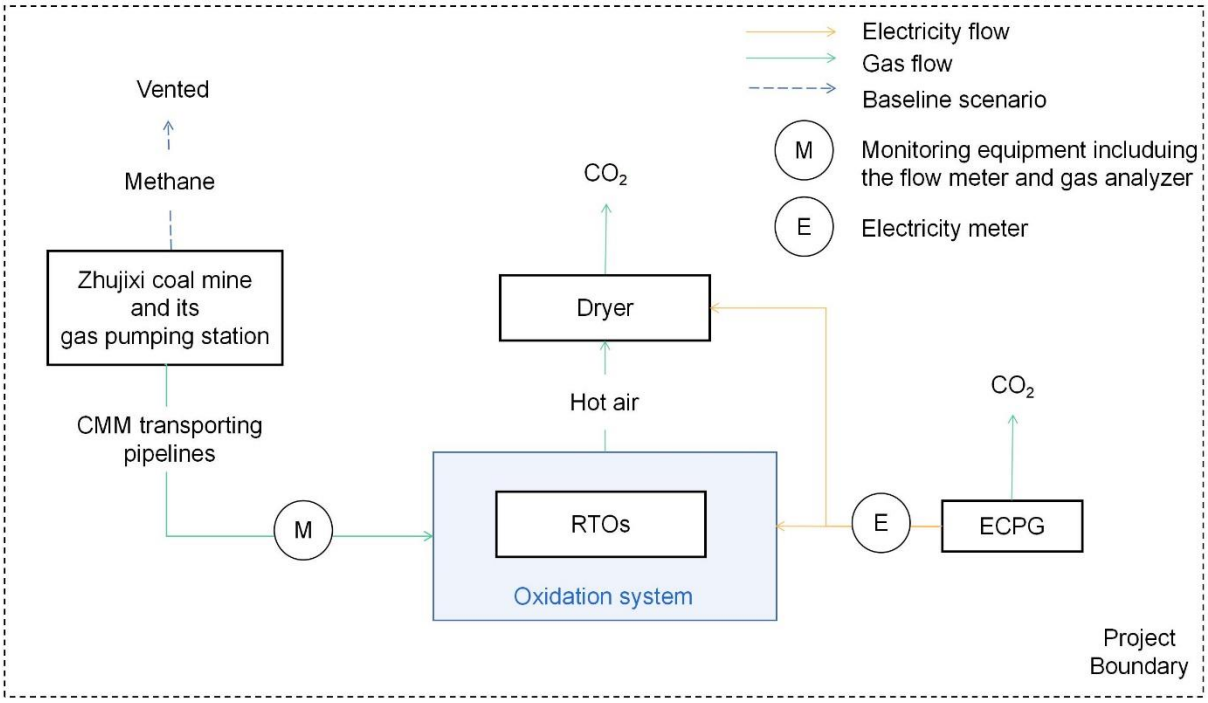


Figure 3 Diagram of the project boundary

The main emission sources and gases included in the project boundary are listed in Table 5 below:

Table 5 Emission sources included in or excluded from the project boundary

Source		Gas	Included?	Justification/Explanation
Baseline scenario	Methane emissions as a result of venting	CH_4	Yes	Main emission source. All CMM captured and sent to electricity generators would be vented in the baseline scenario.
	Emissions from destruction of methane in the baseline	CO_2	No	No flaring or energy use in the baseline scenario.
		CH_4	No	Excluded for simplification.
		N_2O	No	Excluded for simplification.
	Electricity generation (electricity provided to the grid and/or to the captive	CO_2	No	Only included if the project activity is to replace electricity from the grid, and emission

	user), heat and vehicle fuel use			reductions are claimed for such displacement.
		CH_4	No	Excluded for simplification.
		N_2O	No	Excluded for simplification.
Project scenario	Emissions of methane as a result of continued venting	CH_4	No	The project will take into account only the change in CMM emissions in ex ante estimate of GHG emission reduction; this will be done through rigorous monitoring of the amount of methane utilized or destroyed by the project activity.
	On-site electricity and fuel consumption due to the project activity, including transport of the gas	CO_2	Yes	Electricity consumed for the operation of all facilities.
		CH_4	No	Excluded for simplification. This emission source is assumed to be very small.
		N_2O	No	Excluded for simplification. This emission source is assumed to be very small.
	Emissions from methane destruction	CO_2	Yes	Emissions from the oxidation of CMM in RTO in the project activity will be considered.
	Fugitive emissions of unburned methane	CH_4	Yes	Un-oxidated methane from RTO will be considered.
	Fugitive methane emissions from on-site equipment	CH_4	No	Excluded for simplification. This emission source is assumed to be very small.

3.4 Baseline Scenario

According to methodology ACM0008, the latest approved version of the "Combined tool to identify the baseline scenario and demonstrate additionality" is applied to identify the baseline scenario.

Step 0: Demonstration whether the proposed project activity is the first-of-its-kind

The project activity is not the first-of-its-kind.

Step 1: Identification of alternative scenarios

Define realistic and credible alternatives to the project activity(s) through the following Sub-steps:

Sub-step 1a: Define alternative scenarios to the proposed project activity.

Identify realistic and credible alternative(s) available to the project participants or similar project developers that provide outputs or services comparable with the project activity.

a. Options to **handle methane**

According to ACM0008 (version 08.0), the baseline scenario alternatives should include all feasible options to handle methane to comply with safety regulations. These alternatives may include, inter alia:

A1: Extraction of methane prior to the mining (CBM/OCM);

A2: Extraction of methane during and after the mining (CMM);

A3: Extraction of methane through ventilation during the mining;

A4: Extraction of methane from the abandoned mine;

A5: Possible combinations of options A1 to A4 with the relative shares of gas specified.

b. Options to **deal with methane**

The baseline scenario alternatives should include all feasible options to deal with methane. These options could include:

B1 Venting of methane;

B2 Flaring of methane;

B3 Use of methane for energy production, e.g. electricity generation, heat generation, vehicle fuel, gas production, etc.

B4 Possible combinations of options B1 to B3 with the relative shares of gas specified.

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

Any options for CMM management and use that do not meet with local legal or regulatory requirements should be eliminated.

a. Eliminate options to **handle methane**

According to the latest version of National Coalmine Safety Regulation (2016)[12] issued by the State Administration of Work Safety of China and in effect since 01-Oct-2016, the coal mines must be equipped with a complete independent ventilation system and a gas drainage system to ensure the underground safe production; therefore, the pumping system must be installed. Under normal circumstances, the pre-mining extraction and the extraction during mining are carried out through the same set of pumping system, so it is difficult to separate the extraction prior to the mining and the extraction during and after the mining. Therefore, it does not comply with the regulations to carry out pre-mining extraction, during and post-mining extraction separately, and the combination of the two methods must be adopted; the options A1 and A2 are excluded. Regarding Option A3, the methane concentration of the gas extracted through ventilation during the mining must be less than 1% to ensure the safety production, and it cannot be used for electricity generation, which means that Option A3 is excluded. And since the coal mines involved in the Project are not abandoned mines, Option A4 is excluded.

In conclusion, option A5 possible combinations of options A1 to A2 is in compliance with legal and regulatory requirements to handle methane.

b. Eliminate options to **deal with methane**

The extracted CMM utilized in the project is low concentration methane, which is below 30%. On 21-January-2010, the Decision on the Revision of Certain Aspects of the <Coalmine Safety Regulation> was released by the State Administration of Work Safety, stating that CMM with methane concentration of below 30% is forbidden to be combusted directly, but can be either vented or utilized for energy generation.

According to the above regulations, flaring of methane with direct combustion of methane concentration of below 30% is prohibited. Therefore, Option B2 is eliminated.

Regarding option B3 Use of methane for energy production, e.g. electricity generation, heat generation, vehicle fuel, gas production, etc

The electricity demand of the mining area has been able to be met by CMM power generation unit, and there is no additional electricity demand, no need for additional electricity, so option B3 use of methane for electricity generation is excluded.

The concentration and flow of CMM in coal mines are unstable, and the CMM gas sold to the high-pressure natural gas pipeline network should be purified to CH_4 concentration greater than 95%. The project is located in Huainan City, which is mainly composed of plateau mountains. The construction of pipeline project and investment are relatively large. Therefore, it is not suitable to transport to gas pipelines to be used as fuel for vehicles or gas production. Meanwhile, according to “the Urban Gas Specification” (GB50028-93), as urban gas, methane

[12] https://www.mem.gov.cn/gk/gwgg/agwzlfl/zjl_01/201603/W020190705622814170708.pdf

concentration of CMM should reach 36.8%~78.9%. so option B3 use of methane for energy generation, e.g. vehicle fuel, gas production is excluded.

As option B4 possible combinations of options B1 to B3 with the relative shares of gas specified, according to analyse above, the possible combinations are option B1 venting of methane and option B3 use of methane for heat generation. However, it is contradictory for methane venting and methane use for heat, thus, option B4 is excluded.

In conclusion, options B1 venting of methane and B3 use of methane for heat generation are the applicable scenarios in compliance with legal and regulatory requirements.

As above, the baseline alternative options that are technically feasible and comply with all legal and regulatory requirements are listed below:

Scenario ID	CMM extraction	CMM treatment
Scenario 1 (A5+B1)	Combinations of options A1 to A2	Venting
Scenario 2 (A5+B3)	Combinations of options A1 to A2	Use of methane for hot air (thermal energy) production

Step 2: Barrier analysis

Not applicable.

The two combined scenarios need to be further discussed in section 3.5 Step 3: Investment analysis and step 4: Common analysis.

3.5 Additionality

Scenario 2 alternative combination A5+B3 is the situation of project scenario, which can be described as: Extracting methane prior to the mining (CBM/OCM) or methane during and after the mining (CMM) for hot air production and the project activity not undertaken as a VCS project activity. The project activity would not be implemented without the VCS revenue. The project scenario isn't financially attractive, as demonstrated by following steps by using the Tool01 for the Demonstration and Assessment of Additionality (Version 07.0.0) approved by the CDM EB and VCS. Meanwhile, alternative combination A5+B1 is to maintain the present situation and faces no financial barrier. As a supplementary statement for selecting baseline scenarios, alternative combination A5+B1 can be determined as baseline scenario here.

Step 3[13]: Investment Analysis

Sub-step 3a: Determine appropriate analysis method

[13] Here, step 2 of Tool01 is used for investment analysis.

Tool for the Demonstration and Assessment of Additionality (Version 07.0.0) recommends three analysis methods including simple cost analysis (Option I), investment comparison analysis (Option II) and benchmark analysis (Option III).

The project may generate economic benefits through charging for drying coal slimes as well as CDM/VCS revenues, therefore simple cost analysis (Option I) is not appropriate.

Benchmark analysis (Option III) is applied for the project.

Sub-step 3b: Option III. Apply benchmark analysis

Physical processing of coal products belongs to coal cleaning industry, of which the benchmark IRR is 16% (equity IRR, after tax) according to Fagaitouzi[2013]No.586[14] published by National Development and Reform Commission. If the project has an equity IRR less than the benchmark of 16% (after tax), then the project cannot be considered as financially attractive.

Sub-step 3c: Calculation and comparison of the financial indicator

Based on the Feasibility Study Report (FSR), the main assumptions for the investment analysis are shown in *Table 6*.

Table 6 Main parameters for investment analysis and evaluation

	Main parameter	Unit	Value
1	Total static investment	CNY	61,922,000
2	Working capital	CNY	2,196,000
3	Project lifetime (excluded the construction period)	Year	10
4	Annual dry coal slime output	t/year	335,600
5	Coal slime drying tariff including VAT	CNY/t	90
6	Value added tax rate (VAT)	-	13%
7	City maintenance & construction tax rate	-	5%
8	Educational surcharges rate	-	5%
9	Income tax rate	-	25%
10	Depreciation Period	years	10
11	Scrap value of fixed assets	-	3%

[14] https://www.ndrc.gov.cn/fggz/gdzctz/tzfg/201907/W020191104862129391071.pdf

12	OM costs		
	Employee	Number	20
	Salary	CNY per person per year	80,000
	Coefficient of welfare	%	59%
	Material fee	CNY/year	7,862,000
	Insurance fee	%	0.3%
	Repair rate	%	5%

The equity IRR (after tax) is shown in following table:

Without VERs revenue	With VERs revenue	Benchmark
10.25%	15.20%	16%

The conclusion drawn from the investment analysis is that Scenario 2, i.e., the Project without revenue from carbon credits, would not be financially attractive.

A sensitivity analysis is conducted to assess whether the conclusion regarding the financial attractiveness is robust to reasonable variations in the critical assumptions, i.e., whether the equity IRR without revenue from carbon credits would remain below the benchmark value. As per TOOL27 (version 12.0), variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation. Among the parameters listed in *Table 6*, the total static investment is the main project cost during the project construction; during the project operation, the majority of project costs are O&M cost. Regarding project revenues, the service tariff from drying wet coal slime constitutes the major part; since the service tariff are directly influenced by the dry coal slime output, this parameter should hence be subjected to variation.

In summary, the variables which are subjected to variation include:

- Total static investment

- Annual coal slime output

- Annual O&M cost

- Coal slime tariff

The IRR values with variations in these financial parameters are shown in *Table 7*.

Table 7 Sensitivity analysis of Project IRR to variations in financial parameters

	–10%	-5%	0	+5%	+10%	Critical variation
Total static investment	12.97%	11.55%	10.25%	9.05%	7.93%	-19.37%
Annual coal slime output	5.43%	7.92%	10.25%	12.46%	14.61%	13.33%
Annual O&M cost	12.82%	11.55%	10.25%	8.92%	7.56%	-22.18%
Coal slime tariff	5.43%	7.92%	10.25%	12.46%	14.61%	13.33%

As shown table above, even when the total static investment and O & M Costs fluctuate within the range of –10%~10%, the equity IRR (after tax) of the project remains less than 16%. The project is financially unattractive even under wide market variation, thus the Project is not feasible without VERs revenues.

Since all the data used for the investment analysis was sourced from the FSR, which was completed by qualified third party and approved by authorized official. Therefore, the data used in the investment analysis are believed to be reliable and credible and none of above conditions can be achieved.

In conclusion, the equity IRR (after tax) will not reach the benchmark of 16% within reasonable fluctuation range, and the fluctuation scenario of the uncertain factors which could make the Project financially feasible is unlikely to occur. Therefore, the conclusion regarding the feasibility of the project is robust to reasonable variations of the critical assumptions.

Step 4. Common Practice Analysis

Sub-step 4a. Analyse other activities similar to the proposed Project Activity

According to the Tool24 Common Practice (version 3.1), other activities similar to the proposed project activity are analysed as follows:

- ***Calculate applicable capacity or output range as +/-50% of the total design capacity or output of the proposed project activity.***

The project is a CMM utilization project with a designed gas treatment capacity of 10,368,000 m^3 of CH_4 per year, and ± 50% of the capacity is thus from 5,184,000 m^3/y to 15,552,000 m^3/y.

Sub-step 4-2: Identify similar projects (both CDM and non-CDM) which fulfil all of the following conditions:

- ***Identify similar projects (both CDM and non-CDM) which fulfil all the following conditions:***

(a) The projects are located in the applicable geographical area;

As the technology development, geological and transportation conditions and economic development level vary a lot from one province to another, only projects located in Anhui Province are considered.

(b) The projects apply the same measure as the proposed project activity;

Only projects which applies flameless oxidation using CMM are considered.

(c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity;

Only projects which use CMM are considered.

(d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas as the proposed project plant;

Only projects which generate hot air to dry wet coal slime are considered.

(e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1;

Only projects with a gas treatment capacity between 5,184,000 m^3/y to 15,552,000 m^3/y are considered.

(f) The projects started commercial operation before the project design document (VCS-PD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity.

Under the CDM program, the start date is defined as the date on which the project participants commit to making expenditures for the construction or modification of the main equipment or facility, or for the provision or modification of a service; where a contract is signed for such expenditures, it is the date on which the contract is signed; if the project involves more than one of such contracts or incurred expenditures, it is the first of the respective dates. Regarding the Project, the first major contract signed was the Construction Contract of Regenerative Thermal Oxidizer, signed on 30-May-2021; this date is hence considered as the start date. Therefore, only projects which started commercial operation before 30-May-2021 are considered.

To sum up, similar projects should be located in Anhui Province, able to utilize 5,184,000 m^3 to 15,552,000 m^3 of CMM per year, and started commercial operation before 30-May-2021

There is no similar project under CDM, VCS, GS and any GHG reduction programme or mechanism.

- ***Within the projects identified in Step 2, identify those that are neither registered GHG project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number N_{all}.***

Because the number of identified projects is 0, N_{all}=0.

- ***Within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their Number N_{diff}.***

Since N_{all}=0, N_{diff}=0.

- ***Calculate factor $F=1-N_{diff}/N_{all}$ representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.***

The factor for the project activity is calculated as follows:

In terms of the formula: $F=1-N_{diff}/N_{all}$, the result is mathematically meaningless.

$N_{all} - N_{diff}=0$

Thus, the project does not fulfil the requirement that F is greater than 0.2 and $N_{all}-N_{diff}$ is greater than 3, and the project is not a common practice in Anhui Province.

3.6 Methodology Deviations

Not applicable.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Baseline emissions are determined in two steps:

Step A. Determination of methane eligible for crediting

For the project, all captured CMM is eligible for crediting.

Step B. Determination of baseline emissions.

Baseline emissions would have occurred due to methane destruction, methane venting and use of other fossil fuels that are displaced by methane under the project activity. Baseline emissions due to venting should be discounted in case host country has regulations in place that are restricting the release of methane into the atmosphere.

$$BE_y = BE_{MD,y} + BE_{MR,y} + BE_{Use,y} \quad (1)$$

Where:

BE_y	=	Baseline emissions in year y (tCO_2e)
$BE_{MD,y}$	=	Baseline emissions from destruction of methane in the baseline scenario in year y (tCO_2e);
$BE_{MR,y}$	=	Baseline emissions from release of methane into the atmosphere in year y that is avoided by the project activity (tCO_2e)
$BE_{Use,y}$	=	Baseline emissions from the production of power, heat or other forms of useful energy replaced by the project activity in year y (tCO_2e)

Methane destruction in the baseline scenario

The baseline scenario does not involve any flaring or usage of CMM, therefore, there is no methane destruction in the baseline. So, destruction of methane in the baseline scenario ($BE_{MD,y}$) is 0.

Methane venting in the baseline scenario

The amount of methane that would have been emitted to the atmosphere in the baseline scenario shall be determined as follows:

$$BE_{MR,y} = \sum_{i}\sum_{s}(MT_{PJ,s,i,y} - MT_{BL,s,i,y}) \times GWP_{CH4} \qquad (2)$$

Where:

$BE_{MR,y}$	=	Baseline emissions from release of methane into the atmosphere in year y that is avoided by the project activity ($t_{CO2}e$)
$MT_{PJ,s,i,y}$	=	Methane from source s captured and destroyed by use i in the project activity in year y ($t\ CH_4$);
$MT_{BL,s,I,y}$	=	Methane from source s that would have been captured and destroyed by use i in the baseline scenario in the year y ($t\ CH_4$) ;
i	=	Use of methane (flaring, power generation, etc.)
s	=	Source of methane that would have been captured, sent to and destroyed by use i in the baseline scenario in the year y. This may include eligible CBM, CMM, VAM, eligible AMM and eligible OCM
GWP_{CH4}	=	Global warming potential of methane ($t\ CO_2e/t\ CH_4$)

In the baseline scenario, there is no CMM captured and destroyed, and the use of methane only involves hot air production, thus $MT_{BL,s,I,y}$ is 0;

Thus,

$$BE_{MRy} = MT_{PJ,s,i,y} \times GWP_{CH4} \quad (3)$$

Production of power, heat or other forms of useful energy replaced by the project activity in baseline scenario

The project used extracted CMM for hot air (thermal energy) generation. However, the generated hot air can't be monitored. Thus, for the conservative, the emission reduction generated by hot air replacement is not claimed. So $BE_{Use,y}$=0

To conclude, the baseline emissions is calculated by the following equation:

$$BE_y = BE_{MR,y} \quad (4)$$

4.2 Project Emissions

Project emissions comprise the following sources:

(a) Emissions from the energy use to capture and use methane;

(b) Emissions from destruction of captured methane through production of various energy types and/or flaring and/or flameless oxidation;

(c) Emissions from the un-combusted methane.

Project emissions are defined by the following equation:

$PE_y = PE_{ME,y} + PE_{MD,y} + PE_{UM,y}$ (5)

Where:

PE_y	=	Project emissions in year y (tCO_2e)
$PE_{ME,y}$	=	Project emissions from energy use to capture and use methane (tCO_2e)
$PE_{MD,y}$	=	Project emissions from destruction of captured methane (tCO_2e)
$PE_{UM,y}$	=	Project emissions from un-combusted methane in year y (tCO_2e)

Project emissions from the energy use to capture and to use methane

During the normal operation of the project activity, the additional electricity consumption required by the project activity to oxidate the methane gas flow and coal slime dryer.

According to methodology ACM0008 (v08.0), emissions due to electricity consumption should be determined using the latest version of the "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (v03.0) should be used.

Thus, $$PE_{ME,y} = PE_{EC,y} = \sum_j EC_{PJ,j,y} \times EF_{EF,j,y} \times (1 + TDL_{j,y}) \quad (6)$$

Where,

$PE_{EC,y}$	Project emissions from electricity consumption in year y (tCO_2/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_2/MWh)
$TDL_{j,y}$	Average technical transmission and distribution losses for providing electricity to source j in year y
j	Sources of electricity consumption in the project

For the project, Option A2 of Tool05 "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0) is chosen. A value of 1.3 t CO_2/MWh for $EF_{EF,j,y}$ is used to calculate project emissions because the project only involves electricity consumption from the national grid so it accords with (i) Scenario A applies only to project and/or leakage electricity consumption sources but not to baseline electricity consumption sources.

According to the tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0), i) 20% is used for "project or leakage electricity consumption sources". Thus, use as default values of 20% for project and leakage electricity consumption sources for the project, i.e. TDLj,y =20%.

Project emissions from destruction of captured methane

When the captured methane is burned in a flare, heat or power plant, or oxidized in a flameless oxidation unit, combustion emissions are released.

$$PE_{MD,y} = \sum_{i} MD_{i,y} \times CEF_{CH4} \quad (7)$$

Where:

$PE_{MD,y}$	=	Project emissions from methane destroyed (tCO_2e)
$MD_{i,y}$	=	Methane destroyed through use i (tCH_4)
i	=	Use of methane (power generation, heat generation, supply to gas grid to various combustion end uses)
CEF_{CH4}	=	Carbon emission factor for combusted methane. Set as 2.75 (t CO_2/t CH_4)

The Project only involve in methane destroyed through hot air generation.

Thus, $PE_{MD,y}=MD_{i,y}\times CEF_{CH4}$

In each end-use, the amount of methane destroyed depends on the efficiency of oxidation of each end use and should be determined as follows.

$MD_{i,y} = MM_{i,y} \times Eff_{i,y}$ (8)

Where:

$MD_{i,y}$ = Methane destroyed through use i in year y (t CH_4)

$MM_{i,y}$ = Methane measured sent to use i in year y (tCH_4)

$Eff_{i,y}$ = Efficiency of methane destruction in use i in year y (%), equals to the parameter $EFF_{OX,y}$

For the parameter $MM_{i,y}$

As the gaseous flow is measured by flow meter with volume unit, density of the methane shall be determined in order to calculate the methane. The methane density is determined as per Tool08 "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0). For the project, the flow of gaseous stream is volume flow-wet basis, and the volumetric fraction is wet basis, thus, Option C is applied to determine the methane density as follow:

$$\rho_{i,n} = \frac{P_n \times MM_i}{R_u \times T_n} \quad (9)$$

Where:

$\rho_{i,n}$ = Density of greenhouse gas i in the gaseous stream at normal conditions (kg gas i/m^3 wet gas i)

P_n = Absolute pressure at normal conditions (Pa)

T_n = Temperature at normal conditions (K)

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

R_u = Universal ideal gases constant (Pa.m^3 /kmol.K)

The following requirements apply:

a) CH_4 is the greenhouse gas for which the mass flow will be determined;

b) The mass flow will be calculated on an hourly basis for each hour h in year y;

c) The mass flow calculated for hour h is 0 if the equipment is not working in hour h (Opj,h=not working), the hourly values are then summed to a yearly unit basis.

For the parameter $EFF_{i,y}$ ($EFF_{OX,y}$)

The project applies flameless oxidation process to treat CMM, so the efficiency of flameless oxidation process is determined as follows:

$$Eff_{OX,y} = 1 - \frac{PC_{CH4,exhaust,y} \times D_{CH4,correxh,y}}{PC_{CH4,VAM,y} \times D_{CH4,corrinflow,y}} \quad (10)$$

Where:

$EFF_{OX,y}$ = Efficiency of the flameless oxidation process in year y (%)

$PC_{CH4,exhaust,y}$ = Annual average concentration of methane in the gas flow exiting the flameless oxidation unit in year y (m^3/m^3)

$D_{CH4,correxh,y}$ = Annual average density of methane corrected for pressure and temperature in the exhaust gases corrected to reference conditions (t CH_4/m^3)

$PC_{CH4,VAM,y}$ = Annual average concentration of methane in the gas flow entering the flameless oxidation unit (m^3/m^3)

$D_{CH4,corrinflow,y}$ = Annual average density of methane entering the flameless oxidation unit corrected to reference conditions (t CH_4/m^3)

Project emissions from un-combusted methane

Not all of the methane sent to the flare, to the flameless oxidizer or used to generate power and heat will be combusted, so a small amount will be released to the atmosphere. These emissions are calculated as follows:

$$PE_{UM,y} = GWP_{CH4} \times \sum_{i} MM_{i,y} \times (1 - Eff_{i,y}) \quad (11)$$

Where:

$PE_{UM,y}$ = Project emissions from un-oxidated methane (tCO_2e)

GWP_{CH4} = Global warming potential of methane (t CO_2e/t CH_4)

i = Use of methane (power generation, heat generation, supply to gas grid to various combustion end uses)

$MM_{i,y}$ = Methane measured sent to use i in year y (t CH_4), i is only for electricity, so $MM_{i,y}$

$Eff_{i,y}$ = Efficiency of methane destruction in use I in year y (%), equals to $EFF_{OX,y}$

For ex ante projections, the efficiency of destruction of methane in the flameless oxidation process may be assumed to be 90 per cent.

4.3 Leakage

Leakage may occur if the project activity prevents methane from being used to meet baseline thermal energy demand, whether as a result of physical constraints on delivery, or price changes.

Since the baseline scenario of the project does not include thermal energy use, the leakage (LEy) is taken as zero.

4.4 Net GHG Emission Reductions and Removals

According to formula (9), density of methane under 273.15K (temperature) and 101,325pa (pressure) $\rho_{i,n} = \frac{P_n \times MM_i}{R_u \times T_n}$=(101,325Pa × 16.04kg kmol^{-1})/ (8314Pa. m^3/kmol. K × 273.15K) =0.00071566 t CH_4/m^3.

The estimated annual CMM measured sent to RTO will be 10.368 million Nm^3 CMM per year when the project is fully operated. The volume of CMM utilized by the project is estimated under the temperature of 273.15K and 101,325pa. So the methane measured sent to destruct annually is calculated as follows:

$MT_{PJ,s,i,y} = MM_{i,y}$ =10.368×10^6 m^3×0.00071566 t/m^3= 7,419.963 tCH_4

1. **Calculation of the baseline emissions**

According to formula (3) and (4), the baseline emissions from release of methane into the atmosphere is: $BE_{MRy} = GWP_{CH4} \times MT_{PJ,s,i,y}$ = 28 tCO_2/tCH_4×7,419.963 tCH_4 = 207,758 tCO_2e

Baseline emissions are:

$BE_y = BE_{MR,y}$ = 207,758 tCO_2e

2. **Calculation of the project emissions**

2.1 Project emissions from the energy use to capture and to use methane are calculated with formula (6):

$PE_{ME,y} = EC_{PJ,y} \times EF_{i,y} \times (1+TDL_i)$= 11,232MWh x 1.3 MWh/t$CO_2$e x (1+20%)=17,522 t$CO_2$e

2.2 Project emissions from destruction of captured methane are calculated with formula (7), (8) and (9):

$PE_{MD,y} = MD_{i,y} \times CEF_{CH4} = MM_{i,y} \times Eff_{OX,y} \times CEF_{CH4}$=7,419.963 t$CH_4$×90%×2.75t$CO_2$/t$CH_4$=18,365 t$CO_2$e

2.3 Project emissions from un-combusted methane are calculated with formula (11)

$PE_{UM,y} = GWP_{CH4} \times MM_{i,y} \times (1-Eff_{OX,y})$ = 28 tCO_2/tCH_4×7,419.963 tCH_4×(1-90%) = 20,776 tCO_2e

Project emissions are calculated by formula (5), as follows:

$PE_y = PE_{ME,y} + PE_{MD,y} + PE_{UM,y}$= 17,522 t$CO_2$e +18,365 t$CO_2$e +20,776 t$CO_2$e =56,663 t$CO_2$e

3. **Calculation of the leakage**

As described in section 4.3, LE_y=0.

4. **Calculation of emission reductions**

The emission reductions can be obtained from the equation below:

$ER_y = BE_y - PE_y - LE_y$ = 207,758 tCO_2e – 56,663 tCO_2e -0 tCO_2e = 151,095 tCO_2e

Year	Estimated baseline emissions or removals	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals

	(tCO_2e)			(tCO_2e)
14- December -2021 to 31-December-2021	10,246[15]	2,794[16]	0	7,452
01- January -2022 to 31-December-2022	207,758	56,663	0	151,095
01- January -2023 to 31-December-2023	207,758	56,663	0	151,095
01- January -2024 to 31-December-2024	207,758	56,663	0	151,095
01- January -2025 to 31-December-2025	207,758	56,663	0	151,095
01- January -2026 to 31-December-2026	207,758	56,663	0	151,095
01- January -2027 to 31-December-2027	207,758	56,663	0	151,095
01- January -2028 to 31-December-2028	207,758	56,663	0	151,095
01- January -2029 to 31-December-2029	207,758	56,663	0	151,095
01- January -2030 to 31-December-2030	207,758	56,663	0	151,095
01- January -2031 to 13-December-2031	197,512[17]	53,869[18]	0	143,643
Total	2,077,580	566,630	0	1,510,950

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[15] It is covering 18 days from 14-December-2021 to 31-December-2021. So the estimated baseline emission during this period is 10,246 tCO_2e =207,758 tCO_2e *18 days/365days.

[16] It is covering 18 days from 14-December-2021 to 31-December-2021. So the estimated project emission during this period is 2,794 tCO_2e =56,663 tCO2e *18 days/365days.

[17] It is covering 347 days from 01-January-2031 to 13-December-2031. So the estimated baseline emission during this period is 197,512 tCO2e =207,758 tCO2e *347 days/365days.

[18] It is covering 347 days from 01-January-2031 to 13-December-2031. So the estimated project emission during this period is 53,869 tCO2e = 56,663 tCO2e *347 days/365days.

5.1 Data and Parameters Available at Validation

Data / Parameter	CEF_{CH4}
Data unit	tCO_2e/ tCH_4
Description	Carbon emission factor for combusted methane
Source of data	ACM0008 (Version 08.0)
Value applied	2.75
Justification of choice of data or description of measurement methods and procedures applied	ACM0008 (Version 08.0) default value
Purpose of Data	Calculation of project emissions
Comments	$44/16 = 2.75tCO_2e/tCH_4$

Data / Parameter	$EF_{EF, j,y}$
Data unit	tCO_2e/ MWh
Description	Default value of the emission factor
Source of data	Tool 05 "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation"
Value applied	1.3
Justification of choice of data or description of measurement methods and procedures applied	Project emissions of the project only involves electricity consumption from the national grid, so a value of 1.3 t CO_2/MWh is chosen as the project accords with (i), (a), Option A2.
Purpose of Data	Calculation of project emissions
Comments	-

Data / Parameter	$TDL_{j,y}$
Data unit	%
Description	Average technical transmission and distribution losses for providing electricity to source j in year y

Source of data	Methodological tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (v03.0)
Value applied	20%
Justification of choice of data or description of measurement methods and procedures applied	According to the tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0), i) Use as default values of 20% for "project or leakage electricity consumption sources" Thus, Use as default values of 20%.
Purpose of Data	Calculation of project emissions
Comments	The parameter will be updated according to the tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 03.0).

Data / Parameter	R_u
Data unit	$Pa.m^3/kmol.K$
Description	Universal ideal gases constant
Source of data	Tool08 "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0)
Value applied	8,314
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	Calculation of parameter $\rho_{i,n}$, which is used to calculate the methane captured and destroyed by the project activity in mass unit
Comments	-

Data / Parameter	MMi
Data unit	kg/kmol
Description	Molecular mass of greenhouse gas CH_4

Source of data	Tool08 “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (version 03.0)
Value applied	16.04
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	Calculation of parameter $\rho_{i,n,}$ which is used to calculate the methane captured and destroyed by the project activity in mass unit
Comments	-

Data / Parameter	P_n
Data unit	pa
Description	Total pressure at normal conditions
Source of data	Tool08 “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (version 03.0)
Value applied	101,325 Pa
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	Calculation of parameter $\rho_{i,n}$, which is used to calculate the methane captured and destroyed by the project activity in mass unit
Comments	-

Data / Parameter	T_n
Data unit	K
Description	Temperature at normal conditions
Source of data	Tool08 “Tool to determine the mass flow of a greenhouse gas in a gaseous stream” (version 03.0)
Value applied	273.15

Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	Calculation of parameter $\rho_{i,n}$, which is used to calculate the methane captured and destroyed by the project activity in mass unit
Comments	-

Data / Parameter	$\rho_{i,n}$
Data unit	Kg gas i/m^3 gas i
Description	Density of methane under the condition of 273.15 K (temperature) and 101,325 pa (pressure)
Source of data	Tool08 "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0)
Value applied	0.71566
Justification of choice of data or description of measurement methods and procedures applied	-
Purpose of Data	Used to calculate the methane captured and destroyed by the project activity in mass unit. For $MT_{PJ,s,i,y}$ and $MM_{i,y}$ is monitored by flow meter in volume unit, which will be converted to mass unit.
Comments	Applicable to Option C, $\rho i,n$=101,325Pa × 16.04kg/kmol ÷ (8314Pa. m^3/kmol. K × 273.15K) = 0.71566 kg gas i/m^3 gas i

5.2 Data and Parameters Monitored

Data / Parameter	$MT_{PJ,s,i,y}$
Data unit	tCH_4
Description	Methane from source s captured and destroyed by use i in the project activity in year y
Source of data	Calculated using the monitored data
Description of	$MT_{PJ,s,i,y}$ is calculated by multiplying methane volume (measured

measurement methods and procedures to be applied	by flow meters) and methane density $\rho_{i,n}$. All electronic data and paper documents will be archived for two years following the end of the crediting period.
Frequency of monitoring/recording	Continuous
Value applied	7,419.963 (Ex ante)
Monitoring equipment	flow meter and gas analyzer
QA/QC procedures to be applied	Flow meter and gas analyzer will be periodically checked and calibrated.
Purpose of data	Calculation of baseline emissions
Calculation method	For $MT_{PJ,s,i,y}$ is monitored by flow meter in volume unit, which will be converted to mass unit with the parameter of $\rho_{i,n}$..
Comments	-

Data / Parameter	$MM_{i,y}$
Data unit	tCH_4
Description	Methane measured sent for heat generation in year y
Source of data	Calculated from the monitored data
Description of measurement methods and procedures to be applied	$MM_{i,y}$ (same as $MT_{PJ,s,i,y}$) is calculated by multiplying methane volume (measured by flow meters and methane density $\rho_{i,n}$). All electronic data and paper documents will be archived for two years following the end of the crediting period.
Frequency of monitoring/recording	Continuous
Value applied	7,419.963 (Ex ante)
Monitoring equipment	Flow meter and gas analyzer
QA/QC procedures to be applied	Flow meter and gas analyzer will be periodically checked and calibrated.
Purpose of data	Calculation of project emissions
Calculation method	For $MM_{i,y}$ (volume) is monitored by flow meter in volume unit, which will be converted to mass unit with the parameter of $\rho_{i,n}$.

Comments	-

Data / Parameter	GWP_{CH4}
Data unit	tCO_2e/ tCH_4
Description	Global warming potential of methane
Source of data	IPCC Fifth Assessment Report (AR5)
Description of measurement methods and procedures to be applied	IPCC Fifth Assessment Report (AR5) default value
Frequency of monitoring/recording	The parameter will be updated according to the relevant documents
Value applied	28
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of baseline emissions and project emissions
Calculation method	-
Comments	-

Data / Parameter	$EC_{PJ,j,y}$
Data unit	MWh
Description	Quantity of electricity consumed by the project electricity consumption source j in year y
Source of data	Monitoring data provided by the project owner
Description of measurement methods and procedures to be applied	The electricity meter and monthly recorded. All electronic data and paper documents will be archived for two years following the end of the crediting period.
Frequency of monitoring/recording	Continuously
Value applied	11,232 (ex ante)

Monitoring equipment	The electricity meter
QA/QC procedures to be applied	The data will be confirmed by recordings from POs. The electricity meter will be periodically checked and maintained. Calibration will be carried out once a year to ensure normal operation.
Purpose of data	Calculation of project emissions.
Calculation method	-
Comments	-

Data / Parameter	$EFF_{i,y}$ ($Eff_{OX,y}$)
Data unit	-
Description	Efficiency of methane destruction in use i
Source of data	Calculated using recording documents from PP
Description of measurement methods and procedures to be applied	The parameter is calculated with the formula: $Eff_{OX,y} = 1 - \frac{PC_{CH4,exhaust,y} \times D_{CH4,correxh,y}}{PC_{CH4,VAM,y} \times D_{CH4,corrinflow,y}}$. $PC_{CH4,exhaust,y}$ and $PC_{CH4,VAM,y}$ represent "annual average concentration of methane in the flameless oxidation exiting the flameless oxidation unit in year y" and "annual average concentration of methane in the gas flow entering the flameless oxidation unit" respectively. The two variations are measured by concentration meters on-site, daily collected and monthly aggregated. $D_{CH4,correxh,y}$ and $D_{CH4,correinflow,y}$ represent "annual average density of methane corrected for pressure and temperature in the exhaust gases corrected to reference conditions" and "annual average density of methane entering the flameless oxidation unit corrected to reference conditions" respectively. All electronic data and paper documents will be archived for two years following the end of the crediting period.
Frequency of monitoring/recording	Daily collected and monthly aggregated
Value applied	90% (ex-ante)
Monitoring equipment	Concentration meters
QA/QC procedures to be applied	The calculation value of $Eff_{OX,y}$ and 90% (ex-ant value) will be compared and the minimum value will be taken

Purpose of data	Calculation of project emissions
Calculation method	$Eff_{OX,y} = 1 - \frac{PC_{CH4,exhaust,y} \times D_{CH4,correxh,y}}{PC_{CH4,VAM,y} \times D_{CH4,corrinflow,y}}$
Comments	-

5.3 Monitoring Plan

The monitoring plan presented in this PD 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. The details of the monitoring plan are specified as follows:

（A） Data and parameters to be monitored

Data and parameters to be monitored are listed below shows the positions of the monitoring instruments and the table below lists the corresponding parameters monitored:

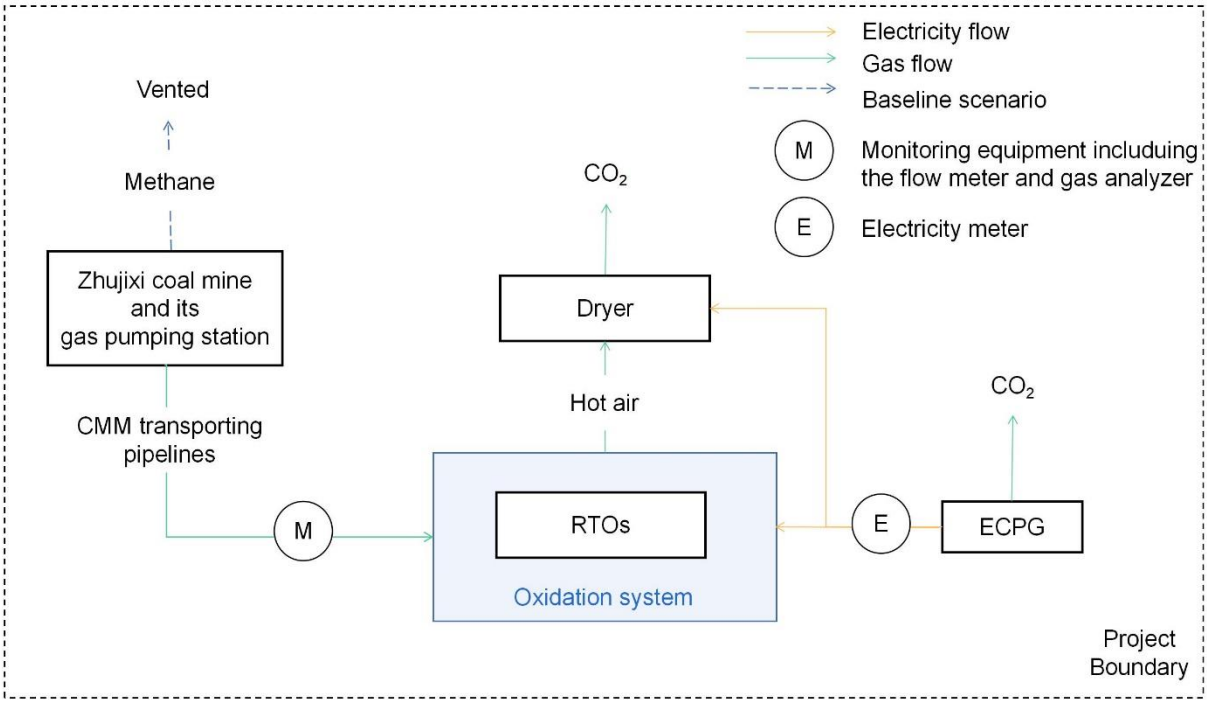

Figure 4 Project monitoring diagram

(B) Management Structure

The Project owner organizes a specific VCS team in project development department to be responsible for data collection, supervision and witness the whole process of data measuring and recording. A VCS manager is appointed to take full responsibility for the overall monitoring of the project. The monitoring and measurement of extracted gas, electricity generation and

consumption etc. are carried out by a few designated monitoring officers. In addition, the Project developer appoints internal verifiers who is responsible for internal check of the measurement, collection of relevant receipts and invoices, and the calculation of the emission reductions. A monitoring and management manual of the project that identifies detailed duties and responsibilities of the relevant parties is developed and served as the basis of the project monitoring. Figure below shows the operation and management structure of the Project.

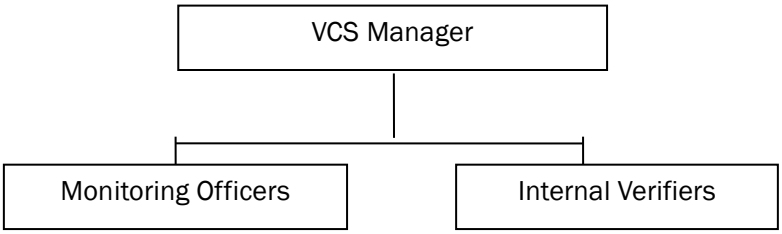

Figure 5 Operation and management structure of the project

(C) Data collection

Monitoring officers are responsible for data collection. Designated teams will read and collect the monitored data regularly. The computer system will automatically monitor and record relevant meter data. Automatic records will serve as the main data source for emission reductions calculation. All data files, relevant purchase invoices and sales receipts will be collected by a designated monitoring officer, who will prepare backup in time and archive all documents properly.

(D) Quality assurance

All metering equipment for monitoring will be chosen in accordance with VCS requirements, and will be calibrated regularly for accuracy by qualified party according to the national regulations. To assist in future verifications, the Project owner will preserve the calibration records, along with the data files of project monitoring.

Error check routines will be established on site and at the point of data storage to detect data measuring/transmission failures as well as malfunctions. In the case of malfunction of the meters, the meter supplier will provide technical support to engage the problem promptly and emission reductions during the corresponding period will be calculated conservatively.

The installation of the electricity metering equipment will fulfill the requirements of "*DL/T448–2016 Technical Administrative Code of Electric Energy Metering*"[19]. The accuracy should not be less than 0.5S. The installation of flow meters and gas analyzers will fulfill the national standard (MT448-2008 and JJG 1138-2017). All the meters will be checked and maintained periodically.

[19] https://wenku.baidu.com/view/c8ad0b432379168884868762caaedd3383c4b59e.html

(E) Data file management

All monitoring data will be electronically filed by the end of each month and the electronic data files will be archived in both disk copy and printed hard copy. Other documents in paper e.g. maps, forms and environment assessment reports will be preserved as well. All data collected as part of monitoring will be archived electronically and be kept at least for 2 years after the end of the crediting period. The Project owner will provide original records and documents if necessary.