



# CHOL CHAROEN GROUP WASTEWATER TREATMENT WITH BIOGAS SYSTEM I (CHOLBURI)



|                                  |                                                                         |
|----------------------------------|-------------------------------------------------------------------------|
| <b>Project title</b>             | Chol Charoen Group Wastewater Treatment with Biogas System I (Cholburi) |
| <b>Project ID</b>                | VCS 430                                                                 |
| <b>Monitoring period</b>         | 01 May 2021 to 31 March 2022                                            |
| <b>Original date of issue</b>    | 22 August 2023                                                          |
| <b>Most recent date of issue</b> | 05 November 2025                                                        |
| <b>Version</b>                   | 08.2                                                                    |
| <b>VCS Standard Version</b>      | 4.7                                                                     |
| <b>Prepared by</b>               | South Pole Carbon Asset Management Ltd.                                 |

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# PROJECT DETAILS

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

Chol Charoen Group Wastewater Treatment with Biogas System I (Cholburi), hereafter “the project activity”, involves the installation and operation of a biogas recovery and utilization system at Chol Charoen Co. Ltd., a tapioca starch factory in Chonburi, Thailand. The system has been in operation since 7 January 2006 (the project start date).

This starch factory has a design daily production capacity of 240 tonnes of dried starch, generating 2,400 m<sup>3</sup> of wastewater per operational day. Under the previous system, wastewater released from the plant was treated in 13 cascading, open anaerobic lagoons with a depth greater than 2 m from the water surface. This condition was a suitable anaerobic environment. Anaerobic bacteria in the ponds break down organic compounds in the wastewater, resulting in the release of biogas. The generated biogas is characterized by the chemical oxygen demand (COD) of the wastewater.

The project activity involves modification of the open anaerobic lagoon-based processes into a closed anaerobic system for the treatment of high organic matter wastewater. This is based on Anaerobic Fixed Film Reactor (AFFR) technology and three covered lagoons which were converted from the previous open lagoons.

The implementation of the AFFR system enables the recovery of biogas that would have been released to the atmosphere and the utilization of the recovered biogas for thermal and electricity generation. The reactor converts both soluble and particulate organic matter in the wastewater to biogas. The generated biogas will be sent to a thermal boiler to generate heat for utilization in a starch drying process. The burner is retrofitted with a combination fuel burner, which allows the boiler to be co-fired using both fuel oil and the biogas collected from the reactors. The biogas is also sent to power generators for electricity production. The power produced by the captured biogas augments the electricity requirement of the plant and is fed to the national grid, under the non-firmed power purchase agreement with the Provincial Electricity Authority (PEA). Excess biogas, if any, is sent to the enclosed flare system. With such utilization of biogas, the project activity achieves greenhouse gas (GHG) emission reductions through the avoidance of methane being released to the atmosphere, and also through the reduction of fossil fuel consumption in the heat generation and the grid electricity.

This is the 6<sup>th</sup> monitoring period of the 2<sup>nd</sup> crediting period. The monitoring period starts from 1 May 2021 to 31 March 2022. The total GHG emission reduction in this monitoring period is 29,731 tCO<sub>2e</sub>.

## 1.2 Audit History

| Audit type                                      | Period                               | Program | Validation/verification body name            | Number of years         |
|-------------------------------------------------|--------------------------------------|---------|----------------------------------------------|-------------------------|
| 1 <sup>st</sup> Crediting period validation     | 1 <sup>st</sup> Crediting period     | VCS     | TÜV NORD CERT GmbH                           | N/A                     |
| 1 <sup>st</sup> CP 1 <sup>st</sup> verification | 01-January-2007 - 31-December-2008   | VCS     | TÜV NORD CERT GmbH                           | 2 years                 |
| 1 <sup>st</sup> CP 2 <sup>nd</sup> verification | 01-January-2009 - 30-September-2010  | VCS     | Germanischer Lloyd Certification GmbH        | 1 year 9 months         |
| 1 <sup>st</sup> CP 3 <sup>rd</sup> verification | 01-October-2010 - 31-December-2011   | VCS     | Germanischer Lloyd Certification GmbH        | 1 year 3 months         |
| 1 <sup>st</sup> CP 4 <sup>th</sup> verification | 01-January-2012 - 31-July-2014       | VCS     | Epic Sustainability Services Private Limited | 2 years 7 months        |
| 1 <sup>st</sup> CP 5 <sup>th</sup> verification | 01-August- 2014 - 14- September-2014 | VCS     | Epic Sustainability Services Private Limited | 1 month 14 days         |
| 1 <sup>st</sup> CP 6 <sup>th</sup> verification | 15-September - 2014 - 31- May-2016   | VCS     | Epic Sustainability Services Private Limited | 1 year 8 months 16 days |
| 1 <sup>st</sup> CP 7 <sup>th</sup> verification | 01-June-2016 - 31-December-2016      | VCS     | KBS Certification Services Pvt. Ltd.         | 7 months                |
| 2 <sup>nd</sup> Crediting period validation     | 2 <sup>nd</sup> Crediting period     | VCS     | KBS Certification Services Pvt. Ltd.         | N/A                     |
| 2 <sup>nd</sup> CP 1 <sup>st</sup> verification | 01-January-2017 - 31-December-2017   | VCS     | KBS Certification Services Pvt. Ltd.         | 1 year                  |
| 2 <sup>nd</sup> CP 2 <sup>nd</sup> verification | 01-January-2018 - 31-March-2019      | VCS     | RINA Services S.p.A.                         | 1 year 3 months         |
| 2 <sup>nd</sup> CP 3 <sup>rd</sup> verification | 01-April-2019 - 31-December-2019     | VCS     | TÜV SÜD South Asia Pvt. Ltd.                 | 9 months                |
| 2 <sup>nd</sup> CP 4 <sup>th</sup> verification | 01-January-2020 - 02-March-2020      | VCS     | 4K Earth Science Private Limited             | 2 months                |

|                                                 |                               |     |                                  |                   |
|-------------------------------------------------|-------------------------------|-----|----------------------------------|-------------------|
| 2 <sup>nd</sup> CP 5 <sup>th</sup> verification | 03-March-2020 - 30-April-2021 | VCS | 4K Earth Science Private Limited | 1 year 2 months   |
| 2 <sup>nd</sup> CP 6 <sup>th</sup> verification | 01-May-2021 – 31-March-2022   | VCS | TÜV SÜD South Asia Pvt. Ltd.     | 11 months         |
| Total                                           |                               |     |                                  | 15 years 3 months |

### 1.3 Sectoral Scope and Project Type

Methane avoidance component:

|                              |                                   |
|------------------------------|-----------------------------------|
| <b>Sectoral scope</b>        | 13. Waste handling and disposal   |
| <b>Project activity type</b> | Type III Other project activities |

Electricity generation component:

|                              |                                                        |
|------------------------------|--------------------------------------------------------|
| <b>Sectoral scope</b>        | 1. Energy industries (renewable/non-renewable sources) |
| <b>Project activity type</b> | Type I Renewable energy projects                       |

Fuel replacement component:

|                              |                                                        |
|------------------------------|--------------------------------------------------------|
| <b>Sectoral scope</b>        | 1. Energy industries (renewable/non-renewable sources) |
| <b>Project activity type</b> | Type I Renewable energy projects                       |

### 1.4 Project Proponent

|                          |                                                                                  |
|--------------------------|----------------------------------------------------------------------------------|
| <b>Organization name</b> | Chol Charoen Co., Ltd.                                                           |
| <b>Contact person</b>    | Ung Mengchua                                                                     |
| <b>Title</b>             | Mr.                                                                              |
| <b>Address</b>           | 1004/200 Soi 27 Rama 3 Road,<br>Bangpongpan, Yannawa,<br>Bangkok, 10120 Thailand |
| <b>Telephone</b>         | +66 2 294 5315-6                                                                 |
| <b>Email</b>             | -                                                                                |

### 1.5 Other Entities Involved in the Project

|                          |                                         |
|--------------------------|-----------------------------------------|
| <b>Organization name</b> | South Pole Carbon Asset Management Ltd. |
|--------------------------|-----------------------------------------|

|                     |                                                                                                            |
|---------------------|------------------------------------------------------------------------------------------------------------|
| Role in the project | Project developer: Responsible for development of emission reduction through the Voluntary Carbon Standard |
| Contact person      | Daniel Klier                                                                                               |
| Title               | CEO                                                                                                        |
| Address             | Technoparkstrasse 1, Zurich 8005 Switzerland                                                               |
| Telephone           | +41 43 501 35 50                                                                                           |
| Email               | <a href="mailto:registration@southpole.com">registration@southpole.com</a>                                 |

## 1.6 Project Start Date

|                    |                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Project start date | 07-January-2006                                                                                                                                 |
| Justification      | This is the date on which retrofitted hot oil boiler became operational and began utilizing of biogas (the date when emission reduction began). |

## 1.7 Project Crediting Period

|                                                       |                                                                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Crediting period                                      | <input type="checkbox"/> Seven years, twice renewable<br><input type="checkbox"/> Ten years, fixed<br><input checked="" type="checkbox"/> Other<br><p>Ten years, two times renewable. Since the registered project has completed validation on or before 19 March 2020, it remains eligible to apply the crediting period requirements under VCS Version 3.</p> |
| Start and end date of first or fixed crediting period | <p>First crediting period: 01-January-2007 to 31-December-2016</p> <p>Second crediting period: 01-January-2017 to 31-December-2026.</p>                                                                                                                                                                                                                         |

## 1.8 Project Location

The proposed project activity is located at Chol Charoen Co., Ltd., in Banbung district, Chonburi<sup>1</sup> province, approximately 250 km from Bangkok. The project activity location is depicted in **Figure 1** and **Figure 2**.

Address: 204 Moo 3 Nongchak, Banbung, Chonburi, 20170, Thailand

<sup>1</sup> The province name was misspelled as "Cholburi" in the PDD and has been corrected to "Chonburi". The official spelling of the province name can be referred to the provincial website <https://www.chonburi.go.th/frontpage>.

Geographic coordinates: 13.295600, 101.151800 (Latitude 13°17'736"N, Longitude 101°09'108"E)



Figure 1: Project location



Figure 2: Geographic project boundary

## 1.9 Title and Reference of Methodology

| Type (methodology, tool or module). | Reference ID, if applicable | Title                                                                                                            | Version |
|-------------------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------|---------|
| Methodology                         | AMS-III.H                   | AMS-III.H Methane Recovery in Wastewater Treatment                                                               | 18.0    |
| Methodology                         | AMS-I.D                     | AMS-I.D Grid connected renewable electricity generation                                                          | 18.0    |
| Methodology                         | AMS-I.C                     | AMS-I.C Thermal energy production with or without electricity                                                    | 20.0    |
| Tool                                | TOOL06                      | Project emissions from flaring                                                                                   | 2.0     |
| Tool                                | TOOL05                      | Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation | 3.0     |
| Tool                                | TOOL03                      | Tool to calculate project or leakage CO2 emissions from fossil fuel combustion                                   | 3.0     |
| Tool                                | TOOL09                      | Determining the baseline efficiency of thermal or electric energy generation systems                             | 2.0     |
| Tool                                | TOOL07                      | Tool to calculate the emission factor for an electricity system                                                  | 6.0     |

## 1.10 Double Counting and Participation under Other GHG Programs

### 1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

*If yes, provide required evidence of no double issuance as outlined by the VCS Standard.*

### 1.10.2 Registration in Other GHG Programs

Was the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

*If yes, provide the registration number and all relevant details including the date of project inactivity in the other GHG program.<sup>2</sup>*

## 1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

### 1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

*If yes, provide all required evidence of no double claiming as outlined by the VCS Standard.*

### 1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

*If yes, provide all required evidence of no double claiming as outlined by the VCS Standard.*

### 1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☒ Yes ☐ No

*If yes:*

Is the project proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☒ Yes ☐ No

*If yes:*

Has the project proponent(s) or authorized representative posted a public statement on their website saying, "Carbon credits may be issued through the Verified Carbon Standard project [project ID] for the greenhouse gas emission reductions or removals associated with [project

<sup>2</sup> The requirement to provide the date of project inactivity only applies to projects which request registration or crediting period renewal under the VCS Program on or after 1 January 2025.

proponent or authorized representative organization name(s)] [name of product(s) whose emissions footprint is changed by the project activities].”

☐ Yes

☒ No

*If yes to all:*

*Provide evidence of the public statement. Evidence must be provided in this section or in an appendix.*

## 1.12 Sustainable Development Contributions

During this monitoring period, the project activity has contributed to Sustainable Development Goals (SDG) which are the SDG 7, 8 and 13. The installation of the anaerobic lagoon allows the recovery and capture of biogas that would have been released into the atmosphere. This installation reduces the amount of GHG released into the atmosphere, corresponding to the SDG 13, Climate Action. Additionally, the captured biogas is utilized to generate electricity, which contributes to SDG 7. Moreover, the operation of the project activity ensures the employment of local residents, contributing to the SDG 8. Please refer to evidence in Appendix 2.

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.b        | Expand infrastructure and upgrade technology for supplying modern and sustainable energy services | Implemented activities to increase usage of sustainable energies.                       | The utilization of captured biogas to generate electricity is an upgraded technology. During the monitoring period, the project contributes to generating 1,107.56 MWh of electricity. | Total generation of electricity over the project lifetime (since 1 <sup>st</sup> CP 1 <sup>st</sup> verification to 2 <sup>nd</sup> CP 6 <sup>th</sup> verification) is 50,152 MWh.      |
| 2)         | 8.5        | 8.5.1 Average hourly earnings of employees, by sex, age, occupation and persons with disabilities | Implemented activities to increase employment with fair payment without discrimination. | No further changes this monitoring period                                                                                                                                              | The project activity has and will continue in providing direct and indirect employment to the community. Fair salary above the minimum wage has been paid to the employee <sup>3</sup> . |

<sup>3</sup> Thailand minimum wage as of 2019, Choburi is 336 THB <https://www.mol.go.th/wp-content/uploads/sites/2/2020/01/Prakadwage10-6Jan2020.pdf>

|    |      |                                                       |                                                               |                                                                                                                                                                            |                                                                                                                                                                                       |
|----|------|-------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3) | 13.0 | Tonnes of greenhouse gas emissions avoided or removed | Implemented activities to increase avoidance of GHG emission. | The capture/recover of biogas reduces the amount of methane gas that is emitted to the atmosphere, decreasing the GHG emission, which equals to 29,731 tCO <sub>2</sub> e. | Total GHG removal over the project lifetime (since 1 <sup>st</sup> CP 1 <sup>st</sup> verification to 2 <sup>nd</sup> CP 6 <sup>th</sup> verification) is 548,424 tCO <sub>2</sub> e. |
|----|------|-------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### 1.13 Commercially Sensitive Information

There is no commercially sensitive information in this monitoring report.

## 2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

### 2.1 Stakeholder Engagement and Consultation

#### 2.1.1 Stakeholder Identification

The stakeholder was identified at the validation and has not been changed.

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Stakeholder Identification                  | The stakeholders were identified before the project validation process where the local stakeholder consultation was held on 24-July-2008. There is no change of stakeholders in this monitoring period.                                                                                                                                                                                                                   |
| Legal or customary tenure/access rights     | The land where the project is located belonged to Chol Charoen Co., Ltd. prior to the construction. Thus, this section is not applicable.                                                                                                                                                                                                                                                                                 |
| Stakeholder diversity and changes over time | There is no change of stakeholders in this monitoring period.                                                                                                                                                                                                                                                                                                                                                             |
| Expected changes in well-being              | The project offers numerous benefits to the local community by positively impacting the environment. These include reducing air pollution and odor issues, preventing groundwater contamination from wastewater, and avoiding the release of untreated wastewater into the external environment. Additionally, the project creates job opportunities for local residents through its construction and operational phases. |
| Location of stakeholders                    | Located within 5 km from the project site, the Chol Charoen Co., Ltd.                                                                                                                                                                                                                                                                                                                                                     |
| Location of resources                       | 204 Moo 3 Nongchak, Banbung, Chonburi, 20170, Thailand                                                                                                                                                                                                                                                                                                                                                                    |

## 2.1.2 Stakeholder Consultation and Ongoing Communication

|                                     |                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ongoing consultation                | The project proponent maintains a register at the plant, where the local stakeholders can come or contact the register about any problems or concerns. This is to ensure good communication between the local stakeholder and the project partner. The location and contact of the company are public and can be found on the website <sup>4</sup> . |
| Date(s) of stakeholder consultation | 24-July-2008 (local stake holder consultation for project validation)<br><br>In addition, the project proponent held another public participation on 29-September-2021. This was for an installation of a new generator (gen 5) as per the authority's requirement.                                                                                  |
| Communication of monitored results  | Details of the local stakeholder communication is available in the validation report. <sup>5</sup>                                                                                                                                                                                                                                                   |
| Consultation records                | See above                                                                                                                                                                                                                                                                                                                                            |
| Stakeholder input                   | See above                                                                                                                                                                                                                                                                                                                                            |

## 2.1.3 Free, Prior, and Informed Consent

|                 |                                                                                                                                                                                                                      |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Consent         | The land properties belong to the PP (Chol Charoen group) and there were no communities in the area at the time of construction. The project does not involve indigenous people thus this section is not applicable. |
| Outcome of FPIC | -                                                                                                                                                                                                                    |

## 2.1.4 Grievance Redress Procedure

| Grievances received                                             | Resolution and outcome                                                                                                                                     |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| There were no grievances received during the monitoring period. | The office at the project site operates daily (8:00 to 17:00, except national holidays) and people who have grievances can send it directly at the office. |

<sup>4</sup> Cholcharoen website <http://www.thaitapiocastarch.com/contactus-1.html>

<sup>5</sup> PDD of VCS430  
[https://registry.terra.org/mymodule/ProjectDoc/Project\\_ViewFile.asp?FileID=24768&IDKEY=Ikialskif098234kj28098sfkilf098098kl32lasjdflki909f34155072](https://registry.terra.org/mymodule/ProjectDoc/Project_ViewFile.asp?FileID=24768&IDKEY=Ikialskif098234kj28098sfkilf098098kl32lasjdflki909f34155072)

## 2.1.5 Public Comments

| Summary of comments received                                                                                                                                                                                                                                                                                                                                                                     | Actions taken                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The overall response to the project was encouraging and positive to local environmental and social-economic conditions, i.e., the stakeholders appreciate the wastewater treatment in a more efficient way in which irritable odor can be avoided while creating new jobs. Overall, no adverse reactions, comments, or clarifications were received during the Stakeholder Consultation process. | <p>The project participants did not recognize any need to make changes to the project design or monitoring plan.</p> <p>There was no grievance received outside the public comment period.</p> |

## 2.2 Risks to Stakeholders and the Environment

### 2.2.1 Management Experience

The management teams of the Chol Charoen Group have experience implementing similar carbon project activities, as they manage another starch plant registered with the VCS. Kean Charoen Co., Ltd. (VCS project ID 427), a starch manufacturing plant under the Chol Charoen Group has been implementing a carbon project since 2006. Essential trainings for operation and management, including safety training, have been provided to all relevant staffs.

### 2.2.2 Risk assessment

|                                                            | Risk identified                                                                          | Mitigation or preventative measure(s) taken                                                                                                                                                                          |
|------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Natural and human-induced risks to stakeholders' wellbeing | No risk identified. The project does not present any risks to nature or human wellbeing. | Local stakeholder consultation was conducted to address potential concerns during the project validation. Feedback has been consistently positive, with no reported risks or disruptions to traditional livelihoods. |

|                                                                                                                                               |                                        |                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Risks to stakeholder participation                                                                                                            | No risk identified.                    | The project poses no risks to stakeholder participation. All stakeholders are engaged in a secure and transparent manner, ensuring their involvement is free from any potential harm or undue influence.                                                                                                     |
| Working conditions                                                                                                                            | Operation of the biogas reactor system | Necessary training and well outlined operation procedures are provided to relevant staffs.                                                                                                                                                                                                                   |
| Safety of women and girls                                                                                                                     | No risk identified.                    | The project activities do not directly involve issues related to the safety of women and girls.                                                                                                                                                                                                              |
| Safety of minority and marginalized groups, including children                                                                                | No risk identified.                    | The project activities do not specifically focus on minority or marginalized groups, including children.                                                                                                                                                                                                     |
| Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers) | Negligible                             | The leakage of biogas is estimated to be negligible since all biogas is utilized in both the boiler and the gas engine during this monitoring period. The treated wastewater was discharged in existing open lagoons in the project area and there was no wastewater discharged into seas, rivers, or lakes. |

## 2.3 Respect for Human Rights and Equity

### 2.3.1 Labor and Work

| Risks identified <sup>6</sup> | Mitigation or preventative measure(s) taken |
|-------------------------------|---------------------------------------------|
|-------------------------------|---------------------------------------------|

<sup>6</sup> The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

|                                 |                    |                                                                                                                                                                                                                                                                     |
|---------------------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Discrimination                  | No risk identified | The project proponent adheres to the Thai Labor Protection Act <sup>7</sup> , ensuring no instances of discrimination or sexual harassment.                                                                                                                         |
| Sexual harassment               | No risk identified | The project proponent adheres to the Thai Labor Protection Act, ensuring no instances of discrimination or sexual harassment.                                                                                                                                       |
| Gender equity in labor and work | No risk identified | The project proponent has upheld gender equity in labor, ensuring compliance with the Thai Labor Protection Act. All employees receive equitable treatment without discrimination, with salaries paid irrespective of gender or nationality ensuring no inequality. |
| Forced labor                    | No risk identified | There is no forced labor in the project activity as it follows the Thai Labor Protection Act.                                                                                                                                                                       |
| Child labor                     | No risk identified | There is no child labor in the project activity as it follows the Thai Labor Protection Act.                                                                                                                                                                        |
| Human trafficking               | No risk identified | There is no human trafficking in the project activity as it follows the Anti-Human Trafficking Act of Thailand <sup>8</sup> .                                                                                                                                       |

### 2.3.2 Human Rights

| Risks identified   | Mitigation or preventative measure(s) taken                                                     |
|--------------------|-------------------------------------------------------------------------------------------------|
| No risk identified | The project activities do not involve IPs, LCs, and customary rights holders as its location is |

<sup>7</sup> Thailand Labor Protection Act B.E. 2541, section 16  
[https://www.labour.go.th/attachments/article/47756/Labour\\_Protection\\_Act\\_BE2541.pdf](https://www.labour.go.th/attachments/article/47756/Labour_Protection_Act_BE2541.pdf)

<sup>8</sup> Thailand Anti-Human Trafficking Act B.E 2551 (2008)  
<https://www.mol.go.th/wp-content/uploads/sites/2/2021/02/ANTI-HUMAN-TRAFFICKING-ACT.pdf>

|  |                                                                          |
|--|--------------------------------------------------------------------------|
|  | the property of the project owner. Thus, this section is not applicable. |
|--|--------------------------------------------------------------------------|

### 2.3.3 Indigenous Peoples and Cultural Heritage

| Risks identified   | Mitigation(s) or preventative measure taken                                                                                                         |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| No risk identified | The project activities do not involve cultural heritage as its location is the property of the project owner. Thus, this section is not applicable. |

### 2.3.4 Property Rights

| Risks identified   | Mitigation or preventative measure(s) taken                                                                                                                                                     |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No risk identified | The project activities do not involve the property rights of IPs, LCs, and customary rights holders as its location is the property of the project owner. Thus, this section is not applicable. |

### 2.3.5 Benefit Sharing

|                                              |                                                                                                |
|----------------------------------------------|------------------------------------------------------------------------------------------------|
| Summary of the benefit sharing plan          | The project activities do not involve the property rights, thus this section is not applicable |
| Benefit sharing during the monitoring period | -                                                                                              |

## 2.4 Ecosystem Health

|                                        | Risk identified    | Mitigation or preventative measure(s) taken during the monitoring period                                                           |
|----------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------|
| Impacts on biodiversity and ecosystems | No risk identified | This aspect is not applicable, as tapioca plantation activities fall outside the scope of this project.                            |
| Soil degradation and soil erosion      | No risk identified | The wastewater is treated as part of the project activity and is not released into the external environment, ensuring that it does |

|                              |                    |                                                                                                                                                                                                                                                                               |
|------------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              |                    | not contribute to soil degradation or erosion.                                                                                                                                                                                                                                |
| Water consumption and stress | No risk identified | The project activity treats wastewater from the starch factory, which is then reused in starch production processes and for plantation within the plant area. As a result, the project does not contribute to excessive water consumption or negatively impact water quality. |

#### 2.4.1 Rare, Threatened, and Endangered species

|                                       |                                                                                                                                           |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Species or habitat                    | The project is not located in, or adjacent to habitats for rare, threatened, or endangered species. Thus, this section is not applicable. |
| Areas needed for habitat connectivity | -                                                                                                                                         |

|                                                       | Risks identified | Mitigation or preventative measure(s) taken |
|-------------------------------------------------------|------------------|---------------------------------------------|
| Habitats for rare, threatened, and endangered species | -                | -                                           |
| Areas for habitat connectivity                        | -                | -                                           |

#### 2.4.2 Introduction of species

| Species introduced | Classification | Justification for use | Adverse effects and mitigation |
|--------------------|----------------|-----------------------|--------------------------------|
| N/A                | -              | -                     | -                              |

| Existing invasive species | Mitigation measures to prevent the spread or continued existence of invasive species |
|---------------------------|--------------------------------------------------------------------------------------|
| N/A                       | -                                                                                    |

#### 2.4.3 Ecosystem conversion

This section is not applicable for this project.

# 3 IMPLEMENTATION STATUS

## 3.1 Implementation Status of the Project Activity

This monitoring period is from 01-May-2021 to 31-March-2022, both days are included.

- As per the registered PD of the second crediting period, generator 4 (Gen 4) has been counted as a gas engine in the project activity. The validation team has checked and validated that the implementation of the generator does not impact on the baseline scenario and additionality. The installed capacity of all 4 generators does not exceed the operation license and is in-line with the (2nd CP) registered project description report. The Gen 4 has been commissioning on 10-September-2018.
- It was noted during the monitoring period, generator 4 has stopped operation since 24-February-2021. No electricity has been generated from the generator. It was then completely removed from the site.
- Generator 5 with a capacity of 1.5 MW was introduced in October 2021. The project decided to use this generator as the primary generator for electricity production. Meanwhile generator no. 1, 2, and 3 will be used as a backup generator in case there is trouble in the electricity production of the primary generator.
- Gen 5 started recording data from 13-November-2021.
- Also noted during the monitoring period that between 30-December-2021 to 06-January-2022, the plant shut down, due to the New Year Holiday.
- From 12-August-2021 to 23-August-2021, the flow meter (FM 1, 2, and 3) was sent for calibration, hence it did not record any data. Moreover, FM 2, and 3 were replaced by FM 4 on 16-March-2022 due to wastewater pipeline upgrading.
- It is noted that during the maintenance or downtime of Boiler 1, biogas is diverted to Boiler 2 to ensure continuous operation of the plant. Boiler 2 has not been included in the project boundary since the beginning of the project activity. Although external to the project, Boiler 2 is equipped with a dedicated flow meter and a regularly maintained logbook. Consequently, no emission reductions were claimed for any period in which Boiler 2 was used. This significantly lowered the total emission reductions achieved during this monitoring period.

**Table 2 Summary of the technology implemented**

| Technology implemented | Capacity                                             |
|------------------------|------------------------------------------------------|
| Boiler                 | Dual fired boiler, capacity of 3.78 MW <sub>th</sub> |
| Generator no. 1 & 2    | Genset Type: 500GF-RZ                                |
| Generator no. 3        | Genset Type: 600GFZ1-RZ-ESM1                         |

|                              |                               |
|------------------------------|-------------------------------|
| Generator no. 4 <sup>9</sup> | Genset Type: 600GFZ1-PWZ-ESM1 |
| Generator no. 5              | Genset Type: JMS420 GS-B.L    |

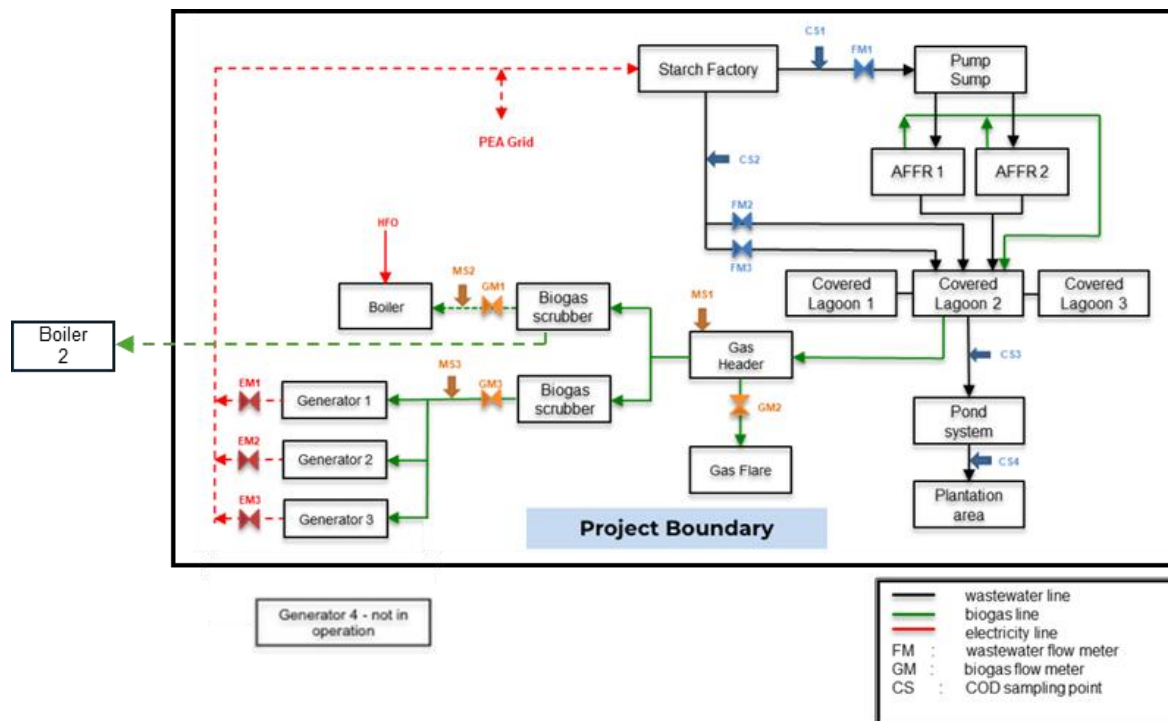


**Figure 3-1:** Diagram of project implementation before changes in this monitoring period (before 19-August-2021 (removal of MS1), 13-November-2021 (Gen 5) and 15-March-2022 (replacing FM2, FM3 with FM4)).

<sup>9</sup> Generator 4 stopped operation on 24/02/2021 and then removed from the site.

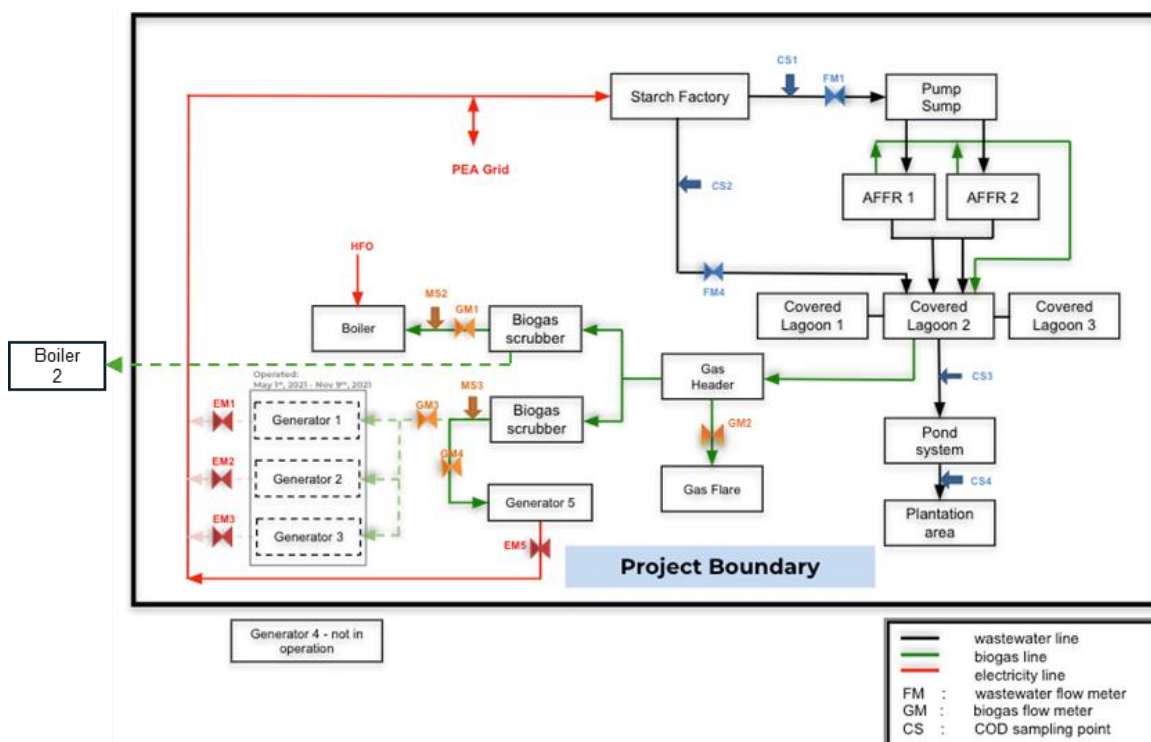


**Figure 3-2:** Monitoring diagram of the project implementation as of the latest update after changes in this MP.

## 3.2 Deviations

### 3.2.1 Methodology Deviations

Deviation 1: Applicable for the whole crediting period and has been validated during the second crediting period renewal.

#### Deviation

Baseline emissions for estimating the fossil fuel replaced. The latest version of methodology AMS I.C. requires monitoring of the fuel that would have been consumed in the absence of the project activity.

#### Deviated approach or formula

The project proponent uses a conservative approach, based on the amount of heat required for starch drying, which in turn is estimated based on heat requirements per tonne of starch when only fuel oil was used. The approach compensates the fuel oil usage from the total fuel oil requirement (in baseline) and conservatively estimates the fuel oil replaced by methane, irrespective of the quantity of methane burnt.

#### Justification for deviation

Due to the incompleteness of the monitoring equipment, a deviation has been made to the approach specified in methodology AMS I.C. The deviated approach ensures that efficiency lost in system due to the dual fired system is conservatively adjusted in the baseline emissions. This means that if any efficiency loss happens due to dual fired system and the energy source is supplied by fuel oil, using the given approach the loss is accounted in biogas usage, thereby estimating lower fuel oil replacement for baseline emission estimation. In addition, the approach does not have any negative impact on the additionality of the project.

With reference to the clarification made by the SSC WG, this approach can be considered as not having a negative impact on the conservativeness of the applied methodology's criteria and procedures to quantify data leading to GHG emission reductions or removals. The clarification from EB, as referenced above, can be used to substantiate this statement.

The deviated approach has been adopted and accepted in the previous verifications and is still applicable for this verification.

### 3.2.2 Project Description Deviations

#### Deviation 1

It was found that source of data and description of measurement methods and procedure to be applied for parameter  $EG_{pj,y}$  were not consistent with the description of the parameter. This deviation was proposed and verified by the validation and verification body during the previous verification of the project activity. The deviation was accepted, and the details were addressed as follows.

#### ***Deviated approach***

The source of data and description of measurement methods and procedure to be applied for  $EG_{pj,y}$ ; the quantity of electricity generation supplied by the project plant/unit to the grid in year  $y$  is obtained by the PEA meter reading report, which continuously monitored and recorded monthly from 01-May-2021 until present, both days included.

#### ***Justification for deviation***

The deviated approach does not impact the applicability of the methodology, additionality, or the appropriateness of the baseline scenario. The project remains in compliance with the VCS Program rules. This project description deviation would be applicable for the whole second crediting period.

#### Deviation 2

During this monitoring period, a new gas engine (Gen 5) with a capacity of 1.5 MW was installed and has started commissioning since 13-November-2021, which deviates from the original capacity written in the registered PDD.

#### ***Deviated approach***

The new generator (Gen 5) installed is used as the main generator, while genset 1, 2, and 3 are used as backup generators.

### ***Justification for deviation***

The installed capacity (1.5 MW) of the new gas engine does not exceed the capacity of the previous generator, which is at 2.2 MW. The installation of new gas engine, which started its operation since 13-November-2021, does not impact the applicability of the methodology, additionality, or the emission reduction of the project, due to the following reasons:

- The new gas engine is in line with the AMS.I-D Methodology Applicability as it still produces electricity from the biogas captured for internal consumption and the national grid. Additionally, even though the capacity of the new gas engine is lower than the registered PDD, it still falls under the applicability criteria where the capacity limit for a small-scale project is 15 MW as well as not using the co-fired fossil fuel.
- The new gas engine does not have an impact on the additionality of the project.
  - Does not change the scale of project baseline since the capacity is below 15 MW.
  - Does not change baseline since the gas engine is not used in the baseline situation.

### **Deviation 3**

In this monitoring period, there are deviations in the monitoring points of the wastewater flow and methane analyzer from the PDD. The deviation is explained as follows.

### ***Deviation approach***

The wastewater flowmeters FM2&FM3 were replaced on 16-March-2022, with FM4. The replacement suggests a deviation in one less monitoring point. Additionally, during the monitoring period, the monitoring point of methane analyzer at the gas header (MS1) was not taken into account due to a high concentration of H<sub>2</sub>S that could cause corrosive damage to the methane analyzer equipment. The removal of monitoring point was advised by the maintenance staff to avoid damage to the analyzer that could cause the error in measurement value.

### ***Justification***

The replacement of the flow meter does not impact the emission reduction, as it continues to collect data at the same location as the previous monitoring point of wastewater from the starch production factory. The change of flowmeter is due to an upgrade in the piping system with wider diameter of wastewater pipe. The upgrade does not suggest an increase in wastewater quantity from the starch production. Hence, the change in wastewater monitoring point does not impact the overall emission reduction of the project.

The removal of the sampling point, MS1, at the gas header is necessary to prevent damage by high concentration of H<sub>2</sub>S to the device. Furthermore, as the methane measured at the gas header is higher than methane measured after passing a biogas scrubber, removal of methane measurement at this point is more conservative. Methane was analyzed from MS2 and MS3 from October 2021 onward.

## **3.3 Grouped Projects**

The project activity is not a grouped project - this section is not required.

### 3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes ☒ No

## 4 DATA AND PARAMETERS

### 4.1 Data and Parameters Available at Validation

|                                                                                              |                                                                                                                                                                                                                                                                                                                                |                      |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Data / Parameter                                                                             | GWP <sub>CH4</sub>                                                                                                                                                                                                                                                                                                             |                      |
| Data unit                                                                                    | tCO <sub>2</sub> e/tCH <sub>4</sub>                                                                                                                                                                                                                                                                                            |                      |
| Description                                                                                  | Global warming potential for methane                                                                                                                                                                                                                                                                                           |                      |
| Source of data                                                                               | Global warming potential for CH <sub>4</sub> valid for the relevant commitment period                                                                                                                                                                                                                                          |                      |
| Value applied                                                                                | <b>Monitoring period</b>                                                                                                                                                                                                                                                                                                       | <b>Value Applied</b> |
|                                                                                              | 01/05/2021 to 31/12/2021                                                                                                                                                                                                                                                                                                       | 28                   |
|                                                                                              | 01/01/2022 to 31/03/2022                                                                                                                                                                                                                                                                                                       | 28                   |
| Justification of choice of data or description of measurement methods and procedures applied | As per section 3.15.4 of VCS standard version 4.6 “For reductions and removals occurring on or after 1 January 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 and Assessment Report (AR5)”. The GWP of CH <sub>4</sub> from IPCC AR5 is 28. |                      |
| Purpose of Data                                                                              | Calculation of baseline and project emissions                                                                                                                                                                                                                                                                                  |                      |
| Comments                                                                                     | For GHG emission reductions occurring on or after 1 January 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).                                                                                                         |                      |

|                                                   |                                                            |
|---------------------------------------------------|------------------------------------------------------------|
| Data / Parameter                                  | B <sub>0,ww</sub>                                          |
| Data unit                                         | kg CH <sub>4</sub> /kg COD                                 |
| Description                                       | Methane producing capacity of the wastewater               |
| Source of data                                    | IPCC default value as per methodology AMS III-H version 18 |
| Value applied                                     | 0.25                                                       |
| Justification of choice of data or description of | Default value                                              |

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

|                                                                                              |                                                           |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| Data / Parameter                                                                             | UF <sub>BL</sub>                                          |
| Data unit                                                                                    | -                                                         |
| Description                                                                                  | Model correction factor to account of model uncertainties |
| Source of data                                                                               | AMS-III.H version 18                                      |
| Value applied                                                                                | 0.89                                                      |
| Justification of choice of data or description of measurement methods and procedures applied | Default value from AMS-III.H version 18                   |
| Purpose of Data                                                                              | Calculation of baseline emissions                         |
| Comments                                                                                     | -                                                         |

|                                                                                              |                                                           |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------|
| Data / Parameter                                                                             | UF <sub>PJ</sub>                                          |
| Data unit                                                                                    | -                                                         |
| Description                                                                                  | Model correction factor to account of model uncertainties |
| Source of data                                                                               | AMS-III.H version 18                                      |
| Value applied                                                                                | 1.12                                                      |
| Justification of choice of data or description of measurement methods and procedures applied | Default value from AMS-III.H version 18                   |
| Purpose of Data                                                                              | Calculation of project emissions                          |
| Comments                                                                                     | -                                                         |

|                                                                                              |                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | $MCF_{ww,treatment,BL,i}$                                                                                                                                       |
| Data unit                                                                                    | -                                                                                                                                                               |
| Description                                                                                  | Methane correction factor for the baseline anaerobic wastewater treatment system j                                                                              |
| Source of data                                                                               | Table 2 from AMS-III.H, Version 18, IPCC default values                                                                                                         |
| Value applied                                                                                | 0.8                                                                                                                                                             |
| Justification of choice of data or description of measurement methods and procedures applied | The baseline wastewater treatment system consists of a succession of anaerobic deep lagoons (depth more than 2 meters) therefore the MCF value is chosen as 0.8 |
| Purpose of Data                                                                              | Calculation of baseline emissions                                                                                                                               |
| Comments                                                                                     | IPCC Default values from chapter 6 of volume 5. Waste in 2006 IPCC Guidelines for National Greenhouse Gas Inventories.                                          |

|                                                                                              |                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | $MCF_{ww,treatment,PJ,k}$                                                                                                                                                                           |
| Data unit                                                                                    | -                                                                                                                                                                                                   |
| Description                                                                                  | Methane correction factor for the project anaerobic wastewater treatment system k                                                                                                                   |
| Source of data                                                                               | Table 2 from AMS-III.H, Version 18, IPCC default values                                                                                                                                             |
| Value applied                                                                                | 0.8                                                                                                                                                                                                 |
| Justification of choice of data or description of measurement methods and procedures applied | The project wastewater treatment system without biogas recovery (secondary treatment) consists in a succession of deep lagoons, with depth more than 2 metres, so the value of 0.8 has been chosen. |
| Purpose of Data                                                                              | Calculation of project emissions                                                                                                                                                                    |
| Comments                                                                                     | IPCC Default values from chapter 6 of volume 5. Waste in 2006 IPCC Guidelines for National Greenhouse Gas Inventories.                                                                              |

|                  |            |
|------------------|------------|
| Data / Parameter | $CFE_{ww}$ |
| Data unit        | Fraction   |

|                                                                                              |                                                                                         |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Description                                                                                  | Capture efficiency of the biogas recovery equipment in the wastewater treatment systems |
| Source of data                                                                               | AMS-III.H version 18                                                                    |
| Value applied                                                                                | 0.9                                                                                     |
| Justification of choice of data or description of measurement methods and procedures applied | Default value as per AMS-III.H                                                          |
| Purpose of Data                                                                              | Calculation of project emissions                                                        |
| Comments                                                                                     | -                                                                                       |

|                                                                                              |                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | $\eta_{\text{COD,BL},i}$                                                                                                                                                                                                                                                                                                 |
| Data unit                                                                                    | %                                                                                                                                                                                                                                                                                                                        |
| Description                                                                                  | COD removal efficiency of the baseline system i                                                                                                                                                                                                                                                                          |
| Source of data                                                                               | Measurement campaign in the baseline wastewater system for 12 samples                                                                                                                                                                                                                                                    |
| Value applied                                                                                | 87%                                                                                                                                                                                                                                                                                                                      |
| Justification of choice of data or description of measurement methods and procedures applied | The COD removal efficiency is based on COD values for the baseline system before project activity. The COD reduction across the baseline treatment system is multiplied by a factor of 0.89 for conservative estimation of baseline emissions. Actual reduction across the system is approximately 98.1% <sup>10</sup> . |
| Purpose of Data                                                                              | Calculation of baseline emissions                                                                                                                                                                                                                                                                                        |
| Comments                                                                                     | -                                                                                                                                                                                                                                                                                                                        |

|                  |                         |
|------------------|-------------------------|
| Data / Parameter | $EF_{\text{grid,CM},y}$ |
| Data unit        | tCO <sub>2</sub> e/MWh  |

<sup>10</sup> COD measurement records can be used to substantiate this value. Water analysis reports showing the quality of treated wastewater during pre-project scenario has been submitted to the DOE.

|                                                                                                     |                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b>                                                                                  | Combined margin CO <sub>2</sub> emission factor for grid connected power generation in year y                                                                                                                                                                                       |
| <b>Source of data</b>                                                                               | A Study on Thailand Grid Emission Factor by Thai DNA                                                                                                                                                                                                                                |
| <b>Value applied</b>                                                                                | 0.5637                                                                                                                                                                                                                                                                              |
| <b>Justification of choice of data or description of measurement methods and procedures applied</b> | The study of the estimation of grid emission factor is carried out by Thai DNA in accordance with the Methodological Tool: Tool to calculate the emission factor for an electricity system. The choice of data has been detailed in the published study by Thai DNA <sup>11</sup> . |
| <b>Purpose of Data</b>                                                                              | Calculation of baseline emissions                                                                                                                                                                                                                                                   |
| <b>Comments</b>                                                                                     | -                                                                                                                                                                                                                                                                                   |

|                                                                                                     |                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <b>Data / Parameter</b>                                                                             | FE                                                                                                                                  |
| <b>Data unit</b>                                                                                    | %                                                                                                                                   |
| <b>Description</b>                                                                                  | Flare efficiency                                                                                                                    |
| <b>Source of data</b>                                                                               | Tool “Project emissions from flaring”                                                                                               |
| <b>Value applied</b>                                                                                | 0%                                                                                                                                  |
| <b>Justification of choice of data or description of measurement methods and procedures applied</b> | Default value for enclosed flare as per tool to determine project emissions from flaring gases containing methane has been applied. |
| <b>Purpose of Data</b>                                                                              | Calculation of baseline emissions                                                                                                   |
| <b>Comments</b>                                                                                     | -                                                                                                                                   |

|                         |                                                     |
|-------------------------|-----------------------------------------------------|
| <b>Data / Parameter</b> | DE                                                  |
| <b>Data unit</b>        | %                                                   |
| <b>Description</b>      | Destruction efficiency of the electricity generator |

<sup>11</sup> The latest study in 2017 is available at the time of validation for renewable of crediting period.  
<http://ghgreduction.tgo.or.th/24-t-ver/t-ver/t-ver-news-and-activities/292-thailand-grid-emission-factor-for-ghg-reduction-project-activity.html>

|                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Source of data                                                                               | SSC WG                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Value applied                                                                                | 100%                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Justification of choice of data or description of measurement methods and procedures applied | According to clarification from SSC WG “in the case that the biogas is combusted for a gainful use of the released energy as in an engine or a power plant, a destruction efficiency of 100% can be used for the portion of biogas that is combusted when applying AMS III.H., i.e., using a value of 100% for FE in equation 16 in paragraph 32 for the portion of biogas that is combusted for a gainful use”. <sup>12</sup> |
| Purpose of Data                                                                              | Calculation of baseline emissions                                                                                                                                                                                                                                                                                                                                                                                              |
| Comments                                                                                     | As per description of deviation 2.                                                                                                                                                                                                                                                                                                                                                                                             |

|                                                                                              |                                                                                                                                                                                |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | EF <sub>CO2,i,y</sub>                                                                                                                                                          |
| Data unit                                                                                    | tCO <sub>2</sub> /TJ                                                                                                                                                           |
| Description                                                                                  | Emission factor of fossil fuel replaced – Residual Fuel oil                                                                                                                    |
| Source of data                                                                               | IPCC 2006 default value for residual fuel oil, Volume 2, Chapter 1, 1.23                                                                                                       |
| Value applied                                                                                | 77.4                                                                                                                                                                           |
| Justification of choice of data or description of measurement methods and procedures applied | IPCC default values used for unavailability of national data. In the pre-project scenario, the residual fuel oil has been the main source of thermal energy for the processes. |
| Purpose of Data                                                                              | Calculation of project emissions                                                                                                                                               |
| Comments                                                                                     | -                                                                                                                                                                              |

|                  |                                                                 |
|------------------|-----------------------------------------------------------------|
| Data / Parameter | $\rho_{CH4,n}$                                                  |
| Data unit        | kg/m <sup>3</sup>                                               |
| Description      | Density of methane gas at reference conditions                  |
| Source of data   | Methodological tool “Project emission from flaring” Version 2.0 |

<sup>12</sup> <http://cdm.unfccc.int/UserManagement/FileStorage/VNWAGY8MS92ZXDKUHEF5LB07QICT1P>

|                                                                                              |                                                      |
|----------------------------------------------------------------------------------------------|------------------------------------------------------|
| Value applied                                                                                | 0.716                                                |
| Justification of choice of data or description of measurement methods and procedures applied | <u>CDM EB as per EB28 Meeting report (Annex 13).</u> |
| Purpose of Data                                                                              | Calculation of project emissions                     |
| Comments                                                                                     | -                                                    |

|                                                                                              |                                                                                                             |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | $\eta_{BL, \text{thermal}}$                                                                                 |
| Data unit                                                                                    | -                                                                                                           |
| Description                                                                                  | Efficiency of the boiler using fossil fuel that would have been used in the absence of the project activity |
| Source of data                                                                               | Default factor as per AMS.I.C                                                                               |
| Value applied                                                                                | 100%                                                                                                        |
| Justification of choice of data or description of measurement methods and procedures applied | Most conservative choice as per AMS I.C                                                                     |
| Purpose of Data                                                                              | Calculation of baseline emissions                                                                           |
| Comments                                                                                     | -                                                                                                           |

|                                                                                              |                                                                                                                                         |
|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | $NCV_{i,y}$                                                                                                                             |
| Data unit                                                                                    | TJ/tonne                                                                                                                                |
| Description                                                                                  | NCV of fuel oil i.e. fossil fuel displaced by biogas                                                                                    |
| Source of data                                                                               | IPCC default value                                                                                                                      |
| Value applied                                                                                | 0.0404                                                                                                                                  |
| Justification of choice of data or description of measurement methods and procedures applied | IPCC default value for heavy fuel oil as per 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 2: Energy, Table 1.2. |

|                 |                                   |
|-----------------|-----------------------------------|
| Purpose of Data | Calculation of baseline emissions |
| Comments        | -                                 |

|                                                                                              |                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | $Q_{FO, starch}$                                                                                                                                                  |
| Data unit                                                                                    | L/tonne                                                                                                                                                           |
| Description                                                                                  | Liters of fossil fuel required per tonne of dry starch historically                                                                                               |
| Source of data                                                                               | Historic data                                                                                                                                                     |
| Value applied                                                                                | 34.3                                                                                                                                                              |
| Justification of choice of data or description of measurement methods and procedures applied | Based on average values compiled from receipts in 2002, 2003, and 2005<br><br>2002 = 34.01 litres/tonne<br>2003 = 34.38 litres/tonne<br>2005 = 34.39 litres/tonne |
| Purpose of Data                                                                              | Calculation of baseline emissions                                                                                                                                 |
| Comments                                                                                     | -                                                                                                                                                                 |

|                                                                                              |                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | $D_{FO}$                                                                                                                                                                  |
| Data unit                                                                                    | kg/litre                                                                                                                                                                  |
| Description                                                                                  | Density of fuel oil                                                                                                                                                       |
| Source of data                                                                               | <a href="http://www.engineeringtoolbox.com/fuels-densities-specific-volumes-d_166.html">http://www.engineeringtoolbox.com/fuels-densities-specific-volumes-d_166.html</a> |
| Value applied                                                                                | 0.93                                                                                                                                                                      |
| Justification of choice of data or description of measurement methods and procedures applied | Public available information                                                                                                                                              |
| Purpose of Data                                                                              | Calculation of baseline emissions                                                                                                                                         |
| Comments                                                                                     | -                                                                                                                                                                         |

|                                                                                              |                                                                                                               |
|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                                             | $P_{el}$                                                                                                      |
| Data unit                                                                                    | kW                                                                                                            |
| Description                                                                                  | Total electrical capacity of the equipment installed in the project activity                                  |
| Source of data                                                                               | Nameplate of the electrical equipment                                                                         |
| Value applied                                                                                | 139.25 kW                                                                                                     |
| Justification of choice of data or description of measurement methods and procedures applied | Extract from nameplate of the electrical equipment.                                                           |
| Purpose of Data                                                                              | Calculation of project emissions                                                                              |
| Comments                                                                                     | The rated power consumption of the equipment is updated according to the nameplate of the existing equipment. |

## 4.2 Data and Parameters Monitored

| Data / Parameter                                                | $Q_{ww,i,y}$                                                                                                                                                                                                                                                       |                   |                                   |                          |         |                          |         |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------------|--------------------------|---------|--------------------------|---------|
| Data unit                                                       | m <sup>3</sup> /month                                                                                                                                                                                                                                              |                   |                                   |                          |         |                          |         |
| Description                                                     | Volume of wastewater treated in the year y. Data were accumulated annually.                                                                                                                                                                                        |                   |                                   |                          |         |                          |         |
| Source of data                                                  | Measured continuously using volumetric flow meter FM1, FM2, FM3, and FM4 (FM2 & FM3 replaced with FM4 on 16-March-2022)                                                                                                                                            |                   |                                   |                          |         |                          |         |
| Description of measurement methods and procedures to be applied | Measured continuously by flow meters installed before entering AFFR system.                                                                                                                                                                                        |                   |                                   |                          |         |                          |         |
| Frequency of monitoring/recording                               | Parameter monitored continuously but aggregated monthly and annually for calculations.                                                                                                                                                                             |                   |                                   |                          |         |                          |         |
| Value monitored                                                 | <table border="1"> <thead> <tr> <th>Monitoring period</th><th>Value monitored (m<sup>3</sup>)</th></tr> </thead> <tbody> <tr> <td>01/05/2021 to 31/12/2021</td><td>427,590</td></tr> <tr> <td>01/01/2022 to 31/03/2022</td><td>221,418</td></tr> </tbody> </table> | Monitoring period | Value monitored (m <sup>3</sup> ) | 01/05/2021 to 31/12/2021 | 427,590 | 01/01/2022 to 31/03/2022 | 221,418 |
| Monitoring period                                               | Value monitored (m <sup>3</sup> )                                                                                                                                                                                                                                  |                   |                                   |                          |         |                          |         |
| 01/05/2021 to 31/12/2021                                        | 427,590                                                                                                                                                                                                                                                            |                   |                                   |                          |         |                          |         |
| 01/01/2022 to 31/03/2022                                        | 221,418                                                                                                                                                                                                                                                            |                   |                                   |                          |         |                          |         |

## Monitoring equipment

There were four flow meters (FM1, FM2, FM3 & FM4) in this monitoring period.

|                    |                      |
|--------------------|----------------------|
| Tag/location       | FM1                  |
| Brand              | Siemens              |
| Model              | MAG500               |
| Serial number      | N1M7300330           |
| Accuracy           | ± 0.40%              |
| Latest calibration | 19/08/2021           |
| Validity           | 18/08/2024           |
| Implementation     | 07/11/2020 till date |

Detail of FM2 is as follow:

|                    |                                             |
|--------------------|---------------------------------------------|
| Tag/location       | FM2                                         |
| Brand              | Euromag                                     |
| Model              | MC 308C (convertor)<br>MUT1000EL (detector) |
| Serial number      | YAP1644 (convertor)<br>YAL1624 (detector)   |
| Accuracy           | ± 0.20%                                     |
| Latest calibration | 12/04/2020                                  |
| Validity           | 11/04/2023                                  |

Detail of FM3 is as follow:

|                    |                                             |
|--------------------|---------------------------------------------|
| Tag/location       | FM3                                         |
| Brand              | Euromag                                     |
| Model              | MC 308C (convertor)<br>MUT1000EL (detector) |
| Serial number      | YAP1645 (convertor)<br>YAL1625 (detector)   |
| Accuracy           | ± 0.20%                                     |
| Latest calibration | 12/04/2020                                  |
| Validity           | 11/04/2023                                  |

The flowmeters FM2 and FM3 were replaced on 16/03/2022 with FM4. The detail of the replaced meter is as below.

|                    |                                          |
|--------------------|------------------------------------------|
| Tag/location       | FM4                                      |
| Brand              | Siemen                                   |
| Model              | MAG 5000                                 |
| Serial number      | NIM7050144                               |
| Accuracy           | ± 0.40%                                  |
| Latest calibration | N/A (started installation on 16/03/2022) |

|                                |                                                                                                                           |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| QA/QC procedures to be applied | Flow meters underwent maintenance/calibration subject to appropriate industry standards, at least once every three years. |
| Purpose of the data            | Calculation of baseline and project emissions                                                                             |
| Calculation method             | -                                                                                                                         |
| Comments                       | -                                                                                                                         |

| Data / Parameter                                                | COD <sub>ww,untreated,y</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--|-------------------|-----------------|-------|-------|---------------|--------------------------|----------|---------|--------------------------|------------|----------|-------------------|-----------------|--|-------|--------|--------------------------|-------|-------|--------------------------|-------|-------|
| Data unit                                                       | t COD/m³                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| Description                                                     | The chemical oxygen demand of the wastewater before the treatment system affected by the project activity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| Source of data                                                  | Measured as per colorimetric method (CS1, CS2)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| Description of measurement methods and procedures to be applied | The COD content was analyzed using a colorimetric method in the on-site laboratory of the treatment plant. The results should be logged in the plant operation report on a daily basis. In this monitoring period, the average value through sampling was used with a confidence/precision level of 90/10.                                                                                                                                                                                                                                                                                                                                       |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| Frequency of monitoring/recording                               | Samples and measurements were ensured with a 90/10 confidence level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| Value monitored                                                 | <div>For AFFR system (CS1)</div> <table><tr><th rowspan="2">Monitoring period</th><th colspan="2">Value (tCOD/m³)</th></tr><tr><th>Lower</th><th>Higher</th></tr><tr><td>01/05/2021 to 31/12/2021</td><td>0.024</td><td>0.026</td></tr><tr><td>01/01/2022 to 31/03/2022</td><td>0.022</td><td>0.026</td></tr></table> <div>For cover lagoon, in (CS2)</div> <table><tr><th rowspan="2">Monitoring period</th><th colspan="2">Value (tCOD/m³)</th></tr><tr><th>Lower</th><th>Higher</th></tr><tr><td>01/05/2021 to 31/12/2021</td><td>0.024</td><td>0.027</td></tr><tr><td>01/01/2022 to 31/03/2022</td><td>0.023</td><td>0.031</td></tr></table> |        |  | Monitoring period | Value (tCOD/m³) |       | Lower | Higher        | 01/05/2021 to 31/12/2021 | 0.024    | 0.026   | 01/01/2022 to 31/03/2022 | 0.022      | 0.026    | Monitoring period | Value (tCOD/m³) |  | Lower | Higher | 01/05/2021 to 31/12/2021 | 0.024 | 0.027 | 01/01/2022 to 31/03/2022 | 0.023 | 0.031 |
| Monitoring period                                               | Value (tCOD/m³)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
|                                                                 | Lower                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Higher |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| 01/05/2021 to 31/12/2021                                        | 0.024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.026  |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| 01/01/2022 to 31/03/2022                                        | 0.022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.026  |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| Monitoring period                                               | Value (tCOD/m³)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
|                                                                 | Lower                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Higher |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| 01/05/2021 to 31/12/2021                                        | 0.024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.027  |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| 01/01/2022 to 31/03/2022                                        | 0.023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.031  |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| Monitoring equipment                                            | <div>Colorimeter</div> <table><tr><td>Brand</td><td>HACH</td></tr><tr><td>Model</td><td>DR900</td></tr><tr><td>Serial number</td><td>HAC160600001037</td></tr><tr><td>Accuracy</td><td>± 2.00%</td></tr><tr><td>Latest calibration</td><td>09/04/2020</td></tr><tr><td>Validity</td><td>08/04/2023</td></tr></table>                                                                                                                                                                                                                                                                                                                             |        |  | Brand             | HACH            | Model | DR900 | Serial number | HAC160600001037          | Accuracy | ± 2.00% | Latest calibration       | 09/04/2020 | Validity | 08/04/2023        |                 |  |       |        |                          |       |       |                          |       |       |
| Brand                                                           | HACH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| Model                                                           | DR900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| Serial number                                                   | HAC160600001037                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| Accuracy                                                        | ± 2.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| Latest calibration                                              | 09/04/2020                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |
| Validity                                                        | 08/04/2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |        |  |                   |                 |       |       |               |                          |          |         |                          |            |          |                   |                 |  |       |        |                          |       |       |                          |       |       |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| QA/QC procedures to be applied | Sampling and analysis were carried out adhering to internationally recognized procedures. The spectrophotometer is calibrated at least once every three years.                                                                                                                                                                                                                                                                                                     |
| Purpose of the data            | Calculation of baseline and project emissions                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Calculation method             | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Comments                       | In the registered PD, the description of measurement methods and procedures to be applied mentioned that the results would be logged in the plant operation report on a daily basis. During this monitoring period, the COD has been measured through sampling, thus the average values were ensured with 90/10 confidence level. Lower value was used for COD <sub>ww,untreated,y</sub> (CS1, CS2) to calculate the baseline emission as a conservative approach. |

| Data / Parameter                                                | COD <sub>ww,treated,y</sub>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |        |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--|-------------------|------------------------------|--|-------|--------|--------------------------|--------|--------|--------------------------|--------|--------|-------------------|------------------------------|--|-------|--------|--------------------------|--------|--------|--------------------------|--------|--------|
| Data unit                                                       | t COD/m <sup>3</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |        |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |
| Description                                                     | The chemical oxygen demand of the wastewater after the treatment system affected by the project activity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |        |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |
| Source of data                                                  | Measured as per colorimetric method (CS3, CS4)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |        |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |
| Description of measurement methods and procedures to be applied | The COD content was analyzed using a colorimetric method in the on-site laboratory of the treatment plant. The results should be logged in the plant operation report. In this monitoring period, average value through sampling was used with the confidence/precision level 90/10.                                                                                                                                                                                                                                                                                                                                                                                          |        |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |
| Frequency of monitoring/recording                               | Samples and measurements were ensured with a 90/10 confidence level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |        |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |
| Value monitored                                                 | <div>For cover lagoon, out (CS3)</div> <table><tr><th rowspan="2">Monitoring period</th><th colspan="2">Value (tCOD/m<sup>3</sup>)</th></tr><tr><th>Lower</th><th>Higher</th></tr><tr><td>01/05/2021 to 31/12/2021</td><td>0.0017</td><td>0.0021</td></tr><tr><td>01/01/2022 to 31/03/2022</td><td>0.0019</td><td>0.0023</td></tr></table> <div>For open pond (CS4)</div> <table><tr><th rowspan="2">Monitoring period</th><th colspan="2">Value (tCOD/m<sup>3</sup>)</th></tr><tr><th>Lower</th><th>Higher</th></tr><tr><td>01/05/2021 to 31/12/2021</td><td>0.0003</td><td>0.0004</td></tr><tr><td>01/01/2022 to 31/03/2022</td><td>0.0003</td><td>0.0004</td></tr></table> |        |  | Monitoring period | Value (tCOD/m <sup>3</sup> ) |  | Lower | Higher | 01/05/2021 to 31/12/2021 | 0.0017 | 0.0021 | 01/01/2022 to 31/03/2022 | 0.0019 | 0.0023 | Monitoring period | Value (tCOD/m <sup>3</sup> ) |  | Lower | Higher | 01/05/2021 to 31/12/2021 | 0.0003 | 0.0004 | 01/01/2022 to 31/03/2022 | 0.0003 | 0.0004 |
| Monitoring period                                               | Value (tCOD/m <sup>3</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |
|                                                                 | Lower                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Higher |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |
| 01/05/2021 to 31/12/2021                                        | 0.0017                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.0021 |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |
| 01/01/2022 to 31/03/2022                                        | 0.0019                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.0023 |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |
| Monitoring period                                               | Value (tCOD/m <sup>3</sup> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |        |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |
|                                                                 | Lower                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Higher |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |
| 01/05/2021 to 31/12/2021                                        | 0.0003                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.0004 |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |
| 01/01/2022 to 31/03/2022                                        | 0.0003                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 0.0004 |  |                   |                              |  |       |        |                          |        |        |                          |        |        |                   |                              |  |       |        |                          |        |        |                          |        |        |

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Monitoring equipment           | Colorimeter                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                | Brand                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                | HACH                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                                | Model                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                | DR900                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                | Serial number                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                | HAC160600001037                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| QA/QC procedures to be applied | Accuracy                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                | ± 2.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                                | Latest calibration                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                | 09/04/2020                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                | Validity                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|                                | 08/04/2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Purpose of the data            | Calculation of baseline and project emissions                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Calculation method             | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Comments                       | <p>In the registered PD the description of measurement methods and procedures to be applied mentioned that the results would be logged in the plant operation report on a daily basis. During this monitoring period, the COD has been measured through sampling, and thus the average values were ensured with 90/10 confidence level.</p> <p>Higher value was used for CS3 and lower value was used for CS4. This is a conservative approach to calculate the project emission.</p> |

|                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                | $S_{final,PJ,y}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Data unit                                                       | t                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Description                                                     | Amount of dry matter in the sludge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Source of data                                                  | Measured – same weighbridge at starch plant for tapioca procuring                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Description of measurement methods and procedures to be applied | <p>The project proponent did not envisage the generation of any sludge during the monitoring period. If sludge was taken outside, the final disposal would be monitored and recorded.</p> <p>In case of sludge removal, the total quantity of sludge will be measured on a wet basis. The volume (m<sup>3</sup>) and density or direct weighing may be used to determine the sludge amount (wet basis). Representative samples are taken to determine the moisture content to calculate the total sludge amount on dry basis.</p> <p>If the methane emissions from anaerobic decay of the final sludge were to be neglected because the sludge was controlled combusted, disposed of in a landfill with methane recovery, or used for soil application, then the end-use of the final sludge would be monitored during the crediting period.</p> |

| Frequency of monitoring/recording | Whenever the sludge is removed, the quantity must be recorded and documented. Monitoring of 100 % of the sludge amount through continuous or batch measurements and moisture content through representative sampling to ensure the 90/10 confidence/precision level                                                                                                                                                |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------|--------------------------|------------------------------|--------------------------|------------------------------|---------------|---------|----------|-----|--------------------|------------|----------|------------|
| Value monitored                   | <table border="1"> <thead> <tr> <th>Monitoring period</th><th>Value monitored (tonnes)</th></tr> </thead> <tbody> <tr> <td>01/05/2021 to 31/12/2021</td><td>There was no sludge removal.</td></tr> <tr> <td>01/01/2022 to 31/03/2022</td><td>There was no sludge removal.</td></tr> </tbody> </table>                                                                                                              | Monitoring period | Value monitored (tonnes) | 01/05/2021 to 31/12/2021 | There was no sludge removal. | 01/01/2022 to 31/03/2022 | There was no sludge removal. |               |         |          |     |                    |            |          |            |
| Monitoring period                 | Value monitored (tonnes)                                                                                                                                                                                                                                                                                                                                                                                           |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
| 01/05/2021 to 31/12/2021          | There was no sludge removal.                                                                                                                                                                                                                                                                                                                                                                                       |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
| 01/01/2022 to 31/03/2022          | There was no sludge removal.                                                                                                                                                                                                                                                                                                                                                                                       |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
| Monitoring equipment              | <p>Truck scale at starch plant</p> <table border="1"> <tbody> <tr> <td>Tag/location</td><td>Truck scale</td></tr> <tr> <td>Brand</td><td>Linear</td></tr> <tr> <td>Model</td><td>PM02</td></tr> <tr> <td>Serial number</td><td>2006220</td></tr> <tr> <td>Accuracy</td><td>N/A</td></tr> <tr> <td>Latest calibration</td><td>11/11/2020</td></tr> <tr> <td>Validity</td><td>10/11/2022</td></tr> </tbody> </table> | Tag/location      | Truck scale              | Brand                    | Linear                       | Model                    | PM02                         | Serial number | 2006220 | Accuracy | N/A | Latest calibration | 11/11/2020 | Validity | 10/11/2022 |
| Tag/location                      | Truck scale                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
| Brand                             | Linear                                                                                                                                                                                                                                                                                                                                                                                                             |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
| Model                             | PM02                                                                                                                                                                                                                                                                                                                                                                                                               |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
| Serial number                     | 2006220                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
| Accuracy                          | N/A                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
| Latest calibration                | 11/11/2020                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
| Validity                          | 10/11/2022                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
| QA/QC procedures to be applied    | <p>The plant manager's signature is required on the record.</p> <p>The calibration and the accuracy of truck scale is controlled and verified by Central Bureau of Weights and Measures. The calibration certificate is valid for 2 years.</p>                                                                                                                                                                     |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
| Purpose of the data               | Calculation of project emissions                                                                                                                                                                                                                                                                                                                                                                                   |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
| Calculation method                | -                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |
| Comments                          |                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                          |                          |                              |                          |                              |               |         |          |     |                    |            |          |            |

|                                                                 |                                                                                                                                                                   |
|-----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Data / Parameter                                                | BG <sub>burnt, combusted, y</sub>                                                                                                                                 |
| Data unit                                                       | Nm <sup>3</sup>                                                                                                                                                   |
| Description                                                     | Amount of biogas combusted for gainful use in the year y                                                                                                          |
| Source of data                                                  | <p>Measured using gas flow meter (GM1, GM3)</p> <p>Calculated from a summation of total biogas utilized in the boiler and generation sets.</p>                    |
| Description of measurement methods and procedures to be applied | Temperature and pressure were automatically measure by thermal-mass type flow meters was, expressing biogas volumes in normalized cubic meters (Nm <sup>3</sup> ) |

| Frequency of monitoring/recording | Monitored continuously (at least hourly measurements are undertaken).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------|--------------------------|------------------|--------------------------|------------------|---------------------|--------------------------|------------|---------------------|---------|---------------------|----------------------|-----------------------------|-----------------|----------|---------|--------------------|------------|----------|------------|--------------|-----------------|-------|-----|-------|------------------|---------------|-------|----------|---------|--------------------|------------|----------|------------|--------------|-----------------|-------|------------|-------|---------------|---------------|------------------|----------|---------|--------------------|------------|----------|------------|
| Value monitored                   | <table><tr><th>Monitoring period</th><th>Value applied (m³)</th></tr><tr><td>01/05/2021 to 31/12/2021</td><td>2,477,722</td></tr><tr><td>01/01/2022 to 31/03/2022</td><td>574,944</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Monitoring period | Value applied (m³) | 01/05/2021 to 31/12/2021 | 2,477,722        | 01/01/2022 to 31/03/2022 | 574,944          |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Monitoring period                 | Value applied (m³)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| 01/05/2021 to 31/12/2021          | 2,477,722                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| 01/01/2022 to 31/03/2022          | 574,944                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Monitoring equipment              | <p>There are three biogas flow meters implemented during this monitoring period.</p> <p>First gas meter is the meter monitoring biogas being sent to the hot oil boiler.</p> <table><tr><td>Tag/location</td><td>GM1 - Boiler</td></tr><tr><td>Brand (detector)</td><td>VERIS</td></tr><tr><td>Model (detector)</td><td>C100-05-H-WCFS-CXXX</td></tr><tr><td>Serial number (detector)</td><td>V9107-03.1</td></tr><tr><td>Brand (transmitter)</td><td>Siemens</td></tr><tr><td>Model (transmitter)</td><td>7MF4433-1BA22-1AC6-Z</td></tr><tr><td>Serial number (transmitter)</td><td>N1-8730-9470592</td></tr><tr><td>Accuracy</td><td>± 1.00%</td></tr><tr><td>Latest calibration</td><td>17/08/2021</td></tr><tr><td>Validity</td><td>16/08/2024</td></tr></table> <p>Second gas meter is the meter monitoring biogas being sent to gas engine.</p> <table><tr><td>Tag/location</td><td>GM3 - Generator</td></tr><tr><td>Brand</td><td>Fox</td></tr><tr><td>Model</td><td>FT2A-09ISSSTE3B0</td></tr><tr><td>Serial number</td><td>20880</td></tr><tr><td>Accuracy</td><td>± 1.00%</td></tr><tr><td>Latest calibration</td><td>10/04/2020</td></tr><tr><td>Validity</td><td>09/04/2023</td></tr></table> <p>On 13-November-2021, Gen 5 was commissioned and used as the main generator. Biogas sent to Gen 5 was monitored by GM4.</p> <table><tr><td>Tag/location</td><td>GM4 - Generator</td></tr><tr><td>Brand</td><td>Siemens AG</td></tr><tr><td>Model</td><td>SITRANS FX330</td></tr><tr><td>Serial number</td><td>D200000001030310</td></tr><tr><td>Accuracy</td><td>± 1.00%</td></tr><tr><td>Latest calibration</td><td>10/12/2020</td></tr><tr><td>Validity</td><td>09/10/2023</td></tr></table> |                   | Tag/location       | GM1 - Boiler             | Brand (detector) | VERIS                    | Model (detector) | C100-05-H-WCFS-CXXX | Serial number (detector) | V9107-03.1 | Brand (transmitter) | Siemens | Model (transmitter) | 7MF4433-1BA22-1AC6-Z | Serial number (transmitter) | N1-8730-9470592 | Accuracy | ± 1.00% | Latest calibration | 17/08/2021 | Validity | 16/08/2024 | Tag/location | GM3 - Generator | Brand | Fox | Model | FT2A-09ISSSTE3B0 | Serial number | 20880 | Accuracy | ± 1.00% | Latest calibration | 10/04/2020 | Validity | 09/04/2023 | Tag/location | GM4 - Generator | Brand | Siemens AG | Model | SITRANS FX330 | Serial number | D200000001030310 | Accuracy | ± 1.00% | Latest calibration | 10/12/2020 | Validity | 09/10/2023 |
| Tag/location                      | GM1 - Boiler                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Brand (detector)                  | VERIS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Model (detector)                  | C100-05-H-WCFS-CXXX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Serial number (detector)          | V9107-03.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Brand (transmitter)               | Siemens                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Model (transmitter)               | 7MF4433-1BA22-1AC6-Z                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Serial number (transmitter)       | N1-8730-9470592                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Accuracy                          | ± 1.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Latest calibration                | 17/08/2021                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Validity                          | 16/08/2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Tag/location                      | GM3 - Generator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Brand                             | Fox                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Model                             | FT2A-09ISSSTE3B0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Serial number                     | 20880                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Accuracy                          | ± 1.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Latest calibration                | 10/04/2020                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Validity                          | 09/04/2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Tag/location                      | GM4 - Generator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Brand                             | Siemens AG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Model                             | SITRANS FX330                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Serial number                     | D200000001030310                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Accuracy                          | ± 1.00%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Latest calibration                | 10/12/2020                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |
| Validity                          | 09/10/2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                    |                          |                  |                          |                  |                     |                          |            |                     |         |                     |                      |                             |                 |          |         |                    |            |          |            |              |                 |       |     |       |                  |               |       |          |         |                    |            |          |            |              |                 |       |            |       |               |               |                  |          |         |                    |            |          |            |

|                                |                                                                                                                                 |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| QA/QC procedures to be applied | Flow meters should undergo maintenance/ calibration subject to appropriate industry standards, at least once every three years. |
| Purpose of the data            | Calculation of baseline emissions                                                                                               |
| Calculation method             | -                                                                                                                               |
| Comments                       | -                                                                                                                               |

|                                                                 |                                                                                                                                                                                                                                                                                                      |  |                   |                                   |                          |   |                          |   |
|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------|-----------------------------------|--------------------------|---|--------------------------|---|
| Data / Parameter                                                | BG <sub>burnt,TOFlare,y</sub> / VRG <sub>m</sub>                                                                                                                                                                                                                                                     |  |                   |                                   |                          |   |                          |   |
| Data unit                                                       | Nm <sup>3</sup>                                                                                                                                                                                                                                                                                      |  |                   |                                   |                          |   |                          |   |
| Description                                                     | Amount of biogas sent to flare system in the year y                                                                                                                                                                                                                                                  |  |                   |                                   |                          |   |                          |   |
| Source of data                                                  | Measured using gas flow meter, GM2                                                                                                                                                                                                                                                                   |  |                   |                                   |                          |   |                          |   |
| Description of measurement methods and procedures to be applied | Thermal-mass type flow meters would automatically measure temperature and pressure, expressing biogas volumes in normalized cubic meters (Nm <sup>3</sup> )                                                                                                                                          |  |                   |                                   |                          |   |                          |   |
| Frequency of monitoring/recording                               | Monitored continuously (at least hourly measurements are undertaken, if less, confidence/precision level of 90/10 shall be attained).                                                                                                                                                                |  |                   |                                   |                          |   |                          |   |
| Value monitored                                                 | <table><tr><td>Monitoring period</td><td>Value monitored (m<sup>3</sup>)</td></tr><tr><td>01/05/2021 to 31/12/2021</td><td>0</td></tr><tr><td>01/01/2022 to 31/03/2022</td><td>0</td></tr></table>                                                                                                   |  | Monitoring period | Value monitored (m <sup>3</sup> ) | 01/05/2021 to 31/12/2021 | 0 | 01/01/2022 to 31/03/2022 | 0 |
| Monitoring period                                               | Value monitored (m <sup>3</sup> )                                                                                                                                                                                                                                                                    |  |                   |                                   |                          |   |                          |   |
| 01/05/2021 to 31/12/2021                                        | 0                                                                                                                                                                                                                                                                                                    |  |                   |                                   |                          |   |                          |   |
| 01/01/2022 to 31/03/2022                                        | 0                                                                                                                                                                                                                                                                                                    |  |                   |                                   |                          |   |                          |   |
| Monitoring equipment                                            | Please see comments below.                                                                                                                                                                                                                                                                           |  |                   |                                   |                          |   |                          |   |
| QA/QC procedures to be applied                                  | Flow meters underwent maintenance / calibration subject to appropriate industry standards, at least once every three years.                                                                                                                                                                          |  |                   |                                   |                          |   |                          |   |
| Purpose of the data                                             | Calculation of project emissions                                                                                                                                                                                                                                                                     |  |                   |                                   |                          |   |                          |   |
| Calculation method                                              | -                                                                                                                                                                                                                                                                                                    |  |                   |                                   |                          |   |                          |   |
| Comments                                                        | During this monitoring period, there was no biogas sent for flaring. The total biogas consumption rate and the biogas storage capacity were checked against the monitored biogas generation value. PP could ensure that no biogas have been sent to the flaring system during the monitoring period. |  |                   |                                   |                          |   |                          |   |

|                  |                    |
|------------------|--------------------|
| Data / Parameter | WCH <sub>4,y</sub> |
|------------------|--------------------|

| Data unit                                                       | %                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|---------------------|--|-------|--------|--------------------------|-------|-------|--------------------------|-------------------|-----|-------------------|---------------------|--|-------|--------|--------------------------|-------|-------|--------------------------|-------|-------|-------------------|---------------------|--|-------|--------|--------------------------|-------|-------|--------------------------|-------|-------|
| Description                                                     | Methane content in biogas in the year y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
| Source of data                                                  | Measured using a gas analyzer (MS1, MS2, MS3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
| Description of measurement methods and procedures to be applied | <p>The fraction of methane in the gas should be measured with a continuous analyzer or, alternatively, with periodical measurements at a 90/10 confidence/precision level.</p> <p>The methane content measurement was carried out close to a location in the system where a biogas flow measurement takes place.</p> <p>During this monitoring period, the methane was analyzed through the portable equipment, thus the confidence/precision level was applied to the monitoring value.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                   |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
| Frequency of monitoring/recording                               | Either with continuous analyzer or alternatively with periodical measurement at 90% confidence level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
| Value monitored                                                 | <p>Methane – header (from AFFR)</p> <table><tr><th rowspan="2">Monitoring period</th><th colspan="2">Value monitored (%)</th></tr><tr><th>Lower</th><th>Higher</th></tr><tr><td>01/05/2021 to 31/12/2021</td><td>53.01</td><td>54.52</td></tr><tr><td>01/01/2022 to 31/03/2022</td><td>N/A<sup>13</sup></td><td>N/A</td></tr></table> <p>Methane - biogas sent to boiler</p> <table><tr><th rowspan="2">Monitoring period</th><th colspan="2">Value monitored (%)</th></tr><tr><th>Lower</th><th>Higher</th></tr><tr><td>01/05/2021 to 31/12/2021</td><td>49.20</td><td>50.05</td></tr><tr><td>01/01/2022 to 31/03/2022</td><td>46.83</td><td>47.34</td></tr></table> <p>Methane – biogas sent to engines</p> <table><tr><th rowspan="2">Monitoring period</th><th colspan="2">Value monitored (%)</th></tr><tr><th>Lower</th><th>Higher</th></tr><tr><td>01/05/2021 to 31/12/2021</td><td>48.92</td><td>49.75</td></tr><tr><td>01/01/2022 to 31/03/2022</td><td>46.45</td><td>47.08</td></tr></table> | Monitoring period | Value monitored (%) |  | Lower | Higher | 01/05/2021 to 31/12/2021 | 53.01 | 54.52 | 01/01/2022 to 31/03/2022 | N/A <sup>13</sup> | N/A | Monitoring period | Value monitored (%) |  | Lower | Higher | 01/05/2021 to 31/12/2021 | 49.20 | 50.05 | 01/01/2022 to 31/03/2022 | 46.83 | 47.34 | Monitoring period | Value monitored (%) |  | Lower | Higher | 01/05/2021 to 31/12/2021 | 48.92 | 49.75 | 01/01/2022 to 31/03/2022 | 46.45 | 47.08 |
| Monitoring period                                               | Value monitored (%)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
|                                                                 | Lower                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Higher            |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
| 01/05/2021 to 31/12/2021                                        | 53.01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 54.52             |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
| 01/01/2022 to 31/03/2022                                        | N/A <sup>13</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | N/A               |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
| Monitoring period                                               | Value monitored (%)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
|                                                                 | Lower                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Higher            |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
| 01/05/2021 to 31/12/2021                                        | 49.20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 50.05             |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
| 01/01/2022 to 31/03/2022                                        | 46.83                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 47.34             |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
| Monitoring period                                               | Value monitored (%)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                   |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
|                                                                 | Lower                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Higher            |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
| 01/05/2021 to 31/12/2021                                        | 48.92                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 49.75             |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |
| 01/01/2022 to 31/03/2022                                        | 46.45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 47.08             |                     |  |       |        |                          |       |       |                          |                   |     |                   |                     |  |       |        |                          |       |       |                          |       |       |                   |                     |  |       |        |                          |       |       |                          |       |       |

<sup>13</sup> Due to interference from high H<sub>2</sub>S, PP decided to stop the measurement of CH<sub>4</sub> at the header.

|                                |                                                                                                                                                                                                                                                                                                                                                                        |            |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| Monitoring equipment           | Methane gas analyzer                                                                                                                                                                                                                                                                                                                                                   |            |
|                                | Brand                                                                                                                                                                                                                                                                                                                                                                  | Gas Data   |
|                                | Model                                                                                                                                                                                                                                                                                                                                                                  | GFM406     |
|                                | Serial number                                                                                                                                                                                                                                                                                                                                                          | 12368      |
|                                | Accuracy                                                                                                                                                                                                                                                                                                                                                               | ± 2.00%    |
|                                | Latest calibration                                                                                                                                                                                                                                                                                                                                                     | 29/09/2021 |
|                                | Validity                                                                                                                                                                                                                                                                                                                                                               | 28/09/2024 |
| QA/QC procedures to be applied | The gas analyzer underwent maintenance/calibration subject to appropriate industry standards, at least once every three years.                                                                                                                                                                                                                                         |            |
| Purpose of the data            | Calculation of baseline and project emissions                                                                                                                                                                                                                                                                                                                          |            |
| Calculation method             | The lowest value of 48.92% was chosen for baseline emission calculation, while highest value of 54.52% was chosen for project emission calculation in 2021. While 46.45% was chosen for baseline emission calculation, while highest value of 47.34% was chosen for the project emission calculation in 2022. The calculation falls within the 90/10 confidence level. |            |
| Comments                       | The lower value was chosen for the baseline emission, while the higher value was selected for the project emission calculation. This is a conservative approach.                                                                                                                                                                                                       |            |

|                                                                                                                     |                                                                                                                 |                     |
|---------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------|
| Data / Parameter                                                                                                    | $\eta_{\text{flare-m}}$                                                                                         |                     |
| Data unit                                                                                                           | %                                                                                                               |                     |
| Description                                                                                                         | The flare efficiency                                                                                            |                     |
| Source of data                                                                                                      | Tool “Project emissions from flaring” version 02.0.0                                                            |                     |
| Description of measurement methods and procedures to be applied                                                     | In the case of enclosed flares, the $\eta_{\text{flare,m}}$ is 0% without the complete flare monitoring system. |                     |
| Frequency of monitoring/recording                                                                                   | Continuously monitored                                                                                          |                     |
| Value monitored                                                                                                     | Monitoring period                                                                                               | Value monitored (%) |
|                                                                                                                     | 01/05/2021 to 31/12/2021                                                                                        | 0                   |
|                                                                                                                     | 01/01/2022 to 31/03/2022                                                                                        | 0                   |
| *Conservative default value for enclosed flare from Methodological tool “Project emission from flaring” Version 2.0 |                                                                                                                 |                     |
| Monitoring equipment                                                                                                | -                                                                                                               |                     |
| QA/QC procedures to be applied                                                                                      | -                                                                                                               |                     |

|                     |                                  |
|---------------------|----------------------------------|
| Purpose of the data | Calculation of project emissions |
| Calculation method  | -                                |
| Comments            | -                                |

| Data / Parameter                                                | EC <sub>PJ,j,y</sub>                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                       |                          |          |                          |        |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------|--------------------------|----------|--------------------------|--------|
| Data unit                                                       | MWh                                                                                                                                                                                                                                                                                                                                                                                                                   |                   |                       |                          |          |                          |        |
| Description                                                     | Electricity consumption by wastewater treatment system and biogas plant in year y                                                                                                                                                                                                                                                                                                                                     |                   |                       |                          |          |                          |        |
| Source of data                                                  | Maximum rated consumption                                                                                                                                                                                                                                                                                                                                                                                             |                   |                       |                          |          |                          |        |
| Description of measurement methods and procedures to be applied | The maximum rated consumption from auxiliary equipment was used to calculate the emissions from PE <sub>power,y</sub> . This approach has taken into account the distribution losses (TDL <sub>j,y</sub> ) which equals to 8.735% for 2021 and 8.444% for 2022, and the calculation is based on an assumption that the electrical appliances were running at full capacity on the operating days for the entire year. |                   |                       |                          |          |                          |        |
| Frequency of monitoring/recording                               | -                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                       |                          |          |                          |        |
| Value monitored                                                 | <table border="1"> <thead> <tr> <th>Monitoring period</th><th>Value monitored (MWh)</th></tr> </thead> <tbody> <tr> <td>01/05/2021 to 31/12/2021</td><td>1,313.07</td></tr> <tr> <td>01/01/2022 to 31/03/2022</td><td>492.40</td></tr> </tbody> </table>                                                                                                                                                              | Monitoring period | Value monitored (MWh) | 01/05/2021 to 31/12/2021 | 1,313.07 | 01/01/2022 to 31/03/2022 | 492.40 |
| Monitoring period                                               | Value monitored (MWh)                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                       |                          |          |                          |        |
| 01/05/2021 to 31/12/2021                                        | 1,313.07                                                                                                                                                                                                                                                                                                                                                                                                              |                   |                       |                          |          |                          |        |
| 01/01/2022 to 31/03/2022                                        | 492.40                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                       |                          |          |                          |        |
| Monitoring equipment                                            | -                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                       |                          |          |                          |        |
| QA/QC procedures to be applied                                  | <p>The maximum rated consumption is used to calculate the emissions from PE<sub>power,y</sub>.</p> <p>Since this approach has taken into account the distribution losses (TDL<sub>j,y</sub>), and was calculated from maximum consumption (full capacity), the QA/QC aspect has already been assured.</p>                                                                                                             |                   |                       |                          |          |                          |        |
| Purpose of the data                                             | Calculation of project emissions                                                                                                                                                                                                                                                                                                                                                                                      |                   |                       |                          |          |                          |        |
| Calculation method                                              | The 10% has been considered for distribution losses for the calculation of the PE <sub>power,y</sub> . This approach is consistent with the second crediting period PD and the applied methodology AMS-III.H.                                                                                                                                                                                                         |                   |                       |                          |          |                          |        |
| Comments                                                        | There has been no separating PEA meter of the imported electricity for the biogas plant since the start of the project. Therefore, the                                                                                                                                                                                                                                                                                |                   |                       |                          |          |                          |        |

|                                                                 |                                                                                                                                                                                                                                   |  |                   |                     |                          |       |                          |       |
|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------|---------------------|--------------------------|-------|--------------------------|-------|
|                                                                 | maximum rated consumption of auxiliary equipment is used.                                                                                                                                                                         |  |                   |                     |                          |       |                          |       |
|                                                                 |                                                                                                                                                                                                                                   |  |                   |                     |                          |       |                          |       |
| Data / Parameter                                                | TDL <sub>j,y</sub>                                                                                                                                                                                                                |  |                   |                     |                          |       |                          |       |
| Data unit                                                       | %                                                                                                                                                                                                                                 |  |                   |                     |                          |       |                          |       |
| Description                                                     | Average technical transmission and distribution losses for providing electricity to the project activity (electricity import)                                                                                                     |  |                   |                     |                          |       |                          |       |
| Source of data                                                  | Recent data available for the host country <sup>14</sup>                                                                                                                                                                          |  |                   |                     |                          |       |                          |       |
| Description of measurement methods and procedures to be applied | As per the guidance given in the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”, the most recent data available within the host country was used during monitoring and verification. |  |                   |                     |                          |       |                          |       |
| Frequency of monitoring/recording                               | Annually<br>In the absence of data from the relevant year, the most recent figures should be used, but not older than five years.                                                                                                 |  |                   |                     |                          |       |                          |       |
| Value monitored                                                 | <table><tr><td>Monitoring period</td><td>Value monitored (%)</td></tr><tr><td>01/05/2021 to 31/12/2021</td><td>8.735</td></tr><tr><td>01/01/2022 to 31/03/2022</td><td>8.444</td></tr></table>                                    |  | Monitoring period | Value monitored (%) | 01/05/2021 to 31/12/2021 | 8.735 | 01/01/2022 to 31/03/2022 | 8.444 |
| Monitoring period                                               | Value monitored (%)                                                                                                                                                                                                               |  |                   |                     |                          |       |                          |       |
| 01/05/2021 to 31/12/2021                                        | 8.735                                                                                                                                                                                                                             |  |                   |                     |                          |       |                          |       |
| 01/01/2022 to 31/03/2022                                        | 8.444                                                                                                                                                                                                                             |  |                   |                     |                          |       |                          |       |
| Monitoring equipment                                            | -                                                                                                                                                                                                                                 |  |                   |                     |                          |       |                          |       |
| QA/QC procedures to be applied                                  | Not applicable                                                                                                                                                                                                                    |  |                   |                     |                          |       |                          |       |
| Purpose of the data                                             | Calculation of project emissions                                                                                                                                                                                                  |  |                   |                     |                          |       |                          |       |
| Calculation method                                              | -                                                                                                                                                                                                                                 |  |                   |                     |                          |       |                          |       |
| Comments                                                        | During this monitoring period, Thailand Energy Balance 2020 published by Department of Alternative Energy Development and Efficiency (DEDE) has been selected for the calculation <sup>15</sup> .                                 |  |                   |                     |                          |       |                          |       |
|                                                                 |                                                                                                                                                                                                                                   |  |                   |                     |                          |       |                          |       |
| Data / Parameter                                                | EG <sub>PJ,y</sub>                                                                                                                                                                                                                |  |                   |                     |                          |       |                          |       |
| Data unit                                                       | MWh                                                                                                                                                                                                                               |  |                   |                     |                          |       |                          |       |
| Description                                                     | Quantity of net electricity generation supplied by the project plant/unit to the grid in year y                                                                                                                                   |  |                   |                     |                          |       |                          |       |
| Source of data                                                  | PEA meters and the electricity built into the generator sets                                                                                                                                                                      |  |                   |                     |                          |       |                          |       |

<sup>14</sup> Department of Alternative Energy Development and Efficiency of Thailand  
[https://www.dede.go.th/ewt\\_news.php?nid=47341](https://www.dede.go.th/ewt_news.php?nid=47341)

<sup>15</sup> [https://www.dede.go.th/ewt\\_news.php?nid=47341](https://www.dede.go.th/ewt_news.php?nid=47341)

|                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------|-----------------------|--------------------------|--------|--------------------------|--------|------------|----------|----------|------------|--------------------|---------------------------------|----------|------------------|
| Description of measurement methods and procedures to be applied | The data from PEA monthly report of meter reading was used for the net electricity generation supplied to the grid in the calculation.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| Frequency of monitoring/recording                               | Continuous monitoring and at least monthly recording                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| Value monitored                                                 | PEA meter <table><tr><td>Monitoring period</td><td>Value monitored (MWh)</td></tr><tr><td>01/05/2021 to 31/12/2021</td><td>854.69</td></tr><tr><td>01/01/2022 to 31/03/2022</td><td>250.61</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                      |  | Monitoring period | Value monitored (MWh) | 01/05/2021 to 31/12/2021 | 854.69 | 01/01/2022 to 31/03/2022 | 250.61 |            |          |          |            |                    |                                 |          |                  |
| Monitoring period                                               | Value monitored (MWh)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| 01/05/2021 to 31/12/2021                                        | 854.69                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| 01/01/2022 to 31/03/2022                                        | 250.61                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| Monitoring equipment                                            | Power export meter <table><tr><td>Tag/location</td><td>PEA-export meter</td></tr><tr><td>Brand</td><td>EDMI</td></tr><tr><td>Model</td><td>Genius</td></tr><tr><td>PEA number</td><td>18324073</td></tr><tr><td>Accuracy</td><td>Class 0.5S</td></tr><tr><td>Latest calibration</td><td>19-September-2018<sup>16</sup></td></tr><tr><td>Validity</td><td>PEA jurisdiction</td></tr></table> <p>The meter is under PEA jurisdiction and calibration is not under project proponent control. According to the PEA protocol announced in 2019, the meter shall be calibrated once every 2 years.</p> |  | Tag/location      | PEA-export meter      | Brand                    | EDMI   | Model                    | Genius | PEA number | 18324073 | Accuracy | Class 0.5S | Latest calibration | 19-September-2018 <sup>16</sup> | Validity | PEA jurisdiction |
| Tag/location                                                    | PEA-export meter                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| Brand                                                           | EDMI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| Model                                                           | Genius                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| PEA number                                                      | 18324073                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| Accuracy                                                        | Class 0.5S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| Latest calibration                                              | 19-September-2018 <sup>16</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| Validity                                                        | PEA jurisdiction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| QA/QC procedures to be applied                                  | The meter should be verified as per the manufacturer's recommendation. The meter used in the project activity is under PEA jurisdiction, thus the calibration/maintenance is out of project participant's control.                                                                                                                                                                                                                                                                                                                                                                                |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| Purpose of the data                                             | Calculation of baseline emissions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| Calculation method                                              | -                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |
| Comments                                                        | According to Thailand Provincial Electricity Authority regulations, VSPP with CT and VT meters at high voltage levels of 22 kV or higher are required to calibrate their electricity export meters at least once a year or as deemed appropriate by the PEA <sup>17</sup> . While the meter calibration of this project is under the PEA jurisdiction, an error (lower gap) was applied to EG <sub>PJ,y</sub> . An error from the latest calibration report was used as it was larger than the specified accuracy for conservativeness.                                                           |  |                   |                       |                          |        |                          |        |            |          |          |            |                    |                                 |          |                  |

<sup>16</sup> The meter was replaced with a new one in May 2023.

<sup>17</sup> The Provincial Electricity Authority regulations regarding procedures related to meters, B.E. 2562 (2019).

|  |                                                                                                                                                                                                                                                           |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>In addition, since there was a meter change by the PEA in 2023 and checked during onsite assessment, the meter details were provided as follows.</p> <p>Brand: EDM I</p> <p>Model: GENIUS</p> <p>Serial no.: 251341993</p> <p>Accuracy: Class 0.5S</p> |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Data / Parameter                                                | $EG_{thermal,y}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |
|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|----------------------|--------------------------|-------|--------------------------|-------|-------------------|----------------------|--------------------------|------|--------------------------|------|
| Data unit                                                       | TJ                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |
| Description                                                     | Net quantity of thermal energy supplied by the project activity during the year y                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |
| Source of data                                                  | Plant records                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |
| Description of measurement methods and procedures to be applied | As per the methodology deviated approach provided in section 2.6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |
| Frequency of monitoring/recording                               | Continuous monitoring, aggregated annually                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |
| Value monitored                                                 | <p>Historical data based on <math>Q_{starch,y}</math></p> <table border="1"> <thead> <tr> <th>Monitoring period</th><th>Value monitored (TJ)</th></tr> </thead> <tbody> <tr> <td>01/05/2021 to 31/12/2021</td><td>50.18</td></tr> <tr> <td>01/01/2022 to 31/03/2022</td><td>25.54</td></tr> </tbody> </table> <p>Fuel Energy Input based on <math>FC_{i,j,y}</math></p> <table border="1"> <thead> <tr> <th>Monitoring period</th><th>Value monitored (TJ)</th></tr> </thead> <tbody> <tr> <td>01/05/2021 to 31/12/2021</td><td>7.70</td></tr> <tr> <td>01/01/2022 to 31/03/2022</td><td>0.03</td></tr> </tbody> </table> | Monitoring period | Value monitored (TJ) | 01/05/2021 to 31/12/2021 | 50.18 | 01/01/2022 to 31/03/2022 | 25.54 | Monitoring period | Value monitored (TJ) | 01/05/2021 to 31/12/2021 | 7.70 | 01/01/2022 to 31/03/2022 | 0.03 |
| Monitoring period                                               | Value monitored (TJ)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |
| 01/05/2021 to 31/12/2021                                        | 50.18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |
| 01/01/2022 to 31/03/2022                                        | 25.54                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |
| Monitoring period                                               | Value monitored (TJ)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |
| 01/05/2021 to 31/12/2021                                        | 7.70                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |
| 01/01/2022 to 31/03/2022                                        | 0.03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |
| Monitoring equipment                                            | <p>For historical data basis – please see <math>Q_{starch,y}</math></p> <p>For fuel energy input – please see <math>FC_{i,j,y}</math></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |
| QA/QC procedures to be applied                                  | <p>The temperature and flow rate meters were subject to periodic calibration according to the equipment's specifications and applicable industry standards.</p> <p>In the absence of monitoring data, <math>EG_{thermal,y}</math> can be estimated in a conservative manner with an energy balance calculation based on the energy inputs to the boiler system (biogas flow, HFO consumption), assuming a conservative value of 100% for the efficiency of the boiler. The amount of starch dried in a certain</p>                                                                                                        |                   |                      |                          |       |                          |       |                   |                      |                          |      |                          |      |

|                     |                                                                                                                                                             |
|---------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                     | period can be used for crosschecking purposes. This approach was chosen for this monitoring period.                                                         |
| Purpose of the data | Calculation of baseline emissions                                                                                                                           |
| Calculation method  | -                                                                                                                                                           |
| Comments            | Metering the energy produced by a sample of the systems where the simplified baseline is based on the energy produced multiplied by an emission coefficient |

| Data / Parameter                                                | FC <sub>i,j,y</sub>                                                                                                                                                                                                                                                                                                                                                                                |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------------------|--------------------------|---------|--------------------------|-------|---------------|-------|----------|---------|--------------------|------------|----------|------------|
| Data unit                                                       | Litres                                                                                                                                                                                                                                                                                                                                                                                             |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Description                                                     | Quantity of fossil fuel used in the boiler in year y.                                                                                                                                                                                                                                                                                                                                              |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Source of data                                                  | A flow meter is available at boiler to monitor the fuel oil usage at the project site.                                                                                                                                                                                                                                                                                                             |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Description of measurement methods and procedures to be applied | A fuel oil meter is available at the hot oil boiler.<br>In recording this parameter, the plant's operators would first manually archive the monitored data onto log sheets then transfer it to the computer for electronic storage. The archiving would be done on a daily basis.                                                                                                                  |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Frequency of monitoring/recording                               | Continuously monitoring with recording on daily basis                                                                                                                                                                                                                                                                                                                                              |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Value monitored                                                 | <table border="1"> <thead> <tr> <th>Monitoring period</th><th>Value monitored (Litres)</th></tr> </thead> <tbody> <tr> <td>01/05/2021 to 31/12/2021</td><td>2,584</td></tr> <tr> <td>01/01/2022 to 31/03/2022</td><td>7,569</td></tr> </tbody> </table>                                                                                                                                            | Monitoring period | Value monitored (Litres) | 01/05/2021 to 31/12/2021 | 2,584   | 01/01/2022 to 31/03/2022 | 7,569 |               |       |          |         |                    |            |          |            |
| Monitoring period                                               | Value monitored (Litres)                                                                                                                                                                                                                                                                                                                                                                           |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| 01/05/2021 to 31/12/2021                                        | 2,584                                                                                                                                                                                                                                                                                                                                                                                              |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| 01/01/2022 to 31/03/2022                                        | 7,569                                                                                                                                                                                                                                                                                                                                                                                              |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Monitoring equipment                                            | Flow meter for fuel oil <table border="1"> <tr> <td>Tag/location</td><td>OM1 (at the boiler)</td></tr> <tr> <td>Brand</td><td>Contoil</td></tr> <tr> <td>Model</td><td>VZF20</td></tr> <tr> <td>Serial number</td><td>20320</td></tr> <tr> <td>Accuracy</td><td>± 1.00%</td></tr> <tr> <td>Latest calibration</td><td>19/08/2021</td></tr> <tr> <td>Validity</td><td>18/08/2024</td></tr> </table> | Tag/location      | OM1 (at the boiler)      | Brand                    | Contoil | Model                    | VZF20 | Serial number | 20320 | Accuracy | ± 1.00% | Latest calibration | 19/08/2021 | Validity | 18/08/2024 |
| Tag/location                                                    | OM1 (at the boiler)                                                                                                                                                                                                                                                                                                                                                                                |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Brand                                                           | Contoil                                                                                                                                                                                                                                                                                                                                                                                            |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Model                                                           | VZF20                                                                                                                                                                                                                                                                                                                                                                                              |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Serial number                                                   | 20320                                                                                                                                                                                                                                                                                                                                                                                              |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Accuracy                                                        | ± 1.00%                                                                                                                                                                                                                                                                                                                                                                                            |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Latest calibration                                              | 19/08/2021                                                                                                                                                                                                                                                                                                                                                                                         |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Validity                                                        | 18/08/2024                                                                                                                                                                                                                                                                                                                                                                                         |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| QA/QC procedures to be applied                                  | Periodic calibrations (once in three years) for flow meter are ensured via an external agency.                                                                                                                                                                                                                                                                                                     |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Purpose of the data                                             | Calculation of project emissions                                                                                                                                                                                                                                                                                                                                                                   |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Calculation method                                              | -                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |
| Comments                                                        | -                                                                                                                                                                                                                                                                                                                                                                                                  |                   |                          |                          |         |                          |       |               |       |          |         |                    |            |          |            |

| Data / Parameter                                                | Q <sub>starch,y</sub>                                                                                                                                                                                                                                                                                                                                              |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------|------------------------|--------------------------|--------|--------------------------|--------|---------------|---------|----------|-----|--------------------|------------|----------|------------|
| Data unit                                                       | Tonnes                                                                                                                                                                                                                                                                                                                                                             |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Description                                                     | Quantity of dry starch produced                                                                                                                                                                                                                                                                                                                                    |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Source of data                                                  | Based on the operational log sheet at the plant                                                                                                                                                                                                                                                                                                                    |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Description of measurement methods and procedures to be applied | A proper record of all starch produced was maintained at the project site. This parameter is a component of regular monitoring for the starch industry as this is the main product and its revenues the core business relies from this product.                                                                                                                    |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Frequency of monitoring/recording                               | The monitored data was summarized annually.                                                                                                                                                                                                                                                                                                                        |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Value monitored                                                 | <table><tr><th>Monitoring period</th><th>Applied value (tonnes)</th></tr><tr><td>01/05/2021 to 31/12/2021</td><td>39,013</td></tr><tr><td>01/01/2022 to 31/03/2022</td><td>20,040</td></tr></table>                                                                                                                                                                |  | Monitoring period | Applied value (tonnes) | 01/05/2021 to 31/12/2021 | 39,013 | 01/01/2022 to 31/03/2022 | 20,040 |               |         |          |     |                    |            |          |            |
| Monitoring period                                               | Applied value (tonnes)                                                                                                                                                                                                                                                                                                                                             |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| 01/05/2021 to 31/12/2021                                        | 39,013                                                                                                                                                                                                                                                                                                                                                             |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| 01/01/2022 to 31/03/2022                                        | 20,040                                                                                                                                                                                                                                                                                                                                                             |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Monitoring equipment                                            | Truck scale at starch factory <table><tr><td>Tag/location</td><td>Truck scale</td></tr><tr><td>Brand</td><td>Linear</td></tr><tr><td>Model</td><td>PM02</td></tr><tr><td>Serial number</td><td>2006220</td></tr><tr><td>Accuracy</td><td>N/A</td></tr><tr><td>Latest calibration</td><td>11/11/2020</td></tr><tr><td>Validity</td><td>10/11/2022</td></tr></table> |  | Tag/location      | Truck scale            | Brand                    | Linear | Model                    | PM02   | Serial number | 2006220 | Accuracy | N/A | Latest calibration | 11/11/2020 | Validity | 10/11/2022 |
| Tag/location                                                    | Truck scale                                                                                                                                                                                                                                                                                                                                                        |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Brand                                                           | Linear                                                                                                                                                                                                                                                                                                                                                             |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Model                                                           | PM02                                                                                                                                                                                                                                                                                                                                                               |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Serial number                                                   | 2006220                                                                                                                                                                                                                                                                                                                                                            |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Accuracy                                                        | N/A                                                                                                                                                                                                                                                                                                                                                                |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Latest calibration                                              | 11/11/2020                                                                                                                                                                                                                                                                                                                                                         |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Validity                                                        | 10/11/2022                                                                                                                                                                                                                                                                                                                                                         |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| QA/QC procedures to be applied                                  | The calibration and the accuracy of a weigher is controlled and verified by Central Bureau of Weights and Measures. The calibration certificate is valid for 2 years.                                                                                                                                                                                              |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Purpose of the data                                             | Calculation of baseline emissions                                                                                                                                                                                                                                                                                                                                  |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Calculation method                                              | -                                                                                                                                                                                                                                                                                                                                                                  |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |
| Comments                                                        | Since the truck scale was calibrated in time (within 2 years), the adjustment of the monitoring data is not necessary.                                                                                                                                                                                                                                             |  |                   |                        |                          |        |                          |        |               |         |          |     |                    |            |          |            |

### 4.3 Monitoring Plan

The monitoring plan is described in section 4.3 of the registered PD. The documented procedure for VCS monitoring program has been established and implemented. This document describes the scope of the VCS project, the responsibilities of individuals involved, job descriptions and scope, and emergency preparedness and response measures.

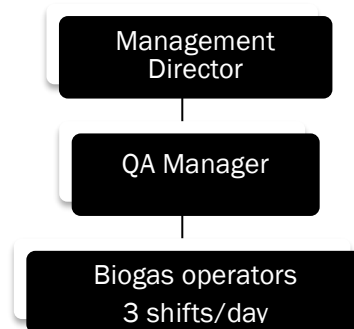
The daily operation data recording and laboratory analysis were carried out by the plant operator. The report was checked and approved by the QA manager. The QA manager controls all equipment calibrations.

The QA manager collected all the information and submitted it to the consultant for the emission calculation.

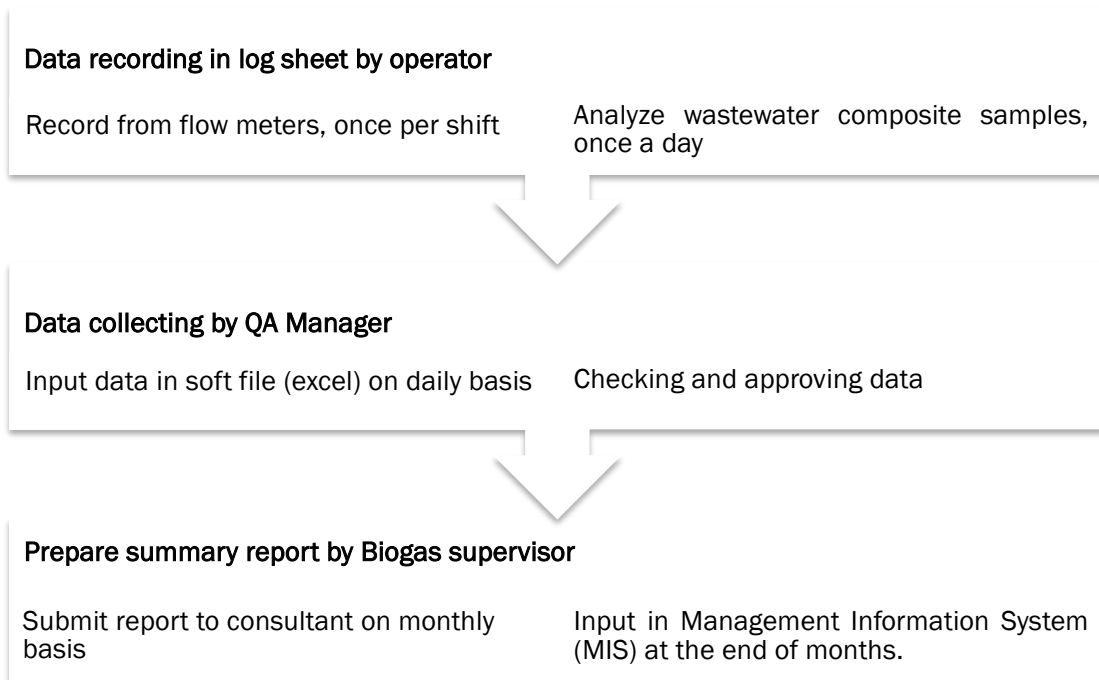
All monitoring data is available in an Excel spreadsheet. This spreadsheet consists of:

1. A summary worksheet containing the results of the monitoring for every day of the monitoring period on a yearly basis; and
2. The parameters monitored during the monitoring period.

#### Organization structure



#### Data Collection and management system



### Data storage and backup

- The original log sheets are collected and stored at the starch operation office by the QA Manager.
- The Excel spreadsheet is stored in the QA manager's computer and backed-up into an external or portable hard disk at least once a month.
- The data stored in MIS report is backup via Chol Charoen's server.
- The Excel spreadsheet submitted to consultant is stored and backed-up via the consultant's internal server on a monthly basis.

## 5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

### 5.1 Baseline Emissions

#### Baseline emissions calculation as per AMS III.H

Baseline emissions for the systems affected by the project activity can be calculated as per equation below.

$$BE_y = \{BE_{power, y} + BE_{ww, treatment, y} + BE_{s, treatment, y} + BE_{ww, discharge, y} + BE_{s, final, y}\} \quad (1)$$

Where:

| Parameters              | Details                                                                                                                | Quantification                                                         |
|-------------------------|------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| $BE_y$                  | Baseline emissions in year y (tCO <sub>2</sub> e)                                                                      | 01/05/2021 to 31/12/2021 = 44,859<br>01/01/2022 to 31/03/2022 = 22,145 |
| $BE_{power, y}$         | Baseline emissions from electricity or fuel consumption in year y (tCO <sub>2</sub> e)                                 | 01/05/2021 to 31/12/2021 = 0<br>01/01/2022 to 31/03/2022 = 0           |
| $BE_{ww, treatment, y}$ | Baseline emissions of the wastewater treatment systems affected by the project activity in year y (tCO <sub>2</sub> e) | 01/05/2021 to 31/12/2021 = 44,859<br>01/01/2022 to 31/03/2022 = 22,145 |

|                                |                                                                                                                                                                                                                                                                                    |                                                              |
|--------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| BE <sub>s, treatment, y</sub>  | Baseline emissions of the sludge treatment systems affected by the project activity in year y (tCO <sub>2e</sub> )                                                                                                                                                                 | 01/05/2021 to 31/12/2021 = 0<br>01/01/2022 to 31/03/2022 = 0 |
| BE <sub>ww, discharge, y</sub> | Baseline methane emissions from degradable organic carbon in treated wastewater discharged into seas, rivers, and lakes in year y (tCO <sub>2e</sub> ). The value of this term is zero for the case 1(b)                                                                           | 01/05/2021 to 31/12/2021 = 0<br>01/01/2022 to 31/03/2022 = 0 |
| BE <sub>s, final, y</sub>      | Baseline methane emissions from anaerobic decay of the final sludge produced in year y (tCO <sub>2e</sub> ). If the sludge is controlled combusted, disposed of in a landfill with biogas recovery, or used for soil application in the baseline scenario, this term was neglected | 01/05/2021 to 31/12/2021 = 0<br>01/01/2022 to 31/03/2022 = 0 |

**a) Emissions on account of electricity or fossil fuel used (BE<sub>power, y</sub>)**

The only electricity consumption devices used in the baseline wastewater treatment systems are pumps for pumping the starch wastewater into the open anaerobic lagoons. There is no consumption of fossil fuels for the operation of the baseline system.

For the sake of simplification and conservativeness, baseline emissions from electricity and fuel consumptions (BE<sub>power, y</sub>) are assumed to be zero.

$$BE_{power, y} = 0$$

**b) Methane emissions from baseline wastewater treatment systems (BE<sub>ww, treatment, y</sub>)**

Methane emissions from the baseline wastewater treatment systems affected by the project (BE<sub>ww, treatment, y</sub>) are determined using the COD removal efficiency of the baseline plant:

$$BE_{ww, treatment, y} = \sum Q_{ww, i, y} * COD_{inflow, i, y} * \eta_{COD, BL, i} * MCF_{ww, treatment, BL, i} * B_{o, ww} * UF_{BL} * GWP_{CH4} \quad (2)$$

Where:

| Parameter                      | Details | Quantification           |                          |
|--------------------------------|---------|--------------------------|--------------------------|
| BE <sub>ww, treatment, y</sub> |         | 01/05/2021 to 31/12/2021 | 44,859 tCO <sub>2e</sub> |

|                                     |                                                                                                                                                                                                     |                          |                                                   |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------------------------------------------------|
|                                     | Methane emissions from the baseline wastewater treatment systems affected by the project                                                                                                            | 01/01/2022 to 31/03/2022 | 22,145 tCO <sub>2</sub> e                         |
| Q <sub>ww, i, y</sub>               | Volume of wastewater treated in baseline wastewater treatment system <i>i</i> in year <i>y</i> .                                                                                                    | 01/05/2021 to 31/12/2021 | 427,590 m <sup>3</sup>                            |
|                                     |                                                                                                                                                                                                     | 01/01/2022 to 31/03/2022 | 221,418 m <sup>3</sup>                            |
| COD <sub>inflow, i, y</sub>         | COD of the wastewater inflow to the baseline treatment system <i>i</i> in year <i>y</i> (t/m <sup>3</sup> ). The average value was used through sampling with a confidence/precision level of 90/10 | 01/05/2021 to 31/12/2021 | COD <sub>ww,untreated, lower</sub> (AFFR) = 0.024 |
|                                     |                                                                                                                                                                                                     |                          | COD <sub>ww,untreated,lower</sub> (CL) = 0.024    |
|                                     |                                                                                                                                                                                                     | 01/05/2022 to 31/12/2022 | COD <sub>ww,untreated, lower</sub> (AFFR) = 0.022 |
|                                     |                                                                                                                                                                                                     |                          | COD <sub>ww,untreated,lower</sub> (CL) = 0.023    |
| η <sub>COD,BL,i</sub>               | COD removal efficiency of the baseline treatment system <i>i</i> , determined as per the paragraphs 38, 39 and 40 of the methodology                                                                | 87%                      |                                                   |
| MCF <sub>ww, treatment, BL, i</sub> | Methane correction factor for baseline wastewater treatment systems <i>i</i>                                                                                                                        | 0.8                      |                                                   |
| <i>i</i>                            | Index for baseline wastewater treatment system                                                                                                                                                      | N/A                      |                                                   |

|              |                                                                                                            |                          |    |
|--------------|------------------------------------------------------------------------------------------------------------|--------------------------|----|
| $B_{o, ww}$  | Methane producing capacity of the wastewater (IPCC value of 0.25 kg CH <sub>4</sub> /kg COD) <sup>18</sup> | 0.25                     |    |
| $UF_{BL}$    | Model correction factor to account for model uncertainties (0.89) <sup>19</sup>                            | 0.89                     |    |
| $GWP_{CH_4}$ | Global Warming Potential for methane                                                                       | 01/05/2021 to 31/12/2021 | 28 |
|              |                                                                                                            | 01/01/2022 to 31/03/2022 | 28 |

**c) Methane emissions from baseline sludge treatment systems ( $BE_{s,treatment,y}$ )**

There is no sludge treatment system in the baseline scenario, only a wastewater treatment system based on open anaerobic lagoons; hence, baseline emissions from sludge treatment are not taken into consideration.

$$BE_{s,treatment,y} = 0$$

**d) Baseline methane emissions from degradable organic carbon in treated wastewater discharged into sea/river/lake ( $BE_{ww,discharge,y}$ )**

In the baseline scenario, treated wastewater is not discharged into seas, lakes, or rivers; therefore, methane emissions from degradable organic carbon in treated wastewater discharged ( $BE_{ww,discharge,y}$ ) into a sea, river or lake in the baseline situation is assumed to be zero.

$$BE_{ww,discharge,y} = 0$$

**e) Baseline methane emissions from anaerobic decay of the final sludge produced ( $BE_{s,final,y}$ )**

For the sake of conservativeness, it is assumed that the sludge is used for soil application in the baseline scenario. Therefore, baseline methane emissions from the anaerobic decay of the final sludge ( $BE_{s,final,y}$ ) produced is also neglected.

$$BE_{s,final,y} = 0$$

**MD<sub>y</sub> approach**

<sup>18</sup> Project activities may use the default value of 0.6 kg CH<sub>4</sub>/kg BOD, if the parameter BOD<sub>5,20</sub> is used to determine the organic content of the wastewater. In this case, baseline and project emissions calculations shall use BOD instead of COD in the equations, and the monitoring of the project activity shall be based in direct measurements of BOD<sub>5,20</sub>, i.e. the estimation of BOD values based on COD measurements is not allowed.

<sup>19</sup> Reference: FCCC/SBSTA/2003/10/Add.2, page 25.

As per the paragraph 46 AMS III.H.,  $MD_y$  has been introduced under this methodology. The lowest emission reduction achieved in any year is the lowest value obtained from either  $MD_y$  approach or  $BE_{y,expost}$  process:

$$MD_y = BG_{burnt,y} * W_{CH4,y} * D_{CH4} * FE * GWP_{CH4} \quad (3)$$

Where:

| Parameters     | Details                                                                                                 | Quantification           |                                      |
|----------------|---------------------------------------------------------------------------------------------------------|--------------------------|--------------------------------------|
| $MD_y$         | Methane captured and destroyed/gainfully used by the project activity in the year y (tCO <sub>2</sub> ) | 01/05/2021 to 31/12/2021 | 24,298                               |
|                |                                                                                                         | 01/01/2021 to 31/03/2022 | 5,353                                |
| $BG_{burnt,y}$ | Biogas flared/combusted in year y (m <sup>3</sup> )                                                     | 01/05/2022 to 31/12/2021 | $BG_{burnt,combusted,y} = 2,477,522$ |
|                |                                                                                                         |                          | $BG_{burnt,TOflare,y} = 0$           |
|                |                                                                                                         | 01/01/2022 to 31/03/2022 | $BG_{burnt,combusted,y} = 574,944$   |
|                |                                                                                                         |                          | $BG_{burnt,TOflare,y} = 0$           |
| $W_{CH4}$      | Methane content of the biogas in the year y (volume fraction)                                           | 01/05/2021 to 31/12/2021 | 48.92%                               |
|                |                                                                                                         | 01/01/2022 to 31/03/2022 | 46.45%                               |
| $D_{CH4}$      | Density of methane at the temperature and pressure of the biogas in the year y (t/m <sup>3</sup> )      | 0.00072                  |                                      |
| FE             | Flare efficiency in year y (fraction)                                                                   | 0                        |                                      |

#### Baseline emissions calculation as per AMS I.C

For thermal energy produced using fossil fuels and/or grid electricity the baseline emissions are calculated as follows:

$$BE_{thermal,CO2,y} = (EG_{thermal,y} / \eta_{BL,thermal}) * EF_{FF,CO2} \quad (4)$$

As per the proposed methodology deviation explained in section 3.2.1 above, the baseline emissions were based on the minimum value between the amount of energy delivered by the dual fuel fired boiler and the historical specific consumption of fossil fuel oil per tonne of starch.

Where:

| Parameter                   | Details                                                                                                                                                              | Quantification           |                                                    |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------------------------------------|
| BE <sub>thermal,CO2,y</sub> | Baseline emissions from thermal energy displaced by the project activity during the year y (tCO <sub>2</sub> )                                                       | 01/05/2021 to 31/12/2021 | 595                                                |
|                             |                                                                                                                                                                      | 01/01/2022 to 31/03/2022 | 1                                                  |
| EG <sub>thermal,y</sub>     | Net quantity of thermal energy supplied by the project activity during the year y (TJ)                                                                               | 01/05/2021 to 31/12/2021 | EG <sub>thermal,y</sub> – Historical data = 50.18  |
|                             |                                                                                                                                                                      |                          | EG <sub>thermal,y</sub> – Fuel energy input = 7.70 |
|                             |                                                                                                                                                                      | 01/01/2022 to 31/03/2022 | EG <sub>thermal,y</sub> – Historical data = 25.54  |
|                             |                                                                                                                                                                      |                          | EG <sub>thermal,y</sub> – Fuel energy input = 0.03 |
| EF <sub>FF,CO2</sub>        | CO <sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant. IPCC default emission factors can be used (tCO <sub>2</sub> /TJ) | 77.40                    |                                                    |
| Q <sub>starch,y</sub>       | Quantity of dry starch produced in year y (tonnes)                                                                                                                   | 01/05/2021 to 31/12/2021 | 39,013                                             |
|                             |                                                                                                                                                                      | 01/01/2022 to 31/03/2022 | 20,040                                             |
| q <sub>FO,starch</sub>      | Quantity of fossil fuel per unit of dry starch (litter/tonne)                                                                                                        | 34.30                    |                                                    |
| q <sub>FO,y</sub>           | Quantity of fossil fuel used in the project activity (litre)                                                                                                         | 01/05/2021 to 31/12/2021 | 2,584                                              |
|                             |                                                                                                                                                                      | 01/01/2022 to 31/03/2022 | 7,569                                              |

|                         |                                                                                                                                                 |        |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| NCV <sub>FO</sub>       | Net calorific value of the fuel oil (TJ/tonne)                                                                                                  | 0.0404 |
| D <sub>FO</sub>         | Density of fuel oil in the year y (tonnes/m <sup>3</sup> )                                                                                      | 0.93   |
| η <sub>BL,thermal</sub> | Efficiency of the plant using fossil fuel that would have been used in the absence of the project activity determined as per paragraph 39 or 40 | 100%   |

### Baseline emissions calculation as per AMS I.D

Baseline emissions include only CO<sub>2</sub> emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y = BE_{gen,y} = EF_{grid,y} * EG_{PJ,y} \quad (5)$$

Where:

| Parameter            | Details                                                                                                                                                                                                                             | Quantification           |        |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------|
| BE <sub>gen,y</sub>  | Baseline emissions in year y (tCO <sub>2</sub> e)                                                                                                                                                                                   | 01/05/2021 to 31/12/2021 | 481    |
|                      |                                                                                                                                                                                                                                     | 01/01/2022 to 31/03/2022 | 141    |
| EG <sub>PJ,y</sub>   | Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the project activity in year y (MWh)                                                                             | 01/05/2021 to 31/12/2021 | 854.69 |
|                      |                                                                                                                                                                                                                                     | 01/01/2022 to 31/03/2022 | 250.61 |
| EF <sub>grid,y</sub> | Combined margin CO <sub>2</sub> emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO <sub>2</sub> e/MWh) | 0.5637                   |        |

## 5.2 Project Emissions

### Project emissions calculation as per AMS III.H

The project emissions are calculated from

$$PE_y = \{PE_{power, y} + PE_{ww, treatment, y} + PE_{s, treatment, y} + PE_{ww, discharge, y} + PE_{s, final, y} + PE_{fugitive, y} + PE_{biomass, y} + PE_{flaring, y}\} \quad (6)$$

Where:

| Parameters                     | Details                                                                                                                                                       | Quantification                                                        |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| PE <sub>y</sub>                | Project activity emissions in the year y (tCO <sub>2</sub> e)                                                                                                 | 01/05/2021 to 31/12/2021 = 12,158<br>01/01/2022 to 31/03/2022 = 6,916 |
| PE <sub>power, y</sub>         | Emissions from electricity or fuel consumption in the year y (t CO <sub>2</sub> e).                                                                           | 01/05/2021 to 31/12/2021 = 805<br>01/01/2022 to 31/03/2022 = 302      |
| PE <sub>ww, treatment, y</sub> | Methane emissions from wastewater treatment systems affected by the project activity, and not equipped with biogas recovery, in year y (t CO <sub>2</sub> e). | 01/05/2021 to 31/12/2021 = 4,688<br>01/01/2022 to 31/03/2022 = 2,854  |
| PE <sub>s, treatment, y</sub>  | Methane emissions from sludge treatment systems affected by the project activity, and not equipped with biogas recovery, in year y (tCO <sub>2</sub> e).      | 01/05/2021 to 31/12/2021 = 0<br>01/01/2022 to 31/03/2022 = 0          |
| PE <sub>ww, discharge, y</sub> | Methane emissions from degradable organic carbon in treated wastewater in year y (tCO <sub>2</sub> e).                                                        | 01/05/2021 to 31/12/2021 = 0<br>01/01/2022 to 31/03/2022 = 0          |
| PE <sub>s, final, y</sub>      | Methane emissions from anaerobic decay of the final sludge produced in year y (tCO <sub>2</sub> e).                                                           | 01/05/2021 to 31/12/2021 = 0<br>01/01/2022 to 31/03/2022 = 0          |
| PE <sub>fugitive, y</sub>      | Methane emissions from biogas release in capture systems in year y (tCO <sub>2</sub> e)                                                                       | 01/05/2021 to 31/12/2021 = 6,665<br>01/01/2022 to 31/03/2022 = 3,760  |

|                          |                                                                                        |                                                              |
|--------------------------|----------------------------------------------------------------------------------------|--------------------------------------------------------------|
| PE <sub>biomass, y</sub> | Methane emissions due to incomplete flaring in year y (tCO <sub>2</sub> e).            | 01/05/2021 to 31/12/2021 = 0<br>01/01/2022 to 31/03/2022 = 0 |
| PE <sub>flaring, y</sub> | Methane emissions from biomass stored under anaerobic conditions. (tCO <sub>2</sub> e) | 01/05/2021 to 31/12/2021 = 0<br>01/01/2022 to 31/03/2022 = 0 |

**a) Emissions from electricity or fuel consumption in the year (PE<sub>Power, y</sub>)**

This emission was calculated as per paragraph 28 of the methodology, by following the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”.

$$PE_{Power, y} = EC_{PJ, j, y} * EF_{EF, j, y} * (1 + TDL_{j, y}) \quad (7)$$

Where:

| Parameter              | Details                                                                                                                                                                                                                                                                                                            | Quantification           |          |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------|
| PE <sub>power, y</sub> | Emissions from electricity consumption in the year y (tCO <sub>2</sub> e)                                                                                                                                                                                                                                          | 01/05/2021 to 31/12/2021 | 805      |
|                        |                                                                                                                                                                                                                                                                                                                    | 01/01/2022 to 31/03/2022 | 302      |
| EC <sub>PJ, j, y</sub> | Electricity from the grid consumed by the project activity (wastewater treatment, biogas recovery and biogas utilization/flaring systems) (MWh)<br><br>Plant load factor of 10% has been added on the maximum rated capacity, this approached is conservative and consistent with the estimation of registered PD. | 01/05/2021 to 31/12/2021 | 1,313.07 |
|                        |                                                                                                                                                                                                                                                                                                                    | 01/01/2022 to 31/03/2022 | 492.40   |
| TDL <sub>j, y</sub>    | Average technical transmission and distribution losses for providing electricity to source j in year y                                                                                                                                                                                                             | 2021                     | 8.735%   |
|                        |                                                                                                                                                                                                                                                                                                                    | 2022                     | 8.444%   |
| EF <sub>y</sub>        | Grid emission factor (tCO <sub>2</sub> e/MWh)                                                                                                                                                                                                                                                                      | 0.5637                   |          |

In the absence of an electricity meter for the electricity consumption of the project activity, the maximum rated consumption was used to calculate the emissions from  $PE_{power,y}$  as follows:

$$PE_{Power,y} = \sum P_{el} * (100\% + TDL_{j,y}) * 8,760 \text{ hours} * EF_y * 10^{-3} \quad (8)$$

Where:

$P_{el}$  = Total electrical capacity of the equipment installed in the project activity (kW)

Determination of  $EF_y$

Scenario A: Electricity consumption from the grid was chosen in this case and the combined margin emission factor of 0.5637 for a grid system was used.

**b) Methane emissions from wastewater treatment systems affected by the project activity, and not equipped with biogas recovery in the project scenario ( $PE_{ww,treatment,y}$ )**

These emissions were calculated as per equation (2) in the baseline emission calculation, using an uncertainty factor of 1.12 and data applicable to the project situation ( $MCF_{ww,treatment,PJ,k}$ ) and with the following changed definition of parameters:

$$PE_{ww,treatment,y} = \sum (Q_{ww,y} * COD_{ww,treated,y} * \eta_{PJ,k,y} * MCF_{ww,treatment,PJ,k} * B_{o,ww} * UF_{PJ} * GWP_{CH4}) \quad (9)$$

Where:

| Parameter             | Details                                                                                                                                                                                                                      | Quantification           |         |
|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|---------|
| $PE_{ww,treatment,y}$ | Methane emissions from wastewater treatment systems affected by the project activity, and not equipped with biogas recovery in the project situation (tCO <sub>2</sub> e)                                                    | 01/05/2021 to 31/12/2021 | 4,688   |
|                       |                                                                                                                                                                                                                              | 01/01/2022 to 31/03/2022 | 2,854   |
| $Q_{ww,i,y}$          | Volume of wastewater treated in baseline wastewater treatment system <i>i</i> in year <i>y</i> (m <sup>3</sup> ). For ex post emissions reduction calculation was based on the actual monitored volume of treated wastewater | 01/05/2021 to 31/12/2021 | 427,590 |
|                       |                                                                                                                                                                                                                              | 01/01/2022 to 31/03/2022 | 221,418 |
| $COD_{ww,treated,y}$  | COD of the wastewater inflow to the baseline treatment system <i>i</i> in year <i>y</i> (t/m <sup>3</sup> ). An average value may be used through sampling with a confidence/precision level of 90/10                        | 01/05/2021 to 31/12/2021 | 0.0017  |
|                       |                                                                                                                                                                                                                              | 01/01/2022 to 31/03/2022 | 0.0021  |
| $\eta_{PJ,k,y}$       | COD removal efficiency of the project activity;                                                                                                                                                                              | 100%                     |         |

|                           |                                                                                                            |                          |
|---------------------------|------------------------------------------------------------------------------------------------------------|--------------------------|
|                           | 100% was used for conservative                                                                             |                          |
| $MCF_{ww,treatment,PJ,k}$ | Methane correction factor for project wastewater treatment system k                                        | 0.8                      |
| k                         | Index for project activity wastewater treatment system                                                     | N/A                      |
| $B_{o,ww}$                | Methane producing capacity of the wastewater (IPCC value of 0.25 kg CH <sub>4</sub> /kg COD) <sup>20</sup> | 0.25                     |
| $UF_{PJ}$                 | Model correction factor to account for model uncertainties (1.12) <sup>21</sup>                            | 1.12                     |
| $GWP_{CH_4}$              | Global Warming Potential for methane                                                                       | 01/05/2021 to 31/12/2021 |
|                           |                                                                                                            | 01/01/2022 to 31/03/2022 |

**c) Methane emissions from sludge treatment systems affected by the project activity, and not equipped with biogas recovery in the project situation ( $PE_{s,treatment,y}$ )**

The project activity does not include sludge treatment system; therefore, the emissions from the sludge treatment system are not taken into consideration.

$$PE_{s,treatment,y} = 0$$

**d) Methane emissions on account of inefficiency of the project activity wastewater treatment systems and presence of degradable organic carbon in treated wastewater ( $PE_{ww,discharge,y}$ )**

In the project activity the treated wastewater was discharged in existing open lagoons and there was no discharge into seas, rivers or lakes. Hence, emissions from this component have not been included in the assessment.

$$PE_{ww,discharge,y} = 0$$

**e) Methane emissions from the decay of the final sludge generated by the project activity treatment systems ( $PE_{s,final,y}$ )**

a disposal of the sludge should be monitored during the crediting period. Therefore, as suggested by the AMS III.H, the emissions from the anaerobic decay of the final sludge produced can be omitted.

$$PE_{s,final,y} = 0$$

**f) Methane fugitive emissions due to inefficiencies in capture systems ( $PE_{fugitive,y}$ )**

<sup>20</sup> Project activities may use the default value of 0.6 kg CH<sub>4</sub>/kg BOD, if the parameter BOD<sub>5,20</sub> is used to determine the organic content of the wastewater. In this case, baseline and project emissions calculations shall use BOD instead of COD in the equations, and the monitoring of the project activity shall be based in direct measurements of BOD<sub>5,20</sub>, i.e. the estimation of BOD values based on COD measurements is not allowed.

<sup>21</sup> Reference: FCCC/SBSTA/2003/10/Add.2, page 25.

Project activity emissions from methane release in capture systems are determined as follows:

$$PE_{\text{fugitive}, y} = PE_{\text{fugitive}, \text{ww}, y} + PE_{\text{fugitive}, \text{s}, y}$$

Where:

| Parameter                     | Details                                                                                                                            | Quantification           |       |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------|
| PE <sub>fugitive, ww, y</sub> | Fugitive emissions through capture inefficiencies in the anaerobic wastewater treatment systems in the year y (tCO <sub>2</sub> e) | 01/05/2021 to 31/12/2021 | 6,665 |
|                               |                                                                                                                                    | 01/01/2022 to 31/03/2022 | 3,760 |
| PE <sub>y, fugitive, s</sub>  | Fugitive emissions through capture inefficiencies in the anaerobic sludge treatment systems in the year y (tCO <sub>2</sub> e)     | 0                        |       |

**Fugitive emissions through capture inefficiencies in the anaerobic wastewater treatment (PE<sub>fugitive, ww, y</sub>)**

$$PE_{\text{fugitive}, \text{ww}, y} = (1 - CFE_{\text{ww}}) * MEP_{\text{ww}, \text{treatment}, y} * GWP_{\text{CH}_4}$$

Where:

| Parameter                       | Details                                                                                                                   | Quantification           |       |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------|--------------------------|-------|
| CFE <sub>ww</sub>               | Capture efficiency of the biogas recovery equipment in the wastewater treatment systems (a default value of 0.9 was used) | 0.9                      |       |
| MEP <sub>ww, treatment, y</sub> | Methane emission potential of wastewater treatment systems equipped with biogas recovery system in year y (t)             | 01/05/2021 to 31/12/2021 | 2,380 |
|                                 |                                                                                                                           | 01/01/2022 to 31/03/2022 | 1,343 |

$$MEP_{\text{ww}, \text{treatment}, y} = Q_{\text{ww}, y} * B_{o, \text{ww}} * UF_{PJ} * \sum_k COD_{\text{removed}, PJ, k, y} * MCF_{\text{ww}, \text{treatment}, PJ, k}$$

Where:

| Parameter | Details | Quantification |
|-----------|---------|----------------|
|-----------|---------|----------------|

|                                    |                                                                                                                                                                    |                          |       |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------|
| COD <sub>removed, PJ, k, y</sub>   | The chemical oxygen demand removed <sup>22</sup> by the treatment system k of the project activity equipped with biogas recovery in the year y (t/m <sup>3</sup> ) | 01/05/2021 to 31/12/2021 | 0.025 |
|                                    |                                                                                                                                                                    | 01/01/2022 to 31/03/2022 | 0.026 |
| MCF <sub>ww,treatment, PJ, k</sub> | Methane correction factor for the project wastewater treatment system k equipped with biogas recovery equipment                                                    | 0.8                      |       |
| UF <sub>PJ</sub>                   | Model correction factor to account for model uncertainties (1.12)                                                                                                  | 1.12                     |       |

Since there is no anaerobic sludge treatment in the project activity, the PE<sub>fugitive,s, y</sub> is considered as zero and excluded from the project emission calculation.

Thus, the fugitive emissions through capture inefficiencies in the anaerobic wastewater treatment systems are given as:

$$PE_{fugitive, y} = PE_{fugitive\ ww, y}$$

#### g) Methane emissions due to incomplete flaring (PE<sub>flare,y</sub>)

If the project activity includes flaring of biogas, then the associated emissions (PE<sub>flare,y</sub>) were estimated using the “Tool to determine project emissions from flaring gases containing methane” version 02.0.0 . The flare efficiency for the minute m ( $\eta_{flare,m}$ ) is 0% , which was applied for this project for conservativeness.

#### Calculation of project emissions from flaring

Project emissions from flaring are calculated as the sum of emissions for each minute *m* in year *y*, based on the methane mass flow in the residual gas ( $F_{CH4,RG,m}$ ) and the flare efficiency ( $\eta_{flare,m}$ ), as follows:

$$PE_{flare,y} = GWP_{CH4} * \sum F_{CH4,RG,m} * (1 - \eta_{flare}) * 10^{-3}$$

Where:

| Parameter             | Details                                                                                 | Quantification                |
|-----------------------|-----------------------------------------------------------------------------------------|-------------------------------|
| PE <sub>flare,y</sub> | Project emission from flaring of the residual gas stream in year y (tCO <sub>2e</sub> ) | 0                             |
| GWP <sub>CH4</sub>    | Global Warming Potential of methane valid for the commitment period                     | 01/05/2021 to 31/12/2021 = 28 |

<sup>22</sup> Difference between the inflow COD and the outflow COD.

|                                  |                                                                      |                               |
|----------------------------------|----------------------------------------------------------------------|-------------------------------|
|                                  | (tCO <sub>2</sub> e/tCH <sub>4</sub> )                               | 01/01/2022 to 31/03/2022 = 28 |
| F <sub>CH<sub>4</sub>,RG,m</sub> | Mass flow of methane in the residual gas in the minute <i>m</i> (kg) | 0                             |
| η <sub>flare,m</sub>             | Flare efficiency in minute <i>m</i>                                  | 0                             |

- h) Methane emissions from biomass stored under anaerobic conditions which would not have occurred in the baseline situation (PE<sub>biomass,y</sub>).

Biomass storage is not envisaged in the project activity. Therefore, methane emissions from biomass stored under anaerobic conditions that do not take place in the baseline situation are not taken into consideration.

$$PE_{biomass,y} = 0$$

#### Project emissions calculation as per AMS I.C

For thermal energy produced using fossil fuels and/or grid electricity the baseline emissions are calculated as follows:

$$PE_{FC,j,y} = FC_{i,y} \times COEF_{i,y}$$

Where:

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO_2,i,y} \quad (4)$$

Where:

| Parameter            | Details                                                                                     | Quantification           |       |
|----------------------|---------------------------------------------------------------------------------------------|--------------------------|-------|
| PE <sub>FC,j,y</sub> | Project emissions from fossil fuel consumption during the year <i>y</i> (tCO <sub>2</sub> ) | 01/05/2021 to 31/12/2021 | 7.51  |
|                      |                                                                                             | 01/01/2022 to 31/03/2022 | 22.01 |
| FC <sub>i,j,y</sub>  | Quantity of fossil fuel used in the project activity (litre)                                | 01/05/2021 to 31/12/2021 | 2,584 |
|                      |                                                                                             | 01/01/2022 to 31/03/2022 | 7,569 |

|                      |                                                                                                                                                                      |        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| EF <sub>FF,CO2</sub> | CO <sub>2</sub> emission factor of the fossil fuel that would have been used in the baseline plant. IPCC default emission factors can be used (tCO <sub>2</sub> /TJ) | 77.40  |
| NCV <sub>FO</sub>    | Net calorific value of the fuel oil (TJ/tonne)                                                                                                                       | 0.0404 |
| D <sub>FO</sub>      | Density of fuel oil in the year y (tonnes/m <sup>3</sup> )                                                                                                           | 0.93   |

### 5.3 Leakage Emissions

The leakage predicted in the methodology employed is not applicable for this project activity as there was no transferred equipment from another activity - although new equipment had to be acquired.

### 5.4 GHG Emission Reductions and Carbon Dioxide Removals

As per the AMS III.H, AMS I.C and AMS I.D, emission reductions were calculated using formulas mentioned in baseline, project, and leakage emissions sections above. Emission reductions were estimated as follows;

$$ER_{y, \text{ex-post}} = BE_{y, \text{ex-post}} - (PE_{y, \text{ex-post}} + LE_{y, \text{ex-post}})$$

AMS I.C

| Parameter                | Unit               | 2021   | 2022   |
|--------------------------|--------------------|--------|--------|
| BE <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 595.00 | 1.00   |
| PE <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 7.51   | 22.01  |
| LE <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 0.00   | 0.00   |
| ER <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 587.49 | -21.01 |

AMS I.D

| Parameter                | Unit               | 2021 | 2022 |
|--------------------------|--------------------|------|------|
| BE <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 481  | 141  |
| PE <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 0    | 0    |
| LE <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 0    | 0    |

|                          |                    |     |     |
|--------------------------|--------------------|-----|-----|
| ER <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 481 | 141 |
|--------------------------|--------------------|-----|-----|

According to the AMS III.H, emission reduction achieved by the project activity is limited to the ex-post calculated baseline emissions minus project emissions using the actual monitored data for the project activity. Emission reductions achieved on any year are the lowest value of the following:

$$ER_{y, \text{ex-post}} = \min ((BE_{y, \text{ex-post}} - PE_{y, \text{ex-post}} - LE_{y, \text{ex-post}}), (MD_y - PE_{\text{power}, y} - LE_{y, \text{ex-post}}))$$

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| Parameter                | Unit               | 2021   | 2022   |
|--------------------------|--------------------|--------|--------|
| BE <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 44,859 | 22,145 |
| PE <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 12,158 | 6,916  |
| LE <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 0      | 0      |
| ER <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 32,701 | 15,229 |

AMS III.H – MD approach

| Parameter                | Unit               | 2021   | 2022  |
|--------------------------|--------------------|--------|-------|
| BE <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 24,298 | 5,353 |
| PE <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 805    | 302   |
| LE <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 0      | 0     |
| ER <sub>y, ex-post</sub> | tCO <sub>2</sub> e | 23,493 | 5,051 |

Total ER<sub>y, ex-post</sub>

| ER <sub>y, ex-post</sub>             | Unit                    | 2021          | 2022         |
|--------------------------------------|-------------------------|---------------|--------------|
| AMS I.C                              | tCO <sub>2</sub> e      | 587.49        | -21.01       |
| AMS I.D                              | tCO <sub>2</sub> e      | 481           | 141          |
| AMS III.H (MD approach)              | tCO <sub>2</sub> e      | 23,493        | 5,051        |
| <b>Total ER<sub>y, ex-post</sub></b> | <b>tCO<sub>2</sub>e</b> | <b>24,561</b> | <b>5,170</b> |

According to the equation above, the emission reduction as per AMS III.H, AMS I.C and AMS I.D. achieved during this monitoring period is as following;

| Vintage period             | Baseline emissions (tCO <sub>2</sub> e) | Project emissions (tCO <sub>2</sub> e) | Leakage emissions (tCO <sub>2</sub> e) | Reduction VCUs (tCO <sub>2</sub> e) | Removal VCUs (tCO <sub>2</sub> e) | Total VCUs (tCO <sub>2</sub> e) |
|----------------------------|-----------------------------------------|----------------------------------------|----------------------------------------|-------------------------------------|-----------------------------------|---------------------------------|
| 01-May-2021 to 31-Dec-2021 | 25,374                                  | 813                                    | -                                      | 24,561                              | -                                 | 24,561                          |
| 01-Jan-2022 to 31-Mar-2022 | 5,495                                   | 325                                    | -                                      | 5,170                               | -                                 | 5,170                           |
| <b>Total</b>               | <b>30,870</b>                           | <b>1,138</b>                           | <b>-</b>                               | <b>29,731</b>                       | <b>-</b>                          | <b>29,731</b>                   |

| Vintage period             | Ex-ante estimated reductions/removals | Achieved reductions/removals | Percent difference | Explanation for the difference                                                                                                                                                                                                                                                                                                                             |
|----------------------------|---------------------------------------|------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01-May-2021 to 31-Dec-2021 | 24,861                                | 24,561                       | -1.21%             | -                                                                                                                                                                                                                                                                                                                                                          |
| 01-Jan-2022 to 31-Mar-2022 | 9,323                                 | 5,170                        | -44.55%            | There was no biogas data record during 5-23 February 2022 due to malfunction of the PLC system so that the meter data was not sent to a computer. And during 13-31 March 2022, biogas was sent to boiler no. 2, the sparing boiler which is not included in the project boundary. Accordingly, ER in the MD approach is much lower than the COD approach.  |
| <b>Total</b>               | <b>34,184</b>                         | <b>29,731</b>                | <b>-13.03%</b>     | Similar explanation as the vintage 2022. Further, in the current monitoring period, there was only one electricity generator (Gen5) operating after November 2021. This resulted in lower EG <sub>PJ,y</sub> than the estimated value.<br>In addition, the days when there was no starch production and public holidays were excluded from ER calculation. |

# APPENDIX 1: COMMERCIALY SENSITIVE INFORMATION

N/A

| Section | Information | Justification |
|---------|-------------|---------------|
|         |             |               |
|         |             |               |
|         |             |               |
|         |             |               |

## SDG 7:

Evidence for the number of clean energies generated and supplied to the grid can be seen through the meter reading report from the PEA meter. The example of the meter reading report is shown below.



**การไฟฟ้าส่วนภูมิภาค**  
PROVINCIAL ELECTRICITY AUTHORITY

**Meter reading report for the VSPP**

รายงานการอ่านมิเตอร์ไฟฟ้าประจำเดือนสำหรับผู้ผลิตไฟฟ้าขนาดเล็กมาก (VSPP Address)  
ประเภทพลังงานหมุนเวียน และ การผลิตไฟฟ้าด้วยระบบ Cogeneration

ชื่อผู้ผลิตไฟฟ้าขนาดเล็กมาก บริษัท ช่อชัยภู จำกัด (1001767622)

อำนาจวันวันที่ 1-ม.ค.-2565

การไฟฟ้าที่อ่านหน่วย การไฟฟ้าอานกอบปริง

December 2021

ธ.ค.-2564

ประจำเดือน

ระดับแรงดัน 22 เควี, 22-33 เควี

| มิเตอร์เครื่องที่ 1 (เชื้อไฟฟ้าจาก กฟผ.)<br>หมายเลขผู้ใช้ไฟ : 20002651801<br>PEA No. : 6000548451 |           |           |           |          | มิเตอร์เครื่องที่ 2 (ขายไฟฟ้าให้ กฟผ.)<br>หมายเลขเครื่องวัด :<br>PEA No. : 18324073 |         |          |         |          |
|---------------------------------------------------------------------------------------------------|-----------|-----------|-----------|----------|-------------------------------------------------------------------------------------|---------|----------|---------|----------|
| ตัวลยอ่าน                                                                                         |           |           |           |          | ตัวลยอ่าน                                                                           |         |          |         |          |
|                                                                                                   | Peak      | Off Peak  | Holiday   | Demand   |                                                                                     | Peak    | Off Peak | Holiday | Demand   |
| เดือนก่อน                                                                                         | 2,977,820 | 2,352,230 | 2,376,110 | 25,115   | เดือนก่อน                                                                           | 737,270 | 368,700  | 338,920 | 28,208   |
| เดือนนี้                                                                                          | 3,033,890 | 2,405,790 | 2,456,080 | 25,793   | เดือนนี้                                                                            | 761,690 | 386,130  | 351,480 | 28,626   |
| ยอดค่า                                                                                            | 56,070    | 53,560    | 79,970    | 0.678    | ยอดค่า                                                                              | 24,420  | 17,430   | 12,560  | 0.415    |
| ตัวคูณ                                                                                            | 4,000     | 4,000     | 4,000     | 4,000    | ตัวคูณ                                                                              | 4,000   | 4,000    | 4,000   | 4,000    |
| หน่วยสุทธิ                                                                                        | 224,280   | 214,240   | 319,880   | 2,712.00 | หน่วยสุทธิ                                                                          | 97,680  | 69,720   | 50,240  | 1,672.00 |
| หน่วยรวม                                                                                          | 758,400   |           |           |          | หน่วยรวม                                                                            | 217,640 |          |         |          |

ลงชื่อ .. (ผู้อ่านหน่วย) บริษัทฯ

(.....)

ตำแหน่ง ..

ลงชื่อ .. (ผู้รับรอง) บริษัทฯ

(.....)

ตำแหน่ง Dir. Supervisor

ลงชื่อ .. (ผู้อ่านหน่วย) กฟผ.

(.....)

ตำแหน่ง ..

ลงชื่อ .. (ผู้รับรอง) กฟผ.

(.....)

ตำแหน่ง ..

หมายเหตุ

- ตั้งรายงานให้ กฟช. ส่งพ. กฟช และ กฟผ. ส่งส. ทางระบบสารสนเทศอิเล็กทรอนิกส์ ภายใน 5 วันนับแต่วันที่จดหน่วย
- เลขที่สัญญา VSPP-PEA 050/2550 ลงวันที่ 7 พฤศจิกายน 2550
- COD ณ วันที่ 22 กรกฎาคม 2554 เวลา 10:15 น. วันที่สิ้นสุด Adder 21 กรกฎาคม 2561
- ปริมาณขายตามสัญญา 2,000,000 MW กำลังการผลิตติดตั้ง 2,000,000 MW ประเภทเชื้อเพลิง ก๊าซชีวภาพ
- ลดหน่วย กรณีขายไฟฟ้าเกินสัญญา

PEAK 0 หน่วย

OFF-PEAK 0 หน่วย

HOLIDAY 0 หน่วย

SDG 8:

The evidence of number of employees working in the project activity and their payment have been provided to the verification body. The below document shows details of payment and social security contribution for individuals as evidence of contribution to SDG 8.

**แบบรายการแสดงการส่งเงินสมทบ**

ชื่อนิติกรประจำโครงการ: Choi Charoen    บริษัท: รณเจริญ จำกัด

ชื่อสาขา (ถ้ามี):    สาขา: รอการ

ที่ตั้งสำนักงานใหญ่สาขา: 209 หมู่ที่ 3 ตำบลหนองเต่า อ.บ้านโป่ง จ.ราชบุรี

รหัสไปรษณีย์: 20170    โทรศัพท์: 161859-60    โทรสาร:   

การนำส่งเงินสมทบสำหรับค่าจ้างเดือน: มีนาคม พ.ศ. 2565

| รายการ                                                              | จำนวนเงิน | บาท | สต. |
|---------------------------------------------------------------------|-----------|-----|-----|
| 1. เงินค่าจ้างทั้งสิ้น Salary                                       |           |     | 00  |
| 2. เงินสมทบผู้ประกันตน Social Security Contribution For individuals |           |     | 00  |
| 3. เงินสมทบนายจ้าง Social Security Contribution (ByCompany)         |           |     | 00  |
| 4. รวมเงินสมทบที่นำส่งทั้งสิ้น Total Social Security Contribution   |           |     | 00  |
| 5. จำนวนผู้ประกันตนที่ส่งเงินสมทบ                                   | 142       | คน  |     |

ข้าพเจ้าขอรับรองว่ารายการที่แจ้งไว้เป็นรายการที่ถูกต้องครบถ้วนและเป็นจริงทุกประการ

หรือลงนามโดย:

☐ รายละเอียดการนำส่งเงินสมทบ    จำนวน    บาท หรือ

☐ เฉพาะจากแม่เหล็ก    จำนวน    บาท

☒ ข้าพเจ้าขอรับรอง

☐ ข้าพเจ้าขอรับรอง

นายจ้าง/ผู้รับมอบอำนาจ:    ตำแหน่ง:    เดือน:    พ.ศ. 2565

หมายเลข: 2233297209

Barcode: 00940001596760220000007032000011 032565000100142 0016266200

SDG 13:

The amount of emission reduced/removed can be seen through the ER calculation as well as in section 5.4 of this monitoring report.