GLOBAL CARBON COUNCIL

Driving Climate Actions

# Project Verification Report

V3.1 - 2020

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| COVER PAGE<br>Project Verification Report Form (PVR) | |
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| | |
| **BASIC INFORMATION** | |
| **Name of approved GCC Project Verifier / Reference No.**<br>(also provide weblink of approved GCC Certificate) | Shenzhen CTI International Certification Co., Ltd. (CTI) /GCCV007/00<br>https://www.globalcarboncouncil.com/wp-content/uploads/2022/03/GCCV007-00-CTI-GCC-Verifier-Certificate-27032022.pdf |
| **Type of Accreditation** | ☐ Individual Track[1]<br>☒ CDM Accreditation<br>☐ ISO 14065 Accreditation<br><br>Name of the entity that provided the accreditation: UNFCCC<br>Date of validity: till 30/05/2028<br>Ref NO. of DOE: E-0061<br>Weblink of the active accreditation certificate and approval:<br>https://cdm.unfccc.int/DOE/list/DOE.html?entityCode=E-0061 |
| **Approved GCC Scopes and GHG Sectoral scopes for Project Verification** | **Approved GCC Scopes for Project Verification:**<br>Green House Gas (GHG# - ACC)<br>Environmental No-harm (E+)<br>Social No-harm (S+)<br>Sustainable Development Goals (SDG+)<br>**Approved GHG Sectoral scopes for Project Verification:**<br>1. Energy (renewable/non-renewable sources) (CDM TA 1.1, 1.2)<br>2. Energy distribution (CDM TA 2.1)<br>3. Energy demand (CDM TA 3.1)<br>4. Manufacturing industries (CDM TA 4.1)<br>5. Chemical industry (CDM TA 5.1, 5.2)<br>6. Construction (CDM TA 6.1)<br>7. Transport (CDM TA 7.1)<br>8. Mining/mineral production (CDM TA 8.1)<br>9. Metal production (CDM TA 9.1, 9.2) |

[1] **Note:** GCC Verifier under Individual tack is not eligible to conduct verifications for the GCC project that intends to supply carbon credits (ACCs) for CORSIA requirements.

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| | 10. Fugitive emissions from fuels (solid, oil and gas) (CDM TA 10.1)<br>11. Fugitive Emissions from production and consumption of halocarbons and sulphur hexafluoride (CDM TA 11.1, 11.2)<br>12. Solvents use (CDM TA 12.1)<br>13. Waste handling and disposal (CDM TA 13.1, 13.2)<br>14. Afforestation and Reforestation (CDM TA 14.1)<br>15. Agriculture (CDM TA 15.1) |
| **Validity of GCC approval of Verifier** | 27/03/2022 to 26/03/2023 |
| **Title, completion date, and Version number of the PSF to which this report applies** | Junan Municipal Solid Waste Incineration For Power Generation Project<br>Version 4.0 dated 29/11/2023 |
| **Title of the project activity** | Junan Municipal Solid Waste Incineration For Power Generation Project |
| **Project submission reference no.**<br>(as provided by GCC Program during GSC) | S00675 |
| **Eligible GCC Project Type[2] as per the Project Standard**<br>(Tick applicable project type) | ☒ **Type A:**<br>☐ Type A1<br>☒ Type A2 sub-type 1<br>☐ **Type B – De-registered CDM Projects:**<br>☐ Type B1<br>☐ Type[3] B2 |
| **Date of completion of Local stakeholder consultation** | 05/12/2014 |
| **Date of completion and period of Global stakeholder consultation. Have the GSC comments been verified. Provide web-link.** | GSC consultation period: 06/12/2022 to 20/12/2022<br>Web-link: https://www.globalcarboncouncil.com/global-stakeholders-consultation-6/<br>No comments were received. |

[2] Project Types defined in Project Standard and Program Definitions on GCC website.

[3] GCC Project Verifier shall conduct Project Verification for all project types except $B_2$.

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| **Name of Entity requesting verification service**<br>(can be Project Owners themselves or any Entity having authorization of Project Owners) | Beijing Tianying Zero Carbon Technology Research Institute Co, Ltd. |
| **Contact details of the representative of the Entity, requesting verification service**<br>(Focal Point assigned for all communications) | Bo Liu<br>Tel: +86-15910601836<br>Email: liubo05@ctyi.com.cn |
| **Country where project is located** | P.R.China |
| **GPS coordinates of the Project site(s)** | 35°09'58'' North Latitude and 118°52 '24″ East Longitude (118.8733E, 35.1661N) |
| **Applied methodologies**<br>(approved methodologies of GCC or CDM can be used) | ACM0022: "Large-scale Consolidated Methodology Alternative waste treatment processes" (Version 03.0) |
| **GHG Sectoral scopes linked to the applied methodologies** | Sectoral scope 1: Energy (renewable/non-renewable sources)<br>Sectoral scope 13: Waste handling and disposal |
| **Project Verification Criteria:**<br>Mandatory requirements to be assessed | ☒ ISO 14064-2, ISO 14064-3<br>☒ GCC Rules and Requirements<br>☒ Applicable Approved Methodology<br>☒ Applicable Legal requirements /rules of host country<br>☒ National Sustainable Development Criteria (if any)<br>☒ Eligibility of the Project Type<br>☒ Start date of the Project activity<br>☒ Meet applicability conditions in the applied methodology<br>☒ Credible Baseline<br>☒ Additionality<br>☒ Emission Reduction calculations<br>☒ Monitoring Plan<br>☒ No GHG Double Counting<br>☒ Local Stakeholder Consultation Process<br>☒ Global Stakeholder Consultation Process<br>☒ United Nations Sustainable Development Goals (Goal No 13-Climate Change)<br>☐ Others (please mention below) |

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| **Project Verification Criteria:**<br>Optional requirements to be assessed | ☒ Environmental Safeguards Standard and do-no-harm criteria<br>☒ Social Safeguards Standard do-no-harm criteria<br>☒ United Nations Sustainable Development Goals (in additional to SDG 13)<br>☒ CORSIA requirements |
| **Project Verifier's Confirmation:**<br>The *GCC Project Verifier* has verified the GCC project activity and therefore confirms the following: | The GCC Project Verifier [Shenzhen CTI International Certification Co., Ltd.], certifies the following with respect to the GCC Project Activity [Junan Municipal Solid Waste Incineration For Power Generation Project].<br><br>☒ The Project Owner has correctly described the Project Activity in the Project Submission Form (version 4.0, dated 29/11/2023) including the applicability of the approved methodology [ACM0022, version 03.0] and meets the methodology applicability conditions and is expected to achieve the forecasted real and additional GHG emission reductions, complies with the monitoring methodology, has appropriately conducted local and global stakeholder consultation processes and has calculated emission reductions estimates correctly and conservatively.<br><br>☒ The Project Activity is likely to generate GHG emission reductions amounting to the estimated [63,073] $tCO_2e$, as indicated in the PSF, which are additional to the reductions that are likely to occur in absence of the Project Activity and complies with all applicable GCC rules, including ISO 14064-2 and ISO 14064-3.<br><br>☒ The Project Activity is not likely to cause any net-harm to the environment and/or society and complies with the Environmental and Social Safeguards Standard, and is likely to achieve the following labels:<br>☒ Environmental No-net-harm Label (**E⁺**)<br>☒ Social No-net-harm Label (**S⁺**)<br><br>☒ The Project Activity is likely to contribute to the achievement of United Nations Sustainability Development Goals (SDGs), complies with the Project Sustainability Standard, and contributes to achieving a total of [5] SDGs, with the following[4] SDG certification label (**SDG⁺**): |

[4] SDG Certification labels: Bronze label (1 star): by achieving 2 out of 17 SDGs; Silver label (2 star): by achieving 3 out of 17 SDGs; Gold label (3 star): by achieving 4 out of 17 SDGs; Platinum label (4 star): by achieving 5 out of 17 SDGs; and Diamond label (5 star): by achieving more than 5 out of 17 SDGs.

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| | ☐ Bronze SDG Label<br>☐ Silver SDG Label<br>☐ Gold SDG Label<br>☒ Platinum SDG Label<br>☐ Diamond SDG Label<br><br>☒ The Project Activity complies with all the applicable GCC rules[5] and therefore recommends GCC Program to register the Project activity with above mentioned labels. |
| **Project Verification Report, reference number and date of approval** | Reference number: GCCS00675v01.0<br><br>Date of approval: 30/11/2023 |
| **Name of the authorised personnel of GCC Project Verifier and his/her signature with date** | Mr. Zhou Lu General Manager  <br><br>30/11/2023 |

[5] "GCC Rules" are defined in Project Definitions and refers to the rules and requirements set out by the GCC program related to GHG emission reductions and its voluntary certification labels and are available on the GCC Program's public website: https://www.globalcarboncouncil.com/resource-centre.html

# 1. PROJECT VERIFICATION REPORT

## Section A. Executive summary

**Brief summary:**

The Project Owner Beijing Tianying Zero Carbon Technology Research Institute Co, Ltd. has commissioned the GCC Verifier Shenzhen CTI International Certification Co., Ltd. (CTI) to perform a Project Verification of the GCC Project Activity “Junan Municipal Solid Waste Incineration For Power Generation Project” in China (hereafter called “the project”). This report summarizes the findings of the Project Verification of the project, performed on the basis of GCC criteria for the project activities, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The proposed project involves the installing and operating new facilities for treating fresh waste through incineration to produce electric energy. These facilities are located southeast of Wangzhuangzi Village, Shizi Road Town, Ju 'nan County, Linyi City, Shandong Province, P.R. China. The geographical coordinates of the proposed project are 35°09’58’’ North Latitude and 118°52 '24″ East Longitude. The project will treat municipal solid waste (MSW) using two 300 t/d incinerators, with a designed estimated treatment capacity of 219,000 tonnes per year. It will generate electricity through waste heat recovery, with a total installed capacity of 12MW, consisting of one sets of a steam turbine-generator with a unit capacity of 12MW. The project started operation from 10/08/2017 and it is estimated to supply approximately 62,049.3MWh of electricity generated annually to the North China Power Grid (NCPG). The project is estimated to deliver an annual emission reduction of 63,073 $tCO_2e$ amounting to 630,730 $tCO_2e$ during the entire fixed 10-year crediting period.

The purpose of a Project Verification is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project’s compliance with relevant GCC and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Project Verification is a requirement for all GCC projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of Approved Carbon Credits (ACCs).

**Scope:**

The Project Verification scope is defined as an independent and objective review of the Project Submission Form (PSF). The PSF is reviewed against the GCC criteria including but not limited to, GCC Project Standard (PS), GCC Verification Standard (VS), applied CDM methodology and other relevant rules and requirements established under Program process. The verification team has, based on the recommendations in the Verification Standard employed (latest version) a risk-based approach, focusing on the identification of significant risks for project implementation, generation of ACCs and implemented safeguards aimed to achieve environmental and social impacts without causing any net harms.

The verification is not meant to provide any consulting towards the project owners. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

**Project Verification process:**
CTI assessed and determined whether the proposed implementation and operation of the project activity, and the steps taken to report emission reductions comply with the requirements specified in the GCC Project Standard V3.1, GCC Verification Standard V3.1, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques. The Verification process consists of the following phases

- the desk review of documents and evidence submitted by the project participant in context of the reference rules and guidelines issued by GCC,
- undertaking/conducting site visit, interview or interactions with the representative of the project owners/representatives,
- reporting audit findings with respect to clarifications and non-conformities and the closure of the findings, as appropriate and
- preparing a draft verification opinion based on the audit findings and conclusions
- technical review of the draft verification opinion along with other documents as appropriate by an independent competent technical review team
- finalization of the verification opinion (this report)

**Appointment of the assessment team:**
Based on the requirements of competency, experience and qualified sectoral scopes, CTI appointed a verification team in accordance with CTI's internal procedures. The detailed information of each team member in the assessment team is listed in the table in Section B.1 below. The qualification of each team member is detail in Appendix 2 to this report.

**Conclusion:**
The review of the PSF, supporting documentation and subsequent follow-up actions (onsite audit and interviews) have provided CTI with sufficient evidence to determine the fulfilment of stated criteria.

CTI is of the opinion that the project activity "Junan Municipal Solid Waste Incineration For Power Generation Project" in China as described in the final PSF (Version 4.0, dated 29/11/2023) meets all relevant requirements of GCC and has correctly applied the CDM baseline and monitoring methodology ACM0022 Version 03.0.

The review of the PSF, supporting documentation and subsequent follow-up actions (onsite audit and interviews) have provided CTI with sufficient evidence to determine the fulfilment of the voluntary labels E+, S+ and SDG+ with Platinum SDG Label. Therefore, the project is being recommended to GCC Steering Committee for request for registration.

The Project Activity complies with all the applicable requirement of the GCC Program and ICAO's requirements on CORSIA Emissions Unit Eligibility Criteria and CORSIA Eligible Emissions Units, as per Clarification No 1., v1.3 paragraph 23-25 /82/, and the ACCs expected to be issued during the crediting period is likely to be CORSIA eligible and can be used by International Airlines for offsetting their emissions during all phases of CORSIA and therefore requests GCC Steering Committee to append CORSIA Certification label (C+) to this project".

## Section B. Project Verification team, technical reviewer and approver

### B.1. Project Verification team

| No. | Role | Type of resource | Last name | First name | Affiliation (e.g. name of central or other office of GCC Project Verifier or outsourced entity) | Involvement in | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Desk/document review | On-site inspection | Interviews | Project Verification findings |
| 1. | Team Leader | IR | Zhang | Lei | CTI | ✓ | ✓ | ✓ | ✓ |
| 2. | Team Member | IR | Zhang | Wenting | CTI | ✓ | ✓ | ✓ | - |
| 3. | Financial expert | IR | Chen | Yazi | CTI | ✓ | - | - | ✓ |

### B.2. Technical reviewer and approver of the Project Verification report

| No. | Role | Type of resource | Last name | First name | Affiliation (e.g. name of central or other office of GCC Project Verifier or outsourced entity) |
|---|---|---|---|---|---|
| 1. | Technical reviewer | IR | Lin | Wu | CTI |
| 2. | TR Member | IR | Feng | Tian | CTI |
| 3. | Approver | IR | Zhou | Lu | CTI |

## Section C. Means of Project Verification

### C.1. Desk/document review

The PSF and additional background documents related to the project design and baseline were submitted to the verification team for review. The document review in particular includes applicability of selected methodology, baseline determination, additionality of project activity, monitoring plan, emission reduction calculations. All documentations that were reviewed during the validation can be found in Appendix 3 of this validation report.

### C.2. On-site inspection

| **Duration of on-site inspection:** 26/10/2023 | | | | |
|---|---|---|---|---|
| **No.** | **Activity performed on-site** | **Site location** | **Date** | **Team member** |
| 1. | The project verification team conducted interviews with the project owner, plant in-charge, other stakeholders to confirm the information and to resolve issues identified in the document review.<br>An assessment was conducted as a part | Project site is located southeast of Wangzhuangzi Village, Shizi Road Town, Ju | 26/10/2023 | Zhang Lei<br>Zhang Wenting |

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| | of project verification activity and involved:<br>1) an assessment of the implementation and operation of the project activity as per the PSF and GCC requirements<br>2) To verify that the project design, as documented is sound and reasonable, and meets the identified criteria GCC Standard Requirements and associated guidance<br>3) To assess conformance with the certification criteria as laid out in the GCC Standards;<br>4) To evaluate the conformance with the certification scope, including the GHG project and baseline scenarios, additionality; GHG sources, sinks, and reservoirs; and the physical infrastructure, activities, technologies and processes of the GHG project to the requirements of the GCC;<br>5) To evaluate the calculation of GHG emissions, including the correctness and transparency of formulae and factors used; assumptions related to estimating GHG emission reductions; and uncertainties; and<br>6) To determine whether the project could reasonably be expected to achieve the estimated GHG reduction/removals.<br>7) a review of information flows for generating, aggregating and reporting of the ex-ante monitoring parameters<br>8) interviews with relevant personnel to confirm that the operational and data collection procedures can be implemented in accordance with the Monitoring Plan<br>9) a cross-check between information provided in the submitted documents and data from other sources<br>10) a review of calculations and assumptions made in determining the GHG data and estimated ERs, and<br>11) an identification of QA/QC procedures in place to prevent, or | 'nan County, Linyi City, Shandong Province, P.R. China | | |

| | | | | |
|---|---|---|---|---|
| | identify and correct, any errors or omissions in the reported monitoring parameters<br>12) Assessment of Stakeholder Consultation by interviewing the stakeholders.<br>13) Assessment of E+, S+, SDG+ and CORSIA aspects as per the PSF and GCC requirements | | | |

## C.3. Interviews

| No. | Interview | | | Date | Subject | Team member |
|---|---|---|---|---|---|---|
| | Last name | First name | Affiliation | | | |
| 1. | Gao | Jun | Junan Tianying environmental protection energy Co., Ltd. (Plant Director) | 26/10/2023 | - PO's background<br>- Ownership<br>- Organizational structure<br>- Project implementation<br>- Technical design<br>- GCC consideration<br>- Project approval<br>- Impacts on local economic, society and sustainable development<br>- Preferential policy<br>- Financial subsidy<br>- Environmental impacts<br>- Environmental approval<br>- Job opportunities<br>- Stakeholder consultation<br>- Social and environmental<br>- impact of the project<br>- SDG contribution | Zhang Lei<br>Zhang Wenting |
| 2.Z | Bai | Hongliang | Junan Tianying environmental protection energy Co., Ltd. (O&M Staff) | | | |
| 3. | Zhang | Yongsheng | Beijing Tianying Zero Carbon Technology Research Institute Co, Ltd. | 26/10/2023 | - Project design<br>- Ownership<br>- Applicability of the selected methodology<br>- Baseline identification<br>- ER calculation<br>- Additionality<br>- Monitoring Plan | Zhang Lei<br>Zhang Wenting |
| 4. | Wang | Ruijun | | | | |

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|---|---|---|---|---|---|---|
| 5. | Wang | Xinxing | Local residents | 26/10/2023 | - Stakeholder consultation<br>- Job opportunities<br>- Social, economic, environmental impacts | Zhang Lei<br>Zhang Wenting |
| 6. | Wang | Xinjun | | | | |
| 7. | Wang | Xinshi | | | | |
| 8. | Chen | Huifan | Officer from local government | 26/10/2023 | - Social, economic, environmental impacts | Zhang Lei<br>Zhang Wenting |

## C.4. Sampling approach

Not applicable as no sampling has been used during the project verification.

## C.5. Clarification request (CLs), corrective action request (CARs) and forward action request (FARs) raised

| Areas of Project Verification findings | Applicable to Project Types | No. of CL | No. of CAR | No. of FAR |
|---|---|---|---|---|
| **Green House Gas (GHG)** | | | | |
| Identification and Eligibility of project type | $A_1$, $A_2$, $B_1$, $B_2$ | 0 | 0 | 0 |
| General description of project activity | $A_1$, $A_2$, $B_1$, $B_2$ | 1 | 0 | 0 |
| Application and selection of methodologies and standardized baselines B | $A_1$, $A_2$, $B_1$, $B_2$ | 0 | 0 | 0 |
| - Application of methodologies and standardized baselines B.1 B.2 | $A_1$, $A_2$, $B_1$, $B_2$ | 0 | 0 | 0 |
| - Deviation from methodology and/or methodological tool | $A_1$, $A_2$, $B_1$, $B_2$ | 0 | 0 | 0 |
| - Clarification on applicability of methodology, tool and/or standardized baseline B.2 | $A_1$, $A_2$, $B_1$, $B_2$ | 1 | 0 | 0 |
| - Project boundary, sources and GHGs B.3 | $A_1$, $A_2$, $B_1$, $B_2$ | 0 | 1 | 0 |
| - Baseline scenario B.4 | $A_1$, $A_2$, $B_1$, $B_2$ | 0 | 1 | 0 |
| - Demonstration of additionality including the Legal Requirements test B.5 | $A_1$, $A_2$, $B_1$, $B_2$ | 1 | 3 | 0 |
| - Estimation of emission reductions or net anthropogenic removals B.6 | $A_1$, $A_2$, $B_1$, $B_2$ | 1 | 4 | 0 |
| - Monitoring plan B.7 | $A_1$, $A_2$, $B_1$, $B_2$ | 2 | 1 | 0 |
| Start date, crediting period and duration | $A_1$, $A_2$, $B_1$, $B_2$ | 0 | 0 | 0 |
| Environmental impacts | $A_1$, $A_2$, $B_1$, $B_2$ | 0 | 0 | 0 |
| Local stakeholder consultation G | $A_1$, $A_2$, $B_1$ | 1 | 0 | 0 |
| Approval & Authorization- Host Country Clearance | $A_1$, $A_2$, $B_1$, $B_2$ | 0 | 0 | 1 |
| Project Owner- Identification and communication | $A_1$, $A_2$, $B_1$, $B_2$ | 0 | 0 | 0 |
| Global stakeholder consultation | $A_1$, $A_2$, $B_1$ | 1 | 0 | 0 |
| Others (compliance with the latest PSF template) | $A_1$, $A_2$, $B_1$, $B_2$ | 0 | 0 | 0 |
| **VOLUNTARY CERTIFICATION LABELS** | | | | |
| Environmental Safeguards ($E^+$) E.1 | $A_1$, $A_2$, $B_1$ | 1 | 0 | 0 |
| Social Safeguards ($S^+$) E.2 | $A_1$, $A_2$, $B_1$ | 1 | 0 | 0 |

| | | | | |
|---|---|---|---|---|
| Sustainable development Goals (SDG$^+$) F | $A_1$, $A_2$, $B_1$ | 0 | 2 | 0 |
| Authorization on Double Counting from Host Country (only for CORSIA) | $A_1$, $A_2$, $B_1$ | 0 | 0 | 1 |
| CORSIA Eligibility ($C^+$) | | 0 | 0 | 1 |
| **Total** | | 9 | 12 | 1 |

# Section D. Project Verification findings

## D.1. Identification and eligibility of project type

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|---|---|
| **Means of Project Verification** | CTI conducted the document review and performed on-site assessment to determine whether the Project Owner identified the type of project activity (A1, A2, B1, B2) in accordance with the Project Standard.<br>The Project Owner (PO) has identified the type of the project activity as Type A2 - subtype1. Whether the identification and eligibility of the project is correct is assessed as per para 11(a)-(ii), 14, 15 and 16 of the Project Standard (PS) v3.1 /74/ as follows:<br>By checking other GHG program data base /98/ i.e., CDM, VCS, GS and CCER etc., and interviewing with PO during site visit, it is confirmed that the project has not been registered under any GHG program.<br>By checking the Quality Supervision and Inspection Report Prior to Commercial Operation of the Unit /13/ issued by Shandong Electric Power Construction Quality Supervision Center, the Operation logs /18/ and via interview with on-site staff during site visit, it is confirmed that the project started operation from 10/08/2017 which is after 01/01/2016 and the crediting period is selected as starting from 10/08/2017 which is after 01/01/2016 but no more than one year after the start date of the operations of the project activity.<br>By checking the registration interface of the project on the GCC website /70/, it is confirmed that the project submitted the initial PSF for GSC on 01/07/2022 which is before 05/07/2022.<br>By checking the relevant applicable laws and regulations at the time of submission of registration, i.e., Renewable Energy Law of the People's Republic of China /48/ and Prevention and Control of Environmental Pollution by Solid Waste Law of the People's Republic of China /49/, it is confirmed that the project is not required by a legal mandate and does not implement a legally enforced mandate.<br>By checking the relevant applicable laws and regulations of the host country /48/-/62/, the Project Approval /9/ and Environment Impact Assessment (EIA) approval /12//10/, it is confirm that the project is Complies with all applicable host-country legal requirements with compliance focused at project level scope.<br>By checking the Feasibility Study Report (FSR) /10/, Project Approval /9/, EIA Approval /12/ and ER calculation spreadsheet /3/ and thorough site visit, it is confirmed that the project delivers real, measurable and additional emission reductions as compared to the baseline scenario.<br>The project applies a CDM approved monitoring and baseline methodology: ACM0022 version 03.0.<br>Based on all assessment above, it is confirmed that the project activity complies with all GCC rules and is eligibility criteria under GCC and the project type is confirmed to be Type A2 - subtype1. |
| **Findings** | No finding was raised in this section. |
| **Conclusion** | CTI concludes that the PO has appropriately identified the type of GCC project activity in accordance with the Project Standard. |

## D.2. General description of project activity

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|---|---|
| **Means of Project Verification** | CTI conducts documentation review and on-site assessment to determine:<br>- whether the description of the proposed GCC project activity is in accordance with applicable Project Verification requirements related to the description of |

<table>
<tr><td></td><td>
the project activity in the Verification Standard and Project Standard and;<br>
- whether the project complies with the requirements on GHG reduction and the voluntary certification labels (E+, S+, SDG+) and CORSIA.<br>
By checking the FSR /10/ and Project Approval /9/, EIA /11/ and its approval /12/,Main equipment purchase contract /22/, it is confirmed that the project is a waste-to-electric with installation of 2 sets of incinerators with MSW incineration of 300t/d, 2 sets of boiler with rated evaporating capacity of 23.6t/h and 1 set of turbogenerator with capacity 12 MW all manufactured by Nantong Tianlan Environmental Protection Energy Sets Co., Ltd. and the total installed capacity of the project is 12MW. The technical specifications of the main equipment listed in the PSF is verified to be consistent with the technical specifications /23/ provided by the manufacturer and the FSR /10/.<br>
The purpose of the project is to incinerate MSW at the project site to generate and supply electricity to North China Power Grid (NCPG), which is confirmed by the Diagram of power connection /17/, Power purchase agreements (PPAs) /26/ and through onsite inspection.<br>
The project is located in southeast of Wangzhuangzi Village, Shizi Road Town, Ju 'nan County, Linyi City, Shandong Province, P.R. China and the geodetic coordinates range of the project site is 35°09’58’’ North Latitude and 118°52 '24″ East Longitude.<br>
The operational lifetime of the main equipment is 30 years as per the technical specifications /23/ provided by the manufacturer and the FSR /10/. The Project Owner has chosen the fixed crediting period of 10 years which is in accordance with the GCC program manual v3.1 /72/ and will generate an estimated annual emission reduction of 63,073 $tCO_2e$.<br>
In addition to generating emission reductions, the PSF also demonstrates that the project qualifies for the following voluntary certification labels
<table>
<tr><td>Voluntary labels</td><td>Applied by the project</td><td>Score/Label</td></tr>
<tr><td>Achieving the United Nations Sustainable Development Goals (SDG+)</td><td>Yes</td><td>5 out of 17 SDGs, Platinum</td></tr>
<tr><td>Environmental No-net harm (E+)</td><td>Yes</td><td>/</td></tr>
<tr><td>Social No-net harm (S+)</td><td>Yes</td><td>/</td></tr>
<tr><td>CORSIA (C+)</td><td>Yes</td><td>/</td></tr>
</table>
Detailed assessment of how the project complied with the requirements of SDG+, E+, S+ and C+ is presented in Section D.10-D.13 of this report.
</td></tr>
<tr><td>Findings</td><td>CL01 was raised and is successfully closed, details please refer to Appendix 4.</td></tr>
<tr><td>Conclusion</td><td>Based on the assessment, CTI concludes that the description of the proposed GCC project activity is in accordance with applicable Project Verification requirements related to the description of the project activity in the Verification Standard and Project Standard. It is also concluded that the project owner has demonstrated the compliance with the requirements on GHG reduction and the voluntary certification labels (E+, S+, SDG+) and CORSIA of the project.</td></tr>
</table>

## D.3. Application and selection of methodologies and standardized baselines

### D.3.1 Application of methodology and standardized baselines

<table>
<tr><td>Means of Project Verification</td><td>The project applied the approved CDM Methodology: ACM0022, (Version 03.0): Large-scale Consolidated Methodology Alternative waste treatment processes. The applicability of the methodology is justified through the following applicable conditions of the methodology:
<table>
<tr><th>Applicability criteria</th><th>GCC Verifier's assessment</th></tr>
<tr><td>The methodology applies to project activities that install and operate new plants for the treatment of fresh waste through any combination of the following processes:<br>(a) Composting process under aerobic conditions;<br>(b) Anaerobic digestion with biogas recovery and flaring and/or its use;<br>(c) Co-composting of wastewater in combination with solid waste;<br>(d) Anaerobic co-treatment of wastewater in combination with solid waste;<br>(e) Mechanical/thermal treatment process to produce refuse-derived fuel (RDF) or stabilized biomass (SB) that is produced within the project boundary and its use;<br>(f) Gasification process to produce syngas and its use;<br>(g) Incineration of fresh waste for the generation of thermal/electric energy.</td><td>By checking the FSR /10/ and through site visit, it is confirmed that the project activity incinerates fresh waste and generate electricity with the waste heat. Therefore, the project is applicable to (g).</td></tr>
<tr><td>(h) The following conditions apply to all project activities using this methodology:<br>(i) The project plant only treats fresh waste/wastewater for which emission reductions are claimed, except for cases involving composting, co-composting and anaerobic digestion;<br>(j) Neither the fresh waste nor the products from the project plant are stored on-site under anaerobic conditions;<br>(k) Any wastewater discharge resulting from the project activity is treated in accordance with applicable regulations;<br>(l) The project activity does not reduce the amount of waste that</td><td>As per condition h, conditions i to n is applicable to all project activity using this methodology.<br>(i) The project plant only treats fresh waste/wastewater for which emission reductions are claimed, except for cases involving composting, co-composting and anaerobic digestion;<br>By checking the FSR /10/ and through site visit, it is confirmed that the project activity only incinerates fresh waste and generate electricity with the waste heat. Therefore, condition (i) is applicable.<br>(j) Neither the fresh waste nor the products from the project plant are stored on-site under anaerobic conditions;<br>By checking the FSR /10/ as well as</td></tr>
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| | would be recycled in the absence of the project activity. This shall be justified and documented in the clean development mechanism project design document (CDM-PDD);<br><br>(m) When applicable regulations mandate any waste treatment process implemented under the project activity, the rate of compliance with such regulations for the treatment process is below 50 per cent;<br><br>(n) Hazardous wastes/wastewater are not eligible under this methodology. | interviewing with project staff and stakeholder through site visit, it is confirmed that fresh waste will be stored in the waste storage pit before combustion for no longer than 10 days. The grab crane will convey and mix waste in the waste storage pit to prevent its anaerobic decomposition. Moreover, the extracted air from the MSW bunker is used as primary combustion air. Therefore condition (j) is applicable.<br><br>(k) Any wastewater discharge resulting from the project activity is treated in accordance with applicable regulations;<br><br>By checking the FSR /10/, EIA Approval /12/ and through site visit, the verification team confirmed that the wastewater is treated by the sewage treatment station in the factory area and meets the third level standard of the <Comprehensive Wastewater Discharge Standard> (GB8978-1996) before being discharged to the local sewage treatment plant. Therefore, condition (k) is applicable.<br><br>(l) The project activity does not reduce the amount of waste that would be recycled in the absence of the project activity. This shall be justified and documented in the clean development mechanism project design document (CDM-PDD);<br><br>The project activity does not reduce the amount of waste that would be recycled in the absence of the project activity. Before the implementation of the project activity, the recycled waste like plastics, metal, glass, etc., were partially collected by the scavengers and sold to the respective recycle industries, while remaining wastes were dumped in the local landfill site. After the implementation of the project activity, the recyclables are still partially collected by the scavengers before MSW is transported to final treatment facility. Other wastes are transported to the project site instead of the existing landfill site. This project activity is for the waste which would be sent to the landfill, it does not influence the rate of recycling. Both landfill and incineration are final treatment methods after waste collection, so no matter landfill or |

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| | | incineration is chosen, the recycling rate will not be affected. Therefore, condition (l) is deemed applicable.<br>(m) When applicable regulations mandate any waste treatment process implemented under the project activity, the rate of compliance with such regulations for the treatment process is below 50 per cent;<br>By checking public information, it is confirmed that no regulations that mandates the waste treatment process implemented under the project activity. Landfill is the most common disposal method for fresh waste. Therefore, condition (m) is applicable.<br>(n) Hazardous wastes/wastewater are not eligible under this methodology.<br>The fresh waste utilized by the project activity is MSW, not hazardous wastes or wastewater. Therefore, condition (n) is applicable. |
| | The methodology is only applicable if the baseline scenario is:<br>(a) The disposal of the fresh waste in a SWDS with or without a partial LFG capture system (M2 or M3);<br>(b) In the case of co-composting or co-treatment of wastewater in an anaerobic digester, the treatment of organic wastewater in either an existing or new anaerobic lagoon or sludge pit without methane recovery (W1 or W4);<br>(c) In the case of electricity generation, the electricity is generated in an existing/new captive fossil fuel fired power-only plant, captive cogeneration plant and/or the grid (P2, P4 or P6);<br>In the case of heat generation, the heat is generated in an existing/new fossil fuel fired cogeneration plant, boiler or air heater (H2 or H4). | By checking the FSR /10/ and through site visit, it is confirmed that prior to the implementation of the project activity, the fresh waste was disposed at nearby landfill without a partial LFG capture system. Therefore, M3 is baseline scenario of the project activity. By checking the FSR /10/ and through site visit, it is confirmed that the electricity generated by the project activity is supplied to the NCPG which is dominated by coal-fired power stations. Therefore, P6 is baseline scenario of the project activity. Therefore, criteria (a) and (c) is applicable. |
| | Specific applicability conditions for the different processes are provided in Table 2 of ACM0022 (Version 03.0).<br>Applicable types of wastes that may be treated：Fresh waste;<br>Applicable products and their use: | By checking the FSR /10/ and through site visit, the verification team confirmed that the project activity uses a mechanical grate incinerator to incinerate fresh waste and generate electricity with waste heat. The project will not produce non-biodegradable |

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| Electricity and/or heat;<br>Applicable waste by-products: Incineration byproduct (e.g. inert materials); Wastewater discharge; Non-biodegradable materials that may have market value (i.e. glass, metals and plastics)<br>Specific applicability conditions: Incineration technology is rotary kiln, rotating fluidized bed, circulating fluidized bed, hearth or grate type; The fraction of energy generated by auxiliary fossil fuels is not more than 50% of the total energy generated in the incinerator | materials. The cinder from incineration will be used to produce construction materials, and fly ash will be disposed of in landfill. The wastewater is treated by the sewage treatment station in the factory area and meets the third level standard of the <Comprehensive Wastewater Discharge Standard> (GB8978-1996) before being discharged to the local sewage treatment plant..<br>The project activity does not require a constant input of auxiliary fossil fuel during the incineration process. By checking the FSR /10/ and through site visit, the verification team confirmed that annual 6 tons diesel fuel will be used as auxiliary fuel in the whole project activity. Compared with the energy generated by the MSW, the energy generated by the diesel oil is far less than 50%. |

In addition, the applicable criteria of the related Tools have been assessed as follows:

| TOOL02: Combined tool to identify the baseline scenario and demonstrate additionality, (Version 7.0) | |
|---|---|
| Applicability criteria | GCC Verifier's assessment |
| The tool is applicable to all types of proposed project activities. However, in some cases, methodologies referring to this tool may require adjustments or additional explanations as per the guidance in the respective methodologies. This could include, inter alia, a listing of relevant alternative scenarios that should be considered in Step 1, any relevant types of barriers other than those presented in this tool and guidance on how common practice should be established. | Baseline scenario and additionality of this project activity will be justified based on this tool.<br>Refer to section D.3.4 and D.3.5 of this report for details. |
| TOOL03: Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion, (Version 3) | |
| Applicability criteria | GCC Verifier's assessment |

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| | This tool provides procedures to calculate project and/or leakage $CO_2$ emissions from the combustion of fossil fuels. It can be used in cases where $CO_2$ emissions from fossil fuel combustion are calculated based on the quantity of fuel combusted and its properties. Methodologies using this tool should specify to which combustion process j this tool is being applied. | The condition is satisfied. $CO_2$ emissions from fossil fuel used in incineration plant are calculated based on the quantity of fuel combusted and its properties. The methodology using the tool, specifies that the combustion processes j correspond to the sources of fossil fuel consumption due to the alternative waste treatment process, other than for electricity generation. |
| | TOOL04: Emissions from solid waste disposal sites, (Version 08.1) | |
| | Applicability criteria | GCC Verifier's assessment |

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| | The tool can be used to determine emissions for the following types of applications:<br>(a) Application A: The CDM project activity mitigates methane emissions from a specific existing SWDS. Methane emissions are mitigated by capturing and flaring or combusting the methane (e.g. "ACM0001: Flaring or use of landfill gas"). The methane is generated from waste disposed in the past, including prior to the start of the CDM project activity. In these cases, the tool is only applied for an ex ante estimation of emissions in the project design document (CDM-PDD). The emissions will then be monitored during the crediting period using the applicable approaches in the relevant methodologies (e.g. measuring the amount of methane captured from the SWDS);<br>(b) (b) Application B: The CDM project activity avoids or involves the disposal of waste at a SWDS. An example of this application of the tool is ACM0022, in which municipal solid waste (MSW) is treated with an alternative option, such as composting or anaerobic digestion, and is then prevented from being disposed of in a SWDS. The methane is generated from waste disposed or avoided from disposal during the crediting period. In these cases, the tool can be applied for both ex ante and ex post estimation of emissions. These project activities may apply the simplified approach detailed in 0 when calculating baseline emissions. | The condition is satisfied. The proposed project activity avoids the disposal of waste at a SWDS as a result of new construction of waste treatment plant (Application B). |
| | These two types of applications are referred to in the tool for determining parameters. | The condition is satisfied. The relevant parameters were determined for Application B. Refer to the Section D.3.6 of this report. |

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| | In the case that: (a) different types of residual waste are disposed or prevented from disposal; or that (b) both MSW and residual waste(s) are prevented from disposal, then the tool should be applied separately to each residual waste and to the MSW. | The condition is not applicable. The proposed activity treats only MSW, not residual waste. |
| | TOOL05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation (Version 3.0) | |
| | Applicability criteria | GCC Verifier's assessment |
| | If emissions are calculated for electricity consumption, the tool is only applicable if one out of the following three scenarios applies to the sources of electricity consumption:<br>(a) Scenario A: Electricity consumption from the grid. The electricity is purchased from the grid only, and either no captive power plant(s) is/are installed at the site of electricity consumption or, if any captive power plant exists on site, it is either not operating or it is not physically able to provide electricity to the electricity consumer;<br>(b) Scenario B: Electricity consumption from (an) off-grid fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants are installed at the site of the electricity consumer and supply the consumer with electricity. The captive power plant(s) is/are not connected to the electricity grid; or<br>(c) Scenario C: Electricity consumption from the grid and (a) fossil fuel fired captive power plant(s). One or more fossil fuel fired captive power plants operate at the site of the electricity consumer. The captive power plant(s) can provide electricity to the electricity consumer. The captive power plant(s) is/are also connected to the electricity grid. Hence, the electricity consumer can be provided with electricity from the captive power plant(s) and the grid. | Through checking the PPAs /26/, it is confirmed that the electricity consumed by the project is from the NCPG, i.e., the grid which complies with Scenario A: Electricity consumption from the grid. Thus, this applicability criteria is met. |

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| | This tool can be referred to in methodologies to provide procedures to monitor amount of electricity generated in the project scenario, only if one out of the following three project scenarios applies to the recipient of the electricity generated:<br>(a) Scenario I: Electricity is supplied to the grid;<br>(b) Scenario II: Electricity is supplied to consumers/electricity consuming facilities; or<br>(c) Scenario III: Electricity is supplied to the grid and consumers/electricity consuming facilities. | Through checking the PPA /26/, it is confirmed that the electricity generated by the project is supplied to the NCPG, i.e., the grid which complies with Scenario I: Electricity is supplied to the grid. Thus, this applicability criteria is met. |
| | This tool is not applicable in cases where captive renewable power generation technologies are installed to provide electricity in the project activity, in the baseline scenario or to sources of leakage. The tool only accounts for $CO_2$ emissions. | Through checking the FSR /10/, the project approval /9/, EIA /11/ and its approval /12/ as well as on-site inspection, it is confirmed that the project does not involve the installation of captive renewable power generation technologies. Thus, this applicability criteria is met. |
| | TOOL07: Tool to calculate the emission factor for an electricity system, (Version 7.0) | |
| | Applicability criteria | GCC Verifier's assessment |
| | This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects). | Since the project activity will not generate electricity, instead electricity from NCPG will be consumed by the project activity.<br>Therefore, this criterion is not applicable. |

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| | Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in "Appendix 1: Procedures related to off-grid power generation" should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity. | By checking the FSR /10/ of the project activity, CTI confirmed that electricity from NCPG will be consumed by the project activity. The emission factor for the project electricity system (NCPG) can be calculated for grid power plants only.<br>Therefore, this criterion is applicable. |
| | In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country. | By checking the FSR /10/ and through site inspection, CTI confirmed the project electricity system is located in Shandong Province, P.R. China, which is not an Annex I country.<br>Therefore, this criterion is applicable. |
| | Under this tool, the value applied to the CO2 emission factor of biofuels is zero. | The project activity uses electricity comes only from NCPG. The latest available emission factor of NCPG issued by China DNA on 17/11/2023 was used to calculate emissions. No biofuel is involved in the grid.<br>Therefore, this criterion a is not applicable. |
| | TOOL08: Tool to determine the mass flow of a greenhouse gas in a gaseous stream, (Version3.0) | |
| | Applicability criteria | GCC Verifier's assessment |

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| | Typical applications of this tool are methodologies where the flow and composition of residual or flared gases or exhaust gases are measured for the determination of baseline or project emissions. | By reviewing the FSR /10/, it has been confirmed that the project activity involves the combustion of biogas by incinerator, which is generated from anaerobic digestion. For ex post emission reduction calculation, this tool will be applied.<br>Therefore, this criterion is applicable. |
| | Methodologies where $CO_2$ is the particular and only gas of interest should continue to adopt material balances as the means of flow determination and may not adopt this tool as material balances are the cost effective way of monitoring flow of $CO_2$. | The project activity applies ACM0022, (Version 03.0). By checking the FSR /10/ and through on-site inspection, it is confirmed that the biogas (mainly $CH_4$) is captured from anaerobic digester and $CO_2$ is not the particular or only gas of interest.<br>Therefore, this criterion is applicable. |
| | The underlying methodology should specify:<br>(a) The gaseous stream the tool should be applied to;<br>(b) For which greenhouse gases the mass flow should be determined;<br>(c) In which time intervals the flow of the gaseous stream should be measured; and<br>(d) Situations where the simplification offered for calculating the molecular mass of the gaseous stream (equations (3) or (17)) is not valid (such as the gaseous stream is predominantly composed of a gas other than $N_2$). | The project activity adopts ACM0022, (Version 03.0):<br>(a) the amounts of total biogas generated by anaerobic digestion (equal the amounts of combustion by incinerator) is determined using the tool;<br>(b) $CH_4$ is the greenhouse gas that the mass flow should be determined;<br>(c) The mass flow should be calculated on an hourly basis for each hour h in year y;<br>(d) The simplification offered for calculating the molecular mass of the gaseous stream is not valid (equations (3) or (17) in the tool).<br>Therefore, these criteria are applicable. |
| | TOOL14: Project and leakage emissions from anaerobic digesters, (Version 02.0) | |
| | Applicability criteria | GCC Verifier's assessment |

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| | The following sources of project emissions are accounted for in this tool: (a) $CO_2$ emissions from consumption of electricity associated with the operation of the anaerobic digester; (b) $CO_2$ emissions from consumption of fossil fuels associated with the operation of the anaerobic digester; (c) $CH_4$ emissions from the digester (emissions during maintenance of the digester, physical leaks through the roof and side walls, and release through safety valves due to excess pressure in the digester); and (d) $CH_4$ emissions from flaring of biogas. | Sources of project emissions including (c), which involved in the project implementation have been accounted by checking the ER calculation sheet /4/. Hence this criterion is applicable for this project activity. |
| | The following sources of leakage emissions are accounted for in this tool: (a) $CH_4$ and $N_2O$ emission from composting of digestate; (b) $CH_4$ emissions from the anaerobic decay of digestate disposed in a SWDS or subjected to anaerobic storage, such as in a stabilization pond. | After anaerobic digestion, the digestate will be treated in incinerator which has been confirmed by site inspection of the project implementation and checking the FSR /10/. By site inspection, CTI confirmed that there was no additional storage yard to store the digestate produced from anaerobic digestion. The leakage emissions associated with the anaerobic digester should not be taken into account for this project. Hence this criterion is not applicable for this project activity. |
| | Emission sources associated with $N_2O$ emissions from physical leakages from the digester, transportation of feed material and digestate or any other on-site transportation, piped distribution of the biogas, aerobic treatment of liquid digestate and land application of the digestate are neglected because these are minor emission sources or because they are accounted in the methodologies referring to this tool. | $N_2O$ emissions are neglected because these are minor emission sources via checking the applied methodology. |
| | TOOL24: Common practice, version 03.1 | |
| | Applicability criteria | GCC Verifier's assessment |

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| | This methodological tool is applicable to project activities that apply the methodological tool "Tool for the demonstration and assessment of additionality", the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality", or baseline and monitoring methodologies that use the common practice test for the demonstration of additionality. | Through the assessment above, the project applies the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality", thus, this applicability criterion is met. |
| | In case the applied approved baseline and monitoring methodology defines approaches for the conduction of the common practice test that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail. | Through checking the applied methodology: ACM0022, version 03.0 /85/, it is confirmed that the methodology applied by the project does not define approaches for the conduction of the common practice test that are different from those described in this methodological tool. Thus, this applicability criterion is not relevant to the project. |
| | TOOL27: Investment analysis, version 12.0 | |
| | Applicability criteria | GCC Verifier's assessment |
| | This methodological tool is applicable to project activities that apply the methodological tool "Tool for the demonstration and assessment of additionality", the methodological tool "Combined tool to identify the baseline scenario and demonstrate additionality", the guidelines "Non-binding best practice examples to demonstrate additionality for SSC project activities", or baseline and monitoring methodologies that use the investment analysis for the demonstration of additionality and/or the identification of the baseline scenario. | Through the assessment above, the project applies the methodological tool "Tool for the demonstration and assessment of additionality", thus, this applicability criterion is met. |

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| | In case the applied approved baseline and monitoring methodology contains requirements for the investment analysis that are different from those described in this methodological tool, the requirements contained in the methodology shall prevail. | Through checking the applied methodology: ACM0022, version 03.0 /85/, it is confirmed that the methodology applied by the project does not contain requirements for the investment analysis that are different from those described in this methodological tool. Thus, this applicability criterion is not relevant to the project. |
| | In conclusion, CTI confirms that all applicability conditions of the Tools applied have been met.<br>By checking the CDM website, it is confirmed that the latest version of the methodology ACM0022, version 03.0 was published on 09/09/2021, the project has applied ACM0022, version 03.0 which is the latest version of the methodology . | |
| **Findings** | N/A | |
| **Conclusion** | CTI concludes that:<br>- the application of the methodology (and related tools) is in accordance with the Project Verification requirements in the Verification Standard and Project Standard;<br>- the selected versions of methodology (and tools) are valid at the time of submission of the proposed GCC project activity for registration;<br>- the chosen methodology is applicable to the project activity. | |

### D.3.2 Clarification on applicability of methodology, tool and/or standardized baseline

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| **Means of Project Verification** | N/A |
| **Findings** | N/A |
| **Conclusion** | N/A |

### D.3.3 Project boundary, sources and GHGs

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| **Means of Project Verification** | CTI conducts documents review, physical site inspection and interview with key staff to determine whether the project boundary, selected sources and gases were in accordance with applicable Project Verification requirements related to the project boundary in the Verification Standard and Project Standard and the applicable methodology.<br>According to ACM0022 (Version 03.0), the project boundary is the physical site of the project where the MSW is treated, including on-site electricity generation and/or consumption, onsite fuel use, wastewater treatment plant and the landfill site. In the case that the project activity provide electricity to the NCPG, the spatial extent of the project boundary will also include those plants connected to theNCPG to which the plant is connected.<br>The project boundary and the selected sources and gases which are justified for the project activity are identified in Section B.3 of the PSF. |

Through observation of the physical site and the equipment used by the project activity, the validation team confirmed that the definition of project boundary in the PSF is accordance with the requirement of methodology. It is also confirmed by the verification team by means of investigation during on-site visiting that all sources and GHGs included in the project boundary are as required in the applied methodology.

The sources and GHG gases involved for proposed project activity are as below:

| Source | | Gas | Included | Justification/explanation |
|---|---|---|---|---|
| **Baseline** | Emissions from decomposition of waste at the SWDS | $CH_4$ | Yes | The major source of emissions in the baseline |
| | | $N_2O$ | No | $N_2O$ emissions are small compared to $CH_4$ emissions from landfills. Exclusion of this gas is conservative |
| | | $CO_2$ | No | $CO_2$ emissions from the decomposition of fresh waste are not accounted |
| | Emissions from electricity generation | $CO_2$ | Yes | Electricity generation is included in the project activity and is sent to the grid in the baseline |
| | | $CH_4$ | No | Excluded for simplification. This is conservative |
| | | $N_2O$ | No | Excluded for simplification. This is conservative |
| **Project activity** | Emissions from on-site fossil fuel consumption due to the project activity other than for electricity generation | $CO_2$ | Yes | Light diesel will be used as auxiliary fuel in incinerator |
| | | $CH_4$ | No | Excluded for simplification. This emission source is assumed to be very small |
| | | $N_2O$ | No | Excluded for simplification. This emission source is assumed to be very small |
| | Emissions from on-site electricity use | $CO_2$ | Yes | May be an important emission source |
| | | $CH_4$ | No | Excluded for simplification. This emission source is assumed to be very small |
| | | $N_2O$ | No | Excluded for simplification. This emission source is assumed to be very small |

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| | | Emissions from the waste treatment processes | $N_2O$ | Yes | $N_2O$ may be emitted from composting, incineration, syngas produced and RDF/SB combustion |
| | | | $CO_2$ | Yes | $CO_2$ emissions from incineration, gasification or combustion of fossil based waste shall be included. $CO_2$ emissions from the decomposition or combustion of fresh waste are not accounted |
| | | | $CH_4$ | Yes | $CH_4$ leakage from the anaerobic digester and incomplete combustion in the flaring process are potential sources of project emissions. CH4 may be emitted from incineration, gasification, composting and RDF/SB combustion |
| | | Emissions from wastewater treatment | $CO_2$ | No | $CO_2$ emissions from the decomposition of fresh waste are not accounted |
| | | | $CH_4$ | Yes | $CH_4$ emissions from anaerobic treatment of wastewater are accounted for |
| | | | $N_2O$ | No | Excluded for simplification. This emission source is assumed to be very small |
| **Findings** | CAR01 was raised and is successfully closed, details please refer to Appendix 4. | | | | |
| **Conclusion** | CTI concludes that the project boundary, selected sources and gases were in accordance with applicable Project Verification requirements related to the project boundary in the Verification Standard and Project Standard and the applicable methodology. | | | | |

### D.3.4 Baseline scenario

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| **Means of Project Verification** | CTI conducts documents review, physical site inspection and interview with key staff to determine whether the baseline scenario identified for the proposed GCC project activity was in accordance with the applicable Project Verification requirements related to the establishment of the baseline scenario in the Verification Standard and Project Standard and the applicable methodology.<br>The baseline identification for the proposed project activity uses step-wise approach and is in accordance with the approved consolidated baseline and monitoring methodology ACM0022 (Version 03.0), “Alternative waste treatment processes”/85/ and TOOL 02 (Version 7.0), “Combined tool to identify the baseline scenario and demonstrate additionality”/86/.<br>As per TOOL 02, version 7.0, PP shall apply the following four Steps: |

(a) STEP 0. Demonstration that a proposed project activity is the first-of-its-kind;
(b) STEP 1. Identification of alternative scenarios;
(c) STEP 2. Barrier analysis;
(d) STEP 3. Investment analysis (if applicable);
(e) STEP 4. Common practice analysis

**Step 0 Demonstration that a proposed project activity is the First-of-its-kind**

The project activity uses a mechanical grate incinerator to incinerate fresh waste and generate electricity with waste heat, which is not a first-of-its-kind project activity in Shandong Province of China.

**Step 1 Identification of alternative scenarios**

As per TOOL 02, for identifying relevant alternative scenarios, an overview of technologies or practices that provide the same output as the project activity and that have been implemented previously or are currently underway in the applicable geographical areas should be provided. Considering that the framework conditions vary significantly between provinces in China, Shandong Province is selected as the relevant geographical area as defined in TOOL 02.

It is verified that the identification of alternative scenarios for the proposed project in the PSF follows the “Combined tool to identify the baseline scenario and demonstrate additionality” using Step 1: Identification of alternatives to the project activity consistent with current laws and regulations and is in line with this requirement and properly justified.

***Step 1a: Define alternative scenarios to the project activity***

The project activity defined alternatives related to two components of the activity that specified in the applied methodology ACM0022 as following:

For the treatment of the fresh waste, the following alternatives or combinations of these alternatives shall be listed and analyzed.

| No. | Alternatives | Justification/explanation |
|---|---|---|
| M1 | The project activity without being registered as a GCC project activity (i.e. any (combination) of the waste treatment options listed in Table 2) | By checking the FSR /10/ and the purchase contract of the incinerators /20/, CTI verification team confirms that the project activity uses the advanced domestic grate furnace technology to incinerate fresh waste in Junan Country.<br>Therefore, **M1 is considered as an alternative scenario**. |
| M2 | Disposal of the fresh waste in a SWDS with a partial capture of the LFG and flaring of the captured LFG. | By review of the national regulation 'The Technical Specification for Sanitary Domestic Waste Landfill (GB50869-2013)' /103/ and 'The Standard for Domestic Waste Landfill Pollution Control (GB16889-2008)' /104/, the landfill gas generated should be vented and flared collectively in case of no condition to utilize landfill gas. The existing landfill site which can’t reach safe and stable status shall install gas venting system and treatment facility. While there are mandatory standards |

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| | | | that require the installation of a system to capture and flare the landfill gas (LFG), there is no requirement for the amount or percentage of LFG that is destroyed. Moreover, this regulation is not enforced systematically and that non-compliance with the requirement is widespread in China. According to 2016 Urban and Rural Construction Statistical Yearbook /110/ and 2016 National Monitoring and Evaluation of Renewable Power Development /111/ , as of 2016, the year of the construction of the project, there were 1,840 sanitary landfills in cities and counties nationwide, and only 138 biogas power generation projects were installed and connected to the grid during the same period, with an industry coverage rate of less than 8%.<br>Based on above discussion, landfill gas generated will not be flared at the landfill site in China as common practice. Therefore, the alternative M2 is considered not common in China and eliminated. It is confirmed by reviewing web information and interview with the governmental officials about local landfill, where dispose the MSW in the absence of the project activity without capture of the LFG and flaring of the captured LFG.<br>Therefore, **the alternative M2 does not comply with the common practice of the MSW disposal** in Shandong Province and should be eliminated. |
| | M3 | Disposal of the fresh waste in a SWDS without a LFG capture system | In line with the above analysis, it is common practice to dispose fresh waste in SWDS without LFG capture systems and therefore **M3 is considered as an alternative scenario**. |
| | M4 | Part of the fresh fraction of the solid waste is recycled and not disposed in the SWDS | Through onsite visits with project staff and government official, CTI confirmed that prior to the construction of this project, there was no waste sorting in Junan County. The waste generated was first sent to public garbage bins, then transported by sanitation workers to waste transfer stations, and finally disposed of through landfilling. Before reaching the transfer stations, a few individuals might pick valuable items (such |
| | M5 | Part of the fresh fraction of the solid waste is treated aerobically and not disposed in the SWDS | |
| | M6 | Part of the organic | |

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| | fraction of the solid waste is incinerated and not disposed in the SWDS | as plastic beverage bottles, cardboard boxes, and metals) from the bins to sell to recycling stations, but this activity was limited and sporadic, with no standardized or large-scale waste sorting in Junan County.<br>Moreover, by reviewing related academic articles /112/, CTI confirmed that in 2015, the year of the project's investment decision, the national recycling rate for municipal waste in hole P.R.China was low, with issues such as uneven regional development in waste recycling.<br>Therefore, the verification team concluded that it was not feasible to sort municipal solid waste or to separate specific waste components for individual treatment in Junan County before the project's construction. Additionally, CTI, upon consulting the 2016 Urban and Rural Construction Statistical Yearbook /110/, verified that landfilling was the primary method for municipal solid waste disposal in Shandong Province prior to the project's construction year (2016). Practices such as aerobic processing, incineration, gasification, anaerobic digestion, and mechanical or thermal treatment for fresh waste processing for RDF/SB production were neither common nor mandatory. Confirming through onsite visits with government officials, it was confirmed that before the project's construction, Junan County only had landfills for municipal solid waste disposal, without facilities capable of processing waste through aerobic processing, incineration, gasification, anaerobic digestion, or mechanical or thermal treatment. Consequently, **M4 to M9 were not plausible alternatives for this project activity**. |
| M7 | Part of the organic fraction of the solid waste is gasified and not disposed in the SWDS | |
| M8 | Part of the organic fraction of the solid waste is treated in an anaerobic digester and not disposed in the SWDS | |
| M9 | Part of the organic fraction of the solid waste is mechanically or thermally treated to produce RDF/SB and not disposed in the SWDS | |

Baseline scenario for electricity generation

According the methodology ACM0022 (Version 03.0), for electricity generation, the following alternatives shall be listed and analyzed.

| No. | Alternatives | Justification/explanation |
|---|---|---|
| P1 | Electricity generated as an output of one of the waste | The project activity not undertaken as a VCS project (P1) is in line with current laws and regulations and hence this is a plausible baseline alternative. |

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| | treatment processes listed in Table 1, not undertaken as a CDM project activity | |
| P2 | Use of an existing or construction of a new on-site or off-site fossil fuel fired cogeneration plant | The alternative P2 and P3 are not plausible alternatives to the project as the project activity is only for power generation and no heat generation involved. |
| P3 | Existing or new construction of an on-site or off-site renewable based cogeneration plant | |
| P4 | Existing or new construction of an on-site or off-site fossil fuel fired electricity plant | Alternative P4 is a plausible baseline scenario. |
| P5 | Existing or new construction of an on-site or off-site renewable based electricity plant | The power generated from the project activity shall be exported to the grid mix and is not meant to cater to any specific inhouse electricity use, which was sourced from an on-site or off-site fossil fuel fired electricity plant. Therefore, the project proponent shall not implement a renewable energy fired electricity plant to cater to specific captive or third-party requirements.<br>Thus, P5 is not a plausible alternative and excluded. |
| P6 | Electricity generation in existing and/or new grid-connected electricity plants | The alternative of existing and/or new grid-connected power plants represents the continuation of the pre-project scenario and is a realistic alternative; no regulation or law in the host country prevents this alternative. Alternative P6 is a plausible baseline scenario. |

The project doesn't involve heat generation; no alternative is identified in regard to this scenario. Outcome of Step 1a is the list of the plausible alternatives (M1, M3, P1, P4 and P6) which is reasonable and in line with step 1 of guidelines in methodology and complete in the PD.

***Step 1b: Consistency with mandatory applicable laws and regulations***

The alternative of existing or construction of a new on-site or off-site fossil fuel fired captive power plant (P4) is not in accordance with current laws and regulations in the host country, as the construction of fossil fuel fired power plants with a capacity below 135 MW is not permitted in China /113/. Therefore,

Alternative P4, construction of a new on-site or off-site fossil fuel fired captive power plant with the installed capacity 14.97 MW (estimation based on average thermal power utilization hours of China in 2016 of 4,416h sourced from China Electric Power yearbook 2017 /40/ and annual net electricity generation for this project of 62,049.3 MWh) as the project, is not in compliance with Chinese regulations on construction of a thermal plant. Alternative P4 is eliminated.

Outcome of Step 1b： P4 is eliminated and list of the plausible alternatives (M1, M3, P1 and P6) are combined as listed below and can conclude that two combinations (scenario I M1+P1 and scenario II M3+P6) are the plausible scenarios to the proposed project activity and proceed to analysis.

| | P1 | P6 |
|---|---|---|
| M1 | Combined alternative scenario I: Implement this project without support from VCS | Not applicable:<br>If import electricity from the grid, there is no need to build the waste incineration project |
| M3 | Not applicable:<br>If disposal of the waste in a landfill site without capturing landfill gas, it is not available for power generation. | Combined alternative scenario II:<br>It corresponds to the practice prior to this project activity. No utilization of landfill gas, purchase of equivalent electricity from the grid. |

Identification of the baseline fuel for electricity generation

As requested by methodology ACM0022, PP shall demonstrate that the identified baseline fuel used for generation of heat is available in abundance in the host country and there is no supply constraint.

P1. Electricity generated as an output of one of the waste treatment options listed in Table B-1 of the methodology ACM0022, not undertaken as a VCS project activity;

This alternative represents the scenario of the project activity undertaken without being registered as a VCS project activity. By reviewing the FSR /10/ and interviewing with the governmental official, CTI verification team confirms the increasing population will lead to more and more MSW in Junan Country. Therefore, there is no constraint for the MSW supply. In addition, the auxiliary fuel diesel oil used in the ignition process is abundant in China and there is no supply constraint /41/.

P6. Electricity generation in existing and/or new grid-connected electricity plants.

As confirmed by review of electricity system emission factor data issued by China DNA /38/, the power supplied to the NCPG is mainly from coal-fired power plants. The baseline energy fossil fuels are available in abundance in China and no supply constraint policy was identified.

**Step 2: Barrier analysis**

The project activity is not the first-of-its-kind project. The combined alternative scenario I and scenario II have no barriers to their implementation in terms of investment and technology.

As per TOOL02 “Combined tool to identify the baseline scenario and

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| | demonstrate additionality" (version 7.0), if more than one alternative scenario is not prevented by any barrier, and if the proposed project activity is not the first-of-its-kind, and the remaining alternative scenarios include the proposed project activity undertaken without being registered as a VCS project activity, then proceed to Step 3 (Investment Analysis). |
| **Findings** | *CAR02 were raised here and are successfully closed, details please refer to Appendix 4.* |
| **Conclusion** | CTI concludes that baseline scenario identified for the proposed GCC project activity in the PSF was in accordance with the applicable Project Verification requirements related to the establishment of the baseline scenario in the Verification Standard and Project Standard and the applicable methodology. |

### D.3.5 Demonstration of additionality

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| **Means of Project Verification** | CTI conducts documents review, physical site inspection and interview with key staff to determine whether the additionality of the project activity was in accordance with the applicable Project Verification requirements related to the demonstration of additionality in the Verification Standard and Project Standard and the applicable methodology.<br>As per GCC Project Standard /74/, the GCC applies the following approach for demonstrating additionality, consisting of two components:<br>**a). Legal Requirement Test:**<br>The relevant law/regulations/policies regarding the waste-to-electricity project include:<br>– Environmental Protection Law of the People's Republic of China /116/;<br>– Prevention and Control of Environmental Pollution by Solid Waste Law of the People's Republic of China /117/;<br>– Guiding items for industrial structure adjustment (2019) /118/;<br>– Water Pollution Prevention and Control Law of the People's Republic of China /119/;<br>– Renewable Energy Law of the People's Republic of China /120/;<br>– Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution /121/;<br>By checking the clauses in above laws/regulations/policies, it is confirmed that the project activity is not mandated by law. And it is also confirmed that there are no other enforced laws, statutes, regulations, court orders, environmental-mitigation agreements, permitting conditions or other legally binding mandates requiring its implementation, or requiring the implementation of a similar technology/measure that would achieve equivalent levels of GHG emission reductions.<br>Thus, it is confirmed that the project meets criteria of the legal requirement test.<br>**b). An Additionality Test either based on a Positive List test or a projects-specific additionality test**<br>As per the applied methodology ACM0022 (Version 03.0) /85/, additionality of the project activity is demonstrated and assessed by the latest version of the TOOL02: Combined tool to identify the baseline scenario and demonstrate additionality, version 7.0 /86/.<br>The PO has adopted the stepwise approach for demonstrating and assessing the additionality of the project activity as follows: |

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| | **Step 0 Demonstration that a proposed project activity is the First-of-its-kind**<br>The verification process is in the Section D.3.4 of this report.<br>**Step 1: Identification of alternative scenarios**<br>The verification process is in the Section D.3.4 of this report.<br>**Step 2: Barrier analysis**<br>The Verification process is in the Section D.3.4 of this report.<br>**Step 3: Investment analysis**<br>PO has conducted the investment analysis in accordance with TOOL02: Combined tool to identify the baseline scenario and demonstrate additionality, version 7.0 /86/ and TOOL27: Investment Analysis, version 12.0 /94/. The assessment of the investment analysis is conducted based on the Financial expert of CTI.<br>*Sub-step 2a: Determine appropriate analysis method*<br>Since the project activity generates financial and economic benefits through the sales of electricity other than GCC related income, the simple cost analysis (Option I) is not appropriate for the project. Further, the alternative to the project does not involve any investment on the part of the project owner, an investment comparison analysis (Option II) is not appropriate for the project. Hence, the benchmark analysis (Option III) is applicable to the project activity /86/.<br>*Sub-step 2b: Option III. Apply benchmarkanalysis*<br><u>Benchmark selection</u><br>According to "Interim Rules on Economic Assessment of Electrical Engineering Retrofit Projects" /42/ issued by State Grid Company in 2002, the sectoral benchmark for project IRR of waste-to-energy power project is 8% (after tax) on real basis. Although the Interim Rules was issued in 2002, it is still the most up-to-date official data source for the sectoral benchmark for project IRR of waste-to-energy power projects and based on our financial expert, CTI was able to confirm that the selection of benchmark is suitable and it is still valid up to date.<br>Thus, it is CTI's opinion that the chosen IRR of 8% is applicable to the project as the benchmark which is complied with the TOOL27: Investment Analysis, version 12.0 /94/.<br>*Sub-step 2c: Calculation and comparison of financial indicators*<br><u>Input parameters</u><br>Through checking the Board meeting minute /16/ and interview with the project developer during site visit, CTI confirms that the investment decision was made on 06/11/2015 based on the financial analysis in the FSR and after seriously considering the carbon credit revenue.<br>A FSR in China is required to be developed by a third party accredited of this task by the government. An approval letter or Project Approval regarding the FSR is issued by the government only after it passes the public assessment of the sector experts designated by the government. It is in CTI's opinion that FSR can be regarded as a reliable and trustworthy source of information coming from a recognized entity once it has the approval from the government.<br>The input parameters used in the financial analysis of this project are taken from the FSR /10/ developed by the Shandong Province Huaneng Design Institute co., Ltd. which is a subsidy of the state-owned company Power Construction Corporation of China and is in rich experiences in developing the FSR for large scale construction projects which is confirmed by checking the public information from National Enterprise Credit Information Publicity System /99/ and the FSR was approved by Linyi |

Development and Reform Commission /9/. Therefore, the input parameters used in the financial analysis of the FSR can thus be considered information provided by an independent and recognized source.

According to the FSR /10/, the technical specifications /23/, Main equipment purchase agreement /20/ and the franchise agreement of this project /22/, the operational lifetime of the project is 30 years. As per para 6 of the TOOL27: Investment analysis v12.0 /94/, "*The period of assessment should not be limited to the proposed crediting period of the CDM project activity … the investment analysis shall be conducted for at least 10 years*". Although the project selects a 10-year fixed crediting period, since the lifetime of the project is 30 years, the investment analysis of the project is conducted for 30 years. Except that, CTI compared other input parameters for the financial analysis included in the PSF with the parameters stated in the FSR and was able to confirm that the values applied are consistent with the values stated in the FSR.

The FSR was completed in 02/2015 with input values taken from 2015 and thus no more than seven months prior to the date of investment decision /16/. Given this relatively short period of time between completion of the FSR and the date of investment decision, it is unlikely in the context of the project that the input values would have materially changed. It is thus reasonable to assume that the FSR has been the basis of the decision to proceed with the investment in the project. CTI was thus able to verify the parameter applied is deemed reasonable.

CTI verification team compared the values stated in the PSF with values determined in the FSR /10/ and was able to confirm that the input values are applied correctly in the PSF.

| Item | | Unit | Value | Source |
|---|---|---|---|---|
| Total static investment | | $10^4$ RMB | 31,230.91 | FSR /10/ |
| Annual MSW disposal | | t | 219,000 | FSR /10/ |
| Annual O&M cost | Raw material cost | $10^4$ RMB | 964.26 | FSR /10/ |
| | Fuel and Power | $10^4$ RMB | 180.00 | FSR /10/ |
| | Salary & welfare | $10^4$ RMB | 452.00 | FSR /10/ |
| | Repair fee | $10^4$ RMB | 293.82 | FSR /10/ |
| | Other cost | $10^4$ RMB | 373.16 | FSR /10/ |
| Feed-in electricity tariff (including VAT) | | RMB/kWh | 0.65 | FSR /10/ |
| Power Tariff (exclude VAT) | | RMB/kWh | 0.5556 | FSR /10/ |
| Depreciation period | | Year | 20 | FSR /10/ |
| Residual value rate | | % | 5 | FSR /10/ |
| Power output tax rate | | % | 17 | FSR /10/ |
| Input tax rate | | % | 17 | FSR /10/ |
| Income tax rate | | % | 25 | FSR /10/ |
| City maitenance & construction tax rate | | % | 7 | FSR /10/ |
| Educational surcharges rate | | % | 3 | FSR /10/ |
| Construction period | | Year | 2 | FSR /10/ |
| Operation period | | Year | 30 | FSR /10/ |
| Waste disposal charge (including | | RMB/t waste | 55 | FSR /10/ |

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| VAT) | | | |
| Waste disposal charge (exclude VAT) | RMB/t waste | 47.0085 | FSR /10/ |
| Assumed VCU Price | RMB/$tCO_2e$ | 80 | Estimated |

The accuracy and suitability of the input values for the investment analysis were crosschecked as below:

(1) Total Static Investment: 31,230.91*$10^4$ RMB

The total investment cost estimated in the FSR is 31,230.91 $10^4$ RMB. By checking all main signed contracts between the project owner and suppliers for project construction and devices /19//20/, the verification team confirmed that the actual investment cost of the project activity was 368,957,104.11 RMB, which is higher than the value of static total investment in the FSR. Therefore, CTI verification team confirmed that the total static investment in the FSR, PD and IRR calculation sheet is reasonable and conservative.

(2) Annual O&M cost: 2,263.24*$10^4$ RMB

a) Raw material fee

The CTI verification team confirmed through reviewing the FSR that the material costs are used for the purchase of pharmaceuticals and materials for flue gas treatment, water treatment, and fly ash stabilization, including activated carbon, chelating agent, cement, etc. According to the FSR /10/, the amount and price of materials were analyzed by Shandong Province Huaneng Design Institute co., Ltd. based on the treatment capacity of the MSW design of the project activity and the local prices, and approved by the Linyi Development and Reform Commission. By checking the Financial Audit Report /21/, it is confirmed that the actual material cost is higher than the estimation, therefore, the annual material cost is not over estimated.

b) Salary & welfare

The labor cost 452.00*$10^4$ RMB /year is calculated as 70 staffs multiply by the 100,000 CNY salary & welfare per staff sourced from the FSR. The plant's labor force is derived from the approved FSR and is in line with the "Construction Standards for Municipal Domestic Waste Incineration Projects"/114/. CTI verification team therefore confirmed that the salary and welfare in the FSR are reasonable.

c) Repair fee

Maintenance and repair cost: The cost of maintenance is designed to be 2.4% of the fixed investment, which is in line with the FSR and based on the technology employed and landfill site conditions, including the operation and maintenance of the generators, the maintenance of gas collection well, the pipeline, and other equipment. The rate is derived from the approved FSR and is in accordance with the provisions and requirements of the Methodology and Parameters for Economic Evaluation (2006), therefore CTI verification team considered the estimation as 2.4% of fixed asset for repairing cost is reasonable.

(3) Electricity output

The annual generation capacity is designed to be 78,086.5MWh, and supplied 62,049.3MWh to the grid per year which are sourced from the FSR /10/. The total electricity generation is mainly determined by the MSW calorific value (1,203kcal/kg), waste incineration (219,000t/year) and the power efficiency of the plant (21.09%), which are sourced from the FSR /10/. The net generation capacity = total annual generation capacity * (1 - 20.54 self-consumption rate), self-consumption rate is also from the

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| | approved FSR /10/.<br>It is well known that an increase in the standard of living leads to an increase in the calorific value of MSW. Through the review of the approved FSR /10/, the MSW heating value around the project activity was measured and estimated by Shandong Province Huaneng Design Institute co., Ltd. and according to the "Construction Standards for Municipal Domestic Waste Incineration Projects"/114/ to the furnace calorific value of the design. Therefore, it is reasonable to take 1,203kcal/kg as the design value of the low calorific value of the incinerator waste for this project.<br>According to the article published in the Journal of Environmental Health Engineering - A Study of Energy Efficiency Levels of Domestic Waste Incineration Power Plants in China /123/, the range of self-consumption rates for MSW plants is generally 16%-22%, so CTI verification team confirmed that the application of self-consumption rates is reasonable.<br>(4) Electricity tariff (with VAT)<br>The grid tariff is derived from the FSR. According to the Notice of the National Development and Reform Commission on Improving the Price Policy of Waste Incineration Power Generation issued by China's National Development and Reform Commission (NDRC) /122/ and the Franchise Agreement /22/, the feed-in tariff for 280 kWh/t of waste is 0.65 RMB/kWh.<br>(5) Annual MSW consumption<br>The project activity will treat 219,000 tons (=600t/d*365d) of MSW per year. According to the FSR/10/, the MSW treatment capacity of 600t/d was designed by Shandong Province Huaneng Design Institute co., Ltd. based on the forecast of MSW generation in Junan Country in the next 10 years. And according to the FSR, under the Maximum Continuous Rating (MCR) condition of incinerator, the power generation from one ton of waste with a calorific value of 1203 kcal/kg at a total plant efficiency of 21.09% is 295.05 kWh. By checking the incinerator's technical service contract /23/, CTI confirmed the similar actual MCR condition of incinerators. Therefore, the CTI verification team confirmed that the annual MSW consumption in the FSR is reasonable.<br>(6) Subsidies of MSW treatment<br>According to the FSR, the subsidy for MSW treatment is 55 RMB/t. The CTI verification team confirmed that the subsidy of MSW treatment is 55 RMB/t by the Franchise Agreement with the government /22/. Therefore, CTI verification team confirms that the subsidy for MSW treatment is reasonable.<br>(7) Assessment period in the IRR calculation<br>As per para 6 of the TOOL27: Investment analysis v12.0 /94/, "*The period of assessment should not be limited to the proposed crediting period of the CDM project activity … the investment analysis shall be conducted for at least 10 years*". Although the project selects a 10-year fixed crediting period, since the lifetime of the project is 20 years /10//22/, the investment analysis of the project is conducted for 20 years which meets the requirements of TOOL27.<br>CTI confirms that 30 years assessment period and 2 year construction time as the assessment period for the project is reasonable. Based on the project IRR calculations /3/, the project IRR without ACC revenues for 30 years assessment period is 7.14%, which is below the benchmark 8% and confirms the project in the absence of GCC benefits is not financially attractive. |

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| | (8) Taxes, interest rate and other parameters<br>•VAT for equipment<br>In the FSR, 17% VAT is paid for purchase equipment, which is as usual for purchased goods. According to the “Interim regulations of the People’s Republic of China on value added tax” /49/, the equipment VAT can be credited over the operation period against the tariff VAT until the VAT from the equipment VAT is fully recovered. For this project, it happened on the 6th year of operation period.<br>•VAT for electricity tariff<br>The VAT used for electricity tariff in the financial analysis of the project activity is 17%, which is sourced from the FSR. The value is complied with the “Interim regulations of the People’s Republic of China on value added tax” /50/.<br>• Income tax<br>The income tax used in the financial analysis for this project activity is 25%, which is in line with the “Enterprise income tax law of the People's Republic of China” /51/.<br>•The city maintenance and construction tax<br>The urban maintenance and construction tax rate (7% of VAT) in the FSR /10/ is verified to be derived from the Urban Maintenance and Construction Tax Policy /53/.<br>• The education surtax rate<br>The education additional tax of 3% applied in the financial analysis was derived from the FSR, which is composed of education additional tax of 3% imposed by central government in line with “Provisional regulations of the People’s Republic of China on education tax” /54//65/.<br>• Depreciation period and Residual rate<br>The depreciation period of 20 year is derived from the FSR /10/. According to the “Enterprise income tax law of the People's Republic of China” /51/, an enterprise shall begin computing depreciation for a fixed asset in the month following the month in which the asset is into service, and shall cease computing depreciation for a fixed asset in the month following in which the asset’s use is ceased. The minimum number of years for computing depreciation of fixed assets is 10 years for the manufacturing and business operations. Therefore, the depreciation period of 20 years for the proposed project is in line with the regulation and has been taken into account in the income tax calculation. Further, the depreciation period of 20 years also represents the normal accounting practice of those registered waste-to-energy projects in China.<br>The residual rate (5%) is derived from the FSR /10/ and is in line with the “Enterprise income tax law of the People's Republic of China” /51/. According this law, the net residual value of a fixed asset shall be reasonably determined by an enterprise according to the nature and condition of the fixed asset. It may not be changed once determined. CTI confirmed that the residual value has been recovered at the end of operational period in the IRR calculation, and deemed to be reasonable.<br>It is of CTI’s opinion that the depreciation period of 20 years and residual value rate of 5% are reasonable and appropriate.<br>• Loan interest rates<br>CTI verified that the long-term loan interest rate 6.765% and short-term loan interest rate 5.31% used in the financial analysis were derived from the FSR /10/ and are consistent with the value stipulated by People’s Bank of China (authority organization in economic field in China) in 03/2015 /66/, which was the latest loan rates available when |

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| | the FSR was completed in 02/2015. By checking the historical loan rates stipulated by People's Bank of China /66/, CTI confirms the long-term loan rate of 6.765% and short-term loan rate of 5.31% were in accordance with the historical records of People's Bank of China.<br>Hence CTI was able to confirm that the loan interest rate applied in the financial analysis is reasonable and acceptable.<br>In conclusion, CTI was able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project.<br>Calculation and conclusion<br>The project IRR calculations provided in a spreadsheet /3/ were verified and found to be correct. The project IRR without ACC revenues is 7.14%, which confirms that the project in the absence of GCC benefits and compared to the benchmark (8%) is not financially attractive. And the project IRR with ACC revenues is 8.16% which just reaches the IRR benchmark.<br>*Sub-step 2d: Sensitivity analysis*<br>To check the robustness of the financial analysis, a sensitivity analysis was performed on parameters that account for more than 20% of the costs and that would affect the total project revenues. Reasonable variations of operating costs, static investments, the power delivered to the grid, the electricity tariff and MSW disposal fee were checked by calculating the variation necessary to reach the benchmark and then discussing the likelihood for that to happen. The result of the sensitivity analysis is as follows:<br>1) Total static Investment: If the total static investment decreased by 8.07%, the IRR would reach benchmark. However, it has been verified in above section that the already contracted costs (368,957,104.11 RMB) have exceed the estimated total static investment in the FSR /10/. Therefore, it's unlikely that the static total investment decreased by 8.07%.<br>2) Annual O&M cost: If the annual O&M cost is decreased by 12.47%, the IRR would reach benchmark. As the assessment above, the annual O&M Cost covers necessary disbursements such as material cost, auxiliary fuel cost, repair expenses and payroll&welfare, etc, and the operational fee is increasing. However, considering the increasing of the Producer Price Index (PPI) /124/, CTI verification team confirmed that the annual O&M cost is unlikely to decrease by 12.47%.<br>3) Power Tariff: When the expected power tariff increases by 7.11%, the IRR of the project activity could reach the benchmark. Through the "Notice on the Improvement of Electricity Price Policy for MSW Incineration" issued by the National Development and Reform Commission of China/122/ and the Franchise Agreement of this project /22/, CTI confirmed that the power tariff of MSW incineration and power generation projects is fixed on 0.65 CNY/kWh. Therefore, it is unlikely that the power tariff increases by 7.11%.<br>4) Electricity delivered to the grid: For the IRR to reach the benchmark, the annual electricity delivered to the grid must be increased by 7.11%. It has been validated in above section that the electricity generation is mainly determined by the MSW calorific value, MSW disposal amount and the power efficiency of the plant, and the MCR condition of the incineration system in the FSR /10/ was also designed based on these factors, and the actual MCR conditions of the incineration system were verified by the verification team through a technical service contract /23/. Therefore, CTI verification team determined through technical service contracts for major equipment /23/, |

operating records /18/, and field interactions with operations and maintenance personnel that the incineration system needed to retain sufficient maintenance time so that a 7.11% increase in annul electricity delivered to the grid is not possible.

5) Waste consumption: When IRR reaches the benchmark, the MSW amount must be increased by 23.82%. The previous section confirmed that the MSW treatment capacity of the project was designed by a third party through the future waste generation and calorific value of Junan Country, therefore the CTI verification team considered that a 23.82% increase in the MSW treatment capacity is not possible.

6) Waste disposal charge: When IRR reaches the benchmark, the tipping fee must be increased by 23.82%. Through the Franchise Agreement of this project /22/, CTI verification team confirmed the tipping fee of MSW treatment is fixed. Therefore, it is unlikely that the tipping fee of MSW treatment increases by 23.82%.

In conclusion, the result of the CTI verification team investment and sensitivity analysis have shown that without the income from the VCU sale, the project activity is not the most financially attractive option.

**Step 4: Common practice analysis**

According to the TOOL02: "Tool for the demonstration and assessment of additionality", version 07.0.0 /86/, projects are considered similar if they are in the same country/region and/or rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc. The following steps are used for common practice analysis according to TOOL24: "Common practice v03.1" /93/.

*Sub-step 4a: The proposed project activity(ies) applies measure(s) that are listed in the definitions section above*

As the project applies power generation incinerating MSW which is one of the measures listed in the definitions section of TOOL02, thus, proceed to Sub-step 4a.

*Sub-Step 4a-1: calculate applicable capacity or output range as +/-50% of the total design capacity or output of the proposed project activity.*

The installed capacity of the proposed project is 12MW, so the ±50% range is 6MW to 18MW.

*Sub-Step 4a-2: identify similar projects (both CDM and non-CDM) which fulfil all of the following conditions*

| Conditions | Identification by the verification team |
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| | (a) The projects are located in the applicable geographical area. | The applicable geographical area of common practice analysis is identified as the Shandong Province in the PSF because China is a large country and most policies are promulgated in provincial level by combining the national policy with the region's condition. Thus, the regulatory framework and investment climate for waste-to-electricity projects in China are similar and comparable only for these projects connected to the same grid and located in the same province /68//69/.<br><br>Therefore, the regulatory framework and investment climate for waste-to-electricity projects are only similar and comparable for projects located in the same Province/Autonomous Region, and the common practice analysis for the proposed project activity is thus restricted to Shandong Province. | |
| | (b) The projects apply the same measure as the proposed project activity. | The same measure as the project activity is methane formation avoidance (use of MSW that would have been left to decay in a solid waste disposal site resulting in the formation and emission of methane, for energy generation). | |
| | (c) The projects use the same energy source/fuel and feedstock as the proposed project activity, if a technology switch measure is implemented by the proposed project activity. | The same energy source/fuel and feedstock as the project activity is municipal solid waste. | |
| | (d) The plants in which the projects are implemented produce goods or services with comparable quality, properties and applications areas (e.g., clinker) as the proposed project plant. | The plants incinerate MSW for methane formation avoidance and power generation with the heat from the MSW treatment system to replace equivalent electricity from the NCPG. | |
| | (e) The capacity or output of the projects is within the applicable capacity or output range calculated in Sub-step 4a-1. | As already described in Sub-step 4a-1, only those plants with the installed capacity between 6MW to 18MW will be possibly identified as similar projects. | |

| | |
|---|---|
| (f) The projects started commercial operation before the project design document (CDM-PDD) i.e., PSF for proposed GCC project activity is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity. | The starting date of the project was 12/04/2015[6] when the incinerator purchase agreement /20/ was signed, which is earlier than the date of PSF for global stakeholder consultation from 06/12/2022. Thus, the similar projects are the waste-to-electric projects in Shandong Province delivering the started commercial operation before 12/04/2015. |

In conclusion, only those projects that incinerate MSW to generate electricity within capacity range of 6MW to 18MW and started commercial operation before 12/04/2015 in the Shandong Province are identified as similar projects (both projects registered under GHG programs and not registered under any GHG program) and included into the common practice analysis.
CIT has assessed the identified projects in the final PSF /2/ by checking the China Electric Power Yearbooks /40/ and other GHG program websites /98/. It's confirmed that the list is completed, and no waste-to-electric project within the applicable range was identified.

*Sub-Step 4a-3: within the projects identified in Sub-Step 4a-2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities undergoing validation. Note their number $N_{all}$.*

According to the Step 4a-2, $N_{all}$ =0.

*Sub-Step 4a-4: within similar projects identified in Sub-Step 4a-3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number $N_{diff}$.*

In Step 4a-3, $N_{all}$ is 0. Thus, $N_{diff} = N_{all} = 0$.

*Sub-Step 4a-5: calculate factor $F=1-N_{diff}/N_{all}$ representing the share of similar projects (penetration rate of the measure/technology) using a measure/technology similar to the measure/technology used in the proposed project activity that deliver the same output or capacity as the proposed project activity.*

Since both $N_{all}$ and $N_{diff}$ equal to 0, Nall = Ndiff. $F=1-N_{diff}/N_{all}=1-1=0<0.2$, $N_{all} -N_{diff}=0$.
Therefore, as per TOOL24 Common Practice, version 03.1, it can be concluded that the project is not a common practice.
In conclusion, it is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions resulting from the project are additional.

[6]The starting date stated here for common practice is based on the "starting date" definition in "Glossary of CDM terms, version 07.0"/120/ and is not the "Start date of the Project Activity" under GCC scheme. As the proposed GCC project activity applies the CDM tool for common practice analysis, thus, it is reasonable to comply with the CDM starting date requirement in the common practice analysis section.

| | |
|---|---|
| **Findings** | *CL03, CAR03, CAR04 and CAR05 were raised here and are successfully closed, details please refer to Appendix 4.* |
| **Conclusion** | CTI concludes that additionality of the project activity was demonstrated in accordance with the applicable Project Verification requirements related to the demonstration of additionality in the Verification Standard and Project Standard and the applicable methodology. |

### D.3.6 Estimation of emission reductions or net anthropogenic removal

| | |
|---|---|
| **Means of Project Verification** | CTI has conducted document review and on-site assessment to determine whether the steps taken and the equations and parameters to calculate the emission reductions or net anthropogenic removals in the PSF were in accordance with the applicable Project Verification requirements related to emission reductions in the Verification Standard and Project Standard and the applicable methodology.<br>The calculation of the emissions reductions exactly follows the procedures described in the methodology ACM0022 (Version 03.0) and relevant tools, e.g., the TOOL04 (Version 8.1), "Emissions from solid waste disposal sites".<br>CTI has verified the calculation of project emissions, baseline emissions, leakage and emission reductions. Corresponding calculations have been carried out based on calculation spreadsheet. The consistency of the parameters and equations presented in the PSF, as well as calculation spreadsheet etc., has been compared with the information and requirements presented in the methodology and respective tools.<br>The assumptions and data used to determine the emission reductions are listed in the PSF and all the sources have been checked. Based on the information reviewed it is confirmed that the sources used are correctly quoted and interpreted in the PSF. The values presented in the PSF are considered reasonably based on the documentation and references reviewed and the results of the interviews.<br>The estimation of the emission reductions is considered correct as the calculations have been reproduced by the verification team with the attainment of the same results.<br>CTI confirms methodology ACM0022 (Version 03.0) and relevant tool have been correctly applied to calculate baseline emissions, project emissions, leakage and net GHG emission reductions.<br>Detailed information on the validation of the parameters used in the equations is found below. The algorithms for the determination of the baseline and project are discussed in the following sections.<br>The emission reductions are calculated by the difference between baseline emissions ($BE_y$), project emissions ($PE_y$) and leakage.<br>**1. Baseline emissions**<br>As per the methodology ACM0022 (Version 03.0) that the baseline emissions of the project include two components 1) destroy of LFG gas by combustion in gas engine and in flaring system; 2) Energy generated or electricity consumed by the grid in the absence of the project activity.<br>The baseline emissions are calculated by the following formula:<br>$$BE_y = \sum_t (BE_{CH4,t,y} + BE_{WW,t,y} + BE_{EN,ty} + BE_{NG,t,y}) \times (1 - RATE_{compliance,t})$$ Equation (1)<br>Where: |

| | |
|---|---|
| $BE_y$ | Baseline emissions in year y ($tCO_2e$) |
| $BE_{CH4,t,y}$ | Baseline emissions of methane from the SWDS in year y ($tCO_2e$) |
| $BE_{WW,t,y}$ | Baseline methane emissions from anaerobic treatment of the wastewater in open anaerobic lagoons or of sludge in sludge pits in the absence of the project activity in year y ($tCO_2e$) |
| $BE_{EN,t,y}$ | Baseline emissions associated with energy generation in year y ($tCO_2e$) |
| $BE_{NG,t,y}$ | Baseline emissions associated with natural gas use in year y ($tCO_2e$) |
| $RATE_{compliance,t}$ | Discount factor to account for the rate of compliance of a regulatory requirement that mandates the use of alternative waste treatment process t |
| t | Type of alternative waste treatment process |

The project activity does not associated with anaerobic treatment of the wastewater and natural gas use by checking the FSR /10/, thus, $BE_{WW,t,y}$ = 0 and $BE_{NG,t,y}$ = 0.

It is verified by the verification team via checking the Prevention and Control of Environmental Pollution by Solid Waste Law of the People's Republic of China /49/, GB 18485-2014 /100/ and on-site interview with local government officials, CTI verification team confirmed that the treatment of MSW by incineration is encouraged in these laws and standards, but not mandatory, and therefore a value of zero for $RATE_{compliance,t}$ is reasonable. The ex-post monitoring procedures for this parameter are detailed in Section D.3.7 of this report.

Therefore, for the project activity, $BE_y = BE_{CH4,t,y} + BE_{EN,t,y}$

**1.1 Determination of $BE_{CH4,t,y}$**

According to methodology ACM0022 (Version 03.0), $BE_{CH4,y}$ is calculated as per the latest version of the approved TOOL04: “Emissions from solid waste disposal sites” considering the following additional equation:

$$\begin{aligned} BE_{CH4,t,y} &= BE_{CH4,SWDS,y} \\ &= \varphi_y \times (1 - f_y) \times GWP_{CH4} \times (1 - OX) \times \frac{16}{12} \times F \\ &\times DOC_{f,y} \times MCF_y \times \sum_{x=1}^{y} \sum_{j} (W_{j,x} \times DOC_j \times e^{-k_j \times (y-x)} \\ &\times (1 - e^{-k_j})) \end{aligned} \qquad \text{Equation (2)}$$

Where

| | |
|---|---|
| $BE_{CH4,SWDS,y}$ | Baseline methane emissions occurring in year y generated from waste disposal at a SWDS during a time period ending in year y ($tCO_2e/yr$) |
| $\varphi_y$ | Model correction factor to account for model uncertainties for year y |

| | | |
|---|---|---|
| | $f_y$ | Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of methane to the atmosphere in year y |
| | $GWP_{CH4}$ | Global Warming Potential of methane |
| | $OX$ | Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste) |
| | $F$ | Fraction of methane in the SWDS gas (volume fraction) |
| | $DOC_{f,y}$ | Fraction of degradable organic carbon (DOC) that decomposes under the specific conditions occurring in the SWDS for year y (weight fraction) |
| | $MCF_y$ | Methane correction factor for year y |
| | $W_{j,x}$ | Amount of solid waste type j disposed or prevented from disposal in the SWDS in the year x (t) |
| | $W_x$ | Total amount of solid waste disposed or prevented from disposal in the SWDS in year x (t) |
| | $p_{j,x}$ | Average fraction of the waste type j in the waste in year x (weight fraction) |
| | $p_{n,j,x}$ | Fraction of the waste type j in the sample n collected during the year x (weight fraction) |
| | $Z_x$ | Number of samples collected during the year x |
| | $n$ | Samples collected in year x |
| | $DOC_j$ | Fraction of degradable organic carbon in the waste type j (weight fraction) |
| | $k_j$ | Decay rate for the waste type j (1 / yr) |
| | $x$ | Years in the time period in which waste is disposed at the SWDS, extending from the first year in the time period (x = 1) to year y (x = y) |
| | $y$ | Year of the crediting period for which methane emissions are calculated (y is a consecutive period of 12 months) |
| | $j$ | Type of residual waste or types of waste in the MSW |
| | Where different waste type j are prevented from disposal, determine the amount of different waste types ($W_{j,x}$) through sampling and calculate the mean from the samples, as follows: | |
| | $$W_{j,x} = W_x \times p_{j,x}$$ | Equation（3） |
| | $$p_{j,x} = \frac{\sum_{n=1}^{Z_x} p_{n,j,x}}{Z_x}$$ | Equation（4） |
| | Where: | |

| | |
|---|---|
| $W_{j,x}$ | Amount of solid waste type j disposed or prevented from disposal in the SWDS in the year x (t) |
| $W_x$ | Total amount of solid waste disposed or prevented from disposal in the SWDS in year x (t) |
| $p_{j,x}$ | Average fraction of the waste type j in the waste in year x (weight fraction) |
| $p_{n,j,x}$ | Fraction of the waste type j in the sample n collected during the year x (weight fraction) |
| $Z_x$ | Number of samples collected during the year x |
| n | Samples collected in year x |

The actual values of parameters $f_y$, $W_x$, $p_{n,j,x}$ and $z_x$ will be monitored by PP and determined ex post as per ACM0022 (Version 03.0), more details in Section D.3.7 of this report.
Through a review of the ACM0022 (Version 03.0), relevant tools and site visits, the CTI verification team determined that the parameters in Equation 2 were correctly valued during the estimation process of $BE_{CH4,t,y}$, as shown in the following table:

| Parameter | Data unit | Value | Verification process |
|---|---|---|---|
| $\varphi_y$ | / | 0.8 | In the case of that the TOOL04 /88/ is used to calculate baseline emissions, the parameter may be determined using a default value (Option 1) or based in project specific situation (Option 2). The PO applied Option 1 and thus $\varphi_y = \varphi_{default}$. As per the Data/parameter table 1 of the TOOL04 /88/, the PO applied 0.8 under Dry conditions and under Application B. Based on mean annual temperature (MAT), Mean annual precipitation (MAP), potential evapotranspiration (PET). provided in the PSF and reviewing the public climate information of Junan Country/101/ and the journal article /102/, the verification team confirmed that the value of the parameter was correctly applied as per the applied methodology and the reference. |

| | | | | |
|---|---|---|---|---|
| | $f_y$ | / | 0.2 | After reviewing the mandatory standards, 'The Technical Specification for Sanitary Domestic Waste Landfill (GB50869-2013)' /103/ and 'The Standard for Domestic Waste Landfill Pollution Control (GB16889-2008)' /104/, CTI confirms that there are current mandatory standards in P.R.China requiring the installation of gas collection facilities in landfills. However, these standards do not explicitly specify the landfill gas collection rate. Additionally, as confirmed earlier, these mandatory standards have not been well implemented. Therefore, the PO's choice of $f_y$=0.2 is reasonable and complies with the requirements of TOOL04. |
| | $GWP_{CH4}$ | $tCO_2e/t\ CH\neq$ | 28 | CTI verification team confirmed by the methodology ACM0022 (Version 03.0) /85/, Tool 04 (Version 8.1) /88/ and IPCC Fifth Assessment Report (AR5) that the value of this parameter is the latest default value of IPCC AR5. |
| | OX | / | 0.1 | CTI verification team confirmed by TOOL04 (Version 8.1) /88/ that this parameter is the default and takes the values of 0.1. |
| | F | / | 0.5 | CTI verification team confirmed by TOOL04 (Version 8.1) /88/ that this parameter is the default and takes the values of 0.5. |
| | $DOC_{f,y}$ | Weight fraction | 0.5 | CTI verification team checked TOOL04 (Version 8.1) /88/ to confirm that this parameter can be selected as the default value in MSW case and takes |

| | | | | |
|---|---|---|---|---|
| | | | | the values of 0.5. |
| | $MCF_y$ | / | 1.0 | According to Paragraph 33 of TOOL04 (Version 8.1) /88/, for Application B, the parameter is determined based on the waster table's position relative to the bottom of SWDS. Through onsite inspection and review of EIA report /11/, the verification team observed that the groundwater level at the Junan County landfill exceeds 68m, placing the water table below the SWDS bottom. Consequently, the parameter is assigned using default value based on the type of SWDS management. The PO applied a value of 1, indicative of anaerobically managed solid waste disposal sites. This is consistent with the standard GB16889-2008 /104/, which stipulated that the landfills should be covered promptly when their operational surfaces are inactive. Interviews with local government staff and a review of documents issued by the Shandong Provincial Government /106/ confirmed that a supervisory mechanism for waste landfill site operation and management is in place, ensuring compliance with relevant standards. Therefore, the default value as per the TOOL04 has been correctly applied. |
| | $DOC_j$ | / | Waste type j: DOC$_j$ (%, wet)<br>Wood and wood products: 43<br>Pulp, paper and cardboard: 40 | Through the FSR /10/, on-site inspection and interview with the staff of the project and local government, CTI confirmed that the MSW composition data are wet-based and therefore it is |

| | | | | |
|---|---|---|---|---|
| | | | Food, food waste, beverage and tobacco: 15<br>Textiles: 24<br>Garden, yard and park waste: 20<br>Glass, plastic, metal, other inert waste: 0<br>Rubber and Leather: 0 | appropriate to apply the faction of degradable organic carbon to the wet waste.<br>Since the project activity treats only MSW, default values in the TOOL04 were applied. The fractions listed in table are based on wet waste basis which are concentrations in the waste as it is delivered to the SWDS<br>This project processes only MSW, but the 'Rubber and Leather' component is not included in Table 6 of Data/Parameters in TOOL04 (Version 08.1). Therefore, the PO selected a value of 0, which CTI considers to be in line with the conservative requirements of TOOL04 and reasonable. |
| | $k_j$ | / | Waste type j / $k_j$:<br>Wood and wood products: 0.02<br>Pulp, paper and cardboard: 0.04<br>Food, food waste, beverage and tobacco: 0.06<br>Textiles: 0.04<br>Garden, yard and park waste: 0.05<br>Glass, plastic, metal, other inert waste: 0<br>Rubber and Leather: 0 | Default values are provided in the TOOL04 (Version 08.1) depending on climate condition.<br>According to the Data/parameter Table 7 of the TOOL04, the PO applied default values for Boreal and Temperate--Dry climate. Climate data for the period from 1956 to 2002 was used to determine $k_j$, the verification team cross-checked the climate data in the PSF against the public climate information of Junan Country/101/, the journal article /102/ and the EIA report /11/.<br>This project processes only MSW, but the 'Rubber and Leather' component is not included in Data/parameter Table 7 of TOOL04 (Version 08.1). Therefore, the PO |

<table>
<tr><td></td><td></td><td></td><td>selected a value of 0, which CTI considers to be in line with the conservative requirements of TOOL04 and reasonable.</td></tr>
<tr><td>$W_{j,x}$</td><td>t</td><td>
<table>
<tr><th>waste type</th><th>Percentage content of waste j(%,wet waste)</th><th>Amount (t)</th></tr>
<tr><td>Wood and wood products</td><td>1.30</td><td>2,847</td></tr>
<tr><td>Pulp,paper and cardboard( other than sludge)</td><td>21.00</td><td>45,990</td></tr>
<tr><td>Food,food waste,beverages and tobacco(other than sludge)</td><td>54.34</td><td>119,005</td></tr>
<tr><td>Textiles</td><td>1.50</td><td>3,285</td></tr>
<tr><td>Garden,yard and park waste</td><td>0.00</td><td>0</td></tr>
<tr><td>Glass,plastic,metal,other inert waste</td><td>9.56</td><td>20,936</td></tr>
<tr><td>Rubber and Leather</td><td>12.3</td><td>26,937</td></tr>
<tr><td>Total</td><td>100</td><td>219,000</td></tr>
</table>
</td><td>The weight of each component of MSW was obtained by multiplying the proportion of each component of MSW by the total amount of MSW during the ex ante calculation. CTI confirmed through FSR /10/ that the total amount of MSW of inbound volume 219,000 t ($W_x$) was the estimated amount of MSW intake based on the treatment capacity of the incineration system, and the proportion of each component of MSW was obtained from the results of the research on the composition of MSW at the project site.<br>The physical composition of municipal solid waste in Junan County was determined through an average of five measurements conducted by a qualified third-party during the FSR preparation process. These measurements were carried out in accordance with the "Methods for Sampling and Analysis of Municipal Solid Waste (CJ/T313-2009)" /107/, as issued by the Ministry of Housing and Urban-Rural Development of the People's Republic of China.<br>Therefore, CTI determined that the values of $W_{j,x}$ were reasonable.</td></tr>
</table>

**1.2 Determination of $BE_{EN,t,y}$**

According to methodology ACM0022 (Version 03.0), $BE_{EC,t,y}$ is calculated as per the latest version of the approved “TOOL05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation:

$$BE_{EC,t,y} = EG_{t,y} \times EF_{grid,CM,y} \times (1 + TDL_{k,y}) \quad \text{Equation (5)}$$

Where:

| | |
|---|---|
| $BE_{EC,t,y}$ | Baseline emissions from electricity consumption in year y ($tCO_2e/yr$) |
| $EG_{t,y}$ | Electricity generated by the alternative waste treatment option t and exported to the grid in year y (MWh) |
| $EF_{grid,CM,y}$ | Grid power emissions factor in year y ($tCO_2/MWh$) |
| $TDL_{k,y}$ | Average technical transmission and distribution losses for providing electricity to source k in year y |
| $k$ | Sources of electricity consumption in the baseline |

The actual value of parameter $EG_{t,y}$ will be monitored and determined ex post as per ACM0022 (Version 03.0) and the detailed information on determination of $EG_{t,y}$ is discussed in Section D.3.7 of this report. The data 62,049.3 MWh derived from the FSR provided is only used for ex ante calculation, CTI verification team confirmed that it is reasonable.

The Combined margin $CO_2$ emission factor for grid connected power generation in year y ($EF_{grid,CM,y}$) is calculated in a transparent and conservative manner as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the steps prescribed in the "Tool to calculate the emission factor for an electricity system", version 07.0.

The PSF applies the calculation of the grid emission factor as per the latest available official guidance "2021 Baseline Emission Factors for Regional Power Grids in China" /38/ published by the DNA of China based on the data from China Electric Power Yearbook (2018~2020) /40/ and China Energy Statistical Yearbook (2018~2020) /41/. ''2021 Baseline Emission Factors for Regional Power Grids in China" is the only most recent available official statistics published by China's DNA on 17/11/2023 as confirmed by checking China DNA's official website /38/. It is confirmed that the latest data published by China's DNA is not older than 3 years which is in compliance with the requirement of para 8&9 stipulated in Clarification No.3, v1.0 /83/ issued by GCC. Thus, $EF_{grid,OMsimple,y}$ is calculated to be 0.9714 $tCO_2e/MWh$ and $EF_{grid,BM,y}$ is calculated to be 0.4701 $tCO_2e/MWh$. The verification team has checked the website of China's DNA /38/ and can confirm that the most recent data available at the time of submission of registration request is applied in the PSF. It is confirmed that the calculation is in accordance with the calculation process of the corresponding methodology and tools.

As per the "Tool to calculate the emission factor for an electricity system" (version 07.0) /90/ and based on the weight $\omega_{OM}$ and $\omega_{BM}$ of 0.5:0.5 by default for the fixed-ten year crediting period, the combined margin emission factor ($EF_{grid,CM,y}$) is calculated to be $0.5\times0.9714+0.5\times0.4701 = 0.72075$ $tCO_2e/MWh$ and the $EF_{grid,CM,y}$ is fixed for the whole crediting period of the project activity

The value of $TD_{Lk,y}$ is sourced from "Methodological tool: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 3.0) /89/. It is validated that the baseline scenario will consume electricity from the grid by review of the FSR. Using a default value 3% to the baseline emissions is in line with the tool and in a conservative manner.

The annual average net electricity supplied to the grid is 62,049.3 MWh which is in line with the original design of the project. It's confirmed that the estimation of the figure is reasonable. Thereby, the baseline emissions from electricity supplies per year could be calculated to be 62,049.3 MWh * 0.72075 $tCO_2e$/MWh*(1+3%) =46,064 $tCO_2e$.

The estimated baseline emissions of this project activity for each year during the fixed 10-year crediting period are summarized in the table below:

| Period | $BE_{CH4,t,y}$ ($tCO_2e$) | $BE_{EC,y}$ ($tCO_2e$) | $BE_y$ ($tCO_2e$) |
|---|---|---|---|
| 10/08/2017-09/08/2018 | 9,763 | 46,064 | 55,827 |
| 10/08/2018-09/08/2019 | 19,039 | 46,064 | 65,103 |
| 10/08/2019-09/08/2020 | 27,854 | 46,064 | 73,918 |
| 10/08/2020-09/08/2021 | 36,232 | 46,064 | 82,295 |
| 10/08/2021-09/08/2022 | 44,194 | 46,064 | 90,258 |
| 10/08/2022-09/08/2023 | 51,763 | 46,064 | 97,827 |
| 10/08/2023-09/08/2024 | 58,959 | 46,064 | 105,022 |
| 10/08/2024-09/08/2025 | 65,800 | 46,064 | 111,864 |
| 10/08/2025-09/08/2026 | 72,306 | 46,064 | 118,370 |
| 10/08/2026-09/08/2027 | 78,493 | 46,064 | 124,557 |
| 10/08/2017-09/08/2018 | 9,763 | 46,064 | 55,827 |

**2. Project emissions**

According to ACM0022 (Version 03.0) project emissions are calculated as follows:

$$PE_y = PE_{COMP,y} + PE_{AD,y} + PE_{GAS,y} + PE_{RDF\_SB,y} + PE_{INC,y} \quad \text{Equation (6)}$$

Where:

| | |
|---|---|
| $PE_y$ | Project emissions in year y ($tCO_2e$) |
| $PE_{COMP,y}$ | Project emissions from composting or co-composting in year y ($tCO_2e$) |
| $PE_{AD,y}$ | Project emissions from anaerobic digestion and biogas combustion in year y ($tCO_2e$) |
| $PE_{GAS,y}$ | Project emissions from gasification in year y ($tCO_2e$) |
| $PE_{RDF\_SB,y}$ | Project emissions associated with RDF/SB in year y ($tCO_2e$) |
| $PE_{INC,y}$ | Project emissions from incineration in year y ($tCO_2e$) |

The project activity incinerates fresh waste from Junan Country for the power generation and is not involved in composting or co-composting, anaerobic digestion or biogas combustion, gasification, or RDF/SB. Therefore, $PE_{COMP,y}$ =0, $PE_{AD,y}$ =0, $PE_{GAS,y}$ =0, $PE_{RDF\_SB,y}$=0 and $PE_y$=$PE_{INC,y}$.

**Project emissions from incineration**

$$PE_y = PE_{INC,y} = PE_{COM,INC,y} + PE_{EC,INC,y} + PE_{FC,INC,y} + PE_{ww,INC,y} \quad \text{Equation (7)}$$

Where:

| | |
|---|---|
| $PE_y$ | Project emissions in year y ($tCO_2e$) |
| $PE_{INC,y}$ | Project emissions from incineration in year y ($tCO_2e$) |
| $PE_{COM,INC,y}$ | Project emissions from combustion within the project boundary of fossil waste associated with incineration in year y ($tCO_2e$) |
| $PE_{EC,INC,y}$ | Project emissions from electricity consumption associated with incineration year y ($tCO_2e$) |
| $PE_{FC,INC,y}$ | Project emissions from fossil fuel consumption associated with incineration in year y ($tCO_2e$) |
| $PE_{ww,INC,y}$ | Project emissions from the wastewater treatment associated with incineration in year y ($tCH_4$) |

According to ACM0022 (Version 03.0), $PE_{COM,INC,y}$= $PE_{COM,c,y}$ and the combustor c is the incinerator, $PE_{EC,INC,y}$= $PE_{EC,t,y}$ and the alternative waste treatment process t is incineration, $PE_{FC,INC,y}$= $PE_{FC,t,y}$ and the alternative waste treatment process t is incineration, $PE_{ww,INC,y}$= $PE_{ww,t,y}$ and the alternative waste treatment process t is incineration. CTI verification team confirm that the taken process of parameters is in compliance with the methodology.

**2.1 Determination of $PE_{COM,t,y}$**

According to ACM0022 (Version 03.0), $PE_{COM,c,y}$ is calculated as follows:

$$PE_{COM,c,y} = PE_{COM,CO2,c,y} + PE_{COM,CH4,N2O,c,y} \quad \text{Equation (8)}$$

Where:

| | |
|---|---|
| $PE_{COM,c,y}$ | Project emissions from combustion within the project boundary of fossil waste associated with incineration in year y ($tCO_2e$) |
| $PE_{COM,CO2,c,y}$ | Project emissions from electricity consumption associated with incineration year y ($tCO_2e$) |
| $PE_{COM,CH4,N2O,c,y}$ | Project emissions of $CH_4$ and $N_2O$ from combustion within the project boundary associated with combustor c in year y ($tCO_2e$) |
| c | Combustor used in the project activity: gasifier or syngas burner, incinerator or RDF/SB combustor |

**2.1.1 Determination of $PE_{COM,C02,c,y}$**

The PD applies option 1 to calculate the emissions of $CO_2$ from combustion within the project boundary:

$$PE_{COM,CO2,c,y} = EFF_{COM,c,y} \times \frac{44}{12} \times \sum_j Q_{j,c,y} \times FCC_{j,y} \times FFC_{j,y} \quad \text{Equation (9)}$$

Where:

| | |
|---|---|
| $PE_{COM,CO2,c,y}$ | Project emissions of CO2 from combustion within the project boundary associated with combustor c in year y (tCO2e) |
| $EFF_{COM,c,y}$ | Combustion efficiency of combustor c in year y (fraction) |

| | |
|---|---|
| $Q_{j,c,y}$ | Quantity of fresh waste type j fed into combustor c in year y (t) |
| $FCC_{j,y}$ | Fraction of total carbon content in waste type j in year y |
| $FFC_{j,y}$ | Fraction of fossil carbon in total carbon content of waste type j in year y (weight fraction) |
| $\frac{44}{12}$ | Conversion factor ($tCO_2/tC$) |
| c | Combustor used in the project activity: gasifier, incinerator or RDF/SB combustor |
| j | Waste type |

The amount of waste type i fed into the waste incineration plant ($Q_{j,c,y}$) will be continuously monitored or calculated as per the following equation according to ACM0022 (Version 03.0):

$$Q_{j,c,y} = Q_{waste,c,y} \times \frac{\sum_{n=1}^{Z} p_{n,j,y}}{Z}$$ Equation（10）

Where:

| | |
|---|---|
| $Q_{j,c,y}$ | Quantity of waste type j fed into combustor c in year y (t) |
| $Q_{waste,c,y}$ | Quantity of fresh waste or RDF/SB fed into combustor c in year y |
| $p_{n,j,y}$ | Fraction of waste type j in the sample n collected during the year y (weight fraction) |
| Z | Number of samples collected during the year y |
| n | Samples collected in year y |
| j | Waste type |

In the PSF (Version 4.0 dated 29/11/2023), for the purpose of ex ante calculation, the appropriate values of $FCC_{j,y,}$ $FFC_{j,y}$ and $EFF_{COM,c,y}$ are adopted from IPCC 2006. And $EFF_{COM,c,y}$, $Q_{waste,c,y}$, and $P_{n,j,y}$, z should be monitored in the actual calculation process according to the methodological requirements, more details in Section D.3.7 of this report.

Through a review of ACM0022 (Version 03.0), relevant tools and site visits, CTI verification team confirmed that the parameters in Equation 9 were correctly valued during the estimation process of $PE_{COM,C02,c,y}$, as shown in the following table:

| Parameter | Data unit | Value | Verification process |
|---|---|---|---|
| $EFF_{COM,c,y}$ | / | 100% | CTI verification team checked ACM0022 (Version 03.0) and 2006 IPCC guidelines to confirm that this parameter can be selected as IPCC default values 100%. |

<table>
<tr>
<td></td>
<td>$Q_{j,c,y}$</td>
<td>t</td>
<td>
<table>
<tr><th>waste type</th><th>Percentage content of waste j(%,wet waste)</th><th>Amount (t)</th></tr>
<tr><td>Wood and wood products</td><td>1.30</td><td>2,847</td></tr>
<tr><td>Pulp,paper and cardboard( other than sludge)</td><td>21.00</td><td>45,990</td></tr>
<tr><td>Food,food waste,beverages and tobacco(other than sludge)</td><td>54.34</td><td>119,005</td></tr>
<tr><td>Textiles</td><td>1.50</td><td>3,285</td></tr>
<tr><td>Garden,yard and park waste</td><td>0.00</td><td>0</td></tr>
<tr><td>Glass,plastic,metal,other inert waste</td><td>9.56</td><td>20,936</td></tr>
<tr><td>Rubber and Leather</td><td>12.3</td><td>26,937</td></tr>
<tr><td>Total</td><td>100</td><td>219,000</td></tr>
</table>
</td>
<td>In the ex-ante calculations, the PO applied the equation $Q_{j,c,y}=W_{j,x}$. Through a review of the FSR /10/, onsite inspections, and interviews with project staff, CTI confirmed that after the waste arrives at the site, it is stored in the waste storage pit for five days. During this storage period, leachate from the waste is produced, resulting in a lower moisture content in the waste fed to the incinerator compared to the moisture content when the waste first arrives at the plant. CTI considers the PO's use of a higher $Q_{j,c,y}$ in the ex-ante calculation of PE as conservative, leading to a higher estimated project emission. Therefore, CTI found the chosen value for $Q_{j,c,y}$ to be reasonable.</td>
</tr>
<tr>
<td></td>
<td>$FCC_{j,y}$</td>
<td>%</td>
<td>
<table>
<tr><th>waste type</th><th>$FCC_{j,y}$</th></tr>
<tr><td>Paper/cardboard</td><td>50%</td></tr>
<tr><td>Textiles</td><td>50%</td></tr>
<tr><td>Food waste</td><td>50%</td></tr>
<tr><td>Wood</td><td>54%</td></tr>
<tr><td>Gardens and park</td><td>55%</td></tr>
<tr><td>Nappies</td><td>90%</td></tr>
<tr><td>Rubber and Leather</td><td>67%</td></tr>
<tr><td>Plasticis</td><td>85%</td></tr>
<tr><td>Metal</td><td>0%</td></tr>
<tr><td>Glass</td><td>0%</td></tr>
<tr><td>Other, inert waste</td><td>5%</td></tr>
</table>
</td>
<td>The project activity only treats MSW, not residual waste. The methodology provides three options to determine the parameter: applying default values in IPCC 2006 guidelines; measuring using relevant standards; applying balance method in Appendix 2 of the methodology. The PP selected to apply default values.<br>CTI verification team checked ACM0022 (Version 03.0) to confirm that this parameter can be selected as the default value.</td>
</tr>
</table>

| | | | |
|---|---|---|---|
| $FFC_{j,y}$ | % | waste type / $FFC_{j,y}$<br>Paper/cardboard 5%<br>Textiles 50%<br>Food waste 0%<br>Wood 0%<br>Gardens and park 0%<br>Nappies 10%<br>Rubber and Leather 20%<br>Plasticis 100%<br>Metal 0%<br>Glass 0%<br>Other, inert waste 100% | The project activity only treats MSW, not residual waste. The methodology provides three options to determine the parameter: applying default values in IPCC 2006 guidelines; measuring using relevant standards; applying balance method in Appendix 2 of the methodology. The PP selected to apply default values.<br>CTI verification team checked ACM0022 (Version 03.0) to confirm that this parameter can be selected as the default value. |

**2.1.2 Determination of $PE_{COM,CH4,N2O,c,y}$**

The PD applies Option 2 to calculate the emissions of $CH_4$ and $N_2O$ from combustion within the project boundary using default emission factors for the amount of $CH_4$ and $N_2O$ emitted per tonne of fresh waste combusted.

$$PE_{COM,CH4,N2O,c,y} = Q_{waste,c,y} \times (EF_{N2O,t} \times GWP_{N2O} + EF_{CH4,t} \times GWP_{CH4}) \quad \text{Equation (11)}$$

Where:

| | |
|---|---|
| $PE_{COM,CH4,N2O,c,y}$ | Project emissions of $CH_4$ and $N_2O$ from combustion within the project boundary associated with combustor c in year y ($tCO_2$) |
| $Q_{waste,c,y}$ | Quantity of fresh waste or RDF/SB fed into combustor c in year y (t) |
| $EF_{N2O,t}$ | Emission factor for $N_2O$ associated with waste treatment process t (t $N_2O$/t waste) |
| $GWP_{N2O}$ | Global Warming Potential of nitrous oxide ($tCO_2e$/t $N_2O$) |
| $EF_{CH4,t}$ | Emission factor for $CH_4$ associated with treatment process t ($tCH_4$/t waste) |
| $GWP_{CH4}$ | Global Warming Potential of methane valid for the commitment period (t $CO_2e$/t $CH_4$) |
| c | Combustor used in the project activity: gasifier, incinerator |
| t | Type of alternative waste treatment processes: gasification, incineration |

The actual values of parameters $Q_{waste,c,y}$ will be monitored by PP and determined ex post as per ACM0022 (Version 03.0). In the process of determining the $PE_{COM,C02,c,y}$, CTI verification team confirmed the basis for taking the $Q_{j,c,y}$ and their r easonableness, and in the ex ante calculation, the $Q_{waste,c,y}$ was taken as 219,000 tons as

the total of all $Q_{j,c,y}$. The data derived from the FSR is only used for ex ante calculation, CTI verification team confirmed that it is reasonable.

Through a review of ACM0022 (Version 03.0), relevant tools and site visits, CTI verification team confirmed that the parameters in Equation 11 were correctly valued during the estimation process of $PE_{COM,CH4,N2O,c,y}$, as shown in the following table:

| Parameter | Data unit | Value | Verification process |
|---|---|---|---|
| $EF_{N2O,t}$ | / | 1.21x 50x $10^{-6}$ | The project activity only treats MSW. By means of interview with PO, the verification team found that country specific data is not available. The PO applied default value for continues incineration in the methodology. Conducted review of EIA report /11/ and FSR /10/ confirmed that the applied value is appropriate for the incineration technology under the project activity. In the methodology, unit of the parameter is 't $N_2O$/t waste' and the value is 1.21x50x$10^{-3}$. However, IPCC 2006 guidelines which is the original reference of the value provides unit of '50 g $N_2O$/t waste'. Given that 1.21 is applied in a conservative manner, '1.21x50x$10^{-6}$ t$N_2O$/ t waste' shall be used according to the original value in IPCC 2006 guidelines. Therefore, CTI confirmed that the value of the parameter applied by PO was correctly. |
| $EF_{CH4,t}$ | t | 1.21x 0.2x $10^{-6}$ | The project activity only treats MSW. By means of interview with PO, the verification team found that country specific data is not available. The PO applied default value for continues incineration and stocker type in the methodology. Conducted review of EIA report /11/ and FSR /10/ confirmed that the applied value is appropriate for the incineration technology under the project activity . Thus, the value of the parameter was correctly applied as per the applied methodology. |

**2.2 Determination of $PE_{EC,t,y}$**

$$PE_{EC,t,y} = EC_{PJ,j,y} \times EF_{grid,CM,y} \times (1 + TDL_{j,y}) \qquad \text{Equation (12)}$$

Where:

| | |
|---|---|
| $PE_{EC,t,y}$ | Project emissions from electricity consumption in year y (t $CO_2$ / yr) |
| $EC_{PJ,j,y}$ | Electricity consumption of electricity generated in an on-site fossil fuel fired power plant or from the grid as a result of the alternative waste treatment process t in year y (MWh/yr) |

| | |
|---|---|
| | $EF_{grid,CM,y}$ Grid power emissions factor in year y ($tCO_2$/MWh)<br>$TDL_{j,y}$ Average technical transmission and distribution losses for providing electricity to source j in year y<br>j Sources of electricity consumption in the project<br>CTI confirmed through the FSR /10/ that the project consumes electricity generated on site and does not introduce electricity from the grid during operation. Therefore, $EC_{PJ,j,y}$=0. The value of $TDL_{j,y}$ is sourced from "Methodological tool: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" version 3.0 /89/. It is validated that the baseline scenario will consume electricity from the grid by review of the FSR and physical site visit. Using a default value 20% is in line with the tool and in a conservative manner. Therefore, $PE_{EC,t,y}$=0×0.72075×(1+20%)=0.<br>**2.3 Determination of $PE_{FC,t,y}$**<br>Review of EIA report and FSR was conducted to confirm that light diesel fuel is used for burner in incineration plant. The PSF included equation for project emissions from fossil fuel consumption (**$PE_{FC,t,y}$**) as per the applied methodology and tool. As per 73 of ACM0022, **$PE_{FC,t,y}$** shall be calculated using TOOL03. The calculation method are follows.<br>$$PE_{FC,t,y} = \sum_i FC_{i,j,y} \times COEF_{i,y}$$ Equation (13)<br>Where:<br>$PE_{FC,t,y}$ Are the $CO_2$ emissions from fossil fuel combustion in process j during the year y ($tCO_2e$/yr)<br>$FC_{i,j,y}$ The quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)<br>$COEF_{i,y}$ Is the CO2 emission coefficient of fuel type i (tCO2/mass or volume unit)<br>i Are the fuel types combusted in process j during the year y<br>Among options to determine $COEF_{i,y}$ the PO chose Option B using NCV and $CO_2$ emission factor because chemical composition data by fossil fuel type is not available. Thus, **$PE_{FC,t,y}$** is determined as the following.<br>$$PE_{FC,t,y} = \sum_i FC_{i,j,y} \times NCV_{i,y} \times EF_{CO2,i,y}$$ Equation (14)<br>Where:<br>$FC_{i,j,y}$ The quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr)<br>$NCV_{i,y}$ Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit)<br>$EF_{CO2,i,y}$ Weighted average $CO_2$ emission factor of fuel type i in year y ($tCO_2$/GJ)<br>The actual values of parameters $FC_{i,j,y}$ $NCV_{i,y}$, $EF_{CO2,i,y}$ will be monitored by PP and determined ex post as per ACM0022 (Version 03.0), more detail information is in the Section D.3.7 of this report. |

Through a review of ACM0022 (Version 03.0), relevant tools and site visits, CTI verification team confirmed that the parameters in Equation 14 were correctly valued during the estimation process of $PE_{FC,t,y}$, as shown in the following table:

| Parameter | Data unit | Value | Verification process |
|---|---|---|---|
| $FC_{i,J,y}$ | t | 6 | By reviewing of the FSR /10/, CTI confirmed that the applied value of $FC_{i,j,y}$ in ex ante calculation is derived from the FSR. |
| $NCV_{i,y}$ | GJ/t | 42.652 | As per the TOOL03, the national default value can be used provided that the data cannot be provided by fuel supplier (a), or measured by PP (b). Through interview with the PO and checking the China Energy Statistical Yearbook 2022 /41/, the verification team found that the correct national default value was applied. It was also checked that any future revision of the China Energy Statistical Yearbook will be taken into account following the TOOL03. |
| $EF_{CO2,i,y}$ | $tCO_2/GJ$ | 0.0748 | As per the TOOL03, IPCC default value can be used provided that the data cannot be provided by fuel supplier (a), measured by PP (b) nor determined using national. Through interview with the PO and checking the IPCC 2006 /108/, the verification team found that the correct IPCC default value corresponding to the fuel type was applied using 95% upper limit. It was also checked that any future revision of the IPCC Guidelines will be taken into account following the TOOL03. |

**2.4 Determination of $PE_{ww,t,y}$**

As per para 80 of the methodology, if the wastewater discharge generated by the project activity is treated using an aerobic treatment process, such as by co-composting, then project emissions from wastewater treatment are assumed to be zero.

As per para 81 of the methodology, if the run-off wastewater is treated in the anaerobic digester, then emissions are calculated according to the procedure “Project emissions from anaerobic digestion”.

By checking the EIA report and FSR, on-site inspection and interviewing with the staff of the project, CTI found that the run-off wastewater from the incineration plant is first treated by an anaerobic digester before undergoing aerobic treatment. The biogas produced during the anaerobic process is channeled into the waste incineration furnace for combustion. As per 80 of ACM0022, $PE_{ww,t,y}$ of the project can only include the emission from anaerobic digestion.

As per 81 of ACM0022, $PE_{ww,t,y}$ shall be calculated using TOOL14. The calculation method are follows:

$$PE_{ww,y} = PE_{AD,y} = PE_{EC,y} + PE_{FC,y} + PE_{CH4,y} + PE_{flare,y} \quad \text{Equation (15)}$$

Where:

| | |
|---|---|
| $PE_{ww,y}$ | Project emissions of methane from wastewater discharge associated with alternative waste treatment process t in year y (t $CO_2e$) |
| $PE_{AD,y}$ | Project emissions associated with the anaerobic digester in year y (t $CO_2e$) |
| $PE_{EC,y}$ | Project emissions from electricity consumption associated with the anaerobic digester in year y (t $CO_2e$) |
| $PE_{FC,y}$ | Project emissions from fossil fuel consumption associated with the anaerobic digester in year y (t $CO_2e$) |
| $PE_{CH4,y}$ | Project emissions of methane from the anaerobic digester in year y (t $CO_2e$) |
| $PE_{flare,y}$ | Project emissions from flaring of biogas in year y (t $CO_2e$) |

The emissions related to electricity consumption and the use of fossil fuels for this project have been calculated separately under $PE_{EC,t,y}$ and $PEF_{C,t,y}$, respectively. The verification process is described above; here, $PE_{EC,y}$=0 and $PE_{FC,y}$=0.

The methane produced by anaerobic digester of this project is combusted in an incinerator, rather than flared. And the Option 2 is applied by PO to calculate $PE_{COM\_CH4,N2O,c,y}$, therefore, as per the para 83 of ACM0022, $PE_{flare,ww,y}$ ( $PE_{flare,y}$)= $PE_{com,ww,y}$. And as per the para 84 of ACM0022 $F_{CH4,flare,y}$ should be determined by TOOL08. Therefore,the calculation method are follows:

$$PE_{ww,y} = PE_{AD,y} = PE_{CH4,y} + PE_{com,ww,y} \quad \text{Equation (16)}$$

$$PE_{com,ww,y} = F_{CH4,flare,y} \times 0.1 \quad \text{Equation (17)}$$

Where:

| | |
|---|---|
| $PE_{com,ww,y}$ | Emissions from combustion of methane generated from wastewater treatment in year y (t $CO_2e$) |
| $F_{CH4,flare,y}$ | Amount of methane in the wastewater treatment gas that is sent to the flare/combustor in year y (t $CO_2e$) |

2.4.1 $PE_{CH4,y}$

According to the TOOL14, Project emissions of methane from the anaerobic digester include emissions during maintenance of the digester, physical leaks through the roof and side walls, and release through safety valves due to excess pressure in the digester.

These emissions are calculated using a default emission factor ($EF_{CH4,default}$), as follows:

$$PE_{CH4,y} = Q_{CH4,y} \times EF_{CH4,default} \times GWP_{CH4} \quad \text{Equation (18)}$$

Where:

| | |
|---|---|
| $PE_{EC,y}$ | Project emissions of methane from the anaerobic digester in year y (t $CO_2e$) |
| $Q_{CH4,y}$ | Quantity of methane produced in the anaerobic digester in year y (t $CH_4$) |
| $EF_{CH4,default}$ | Default emission factor for the fraction of $CH_4$ produced that leaks from the anaerobic digester (fraction) |
| $GWP_{CH4}$ | Global warming potential of $CH_4$ (t $CO_2$ / t $CH_4$) |

***Verification of $Q_{CH4,y}$***

The anticipated annual emission reduction of the project exceeds 60,000 t$CO_2e$, which aligns with the definition of a large scale project under the CDM framework. Therefore,

based on TOOL 14 /92/, CTI confirmed that selecting Option 1 to determine methane production is reasonable.

Option1: Procedure using monitored data $Q_{CH4,y}$ shall be measured using the TOOL08: "Tool to determine the mass flow of a greenhouse gas in a gaseous stream" (version 03.0) /91/. When applying the tool, the following applies:

a) The gaseous stream to which the tool is applied is the biogas collected from the digester;

b) $CH_4$ is the greenhouse gas i for which the mass flow should be determined; and

c) The flow of the gaseous stream should be measured on an hourly basis or a smaller time interval; and then accumulated for the year y. Please note that units need to be converted to tons, when applying the results in this tool.

The biogas is produced and collected from anaerobic digestion process. The flowmeters are installed at the outlet of the biogas digesters and the measured on an hourly basis time interval. So the quantity of methane produced in the digester in year y ($Q_{CH4,y}$) is the accumulation of the mass flow of methane in the gaseous stream in an hourly basis time interval. i.e.,$Q_{CH4,y} = \sum_{i=1}^{8760} F_{i,t} \div 1000 \times GWP_{CH4}$.

After reviewing the FSR /10/ and the technical agreement of the anaerobic digester /23/, observing the interface of the leachate treatment control system on site /125/, and conducting interviews with project staff, CTI confirms that the reaction temperature of the anaerobic reactor will not exceed 60 ℃ and the biogas produced by the anaerobic digester is not heated before being delivered to the combustor.

Therefore, CTI confirmed that the temperature of the gaseous stream at the monitoring point is below 60℃. It is thus reasonable for the PO to use Option A in TOOL 08 for calculating the total methane mass flow rate.

As per the TOOL08, the mass flow of greenhouse gas i ($F_{i,t}$) is determined as follows:

$$F_{i,t} = V_{t,db} \times \upsilon_{i,t,db} \times \rho_{i,t} \quad \text{Equation (19)}$$

$$\rho_{i,t} = \frac{P_t \times MM_i}{R_u \times T_t} \quad \text{Equation (20)}$$

Where:

| | |
|---|---|
| $F_{i,t}$ | Mass flow of greenhouse gas i in the gaseous stream in time interval t (kg gas/h) |
| $V_{t,db}$ | Volumetric flow of the gaseous stream in time interval t on a dry basis ($m^3$ dry gas/h) |
| $\upsilon_{i,t,db}$ | Volumetric fraction of greenhouse gas i in the gaseous stream in a time interval t on a dry basis ($m^3$ gas i/$m^3$ dry gas) |
| $\rho_{i,t}$ | Density of greenhouse gas i in the gaseous stream in time interval t (kg gas i/$m^3$ gas i) |
| $P_t$ | Absolute pressure of the gaseous stream in time interval t (Pa) |
| $MM_i$ | Molecular mass of greenhouse gas i (kg/kmol) |
| $R_u$ | Universal ideal gases constant (Pa.$m^3$/kmol.K) |
| $T_t$ | Temperature of the gaseous stream in time interval t (K) |

CTI verification team confirmed, in accordance with TOOL14 (Version 02.01) /92/, that $R_u$ and $MM_i$ are defaults, taking the values of 8,314 Pa.$m^3$/kmol.K and 16.04 kg/kmol for methane, respectively.

The actual values of parameters $V_{t,db}$, $v_{i,t,db}$, $P_t$ and $T_t$ will be monitored by the staff of project and determined ex post as per ACM0022 (Version 03.0), more detail information is in the Section D.3.7 of this report.

2.4.2 $PE_{com,ww,y}$

By reviewing the FSR /10/ and conducting site visits with project staff, CTI confirmed that all the biogas produced by the anaerobic reactor is combusted in the incineration furnace; hence, $F_{CH4,flare,y}$ equals $Q_{CH4,y}$. For more details, please refer to the verification process of $PE_{CH4,y}$.

By reviewing the FSR /10/ and conducting on-site interviews with project staff, CTI confirmed that there are no estimated figures for the amount of biogas produced by the anaerobic reactor or for the methane concentration in the FSR. Therefore, the PO has conducted an ex-ante calculation of $PE_{ww,t,y}$ using the following formula, in accordance with ACM0022 paragraphs 82(a) and 83. CTI confirmed that this approach is reasonable.

$$PE_{ww,t,y} = Q_{ww,y} \times P_{COD,y} \times B_0 \times MCF_{ww} \times GWP_{CH4} \times 0.1 \quad \text{Equation (21)}$$

Where:

| | |
|---|---|
| $Q_{ww,y}$ | Amount of wastewater discharge generated by the project activity and treated anaerobically or released untreated from the project activity in year y ($m^3$) |
| $P_{COD,y}$ | COD of the wastewater discharge generated by the project activity in year y ($tCOD/m^3$) |
| $B_0$ | Maximum methane producing capacity, expressing the maximum amount of $CH_4$ that can be produced from a given quantity of chemical oxygen demand ($t\ CH_4/tCOD$) |
| $MCF_{ww}$ | Methane conversion factor (fraction) |
| $GWP_{CH4}$ | Global Warming Potential of methane valid for the commitment period ($t\ CO_2e/t\ CH_4$) |

The actual values of parameters $Q_{ww,y}$ and $P_{COD,y}$ will be monitored by the PP and determined ex post as per ACM0022 (Version 03.0).

Through a review of the ACM0022 (Version 03.0), relevant tools and site visits, the CTI verification team determined that the parameters in Equation 21 were correctly valued during the estimation process of ex ante $PE_{ww,t,y}$, as shown in the following table:

| Parameter | Data unit | Value | Verification process |
|---|---|---|---|
| $Q_{ww,y}$ | $m^3$ | 54,750 | CTI confirmed through the FSR /10/ that the wastewater generated by the project activity is waste leachate, and the wastewater volume data is estimated by a third party based on the water content of the waste at the project site and the designed operation, so CTI confirmed that the value of $Q_{ww,y}$ used in the ER sheet is reasonable. |
| $P_{COD,y}$ | $tCOD/m^3$ | 0.06 | CTI confirmed through FSR /10/ that COD contents of waste leachate is estimated by a third party, so CTI |

| | | | |
|---|---|---|---|
| | | | confirmed that the value of $P_{COD,y}$ used by PO is reasonable. |
| $B_0$ | $tCH_4/tCOD$ | 0.25 | As per ACM0022 (Version 03.0), CTI confirmed that $B_o$ is an en ante parameter, which is not be monitored and from Section 6.2.3.3, chapter 6, volume 5 of IPCC 2006 guidelines /108/, so CTI confirmed that the value of Bo used by PP is reasonable. |
| $MCF_{ww}$ | fraction | 0.8 | As per ACM0022 (Version 03.0), CTI confirmed that $MCF_{WW}$ is an en ante parameter, which is not be monitored and is the IPCC default values, so CTI confirmed that the value of $MCF_{WW}$ used by PP is reasonable. |

CTI verification team confirmed the determination of $PE_y$ is appropriate and reasonable. The estimated project emissions of this project activity for each year during the fixed 10-year crediting period are summarized in the table below:

| Period | $PE_{EC,t,y}$ ($tCO_2e$) | $PE_{COM,t,y}$ ($tCO_2e$) | $PE_{FC,t,y}$ ($tCO_2e$) | $PE_{ww,t,y}$ ($tCO_2e$) | $PE_{y=}PE_{INC,Y}$ ($tCO_2e$) |
|---|---|---|---|---|---|
| 10/08/2017-09/08/2018 | 0 | 27,572 | 19 | 1,840 | 29,431 |
| 10/08/2018-09/08/2019 | 0 | 27,572 | 19 | 1,840 | 29,431 |
| 10/08/2019-09/08/2020 | 0 | 27,572 | 19 | 1,840 | 29,431 |
| 10/08/2020-09/08/2021 | 0 | 27,572 | 19 | 1,840 | 29,431 |
| 10/08/2021-09/08/2022 | 0 | 27,572 | 19 | 1,840 | 29,431 |
| 10/08/2022-09/08/2023 | 0 | 27,572 | 19 | 1,840 | 29,431 |
| 10/08/2023-09/08/2024 | 0 | 27,572 | 19 | 1,840 | 29,431 |
| 10/08/2024-09/08/2025 | 0 | 27,572 | 19 | 1,840 | 29,431 |
| 10/08/2025-09/08/2026 | 0 | 27,572 | 19 | 1,840 | 29,431 |
| 10/08/2026-09/08/2027 | 0 | 27,572 | 19 | 1,840 | 29,431 |
| 10/08/2017-09/08/2018 | 0 | 27,572 | 19 | 1,840 | 29,431 |

(3) Leakage

Leakage of the project activity is not considered according to ACM0022 (Version 03.0).

(4) Emission reductions

Based on the calculations and results presented in the sections above the implementation of the project activity will result in an average ex-ante estimation of emission reductions conservatively calculated to be 63,073 $tCO_2e$ per year for the fixed 10-year crediting period. Total emission reductions during the fixed 10-year crediting period are estimated to be 630,730 $tCO_2e$.

| Year | $BE_y$ ($tCO_2e$) | $PE_y$ ($tCO_2e$) | $L_y$ ($tCO_2e$) | $ER_y$ ($tCO_2e$) |
|---|---|---|---|---|
| 10/08/2017-09/08/2018 | 55,827 | 29,431 | 0 | 26,396 |
| 10/08/2018-09/08/2019 | 65,103 | 29,431 | 0 | 35,672 |
| 10/08/2019-09/08/2020 | 73,918 | 29,431 | 0 | 44,487 |
| 10/08/2020-09/08/2021 | 82,295 | 29,431 | 0 | 52,865 |
| 10/08/2021-09/08/2022 | 90,258 | 29,431 | 0 | 60,827 |
| 10/08/2022-09/08/2023 | 97,827 | 29,431 | 0 | 68,396 |
| 10/08/2023-09/08/2024 | 105,022 | 29,431 | 0 | 75,592 |
| 10/08/2024-09/08/2025 | 111,864 | 29,431 | 0 | 82,433 |
| 10/08/2025-09/08/2026 | 118,370 | 29,431 | 0 | 88,939 |
| 10/08/2026-09/08/2027 | 124,557 | 29,431 | 0 | 95,126 |
| 10/08/2017-09/08/2018 | 55,827 | 29,431 | 0 | 26,396 |
| Total | 925,040 | 294,306 | 0 | 630,730 |
| Average | -- | -- | -- | 63,073 |

**Findings**

*CL04, CAR06, CAR07, CAR08 and CAR09 were raised here and is successfully closed, details please refer to Appendix 4.*

**Conclusion**

CTI concludes that the steps taken and the equations and parameters to calculate the emission reductions or net anthropogenic removals in the final PSF were in accordance with the applicable Project Verification requirements related to emission reductions in the Verification Standard and Project Standard and the applicable methodology. The calculation of the estimated emission reductions is correct.

### D.3.7 Monitoring plan

**Means of Project Verification**

CTI has conducted document review and on-site assessment to determine whether monitoring plan in the PSF was in accordance with the applicable Project Verification requirements related to the monitoring plan in the Verification Standard and Project Standard and the applicable methodology.

**Data and parameters to be monitored**

As per the monitoring plan, parameters required to be monitored are described in the table below

| Parameters | Description | Measurement method and QA/QC procedures |
|---|---|---|
| $f_y$ | Fraction of methane captured at the SWDS and flared, combusted or used in another manner that prevents the emissions of | This parameter will be monitored annually, which is in line with the requirements of TOOL04. |

| | | | |
|---|---|---|---|
| | | methane to the atmosphere in year y | |
| | $W_x$ | Total amount of waste disposed in a SWDS in year x (t) | The parameter is measured by weighbridge, which is located in the entrance of the factory area, on wet basis continuously and aggregated at least annually. QA)/QC procedures to be applied, including calibration procedures where applicable. |
| | $Q_{waste,c,y}$ | Quantity of fresh waste or RDF/SB fed into combustor c in year y | The parameter is measured continuously by Garbage crane and aggregated at least annually, checked and regularly maintained in accordance with applicable procedures. |
| | $p_{n,j,x}$ | Fraction of the waste type j in the sample n collected during the year x (weight fraction) | The parameter is measured with a minimum of three samples every three months, using waste categories j, on a wet basis. |
| | $p_{n,j,y}$ | Fraction of waste type j in the sample n collected during the year y (weight fraction) | The parameter is measured quarterly by sampling the waste composition, taking a minimum of three samples across various waste categories (j), measured on a wet basis. |
| | $z/z_x$ | Number of samples collected during the year y | The parameter is measured continuously with minimum of three samples every three months and aggregated annually. |
| | $EG_{t,y}$ | Electricity generated by the alternative waste treatment option t and exported to the grid in year y (MWh) | The parameter is continuously monitored by electricity meter with accuracy 0.5s installed at the state grid corporation and aggregated monthly, and will be double-checked by settlement note.<br>The metering equipment will calibrated at least once a year. |
| | $EC_{PJ,j,y}$ | Electricity consumption of electricity generated in an on-site fossil fuel fired power plant or from the grid as a result of the alternative waste treatment | The parameter is continuously monitored by electricity meter with accuracy 0.5s installed at the state grid corporation and aggregated monthly, and will be double-checked by invoice.<br>The metering equipment will calibrated at least once a year. |

| | | | |
|---|---|---|---|
| | | process t in year y (MWh/yr) | |
| | $TDL_{k,y}$ /$TDL_{j,y}$ | Average technical transmission and distribution losses for providing electricity to source k/j in year y | The values is sourced from "Tool to calculate baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" (version 3.0) /89/ and will be monitored annually, unless the most recent figure should be used if data for the relevant year is not available, but not more than 5 years. It is validated that the baseline scenario will consume electricity from the grid by review of FSR and physical site visit. Using a default value 3% for baseline emission and 20% for project emission is in line with the tool and in a conservative manner. |
| | $EFF_{COM,c,y}$ | Combustion efficiency of combuster c in year y (fraction) | This parameter will be monitored annually based on 2006 IPCC guidelines. |
| | $FC_{diesel,j,y}$ | The quantity of fuel type i combusted in process j during the year y (mass or volume unit/yr) | The parameter is measured continuously by either mass or volume meters. The metered fuel consumption quantities should also be cross-checked with available purchase invoices from the financial records. This monitoring is in line with the methodology. |
| | $NCV_{i,y}$ | Weighted average net calorific value of the fuel type i in year y (GJ/mass or volume unit) | The parameter is reviewed annually based on China Energy Statistical Yearbook. |
| | $EF_{CO2,i,y}$ | Weighted average $CO_2$ emission factor of fuel type i in year y ($tCO_2/GJ$) | The parameter is reviewed annually based on IPCC Guidelines. Any future revision of IPCC Guidelines should be taken into account. |
| | $\upsilon_{i,t,db}$ | Volumetric fraction of greenhouse gas i in time interval t on a dry basis | This parameter will be monitored continuously by gas analyzer and the data will be recorded in the operation system. |

| | | |
|---|---|---|
| $V_{t,db}$ | Volumetric flow of the gaseous stream in time interval t on a dry basis (m³ dry gas/h) | Tthe data will be monitored by the flow meter installed at the outlet of the anaerobic digester and recorded in the operation system. |
| $P_t$ | Absolute pressure of the gaseous stream in time interval t (Pa) | By reviewing the technical service contract for the gas flow meter and on-site inspection, CTI confirmed that the flow meters used in this project is equipped with pressure and temperature sensors. The reading of the flow meter represents the flow rate under standard conditions (101.325 kPa, 20°C). |
| $T_t$ | Temperature of the gaseous stream in time interval t (K) | By reviewing the technical service contract for the gas flow meter and on-site inspection, CTI confirmed that the flow meters used in this project is equipped with pressure and temperature sensors. The reading of the flow meter represents the flow rate under standard conditions (101.325 kPa, 20°C). |

**Parameters to be monitored for E+/S+ assessments and SDG labels (positive impacts)**

| Parameter | Purpose | Measurement methods and QA/QC procedures |
|---|---|---|
| **$CO_2$ emissions reductions** | For demonstration of positive impacts of **EA03&SDG13** | $CO_2$ emissions reductions will be measured continuously and recorded monthly. |
| **Net electricity generated and delivered to the grid by the project ($EG_{t,y}$)** | For demonstration of positive impacts of **ENR07** | Same as the monitoring procedure for the electricity data above. |
| Employment records | For demonstration of positive impacts of **SJ01** | Any employment records will be checked on a yearly basis. All data and records will be archived till the end of the final crediting period. |
| Training record | For demonstration of positive impacts of **SHS03** | Any training records will be checked on a yearly basis. All data and records will be archived till the end of the final crediting period. |

**Data and parameters to be monitored for E+/S+ assessments (negative**

**impacts)**

| Parameter | Purpose | Measurement methods and QA/QC procedures |
|---|---|---|
| **$SO_2$** | To demonstrate that the $SO_x$ caused by the project is in compliance with the legal/regulatory/corporate requirements and do not cause any net harm to environment | The $SO_2$ levels will be monitored online. |
| **$NO_2$** | To demonstrate that the $NO_x$ caused by the project is in compliance with the legal/regulatory/corporate requirements and do not cause any net harm to environment | The $NO_2$ levels will be monitored online. |
| Fly ash | To demonstrate that the fly ash caused by the project is in compliance with the legal/regulatory/corporate requirements and do not cause any net harm to environment | The fly ash will be monitored once a month. |
| **Noise level** | To demonstrate that the noise pollution caused by the project is in compliance with the legal/regulatory/corporate requirements and do not cause any net harm to environment. | The noise level will be monitored 4 times per year during the first two years of the operation period to ensure that the noise from the project meet the II-level of the standard of Boundary Noise Emission Standard for Industrial Enterprises (GB12348- 2008).. |
| **Water quality of the treated wastewater** | To demonstrate that the wastewater generated by the project is treated in compliance with the legal/regulatory/corporate requirements and do not cause any net harm to environment. | The wastewater quality will be monitored once a quater. |

CTI confirms that the monitoring plan contains all necessary parameters which have been clearly described in final PSF /2/ and that the means of monitoring described in the plan complies with the requirements of the methodology, TOOL05, and GCC rules, i.e., Project Sustainability Standard v3.0, Environment

| | |
|---|---|
| | and Social Safeguards Standard v3.0 etc.<br>An organizational structure is provided in the PSF. The functions such as data collection, aggregation, verification, calculation, archiving, as well as the maintenance of equipment etc. have been defined. Quality assurance and quality control procedures for recording, maintaining and data archiving etc. would be ensured according to GCC rules. The calibration of the meter will be implemented as per national standard. Correction actions for non-compliance has been defined in the PSF when the meter is in malfunction. Data management and quality control system are quoted in the PSF. The monitoring staffs will be trained based on the training program described in the PSF.<br>The monitoring plan will give opportunity for real measurements of achieved emission reductions as well as potential social, environmental impacts and SDG contributions. CTI considers the project owner is capable to implement the monitoring plan. |
| **Findings** | *CL 05, CL 06 and CAR 10 were raised here and are successfully closed, details please refer to Appendix 4.* |
| **Conclusion** | CTI concludes that the monitoring plan is in accordance with the applicable Project Verification requirements related to the monitoring plan in the Verification Standard and Project Standard and the applicable methodology. |

## D.4. Start date, crediting period and duration

| | |
|---|---|
| **Means of Project Verification** | CTI conducts document review and on-site assessment to determine whether the the start date of the Project, expected operational lifetime, crediting period and duration in the PSF was in accordance with the applicable Project Verification requirements in the Verification Standard and Project Standard.<br>As per para 38 of GCC PS v3.1 /74/: "*The project start date is the date of start of operations of the project*". By checking the Notification on grid connection /13/, the Commissioning report /15/ and the Operation logs /18/ of the project and through on-site interview with key staff, it is confirmed that the project started operation on 10/08/2017 and thus, the project start date is determined as 10/08/2017 in the PSF which is in line with the requirement of GCC PS.<br>By checking the approved FSR /10/ and the Technical specifications of the main equipment /23/ provided by the manufacturer, CTI confirms that the expected operational lifetime of the project activity is 30 years. Thus, the expected operational lifetime in the PSF is correct and reasonable.<br>As per para 39 and 40 (b) of GCC PS v3.1 /74/: "*Crediting periods for all GCC project types are determined in the relevant Baseline and Monitoring Methodologies and refer the minimum of either a 10-year period or a conservative estimate of the technical lifetime of the installed technologies or implemented measures, whichever is shorter*" and "*The start date of the crediting period shall be: For Type A2 Project Activities: after 1 Jan 2016 but not more than one year after the start date of the operations of the GCC Project Activity*". As verified above, the project started operation on 10/08/2017 with an expected operational lifetime of 30 years, thus CTI confirms that it is acceptable for PO to select a fixed 10-year crediting period starting from 10/08/2017 and ends on 09/08/2027. |
| **Findings** | / |

| | |
|---|---|
| **Conclusion** | CTI concludes that the start date of the Project, expected operational lifetime, crediting period and duration demonstrated in the PSF was in accordance with the applicable Project Verification requirements in the Verification Standard and Project Standard. |

## D.5. Environmental impacts

| | |
|---|---|
| **Means of Project Verification** | CTI conducted document review and on-site assessment to determine whether the environmental impact assessment in the PSF is in accordance with the applicable Project Verification requirements related to the environmental impacts in the Verification Standard and Project Standard.<br>An Environmental Impact Assessment (EIA) has been conducted by Shandong Academy of Environmental Science in 08/2015 /11/ according to Chinese Laws & regulations. Linyi Environmental Protection Bureau approved the EIA of the project activity on 08/10/2015 /12/.<br>In CTI's opinion, the potential environmental impacts were sufficiently identified in the EIA and no significant environmental impacts are expected from the project activity. |
| **Findings** | / |
| **Conclusion** | CTI concludes that the environmental impact assessment in the PSF is in accordance with the applicable Project Verification requirements related to the environmental impacts in the Verification Standard and Project Standard. |

## D.6. Local stakeholder consultation

| | |
|---|---|
| **Means of Project Verification** | CTI conducted document review and on-site assessment to determine whether the local stakeholder consultation process described in the PSF is in accordance with the applicable Project Verification requirements related to the local stakeholder consultation in the Verification Standard and Project Standard.<br>Through checking the EIA report /11/, Local stakeholder consultation records including questionnaires and meeting minutes /30/ and interview with PO during site visit, it is confirmed that a local stakeholder consultation was conducted by Shandong Academy of Environmental Science during 05/12/2014 to 26/05/2015 along with the Environmental Impact Assessment (EIA). Local residents and government officials were invited to participate in the stakeholder consultation by questionnaire /30/. The participants covered various ages, occupations, educations and genders. In the survey, 36 questionnaires were distributed and returned as a 100% responds rate. The result shows that the project is received support from local stakeholders. CTI have also checked all questionnaires received and confirmed that no negative opinion on the proposed project from local stakeholders.<br>CTI confirmed the adequacy of the local stakeholder consultation process. |
| **Findings** | *CL09 was raised here and is successfully closed, details please refer to Appendix 4.* |
| **Conclusion** | CTI concludes that the local stakeholder consultation process described in the final PSF is in accordance with the applicable Project Verification requirements related to the local stakeholder consultation in the Verification Standard and Project Standard. |

## D.7. Approval and Authorization- Host Country Clearance

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|---|---|
| **Means of Project Verification** | CTI conducted document review and on-site assessment to determine whether the approval and clearance from the host-country was obtained in accordance with the applicable Project Verification requirements related to the approval in the Verification Standard and Project Standard.<br>As per the GCC Clarification No.1 /82/, submission of Host Country Attestation on Double Counting as and when required by CORSIA. For carbon credits issued during 10/08/2017 to 31/12/2020, Host Country Attestation on no Double Counting is not required for CORSIA labelled credits. The Host Country Attestation on no Double Counting will be provided during the first or subsequent verification, when the issuance of carbon credit is considered beyond 01/01/2021 as confirmed by checking the self-declaration /6/ provided by PO and through interview with PO.<br>Since the project crediting period is beyond 01/01/2021, FAR 01 has been raised for submission of the Host Country Attestation on no Double Counting at issuance stage when the issuance of carbon credit is considered beyond 01/01/2021. |
| **Findings** | FAR 01 Remains OPEN. |
| **Conclusion** | CTI concludes that confirms that approval and clearance from the host-country was not obtained at the time of project verification while the Host Country Attestation on no Double Counting will be provided by PO during the first or subsequent verification, when the issuance of carbon credit is considered beyond 01/01/2021. |

## D.8. Project Owner- Identification and communication

| | |
|---|---|
| **Means of Project Verification** | CTI conducted document review and on-site assessment to identify the Project Owners and to determine whether their communication details as provided in the PSF is in accordance with the applicable Project Verification requirements related to the modalities of communication in the Verification Standard and Project Standard.<br>As per Instruction to fill up the LoA-LoN by GCC /84/, Legal Owner is the owner of the asset or facility while Project Owner is the one that authorized by the legal owner to participate in the submission of the project related to the facility. By checking the business license of Junan Tianying environmental protection energy Co., Ltd.,/7/, EIA approval /12/, Project Approval /9/, contracts /19//20//22/ and via interview during site visit, it is confirmed that the Legal Owner of the project activity i.e., the power plant is Junan Tianying environmental protection energy Co., Ltd. By checking the Letter of Authorization (LoA) /14/, it is confirmed that the Legal Owner: Junan Tianying environmental protection energy Co., Ltd. authorized Beijing Tianying Zero Carbon Technology Research Institute Co, Ltd. to act as the Project Owner with exclusive rights. Thus, CTI confirms that Beijing Tianying Zero Carbon Technology Research Institute Co, Ltd. is the Project Owner of the proposed GCC project activity. Furthermore, by checking the business license of Beijing Tianying Zero Carbon Technology Research Institute Co, Ltd./8/ and checking the company's information in the National Enterprise Credit Information Publicity System /99/ as well as interview with PO during site visit, it is confirmed that communication details as provided in the PSF are correct and complete. |
| **Findings** | / |

| | |
|---|---|
| **Conclusion** | CTI concludes that Beijing Tianying Zero Carbon Technology Research Institute Co, Ltd. is identified as the Project Owner and their communication details as provided in the PSF is in accordance with the applicable Project Verification requirements related to the modalities of communication in the Verification Standard and Project Standard. |

## D.9. Global stakeholder consultation

| | |
|---|---|
| **Means of Project Verification** | CTI conducted document review and on-site assessment to assess whether the global stakeholder consultation process is in accordance with the applicable Project Verification requirements related to the global stakeholder consultation in the Verification Standard and Project Standard.<br>By checking the project's interface on GCC website: https://projects.globalcarboncouncil.com/project/1057, it is confirmed that the PSF (version 2.0 dated 03/11/2022) was published on GCC's website for global stakeholder consultation during 06/12/2022 to 20/12/2022 and no comments were received. |
| **Findings** | / |
| **Conclusion** | CTI concludes that the global stakeholder consultation process is in accordance with the applicable Project Verification requirements related to the global stakeholder consultation in the Verification Standard and Project Standard. |

## D.10. Environmental Safeguards (E+)

| | |
|---|---|
| **Means of Project Verification** | CTI conducted document review and on-site assessment to assess that whether Project Activity will cause any net-harm to the environment as per Verification Standard and Project Standard.<br>As per para 13 of Environment and Social Safeguards Standard v3.0 /76/, the Project Owner has to conduct a Net-harm assessment for each impact identified. The PO has identified the environmental impacts, Do-No-Harm risk assessment, risk mitigation action plans, monitoring etc in the PSF. The project owner has identified the environmental impact during the both construction and operation of the project and demonstrated that the project is unlikely to cause any net harm to the environment. Based on the document review and on-site assessment, CTI confirms that there are 2 positive impacts i.e., 1). Air- $CO_2$ emissions (reducing), 2). Natural Resources- Replacing fossil fuels with renewable sources of energy and 5 possible negative impacts i.e., 1). Air - $SO_x$ emissions, 2) Air - $NO_x$ emissions, 3) Air - Fly ash generation, 4) Air - Noise pollution, 5). Water- Generation of wastewater, but are all within the national regulatory requirements or legal limits. Therefore, CTI is able to confirm that the proposed GCC project is not likely to cause any net harm to the environment. |
| **Findings** | The detailed assessment is shown in the matrix in Appendix 5 of the report.<br>*CL07 were raised here and are successfully closed, details please refer to Appendix 4.* |
| **Conclusion** | CTI concludes that the proposed GCC project activity will not cause any net-harm to the environment as per Verification Standard and Project Standard. |

## D.11. Social Safeguards (S+)

| | |
|---|---|
| **Means of Project Verification** | CTI conducted document review and on-site assessment to assess that whether the Project Activity will cause any net-harm to the society as per Verification Standard and Project Standard.<br>As per para 13 of Environment and Social Safeguards Standard v3.0 /76/, the Project Owner has to conduct a Net-harm assessment for each impact identified. The PO has identified the environmental impacts, Do-No-Harm risk assessment, risk mitigation action plans, monitoring etc in the PSF. The project owner has identified the social impact during the both construction and operation of the project and demonstrated that the project is unlikely to cause any net harm to the society. Based on the document review and on-site assessment, CTI confirms that there are 3 positive impacts i.e., 1). Jobs- Long-term jobs (> 1 year) created/ lost, 2) Reducing / increasing accidents/Incidents/fatality, 3) Education- Specialized training / education to local personnel and no negative impacts identified. The possible risks regarding: Health & Safety and Welfare including Reducing / increasing accidents/Incidents/fatality, Sanitation and waste management, Women's empowerment and Exploitation of Child labour have been fairly addressed in the PSF.<br>The detailed assessment is shown in the matrix in Appendix 6 of the report. |
| **Findings** | *CL 08 was raised here and is successfully closed, details please refer to Appendix 4.* |
| **Conclusion** | CTI concludes that the proposed GCC project activity will not cause any net-harm to the society as per Verification Standard and Project Standard. |

## D.12. Sustainable development Goals (SDG+)

| | |
|---|---|
| **Means of Project Verification** | CTI conducted document review and on-site assessment to assessed that whether the Project Activity will contribute towards achieving the United Nations Sustainability Development Goals (SDGs) as per Verification Standard and Project Standard.<br>The assessment of the contribution of the project activity on United Nations Sustainable Development Goals has been carried out by verification team. Out of the 17 Goals project activity has no adverse effect on any of the goal and contribute to 5 SDGs as follows:<br>Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all<br>Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all<br>Goal 11. Sustainable urban areas<br>Goal 12 Sustainable consumption and production patterns<br>Goal 13. Take urgent action to combat climate change and its impacts<br>The detailed assessment is shown in the matrix in Appendix 7 of the report. |
| **Findings** | *CAR 11 and CAR 12 were raised here and are successfully closed, details please refer to Appendix 4.* |
| **Conclusion** | CTI concludes that the proposed GCC project activity will actually contribute towards achieving the United Nations Sustainability Development Goals (SDGs) as per Verification Standard and Project Standard. |

## D.13. Authorization on Double Counting from Host Country (for CORSIA)

| | |
|---|---|
| **Means of Project Verification** | CTI conducted document review and on-site assessment to determine whether the Project Owner has chosen to apply for CORSIA (section A.6 of PSF) and has obtained and provided, a written attestation from the host country's national focal point or the focal point's designee, as required by CORSIA Emissions Unit Eligibility Criteria as required by Verification Standard and Project Standard and whether the Project Activity will not lead to double counting of ACCs as per Verification Standard and Project Standard.<br>By interviewing with the Project Owner, it is confirmed that the and the declaration by the Authorization on Double Counting from Host Country has not been obtained at the time of submission of the PSF. As per GCC Clarification No.1 /82/, for the carbon credits issued during 01/01/2016 to 31/12/2020, Host Country Attestation on Double Counting is not required for CORSIA labelled credits and for the carbon credits issued after 31/12/2020, the Authorization on Double Counting from Host Country have to be provided. Therefore, by checking the self-declaration by the PO and interview with PO, it is confirmed that the PO promises to provide the Authorization on Double Counting from Host Country during the first or subsequent verification, when the issuance of carbon credit is considered beyond 01/01/2021. Since the project crediting period is beyond 31/12/2020, FAR 01 has been raised for submission of the Host Country Attestation on no Double Counting at issuance stage when the issuance of carbon credit is considered beyond 01/01/2021. |
| **Findings** | FAR01 Remains OPEN. |
| **Conclusion** | CTI concludes that the Authorization on Double Counting from Host Country (for CORSIA) has not been obtained yet and the PO promised to provide the Authorization on Double Counting from Host Country during the first or subsequent verification, when the issuance of carbon credit is considered beyond 01/01/2021. |

## D.14. CORSIA Eligibility (C+)

| | |
|---|---|
| **Means of Project Verification** | CTI conducted document review and on-site assessment to determine whether the Project Owner has chosen to apply for CORSIA (section A.6 of PSF) and that the Project Activity will be eligible to generate ACCs compatible with the requirements of CORSIA Emissions Unit Eligibility Criteria as required by Verification Standard and Project Standard<br>Through the assessment above and by checking the CORSIA Eligible Emissions Units by International Civil Aviation Organization /97/ and the self-declaration /6/ by PO it is confirmed that the project activity meets the following CORSIA eligibility criteria:<br>a) The project started operation on 10/08/2017 with the crediting period started on the same day which is after 01/01/2016 and the project complied with all applicable GCC rules:<br>b) The Project Activity is likely to result in GHG emission reductions as a result of implementation of the registered GCC project activity;<br>c) The Project Activity has not caused any net harm to the environment and/or society and therefore achieves Environmental No-net-harm Label (E+) and Social No-net harm Label (S+); |

| | |
|---|---|
| | d) The Project Activity has made contributions for achieving United Nations Sustainability Development Goals (SDGs) and has contributed to achieving four SDGs and therefore targets to achieve Platinum SDG certification label (SDG+);<br>e) The project meets all the requirement of the CORSIA Eligible Emissions Units required for GCC projects and does not fall under the excluded unit types, methodologies, programme elements, and/or procedural classes.<br>Since the project crediting period is beyond 01/01/2021, FAR 01 has been raised for submission of the Host Country Attestation on no Double Counting at issuance stage when the issuance of carbon credit is considered beyond 01/01/2021. |
| **Findings** | FAR 01 Remains OPEN. |
| **Conclusion** | CTI concludes that the Project Owner has chosen to apply for CORSIA and the Project Activity will be eligible to generate ACCs compatible with the requirements of CORSIA Emissions Unit Eligibility Criteria as required by Verification Standard and Project Standard. In particular, the PO promised to provide the Authorization on Double Counting from Host Country during the first or subsequent verification, when the issuance of carbon credit is considered beyond 01/01/2021. |

## Section E. Internal quality control

The final validation report has undergone a technical review by a qualified independent reviewer before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with CTI Certification's qualification scheme for GCC project verification and emission reductions verification that meets the criteria of GCC guidelines for qualification.

## Section F. Project Verification opinion

The GCC Project Verifier Shenzhen CTI International Certification Co., Ltd (CTI), has verified and certify that the GCC Project Activity Junan Municipal Solid Waste Incineration For Power Generation Project:

(a). has correctly described the Project Activity in the Project Submission Form (version 4.0, dated 29/11/2023) including the applicability of the approved methodology ACM0022, version 03.0 and meets the methodology applicability conditions, is additional and is expected to achieve the forecasted real and additional GHG emission reductions, complies with the monitoring methodology, has appropriately conducted local and global stakeholder consultation processes and has calculated emission reduction estimates correctly and conservatively;

(b). is likely to generate GHG emission reductions amounting to the estimated 63,073 $tCO_2eq$/annum, as indicated in the PSF, which are additional to the reductions that are likely to occur in absence of the Project Activity and complies with all applicable GCC rules, including ISO 14064-2 and ISO 14064-3, and therefore requests the GCC Program to register the Project Activity;

(c). is not likely to cause any net-harm to the environment and/or society and complies with the Environmental and Social Safeguards Standard, and therefore requests the GCC Program to register the Project Activity, which is likely to achieve the requirements of the Environmental No-net-harm Label (E+) and the Social No-net harm Label (S+); and

(d). is likely to contribute to the achievement of United Nations Sustainability Development Goals (SDGs), comply with the Project Sustainability Standard, and contribute to achieving a total of 5 SDGs, which is likely to achieve the Platinum SDG certification label (SDG+).

(e). The Project Activity complies with all the applicable requirements of the GCC Program and ICAO‘s requirements on CORSIA Emissions Unit Eligibility Criteria and CORSIA Eligible Emissions Units, as per Clarification No 1., v1.3 paragraph 23-25, and the ACCs expected to be issued during the crediting period is likely to be CORSIA eligible and can be used by International Airlines for offsetting their emissions during all phases of CORSIA and therefore requests GCC Steering Committee to append CORSIA Certification label (C+) to this project.

## Appendix 1. Abbreviations

| Abbreviations | Full texts |
|---|---|
| ACC | Approved Carbon Credits |
| BE | Baseline Emissions |
| BM | Build Margin |
| CAP | Installed Capacity |
| CAR | Corrective Action Request |
| CCER | Chinese Certified Emission Reduction |
| CDM | Clean Development Mechanism |
| CL | Clarification request |
| $CO_2$ | Carbon dioxide |
| $CO_2e$ | Carbon dioxide equivalent |
| CTI | Shenzhen CTI International Certification Co., Ltd |
| EIA | Environmental Impact Assessment |
| ER | External Resources |
| ETN | Electricity Transaction Note |
| FAR | Forward Action Request |
| FSR | Feasibility Study Report |
| GCC | Global Carbon Council |
| GHG | Green House Gas |
| GS | Gold Standard |
| GSC | Global Stakeholder Consultation |
| GWP | Global Warming Potential |
| IPCC | Intergovernmental Panel on Climate Change |
| IR | Internal Resources |
| IRR | Internal Return Rate |
| ISO | International Organization for Standardization |
| LSC | Local Stakeholder Consultation |
| NCPG | North China Power Grid |
| OM | Operating Margin |
| PE | Project Emissions |
| PLF | Plant Load Factor |
| PO | Project Owner |
| PPA(s) | Power Purchase Agreement(s) |
| PS | Project Standard |
| PSF | Project Submission Form |
| PVR | Project Verification Report |
| SDG | Sustainable Development Goal |
| UNFCCC | United Nations Framework Convention on Climate Change |
| VCS | Verified Carbon Standard |

## Appendix 2. Competence of team members and technical reviewers

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CTI 华测认证 CTI CERTIFICATION

### CERTIFICATE OF APPOINTMENT

Mr. Lei ZHANG

Satisfies the requirements of competence management system of CTI Certification, and is hereby appointed as:

| Qualification | | | | | | |
|---|---|---|---|---|---|---|
| Status | GHG Auditor | Validator | Verifier | Team Leader | Technical Reviewer | Technical Expert |
| Date | √ | √ | √ | √ | √ | √ |

| Scope | Technical Area |
|---|---|
| SS 1: Energy industries (renewable/non-renewable sources) | TA 1.1: Thermal energy generation |
| | TA 1.2: Energy generation from renewable energy sources |
| SS 3: Energy demand | TA 3.1: Energy demand |
| SS 4: Manufacturing industries | TA 4.1: Cement and lime production |
| SS 13: Waste handling and disposal | TA 13.1: Solid waste and wastewater |
| | TA 13.2: Manure |

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by:
Wu LIN Wu Lin
Technical Competent Manager
Shenzhen, 25/10/2022

CTI 华测认证 CTI CERTIFICATION

# CERTIFICATE OF APPOINTMENT

Ms. Wenting ZHANG

Satisfies the requirements of competence management system of CTI Certification, and is hereby appointed as:

| Qualification | | | | | | |
|---|---|---|---|---|---|---|
| Status | GHG Auditor | Validator | Verifier | Team Leader | Technical Reviewer | Technical Expert |
| Date | √ | - | √ | - | - | - |

| Scope | Technical Area |
|---|---|
| SS 1: Energy industries (renewable/non-renewable sources) | TA 1.2: Energy generation from renewable energy sources |

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by:

Wu LIN Wu Lin

Technical Competent Manager

Shenzhen, 25/10/2022

CTI 华测认证 CTI CERTIFICATION

# CERTIFICATE OF APPOINTMENT

Ms. Yazi CHEN

Satisfies the requirements of competence management system of CTI Certification, and is hereby appointed as:

| Qualification | | | | | | |
|---|---|---|---|---|---|---|
| Status | GHG Auditor | Validator | Verifier | Team Leader | Technical Reviewer | Technical Expert |
| Date | - | - | - | - | - | √ |

| Scope | Technical Area |
|---|---|
| Financial Expert | Financial Expert |

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by:

Wu LIN Wu Lin

Technical Competent Manager

Shenzhen, 10/01/2022

CTI 华测认证 CTI CERTIFICATION

# CERTIFICATE OF APPOINTMENT

Mr. Wu LIN

Satisfies the requirements of competence management system of CTI Certification, and is hereby appointed as:

| Qualification | | | | | | |
|---|---|---|---|---|---|---|
| Status | GHG Auditor | Validator | Verifier | Team Leader | Technical Reviewer | Technical Expert |
| Date | √ | √ | √ | √ | √ | √ |

| Scope | Technical Area |
|---|---|
| SS 1: Energy industries (renewable/non-renewable sources) | TA 1.1: Thermal energy generation |
| | TA 1.2: Energy generation from renewable energy sources |
| SS 2: Energy distribution | TA 2.1: Electricity distribution |
| SS 3: Energy demand | TA 3.1: Energy demand |
| SS 4: Manufacturing industries | TA 4.1: Cement and lime production |
| SS 5: Chemical industry | TA 5.1: Chemical industry |
| | TA 5.2: Caprolactam, nitric and adipic acid |
| SS 10: Fugitive emissions from fuels (solid, oil and gas) | TA 10.1: Fugitive emissions from oil and gas |
| SS 11: Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride | TA 11.1: Emissions of fluorinated gases |
| | TA 11.2: Refrigerant gas production |
| SS 12: Solvents use | TA 12.1: Chemical industry |
| SS 13: Waste handling and disposal | TA 13.1: Solid waste and wastewater |
| | TA 13.2: Manure |

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by:

Lu ZHOU

General Manager

Shenzhen, 01/01/2021

Mr. Tian FENG

Satisfies the requirements of competence management system of CTI Certification, and is hereby appointed as:

| Qualification | | | | | |
|---|---|---|---|---|---|
| GHG Auditor | Validator | Verifier | Team Leader | Technical Reviewer | Technical Expert |
| √ | √ | √ | √ | - | - |

| Scope | Technical Area |
|---|---|
| SS 1: Energy industries (renewable/non-renewable sources) | TA 1.2: Energy generation from renewable energy sources |
| SS 8: Mining/mineral production | TA 8.1: Mining/mineral production |
| SS 13: Waste handling and disposal | TA 13.1: Solid waste and wastewater |
| | TA 13.2: Manure |

This appointment is valid for 3 years from its date of approval below and is bound by internal requirements of management system of the Certification Body of CTI.

Approved by: Shunrong Lin

Shunrong LIN

Technical Competent Manager

Shenzhen, 20/05/2023

## Appendix 3. Document reviewed or referenced

| No. | Author | Title | References to the document | Provider |
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| /2/ | Beijing Tianying Zero Carbon Technology Research Institute Co, Ltd. | Project Submission Form final version 4.0 | 29/11/2023 | Project Owner |
| /3/ | Beijing Tianying Zero Carbon Technology Research Institute Co, Ltd. | IRR Calculation Spreadsheet | 29/11/2023 | Project Owner |
| /4/ | Beijing Tianying Zero Carbon Technology Research Institute Co, Ltd. | Emission Reduction Calculation Spreadsheet | 29/11/2023 | Project Owner |
| /5/ | Beijing Tianying Zero Carbon Technology Research Institute Co, Ltd. | Declaration on No double counting | 01/02/2023 | Project Owner |
| /6/ | Beijing Tianying Zero Carbon Technology Research Institute Co, Ltd. | Self-declaration of providing the Host Country Attestation on Double Counting | 01/02/2023 | Project Owner |
| /7/ | State Administration for Market Regulation | Business License of Junan Tianying environmental protection energy Co., Ltd. (Legal Owner) | 28/12/2021 | Others |
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| /10/ | Shandong Province | Feasibility Study Report (FSR) | 02/2015 | Others |

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| /21/ | Beijing Zhongtianheng Accounting Co., Ltd. | Financial Audit Report | / | Others |
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| /89/ | CDM | TOOL05: Baseline, project and /or leakage emissions from electricity consumption and monitoring of electricity generation, version3.0 | 22/09/2017 https://cdm.unfccc.int/Reference/tools/index.html | Others |
| /90/ | CDM | TOOL07: Tool to calculate the emission factor for an electricity system, version 7.0 | 31/08/2018 https://cdm.unfccc.int/Reference/tools/index.html | Others |
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| /117/ | National Law/regulations/ policy | Prevention and Control of Environmental Pollution by Solid Waste Law of the People's Republic of China | 30/04/2020 https://www.mee.gov.cn/ywgz/fgbz/fl/202004/t20200430_777580.shtml | Others |
| /118/ | National Law/regulations/ policy | Guiding items for industrial structure adjustment (2019) | 06/11/2019 https://www.gov.cn/xinwen/2019-11/06/content_5449193.htm | Others |
| /119/ | National Law/regulations/ policy | Water Pollution Prevention and Control Law of the People's Republic of China | 01/01/2018 https://www.mee.gov.cn/ywgz/fgbz/fl/200802/t20080229_118802.shtml | Others |
| /120/ | National Law/regulations/ policy | Renewable Energy Law of the People's Republic of China | 28/02/2005 https://www.gov.cn/ziliao/flfg/2005-06/21/content_8275.htm | Others |
| /121/ | National Law/regulations/ policy | Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution | 13/11/2018 https://www.mee.gov.cn/ywgz/fgbz/fl/201811/t20181113_673567.shtml | Others |
| /122/ | National Law/regulations/ policy | The Notice of the National Development and Reform Commission on Improving the Price Policy of Waste Incineration Power Generation issued by China's National Development and Reform Commission (NDRC) | 10/04/2012 https://www.gov.cn/zwgk/2012-04/10/content_2109921.htm | Others |
| /123/ | Journal Article | WU Jian, Jian Jian, Ruihuan Jian, Ruihuan Liu, Tao Liu. Research on the energy efficiency level of domestic waste incineration power plants in China[J]. Environmental Sanitation Engineering, 2018, 26(3): 39-42. | 25/06/2018 http://www.srhj.org.cn/CN/Y2018/V26/I3/39 | Others |
| /124/ | National Bureau of Statistics | The Consumer Price Index (CPI) of 2016-2022 in China | http://www.stats.gov.cn/tjsj/ndsj/2023/indexch.htm | Others |
| /125/ | On-site photos | The photo of interface of the leachate treatment control system | 26/10/2023 Photoed by verification team | Others |

# Appendix 4. Clarification request, corrective action request and forward action request

Table 1. CLs from this Project Verification

| **CL ID** | 01 | **Section no.** | A.3 | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| As per PSF Template v4.0, the project owner is requested to specify the following aspects regarding the Technologies/measures:<br>1.The arrangement of the facilities, systems and equipment;<br>2.The monitoring equipment and their location in the systems;<br>3.Load factors and efficiencies;<br>4.Provide a short summary of facilities, systems and equipment in the baseline scenario as established in section B.4 below. | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *We are gathering information that will be available in our next response.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CL can be closed. | | | | |

| **CL ID** | 02 | **Section no.** | B.2 | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| When discussing the applicability of the methodology "The fraction of energy generated by auxiliary fossil fuels is not more than 50% of the total energy generated in the incinerator," the project owner did not clarify how the heat generated by diesel consumption is less than 50% of the total heat produced by the project. | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *The corresponding section in PSF has been modified.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CL can be closed. | | | | |

| **CL ID** | 03 | **Section no.** | B.5 | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| In accordance with the requirements of Tool 27, the project owner should specify the benchmark data source and demonstrate that this data source was valid and applicable at the time the investment decision was made by the project owner. | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *We are gathering information that will be available in our next response.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CL can be closed. | | | | |

| **CL ID** | 04 | **Section no.** | B.6.1 | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| The Ex-ante calculation of emission reductions section lacks the discussion of Discharge of wastewater | | | | |

| |
|---|
| management($PE_{ww,INC,y}$), thus CL04 is raised for clarification. |
| **Project Owner's response** **Date:** 29/11/2023 |
| *This has been supplemented in the corresponding section of the PSF.* |
| **Documentation provided by Project Owner** |
| Updated PSF |
| **GCC Project Verifier assessment** **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CL can be closed. |

| **CL ID** | 05 | **Section no.** | B.7.1 | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| Project owner should specify the data source according to the requirements of PSF Template v4.0: indicate the source(s) of data that will be used for the Project Activity (e.g., records, invoices etc.). Where several sources are used, justify which data sources should be preferred. | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *The corresponding section in the PSF has been modified and supplemented.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CL can be closed. | | | | |

| **CL ID** | 06 | **Section no.** | B.7.1 | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| Project owner should provide the location, serial number and the calibration information of the monitoring equipment i.e. electricity meters. | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *The corresponding section in the PSF has been modified and supplemented.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CL can be closed. | | | | |

| **CL ID** | 07 | **Section no.** | E.1 | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| As per Environmental and Social Safeguards Standard v3.0, the following Environmental aspects and impacts shall be assessed at a minimum which are missing in the PSF:<br>1. Waste generation<br>2. Ground water usage / degradation<br>3. Threat to bio- diversity<br>4. Hazardous waste gen.<br>5. Fire hazard<br>Emergency Scenario (Emissions / spillage control ) | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *It has already been supplemented in the corresponding part in the PSF.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CL can be closed. | | | | |

| CL ID | 08 | Section no. | E.2 | Date: 26/10/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| As per Environmental and Social Safeguards Standard v3.0, the following Social aspects and impacts shall be assessed at a minimum which are missing in the PSF:<br>1.Child labour/forced labour<br>2.Social inequality /safeguards<br>3.Threatened livelihood<br>4.Accidents / Incidents / Fatalities<br>5.Sanitation / health issues<br>6.Women empowerment | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *It has already been supplemented in the corresponding part in the PSF.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CL can be closed. | | | | |

| CL ID | 09 | Section no. | G.3 | Date: 26/10/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| The project owner should demonstrate if any comments received during the period that the PSF published on the GCC website for GSC. | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *It has already been supplemented in the corresponding part in the PSF.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CL can be closed. | | | | |

Table 2. CARs from this Project Verification

| CAR ID | 01 | Section no. | B.3 | Date: 26/10/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| As per PSF Template v4.0, the project owner is requested to specify the applicability of tools:<br>Justify the choice of the selected methodologies and tools, where applicable, the selected standardized baseline by showing that the Project Activity meets all applicability conditions of the methodology(ies), tools and, where applicable, the standardized baseline. | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *It has been supplemented and modified in the corresponding part of the PSF.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CAR can be closed. | | | | |

| CAR ID | 02 | Section no. | B.4 | Date: 26/10/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| The project owner did not complete the baseline scenario discussion in accordance with the steps outlined in Tool02. | | | | |

| **Project Owner's response** | **Date:** 29/11/2023 |
|---|---|
| *The corresponding section in the PSF has already been modified.* | |
| **Documentation provided by Project Owner** | |
| Updated PSF | |
| **GCC Project Verifier assessment** | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CAR can be closed. | |

| **CAR ID** | 03 | **Section no.** | B.5 | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| The project owner did not adhere to the template's requirements by listing all parameters used in the investment analysis: "When utilizing an investment analysis, clearly specify the date of the project's investment decision and enumerate all pertinent assumptions and parameters involved in the analysis." | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *It has been supplemented and modified in the corresponding part of the PSF.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF. | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CAR can be closed. | | | | |

| **CAR ID** | 04 | **Section no.** | B.5 | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| In the common practice analysis, the project owner's identification of projects similar to the proposed project is incomplete. | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *It has been supplemented and modified in the corresponding part of the PSF.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF. | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CAR can be closed. | | | | |

| **CAR ID** | 05 | **Section no.** | B.5 | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| In the common practice analysis, the project owner's identification of projects similar to the proposed project is incomplete. | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *It has been supplemented and modified in the corresponding part of the PSF.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF. | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CAR can be closed. | | | | |

| **CAR ID** | 06 | **Section no.** | B.6.1 | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| In section B.6.1, the project owner has not listed all the formulas used in the emission reduction calculation process as required by the template. For instance, the calculation formula for the $W_{j,x}$ parameter is missing. Additionally, the reasons for selecting default values for certain parameters are not explained, such as the basis for the value of the parameter $f_y$. Below are the requirements from the template:<br>37. Explain and justify all relevant methodological choices, including: | | | | |

| |
|---|
| (a) If the applied methodologies, and where applicable, the standardized baselines include different scenarios or cases, specify and justify which scenario or case is relevant to the Project Activity.<br>(b) If the applied methodologies, and where applicable, the standardized baselines permit different default values, specify and justify the chosen default value for the Project Activity. |
| **Project Owner's response** **Date:** 29/11/2023 |
| *It has been supplemented and modified in the corresponding part of the PSF.* |
| **Documentation provided by Project Owner** |
| Updated PSF. |
| **GCC Project Verifier assessment** **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CAR can be closed. |

| **CAR ID** | 07 | **Section no.** | B.6.1, B.6.3 & ER table | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| The emission reduction calculation formula and parameter notation in the "project emissions" sheet of the ER table do not align with the ACM0022 methodology. They are also inconsistent with the content in sections B.6.1 and B.6.3 of the PSF. As a result, the Verification team is unable to verify the accuracy of the emission reduction calculation process. | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *It has been supplemented and modified in the corresponding part of the PSF and ER table.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF and ER table. | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CAR can be closed. | | | | |

| **CAR ID** | 08 | **Section no.** | B.6.2 & B.6.3 | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| By reviewing the FSR, the Verification team has confirmed that the waste treated by the project contains rubber. However, in the baseline emission calculation process, the project owner did not assign values to the two parameters for rubber, $DOC_j$ and $k_j$. As a result, the baseline emission calculation is incorrect. | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *The corresponding section in the PSF has already been modified.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF. | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CAR can be closed. | | | | |

| **CAR ID** | 09 | **Section no.** | B.6.2 | **Date:** 26/10/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| Section B.7.1 of the PSF is missing the following parameters:<br>1.$DOC_{f,y}$<br>2.$MCF_y$<br>3.$EF_{grid,CM,y}$ | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| It has already been supplemented in the corresponding part in the PSF. | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF. | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CAR can be closed. | | | | |

| CAR ID | 10 | Section no. | B.7.1 | Date: 26/10/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| Section B.7.1 of the PSF is missing the following parameters:<br>1.$NCV_{diesel,y}$<br>2.$EF_{CO2,diesel,y}$<br>3.$P_{n,j,x}$<br>4.$w_x$<br>5.$z_x$ | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *It has already been supplemented in the corresponding part in the PSF.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF. | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CAR can be closed. | | | | |

| CAR ID | 11 | Section no. | F | Date: 26/10/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| The description of Project-level Targets/ Actions of SDG7 is not in line with the PSF Template requirement, thus CAR11 was raised for correction. | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *The corresponding part has been modified in the PSF.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF. | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CAR can be closed. | | | | |

| CAR ID | 12 | Section no. | F | Date: 26/10/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| The number of long-term employees stated in the PSF is not consistent with the staff roster provided by project owner. | | | | |
| **Project Owner's response** | | | | **Date:** 29/11/2023 |
| *The corresponding part has been modified in the PSF.* | | | | |
| **Documentation provided by Project Owner** | | | | |
| Updated PSF. | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| By checking the updated PSF and related documents, CTI confirmed that CAR can be closed. | | | | |

Table 3. FARs from this Project Verification

| FAR ID | 01 | Section no. | D.7, D.13, D.14 | Date: 26/10/2023 |
|---|---|---|---|---|
| **Description of FAR** | | | | |
| Project Owners shall demonstrate the compliance to CORSIA requirements for the credits claimed beyond 31 December 2020 with respect to double counting and HCLOA requirements and also future CORSIA requirements applicable time to time for the project activity. | | | | |
| **Project Owner's response** | | | | **Date:** - |
| - | | | | |
| **Documentation provided by Project Owner** | | | | |
| - | | | | |
| **GCC Project Verifier assessment** | | | | **Date:** 30/11/2023 |
| OPEN | | | | |

## Appendix 5. Assessment matrix of Environmental Safeguards (E+)

| **Impact of Project Activity on** | | **Information on Impacts, Do-No-Harm Risk Assessment and Establishing Safeguards** | | | | | | | | **Project Owner's Conclusion** | | **GCC Project Verifier's Conclusion (To be included in Project Verification Report only)** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Description of Impact** *(positive or negative)* | **Legal/ voluntary corporate requirement / regulatory/ voluntary corporate threshold Limits** | **Do-No-Harm Risk Assessment (choose which ever is applicable)** | | | **Risk Mitigation Action Plans for aspects marked as Harmful** | | **Performance indicator for monitoring of impact** | ***Ex-ante* scoring of environmental impact** | ***Explanation of the Conclusion*** | **3rd Party Audit** |
| | | | | **Not Applicable** | **Harmless** | **Harmful** | **Operational Controls** | **Program of Risk Management Actions** | **Monitoring parameter and frequency of monitoring** | **Ex- Ante scoring of the environmental impact (as per scoring matrix Appendix-02)** | **Ex- Ante description and justification/explanation of the scoring of the environmental impact** | **Verification Process** |
| ***Environmental Aspects on the identified categories*** [7] ***indicated below.*** | *Indicators for environmental impacts* | *Describe and identify anticipated and actual significant environmental impacts, both positive and negative from all sources (stationary and mobile) during normal and abnormal/emergency conditions, that may result from the construction and operations of the Project Activity, within and outside the project boundary, over which the Project Owner(s) has/have control.* | *Describe the applicable national regulatory requirements /legal limits / voluntary corporate limits related to the identified risks of environmental impacts.* | *If no environmental impacts are anticipated, then the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as* ***Not Applicable*** | *If environmental impacts exist but are expected to be in compliance with applicable national regulatory /stricter voluntary corporate requirements and will be within legal/ voluntary corporate limits by way of plant design and operating principles, then the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as* ***Harmless*** */If the project has a positive impact on the* | *If negative environmental impacts exist that will not be in compliance with the applicable national legal/ regulatory requirements or are likely to exceed legal limits, then the Project Activity is likely to cause harm (may be un-safe) and shall be indicated as* ***Harmful*** | *Describe the operational controls and best practices, focusing on how to implement and operate the Project Activity, to reduce the risk of impacts that have been identified as '****Harmful*** *at least to a level that is in compliance with applicable legal/regulatory requirements or industry best practice or stricter voluntary corporate requirements* | *Describe the Program of Risk Management Actions (refer to Table 3), focusing on additional actions (e.g., installation of pollution control equipment) that will be adopted to reduce or eliminate the risk of impacts that have been identified as* ***Harmful****.* | *Describe the monitoring approach and the parameters (KPI) to be monitored for each impact irrespective of whether it is harmless of harmful. The frequency of monitoring to be specified as well including the data source.* | *-1*<br>*0*<br>*+1* | *Confirm the score of environmental impact of the project with respect to the aspect and its monitored value in relation to legal /regulatory limits (if any) including basis of conclusion.* | *Describe how the GCC Verifier has assessed that the impact of the Project Activity against the particular aspect and in case of "harmful impacts" how has the project adopted Risk Mitigation Action Plans to mitigate the risks of negative environmental impacts to levels that are unlikely to cause any harm as well as the net positive impacts of the project with respect to the most likely baseline alternative.* |

[7] sourced from the CDM SD Tool and the sample reports are available ( https://www4.unfccc.int/sites/sdcmicrosite/Pages/SD-Reports.aspx )

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | *environment mark it as "harmless" as well.* | | | | | | | |
| ***Reference to paragraphs of Environmental and Social Safeguards Standard*** | | *Paragraph 12 (a)* | *Paragraph 13 (c)* | *Paragraph 13 (d) (i)* | *Paragraph 13 (d) (ii)* | *Paragraph 13 (d) (iii)* | *Paragraph 13 (e) (i)* | *Paragraph 13 (e) (ii)* | *Paragraph 12 (c) and Paragraph 13 (f)* | *Paragraph 22* | | *Paragraph 24 and Paragraph 26 (a) (i)* |
| **Environment - *Air*** | *$SO_x$ emissions (EA01)* | Under the project activities, SOx emissions will be generated, but without the project activities, no emissions will be generated. | The emission of SOx meets the Pollution Control Standard of Domestic Waste Incineration (GB18485-2014)(One hour average: 100mg/$m^3$ 24-hour average: 80mg/$m^3$) | - | The SOx emission generated by this project is expected to be lower than the legal limit, so this project is considered harmless. | - | SNCR+semi-dry method (lime slurry)+dry method (slaked lime)+activated carbon injection+bag filter | N/A | Every three month | +1 | Under the project activities, SOx emissions will be generated, but without the project activities, no emissions will be generated. | By reviewing the FSR /10/ and interviewing with the project staff, CTI confirmed that the project employs the SNCR+semi-dry method (lime slurry)+dry method (slaked lime)+activated carbon injection+bag filter system to treat waste gas. This system achieves denitrification, desulfurization, and dust removal efficiencies of 50%, 85%, and 99.8% respectively. The concentration of pollutants after purification complies with the Pollution Control Standard for Domestic Waste Incineration (GB18485-2014) /45/ |
| | *$NO_x$ emissions (EA02)* | Under the project activities, NOx emissions will be generated, but without the project activities, no emissions will be generated. | The emission of NOx meets the Pollution Control Standard of Domestic Waste Incineration (GB18485-2014)(One hour average: 300mg/$m^3$ 24-hour average: 250mg/$m^3$) | - | The NOx emission generated by this project is expected to be lower than the legal limit, so this project is considered harmless. | - | SNCR+semi-dry method (lime slurry)+dry method (slaked lime)+activated carbon injection+bag filter | N/A | Every three month | +1 | For waste gas, such as sulfide, the flue gas purification process of SNCR+semi-dry method (lime slurry)+dry method (slaked lime)+activated carbon injection+bag filter Ⅱ will be adopted, with the denitrification, desulfurization and dust removal efficiencies of 50%, 85% and 99.8% respectively, and the concentration of pollutants after purification can | By reviewing the FSR /10/ and interviewing with the project staff, CTI confirmed that the project employs the SNCR+semi-dry method (lime slurry)+dry method (slaked lime)+activated carbon injection+bag filter system to treat waste gas. This system achieves denitrification, desulfurization, and dust removal efficiencies of 50%, 85%, and 99.8% respectively. The concentration of pollutants after purification complies with the Pollution Control Standard for Domestic Waste Incineration (GB18485-2014) /45/ |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | meet the Pollution Control Standard for Domestic Waste Incineration (GB184852014) | |
| | *$CO_2$ emissions (EA03)* | The project reduces $CO_2$ emissions since it reduces the amount of fossil fuel used. In case of “no project”, stated amount of electricity would be generated from fossil fuel and cause air pollution. The project also achieves emission reduction by avoiding methane production from waste disposal in landfills. | N/A | N/A | There are no relevant emission standards in China | - | N/A | N/A | The electricity generated will be monitored and $CO_2$ emission reductions and Waste comsuption will be Calculated accordingly. | +1 | The project reduces $CO_2$ emissions since it reduces the amount of fossil fuel used. In case of “no project”, stated amount of electricity would be generated from fossil fuel and cause air pollution. The project also achieves emission reduction by avoiding methane production from waste disposal in landfills.The project is expected to result in lower $CO_2$ emission than the baseline throughout the crediting period. | Based on the assessment above, it is confirmed that purpose of the project is to generate $CO_2$ emission reductions by incinerating MSW for electricity generation. Thus, the project has positive impact from reducing $CO_2$ emissions. Thus, it is concluded that the impact regarding $CO_2$ emissions is positive and the $CO_2$ emissions are monitored properly. |
| | *CO emissions (EA04)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Suspended particulate matter (SPM) emissions (EA05)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Fly ash generation (EA06)* | Project activities will generate fly ash. | The fly ash is stabilized in the factory, and the process of "cement + chelating agent" is adopted. The cured fly ash meets the | - | After treatment, the fly ash will be sent to the landfill for treatment, which will not | - | N/A | N/A | N/A | +1 | The fly ash cement+chelating agent solidification and stabilization process is adopted, and then sent to the municipal solid waste treatment project of Ju | By reviewing the FSR /10/ and interviewing with the project staff, CTI confirmed that the project employs fly ash cement+chelating agent solidification and stabilization process to treat fly ash and then sent to the municipal solid waste treatment project of Ju 'nan County for landfill treatment |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | limits of the moisture content, dioxin content and the concentration of pollutants in the leaching liquid (GB16889-2008) and is sent to the domestic waste landfill | | cause harm. | | | | | | 'nan County for landfill treatment. | |
| | *Non-Methane Volatile Organic Compounds (NMVOCs) (EA07)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Odor (EA08)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Noise Pollution (EA09)* | The equipment may case noise pollution during operation. The low noise equipment have been chosen for the project activity | Emission standard for industrial enterprises noise at boundary> (GB12348-2008) Class II requires noise under 60 dB during daytime and 50dB during night. | N/A | The noise by the project will Be controlled lower than the legal limits, hence the project is deemed Harmless | - | N/A | N/A | The noise within and outside the project boundary will be monitored at periodic interval. | +1 | Choose low-noise equipment, and take noise reduction measures such as foundation vibration reduction, fan installation silencer, etc. | Furthermore, by checking the monitoring plan in PSF, it is confirmed that the noise level during the operation period will be monitored for 1 day every quarter to ensure that the noise level during operation period complies with "Emission standard for industrial enterprises noise at boundary GB12348-2008" /46/.<br>Thus, CTI confirms that the noise generated from the project activity is not likely to cause any net harm to the environment and the monitoring KPI has been fairly addressed. |
| | *Others (EA10)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Add more rows if required and corresponding notation with EA as prefix)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | | | | |
| **Environment -** | *Solid waste Pollution* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Land*** | *from Plastics (EL-01)* | | | | | | | | | | | |
| | *Solid waste Pollution from Hazardous wastes (EL02)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Solid waste Pollution from Bio-medical wastes (EL03)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Solid waste Pollution from E-wastes (EL04)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Solid waste Pollution from Batteries (EL05)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Solid waste Pollution from end-of-life products/ equipment (EL06)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Soil Pollution from Chemicals (including Pesticides, heavy metals, lead, mercury) (EL07)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *land use change (change from cropland /forest land to project land) (EL08)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Others (EL09)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Add more rows if required* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | | | | |
| **Environment – *Water*** | *Reliability/ accessibility of water supply (EW01)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Water Consumption from ground and other sources (EW02)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Generation of wastewater (EW03)* | Landfill leachate, discharge flushing water and domestic water produced by the project. | The treatment reaches the standard in Table 2 of the Pollution Control Standard for Domestic Waste Landfill Site (GB16889-2008) | N/A | After treatment, the wastewater is discharged up to standard and is considered harmless to the environment. | - | N/A | N/A | N/A | +1 | After treatment, the wastewater is discharged into the municipal pipe network and treated by Junan Jiacheng Water Purification Co., Ltd., | By checking the monitoring plan in the PSF, it is confirmed that the water quality of the treated wastewater will be monitored regularly.<br>Thus, CTI confirms that the wastewater generated by the project will not cause any net harm to the environment and the monitoring KPI has been fairly addressed. |
| | *Wastewater discharge without/with insufficient treatment (EW04)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Pollution of Surface, Ground and/or Bodies of water (EW05)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Discharge of harmful chemicals like marine pollutants / toxic waste (EW06)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Waste Oil (EW07)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Add more rows if required* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | | | | |
| **Environment – *Natural Resources*** | *Conserving mineral resources (ENR01)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Protecting/ enhancing plant life (ENR02)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Protecting/ enhancing species diversity (ENR03)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Protecting/ enhancing forests (ENR04)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Protecting/ enhancing other depletable natural resources (ENR05)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Conserving energy (ENR06)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Replacing fossil fuels with renewable sources of energy (ENR07)* | The project uses waste incineration to generate electricity instead of fossil fuel to generate electricity. | There is no such legal limit | - | The project uses waste to generate electricity instead of some fossil fuels, which is harmless. | - | N/A | N/A | The electricity generated by this project will be monitored throughout the crediting period | +1 | The project is expected to supply an average of 62,049.3MWh electricity to NCPG annually, hence this parameter will be scored. | Through the assessment above, it is confirmed that the project is a waste-to-electricity project, which replaces the equivalent amount of electricity generated by NCPG using fossil fuels. The net electricity generated by the project is continuously monitored.<br>Thus, CTI confirms that the project has a positive impact on the environment through replacing fossil fuels with renewable sources of energy. |
| | *Replacing ODS with non-ODS refrigerants (ENR08)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Others (ENR09)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Add more rows if required* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | | | | | | | | | | | | |
| **Net Score:** | | | **+7** | | | | | | | | | |
| **Project Owner's Conclusion in PSF:** | | | | The Project Owner confirms that the Project Activity will not cause any net harm to Environment. | | | | | | | | |
| **GCC Project Verifier's Opinion:** | | | | The GCC Verifier certifies that the Project Activity is not likely to cause any net harm to the environment. | | | | | | | | |

## Appendix 6. Assessment matrix of Social Safeguards (S+)

| **Impact of Project Activity on** | | **Information on Impacts, Do-No-Harm Risk Assessment and Establishing Safeguards** | | | | | | | **Project Owner's Conclusion** | | **GCC project Verifier's Conclusion (To be included in Project Verification Report only)** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Description of Impact** (*positive or negative*) | **Legal requirement /Limit, Corporate policies / Industry best practice** | **Do-No-Harm Risk Assessment (Choose which ever is applicable)** | | | **Risk Mitigation Action Plans (for aspects marked as Harmful)** | **Performance indicator for monitoring of impact.** | **Ex-ante scoring of environmental impact** | **Explanation of the Conclusion** | **3rd Party Audit** |
| | | | | **Not Applicable** | **Harmless** | **Harmful** | **Operational / Management Controls** | **Monitoring parameter and frequency of monitoring (as per scoring matrix Appendix-02)** | **Ex- Ante scoring of social impact of the project** | **Ex- Ante description and justification /explanation of the scoring of social impact of the project** | **Verification Process Will the Project Activity cause any harm?** |
| ***Social Aspects on the identified categories[8] indicated below.*** | *Indicators for social impacts* | *Describe and identify actual and anticipated impacts on society and stakeholders, both positive or negative, from all sources during normal and abnormal/emergency conditions that may result from constructing and operating of the Project Activity within or outside the project boundary, over which the project Owner(s) has/have control* | *Describe the applicable national regulatory requirements / legal limits or organizational policies or industry best practices related to the identified risks of social impacts* | *If no social impacts are anticipated, then the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as* ***Not Applicable*** | *If social impacts exist but are expected to be in compliance with applicable national regulatory requirements/ stricter voluntary corporate limits by way of plant design and operating principles then the Project Activity is unlikely to cause any harm (is safe) and shall be indicated as* ***Harmless****), project having positive impact on society. To the BAU / baseline scenario must also mark their aspect as* ***"harmless"*** | *If negative social impacts exist that will not be in compliance with the applicable national legal/ regulatory requirements or are likely to exceed legal limits, then the Project Activity is likely to cause harm and shall be indicated as* ***Harmful*** | *Describe the operational or management controls that can be implemented as well as best practices, focusing on how to implement and operate the Project Activity, to reduce the risk of impacts that have been identified as* ***Harmful****.* | *Describe the monitoring approach and the parameters (KPI) to be monitored for each impact irrespective of whether it is harmless of harmful. The frequency of monitoring to be specified as well. Monitoring parameters can be quantitative or qualitative in nature along with the data source* | *-1 0 +1* | *Confirm the score of the social impacts of the project with respect to the aspect and its monitored value in relation to legal/regulatory limits (if any) including basis of conclusion* | *Describe how the GCC Verifier has assessed that the impact of Project Activity on social aspects (based on monitored parameters, quantitative or qualitative) and in case of "harmful aspects how has the project owner adopted Risk Mitigation Action / management actions plans and policies to mitigate the risks of negative social impacts to levels that are unlikely to cause any harm. Also describe the positive impacts of the project on the society as compared to the baseline alternative or BAU scenario.* |
| ***Reference to paragraphs of Environmental and Social Safeguards Standard*** | | *Paragraph 12 (a)* | *Paragraph 13 (c)* | *Paragraph 13 (d) (i)* | *Paragraph 13 (d) (ii)* | *Paragraph 13 (d) (iii)* | *Paragraph 13 (e) (i)* | *Paragraph 12 (c) and Paragraph 13 (f)* | *Paragraph 23* | | *Paragraph 24 and Paragraph 26 (a) (ii)* |
| **Social - *Jobs*** | *Long-term jobs (> 10 year) created/* | Long-term jobs (> 1 year) created/ lost | The project creates long term job opportunities | All employments are done | - | The social impact is expected to | - | Project activity creates direct employment for | +1 | The social impact is expected to | By checking the employment contract and payroll of the staff /31/, social security insurance payment slips and |

[8] sourced from the CDM SD Tool and the sample reports are available ( https://www4.unfccc.int/sites/sdcmicrosite/Pages/SD-Reports.aspx )

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *lost (SJ01)* | | during operation. | according to the national employment regulations | | increase employment ; hence the project is harmless | | around 70people per year during the operation and maintenance of the project activity. Which provides the positive impact on society which would have not been available in the absence of the project activity. It will be monitored Through Employment records | | increase employmen t , which can be confirmed by payroll records or the social insurance payment records of the project owner, therefore This parameter will be scored | interview with the staff from the financial department, it is confirmed that the 70 people are working for the project as long-term employees by the date when CTI conducted the on-site visit, i.e. 26/10/2023. All employees signed the formal contract and are provided with the social security insurance, health insurance, housing allowance and some other welfares in line with the Labor Law of the People's Republic of China/56/. Furthermore, by checking the monitoring plan in the PSF, it is confirmed that the employment records. will be monitored annually. Thus, CTI confirms that the project creates long-term job opportunities which has a positive impact on the society and the relevant monitoring KPI has been fairly addressed. |
| | *New short-term jobs (< 1 year) created/ lost (SJ02)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Sources of income generation increased / reduced (SJ03)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Avoiding discrimination when hiring people from different race, gender, ethnics, religion, marginalized groups, people with disabilities (SJ04) (Human rights)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Social - *Health & Safety*** | *Disease prevention (SHS01)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Occupational health hazards (SHS02)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Reducing / increasing accidents/Incid ents/fatality (SHS03)* | The project may cause accidents/Incident s/fatality. | The operation and the internal Regulations on safety production of the Project are in accordance with Law of | Not Applicable | The Construction and installation of waste incineration power plant was | - | N/A | Project proponent will record number of incident/accidents, number of HSE training conducted and compliance of | +1 | Project proponent will record number of incident/ac cidents, number of | Project proponent will record number of incident/accidents, number of HSE training conducted and compliance of use of PPE's to avoiding accidents at site. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Labour of P.R. China. | | standardized, the operation and maintenance of waste incineration power plant was strengthened, employee training on job HSE was provided and PPE's required was complied. Thus, it deemed as harmless | | | use of PPE's to avoiding accidents at site. | | HSE training conducted and compliance of use of PPE's to avoiding accidents at site. | |
| | *Reducing / increasing crime (SHS04)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Reducing / increasing food wastage (SHS05)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Reducing / increasing indoor air pollution (SHS06)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Efficiency of health services (SHS07)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Sanitation and waste management (SHS08)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Other health and safety issues (SHS09)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Add more rows if required* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Social - *Education*** | specialized training / education to local personnel (SE01) | The project owner provides job related raining for the special positions. | There is no legal requirement from local authority to provide training to local people | - | The project provides job related training for all employees; hence it is harmless | - | N/A | The project provided the job-related training, it can be verified from the training records and attendance sheet. | +1 | Project owner confirms that by training the people on New technology it will upgrade their skills and creates Positive impact. | By checking the monitoring plan in the PSF, it is confirmed that the training records will be monitored annually. Thus, CTI confirms that the project provides job related training for all staff which has a positive impact on the society and the monitoring KPI has been fairly addressed. |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Hence it will be scored | |
| | *Educational services improved or not (SE02)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Project-related knowledge dissemination effective or not (SE03)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Other educational issues (SE03)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Add more rows if required (SE04)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Social - *Welfare*** | *Improving/ deteriorating working conditions (SW01)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Community and rural welfare (indigenous people and communities) (SW02)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Poverty alleviation (more people above poverty level) (SW03)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Improving / deteriorating wealth distribution/ generation of income and assets (SW04)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Increased or / deteriorating municipal revenues (SW05)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Women's empowerment (SW06) (Human rights)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Reduced / increased traffic congestion (SW07)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Exploitation of Child labour (Human rights) (SW08)* | There is no child labor employed in the project, so there is no phenomenon of child labor exploitation. | The Project complies with the Law of the People's Republic of China on the Protection of Minors, the Provisions on the Prohibition of Child Labour and Labour Law of the People's Republic of China | Not applicable | - | - | N/A | N/A | N/A | N/A | By checking the employment contract and payrolls of the staff and interview with project owner and ground inspection during site visit, it is confirmed that there is no child labor involved in the project which is in line with Law of the People's Republic of China on the Protection of Minors/59/, the Provisions on the Prohibition of Child Labor/60/ and Labor Law of the People's Republic of China/56/.<br>Since there is clear laws and regulations on preventing child labor and protecting the rights of children in China, CTI confirms that the project is not likely to cause any net harm to the society regarding child labor exploitation. |
| | *Minimum wage protection (Human rights) (SW09)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Abuse at workplace. (With specific reference to women and people with special disabilities / challenges) (Human rights) (SW10)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Other social welfare issues (SW11)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Avoidance of human trafficking and forced labour (Human rights) (SW12)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Avoidance of forced eviction and/or partial physical or economic displacement of IPLCs (Human rights) (CW13)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | *Provisions of resettlement and human settlement displacement (Human rights) (CW14)* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Add more rows if required* | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| | |
|---|---|
| | |
| **Net Score:** | **+3** |
| **Project Owner's Conclusion in PSF:** | The Project Owner confirms that the Project Activity will not cause any net harm to society. |
| **GCC Project Verifier's Opinion:** | The GCC Verifier certifies that the Project Activity is not likely to cause any net harm to society. |

## Appendix 7. Assessment matrix of Sustainable development Goals (SDG+)

| UN-level SDGs | UN-level Target | Declared Country-level SDG | Defining Project-level SDGs | | | | GCC Project Verifier's Conclusion (To be included in Project Verification Report only) | |
|---|---|---|---|---|---|---|---|---|
| | | | **Project-level SDGs** | **Project-level Targets/Actions** | **Contribution of Project-level Actions to SDG Targets** | **Monitoring** | **Verification Process** | **Are Goal/ Targets Likely to be Achieved?** |
| ***Describe UN SDG targets and indicators***<br>***See:*** ***https://unstats.un.org/sdgs/indicators/indicators-list/*** | *Describe the UN-level target(s) and corresponding indicator no(s)* | *Has the host country declared the SDG to be a national priority? Indicate Yes or No* | *Define project-level SDGs by suitably modifying and customizing UN/ Country-level SDGs to the project scope or creating a new indicator(s). Refer to previous column for guidance.* | *Define project-level targets/actions in line with nee project level indicators chosen. Define the target date by which the project Activity is expected to achieve the project-level SDG target(s).* | *Describe and justify how actions taken under the Project Activity are likely to result in a direct positive effect that contributes to achieving the defined project-level SDG targets* | *Describe the monitoring approach and the monitoring parameters to be applied for each project-level SDG indicator and its corresponding target, frequency of monitoring and data source* | *Describe how the GCC Verifier has verified the claims that the project is likely to achieve the identified Project level SDGs target(s).* | *Describe whether the project-level SDG target(s) is likely to be achieved by the target date*<br>*(Yes or no)* |
| **Goal 1: End poverty in all its forms everywhere** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Goal 3. Ensure healthy lives and promote well-being for all at all ages** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Goal 5. Achieve gender equality and empower all women and girls** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Goal 6. Ensure availability and sustainable management of water and sanitation** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **for all** | | | | | | | | |
| **Goal 7. Ensure access to affordable, reliable, sustainable, and modern energy for all** | SDG Indicator 7.2 "By 2030, increase substantially the share of renewable energy in the global energy mix." | Yes | The project contributes to increasing the share of renewables in the total installed power capacity connected to the national/regional electricity grid. | The project targets to generate and feed 62,049.3 MWh/year electricity for entire project life time into the North China Power Grid. | The project has already started operation since 10/08/2017 and began to generate and deliver renewable energy to NCPG. The estimated electricity that delivered to NCPG is 62,049.3 MWh/year during its entire project life time. | Project Operation and Maintenance team on site continuously monitor the quantity of net electricity generated and supplied by the project to the grid. | Through checking FSR/10/, the Operation Logs/18/ and interview with on-site staff and ground inspection, it is confirmed that the project is a waste-to-electricity project which generates electricity and deliver to NCPG, the annual net electricity is estimated to be 62,049.3MWh during the entire project lifetime. The project has already started operation since 10/08/2017 and the net electricity supply will be continuously monitored by the OM team.<br>Thus, CTI confirms that the project is likely to achieve the project level SDG target. | Yes |
| **Goal 8. Promote sustained, inclusive, and sustainable economic growth, full and productive employment and decent work for all** | SDG Indicator 8.5 "By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities and equal pay for work of equal value" | Yes | Increase the decent job opportunities for the local community. | The project is targeted to create about 70 long-term decent job opportunities which provides income higher than local average level by the end of 2022. | The project was put into operation since 10/08/2017 and by the end of 2022, the project has already employed 70 people as long-term employees which has income rate higher than the local average level. | The employee turnover and the income will be recorded and the records will be monitored on a monthly basis. | By checking the employment contract and payroll of the staff /31/, the Annual average remuneration of employment personnel in urban non-private units in Shandong Province in 2017 and 2022 /42/ issued by Statistics Bureau of Shandong Province and through on-site interview, it is confirmed that the project has employed 70 people by the end of 2022 as long-term staff with annua average salary from higher than the local average level.<br>Thus, CTI confirms that the project has contributes to the project level SDG target: create about 70 long-term decent job opportunities by the end of 2022. | Yes |

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| **Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | Yes |
| **Goal 10. Reduce inequality within and among countries** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Goal 11. Make cities and human settlements inclusive, safe, resilient, and sustainable** | SDG Target 11.6 | Yes | The project is waste incineration to generate electricity, which reduces the per capital negative environmental impact of the city. | Activities include the installation of 12MW waste incineration power generation project in China. | 11.6.1 The proportion of municipal solid waste collected and managed by the control department to the total output of municipal waste, by city. Activities have been reduced in proportion. | The operation and maintenance team of the project constantly strives to reduce the interruption of the factory and maximize the availability of the power grid, so as to generate and provide the maximum energy for the power grid and reduce the waste ratio. | The operation and maintenance team monitors the real-time waste volume of the factory. | Yes |
| **Goal 12. Ensure sustainable consumption and production patterns** | SDG Target 12.2 | Yes | The project generates electricity from waste incineration instead of fossil fuel combustion | Activities include the installation of 12MW waste incineration power generation project in China. | 62049.3MWh per yr | Ensure optimum generation from the plant to the grid. | The project operation and maintenance team at the project site continuously monitors the net power generation provided by the project. | Yes |
| **Goal 13. Take urgent action to combat climate change and its impacts** | SDG Indicator 13.2 “Integrate climate change measures into national policies, strategies and planning” | Yes | Amount of emission reduction achieved by project under GCC market mechanism | 63,073 $tCO_2e$ per year during the entire project lifetime. | The project has started operation since 10/08/2017 and is implemented as per design spec and is likely to provide clean renewable energy of around 62,049.3 MWh per year thus resulting in around 63,073$tCO_2e$ emission reduction per year. | Project Operation and Maintenance team on site continuously monitor the real-time operation of the project. They record and report the quantity of net electricity generated and supplied by the project on a daily basis. Then the greenhouse gas emission reduction can be calculated accordingly. | Through checking FSR/10/, the Operation Logs/18/ and interview with on-site staff and ground inspection, it is confirmed that the project is a waste-to-electricity project which generates electricity and deliver to NCPG, the annual ER is estimated to be 63,073$tCO_2e$ during the entire project lifetime. The project has already started operation since 10/08/2017 and the net electricity supply will be continuously monitored by the OM team and the emission reductions will be calculated accordingly. Thus, CTI confirms that the project is likely to | Yes |

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|---|---|---|---|---|---|---|---|---|
| | | | | | | | achieve the project level SDG target. | |
| **Goal 14. Conserve and sustainably use the oceans, seas, and marine resources for sustainable development** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Goal 15. Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

| **SUMMARY** | **Targeted** | **Likely to be Achieved** |
|---|---|---|
| **Total Number of SDGs** | **5** | **5** |
| **Certification label (Bronze, Silver, Gold, Platinum, or Diamond) for the ACCs as defined in the PSF** | **Platinum** | **Platinum** |

# DOCUMENT HISTORY

| Version | Date | Comment |
|---|---|---|
| **V 3.1** | 31/12/2020 | ▪ The name of GCC Program's emission units has been changed from "Approved Carbon Reductions" or ACRs to "Approved Carbon Credits" or ACCs. |
| V 3.0 | 23/08/2020 | ▪ Revised version released on approval by the Steering Committee as per the GCC Program Process;<br>▪ Revised version contains the following changes:<br>o Change of name from Global Carbon Trust (GCT) to Global Carbon Council (GCC);<br>o Considered and addressed comments raised by the Steering Committee:<br>➢ during physical meeting (SCM 01, dated 29 Oct 2019, Doha Qatar); and<br>➢ electronic consultations EC01-Round 04 (17.08.2020 – 22.08.2020).<br>▪ Feedback from the Technical Advisory Board (TAB) of ICAO on GCC submissions for approval under CORSIA[9]; |
| **V 2.0** | 25/06/2019 | ▪ Revised version released for approval by the GCC Steering Committee.<br>▪ This version contains details and information to be provided, consequent to the latest worldwide developments (e.g., CORSIA EUC). |
| **v1.0** | 01/11/2016 | ▪ Initial version released for approval by the GCC Steering Committee under GCC Program Version 1 |

[9]See ICAO recommendation for conditional approval of GCC at https://www.icao.int/environmental-protection/CORSIA/Documents/TAB/Excerpt_TAB_Report_Jan_2020_final.pdf

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