**KEY PROJECT INFORMATION & PROJECT DESIGN DOCUMENT (PDD)**

###### PUBLICATION DATE **14.10.2020** VERSION **v. 1.2** RELATED SUPPORT

###### **-** [**TEMPLATE GUIDE Key Project Information & Project Design Document v.1.2**](https://globalgoals.goldstandard.org/standards/TGuide-PreReview_V1.2-Project-Design-Document.pdf)

This document contains the following Sections

Key Project Information

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Appendix 3 - Summary of Approved Design Changes (project specific)

### KEY PROJECT INFORMATION

|  |  |
| --- | --- |
| GS ID of Project | GS11356 |
| Title of Project | Fuel-Switch Project Deriving Carbon Assets from the Use of Non-Edible Raw Agriculture-Derived Oil System (NERADO System) To Replace Heavy Fuel Oil for Aluminium Dross Recycling In Malaysia |
| Time of First Submission Date | 08/09/2021 |
| Date of Design Certification |  |
| Version number of the PDD | 1.1 |
| Completion date of version | 07/03/2022 |
| Project Developer | JTS Engineering Sdn Bhd  JTS Optimax Pte Ltd |
| Project Representative | Climate Resources Exchange International Pte Ltd |
| Project Participants and any communities involved | Climate Resources Exchange International Pte Ltd |
| Host Country (ies) | Malaysia |
| Activity Requirements applied | ☐ Community Services Activities  ☒ Renewable Energy Activities  ☐ Land Use and Forestry Activities/Risks & Capacities  ☐ N/A |
| Scale of the project activity | ☒ Micro scale  ☐ Small Scale  ☐ Large Scale |
| Other Requirements applied | NA |
| Methodology (ies) applied and version number | AMS.III.AS: Switch from fossil fuel to biomass in existing manufacturing facilities for non-energy applications, Version 02.0 |
| Product Requirements applied | ☒ GHG Emissions Reduction & Sequestration  ☐ Renewable Energy Label  ☐ N/A |
| Project Cycle: | ☐ Regular  ☒ Retroactive |

**Table 1 – Estimated Sustainable Development Contributions**

|  |  |  |  |
| --- | --- | --- | --- |
| Sustainable Development Goals Targeted | SDG Impact  (defined in B.6.) | Estimated Annual Average | Units or Products |
| 13 Climate Action (mandatory) | Emissions Reductions | 3,072 VERs | |
| 8 Decent Work and Economic Growth | The number of males and females employed by the project and the Average monthly salary | The number of males and females employed by the project: 32   * Females: 8 * Males: 24   The Average monthly salary is XXX RM/person with equal salaries for men and women in the same post | |
| 3 Good Health and Well-being | PPM | 8 PPM | |

#### SECTION A. DESCRIPTION OF PROJECT

##### A.1 Purpose and general description of project

The Fuel-Switch Project Deriving Carbon Assets from The Use of Non-Edible Raw Agriculture-Derived Oil System (Nerado System) to Replace Heavy Fuel Oil for Aluminium Dross Recycling in Malaysia (hereinafter referred to as the “**project activity**”) is a fuel switch project implemented by JTS Engineering Sdn Bhd.

JTS Engineering Sdn. Bhd (**“JTS”**) is the leading pioneer in Aluminum Dross recycling in Malaysia and was the very first to obtain approval from the Malaysian Department of Environment for handling and recycling aluminum dross. With over 25 years of experience, JTS’ customers include multi-national and national smelters. Additionally, JTS is in the process of getting its ISO 14067 certification.

A corporate review of JTS’s Aluminum Dross Recycling processes was done in 2018, to look at potential ways in which its operations could become more environmentally sustainable. One of the issues the company was looking at was its furnace fuel, which currently uses Heavy Fuel Oil (HFO), derived from residues of petroleum catalytic cracking. HFO is not sustainable in the long run as it is derived from fossil fuels, which initiated a search for a more sustainable fuel that could produce the required amount of energy for the smelting process. Potential alternative options for the replacement of HFO have been examined for similar thermal energy output values, and possible lower carbon dioxide (CO2), nitrogen (NOx) and sulphur (SOx) content. One such alternative that was proposed was Non-Edible Raw Agriculture-Derived oils (NERADOs) which is commonly available in the local region. A test project had been proposed and approved, and a test-burner capable of heating and burning the proposed alternative biofuel was installed in one of the furnaces for test run.

The project activity will directly contribute to the reduction of greenhouse gas emissions produced from the combustion of fossil fuel. Additionally, it will also contribute towards Malaysia’s objective to maximize its green industry and renewable energy potential in 2020. Other benefits of the project activity are as follows:

**Environmental well-being:**

* The project uses renewable fuels in place of non-renewable fuels, thereby reducing emissions into the atmosphere resulting in lower emissions to the surrounding environment and contributing on a regional and global level.

**Economic well-being:**

* Implementation of the project activity will result in employment opportunities for people involved with installation of the technologies.
* Sales of carbon credits generated by the project activity will result in increased foreign direct investment.
* Encourage industrial development in the region and generate economic growth. It will provide for business opportunities for local stakeholders such as suppliers, manufacturers, contractors etc.

**Social well-being:**

* The project activity uses renewable fuel which does not emit GHGs into the atmosphere. This reduces the adverse impact of GHG emissions leading to a cleaner environment and with reduced soot and smog production, better working conditions in the plant premises and improved local environment of the people living in proximity.

**Technological well-being:**

* The project activity will use environmentally friendly, inexhaustible, and clean fuels.
* It will create opportunities for skill improvement and technology penetration in the Host Party.
  + 1. Eligibility of the project under Gold Standard

|  |  |  |
| --- | --- | --- |
| **Sr. No** | **Eligibility criteria** | **Applicability of the Project to the eligible criteria** |
|  | **Types of Project:**  Eligible projects shall include physical action/implementation on the ground. Pre-identified eligible project types are identified in the Eligibility Principles and Requirements section. | The project is eligible under section 3.1.1 of the GS4GG Principles and Requirements as it follows an established Gold Standard methodology.  The Project includes actual implementation of a new fuel source which is more sustainable than the previously used HFO. |
|  | **Location of Project:**  Projects may be located in any part of the world. | The Project is located in Johor Bahru, Malaysia. |
|  | **Project Area, Project Boundary and Scale:**  The Project Area and Project Boundary shall be defined. Projects may be developed at any scale although certain rules, requirements and limitations may apply under specific Activity Requirements, Impact Quantification Methodologies and Products Requirements. In order to avoid double counting the Project shall not be included in any other voluntary or compliance standards programme unless approved by Gold Standard (for example through dual certification). Also, if the Project Area overlaps with that of another Gold Standard or other voluntary or compliance standard program of a similar nature, the project shall demonstrate that there is no double counting of impacts at design and performance certification (for example use of similar technology or practices through which the potential arises for double counting or misestimation of impacts amongst projects). | The Project Area and Project Boundary have been addressed in section A.4 and B.3 respectively.  The Project will be developed at micro scale. The Project is not included under any other voluntary or compliance standards and shall only be registered under the Gold Standard. |
|  | **Host Country Requirements:** Projects shall be in compliance with applicable Host Country’s legal, environmental, ecological and social regulations. | The VPA will ensure compliances with all the Host country’s legal, environmental, ecological and social regulations. This can be done through approvals from the host country itself or licensees associated with the industry.  Additionally, the VPA is located in a host country or state which does not have a cap enforced, or provide satisfactory assurances that an equivalent amount of allowances will be retired to back-up the issued GS VERs |
|  | **Contact Details:**  As part of the Project Documentation the Project Developer shall provide (i) name and (ii) contact details of all Project Participants; AND in case of an organization (iii) the legal registration details and (iv) documentation by the governing jurisdiction that proves that the entity is in good standing (defined as being a legal or other appropriate entity registered in or allowed to operate within the required jurisdiction and with no evidence of insolvency or legal/criminal notices placed against it or any of its Directors). Gold Standard retains the right (at its own discretion) to refuse use of the Standard where reputational concerns are highlighted. | The contact details of the Project developer as well as the Project participants have been provided in Annexure 1 of the document.  The legal registration details as well as certification of good standing are attached in the Annexure 2 of the document. |
|  | **Legal Ownership:**  Full and uncontested legal ownership of any Products that are generated under Gold Standard Certification, (for example carbon credits) shall be demonstrated. Where such ownership is transferred from project beneficiaries this must be demonstrated transparently and with full, prior and informed consent (FPIC). Note that for certain Project types there is a requirement for full and uncontested legal land title/tenure to be demonstrated. These are contained within specific Activity or Product Requirements. All projects shall immediately report to Gold Standard any land title/tenure disputes arising. | For any products generated under the Gold Standard, JTS and CRX will be the legal owners. This has been further detailed in section A.3.  The ownership of these products is not being transferred to any beneficiary. |

* + 1. Legal ownership of products generated by the project and legal rights to alter use of resources required to service the project

JTS Engineering Sdn Bhd is the project developer of the project activity and has the legal right to control and operate the project.

The project ownership has been demonstrated through the below supporting documents:

1. **Certificate of incorporation**

This certificate of incorporation of JTS Engineering Sdn Bhd provided by SURUHANJAYA SYARIKAT MALAYSIA, a statutory board that regulates the corporate and business affairs in Malaysia, gives the legal right to allow a fuel switch project to take place as part of making the operations of the company more sustainable and resource efficient.

1. **Purchase order for equipment**

The purchase order issued by JTS for the purchase of Crude Palm Oil firing equipment and thermal oil heating for 3-unit dross furnace serves as further evidence that it has the legal right, ownership and control of the Project.

1. **Agreement between CRX and JTS Engineering Sdn. Bhd.**

The agreement signed between CRX and JTS gives both companies the legal right to share the carbon credits generated from the Project.

##### A.2 Location of project

Lot 227 Jalan Tembaga 2, 81700 Pasir Gudang Johor, Malaysia

Geographical Coordinates: Latitude 1.450723 Longitude: 103.895010

A high angle view of a building

Description automatically generated with low confidence

##### A.3 Technologies and/or measures

The technology of this project activity consists of the fuel switching from Heavy Fuel Oil (HFO) to the JTS patented Non-Edible Raw Agriculture-Derived Oil (NERADO) Alternative Fuel, that is used during JTS’s processing of Steel Ingots.

The alternative fuel is used mainly during the smelting process in the rotary furnace (Fig. 1).

A picture containing outdoor, night

Description automatically generated



The aluminum dross recovery industry standard of fuel used by the aluminum dross recovery plants are fossil fuels like Natural gas, Diesel or Heavy Fuel Oil (HFO), a type of residual fuel oil used for re-fueling marine vessels. These fuels are essential to sustaining a minimum temperature of 660.3°C is essential to recover aluminum from dross however, it results in greater carbon emissions. The fumes from the burning of HFO is corrosive in nature and requires all workers to wear personal protection equipment while the furnace is in operation. The corrosive fumes from the smelting process also damage other protective equipment in operation such as the filter bags and the metal pipes of the dust collectors, which has increased the firm’s replacement budget for the filter bags and maintenance budget for the dust collectors.

As such an alternative sustainable fuel is needed that can achieve the required temperature and remain as cost-effective and competitive as HFO.

The switch to NERADOs are the obvious choice as they are first and foremost derived from sustainable oil sources, such as Crude Palm Oil (CPO) and Sludge Palm Oil (SPO) from palm plantations. However, a system had to be designed to use these NERADOs without converting them into Biodiesels which would require additives and hence increased carbon footprint.

NERADOs have characteristics such as peak heat release and combustion rate, that are similar to that of HFO, are liquid at the range of heating temperatures similar to HFO and cause minimal corrosion to equipment and must above all have lower emissions compared to HFO. All these benefits must also be achieved while meeting the average fuel price set by the firm’s budget.

Keeping all these parameters in mind JTS has been undertaking tests to find the best and most sustainable alternative. These efforts contribute to undertaking sustainable industrialization as well as foster innovation. By replacing a CO2 intensive oil with a less pollutive product.

**Comparison Table between Heavy Fuel Oil (HFO) vs Crude Palm Oil (CPO)**

**Table 1: Comparison between Heavy Fuel Oil (HFO) vs Crude Palm Oil (CPO)**

|  |  |  |  |
| --- | --- | --- | --- |
| **Characteristics** | **HFO** | **CPO** | **Remarks/References** |
| RM per Kg | 2.37 - 2.43 | 2.27 - 2.40 | CPO prices taken from June 2018 average |
| Density, Kg/m3 | 980 at 15ºC | 887.5 at 25ºC | <http://www.lipico.com/technical_references_palm_oil_properties.html> |
| Calorific value, KJ/Kg | 39,000 to 42,000 | 38,000 to 41,000 | Lim, T.H. & Bari, S & Yu, C.W.. (2017). USING CRUDE PALM OIL (CPO) AS DIESEL ENGINE FUEL. ASEAN Journal on Science and Technology for Development. 19. 1. 10.29037/ajstd.334. |
| Sulphur Content,% | 0.5 to 3.5% | 0.00097 to 0.02 | B. He, B & H. Van Gerpen, J & C. Thompson, J. (2010). Sulfur Content in Selected Oils and Fats and their Corresponding Methyl Esters. Applied Engineering in Agriculture. 25. 10.13031/2013.26319. |
| Nitrogen content | 0.2 to 0.4% | 0.02 to 0.0215 | Lim, T.H. & Bari, S & Yu, C.W.. (2017). USING CRUDE PALM OIL (CPO) AS DIESEL ENGINE FUEL. ASEAN Journal on Science and Technology for Development. 19. 1. 10.29037/ajstd.334. |

\*\*\* CPO/Biodiesel which is extracted from palm trees can be considered carbon natural vs LFO

From JTS’s experiments the temperature for using the oil has to be (set above 33 oC) and to ensure the fuel burns properly and achieves complete combustion to minimize soot. For the project test run, JTS used a mix of 7.67% HFO and 92.33% CPO as fuel for the system.

##### A.4 Scale of the project

As less than 10,000 tons of CO2-eq reductions are generated each year, the project is considered a micro-scale project.

##### A.5 Funding sources of project

The project activity does not have any public funding or Official Development Assistance (ODA) funding.

#### SECTION B. APPLICATION OF APPROVED GOLD STANDARD METHODOLOGY (IES) AND/OR DEMONSTRATION OF SDG CONTRIBUTIONS

##### B.1. Reference of approved methodology (ies)

AMS.III.AS – Switch from fossil fuel to biomass in existing manufacturing facilities for non-energy applications version 02.0

With reference to the following tools where applicable:

* “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” Version 3.0
* “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” Version 3.0
* “Upstream leakage emissions associated with fossil fuel use” Version 2.0

##### B.2. Applicability of methodology (ies)

The project activity is a fuel switch project in an existing manufacturing facility and there meets the applicability criteria states in the methodology AMS-III.AS:

|  |  |
| --- | --- |
| **Applicability** | **Compliance Status** |
| This methodology is applicable to project activities that involve switching (complete or partial) from the use of carbon intensive energy source (or a mix of energy sources) of fossil fuel origin to renewable biomass or a mix of renewable biomass and fossil fuel in existing manufacturing facilities (e.g. steel, ceramics, aluminum, lime, clinker production). | **Yes**  The proposed project activity involves a complete switch from Heavy Fuel Oil to Non-edible Raw Agriculture-Derived Oil in an existing aluminum dross recycling plant. Hence, this criterion is met by the project. |
| Fuel switching may also result in energy efficiency improvements; however, the primary aim of project activity is to reduce emissions through fuel switching | **Yes**  The project activity may result in energy efficiency improvements; however, the main aim of the project activity will be focused on the reduction of emissions through fuel switching. |
| The methodology is applicable if the following requirements are met:   1. The baseline fossil fuel and the project biomass are consumed in thermal energy conversion equipment (e.g. furnaces, kilns, dryers) that are used in the manufacture of products (e.g. steel, ceramics, aluminium, lime, clinker). | **Yes**  The baseline fuel and project biomass are consumed for thermal energy conversion equipment i.e. the furnace to smelter aluminium dross. Hence, this criterion is met by the project. |
| 1. It shall be demonstrated, with historical data, that for at least the immediately prior three year to the start date of project, only fossil fuels (non renewable biomass) were used in the production systems, which are being modified, retrofitted or replaced. In cases where small quantities of biomass were used for experimental purposes then this can be excluded | **Yes**  In the preceding three years from the start date of the project only fossil fuel was used in the production system, except for in 2019 where small quantities of biomass fuel were used for experimental purpose. Hence, this criterion is met. |
| 1. Regulations do not restrict the use of the baseline fossil fuel or require the use of project biomass and low carbon energy sources unless widespread noncompliance (less than 50 per cent of manufacturing production activities comply in the country) of the local regulation is evidenced; | **Yes**  There are no regulations that restrict the use of baseline fossil fuel or require use of project biomass in Johor/Malaysia. Hence, the criterion is met. |
| 1. The production process where the fuel switch takes place shall have a distinct energy input (i.e. specific fuels) and distinct output (i.e. intermediate or finished product). The output of each element process shall be an output for which an appropriate international/national standard or industrial norm exists. | **Not Applicable**  In the proposed project activity, the distinct energy input is the Non-edible Raw Agriculture-derived Oil, and the distinct output is Aluminum ingots, which is not required to follow any industrial/international standard but depends on the buyer and his specifications of the aluminum ingots. |
| 1. This methodology is not applicable to project activities where primary output of the processes is energy (e.g. heat, electricity) that can be directly measured. | **Yes**  The primary output of this project activity is aluminum ingot and not energy. Therefore, this criterion is met. |
| 1. The product(s) (e.g. ceramic insulators, tiles, steel ingots, lime, aluminum cookware) produced in the industrial facility throughout the crediting period shall be equivalent to the product(s) produced in the baseline.   For the purposes of this methodology, equivalent products are defined as products having the same use, the same general physical properties, and which function in a similar manner. In addition, products produced in the industrial facility throughout the crediting period shall provide the same level of service, or better, and be of the same level of quality, or better than the product(s) produced in the baseline. When national or international product standards apply to the product(s), product quality shall be as defined in such standards, otherwise the relevant industrial norms are to be followed. | **Yes**  As provided in the production report the production during the crediting period will be equivalent to that in the baseline.  Products produced by the project activity throughout the crediting period will provide the same level of service, or better, and be of the same level of quality, or better than the product(s) produced in the baseline. Therefore, this criterion is met. |
| 1. The type of input materials used in the project shall be homogeneous and similar to the input material that was used in the baseline and any deviation during the crediting period of input material type, composition, or amount used per unit of product output shall be within the range of ±15 percent of the baseline characteristics and values. | The input i.e. the Non-edible Raw Agriculture-derived Oil is similar in terms that it is an oil when burnt produces thermal energy to power the furnace.  The input increases by 30 - 35% to generate the same quantity of aluminum ingots. |
| 1. The facilities involving modification, retrofit and/or replacement shall not influence the production capacity beyond ±15 per cent of the baseline capacity. | **Yes**  As provided in the production report the production capacity is the same/ ± 15 percent of the baseline.  Therefore, this criterion is met. |
| Any emissions reduction derived from chemical processes related to the transformation of raw materials in the industrial facilities are not eligible for claiming certified emission reductions (CERs). Examples include de-carbonisation of raw materials (i.e. CaCO3 and MgCO3 bearing minerals) in kiln producing clinker and utilization of biomass as a reducing agent in metal ore reduction processes using charcoal. | **Not Applicable**  No raw materials are being transformed through a chemical process in the industrial facility and therefore there are no certified emission reductions to be claimed. Therefore, this criterion is not applicable to the project activity. |
| The renewable biomass utilized by the project activity shall not be chemically processed (e.g. esterification to produce biodiesel, degumming and/or neutralization by chemical reagents) prior to the combustion but it may be processed mechanically (e.g. pressing, filtering)/thermally (e.g. gasification to produce syngas). | **Yes**  The renewable biomass utilized by the project activity is not chemically processed.  Therefore, this criterion is met. |
| This methodology is applicable to project activities that involve a retrofit of (an) existing plant(s); or a replacement of (an) existing plant(s) that must have been in operation for at least the immediately prior three years to the start date of the project activity. This requirement is in order to ensure that adequate baseline performance data are available. | **Yes**  The proposed project activity involved replacement of the oil used for operating the furnace in the production process. The plant itself has been in operation for more than 3 years and therefore this criterion is met. |
| Farmer records shall be cross-checked with records from seed suppliers and synthetic nitrogen fertilizer suppliers. In case of discrepancies between farmer records and those from the respective suppliers, the most conservative value shall be taken. | **Not Applicable**  The Non-edible Agriculture-Derived oil is supplied by a supplier and not a farmer and hence this criterion is not applicable. |
| In case biomass is sourced from dedicated plantations, the applicability criteria in the tool “Project emissions from cultivation of biomass” shall apply. | **Not Applicable**  The biomass is not sourced from dedicated plantations. Therefore, this criterion is not applicable to the project activity. |
| In cases where the project activity utilizes charcoal produced from renewable biomass as fuel, the methodology is applicable provided that:   1. Charcoal is produced in kilns equipped with methane recovery and destruction facility; or 2. If charcoal is produced in kilns not equipped with a methane recovery and destruction facility, methane emissions from the production of charcoal shall be considered. | **Not Applicable**  The project activity does not utilize charcoal produced from renewable biomass as fuel and hence this criterion is not applicable |
| The requirements concerning demonstration of the remaining lifetime of the replaced equipment shall be met as described in the most recent version of “General guidelines for SSC CDM methodologies”. If the remaining lifetime of the affected systems increases due to the project activity, the crediting period shall be limited to the estimated remaining lifetime, i.e. the time when the affected systems would have been replaced in the absence of the project activity. | **Yes**  According to the most recent version of “General guidelines for SSC CDM methodologies”. The lifetime of the system does not increase in an overall scenario; however, the lifetime of certain equipment used such as filter bags, dust collection will be lengthened as the corrosion level will be lower due to change in the fuel.  This increase, however, is negligible.  As such, the crediting period shall remain the estimated lifetime of the system that would have been without in the absence of the project activity. Hence, this criterion is met. |
| In cases where product output (e.g. hot/fused metal) cannot be measured, the input material used in the manufacturing process can be used as a proxy for determining baseline/project emissions | **Not Applicable**  In the proposed project activity, the output can be measured and therefore this criterion is not applicable |
| Measures are limited to those that result in emission reductions of less than or equal to 60 kt CO2 equivalent annually. | **Yes**  The emission reduction in the proposed project activity is 2,991.1TCO2e annually and hence this criterion is met |

##### B.3. Project boundary

**Diagram

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|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Source** | | **GHG** | **Included?** | **Justification/Explanation** |
| **Baseline Scenario** | Emissions generated from the use of Heavy Fuel Oil that is being switched to biomass in the project activity | CO2 | Included | Main source of baseline emissions. |
| CH4 | Excluded | Minor Source. These emissions are excluded for simplicity |
| N2O | Excluded | Minor Source. These emissions are excluded for simplicity |
| Other | Excluded | Minor Source. These emissions are excluded for simplicity |
| **Project Scenario** | Emission from additional electricity and as a result of the project activity (PE*elec,y*) | CO2 | Included | It is a significant emission source. The project activity includes installation of new equipment that may increase electricity consumption |
| CH4 | Excluded | Excluded for simplification |
| N2O | Excluded | Excluded for simplification |
| Emissions from fossil fuel consumption as a result of the project activity (PE*fossilfuel,y*) | CO2 | Excluded | The project activity does not include consumption of fossil fuels |
| CH4 | Excluded | The project activity does not include consumption of fossil fuels |
| N2O | Excluded | The project activity does not include consumption of fossil fuels |
| Emission from transportation of the renewable biomass from the place of origin to the manufacturing facility in the year (PE*transport,y*) | CO2 | Included | Can be a significant source of emissions. The emissions from trucks/tanker used for transportation of the biomass oil is considered |
| CH4 | Excluded | Emission is negligent and hence excluded for simplification |
| N2O | Excluded | Emission is negligent and hence excluded for simplification |
| Emissions from the cultivation of renewable biomass at the dedicated plantation (PE*cultivation,y*) | CO2 | Excluded | The project activity does not include biomass from a dedicated plantation |
| CH4 | Excluded | The project activity does not include biomass from a dedicated plantation |
| N2O | Excluded | The project activity does not include biomass from a dedicated plantation |

##### B.4. Establishment and description of baseline scenario

According to AMS-III.AS, for a fuel switch project, the baseline is related to the historical fossil fuel consumption associated with the element processes, affect by the project activity that would continue to occur in the absence of the project activity. The baseline scenario is that the Heavy Fuel Oil was used to power the furnace in the recycling of aluminum dross.

The current industry standard of fuel used by the aluminum dross recovery plants are fossil fuels like Natural gas, Diesel or Heavy Fuel Oil (HFO), a type of residual fuel oil used for re-fueling marine vessels. With the shipping industry also beginning to respond to the challenges of climate change, industries dependent on HFO and similar residual fuel have also begun searching for new ways to meet emissions standards set by the Paris Agreement in 2015. These standards dictate reducing the CO2, NOx and SOx content of the HFO used, or in the case of the shipping industry, to rely on hybrid energy technology.

The Project Activity revolves around the fuel-switch from HFOs to NERADOs, an alternative fuel that has similar characteristics and qualities to HFOs but causes minimal corrosion to equipment and must above all have lower emissions compared to HFO.

In the absence of the project activity, the aluminum dross recycling plant would continue to consume fossil fuel as shown in the table below:

|  |  |  |
| --- | --- | --- |
| **Year** | **Heavy Fuel Oil consumed (liters)** | **Source of Information** |
| 2019 | 447,720 | Product Data Sheet |
| 2018 | 998,860 | Product Data Sheet |
| 2017 | 1,029,210 |  |
| 2016 | 914,550 |  |

Table 3: Historic fossil fuel consumption in the aluminum dross recycling plant

##### B.5. Demonstration of additionality

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

The proposed project activity is a micro-scale project that consists of switching of fuel and therefore does not fall under the positive list mentioned in TOOL 32 “Positive list of technologies”.

**Step** **1: Identification of alternatives to the project activity consistent with current laws and regulations**

The baseline scenarios considered in this section refer to possible energy matrixes that could be adopted in the absence of the project activity. The alternative baseline scenarios are identified below and will be further explained in this section:

1. Continuation of the current practice of using HFO or other high carbon emitting fuel
2. Switching from HFO or other high carbon emitting fuel to biomass

All considered alternatives are in compliance with current applicable laws and regulations.

Therefore, in order to demonstrate additionality for this project, the tool, TOOL 21- Demonstration of additionality for small-scale project activities shall be used. As per paragraph 5 of the tool, project participants shall provide an explanation as to show that the project activity would not have occurred anyway due to at least one of the following barriers:

(a) Investment barrier:

(b) Technological barrier;

(c) Barrier due to prevailing practice

(d) Other barriers:

**Step 2: Investment Analysis**

JTS will have to show that a financially more viable alternative to the project activity would have led to higher emissions. As per the guidelines on the assessment of investment analysis, the use of investment analysis to demonstrate additionality is intended to assess whether or not a reasonable investor would decide to proceed with a particular project activity without the benefits of the CDM.[[1]](#footnote-1)

**Sub-Step 2a: Determine appropriate analysis method**

According to paragraph 19 of the “Guidance on the Assessment of Investment Analysis”, if the proposed baseline scenario leaves the project participant no other choice than to make an investment to supply the same products or services, a benchmark analysis is not appropriate and an investment comparison analysis shall be used.

**Sub-Step 2b: Option II. Apply investment comparison analysis**

According with the “Tool for the Demonstration and Assessment of Additionality (Version 07.0)” the financial indicator for the analysis will be the Project IRR, and it will be compared with the cost of capital.

With reference to the Methodological Tool – Investment Analysis (version 10.0), wherein the cases of projects which could be developed by an entity other than the project participant the benchmark should be based on parameters that are standard in the market.

Additionally, if the benchmark is based on parameters that are standard in the market, then the typical debt/equity finance structure observed in the sector of the country should be used. As such information is not readily available in Malaysia, 50% debt and 50% equity financing will be assumed as a default.

**Sub-step 2c: Calculation and comparison of financial indicators**

Financial indicator calculations will be done using a financial model based on a list of economic parameters provided by the CPA implementing agency and in accordance with Methodological tool “Investment analysis”. This list of parameters as applicable would include the following:

|  |  |  |
| --- | --- | --- |
| Details Input Parameters of the Project Activity (NERADOs) | | Source of Information |
| Start date of Project Activity | 27/06/2019 | PAI-DD |
| Location of Project Activity | Malaysia | PAI-DD |
| Annual Energy Required for Operations (MWh) | 9.45MWh | Project Data Sheet |
| Cost of HFO (RM/MT) | 2,393 | Project Data Sheet |
| Cost of NERADOs (RM/MT) | 3,748.50 | Project Data Sheet |
| Financial Parameters | |  |
| Total Cost of Project (RM) | 361,866 | Project Data Sheet |
| Loan Amount (%) | 0 | N/A |
| Equity (%) | 100 | Project Data Sheet |
| Income Tax | |  |
| Financial Year | 2019 | Project Data Sheet |
| Income Tax Rate (%) | 24 | https://taxsummaries.pwc.com/malaysia/corporate/taxes-on-corporate-income |
| VAT (%) | 0 | N/A |
| Service Tax (%) | 0 | N/A |
| Operation and maintenance cost | |  |
| Annual O&M Cost (RM/yr) | 1,341,611 | Project Data Sheet |
| O&M Depreciation Rate | 0.97% | https://www.statista.com/statistics/319033/inflation-rate-in-malaysia/ |

In this Project, JTS has had to use an additional 8% of NERADO oil in order to generate the same volume of energy production.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Fuel Type** | **Fuel Energy Density**  **(kJ/MT)** | **Volume of Fuel Required**  **(MT)** | **Average Energy Consumption per Year [[2]](#footnote-2)**  **(kJ)** | **Source of Information** |
| HFO | 0.000041[[3]](#footnote-3) | 994.18 | 0.0408 | Project Data Sheet |
| NERADOs | 0.000038[[4]](#footnote-4) | 1,073.68 | 0.0408 | Project Data Sheet |

The average cost per unit (MT) of using NERDADO oil is also higher than that of HFO.

Average Cost of HFOs and NERADOs:

|  |  |  |
| --- | --- | --- |
| **Fuel Type** | **Average Cost of Fuel**  **(RM/MT)** | **Source of Information** |
| HFO | 2,393 | Project Data Sheet, Calculated Figure |
| NERADOs | 3,748.50[[5]](#footnote-5) | Malaysian Palm Oil Board (Daily Price of Crude Oil) |

The cost per unit (MT) of using NERADO oil ranges up to RM 3,748.50 per MT whereas the cost for using HFO is RM 2,393 per MT.

From the table above, it can be concluded that NERADOs tend to cost 56.64% more than HFOs. Therefore, using HFO is financially more viable however the emission released from using HFO are significantly more than the emissions from using Non-edible Raw Agriculture Derived Oil.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Fuel Type** | **Volume of Fuel Required**  **(MT)** | **Average Cost of Fuel**  **(RM/MT)** | **Annual Fuel Consumption Cost**  **(RM)** | **Source of Information** |
| HFO | 994.18 | 2,393 | 2,379,072.74 | Project Data Sheet, Calculated Figure |
| NERADOs | 1,073.68 | 3,748.50[[6]](#footnote-6) | 4,024,689.48 | Project Data Sheet, Calculated Figure |

Coupled with the need for the 8% increase in fuel consumption by NERADOs, this fuel switch would cost JTS **RM 1,645,616.74**. This is an overall increase of **69.2%** in cost for fuel alone.

Factoring this additional cost into a simple investment analysis, the following outcomes were derived:

|  |  |
| --- | --- |
| **Project Consideration** | **IRR (%)** |
| 100% HFO Operations (Baseline) | 3.919% |
| 100% NERADOS Operations (Project) | 3.380% |

**Outcome of Sup-step 2c:**

From the analysis above, 100% HFO Operations will have a higher IRR as compared to 100% NERADOS Operations. As such, it is justified that 100% HFO Operations are a financially more viable alternative to the project activity. However, this would have led to higher emissions.

**Sub-Step 2d: Sensitivity Analysis**

A sensitivity analysis was performed in order to evaluate if there’s any possible scenario where the project can be economically feasible for JTS investment decision criteria without considering CER’s revenue.

In the Guidance on the Assessment of Investment Analysis, paragraph 20 mentions the following:

*Only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation (all parameters varied need not necessarily be subjected to both negative and positive variations of the same magnitude).*

For the last paragraph, we conclude the following variables in the sensitivity analysis:

* + 1. Investment: The paragraph mentions that the investment cost should be included in the sensitivity analysis.
    2. Fossil fuel prices: This cost represents the baseline fuel energy cost that will be generated in absence of project activity as a default activity.
    3. Biomass fuel prices: This cost represents the project fuel energy cost that will be generated during project activity due to fossil fuel displacement.

The financial indicator fluctuates are presented below:

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameters** | **Variation (%)** | | |
| **-10%** | **0%** | **10%** |
| Cost of HFOs | 4.00% | 3.38% | 3.84% |
| Cost of NERADOs | 3.51% | 3.38% | 3.25% |
| Project Investment Cost | 4.57% | 3.38% | 2.35% |
| Benchmark | 9.31%[[7]](#footnote-7) | | |

**Outcome of Sub-Step 2d:**

A scenario in which fossil fuels prices increase significantly without affecting biomass residues prices is not realistic. This is mainly because biomass residues final cost is related to the fossil fuels cost. The biomass residues cost is comprising of several factors such as collection, preparation, transportation, etc. As a result, it is not plausible a scenario in which fossil fuels prices increase without affecting biomass residues price.

A scenario in which biomass residues prices decrease significantly is also not realistic. This would imply that other costs independent from biomass residues transportation would have to be reduced enormously; however, since these activities involve manpower and in some cases fossil fuels or electricity consumption, the trend of this cost is to be increased at least by the inflation rate in the country which is expected to be around [0.97%] by the start of the project activity.

**Outcome of Step 2:**

The additionality of the project activity has been clearly demonstrated based on the Investment analysis.

In conclusion, the project is in accordance with the requirements of this step, and it’s demonstrated that the project’s activity is additional; this conclusion is supported by the following:

* In the investment analysis whereby, it is justified that 100% HFO Operations are a financially more viable alternative to the project activity.

* In the sensitivity analysis the variable that has the most remarkable impact on the project’s IRR are the fossil fuel and biomass fuel prices. However, it is clearly demonstrated that in the most positive scenario when the biomass price is decreased by 10%, the project’s IRR is still clearly below the benchmark.

In conclusion, the development of the project activity without the carbon credits incentive does not represent an attractive investment alternative.

**Barrier Analysis:**

Project proponents can use either investment analysis or barrier analysis step. As project proponents already apply the investment analysis it is not required to elaborate on barriers analysis.

**Common Practice Analysis:**

The latest version 03.1 of the CDM methodological tool Common practice is applied:

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

Due to the nature of the project activity, the energy output range of the project activity will be used. The net quantity of electricity consumed from the grid is calculated as 9.45MWh per year.

As such, the +/-50% range will be 4.73MWh – 14.18MWh per year.

**Step 2:** Identify similar projects (both CDM and non-CDM) which fulfil all the following conditions:

|  |  |
| --- | --- |
| **Applicability Criteria** | **Project Common Practice Applicability** |
| (a) The projects are located in the applicable geographical area; | Malaysia |
| (b) The projects apply the same measure as the proposed project activity; | Fuel-Switch |
| (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; | NERADOs or a less pollutive fuel |
| (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 in which the projects are implemented will produce goods or services with comparable quality, properties and applications areas as the proposed project plant. |
| (e) The capacity or output of the projects is within the applicable capacity or output range calculated in Step 1; | 4.73MWh – 14.18MWh per year |
| (f) The projects started commercial operation before the project design document (CDM-PDD) is published for global stakeholder consultation or before the start date of proposed project activity, whichever is earlier for the proposed project activity. | 27/06/2019[[8]](#footnote-8) |

Based on… there are no similar projects in Malaysia that falls within the above specifications.

**Step 3:** Within the projects identified in Step 2, identify those that are neither registered CDM project activities, project activities submitted for registration, nor project activities Undergoing validation. Note their number Nall.

Nall = 0

**Step 4:** Within similar projects identified in Step 3, identify those that apply technologies that are different to the technology applied in the proposed project activity. Note their number Ndiff.

Ndiff = 0

**Step 5:** Calculate factor F=1-Ndiff/Nall 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.

F = 1 – Ndiff / Nall

= 1 - (0/0)

= 0

As the value for Factor F is less than 0.2 and Nall - Ndiff = 0 less than 3, according to the methodological tool, the proposed project activity cannot be considered as a common practice within an energy generation sector in the applicable geographical area.

**Outcome of Common Practice Analysis:**

Step 5 is satisfied, i.e., the proposed project activity is not regarded as “common practice”. In conclusion of the overall additionality demonstration, the proposed project activity is deemed additional.

B.5.1 Prior Consideration

Project activity is a retroactive PA, and would have been registered as a project activity, however the registration of the PA and conducting of the Local Stakeholder consultation was held back due to COVID-19 restrictions in the host country.

A deviation request was requested for and approved of, and has been made available on the platform.

B.5.2 Ongoing Financial Need

N/A

##### B.6. Sustainable Development Goals (SDG) outcomes

Relevant Target/Indicator for each of the three SDGs

|  |  |  |
| --- | --- | --- |
| Sustainable Development  Goals Targeted | Most relevant  SDG Target | SDG Impact |
| **Indicator (Proposed or SDG Indicator)** |
| 3 Good Health and Well-Being | **Target 3.9**  Integrate climate change, measures into national policies, strategies and planning | Emission reductions in tCO2e |
| 8 Decent Work and Economic Growth | **Target 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.  The project activity will provide job opportunities for all locals during project implementation and monitoring activities irrespective of gender or any other status. Equal pay for work of equal value will be made to both men and women. | 8.5.1 Average hourly earnings of female and male employees, by occupation, age and persons with disabilities |
| 13 Climate Action  (mandatory) | **Target 13.2[[9]](#footnote-9)**  By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination | Reduction in particulate matter (PM) levels |

B.6.1 Explanation of methodological choices/approaches for estimating the SDG Impact

**SDG 3-Good Health and Well-Being**

The implementation of the project activity will reduce the amount of air pollution (Particulate Matter) being released into the atmosphere/working environment. This is because burning of NERADO biomass is less pollutive than burning Heavy Fuel Oil. Hence, the health and well-being of the facility workers are better protected.

In order to ascertain the improvement in working conditions and the health of people working in the facility, the contribution baseline estimation and project estimation to SDG 3 will be quantified by the reduction in PM levels (mg/m3) that is released into the atmosphere from the chimney furnace. This will be the difference between total PM levels in the baseline (PMbaseline) and in project scenario (PMproject).

**SDG 8- Decent Work and Economic Growth**

|  |  |  |
| --- | --- | --- |
| **Project monitoring indicator** | **Baseline outcome** | **Project outcome** |
| 1) Number of males and females employed by the project. | In the baseline situation, no new jobs were created. Therefore, the baseline outcome is 0. | In project situations, the number of jobs created for males and females will be recorded. Source of data is a record keeping book and it will be cross checked by the labor contracts. |
| 2) Average monthly salary. | The average monthly salary will be determined by the record keeping book and cross checked by the salary slips. |

Net benefit of SDG8=Project outcome of SDG8 – Baseline outcome of SDG8

**SDG 13-Climate Action**

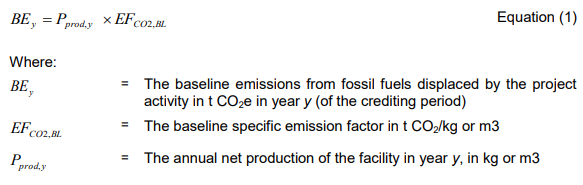
**Baseline emissions**

Project activities resulting in an annual emission reduction of less than 20 kt CO2 may apply Option 1 for baseline emissions calculations, whereas projects exceeding 20 kt CO2 shall apply Option 2.

The proposed project activity has annual emission reductions equivalent to 2,991.1 tons; therefore, baseline emissions are calculated using Option 1.

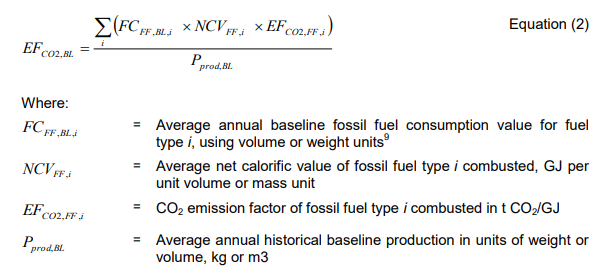
Option 1

As per paragraph 22, for projects that involve replacing, modifying or retrofitting systems in existing facilities, the average of the immediately prior three-year historical fossil fuel consumption data, for the existing facility, shall be used to determine an average annual baseline fossil fuel consumption value. Similarly, prior three-year historical production data (excluding abnormal years) for the existing facility, shall be used to determine an average annual historical baseline output production rate.



|  |  |  |
| --- | --- | --- |
| **Parameter** | **Value** | **Source of Information** |
| **Pprod,y** | 4,107,030 kg | Product Data Sheet (2018) |
| **EF CO2,BL** | 0.0007497 tCO2/kg | Calculated |
| **therefore BEy** | 4,107,030 \* 0.0007497 | Calculated |
| **= 3,079.082 tCO2e** |

The baseline specific emission factor (EFCO2,BL ) can be calculated ex ante as follows:



|  |  |  |
| --- | --- | --- |
| **Parameter** | **Value** | **Source of Information** |
| **FCFF,BL,i** | 951,708.61 kg | Calculated |
| **NCV FF,i** | 41.8 MJ/kg  = 0.0418 GJ/kg | https://www.engineeringtoolbox.com/fuels-higher-calorific-values-d\_169.html |
| **EF CO2,FF,i** | 77.4 kg CO2/GJ  = 0.0774 t CO2/GJ | IPCC data |
| **P prod,BL** | 4,107,030 kg | Product Data Sheet (2018) |
| **therefore EFCO2,BL** | **= 0.0007497 tCO2/kg** | Calculated |

**FCFF,BL,i** is the Average annual baseline fossil fuel consumption value for fuel type i, using volume or weight units, and is derived from the follow year’s average:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Year** | | | | | |
| **2016** | **Unit** | **2017** | **Unit** | **2018** | **Unit** |
| 914,550 | Litres | 1,029,210 | Litres | 928,600 | Litres |

From the above table, the average fuel consumption for fuel type i is:

( 914,550 litres + 1,029,210 litres + 928,600 litres) / 3 years = 957,453.33 litres/yearaverage

**FCFF,BL,i =** 957,453.33 liters/year

**Conversion:** 957,453.33 liters \* 0.994 kg/L

**= 951,708.61kg**

As such,

EFCO2,BL = (951,708.61kg x 0.0418 GJ/kg x 0.0774 tCO2/GJ) / 4,107,030 kg

**= 0.0007497 tCO2/kg**

**Project Emissions**

Project emissions can be calculated as per paragraph 33, equation (9):

Text, letter

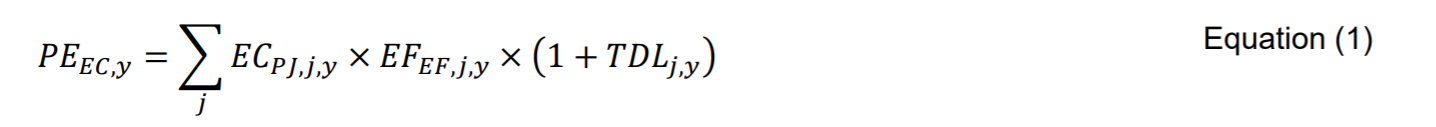
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In this project activity, as the transport distance is less than 200km, PEtransport,y = 0. The biomass is not sourced from dedicated plantations, hence PEcultivation,y = 0. The project activity does not involve the production of charcoal in kilns, hence PECH4,y = 0. There is no increased usage of fossil fuel consumption, hence PEfossilfuel,y = 0.

As such, the above equation is simplified to:

Project emissions from electricity consumption

As per the methodological tool “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” PEelec,y can be calculated as such:



Determination of TDLj,y

In this situation, the electricity is being consumed from the grid, as such Scenario C: Electricity consumption from the grid, specifically ‘Case C.I: Grid electricity’ applies. As such, according to the methodological tool, a default value of 20% for TDLj,y for project electricity consumption sources is applicable for Case C.I (Data/Parameter table 3)

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Value** | **Source of Information** |
| **ECPJ,j,y**  (qty of electricity consumed in biomass processing) | 9.45 MWh |  |
| **EFef,j,y**  (Emission factor for electricity generation for source.) | 0.585 tCO2/MWh | Calculated |
| **TDLj,y** | 20% default value from meth. tool 05 | Default Value |
| **therefore PEelec,y** | 9.45 MWh \* 0.585 \* (1+0.2) | Calculated |

**As such,**

**PEelec,y=** 9.45 MWh x 0.585 tCO2/MWh x (1+0.2)

**= 6.634 tCO2**

Determination of EFEF,j,y = EFgrid,CM,y

As per methodology, combined margin CO2 emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (tCO2/MWh), Version 07.0. In this tool, EFEF,j,y is the same as EFgrid,CM,y.

The combined margin (EFgrid,CM,y) is the result of a weighted average of two emission factors pertaining to the electricity system: the operating margin (OM) and build margin (BM). Calculations for this combined margin must be based on data from an official source, such as from the country’s Electricity Regulatory Authority.

**As per the "Tool to calculate the emission factor for an electricity system" Version 07.0, EB 87, Annex 9, the following steps have been followed.**

**STEP 1: Identify the relevant electricity power systems**

STEP 2: Determine boundary of calculation in the project electricity system

STEP 3: Select a method to determine the operating margin (OM);

STEP 4: Calculate the operating margin emission factor according to the selected method.

STEP 5: Calculate the build margin (BM) emission factor;

STEP 6: Calculate the combined margin (CM) emission factor.

The tool defines that “for determining the electricity emission factors, identify the relevant electricity system. Similarly, identify any connected electricity systems”.

**STEP 2: Determine boundary of calculation in the project electricity system**

Project participants have the option of choosing between the following two options to calculate the operating margin and build margin emission factor:

**Option I:** Only grid power plants are included in the calculation.

**Option II:** Both grid power plants and off-grid power plants are included in the calculation.

The Project Participant has chosen only grid power plants in the calculation.

**STEP 3: Select a method to determine the operating margin (OM) method**

The calculation of the operating margin emission factor (EFgrid,OM,y) is based on one of the following methods, which are described under Step 4:

(a) Simple OM, or

(b) Simple adjusted OM, or

(c) Dispatch data analysis OM, or

(d) Average OM.

The data required to calculate simple adjusted OM or Dispatch data analysis is not possible due to lack of availability of this activity data in the host parties within the PoA boundary. The choice of the other two options (a and d) for calculating the operating margin emission factor depends on specific conditions in the grid to which the CPA will export electricity. Depending on such conditions, either method (a) or method (d) could be used.

**Simple OM**

The “Simple operating margin” has been calculated as per the weighted average emissions (in tCO2/MWh) of all generating sources serving the system, excluding solar generation.

For the simple OM, and the average OM, the emissions factor can be calculated using either of the two following data vintages:

* **Ex-ante option:** If the ex-ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required.  
    
  **Or**
* **Ex-post option:** If the ex-post option is chosen, the emission factor is determined for the year in which the CPA displaces grid electricity, requiring the emissions factor to be updated annually during monitoring.

If PP choses the ex-ante option for the calculation of OM, 3 years’ worth of generation weighted average of the most recent years available at the time of submission of CDM-PoA-DD to the DOE for validation will be required. This parameter will be fixed for the first crediting period with no need to update.

OM determined at validation of CPA inclusion stage will be the same throughout the crediting period. There will be no requirement to monitor & recalculate the emission factor during the first crediting period.

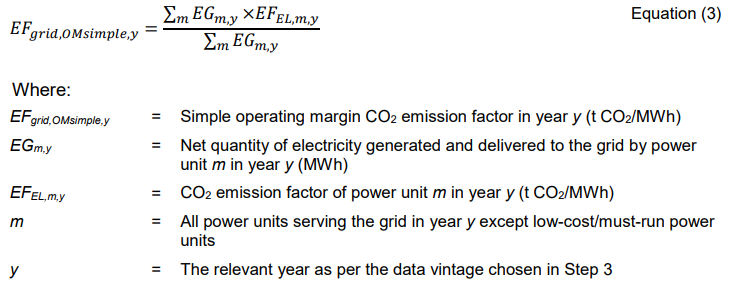
**Average OM**

The average OM emission factor (EFgrid,OM-ave,y) is calculated as the average emission rate of all power plants serving the grid, using the methodological guidance as described under (a) above for the simple OM, but including in all equations also low-cost/must-run power plants.

Option A (Simple OM method) should be preferred and must be used if fuel consumption data is available for each power plant / unit.

**STEP 4: Calculate the operating margin emission factor according to the selected method**

Under this option, the simple OM emission factor is calculated based on the net electricity generation of each power unit and an emission factor for each power unit, as follows:



As such, according to “2017 CDM Electricity Baseline for Malaysia” study by Malaysian Green Technology Corporation, the Operating Margin for peninsular Malaysia is listed as **0.644 tCO2/MWh**.

**STEP 5: Calculate the build margin emission factor (EFBM,y)**

BM is calculated ex-ante based on the most recent information available at the time of submission of CPA-DD and will be renewed at the end of every 7 year-period during the 3 renewable crediting periods.

In terms of vintage of data, project participants can choose between one of the following two options:

**Option 1.** For the first crediting period, calculate the build margin emission factor ex-ante based on the most recent information available on units already built for sample group m at the time of CDM-PDD submission to the DOE for validation. For the second crediting period, the build margin emission factor should be updated based on the most recent information available on units already built at the time of submission of the request for renewal of the crediting period to the DOE. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used. This option does not require monitoring the emission factor during the crediting period.

**Option 2.** For the first crediting period, the build margin emission factor shall be updated annually, ex-post, including those units built up to the year of registration of the CPA or, if information up to the year of registration is not yet available, including those units built up to the latest year for which information is available. For the second crediting period, the build margin emissions factor shall be calculated ex-ante, as described in option 1 above. For the third crediting period, the build margin emission factor calculated for the second crediting period should be used.

The build margin emissions factor is the generation-weighted average emission factor (tCO2/MWh) of all power units m during the most recent year y for which power generation data is available, calculated as follows:

Graphical user interface, text, application

Description automatically generated

The CO2 emission factor of each power unit m (EFEL,m,y) should be determined as per the guidance in step 3 (a) for the simple OM, using for ‘y’ the most recent historical year for which power generation data is available, and using for ‘m’ the power units included in the build margin.

As such, according to “2017 CDM Electricity Baseline for Malaysia” study by Malaysian Green Technology Corporation, the Build Margin for peninsular Malaysia is listed as **0.525 tCO2/MWh**.

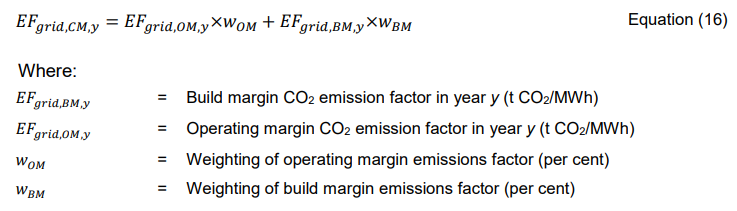
**STEP 6: Calculate the combined margin (CM) emissions factor**

**Combined Margin –** The combined margin is the weighted average of the simple OM and the BM. For intermittent and non-dispatchable generation types such as solar photovoltaic, the Tool to calculate the emission factor for an electricity system, Version 05.0.0, EB 87, Annex 9, allows to weigh the OM and the BM.

The baseline emission factor is calculated using the combined margin approach as described in the following steps:

**Calculation of Baseline Emission Factor**

The baseline emission factor EFgrid,CM,y is calculated as the weighted average of the Operating Margin emission factor (EFOM,y) and the Build Margin emission factor (EFBM,y):



As the project activity is neither a Wind of Solar PV project, wOM = 0.5 and wBM = 0.5 for the first crediting period.

Therefore, the calculation of the Combined Margin is:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| EFgrid,CM,y | = | EFgrid,OM,y | x | wOM | + | EFgrid,BM,y | x | wBM |
|  | = | 0.644 | x | 0.5 | + | 0.525 | x | 0.5 |
|  | = | 0.322 | + | 0.263 |  |  |  |  |
|  | = | **0.585** | **tCO2/MWh** | | |  |  |  |

**Leakage**

As per Tool 22: Leakage in biomass in small-scale project activities, the relevant source of emission for the project activity is competing uses of biomass (Section 5.5, Paragraph 22). It is stated that:

“The project participant shall evaluate ex ante if there is a surplus of the biomass in the region of the project activity, which is not utilized. If it is demonstrated (e.g., using published literature, official reports, surveys etc.) at the beginning of each crediting period that the quantity of available biomass in the region (e.g., 50 km radius), is at least 25% larger than the quantity of biomass that is utilized including the project activity, then this source of leakage can be neglected otherwise this leakage shall be estimated and deducted from the emission reductions.”

Similarly, according to the Gold Standard Renewable Energy Requirements/Community Service Activity Requirements:

“Project activities expected to make use of biomass resources already in use shall NOT be eligible for Gold Standard registration unless convincing evidence is provided to demonstrate that the current users agree with the envisioned shift of use (potential leakage associated to such a shift must be taken into account). In the absence of such an agreement, Project Developers shall demonstrate that their project activity makes use of surplus biomass for each type of biomass resources used”

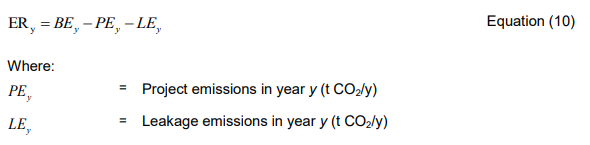
As such, JTS consumes about 1,080 metric tons of NERADO oil per annum. Assuming NERADO is made up of 100% crude palm oil (CPO), the average monthly production of CPO is 1,654,864 tons and this works out to 19,858,368 tons in the year 2019, for the whole of Malaysia.[[10]](#footnote-10) As such, JTS’ consumption of 1080 tons is 0.00543% of Malaysia total output on a yearly average.

If specific to region or the state of Johor (where the project activity is located), Johor produced a total of 4,000,921 tons in 2019[[11]](#footnote-11). As such, JTS’ consumption is 0.0275% of Johor’s output in 2019.

As such, the available biomass in the region is at least 25% larger than the quantity of biomass used in this project activity, and there is a surplus of biomass available in the region and country. There is no diversion of biomass from existing uses or those already in use.

**Emission reductions**

Emission reductions in year y (ERy) are calculated as follows:



As such,

**ERy =** 3,079.082 tCO2 - 6.634 tCO2 - 0 tCO2

**= 3,072.45 tCO2/y**

B.6.2 Data and parameters fixed ex ante  **SDG13**

|  |  |
| --- | --- |
| Data/parameter | TDLj,y |
| Unit | % |
| Description | Average technical transmission and distribution losses for providing electricity to source j |
| Source of data | In case of scenario B and scenario C, case C.II, assume TDLj/k/l,y = 0 as a simplification. In case of other scenarios (scenario A and scenario C, cases C.I and C.III), choose one of the following options:    1. Use annual average value based on the most recent data available within the host country;  2. Use as default values of 20% for:  (a) project or leakage electricity consumption sources;  (b) baseline electricity consumption sources if the electricity consumption by all project and leakage electricity consumption sources to which scenario A or scenario C (cases C.I or C.III) applies is larger than the electricity consumption of all baseline electricity consumption sources to which scenario A or scenario C (cases C.I or C.III) applies;  3. Use as default values of 3% for:  (a) baseline electricity consumption sources;  (b) project and leakage electricity consumption sources if the electricity consumption by all project and leakage electricity consumption sources to which scenario A or scenario C (cases C.I or C.III) applies is smaller than the electricity consumption of all baseline electricity consumption sources to which scenario A or scenario C (cases C.I or C.III) applies |
| Value(s) applied | 20 |
| Choice of data or Measurement methods and procedures | As the electricity consumed is from the grid, option 2 above (default value of 20%) is chosen for TDLj,y |
| Purpose of data | To estimate Project Emissions from electricity consumption |
| Additional comment | NIL |

**SDG3**

|  |  |
| --- | --- |
| Data/parameter | PMbaseline |
| Unit | mg/m3 |
| Description | Amount of PM released in the baseline scenario where HFO as used |
| Source of data | In-built sensor equipment on chimney of furnace where the fuel-switch is occurring |
| Value(s) applied | 13 |
| Choice of data or Measurement methods and procedures | *Measured once prior to fuel-switch occuring, when HFO was the fuel being used in the furnace.* |
| Purpose of data | *Baseline of SDG 3* |
| Additional comment | *NIL* |

**SDG13**

|  |  |
| --- | --- |
| Data/parameter | NCVFF,i |
| Unit | GJ/tonne |
| Description | Average net calorific value of fossil fuel type i combusted, GJ per unit volume or mass unit |
| Source of data | 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 1, Table 1.2, Residual Fuel Oil  https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2\_Volume2/V2\_1\_Ch1\_Introduction.pdf |
| Value(s) applied | 40.4 |
| Choice of data or Measurement methods and procedures | Heavy fuel oil falls under the category of Residual Fuel Oil |
| Purpose of data | To estimate Baseline CO2e Emissions |
| Additional comment | NIL |

B.6.3 Ex ante estimation of SDG Impact

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/N** | **Sustainable Development Goal (SDG)** | **Implementation Method** | **Ex-Ante Parameters** | **Justification and Quantitative Indicator** |
| 1 | SDG 3 – Good Health and Well Being | The project activity will reduce the amount of air pollution (Particulate Matter) being released into the atmosphere/working environment.  This will be quantified by the reduction in PM levels that is released into the atmosphere from the chimney furnace. This will be the difference between PM levels in the baseline (PMbaseline) and in project scenario (PMproject) | PMbaseline  PMProject | The quantitative indicator is the difference of Particulate Matter in the baseline and project scenario.  This information may be referred to in the 3rd Party PM Report, provided by JTS and issued by ENVILAB SDN. BHD. |
| 2 | SDG 8: Decent Work and Economic Growth | Number of males and females employed by the project will be reported for each monitoring period based on keeping book and be cross checked by the labor contracts and training records of employees. For ex ante estimation, 18 jobs are created including 9 males and 9 females. | For ex ante estimation, average monthly salary is XXX RM/person with equal salaries for men and women in the same post. The actual average monthly salary will be determined by the record keeping book and cross checked by the salary slips. | |
| 3 | SDG 13 – Climate Action | The implementation of the project activity contributes to SDG 13, by ensuring that there is sustainable management and efficient use of natural resources. This can be quantified and measured by the volume amount of HFO that is being avoided from being used in the furnace of the facility each year. This HFO fuel is replaced with NERADO oil. | Pprod,y, EFCO2,FF,I, FCFF,BL,I and ECelec,y | The calculation and justification of this indicator will be elaborated on in the section below. |

B.6.4 Summary of ex ante estimates of each SDG Impact

**SDG 3 – Good Health and Well-Being**

|  |  |  |  |
| --- | --- | --- | --- |
| Year | Baseline estimate | Project estimate | Net benefit |
| Year 1 | 13 | 5 | 8 |
| Year 2 | 13 | 5 | 8 |
| Year 2 | 13 | 5 | 8 |
| Year 4 | 13 | 5 | 8 |
| Year 5 | 13 | 5 | 8 |
| Year 6 | 13 | 5 | 8 |
| Year 7 | 13 | 5 | 8 |
| Year 8 | 13 | 5 | 8 |
| Year 9 | 13 | 5 | 8 |
| Year 10 | 13 | 5 | 8 |
| **Total** | **80ppm** | | |
| Total Number of Crediting Years | 10 | | |

**SDG 8- Decent Work and Economic Growth**

|  |  |  |  |
| --- | --- | --- | --- |
| Year | Baseline estimate | Project estimate | Net benefit |
| Year 1 | 0 | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) |
| Year 2 | 0 | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) |
| Year 2 | 0 | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) |
| Year 4 | 0 | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) |
| Year 5 | 0 | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) |
| Year 6 | 0 | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) |
| Year 7 | 0 | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) |
| Year 8 | 0 | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) |
| Year 9 | 0 | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) |
| Year 10 | 0 | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) |
| **Total** | 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) | | |
| Total Number of Crediting Years | 10 | | |

|  |  |
| --- | --- |
| **Annual average over the crediting period** | **80ppm** |

**SDG 13 – Climate Action**

|  |  |  |  |
| --- | --- | --- | --- |
| Year | Baseline estimate | Project estimate | Net benefit |
| Year 1 | 3,079.08 | 6.634 | 3,072.45 |
| Year 2 | 3,079.08 | 6.634 | 3,072.45 |
| Year 2 | 3,079.08 | 6.634 | 3,072.45 |
| Year 4 | 3,079.08 | 6.634 | 3,072.45 |
| Year 5 | 3,079.08 | 6.634 | 3,072.45 |
| Year 6 | 3,079.08 | 6.634 | 3,072.45 |
| Year 7 | 3,079.08 | 6.634 | 3,072.45 |
| Year 8 | 3,079.08 | 6.634 | 3,072.45 |
| Year 9 | 3,079.08 | 6.634 | 3,072.45 |
| Year 10 | 3,079.08 | 6.634 | 3,072.45 |
| **Total** | **30,790.8** | | |
| Total Number of Crediting Years | 10 | | |

|  |  |
| --- | --- |
| **Annual average over the crediting period** | **30,790.8** |

##### B.7. Monitoring plan

B.7.1 Data and parameters to be monitored

**SDG 3**

|  |  |
| --- | --- |
| Data / Parameter | PMproject |
| Unit | mg/m3 |
| Description | Amount of PM released once project activity/fuel switch has been implemented |
| Source of data | In-built sensor equipment on chimney of furnace where the fuel-switch is occurring. Also by 3rd party accredited labs that will do mandatory quarterly stage emissions monitoring |
| Value(s) applied | To be measured |
| Measurement methods and procedures | Sensor equipment that continuously records PM levels, which is then automatically recorded in a computerized system for record keeping and validation. |
| Monitoring frequency | Continuously, quarterly |
| QA/QC procedures |  |
| Purpose of data | To estimate project contribution to SDG 3 |
| Additional comment | NIL |

**SDG 13**

|  |  |
| --- | --- |
| Data / Parameter | Pprod,y |
| Unit | tons/year |
| Description | The annual net project production of the element process*i* in year *y* |
| Source of data | Invoices/receipts, inventory records |
| Value(s) applied | 9,186.23 |
| Measurement methods and procedures | Measurement results shall be cross-checked with records for sold production (e.g. invoices/receipts), inventory records and by performing mass measurements using annually 3rd party Calibrated weigh bridge. |
| Monitoring frequency | Monthly and Yearly |
| QA/QC procedures |  |
| Purpose of data | Estimation of CO2e emission reductions |
| Additional comment |  |

|  |  |
| --- | --- |
| Data / Parameter | EFCO2,FF,i |
| Unit | t CO2/GJ |
| Description | CO2 emission factor of fossil fuel type i combusted |
| Source of data | 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Chapter 2, Table 2.2, Residual Fuel Oil  https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2\_Volume2/V2\_2\_Ch2\_Stationary\_Combustion.pdf |
| Value(s) applied | 0.0774 |
| Measurement methods and procedures | NIL |
| Monitoring frequency | NIL |
| QA/QC procedures | NIL |
| Purpose of data | Estimation of CO2e emission reductions |
| Additional comment |  |

|  |  |
| --- | --- |
| Data / Parameter | FC,FF,BL,i |
| Unit | tons |
| Description | Average annual baseline fossil fuel consumption value for fuel type i, using volume or weight units |
| Source of data | Based on average of the immediately prior three-year historical fossil fuel consumption data, as recorded from receipts/invoices for fossil fuel (Heavy fuel oil) purchases |
| Value(s) applied | 957.45 |
| Measurement methods and procedures | NIL |
| Monitoring frequency | NIL |
| QA/QC procedures | NIL |
| Purpose of data | Estimation of CO2e emission reductions |
| Additional comment |  |

|  |  |
| --- | --- |
| Data / Parameter | ECPJ,j,y |
| Unit | MWh/y |
| Description | Quantity of electricity consumed in year y |
| Source of data | **Utility Bills from Tenaga (Malaysia power provider)** |
| Value(s) applied | 9.45 |
| Measurement methods and procedures | Measurements are undertaken using calibrated energy meters.  As per the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” |
| Monitoring frequency | Yearly |
| QA/QC procedures | NIL |
| Purpose of data | Calculation of Project Emissions |
| Additional comment | NIL |

|  |  |
| --- | --- |
| Data / Parameter | Number of males and females employed by the project |
| Unit | Number |
| Description | Jobs created for both female and male. |
| Source of data | Record keeping book and labor contract |
| Value(s) applied | Will be reported for each monitoring period. For ex ante estimation, 32 jobs created including 9 for females, 24 for males (with equal salaries for men and women) |
| Measurement methods and procedures | The number of jobs created for males and females will be recorded. Source of data is a record keeping book and it will be cross checked by the labor contracts. |
| Monitoring frequency | Once for each monitoring period. |
| QA/QC procedures | After the first verification, only changes in employees will be reported. The results will also be cross checked with training records of employees. |
| Purpose of data | To demonstrate contribution to SDG 8. |
| Additional comment | N/A |

|  |  |
| --- | --- |
| Data / Parameter | Average monthly salary |
| Unit | RM/Person |
| Description | This parameter states the payment conditions of the people employed within the project. Equal pay for work of equal value regardless of gender. |
| Source of data | Payroll |
| Value(s) applied | To be monitored and for ex ante estimation, the average monthly salary is XXX RM/person with equal salaries for men and women in the same post. The actual number of the data used in the monitoring periods will be monitored by Project proponents |
| Measurement methods and procedures | The average monthly salary will be determined by pay roll and cross checked by the labor contract. |
| Monitoring frequency | Monthly |
| QA/QC procedures | The results will also be cross checked with labor contracts. |
| Purpose of data | To demonstrate contribution to SDG 8. |
| Additional comment | N/A |

B.7.2 Sampling plan

Not Applicable

B.7.3 Other elements of monitoring plan

The sources of NERADO are from crops (coconut acid oil, crude palm oil and sludge palm oil from oil palm) that are integral to Malaysia’s agriculture practice. There is no special allocation of land for growing crops specific for JTS’ project use, and the croplands JTS were existent prior to this. JTS has designed their system to make sure they use what is available in the market without the need for land dedicated or re-purposed for their specific use in the project activity. JTS’ use for the project activity constitutes 0.00543% of Malaysia total output of CPO.

The four main producers are IOI, PGEO, Felda and Sime Darby of whom JTS (based in Pasir Gudang, Johor) get their Palm oil and palm oil by-product (SPO) from are all RSPO registered. PGEO, Felda and IOI are certified in Pasir Gudang while Sime Darby is in Selangor.

Any users (ie. JTS) of CPO or SPO must also be registered and must have a permit by Malaysia Palm Oil Board.

The RSPO Certification of the palm oil products producers/suppliers will be monitored annually.

**SDG 13 Climate Action**

The monitoring plan is developed in accordance with the modalities and procedures for CDM project activities and is proposed for the fuel switch project being implemented in Johor, Malaysia. The monitoring plan describes the monitoring organisation, parameters to be monitored, monitoring practices, quality assurance, quality control procedures, data storage and archiving.

The authority and responsibility for registration, monitoring, measurement, reporting and reviewing of the data results is with the CME. CME proposes the following structure for data monitoring, collection, data archiving and calibration of equipment for this project activity. The team comprises the following members.

Diagram

Description automatically generated

**Organizational structure for monitoring**

|  |  |
| --- | --- |
| **Designation** | **Responsibilities** |
| Head / Manager | ● Overall functioning and maintenance  ● Holds complete control over monitoring aspects pertaining to the project |
| Plant / Site In-Charge | Maintains the data records, reliability of data (calibration of equipment) and ensures completeness of data such as:  ● Recording  ● Verification  ● Storage of Data |
| Shift In-Charge / Site Engineer | Responsible for day-to-day maintenance of:  ● Data collection  ● Logbook for monitored data  ● Storage of Data |

**QA & QC Procedures to be followed**

All Incoming Raw Material, And Fuels Are Recorded By

* + - 1. Site Supervisor
      2. EHS Officer
      3. EHS supervisor
      4. Facility Specialist

**Data Recording and Storage**

The Shift In-charge and Plant In-charge will be responsible for recording and monitoring data (amount of soot levels, net production of aluminum products from the recycling facility etc), as well as maintaining the electronic database each month.

**SW 501 (Furnace Dust collector Ash) levels will be monitored by:**

**Production team site supervisor and production manager**

**EHS TEAM – EIMAS certified competent persons and assistant admin manager**

**Net production of aluminum ingots/products will be measured by :**

* + - 1. **Site assistant supervisor, factory production manager**
      2. **Admin and Finance department – admin head and admin assistant (EIMAS certified competent person)**

**Personnel training**

In order to ensure a proper functioning of the project activity and a proper monitoring of emission reductions, the staff will be trained. The Shift In-charge and Plant In-charge will be trained in equipment operation, data recording, operation and maintenance and all procedures in compliance with the monitoring plan

**Emergency preparedness**

The project activity will not result in any unidentified activity that can result in emissions from the project activity. Therefore, emergency preparedness in data monitoring is not required.

#### SECTION C. DURATION AND CREDITING PERIOD

##### C.1. Duration of project

C.1.1 Start date of project

The start date of the project is 27/06/2019.

This date has been determined as the start date for the Project in accordance with para 4.1.39 of the GS4GG Principle and Requirement which states that the Project Start date is the earliest date on which the project developer has committed to expenditures related to the implementation of the Project. As per this definition, the Project Start date is based on the date the first expenditure was made towards purchasing project equipment on June 27, 2019. This can be justified with the purchase order received.

C.1.2 Expected operational lifetime of project

20 Years

##### C.2. Crediting period of project

C.2.1 Start date of crediting period

27/06/2019

C.2.2 Total length of crediting period

As per para 5.1.1 (f) the project is limited to one Renewal i.e a total length of 10 years of crediting period.

#### SECTION D. SUMMARY OF SAFEGUARDING PRINCIPLES AND GENDER SENSITIVE ASSESSMENT

##### D.1 Safeguarding Principles that will be monitored

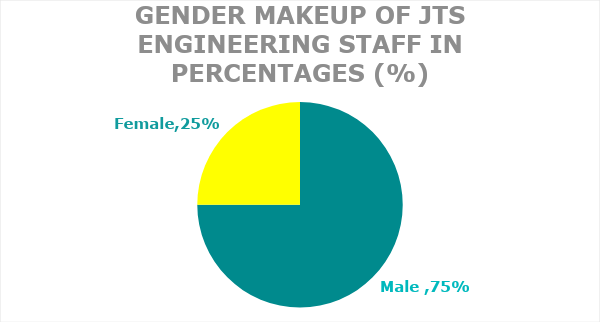
A completed Safeguarding Principles Assessment is in [Appendix 1](#_35nkun2).

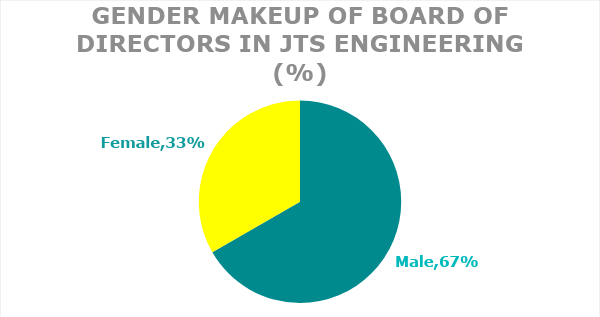
##### D.2. Assessment that project complies with GS4GG Gender Sensitive requirements

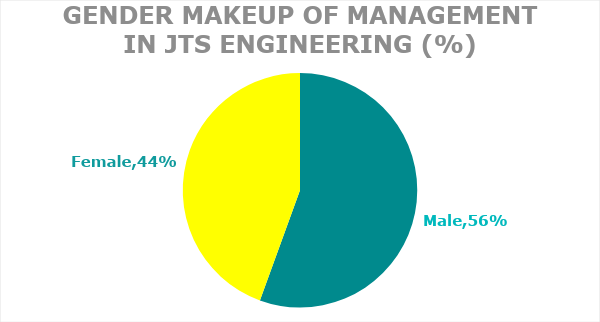
As per Gold Standard Gender Policy, “Foundational gender-sensitive requirement” a project must “do no harm “and should address safeguards to prevent or mitigate adverse impacts on women or men and girls and boys. The project will not discriminate against any gender and will mitigate adverse impact, if any, during the gender analyses.

This can be identified by JTS’s Organization and Gender Distribution Chart below:

|  |  |  |
| --- | --- | --- |
| **Diversity and Gender Breakdown of Staff at JTS Engineering** | | |
| **Race** | **Headcount** | **Percentage %** |
| **Chinese** | 5 | 15.63 |
| **Malay** | 6 | 18.75 |
| **Indian** | 9 | 28.13 |
| **Myanmarese** | 12 | 37.50 |
|  |  |  |
| **Gender** | **Headcount** | **Percentage %** |
| **Male** | 24 | 75 |
| **Female** | 8 | 25 |
|  |  |  |
| **Gender on Board of Director** | **Headcount** | **Percentage %** |
| **Male** | 2 | 66.6 |
| **Female** | 1 | 33.3 |
|  |  |  |
| **Gender in Management** | **Headcount** | **Percentage %** |
| **Male** | 10 | 55.6 |
| **Female** | 8 | 44.4 |







The project will also ensure gender-sensitive approaches in stakeholder consultation where equitable information sharing with women and men stakeholders will be upheld.

**Question 2 - Explain how the project aligns with existing country policies, strategies and best practices**

The project does not discriminate against gender and aligns itself with Malaysia’s existing policies on gender equality. Women are appointed to various decision-making levels either in the public or private sectors. In the Malaysian Constitution, protection of women is a concurrent matter under the Ninth Schedule whereby the federal and the state governments have legislative and executive powers to enact law and policies. The Malaysian Government, through the Ministry of Women, Family and Community Development, has established measures to elevate women in various sectors. All states in Malaysia have an executive councilor or Exco in charge of women affairs. [[12]](#footnote-12)Malaysia is also in the process of drafting its Gender Equality Bill, which seeks to level the economic playing field. A special task force was set a year ago for this purpose and includes the Foreign Ministry, Malaysian Islamic Development Department, academics, experts, and other stakeholders. This bill was proposed in line with Malaysia’s commitment to the Convention on Elimination of Discrimination Against Women (CEDAW) and includes salient features such as setting up of a Gender Equality Commission.

The project complies with existing policies and regulations on Gender Equality in Malaysia and has incorporated a robust Gender Equality Policy at an organisational level. The project does not discriminate on the basis of gender as mentioned in Article 8 (2) of the Federal Constitution. JTS also complies with the Code of Practice on the Prevention and Handling of Sexual Harassment in the Workplace enacted on 1 March 1999, which contains guidelines to employers on the establishment and implementation of in-house preventive and redress mechanisms to prevent and eradicate sexual harassment at the workplace.

**Question 3 - Is an Expert required for the Gender Safeguarding Principles & Requirements?**

The gender distribution charts, there is a good mix of both genders throughout the organization structure of JTS, therefore an Expert is not required for the Gender Safeguarding Principles & Requirements.

**Question 4 - Is an Expert required to assist with Gender issues at the Stakeholder Consultation?**

Similar to the reasoning above, there is no need for an Expert to assist with Gender issues at the Stakeholder Consultation.

#### SECTION E. SUMMARY OF LOCAL STAKEHOLDER CONSULTATION

The below is a summary of the 2 step GS4GG Consultation for monitoring purposes. Pleaserefer to the separate Stakeholder Consultation Report for a complete report on the initial consultation and stakeholder feedback round.

##### E.1 Summary of stakeholder mitigation measures

The stakeholders are defined as the public, including individuals (villagers in the vicinity), groups or communities (other institutions, NGO’s, etc), affected, or likely to be affected, by the proposed CDM project activity. Identified stakeholders were requested personally by the project proponent to participate in the stakeholder consultation meeting to discuss any potential concerns regarding the project activity. In this regard, an invitation letter comprising a brief summary of the project and the purpose of the said consultation was sent to the stakeholder 30 days before the stakeholder meeting and individual signature of the stakeholder was taken after reading the invitation to them in local language.

As such, the Local Stakeholder Consultation (LSC) was held on **31st May 2021** at JTS’s Offices as a ‘hybrid’ consultation, whereby participants could join the consultation both virtually and physically. During the consultation, participants were briefed on the project, the Gold Standard, as well as the importance of a local stakeholder consultation being held.

During the consultation, participants were able to comment and provide feedback on the project, and JTS was able to provide further explanation on how the project worked and affected stakeholders directly.

Comments that came in during the feedback portion of the LSC was all positive. An example of a few are as follows:

|  |  |
| --- | --- |
| **No.** | **Question** |
| **1** | How much HFOs have you consumed per month? How much of the HFOs are you converting to NERADO? What is the reduction rate? |
| **2** | What is the NOx and SOx reductions in PPM? |
| **3** | How is the modification on furnace or site done? |
| **4** | Is the project scalable? |
| **5** | What is the estimated amount of CO2 reduced in a year? |

The final attendance of the LSC was a total of 28 participants, with the following attendance breakdown:

* 10 Physical Participants
* 18 Virtual Participants

Of the 28 participants the gender breakdown is as follows:

* 13 Male
* 15 Female

There were no adverse comments received from the stakeholders and the net beneficial effects of the project activity was acknowledged by the stakeholders present. As all comments were very positive about the project, no further action is required.

##### E.2 Final continuous input / grievance mechanism

|  |  |
| --- | --- |
| Method | Include all details of Chosen Method (s) so that they may be understood and, where relevant, used by readers. |
| Continuous Input / Grievance Expression Process Book (mandatory) | A feedback portal has been set up on the JTS website to allow stakeholders that come in after the development of the project to give feedback throughout the crediting period of the project activity. |
| GS Contact (mandatory) | [help@goldstandard.org](mailto:help@goldstandard.org) |
| Other | info@jts.com.my |

### Appendix 1 - Safeguarding Principles Assessment

Complete the Assessment below and copy all Mitigation Measures for each Principle into [SECTION D](#17dp8vu) above. Please refer to the instructions in the [Guide to Completing](https://globalgoals.goldstandard.org/standards/TGuide-PreReview_V1.2-Project-Design-Document.pdf) this Form.

|  |  |  |  |
| --- | --- | --- | --- |
| **Assessment Questions/**  **Requirements** | **Justification of Relevance (Yes/potentially/no)** | **How Project will achieve Requirements through design, management or risk mitigation.** | **Mitigation Measures added to the Monitoring Plan (if required)** |
| **Principle 1. Human Rights** | | | |
| 1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights 2. The Project shall not discriminate with regards to participation and inclusion | No | The project respects internationally proclaimed human rights and is not complicit of human rights abuses of any kind as defined in the Universal Declaration of Human Rights. The project also does not discriminate with regards to participation and inclusion.  As detailed in section A.6, the project does not discriminate on the basis of gender nor does it discriminate on the basis of inclusion and participation. | N/A |
| **Principle 2.  Gender Equality** | | | |
| 1. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality and/or the situation of women 2. Projects shall apply the principles of non-discrimination, equal treatment, and equal pay for equal work 3. The Project shall refer to the country’s national gender strategy or equivalent national commitment to aid in assessing gender risks 4. (where required) Summary of opinions and recommendations of an Expert Stakeholder(s) | No | The Project Activity does not directly or indirectly reinforce gender-based discrimination and shall not lead or contribute to adverse impacts on gender equality and/or the situation of women in terms of:   1. Sexual harassment and/or any forms of violence against women. 2. Slavery, imprisonment, physical and mental drudgery, punishment or coercion of women and girls. 3. Restriction of women’s rights or access to resources.   The project will instead:   1. Recognize women’s ownership rights regardless of marital status – adopt project measures where possible to support women's access to inherit and own land, homes, and other assets or natural resources. (where applicable) 2. Apply the principles of non-discrimination, equal treatment, and equal pay for equal work. 3. Implement a Project, paid, volunteer work or community contributions will be organized to provide the conditions for equitable participation of men and women in the identified tasks/activities where applicable. 4. Introduce conditions that ensure the participation of women or men in Project activities and benefits based on pregnancy, maternity/paternity leave, or marital status. 5. Ensure that these conditions do not limit the access of women or men, as the case may be, to Project participation and benefits.   Section A.6 elaborates how the project activity keeps in mind women’s rights and ensures gender equality. | N/A |
| **Principle 3. Community Health, Safety and Working Conditions** | | | |
| 1. The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community | Yes | The project does not increase the health risks to the community and workers, but rather decreases the adverse effects. With reduced burning of heavy fuel oil fossil fuels, the level of smoke and soot is reduced, and this will lead to better health conditions for the workers and the community. | N/A |
| **Principle 4.1 Sites of Cultural and Historical Heritage** | | | |
| Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture? | No | The project activity does not include sites, structures or objects with historical, cultural, artistic, traditional or religious value or intangible forms of culture. | N/A |
| >> |
| **Principle 4.2 Forced Eviction and Displacement** | | | |
| Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)? | No | The fuel-switch/project activity takes place at an existing aluminum dross recycling facility in the designated Heavy industrial zone of Pasir Gudang, Malaysia. No additional land is needed and therefore does not require any change to land tenure arrangements and/or rights or evict peoples as the area is an industrial area with no residential buildings. Hence, there are also no indigenous people within the project area nor is the project located on land claimed by indigenous people.  Furthermore, the biomass/agriculture-derived oil is sourced from the residues of Empty Fruit Bunches of palm oil etc. of existing plantations, that does not require any expansion of land/plantation to obtain. | N/A |
| >> |
| **Principle 4.3 Land Tenure and Other Rights** | | | |
| Does the Project require any change, or have any uncertainties related to land tenure arrangements and/or access rights, usage rights or land ownership?  For Projects involving land use tenure, are there any uncertainties with regards to land tenure, access rights, usage rights or land ownership? | No | The fuel-switch/project activity takes place at an existing aluminum dross recycling facility in the designated Heavy industrial zone of Pasir Gudang, Malaysia. No additional land is needed and therefore does not require any change to land tenure arrangements and/or rights or evict peoples as the area is an industrial area with no residential buildings. Hence, there are also no indigenous people within the project area nor is the project located on land claimed by indigenous people.  Furthermore, the biomass/agriculture-derived oil is sourced from the residues of Empty Fruit Bunches of palm oil etc. of existing plantations, that does not require any expansion of land/plantation to obtain. | N/A |
| >> |
| **Principle 4.4 - Indigenous people** | | | |
| Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples? | No | The fuel-switch/project activity takes place at an existing aluminum dross recycling facility in the designated Heavy industrial zone of Pasir Gudang, Malaysia. No additional land is needed and therefore does not require any change to land tenure arrangements and/or rights or evict peoples as the area is an industrial area with no residential buildings. Hence, there are also no indigenous people within the project area nor is the project located on land claimed by indigenous people.  Furthermore, the biomass/agriculture-derived oil is sourced from the residues of Empty Fruit Bunches of palm oil etc. of existing plantations, that does not require any expansion of land/plantation to obtain. | N/A |
| >> |
| **Principle 5. Corruption** | | | |
| 1. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects | No | The Project will not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects  The suppliers of NERADO have established codes of conduct and anti-corruption policies set in place as part of each organization’s overarching corporate governance structure. | N/A |
| **Principle 6.1 Labour Rights** | | | |
| * 1. The Project Developer shall ensure that all employment is in compliance with national labour occupational health and safety laws and with the principles and standards embodied in the ILO fundamental conventions   2. Workers shall be able to establish and join labour organisations   3. Working agreements with all individual workers shall be documented and implemented and include:      1. Working hours (must not exceed 48 hours per week on a regular basis), AND      2. Duties and tasks, AND      3. Remuneration (must include provision for payment of overtime), AND      4. Modalities on health insurance, AND      5. Modalities on termination of the contract with provision for voluntary resignation by employee, AND      6. Provision for annual leave of not less than 10 days per year, not including sick and casual leave.   4. No child labour is allowed (Exceptions for children working on their families’ property requires an [Expert Stakeholder](https://globalgoals.goldstandard.org/glossary/) opinion)   5. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures | No | (a) The project developer ensures that there is no forced labour and all employment is in compliance with Malaysia’s Employment Act (1955), which states that “Contracts of service not to restrict rights of employees to join, participate in or organize trade unions”.  (b) All these rights are guaranteed to the worker according to local legislation i.e. Employment Act 1955.  (c) The prohibition of child labour in Malaysia rests in the [Children and Young Persons (Employment) Act 1966](http://www.agc.gov.my/agcportal/uploads/files/Publications/LOM/EN/Act%20350%20-%20Children%20and%20Young%20Persons%20(Employment)%20Act%201966.pdf). “*No child or young person shall be, or be required or permitted to be, engaged in any hazardous work, or any employment other than those specified in this section.”*  A child is defined as any individual younger than 15 years old. The exceptions are:   1. Light work in relation to family-run or family-owned businesses 2. Work in the field of public entertainment 3. Work that is sponsored by the government within a school or institution 4. Contracted apprenticeships that are approved by authorities   This project does not fall under these exceptions and will not hire any child labour. | N/A |
| **Principle 6.2 Negative Economic Consequences** | | | |
| * 1. Does the project cause negative economic consequences during and after project implementation? | No | The project will not cause any negative economic consequences on any vulnerable and marginalized social groups in targeted communities. | N/A |
| >> |
| **Principle 7.1 Emissions** | | | |
| Will the Project increase greenhouse gas emissions over the Baseline Scenario? | No | The Project will not increase emissions above the baseline, but rather reduce it by reducing the dependence on heavy fuel oil/fossil fuels | N/A |
| >> |
| **Principle 7.2  Energy Supply** | | | |
| Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users? | No | The project will not use energy from the local grid (i.e not connected to a national or regional grid), but use energy provided by the renewable biomass fuel source (crude palm oil/NERADO). Other uses of crude palm oil include making of Soap Noodles, which is not an energy supply-related use by locals. | N/A |
| >> |
| **Principle 8.1 Impact on Natural Water Patterns/Flows** | | | |
| Will the Project affect the natural or pre-existing pattern of watercourses, groundwater and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity? | No | The project does not have any impact on watercourses, watersheds, groundwater, or other water related issues. It is purely a fuel-switch project with no relation or disruption to water sources/bodies | N/A |
| >> |
| **Principle 8.2 Erosion and/or Water Body Instability** | | | |
| * + - * 1. Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion?         2. Is the Project’s area of influence susceptible to excessive erosion and/or water body instability? | No | The Project will not cause additional erosion directly or indirectly and/or water body instability or disrupt the natural pattern of erosion. | N/A |
| >> |
| **Principle 9.1  Landscape Modification and Soil** | | | |
| Does the Project involve the use of land and soil for production of crops or other products? | No | The Project does not involve land and soil for producing crops or other products | N/A |
| >> |
| **Principle 9.2 Vulnerability to Natural Disaster** | | | |
| Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions? | No | The project is not susceptible or leads to vulnerability to extreme climatic conditions. | N/A |
| >> |
| **Principle 9.3 Genetic Resources** | | | |
| Could the Project be negatively impacted by or involve genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development, or take place in facilities or farms that include GMOs in their processes and production)? | No | The project will not be negatively impacted using GMOs | N/A |
| >> |
| **Principle 9.4 Release of pollutants** | | | |
| Could the Project potentially result in the release of pollutants to the environment? | No | The project will not release more pollutants into the environment than the baseline scenario where heavy fuel oil was being used in the furnace. In fact, there will be less NOx, SOx, dark smoke and particulate matter | N/A |
| >> |
| **Principle 9.5  Hazardous and Non-hazardous Waste** | | | |
| Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials? | No | The Project will not involve the manufacture/trade/release/use of hazardous and non-hazardous chemicals and/or materials. HFO is being removed from the system and replaced by a crude palm oil by-product as fuel source. | N/A |
| >> |
| **Principle 9.6 Pesticides & Fertilisers** | | | |
| Will the Project involve the application of pesticides and/or fertilisers? | No | The project does not involve any application of pesticides or fertilizers. It will only make use of the oil residues of crops. | N/A |
| >> |
| **Principle 9.7 Harvesting of Forests** | | | |
| Will the Project involve the harvesting of forests? | No | The project does not involve the harvesting of forests. It only makes use of agriculture-derived oil from existing palm oil plantations that have been RSPO certified. | N/A |
| >> |
| **Principle 9.8 Food** | | | |
| Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives? | No | The Project does not have any impact on the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives. | N/A |
| >> |
| **Principle 9.9 Animal husbandry** | | | |
| Will the Project involve animal husbandry? | No | No animal husbandry is involved | N/A |
| >> |
| **Principle 9.10  High Conservation Value Areas and Critical Habitats** | | | |
| Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified? | No | The project is not located within or has any impact on high conservation value areas and habitats. There is no link to these ecosystems and habitats. The project activity of fuel-switching occurs in an industrial region of Johor, Malaysia and that is away from any natural habitats. Plantations/suppliers of the palm oil will be RSPO certified. | N/A |
| >> |
| **Principle 9.11 Endangered Species** | | | |
| a. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)?   * + - 1. Does the Project potentially impact other areas where endangered species may be present through transboundary affects? | No | 1. There are no endangered species identified as potentially being present within the Project boundary. The project activity of fuel-switching occurs in an industrial region of Johor, Malaysia and that is away from any natural habitats with endangered species. Plantations/suppliers of the palm oil will be RSPO certified     The project does not impact other areas where endangered species may be present through transboundary effects. | N/A |
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### Appendix 2- Contact information of project participants

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| --- | --- |
| Organization name | Climate Resources Exchange International Pte Ltd |
| Registration number with relevant authority |  |
| Street/P.O. Box | 20 Malacca Street |
| Building | #07-00 Malacca Centre |
| City | Singapore |
| State/Region | Singapore |
| Postcode | 048979 |
| Country | Singapore |
| Telephone | +65 6922 9881 |
| E-mail | v.kesava@climate-resources.com |
| Website | www.climateresources.net |
| Contact person | Vinod Kesava |
| Title | Chief Executive Officer |
| Salutation | Mr |
| Last name | Kesava |
| Middle name | - |
| First name | Vinod |
| Department | - |
| Mobile | +65 9384 0166 |
| Direct tel. | - |
| Personal e-mail | - |

### Appendix 3-Summary of Approved Design Changes

Please refer to Design Change [Requirements](https://globalgoals.goldstandard.org/111-par-design-change-requirements/) for more information on procedures governing Design Changes

##### Revision History

|  |  |  |
| --- | --- | --- |
| **Version** | **Date** | **Remarks** |
| 1.2 | 14 October 2020 | Hyperlinked section summary to enable quick access to key sections  Improved clarity on Key Project Information  Inclusion criteria table added  Gender sensitive requirements added  Prior consideration (1 yr rule) and Ongoing Financial Need added  Safeguard Principles Assessment as annex and a new section to include applicable safeguards for clarity  Improved Clarity on SDG contribution/SDG Impact term used throughout  Clarity on Stakeholder Consultation information required  Provision of an [accompanying Guide](https://globalgoals.goldstandard.org/standards/TGuide-PreReview_V1.2-Project-Design-Document.pdf) to help the user understand detailed rules and requirements |
| 1.1 | 24 August 2017 | Updated to include section A.8 on ‘gender sensitive’ requirements |
| 1.0 | 10 July 2017 | Initial adoption |

1. 1. Para 6 of the guidelines on the assessment of investment analysis.

   [↑](#footnote-ref-1)
2. Taking the total Energy Consumption by HFO in 2018 [↑](#footnote-ref-2)
3. https://www.ntnu.edu/documents/20587845/1266707380/01\_Fuels.pdf/1073c862-2354-4ccf-9732-0906380f601e [↑](#footnote-ref-3)
4. Biofuels: https://energyeducation.ca/encyclopedia/Energy\_density [↑](#footnote-ref-4)
5. <https://bepi.mpob.gov.my/index.php/en/?option=com_content&view=article&id=1030&Itemid=136> , January 2021 Average Figure DAILY PRICE OF CRUDE PALM OIL - MALAYSIA (RM/TONNE) [↑](#footnote-ref-5)
6. <https://bepi.mpob.gov.my/index.php/en/?option=com_content&view=article&id=1030&Itemid=136> , January 2021 Average Figure DAILY PRICE OF CRUDE PALM OIL - MALAYSIA (RM/TONNE) [↑](#footnote-ref-6)
7. As per Default values for the cost of equity (expected return on equity) of Malaysia, TOOL 27, Investment analysis, Version 10.0 [↑](#footnote-ref-7)
8. As per the start date of the project activity. [↑](#footnote-ref-8)
9. 1. <https://www.un.org/sustainabledevelopment/climate-change/>

   [↑](#footnote-ref-9)
10. http://mpoc.org.my/monthly-palm-oil-trade-statistics-2019/ [↑](#footnote-ref-10)
11. http://bepi.mpob.gov.my/index.php/en/production/production-2020/production-of-crude-oil-palm-2020.html [↑](#footnote-ref-11)
12. https://www.researchgate.net/publication/332751792\_TOWARDS\_GENDER\_EQUALITY\_IN\_MALAYSIA\_LEGAL\_AND\_POLICY\_PERSPECTIVES [↑](#footnote-ref-12)