PROJECT DESIGN DOCUMENT (PDD) FORM FOR ARTICLE 6.4 PROJECTS

(Version 01.0)

BASIC INFORMATION			
Project title:	MSW Processing and use in cement kiln at FICEM (Fictitious project)		
UNFCCC project reference number:	>>		
Host Party:	Choose a Party.		
Other participating Parties:	Choose a Party.		
Activity participant(s): (add rows if needed)	**Type of Party**	**Name of activity participant(s)**	**Party that is to provide authorization**
	Other participating Party	FICEM	Choose a Party.
	Choose a type of Party.	>>	Choose a Party.
	Choose a type of Party.	>>	Choose a Party.
PDD version number:	01		
PDD completion date:	31/06/2026		
Applied methodologies and standardised baselines, and their versions:	New methodology proposal under Article 6.4 mechanism proposed by FICEM		
Sectoral scope(s):	3 Energy Demand		
Type of the project:	☒ Emission reductions activity ☐ Removals activity ☐ Combined emission reductions and removals activity		
Estimated annual emission reductions or net removals over the crediting period (tCO_2e/year):	323,935		

SECTION A. Project description

A.1. Project purpose and general description

Substitute a primary fossil fuel (pet-coke) with an alternative renewable fuel, Refuse-Derived Fuel (RDF). By doing so, there will be changes in direct combustion process emissions, methane emissions from landfills, and indirect emissions from fuel preparation. The change in CO_{2e} will be calculated by means of the “Partial substitution of fossil fuels by MSW in cement manufacture” methodology.

Based on general emission factors, it is estimated that there will be a reduction in combustion process emissions, a mitigation of CO_{2e} landfill emissions from methane avoidance, and an increase in material preparation emissions. All these emissions will be accounted for in the final consolidated total change in emissions.

A.2. Confirmation that the project aligns with the A6.4 activity types indicated by the host Party

The government of the host Party for the purpose of this fictitious PDD has issues regulatory issues in the sector. Consequently, we simulate a RAF factor of 97.5% for the crediting period of 10 years.

A.3. Demonstration that the project, does not constrain, but aligns with the policies, options and implementation plans of the host Party

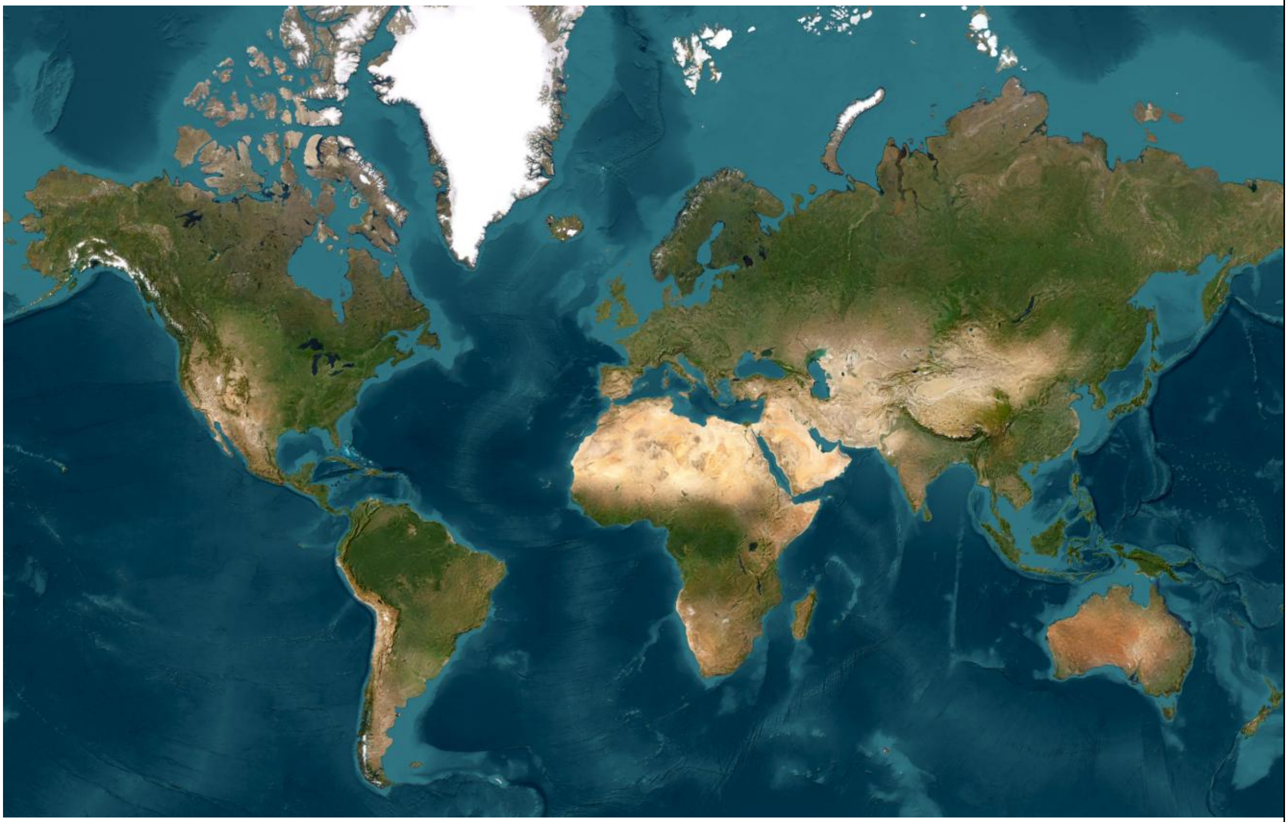
For this fictional case, the host country has commitments and level of ambition, giving industrial facilities in cement, oil & gas, and iron & steel greater weight and impact on the country's carbon budget. The project, by using MSW and reducing coal use, directly contributes to this goal and the country's decarbonization path.

The national agenda will have con-conditioned and conditional goals based on Paris Agreement by 2050.

The FICEM, as organization that represents the cement sector in Latin America, has strong commitment to decarbonization and a road map for the sector. They are part of numerous reports of the cement research facilities and can provide a reliable “Adjusted Baseline” for this project.

A.4. Project location

Host Party	Choose a Party.
Region(s)/State(s)/Province(s)	Fictional place
Cities/towns/communities	
Geographic coordinates	Global
Map of project location	



A.5. Technology/measures

A.5.1. Existing technologies/measures prior to project implementation

The core processes in clinker and cement production are combustion and sintering in the clinker kiln; it is in this stage that thermal energy from the fuel is applied. This main infrastructure necessity is accomplished in every cement plant. There is potential to source waste as a raw material, which supports the project's viability.

At the fictional facility, the operation transforms raw materials like limestone and clay into cement through a multi-stage process: quarrying and crushing, raw material grinding into a fine powder (raw meal), heating in a massive kiln to form clinker, cooling the clinker, and finally grinding it with gypsum and additives to produce the finished cement, which is then stored and bagged for distribution. The process is highly energy-intensive and relies on coke, an abundant resource in the country. The temperature inside the kiln can reach up to 1450 °C. The general workflow has the following stages:

(a) Quarrying and crushing. to extract limestone, clay, and shale from mines and quarries. Later, robust mills crush these materials into small pieces to facilitate their transformation.

(b) Raw materials preparation. The crushed materials are mixed in proportions determined by a chemical balance to ensure the clinker's later mechanical properties. There is secondary grinding to transform all the flow into a fine powder, or to a raw mill. This prepared material undergoes preheating to improve the kiln's energy balance.

(c) Clinker production. The raw mill enters a preheater tower as shown in the following figure. There, the hot gases from the kiln preheat it, saving energy before entering the kiln for calcination and sintering. The kiln undergoes chemical changes, forming small nodules called clinkers.

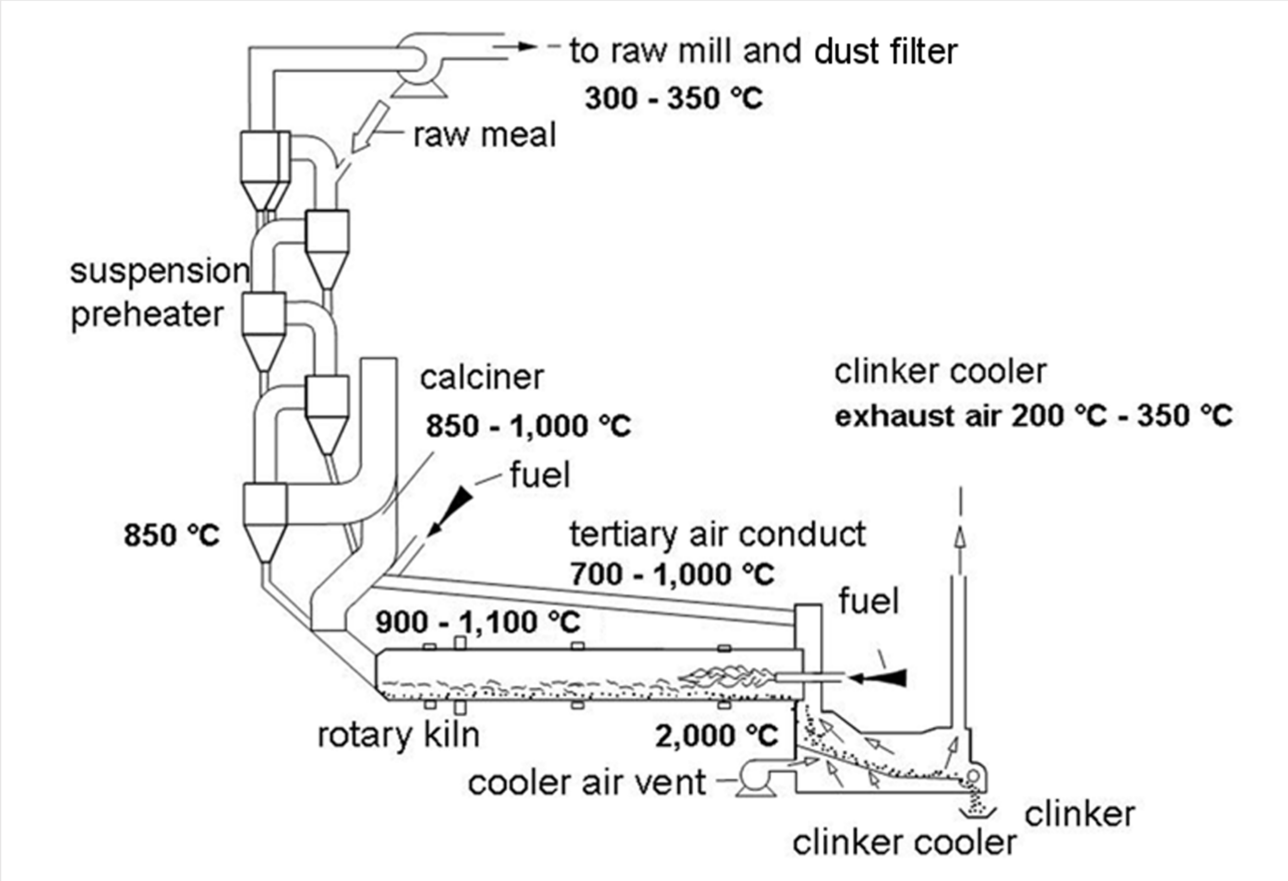


Figure. Preheating and Calcination Systems for Clinker Production

Source: European Cement Research Academy 2016

(d) Cooling and finishing Grinding. The final production step is rapid cooling of clinker to make a final adjustment, followed by grinding and blending with additives (gypsum) to produce cement powder.

(e) Packing and delivery to market. The finished cement is stored in silos and delivered to the market as bulk in trucks/trains/ships or paper bags.

The typical lifespan of this type of installation is measured in decades. The refractory materials inside the kiln are used in campaigns of 6-9 months.

The following Figure illustrates the entire production chain in a cement facility like this fictional case.

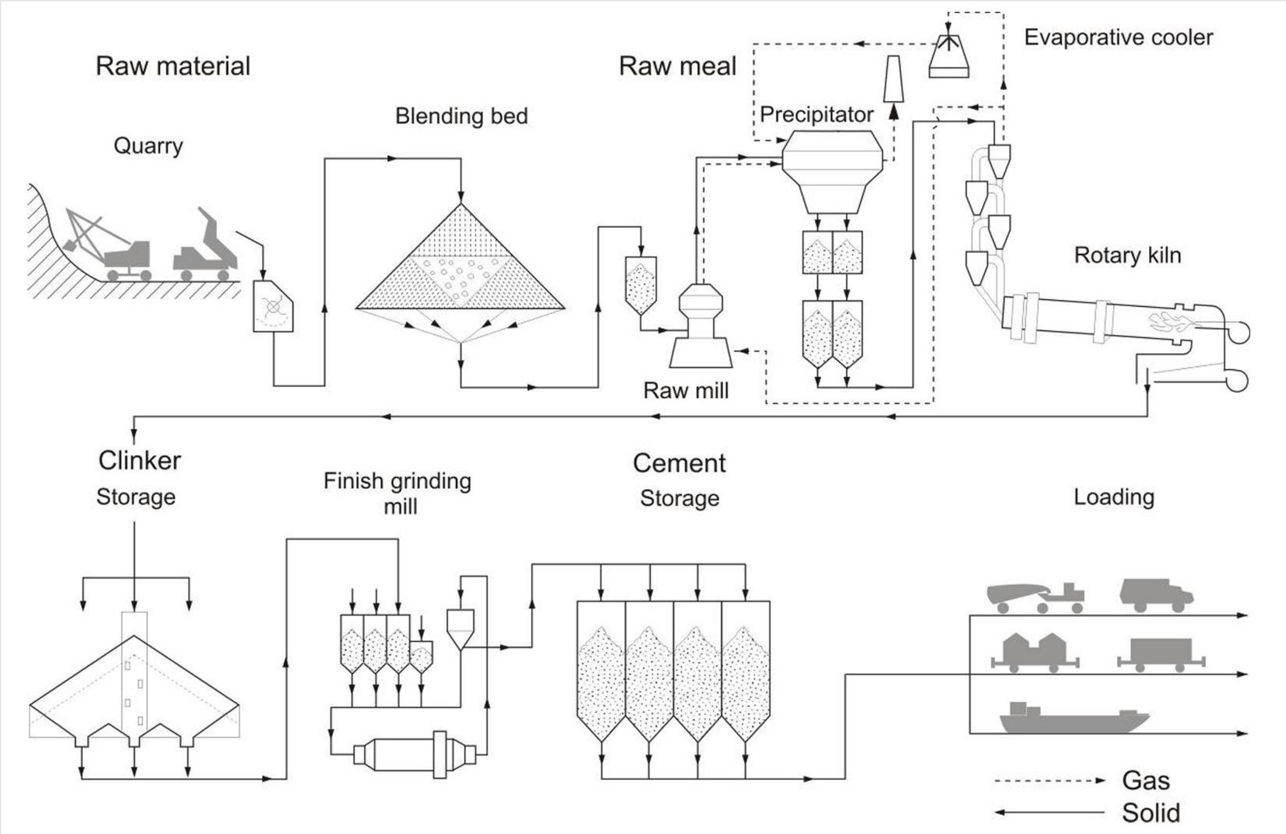


Figure. Full Overview of a Cement Facility Production

Source: European Cement Research Academy 2016

A.5.2. Technologies/measures implemented/deployed by the project

The technology implemented in this project includes a dedicated MSW processing facility for the cement plant and a feeding system for RDF to the kiln's preheating system, to ensure preheating of the RDF, blending with coke, and its entry into the kiln under optimal conditions.

RDF is defined as a solid fuel produced by processing nonhazardous mono- or mixed waste streams (such as MSW, construction and demolition waste, or industrial waste) into a suitable feedstock for energy recovery, in strict compliance with the legislation. In general, MSW can be processed by physical technologies and divided into three main fractions: combustible, incombustible, and moisture, with the combustible fraction corresponding to the RDF. The processing of MSW to produce RDF begins with waste separation at the mechanical biological treatment (MBT) plant. The aim of the MBT plant is to separate and stabilize the quickly biodegradable fraction of waste (including food waste), as well as to recover recyclables from mixed-waste streams. This is one of the main technologies used in MSW management and consists of two processes: mechanical biological pretreatment (MBP) and mechanical–biological stabilization (MBS). In MBP, the organic fraction is separated and biologically stabilized before forwarding to the landfill, and recyclables and RDF are recovered from the residual coarse fraction. In the MBS or bio-drying process, the waste is dried before a larger fraction of RDF is extracted. MBP aims to stabilize the organic fraction to minimize landfill gas and leachate emissions, while MBS maximizes the RDF and material recovery. In general, RDF is produced by combining processes such as screening, shredding, sanitizing, drying, and densification. As mentioned, the RDF materials are mainly generated during MBT; however, the remaining quantities are produced along the waste-processing line.

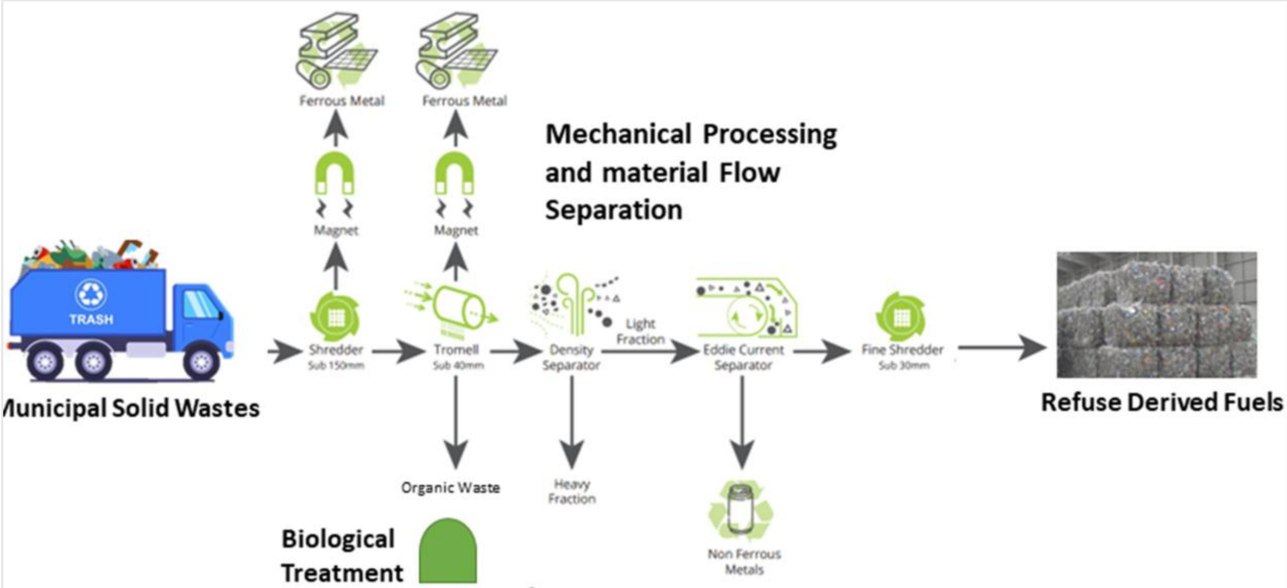


Figure. RDF Production Process

Source: https://doi.org/10.1002/bse.3345

RDF mainly consists of carbon derivatives such as organics, plastics, paper, wood, and textiles. Plastic and paper are the main fractions of RDF and consist of about 50–80%; the remaining fractions are mostly organics, wood, and textiles. Typically, RDF has the following proximate composition: moisture content between 4–23 wt.%, volatile matter between 19–81 wt.%, fixed carbon between 4–24 wt.%, and ash content between 5–60 wt.%. As for the ultimate composition, RDF characterization studies have found the following values: carbon (41–58 wt.%), hydrogen (5–10 wt.%), nitrogen (0.8–2.5 wt.%), oxygen (1–50 wt.%), and sulphur (0.1–0.4 wt.%).

A.5.3. Declaration related to the existence of a former project in the same geographical location

A similar project was implemented, but it is not operating due to economic and technical barriers.

A.6. Parties and activity participants

(Add/remove rows as necessary)

Type of Party	Name of the Party	Activity participant(s)
Host Party	Mexico	
Choose a type of Party.	Choose a Party.	
Choose a type of Party.	Choose a Party.	

SECTION B. Application of methodologies and standardized baselines

B.1. References to methodologies and standardized baselines

>>Not Applicable

B.2. Applicability of methodologies and standardized baselines

>> Not Applicable

(Insert the UNFCCC reference number, title and version of the methodology, other methodological regulatory documents including methodological tool, standardized baseline approved by the Supervisory Body, or the methodological requirements specified by the host Party)

Applicability condition in the methodological regulatory document or the methodological requirement specified by the host Party	Compliance of the project with the applicability condition in the methodological regulatory document or the methodological requirement specified by the host Party
>>N/A	>>N/A
>>	>>
>>	>>
>>	>>

B.3. Project boundary, sources, sinks and greenhouse gases

The physical project boundary covers all production processes related to clinker production, including:

o The pre-heaters, where the heat of exhaust gas is used to heat the inputs for clinker production;

o The pre-calciner, where fuels are fired for the pre-calcination of the inputs for clinker production;

o The kiln tube, where fuels are also fired and where the calcination process takes place;

o On-site storage, on-site transportation, and preparation of alternative fuels in the project activity;

o The vehicles used for transportation of alternative fuels to the project site;

o Where residues are used, the project boundary includes the sites where the residues would be dumped, left to decay, or burnt in the absence of the project activity;

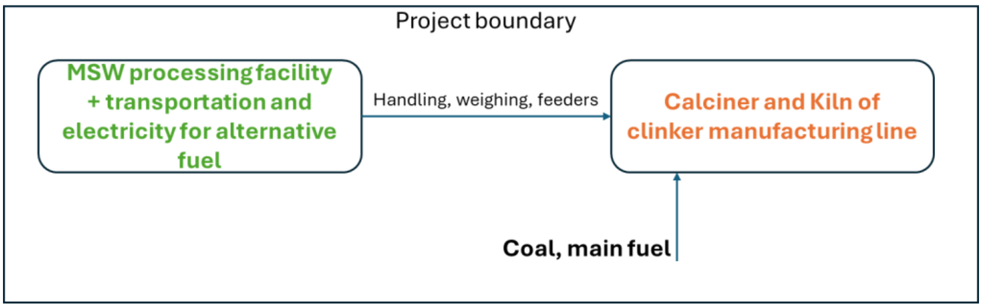
B.3.1. Baseline emissions/removals

Source/reservoir/pool	GHG		Justification/Explanation
Emissions from fossil fuels are displaced in the project plant	CO_2	☒ Included ☐ Not included	Main emission source
	CH_4	☐ Included ☒ Not included	Minor source. Neglected for simplicity
	N_2O	☐ Included ☒ Not included	Minor source. Neglected for simplicity
	-----	☐ Included ☐ Not included	
Uncontrolled burning or decay of transformed waste	CO_2	☐ Included ☒ Not included	Can be a significant emission source.
	CH_4	☒ Included ☐ Not included	Included if W3, W4, or W7 has been identified as the most likely baseline scenario
	N_2O	☐ Included ☒ Not included	Minor source. Neglected for simplicity
	-----	☐ Included ☐ Not included	
-----	CO_2	☐ Included ☐ Not included	
	CH_4	☐ Included ☐ Not included	
	N_2O	☐ Included ☐ Not included	
	-----	☐ Included ☐ Not included	

B.3.2. Project emissions/removals

Source/reservoir/pool	GHG		Justification/Explanation
Emissions from the use of alternative fuels	CO_2	☒ Included ☐ Not included	Main emission source
	CH_4	☐ Included ☒ Not included	Minor source. Neglected for simplicity
	N_2O	☐ Included ☒ Not included	Minor source. Neglected for simplicity
	-----	☐ Included ☐ Not included	
Emissions from additional electricity and/or fossil fuel consumption as a result of the project activity	CO_2	☒ Included ☐ Not included	Can be a significant emission source
	CH_4	☐ Included ☒ Not included	Minor source. Neglected for simplicity
	N_2O	☐ Included ☒ Not included	Minor source. Neglected for simplicity
	-----	☐ Included ☐ Not included	
Emissions from the combustion of fossil fuels for the transportation of alternative fuels to the project plant	CO_2	☒ Included ☐ Not included	Can be a significant emission source
	CH_4	☐ Included ☒ Not included	Minor source. Neglected for simplicity
	N_2O	☐ Included ☒ Not included	Minor source. Neglected for simplicity
	-----	☐ Included ☐ Not included	
Leakage emissions from fossil fuel use	CO_2	☒ Included ☐ Not included	Depend on the value chain of production of the fuel
	CH_4	☒ Included ☐ Not included	Minor source. Neglected for simplicity
	N_2O	☒ Included ☐ Not included	Minor source. Neglected for simplicity
	-----	☐ Included ☐ Not included	

Flow diagram:



B.4. Establishment and description of baseline scenario

B.4.1. Identification of the baseline scenario

The project has the following alternatives for the fuel mix for cement manufacturing, which may include, inter alia:

F1: The proposed project activity is not undertaken as a 6.4 project activity (i.e., use of alternative fuels and/or less carbon-intensive fossil fuels).

F2: Continuation of current practice, i.e., a scenario in which the company continues cement production using the existing technology, materials, and fuel mix.

F3: The continuation of using only fossil fuels and no alternative fuels, however, with a different fuel mix portfolio, taking into account the relative prices of fuels available. The scenario(s) may be based on one fuel or different mixes of fuels.

F4: The currently used fuels are partially substituted with alternative fuels and/or less carbon-intensive fossil fuels other than those used in the A6.4 project activity and/or any other fuel types, without using the A6.4 mechanism. If relevant, develop different scenarios with different mixes of alternative fuels or less carbon-intensive fuels and varying degrees of fuel-switching from traditional to alternative fuels or less carbon-intensive fuels.

F5: The construction and operation of a new cement plant.

The baseline scenario is the continuation of the current practice of using coke, an abundant fuel in the country. The following numbers present the base year of analysis and the information for the 3 previous years at the energy consumption level.

Total Clinker Production

Year	Clinker (t)
2025	1,564,320
2024	1,311,427
2023	1,125,030
2022	1,627,190

Fuel consumption

Summary

Year	Energy Consumption	Unit
2025	1,224,971,931	Mcal
2024	1,035,464,566	Mcal
2023	900,863,809	Mcal
2022	1,330,774,188	Mcal
Year	Energy Consumption	Unit
2024	4,332	Tj
2023	3,769	Tj
2022	5,568	Tj

Emission Factor		

	Fuel Oil	0.0003238	tCO2/Mcal
	Coke	0.0004079	tCO2/Mcal
	Liquids	0.0003067	tCO2/Mcal

The project participant has determined what would happen to the alternative fuels in the absence of the project activity. The options are as follows:

Wastes: Where wastes originating from MSWD are used as an alternative fuel, the options to be analyzed may include, inter alia:

W1: Incineration of the waste in a waste incinerator without utilizing the energy from the incineration.

In the absence of the project activity, waste from fossil sources would not be incinerated. Because incinerators are expensive, this is not a common practice in Mexico. Currently, only 1% of the total waste generated in Mexico is incinerated.

W2: Incineration of the waste in a waste incinerator with the use of the energy (e.g., for heat and/or electricity generation).

This type of waste is not generally incinerated to generate energy because incinerators are expensive. Instead, the common practice for waste disposal is send it to landfills or specialized confinement sites.

W3: Disposal of the waste at a managed or unmanaged landfill. The waste is dumped or left to decay mainly under aerobic conditions.

As stated in the National Program for Residue Prevention and Integral Management, the current strategy for final waste disposal is primarily focused on the construction of municipal landfills.

Based on the above, it can be confirmed that waste disposal at managed or unmanaged landfills is the current practice. In the absence of the project activity, the waste to be used at the Yaqui cement plant would be confined to specialized containment sites.

W4: Disposal of the waste at a managed landfill. The waste is dumped or left to decay under clearly anaerobic conditions. This applies, for example, to landfills with cells deeper than 5 meters.

Similar to the previous one for larger landfills.

W5: The use of the waste at other facilities, for example, other cement plants or power plants, as a feedstock or for the generation of energy.

The use of the waste proposed in the project activity is not feasible. Main reasons are: This type of waste cannot be used in a power plant as per Mexican regulations and emissions restrictions. The use of waste in other cement or quicklime plants faces several technological and investment barriers

W6: The recycling or reutilization of the waste.

The waste to be used in the project activity would not be recycled in the absence of the project activity. The recycling or reutilization of this material would require lobbying the authorities to modify the applicable regulations. Unfortunately, this process would yield significant results, probably not before a decade.

W7: The wastes are burnt in an uncontrolled manner without utilizing them for energy purposes.

This scenario requires proper conditions of humidity, temperature, and physical storage of the waste to transform it into methane. This condition is not standard in all cases.

W8: The proposed project activity, not undertaken as an A6.4 project activity, i.e., the use of the waste in the project plant.

This alternative is not the most plausible scenario due to the technological and investment barriers

B.4.2. Identification of the BAU scenario or reference benchmark

The BAU emissions formula estimates the total greenhouse gas (GHG) emissions from clinker production under standard conditions (before any decarbonization measures). $BAU_{Emission,y}$ emissions are calculated as follows:

$BAU_{Emission,y} = (E_{Clinker,y}) * RAF$ = (347,766 tCO2e/year) (97.5%)

= 330,376 tCO2e/year

Where:

$E_{Clinker,y}$	=	Emissions from clinker production in year y
RAF	=	Regulated Adjustment Factor to account for policy-mandated efficiency improvement (correction factor), a value in the range [0, 1]. In this fictional case the host country has a regulatory value of 97.5% to mandate higher energy efficiency beyond measures accepted by all producers.

B.5. Demonstration of additionality

B.5.1. Regulatory analysis

Compliance with National Environmental and Industrial Regulations

The project shall comply with the following key regulatory frameworks:

Environmental regulations for industries focus on Environmental Impact Assessments (EIAs), strict emission controls (air, water), comprehensive waste management, water usage/discharge limits, and mandatory audits/reporting via the National Emissions Registry, requiring permits for operations and compliance with various official regulations.

Key laws include the National Waters Law, with specific rules for hazardous waste, water discharge, and high-risk activities.

Key Regulatory Areas

Permitting & Authorizations:

Environmental Impact Authorization (AIA): Required before establishing or expanding projects, assessing impacts on air, water, soil, and biodiversity.

Integrated Permitting: For federal jurisdiction, a single license covers air, water, and hazardous waste, requiring annual reports (COAs).

Air Quality:

Strict limits on pollutants (PM, VOCs, GHGs).

Registration and reporting via the National Emissions Registry (RENE).

Water Management:

Sustainable extraction limits and treated wastewater discharge standards.

Federal permits for discharge.

Waste Management (Hazardous & Non-Hazardous):

Classification, registration as a generator, and approved management plan.

Rules for storage, labeling, transport, and disposal by authorized firms.

Reporting & Auditing:

Mandatory internal/external audits and environmental performance reports.

Annual Operating Reports for federal jurisdiction.

Key Legislation & Standards

General Law of Ecological Balance and Environmental Protection: The foundational law.

National Waters Law: Governs water usage and discharge.

High-Risk Activities

Requires specific Accident Prevention Plans (PPA) approval and separate permits.

B.5.2. Avoidance of lock-in

The project activity is designed to avoid emissions lock-in by ensuring that it:

1. Does not create dependency on specific alternative fuels, as the MSW is a mixture of different elements according to the zone of extraction. Moreover, there are other large-scale alternatives, such as tires and pure biomass, that could replace or mix with MSW.

2. Does not extend the lifespan of the facility. The thermal parameters are similar, including the corrosivity and stress of refractory materials.

3. There is room for other future technologies, as the prices and technology maturity improve, such as direct use of hydrogen or ammonia, and any other PtX solution related to decarbonization or low-carbon solution with a similar level of service if compared to coke.

4. Does not trigger market/regulatory shifts that favor fossil fuels, ensuring that it does not crowd out renewable energy investments.

B.5.3. Financial additionality or performance-based approach

☒ Financial additionality ☐ Performance-based approach

Cost of Equity

The Project Activity finance assessment uses FICEM global guidelines for the cost of equity, with the following parameters:

Risk-free rate = 3.31%
Market premium = 5.44%
Sector Beta = 1.21
Country Risk = 2.82%

Ke_{USA} = RFR_{USA} + $BETA_{sector}$ * (Market Premium) ……………………(1)
Ke_{USA} = 3.31% + 1.21 * (5.44%)

$Ke_{adjusted}$ = KeUSA + Country Risk $_{developing\ economy}$ ……………………..(2)
$Ke_{adjusted}$ = 9.9% + 2.82% = **12.7%**

The equity expectation (Ke) of 12.71% represents the value for assessing standalone projects, assuming investors pay 100% of capital expenses through a single legal entity. There is no inclusion of debt because the level of debt depends on many other variables that the firm manages during its lifetime. The PDD will be assessed against a 12.7% equity benchmark.

The Guideline was assessed globally by all associates of FICEM, who have shares and debt in the US market. For the purpose of this fictional narrative, a value of 2.82% is assumed to be typical in a developing economy, where most of FICEM associations operate.

CAPEX

All the activity requires an investment of 4,947,471 USD.

Note: this value is taken from research of old climate projects developed for FICEM during the Kyoto Protocol period.

(a) Investment Data

	USD	%
Engineering	110,000	2%
Construction	1,040,674	21%
Materials	359,123	7%
Equipment	2,757,963	56%
Service Parts	248,500	5%
Technical services	4,000	0%
Other expenses	177,479	4%
Works	87,150	2%
Indirect cost	162,583	3%
CAPEX	**4,947,471**	**100%**

OPEX

The Operational expenditures have fuel switch, manufacturing of RDF and power supply:

(b) Costs and contribution margin due to the change of fuel

Coke	2025	1,224,971,931	Mcal	**RDF**	2025	1,224,971,931	Mcal
		8,015	Kcal/Kg			40%	Substitution
		152,835	t/año			489,988,772	Mcal
		508	USD/t			4,086	Kcal/Kg
		77,640,142	USD/year			119,928	t/año
		40%	Substitution			215	USD/t
		31,056,057	USD/Year			25,784,496	USD/year

Cost related to RDF manufacturing

RDF Handling

	Transportation	Mechanical treatment	Feeding	USD/t	% Mass dry Basis
Wood Residues	18.3	0.0	8.2	26.5	0.01965
Fabric and textiles	3.9	30.0	8.2	42.1	0.07697
Paper and cardboard	3.9	30.0	8.2	42.1	0.16578
Organic sludge	9.4	0.0	8.2	17.6	0.22172
Other biomass (pollinase, coffee pulp)	18.3	0.0	8.2	26.5	0.14847
MSW	3.9	30.0	8.2	42.1	0.00000
Plastics	3.9	30.0	8.2	42.1	0.00000
Liquid waste	179.0	0.0	1.1	180.0	0.00000
Refinery residues	9.4	0.0	8.2	17.6	0.00000
Tires	38.1	0.0	23.3	61.4	0.00000
Industrial sludge	9.4	0.0	8.2	17.6	0.00000
Others	3.9	30.0	8.2	42.1	0.36742

USD/t RDF	34.01
t RDF	119,928
Activity Cost in USD	4,078,688

Cost of electricity

Electricity

Power	1	MW
Time	7,884	Hours/year
Energy	6,307	MWh/year

The previous data is used in a business model with 12.7% as discount rate. Three financial indicators are used to assess the model.
The lifetime is assumed to be 20 years.
A sensitivity analysis of IRR is added to assess the effects of lower CAPEX and reduced RDF costs. Both possibilities are low.
In all cases, the project's economics are below the corporate Ke, and an additional source of income, such as carbon crediting, is needed.

Business Model: Base Case

Assumptions
1. No subsidy
2. Cost of electricity at market condition, no indirect subsidy
3. Discount factor of 12%

(Cash flow in 000´s USD)

1) Marginal Contribution of Fuel Switch			**Year**																				
			0	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Cost of Coke USD/year				31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057	31,056,057
Cost of RDF USD/year				25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496	25,784,496
Margin USD/year				5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560	5,271,560
2) Macro economic adjustment for the period			**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
US inflation (estimation)			2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Accumulated inflation				1.02	1.04	1.06	1.08	1.10	1.13	1.15	1.17	1.20	1.22	1.24	1.27	1.29	1.32	1.35	1.37	1.40	1.43	1.46	1.49
3) Total CAPEX	4,947,471	USD	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
			4,947										1,034										
4) Income (no tax incl.)		KUSD/year	0	5,377	5,485	5,594	5,706	5,820	5,937	6,055	6,176	6,300	6,426	6,555	6,686	6,819	6,956	7,095	7,237	7,381	7,529	7,680	7,833
5) Variable Cost		KUSD/year	0	4,418	4,506	4,596	4,688	4,782	4,877	4,975	5,074	5,176	5,279	5,385	5,493	5,603	5,715	5,829	5,946	6,064	6,186	6,309	6,436
Electricity	40.00	USD/MWH																					
	6,307	KWh/year		252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252	252
RDF Management	4,078,688	USD/year		4,079	4,079	4,079	4,079	4,079	4,079	4,079	4,079	4,079	4,079	4,079	4,079	4,079	4,079	4,079	4,079	4,079	4,079	4,079	4,079
6) Contribution Margin		USD/year	0	959	979	998	1,018	1,038	1,059	1,080	1,102	1,124	1,147	1,169	1,193	1,217	1,241	1,266	1,291	1,317	1,343	1,370	1,398
7) Fixed Cost		USD/year	0	505	515	525	536	546	557	568	580	591	603	615	627	640	653	666	679	693	707	721	735
Maintenance	10%		0	495	495	495	495	495	495	495	495	495	495	495	495	495	495	495	495	495	495	495	495
% of CAPEX																							
8) EBITDA - CF before taxes		USD/year	0	455	464	473	483	492	502	512	522	533	543	554	565	577	588	600	612	624	637	650	662
9) Depretiation (by yearly use)		USD/year	0	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247	247
10) EBIT			0	207	216	226	235	245	255	265	275	285	296	307	318	329	341	353	365	377	389	402	415
11) Taxes	30%		0	62	65	68	71	73	76	79	82	86	89	92	95	99	102	106	109	113	117	121	125

12) Net Income		0	145	152	158	165	171	178	185	192	200	207	215	223	231	239	247	255	264	273	281	291
13) Residual life		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14) Net Operating Profit after Tax	USD	-4,947	393	399	405	412	419	426	433	440	447	-579	462	470	478	486	494	503	511	520	529	538
15) Financial Indicators	**12.7%**	Discount Factor																				

NPV	**-2,159**	**USD**
IRR	**5.0%**	
B/C	**0.0**	**USD/USD**

Sensitivity Analysis of IRR vs variations of CAPEX and price of RDF

IRR	**CAPEX -Subsidy vs price of Hydrogen**						
			CAPEX USD (Subsidy)				
			0%	-3%	-5%	-15%	-20%
			4,947,471	4,452,724	3,957,977	3,463,230	2,968,483
	15%	247.3	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
	10%	236.5	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
Price	5%	225.8	#NUM!	#NUM!	#NUM!	#NUM!	#NUM!
RDF	0%	**215.0**	**5.0%**	7.4%	10.1%	13.2%	17.13%
(USD/t)	-5%	204.3	27.7%	31.4%	36.1%	42.0%	49.7%
	-10%	193.5	46.8%	52.6%	59.7%	68.8%	80.9%
	-15%	182.8	65.6%	73.4%	83.0%	95.4%	112.0%

B.5.4. Common practice analysis

In this fictional case, it is assumed there are no other similar activities in operation in the country, with proper evidence (e.g., national energy balance from IEA, national communications to UNFCCC, among others).

B.6. Addressing non-permanence and risks of reversals

B.6.1. Identification of risk of reversal

Not applicable

B.6.2. Reversals risk mitigation plan

Not applicable

B.6.3. Remediation of reversals

Not applicable

B.7. Calculation of emission reductions or net removals

B.7.1. Calculation of BAU emissions/removals and baseline emissions/removals

B.7.1.1. Calculation of BAU emissions/removals

Baseline Emissions

BEy = BE FF,y + BE CH4, y

BE y	347,766	t CO2e
BE FF,y	199,886	t CO2
BE CH4,Y	147,880	t CO2e

year 2025, and historical data 2022:2024

Fact: the kiln operates at 100% Coke; the liquid fuel (diesel or bunker) is used only for the start-up, and it is not material for the calculations

Substitution %	**40%**

I Baseline Emissions from fossil fuels displaced

BE FF, Y	199,866	t CO2	
FCpj,k,y	119,928	t RDF	
NCV k,y	4,086	Kcal/t RDF	
FPy	0	Mcal	
EF CO2,BL,y	0.0004079	tCO2/Mcal Coke	
k	RDF	Refuse-Derived Fuel	

Fuel Penalty Calculation (FPy)

EF CO2,BL,Y	0.00040794	tCO2/Mcal Coke
FC Pj,K,Y	61,137	t equivalent coke substituted

NCV i,y	8,015	Mcal/t Coke
i	Coke	Fuel

Specific Energy Consumption (SEC)

SEC Clinker, BL	803	Mcal/t Clinker
HGx	1,035,464,566	Mcal
HGx-1	900,863,809	Mcal
HGx-2	1,330,774,188	Mcal
Pclinker,x	1,311,427	t clínker
Pclinker,x-1	1,125,030	t clínker
Pclinker,x-2	1,627,190	t clínker

Activity-specific combustion correction (ASCCy)

ASCCy	0	Mcal
Pclinker,y	1,564,320	t clínker
SEC Clinker,Pj,Y	783	Mcal/t Ckr
SEC Clinker, BL	803	Mcal/t Ckr

The calculation of baseline methane emissions from waste residues dumped, left to decay, or burnt in an uncontrolled manner without utilizing them for energy purposes depends on the applicable baseline scenario (W3, W4, or W7). Baseline emissions from decay, dumping, or burning of waste are calculated as follows:

$$BE_{CH4,waste,y} = BE_{CH4,W3/\,W7,y} + BE_{CH4,W4,y}$$

The emissions are computed for scenario W4, anaerobic decay of waste, using the IPCC-TFI waste model from the 2019 refinement volume 5, Waste.

II Baseline emissions of avoided CH4

Anaerobic decay of waste

GWP100 CH4	**28**

CH4 generation	kg CH4/kg Res.	% weight	kg CH4/kg RDF
Food	0.069424	0.063846	0.004432
Garden	0.091624	0.020666	0.001893
Paper	0.127898	0.165781	0.021203
Wood	0.022879	0.019647	0.000450
Textile	0.076739	0.076965	0.005906
Nappies	0.078535	0.063957	0.005023
Sludge	0.023141	0.221721	0.005131
MSW	0.000000	0.000000	0.000000
Inert	0.000000	0.367417	0.000000
Industrial	0.000000	0.000000	0.000000

Total		1.000000	0.044038

CO2e generation	kg CO2e/kg Res.	% weight	kg CO2e/kg RDF
Food	1.943870		0.124108
Garden	2.565468		0.053017
Paper	3.581154		0.593687
Wood	0.640611		0.012586
Textile	2.148693		0.165375
Nappies	2.198973		0.140639
Sludge	0.647957		0.143666
MSW	0.000000		0.000000
Inert	0.000000		0.000000
Industrial	0.000000		0.000000
Total			**1.233078**

FC pj,k,y	119,928	t RDF
BE CH4, y	147,880	t CO2e

ϕ	0.8
f	0
GWP_ch4	21
OX	0
F	0.5
DOCf	0.5
MCF	1
K	Dry-temperate

B.7.1.2. Calculation of baseline emissions/removals

N/A

B.7.1.3. Calculation of the annual difference between baseline and BAU emissions/removals

Activity participants shall calculate the difference between the baseline emissions or removals and BAU emissions as an annual and total amount concerning the crediting period:

$$\Delta_d = BAU_{Emissions,y} - BE_{ADJ,y} > 0.0$$

(97.5%- 95.0%)*$BE_{ADJ,y}$= 2.5%*347,766 = 8,696 tCO2e/year >0.0

Where:

Δd	= Difference between BAU and baseline emissions in year y (tCO_2/year)
$BAU_{Emissions,y}$	= Business As Usual Emissions in year y (tCO_2/tClinker)
$BE_{ADJ,y}$	= Final Adjusted Baseline Emissions based on the most conservative factor in yr y (tCO_2)

B.7.1.4. Factors or quantitative methods for downward adjustment of baseline

The sector continues to improve its technology and practices, and FICEM is a multinational with policies for continuous improvement and the revision of its standards, so the company should follow the trend set by many cement associations. The sector has an official global trend 1990-2025, which allows an algorithm to predict the crediting period as the trend correlates well with a high R-squared.

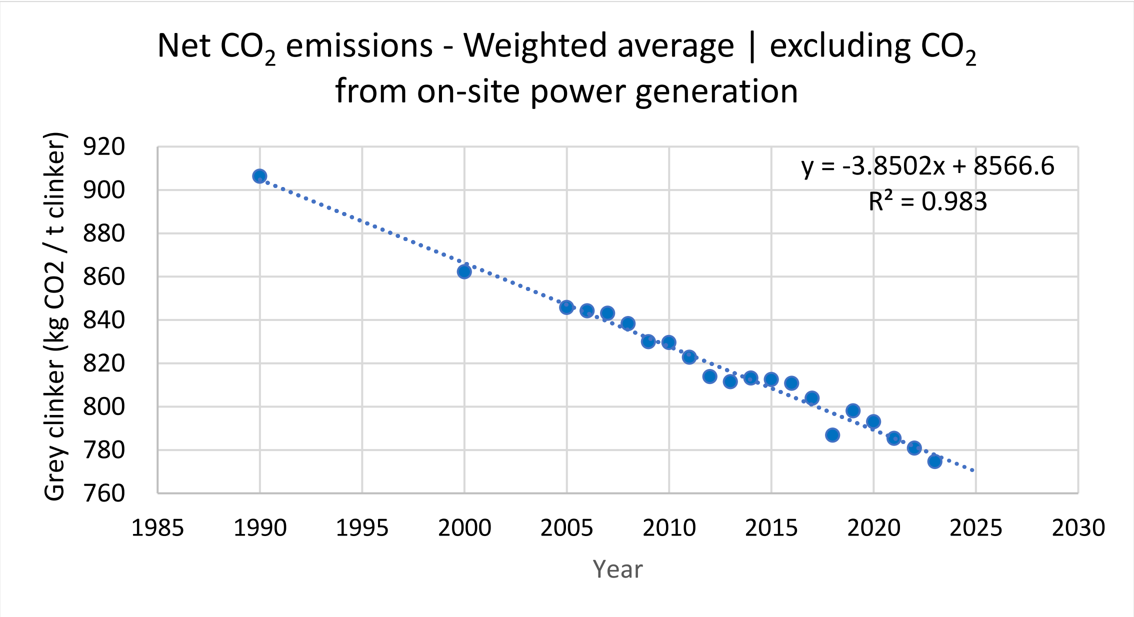


Figure. Global Net CO_2 emissions trend of the cement industry
Source: ECRA Technology Papers 2022

Based on the trend equation, the projection to 2035 is computed, and the Baseline is adjusted accordingly.

Adjustment based on the Global BAT trend

1990	904.7	kg CO2 / t clinker
2025	769.9	kg CO2 / t clinker
2035	731.4	kg CO2 / t clinker

Expected % Change 2025-35	5.00%	Downward trend
Adjusted BEy	95.00%	
	347,766	tCO2e/year
($BE_{ADJ,y}$)	**330,376**	tCO2e/year

B.7.2. Calculation of project emissions/removals

The activity has two sources of emissions. First, the use of electricity, which requires monitoring and verification of the official EF of the grid, is measured at a single counter device. Secondly, the transportation of RDF to the cement facility.

(a) Electricity

Energy Consumption	6,307	MWh/year
Grid Emission Factor	0.42	tCO2e/MWh
Emissions	2,649	tCO2e/year

The transportation uses a default value for heavy vehicles, the distance and type of vehicle (heavy, fixed capacity) are standard.

Vehicle class	Emission factor (g CO_2/t km)
Light vehicles	245
Heavy vehicles	129

(b) Transportation Emissions

Type of vehicle	Heavy class	
EE	129	g CO2/t-KM
Distance to landfill	200	KM
Volume	119,928	t/year
Load	25	T
Trips/year	4,797	Per year
Emissions	3,094	tCO2/year
Total Activity emissions (AE_y)	**5,743**	tCO2e year

The total emissions are 5,743 tCO2e/year.

B.7.3. Addressing of leakage

B.7.3.1. Sources of leakage

The only potential source of leakage attributable to the project activity is the use of fossil fuels for transporting the RDF, which is done via a permanent convoy of trucks.

B.7.3.2. Description of how leakage is avoided, minimized or addressed

Leakage can be minimized and/or avoided through the following measures:

- Higher efficiency of the fleet, which is related to the maintenance of the engines and the state and type of tires (aerodynamics improvement)
- Use of blended fuel with biofuels to reduce the upstream emissions
- Use of electric engines or power cells based on renewable energy.
- Use natural gas engines, which have 50% lower direct emissions and lower upstream emissions.

B.7.3.3. Calculation of leakage emissions

The leakage is computed through default values as shown in the lower table:

Fossil fuel type	Default emission factor ($t\ CO_2e/TJ$)
Natural Gas (NG)	2.9
Natural Gas Liquids (NGL)	2.2
Liquefied Natural Gas (LNG)	16.2
Compressed Natural Gas (CNG)	10
Light Fuel Oil (Diesel)	16.7

C) Leakage

Equivalent fuel consumption		
Emissions	3,094	tCO2/year
EF Diesel	74.1	t CO2/Tj
Equivalent Energy	41.8	Tj
EF upstream	16.7	tCO2/Tj
Leakage (LE_y)	**697.3**	tCO2e/year

B.7.4. Calculation of emission reductions or net removals

The emissions are finally computed with:

$ER_y = BE_{ADJ,y} – AE_y – LE_y$

Year	Baseline ADJ	Activity	Leakage	Reductions
1	330,376	5,743	697	323,935
2	330,376	5,743	697	323,935
3	330,376	5,743	697	323,935
4	330,376	5,743	697	323,935
5	330,376	5,743	697	323,935
6	330,376	5,743	697	323,935
7	330,376	5,743	697	323,935
8	330,376	5,743	697	323,935
9	330,376	5,743	697	323,935
10	330,376	5,743	697	323,935
tCO2e	3,303,760	57,432	6,973	3,239,355

B.7.5. Data and parameters fixed ex ante

Data/parameter table 1

Data/parameter	$FC_{i,x}$, $FC_{i,x-1}$ and $FC_{i,x-2}$
Description	Quantity of fossil fuel of type *i* used in the project plant in year *x*, *x-1* and *x-2* where *x* is the year prior to the start of the project activity and *i* are the fossil fuel types used in the project plant in the last three years prior to the start of the project activity. Year / Energy Consumption / Unit 2025 / 1,224,971,931 / Mcal / 152,835 / t Coke

	2024 1,035,464,566 Mcal 129,191 t Coke 2023 900,863,809 Mcal 112,397 t Coke 2022 1,330,774,188 Mcal 166,035 t Coke
Data unit	Mass or volume units
Equations referred	Equation (3)
Purpose of data	☒ Baseline emissions / removals ☐ Project emissions / removals ☐ Leakage emissions
Value(s) applied	Three years of data from fuel consumption data logs at the project site
Source of data	☒ Measured ☐ Other sources
Choice of data or measurement methods and procedures	Use mass or volume meters. The consistency of metered fuel consumption quantities should be cross-checked by an annual energy balance that is based on purchased quantities and stock changes. Where the purchased fuel invoices can be identified specifically for the A6.4 project, the metered fuel consumption quantities should also be cross-checked with available purchase invoices from the financial records
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbour imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.
Additional comments	No comments

Data/parameter table 2

Data/parameter	$FC_{BL,F3,i,y}$
Description	Quantity of fossil fuel type *i* that would be used in the project plant in the absence of the project activity, according to the selected baseline scenario F3 in year *y* Year Energy Consumption Unit 2025 1,224,971,931 Mcal 152,835 t Coke 2024 1,035,464,566 Mcal 129,191 t Coke 2023 900,863,809 Mcal 112,397 t Coke 2022 1,330,774,188 Mcal 166,035 t Coke
Data unit	Mass or volume units
Equations referred	Equation (5)

Purpose of data	☒ Baseline emissions / removals ☐ Project emissions / removals ☐ Leakage emissions
Value(s) applied	
Source of data	☒ Measured ☐ Other sources
Choice of data or measurement methods and procedures	
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbor imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.
Additional comments	Only applicable if F3 has been determined as the most likely baseline scenario

Data/parameter table 3

Data/parameter	$P_{clinker,x}$, $P_{clinker,x-1}$ and $P_{clinker,x-2}$
Description	Production of clinker in year *x*, *x-1,* and *x-2* where *x* is the year prior to the start of the project activity Year — Clinker (t) 2025 — 1,564,320 2024 — 1,311,427 2023 — 1,125,030 2022 — 1,627,190
Data unit	t (tons)
Equations referred	Equation (8)
Purpose of data	☒ Baseline emissions / removals ☐ Project emissions / removals ☐ Leakage emissions
Value(s) applied	Three years of data from production data logs at the project site
Source of data	☒ Measured ☐ Other sources
Choice of data or measurement methods and procedures	Use appropriate mass meters and/or weighing devices

Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbor imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.
Additional comments	No comments

Data/parameter table 4

Data/parameter	***NCV_i*** NCV i,y 8,015 Mcal/t Coke
Description	Net calorific value of the fossil fuel type *i*
Data unit	GJ/mass or volume units
Equations referred	Equations (2,3,4,5,7,10,19,20)
Purpose of data	☒ Baseline emissions / removals ☐ Project emissions / removals ☐ Leakage emissions
Value(s) applied	The following data sources may be used if the relevant conditions apply: <table><tr><th>Data source</th><th>Conditions for using the data source</th></tr><tr><td>(a) Values provided by the fuel supplier in invoices</td><td>This is the preferred source</td></tr><tr><td>(b) Measurements by the project participants</td><td>If (a) is not available</td></tr><tr><td>(c) Regional or national default values</td><td>If (a) is not available. These sources can only be used for liquid fuels and should be based on well documented, reliable sources (such as national energy balances)</td></tr><tr><td>(d) IPCC default values at the lower limit of the uncertainty at a 95 per cent confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If (a) is not available</td></tr></table>
Source of data	☐ Measured ☒ Other sources
Choice of data or measurement	For (a) and (b): measurements should be undertaken in line with national or international fuel standards

methods and procedures	
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbour imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.
Additional comments	Verify if the values under (a), (b), and (c) are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the values fall below this range, collect additional information from the testing laboratory to justify the outcome or conduct additional measurements. The laboratories in (a), (b), or (c) should have ISO17025 accreditation or justify that they can comply with similar quality standards.

B.7.6. Summary of ex ante estimates of emission reductions/net removals

Year	Baseline emissions/removals (tCO_2e)	Project emissions/removals (tCO_2e)	Leakage emissions (tCO_2e)	Emission reductions/Net removals (tCO_2e)
Year 1	330,376	5,743	697	323,935
Year 2	330,376	5,743	697	323,935
Year 3	330,376	5,743	697	323,935
Year 4	330,376	5,743	697	323,935
Year 5	330,376	5,743	697	323,935
Year 6	330,376	5,743	697	323,935
Year 7	330,376	5,743	697	323,935
Year 8	330,376	5,743	697	323,935
Year 9	330,376	5,743	697	323,935
Year 10	330,376	5,743	697	323,935
Total	3,303,760	57,432	6,973	3,239,355
Total number of years in the crediting period	10			
Annual average over the crediting period	330,376	5,743	697	323,935

B.8. Monitoring Plan

B.8.1. Data and parameters to be monitored

Data/parameter table 5

Data/parameter	**Regulated Adjustment Factor (RAF)**	
Description	A "downward adjustment factor" is applied to the BAU line to account for policy-mandated efficiency improvement.	
Data unit	Fraction of 1.0	
Equations referred	Equation (18, 21)	
Purpose of data	☒ Baseline emissions / removals ☐ Project emissions / removals ☐ Leakage emissions	
Measurement methods and procedures	The values must be aligned with Nationally Determined Contributions (NDCs) and Long-Term Low Emissions Development Strategies (LT-LEDS) to ensure compliance with enforced regulations and prevent overestimation. Voluntary initiatives are not included.	
Entity/person responsible for the measurement	Project developer	
Measuring instrument(s)	*Type of instrument*	Not applicable
	Accuracy class	Not applicable
	Calibration requirements	Not applicable
	Location	Not applicable
Measurement intervals	Not applicable	
QA/QC procedures		
Treatment of uncertainty	*Not Applicable*	
Additional comment	Comments may be provided if necessary.	

Data/parameter table 6

Data/parameter	$FC_{PJ,k,y}$, $FC_{PJ,i,y}$, $FC_{i,C,y}$ FCpj,k,y 119,928 t RDF
Description	Quantity of alternative fuel of type *k* ($FC_{PJ,k,y}$), fossil fuel of type *i* ($FC_{PJ,i,y}$) and ($FC_{i,C,y}$), used in the project plant in year *y*
Data unit	Mass or volume units
Equations referred	Equation (19, 20)
Purpose of data	☒ Baseline emissions / removals ☐ Project emissions / removals ☐ Leakage emissions

Measurement methods and procedures	Use mass or volume meters. The consistency of metered fuel consumption quantities should be cross-checked by an annual energy balance that is based on purchased quantities and stock changes. Where the purchased fuel invoices can be explicitly identified for the A6.4 project, the metered fuel consumption quantities should also be cross-checked with available purchase invoices from the financial records.	
Entity/person responsible for the measurement	Facility Operator	
Measuring instrument(s)	*Type of instrument*	Electronic meters certified to national or IEC standards, including a backup device and registries of data in a SCADA or equivalent.
	Accuracy class	Minimum accuracy grade: 0.2
	Calibration requirements	Ensure that the equipment is calibrated following the local/national standards or the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used.
	Location	Primary meter at the substation level or before entering the process.
Measurement intervals	Recorded continuously and aggregated at least annually	
QA/QC procedures	According to ISO 9001 or a similar quality system The consistency of metered fuel consumption quantities should be cross-checked against an annual energy balance based on amounts purchased and stock changes. Where the purchased fuel invoices can be explicitly identified for the A6.4 project, the metered fuel consumption quantities should also be cross-checked with available purchase invoices from the financial records.	
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbour imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.	
Additional comment	No comments	

Data/parameter table 7

Data/parameter	$EF_{CO2,k,y}$ and $EF_{CO2,FF,i,y}$
Description	Weighted average CO_2 emission factor for alternative fuels of type *k* ($EF_{CO2,k,y}$) and fossil fuel of type *i* ($EF_{CO2,FF,i}$) in year *y* Emission Factor Fuel Oil: 0.0003238 tCO2/Mcal Coke: 0.0004079 tCO2/Mcal

<table>
<tr><td></td><td><table><tr><td></td><td>Liquids</td><td>0.0003067</td><td>tCO2/Mcal</td></tr></table></td></tr>
<tr><td>Data unit</td><td>t CO_2/GJ</td></tr>
<tr><td>Equations referred</td><td>Equation (2, 3, 4, 5,19,20)</td></tr>
<tr><td>Purpose of data</td><td>☒ Baseline emissions / removals ☐ Project emissions / removals ☐ Leakage emissions</td></tr>
<tr><td>Measurement methods and procedures</td><td>For fossil fuels and for wastes originating from fossil sources for which W7 has been identified as the most likely baseline scenario, the following data sources should be used:
<table>
<tr><th>Data source</th><th>Conditions for using the data source</th></tr>
<tr><td>(a) Values provided by the fuel supplier in invoices</td><td>This is the preferred source</td></tr>
<tr><td>(b) Measurements by the project participants</td><td>If (a) is not available</td></tr>
<tr><td>(c) Regional or national default values</td><td>If (a) is not available.
These sources can only be used for liquid fuels and should be based on well-documented, reliable sources (such as national energy balances)</td></tr>
<tr><td>(d) IPCC default values at the upper/lower limit[1] of the uncertainty at a 95 per cent confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories</td><td>If (a) is not available</td></tr>
</table></td></tr>
<tr><td>Entity/person responsible for the measurement</td><td>Facility Operator</td></tr>
<tr><td>Measuring instrument(s)</td><td><table>
<tr><td>Type of instrument</td><td>Not applicable</td></tr>
<tr><td>Accuracy class</td><td>Not applicable</td></tr>
<tr><td>Calibration requirements</td><td>Not applicable</td></tr>
<tr><td>Location</td><td>Not applicable</td></tr>
</table></td></tr>
<tr><td>Measurement intervals</td><td>For (a) and (b): the CO_2 emission factor should be obtained for each fuel delivery, from which weighted average annual values should be calculated.
For (c): Review the appropriateness of the values annually.
For (d): any future revision of the IPCC Guidelines should be taken into account</td></tr>
<tr><td>QA/QC procedures</td><td>According to ISO 9001 or a similar quality system</td></tr>
<tr><td>Treatment of uncertainty</td><td>To manage uncertainty in data from instruments or systems:</td></tr>
</table>

[1] To be conservative, choose the upper limit where project emissions are calculated and the lower limit where baseline emissions are calculated.

	▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbour imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.
Additional comment	For (a): if the fuel supplier does provide the NCV value and the CO_2 emission factor on the invoice, and these two values are based on measurements for this specific fuel, this CO_2 factor should be used. If another source for the CO_2 emission factor is used or no CO_2 emission factor is provided, Options (b), (c), or (d) should be used.

Data/parameter table 8

Data/parameter	***$NCV_{k,y}$,***
Description	Weighted average net calorific value of the alternative fuel types *k* (*$NCV_{k,y}$*), in year *y* NCV k,y 4,086 Kcal/t RDF
Data unit	GJ/mass or volume units
Equations referred	Equation (2, 3, 4, 5,19,20)
Purpose of data	☒ Baseline emissions / removals ☐ Project emissions / removals ☐ Leakage emissions *Tick the applicable box(es).*
Measurement methods and procedures	The following data sources may be used if the relevant conditions apply:

Data source	**Conditions for using the data source**
(a) Values provided by the fuel supplier in invoices	This is the preferred source
(b) Measurements by the project participants	If (a) is not available
(c) Regional or national default values	If (a) is not available. These sources can only be used for liquid fossil fuels and should be based on well-documented, reliable sources (such as national energy balances)
(d) IPCC default values at the upper limit of the uncertainty at a 95 per cent confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories	If (a) is not available. This source may only be used for fossil fuels.

Entity/person responsible for the measurement	Facility operator	
Measuring instrument(s)	*Type of instrument*	Not applicable
	Accuracy class	Not applicable
	Calibration requirements	Not applicable
	Location	Not applicable

Measurement intervals	For (a) and (b): the NCV should be obtained for each fuel delivery, from which weighted average annual values should be calculated.
	For (c): review appropriateness of the values annually.
	For (d): any future revision of the IPCC Guidelines should be taken into account	

QA/QC procedures	Verify if the values under (a), (b), and (c) are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the values fall below this range, collect additional information from the testing laboratory to justify the outcome or conduct additional measurements. The laboratories in (a), (b), or (c) should have ISO17025 accreditation or justify that they can comply with similar quality standards	
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbour imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.	
Additional comment	No comments	

Data/parameter table 9

Data/parameter	$P_{clinker,y}$		
Description	Production of clinker in year y Year / Clinker (t) 2025 / 1,564,320 2024 / 1,311,427 2023 / 1,125,030 2022 / 1,627,190		
Data unit	t (tons)		
Equations referred	Equations (6,7,8,10)		
Purpose of data	☒ Baseline emissions / removals	☐ Project emissions / removals	☐ Leakage emissions

Measurement methods and procedures		
Entity/person responsible for the measurement	Facility operator	
Measuring instrument(s)	*Type of instrument*	weight scale for batch or continuous measurement (certified to national or IEC standards).
	Accuracy class	minimum accuracy class II.
	Calibration requirements	Ensure that the equipment is calibrated following the local/national standards or the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used.
	Location	Conveyors, platform or tanks (silos).
Measurement intervals	Recorded/calculated, and reported monthly	
QA/QC procedures	According to ISO 9000 or similar quality systems	
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbour imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.	
Additional comment	No comments	

Data/parameter table 10

Data/parameter	$EF_{CO2,BL,y}$
Description	Emissions factor for the fossil fuels displaced by the use of alternative fuels in the project plant EF CO2,BL,Y | 0.00040794 | tCO2/Mcal Coke
Data unit	t CO_2/GJ
Equations referred	Equations (2)
Purpose of data	☒ Baseline emissions / removals ☐ Project emissions / removals ☐ Leakage emissions
Measurement methods and procedures	Calculated as follows, as the lowest of the following CO_2 emission factors: The weighted average annual CO_2 emission factor for the fossil fuel(s) consumed and monitored ex ante during the most recent three years before the start of the project activity.

	The weighted average annual CO_2 emission factor of the fossil fuel(s) consumed in the project plant in year y that are not less carbon-intensive fossil fuels. If F2 has been determined as the most likely baseline scenario: the weighted average annual CO_2 emission factor for the fossil fuel(s) that would have been consumed according to the fuel mix determined in the selection of the most plausible baseline scenario and demonstration of additionality.	
Entity/person responsible for the measurement	Facility Operator	
Measuring instrument(s)	*Type of instrument*	Not applicable
	Accuracy class	Not applicable
	Calibration requirements	Not applicable
	Location	Not applicable
Measurement intervals	Continuously, aggregated at least annually.	
QA/QC procedures		
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbour imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.	
Additional comment	No comments	

Data/parameter table 11

Data/parameter	**$FC_{i,j,y}$**
Description	Quantity of fuel type i combusted in process j during the year y Year / Energy Consumption / Unit 2025 / 1,224,971,931 / Mcal / 152,835 / t Coke 2024 / 1,035,464,566 / Mcal / 129,191 / t Coke 2023 / 900,863,809 / Mcal / 112,397 / t Coke 2022 / 1,330,774,188 / Mcal / 166,035 / t Coke
Data unit	Mass or volume unit per year (e.g., ton/yr or m3/yr)
Equations referred	Equation (3,4,5,7,10)

Year	Energy Consumption	Unit		
2025	1,224,971,931	Mcal	152,835	t Coke
2024	1,035,464,566	Mcal	129,191	t Coke
2023	900,863,809	Mcal	112,397	t Coke
2022	1,330,774,188	Mcal	166,035	t Coke

Purpose of data	☐ Baseline emissions / removals ☒ Project emissions / removals ☐ Leakage emissions	
Measurement methods and procedures	• Use either mass or volume meters. In cases where fuel is supplied from small daily tanks, rulers can be used to determine mass or volume of the fuel consumed, with the following conditions: The ruler gauge must be part of the daily tank and calibrated at least once a year, and have a book of control for recording the measurements (daily or per shift) • Accessories such as transducers, sonar, and piezo electronic devices are accepted if they are properly calibrated with the ruler gauge and receive reasonable maintenance • In case of daily tanks with pre-heaters for heavy oil, the calibration will be made with the system at typical operational conditions	
Entity/person responsible for the measurement	Plant Operator	
Measuring instrument(s)	*Type of instrument*	Electronic meters certified to national or IEC standards, including a backup device and registries of data in a SCADA or equivalent.
	Accuracy class	Minimum accuracy grade: 0.2
	Calibration requirements	Ensure that the equipment is calibrated following the local/national standards or the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used.
	Location	Located in the main fuel line or mechanical feeder that supplies energy input to a combustion process.
Measurement intervals	Continuously	
QA/QC procedures	The consistency of metered fuel consumption quantities should be cross-checked by an annual energy balance that is based on purchased quantities and stock changes. Where the purchased fuel invoices can be identified specifically for the A6.4 project, the metered fuel consumption quantities should also be cross-checked with available purchase invoices from the financial records	
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbour imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.	
Additional comment	No comments	

Data/parameter table 12

Data/parameter	$W_{C,i,y}$	
Description	Weighted average mass fraction of carbon in fuel type i in year y	
Data unit	tC/mass unit of the fuel	
Equations referred	Equation (27)	
Purpose of data	☐ Baseline emissions / removals ☒ Project emissions / removals ☐ Leakage emissions	
Measurement methods and procedures	The following data sources may be used if the relevant conditions apply: (a) Values provided by the fuel supplier in invoices. This is the preferred source. (b) Measurements by the project participants, if (a) is not available Measurements should be undertaken in line with national or international fuel standards.	
Entity/person responsible for the measurement	Plant Operator	
Measuring instrument(s)	*Type of instrument*	Not applicable
	Accuracy class	Not applicable
	Calibration requirements	Not applicable
	Location	Not applicable
Measurement intervals	The mass fraction of carbon should be obtained for each fuel delivery, from which weighed average annual values should be calculated.	
QA/QC procedures	Verify if the values under (a) and (b) are within the uncertainty range of the product of the IPCC default values as provided in Table 1.2 and Table 1.3, Vol. 2 of the 2006 IPCC Guidelines. If the values fall below this range, collect additional information from the testing laboratory to justify the outcome or conduct additional measurements. The laboratories in (b) should have ISO17025 accreditation or justify that they can comply with similar quality standards.	
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbour imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.	
Additional comment	Applicable where Option A is used	

Data/parameter table 13

Data/parameter	$\rho_{i,y}$
Description	Weighted average density of fuel type i in year y
Data unit	Mass unit/volume unit

Equations referred	Equation (27)	
Purpose of data	☐ Baseline emissions / removals ☒ Project emissions / removals ☐ Leakage emissions	
Measurement methods and procedures	Measurements should be undertaken in line with national or international fuel standards.	
Entity/person responsible for the measurement	Plant Operator	
Measuring instrument(s)	*Type of instrument*	Not applicable
	Accuracy class	Not applicable
	Calibration requirements	Not applicable
	Location	Not applicable
Measurement intervals	The density of the fuel should be obtained for each fuel delivery, from which weighted average annual values should be calculated.	
QA/QC procedures		
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbor imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.	
Additional comment	Applicable where Option A is used and where $FC_{i,j,y}$ is measured in a volume unit. Preferably, the same data source should be used for $W_{C,i,y}$ and $\rho_{i,y}$	

Data/parameter table 14

Data/parameter	**$TDL_{j,y}$, $TDL_{k,y}$ and $TDL_{l,y}$**
Description	Average technical transmission and distribution losses for providing electricity to source j, k, or l in year y
Data unit	Dimensionless %
Equations referred	Equation (29,30)
Purpose of data	☐ Baseline emissions / removals ☒ Project emissions / removals ☐ Leakage emissions
Measurement methods and procedures	In case of scenario B and scenario C, case C.II, assume $TDLj/k/l,y$ = 0 as a simplification. In the case of other scenarios (scenario A and scenario C, cases C.I and C.III), choose one of the following options: 1. Use the 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 projects 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. 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.	
Entity/person responsible for the measurement	Plant Operator	
Measuring instrument(s)	*Type of instrument*	Not applicable
	Accuracy class	Not applicable
	Calibration requirements	Not applicable
	Location	Not applicable
Measurement intervals	For (a): $TDL_{j/k/l,y}$ should be estimated for the distribution and transmission networks of the electricity grid of the same voltage as the connection where the proposed A6.4 project activity is connected to. The technical distribution losses should not contain other types of grid losses (e.g., commercial losses/theft). The distribution losses can either be calculated by the project participants or be based on references from utilities and network operators. Or other official documentation	
QA/QC procedures		
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbour imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.	
Additional comment	No comments	

Data/parameter table 15

Data/parameter	**$FC_{n,i,t}$**
Description	Quantity of fossil fuel type i fired in the captive power plant n in the time period t
Data unit	Mass or volume unit at reference conditions per year (in m^3, ton, or l)

<table>
<tr><td></td><td colspan="2">The reference environmental conditions are: 0 oC (273.15 K, 32ºF) and 1 atm (101.325 kN/m2, 101.325 kPa,14.69 psia, 29.92 in Hg, 760 torr).</td></tr>
<tr><td>Equations referred</td><td colspan="2">Equation (31)</td></tr>
<tr><td>Purpose of data</td><td colspan="2">☐ Baseline emissions / removals ☒ Project emissions / removals ☐ Leakage emissions</td></tr>
<tr><td>Measurement methods and procedures</td><td colspan="2">Annual data during the crediting period: On-site measurements

Historical data: Historical records / onsite measurements

Use either mass or volume meters. In cases where fuel is supplied from small daily tanks, rulers can be used to determine the mass or volume of the fuel consumed, with the following conditions: The ruler gauge must be part of the daily tank and calibrated at least once a year, and have a book of control for recording the measurements (daily or per shift).

Accessories such as transducers, sonar, and piezo electronic devices are accepted if they are properly calibrated using the ruler gauge and receive regular maintenance in accordance with the supplier's specifications.

For daily tanks with pre-heaters for heavy oil, calibration will be performed with the system at typical operational conditions.</td></tr>
<tr><td>Entity/person responsible for the measurement</td><td colspan="2">Plant Operator</td></tr>
<tr><td rowspan="4">Measuring instrument(s)</td><td>Type of instrument</td><td>Electronic meters certified to national or IEC standards, including a backup device and registries of data in a SCADA or equivalent.</td></tr>
<tr><td>Accuracy class</td><td>Minimum accuracy grade: 0.2</td></tr>
<tr><td>Calibration requirements</td><td>Ensure that the equipment is calibrated following the local/national standards or the manufacturer’s specifications. If local/national standards or the manufacturer’s specifications are not available, international standards may be used.</td></tr>
<tr><td>Location</td><td>Located in the main fuel line or mechanical feeder that supplies energy input to a combustion process.</td></tr>
<tr><td>Measurement intervals</td><td colspan="2">Continuously, aggregated at least annually.</td></tr>
<tr><td>QA/QC procedures</td><td colspan="2">The consistency of metered fuel consumption quantities should be cross-checked against an annual energy balance based on amounts purchased and stock changes.</td></tr>
<tr><td>Treatment of uncertainty</td><td colspan="2">To manage uncertainty in data from instruments or systems:
If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbour imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation.
The registered data set should maintain a confidence level of 95% or lower.
If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.</td></tr>
<tr><td>Additional comment</td><td colspan="2">Only applicable if option B1 is used.</td></tr>
</table>

Data/parameter table 16

Data/parameter	***$EG_{n,t}$***	
Description	Quantity of electricity generated in the captive power plant n in the time period t	
Data unit	MWh	
Equations referred	Equation (32)	
Purpose of data	☐ Baseline emissions / removals ☒ Project emissions / removals ☐ Leakage emissions	
Measurement methods and procedures	Use electricity meters Onsite measurements	
Entity/person responsible for the measurement	Plant Operator	
Measuring instrument(s)	*Type of instrument*	Electronic meters certified to national or IEC standards, including a backup device and registries of data in a SCADA or equivalent.
	Accuracy class	Minimum accuracy grade: 0.2
	Calibration requirements	Ensure that the equipment is calibrated following the local/national standards or the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used.
	Location	Located in a substation before the delivery of electricity to consumers.
Measurement intervals	Continuously, aggregated at least annually.	
QA/QC procedures	Cross-check measurement results with records for sold electricity, where relevant.	
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbour imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.	
Additional comment	Only applicable if option B1 is used.	

Data/parameter table 17

Data/parameter	***$HG_{n,t}$***
Description	Quantity of heat co-generated in the captive power plant n in the period t
Data unit	GJ
Equations referred	Equation (32)

Purpose of data	☐ Baseline emissions / removals ☒ Project emissions / removals ☐ Leakage emissions	
Measurement methods and procedures	Heat generation is determined as the difference between the enthalpy of the steam or hot water generated and the enthalpy of the feed water and any condensate return. The respective enthalpies should be determined based on the mass (or volume) flows, the temperatures, and, in the case of superheated steam, the pressure. Steam tables or appropriate thermodynamic equations may be used to calculate the enthalpy as a function of temperature and pressure.	
Entity/person responsible for the measurement	Plant Operator	
Measuring instrument(s)	*Type of instrument*	Electronic meters certified to national or IEC standards, including a backup device and data registries in a SCADA or equivalent system, or arrangements with thermocouples and pressure gauges connected to a SCADA or PLC for computing enthalpies and energy (heat) through a program.
	Accuracy class	Minimum accuracy grade: 0.2
	Calibration requirements	Ensure that the equipment is calibrated following the local/national standards or the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used.
	Location	Meters or instruments are inserted in the main pipelines.
Measurement intervals	Continuously, aggregated at least annually.	
QA/QC procedures	Cross-check measurement results with records for sold heat and the other energy measurements, where relevant.	
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbor imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower. ▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.	
Additional comment	Only applicable if option B1 is used and if heat generation is not ignored.	

Data/parameter table 18

Data/parameter	$EC_{PJ,j,y}$; $EC_{LE,l,y}$
Description	Quantity of electricity consumed by the project electricity consumption source j in year y Net increase in electricity consumption of source l in year y as a result of leakage1
Data unit	MWh/yr

Equations referred	Equation (29,30)	
Purpose of data	☐ Baseline emissions / removals ☐ Project emissions / removals ☐ Leakage emissions	
Measurement methods and procedures	Use electricity meters installed at the source of electricity consumption. Direct measurement or calculated based on measurements from more than one electricity meter.	
Entity/person responsible for the measurement	Plant Operator	
Measuring instrument(s)	*Type of instrument*	Electronic meters certified to national or IEC standards, including a backup device and registries of data in a SCADA or equivalent.
	Accuracy class	Minimum accuracy grade: 0.2
	Calibration requirements	Ensure that the equipment is calibrated following the local/national standards or the manufacturer's specifications. If local/national standards or the manufacturer's specifications are not available, international standards may be used.
	Location	Located in a substation before the delivery of electricity to consumers.
Measurement intervals	Continuous measurement and at least monthly recording	
QA/QC procedures	In cases where electricity meters are regulated (e.g., the electricity is supplied by the electric grid – scenario A), the electricity meter will be subject to regular maintenance and testing following the stipulation of the meter supplier and/or as per the requirements set by the grid operators or national requirements. The calibration of meters, including the frequency of calibration, should be done in accordance with national standards or requirements set by the meter supplier or requirements set by the grid operators. The accuracy of the meters should be in accordance with the stipulation of the meter supplier and/or as per the requirements set by the grid operators or national requirements. In cases where electricity meters are not regulated (e.g. the electricity is supplied by captive power plants – Scenario B), the electricity meter will be subject to regular maintenance and testing in accordance with the stipulation of the meter supplier or national requirements. The calibration of meters, including the frequency of calibration, should be done in accordance with national standards or requirements set by the meter supplier. The accuracy class of the meters should be in accordance with the stipulation of the meter supplier or national requirements. If these standards are not available, and the meter supplier does not specify, calibrate the meters every 3 years and use the meters with at least a 0.5 accuracy class (e.g., a meter with a 0.2 accuracy class is more accurate and thus it is accepted).	
Treatment of uncertainty	To manage uncertainty in data from instruments or systems: ▪ If the time series has data gaps due to the malfunction of instruments or human error, the project participants will use a procedure developed for this purpose using statistical techniques (e.g., linear interpolation, k-nearest neighbour imputation, or regression-based imputation) to rebuild the data and maintain the same standard deviation. ▪ The registered data set should maintain a confidence level of 95% or lower.	

	▪ If modelling is used for getting a parameter, a small p-value (typically < 0.05) must be used. For time series, use indicators such as the Akaike criterion or equivalent to select the best models.
Additional comment	No comments

B.8.2. Sampling plan

>>Not applicable

B.8.3. Monitoring management system

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

B.8.4. Post-crediting period monitoring plan

>>Not applicable

SECTION C. Start date, crediting period type and duration

C.1. Project start date

>> Start Date 01/01/2027

C.2. Expected operational lifetime of the project

>>20 years

C.3. Project crediting period

C.3.1. Type of crediting period approved by the host Party

☐ Renewable ☒ Fixed

C.3.2. Start date of the crediting period

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

C.3.3. Duration of the crediting period

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

SECTION D. Environmental impacts, social impacts and sustainable development impacts

D.1. Environmental and social impacts and sustainable development impacts as per the Article 6.4 sustainable development tool

D.1.1. Summary of the environmental and social risk assessment and applicable mitigation measures

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

D.1.2. Summary of the sustainable development impacts assessment

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

D.1.3. Monitoring plan of activity-level environmental and social indicators and activity-level SD indicators

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

D.2. Environmental and social impacts as per the host Party regulations

D.2.1. Summary of host Party requirements

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

D.2.2. Summary and conclusion of the assessment

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

SECTION E. Local stakeholder consultation

E.1. Scope of the consultation

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

E.2. Stakeholders invited

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

E.3. Modalities for the consultation

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

E.4. Summary of comments received

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

E.5. Consideration of comments received

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

SECTION F. Confirmation of avoidance of double or revived registration

A 6.4 mechanism	☒	**The proposed A6.4 project has not been already registered as an A6.4 project.**
	☐	**The proposed A6.4 project has not been already included as a component project (CP) in a registered Article 6.4 mechanism programme of activities (A6.4 PoA).**

	☐ **The proposed A6.4 project has not been previously deregistered from the Article 6.4 mechanism.** >> *Tick all the three boxes above as a confirmation of compliance with mandatory requirements.*
	☐ **The proposed A6.4 project has not been excluded from a registered A6.4 PoA.** >>*Tick the box if applicable.*
Other	☒ **The proposed A6.4 project is not currently registered or being pursued for registration, or covered by a programme, under any other international, regional, national, subnational or sector-wide GHG mitigation crediting scheme.** ☐ **The proposed A6.4 project was previously registered under or covered by a programme under any other international, regional, national, or subnational or sector-wide GHG mitigation crediting scheme but deregistered or excluded from the other crediting scheme before fully consuming the crediting period under the other crediting scheme.** ☐ **The proposed A6.4 project is currently registered or covered by other international, regional, national, subnational or sector-wide GHG mitigation crediting scheme.** >> *Tick only one applicable box.*

Appendix 1. Contact information of activity participants

Organization name	FICEM
Country	Choose an item.
Address	Calle 118 # 19 – 52 Oficina 206 Bogotá, Colombia
Telephone	+57 1 658 2978
Mobile	+56 997891457
E-mail	rpareja@ficem.org
Website	https://ficem.org
Contact person	Mr. Ricardo Pareja

Appendix 2. Applicability of methodologies and standardized baselines

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

Appendix 3. Further background information on ex ante calculation of emission reductions or net removals

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

Appendix 4. Summary of post-registration changes

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

Appendix 5. Further background information on monitoring plan

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

Appendix 6. A6.4 Environmental and Social Safeguards Risk Assessment Form (A6.4-FORM-AC-015)

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

Appendix 7. A6.4 Environmental and Social Management Plan Form (A6.4-FORM-AC-016)

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

Appendix 8. A6.4 Sustainable Development Impact Form (A6.4-FORM-AC-017)

[Not to be completed in this stage, this fictitious PDD is focused on the algorithm of the proposed new methodology]

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