GEF-8 REQUEST FOR CEO ENDORSEMENT/APPROVAL

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General Project Information

Project Title Greening of the Philippines cement and construction industry	
Region Asia	GEF Project ID 11707
Country(ies) Philippines	Type of Project FSP
GEF Agency(ies): UNIDO	GEF Agency Project ID 230234
Project Executing Entity(s) Clean Air Asia	Project Executing Type Others
GEF Focal Area (s) Multi Focal Area	Submission Date 6/1/2026
Type of Trust Fund GET	Project Duration (Months) 60
GEF Project Grant: (a) 6,192,694.00	GEF Project Non-Grant: (b) 0.00
Agency Fee(s) Grant: (c) 588,306.00	Agency Fee(s) Non-Grant (d) 0.00
Total GEF Financing: (a+b+c+d) 6,781,000.00	Total Co-financing 41,711,796.83
PPG Amount: (e) 200,000.00	PPG Agency Fee(s): (f) 19,000.00
Total GEF Resources: (a+b+c+d+e+f) 7,000,000.00	
Project Tags CBIT: No NGI: No SGP: No Innovation: No Competitive Window: No	
Project Sector (CCM Only) Technology Transfer/Innovative Low-Carbon Technologies	

Taxonomy

Stakeholders, Type of Engagement, Consultation, Participation, Information Dissemination, Partnership, Beneficiaries, Civil Society, Academia, Community Based Organization, Non-Governmental Organization, Private Sector, Large corporations, Individuals/Entrepreneurs, Communications, Awareness Raising, Strategic Communications, Public Campaigns, Education, Focal Areas, Chemicals and Waste, Sound Management of chemicals and waste, Emissions, Best Available Technology / Best Environmental Practices, Industrial Emissions, Mercury, Climate Change Adaptation, Climate Change, Influencing models, Convene multi-stakeholder alliances, Demonstrate innovative approache, Transform policy and regulatory environments, Strengthen institutional capacity and decision-making, Gender Equality, Capacity, Knowledge and Research, Gender Mainstreaming, Gender-sensitive indicators, Women groups, Sex-disaggregated indicators, Gender results areas, Participation and leadership, Knowledge Generation and Exchange, Capacity Development, Knowledge Generation, Innovation, Enabling Activities, Knowledge Exchange, Conference, Peer-to-Peer, Field Visit, Exhibit

Rio Markers

Climate Change Mitigation	Climate Change Adaptation	Biodiversity	Land Degradation
Significant Objective 1	No Contribution 0	No Contribution 0	No Contribution 0

Project Summary

Provide a brief summary description of the project, including: (i) what is the problem and issues to be addressed? (ii) what are the project objectives, and if the project is intended to be transformative, how will this be achieved? iii), how will this be achieved (approach to deliver on objectives), and (iv) what are the GEBs and/or adaptation benefits, and other key expected results. The purpose of the summary is to provide a short, coherent summary for readers. (max. 250 words, approximately 1/2 page)

The Philippine construction market is projected to grow by about 6.7% annual from 2025 to 2030, making it the fastest growing in the region. Rapid infrastructure expansion, urbanization, and housing demand will significantly increase the use of cement, steel, and glass. Thus, the construction sector is becoming a major contributor to energy consumption, greenhouse gas emissions, mercury pollution, and construction and demolition (C&D) waste, despite limited national data on these impacts.

Cement poses the greatest environmental risks. The Philippine cement market is expected to reach USD 1.46 billion in 2025, reflecting continued growth in construction demand. Globally, cement production contributes approximately 230 tons of atmospheric mercury emissions annually, representing about 10–11% of total anthropogenic mercury emissions (UNEP, 2019), and is also responsible for 7–8% of global CO_2 emissions.

As a signatory to the Minamata Convention and through its Nationally Determined Contribution, the Philippines has committed to reducing 75% of greenhouse gas emissions by 2030. However, policy, monitoring, and enforcement gaps remain. This project addresses these challenges by promoting green construction materials, reduced clinker ratios, fuel switching, circular economy approaches, and gender-responsive technology transfer across cement and related materials industries. It aims to reduce 0.4 t/yr (2.0 t over 5 yr) of mercury, at least 1 million tons of CO_2e while benefiting at least 6 million people (50% women/50% men), supporting a gender-inclusive transition to a low-carbon, resource-efficient, and healthier construction sector aligned with SDGs 3, 5, 9, 12 and 13.

Project Description Overview

Project Objective

Advance Philippines efforts to reduce mercury releases to the environment, focusing on cement manufacturing, leveraging on the policies and actions for reduction of the GHG emissions

Project Components

Component 1: Policy, regulatory and institutional enabling framework

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
1,215,000.00	5,100,000.00

Outcome:

Outcome 1.1 National policy, regulatory and institutional framework strengthened, encouraging gender parity

Output:

1.1.1 National policy and regulatory framework for green cement and construction materials reviewed and a policy reform roadmap produced.

1.1.2 National regulatory framework and implementing provisions for monitoring and controlling mercury emissions in the cement sector developed and submitted for government adoption.

1.1.3 National technical guidelines and standards for low-impact buildings, low-carbon construction materials, and industrial emission reductions developed for endorsement.

1.1.4 National MRV and material traceability system for construction materials and associated mercury and GHG emissions established.

1.1.5 Gender-responsive policy recommendations and Gender Action Plan for green construction materials integrated into the national policy framework.

Component 2. Business development

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
1,000,000.00	5,000,000.00

Outcome:

Outcome 2.1 Market actors adopt investment-ready pathways

Output:

Output 2.1.1 Full value-chain cement roadmap for low-mercury and net-zero sector by 2050 with climate-smart technologies developed and gender mainstreamed

Output 2.1.2 Business model and incentive framework for low-mercury and low-carbon investments developed.

Output 2.1.3 Industry partnership and technology transfer platform established to facilitate cooperation, knowledge exchange and uptake of low-mercury and low-carbon solutions in the cement and construction sector.

Output 2.1.4 Pipeline of bankable investment opportunities and financing partnerships for green construction practices and products developed.

Component 3. Technology demonstration

Component Type	Trust Fund
Investment	GET
GEF Project Financing ($)	Co-financing ($)
2,466,804.00	22,631,796.83

Outcome:

Outcome 3.1. Innovative, low-carbon and resource efficient cement technologies demonstrated and validated

Output:

Output 3.1.1 Technology demonstration projects for low-mercury green cement

Output 3.1.2 Supporting the implementation of energy-efficient processes in kiln operations

Output 3.1.3 Advancing circular approaches for recycled concrete, clinker and alternative materials

Component 4: Capacity Building

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
1,030,000.00	5,000,000.00

Outcome:

Outcome 4.1 Capacity strengthened for control and reduction of mercury emissions in line with the Minamata Convention and use of green cement/construction material use.

Outcome 4.2 Knowledge management platform established to support stakeholder within the construction industry with greener transformation, promoting female leadership

Output:

Output 4.1.1. National enforcement capacity strengthened for mercury monitoring and reporting, to ensure compliance with regulatory limits

Output 4.1.2. National institutional capacity for green procurement on infrastructure programmes built to facilitate green cement and construction materials use

Output 4.2.1 Knowledge documented and shared with stakeholders

Output 4.2.2 Project results communicated through relevant platforms

Output 4.2.3 Targeted outreach for the general public, decision-makers and industry experts with gender-specific communication

5. M&E

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
186,000.00	2,000,000.00

Outcome:

Outcome 5.1 Project monitored and evaluated

Output:

Output 5.1.1 Ongoing project monitoring

Output 5.1.2

Mid-term project review

Output 5.1.3 Terminal Evaluation

Component Balances

Project Components	GEF Project Financing ($)	Co-financing ($)
Component 1: Policy, regulatory and institutional enabling framework	1,215,000.00	5,100,000.00
Component 2. Business development	1,000,000.00	5,000,000.00
Component 3. Technology demonstration	2,466,804.00	22,631,796.83
Component 4: Capacity Building	1,030,000.00	5,000,000.00
5. M&E	186,000.00	2,000,000.00
Subtotal	**5,897,804.00**	**39,731,796.83**
Project Management Cost	294,890.00	1,980,000.00
Total Project Cost ($)	**6,192,694.00**	**41,711,796.83**

Please provide Justification

PROJECT OUTLINE

A. PROJECT RATIONALE

Describe the current situation: the global environmental problems and/or climate vulnerabilities that the project will address, the key elements of the system, and underlying drivers of environmental change in the project context, such as population growth, economic development, climate change, sociocultural and political factors, including conflicts, or technological changes. Describe the objective of the project, and the justification for it. (Approximately 3-5 pages) see guidance here

Global environmental problems related to the cement and construction sector

1. The construction industry is one of the largest contributors to global environmental degradation, driving air pollution, water contamination, waste generation, and greenhouse gas emissions. Its impacts extend across ecosystems, resource use, and climate change, making sustainable practices essential for the sector's future. Construction and the wider buildings sector are significant sources of environmental pressure, affecting air quality, water resources, waste generation, ecosystems and climate. Construction activities can generate dust and particulate pollution through earthworks, material handling, transport and the operation of heavy machinery, while the production of construction materials such as cement and steel is also emissions intensive. The buildings and construction sector is estimated to account for nearly 50% of global material extraction, illustrating the scale of its resource footprint ((1) UNEP & GlobalABC, 2026) Construction-site runoff can carry sediment, debris, chemicals, metals and other pollutants into rivers, lakes and coastal waters, potentially affecting water quality and aquatic ecosystems. Construction activities involving land clearing, grading and excavation can disturb soils and increase the risk of erosion and pollutant discharges through stormwater runoff. (2- US EPA, 2026)

1.a. Construction and demolition (C&D) activities also generate very large volumes of waste. A recent peer-reviewed review estimates that C&D waste accounts for approximately 25–40% of all solid waste worldwide, although the proportion varies considerably by country and according to how waste is defined

and measured. (A critical review on recycling and reuse of construction and demolition waste materials, 2025) Land clearing and urban expansion can contribute to habitat loss, soil erosion and ecosystem fragmentation, while construction activities and heavy machinery can contribute to environmental noise. Building sites are recognized by the World Health Organization as an important source of environmental noise, and excessive noise exposure can have adverse effects on human health and well-being, including sleep disturbance, cardiovascular effects, hearing impairment and cognitive impacts. (2A-WHO, 2024)

1.b Most significantly from a climate perspective, the buildings and construction sector accounts for around 37% of global CO_2 emissions. The sector also consumes approximately 32% of global energy and is therefore central to global efforts to reduce emissions and accelerate the transition towards more resource-efficient, low-carbon and sustainable construction practices. (2B- UNEP & GlobalABC, 2026)

2. The cement industry is one of the most environmentally impactful sectors worldwide, contributing significantly to greenhouse gas emissions, resource depletion, and pollution. Its global footprint makes it a critical focus for sustainability and climate action. Cement production is responsible for 7–8% of global CO_2 emissions, primarily from the calcination of limestone and the burning of fossil fuels in kilns.[3][1] The industry emits large amounts of particulate matter, nitrogen oxides (NOx), and sulfur oxides (SOx), contributing to smog, acid rain, and respiratory health problems. Cement manufacturing consumes vast quantities of limestone, clay, sand, and fossil fuels, leading to habitat destruction and unsustainable resource extraction. Production processes require significant water for cooling and dust suppression, while wastewater discharge can contaminate local water sources. Dust, kiln residues, and solid waste from quarrying and production contribute to environmental degradation if not properly managed. Beyond direct emissions, cement reliance on coal and petroleum fuels intensifies its role in global warming, making it one of the hardest-to-abate industrial sectors. The cement industry is indispensable for global infrastructure but remains one of the largest industrial polluters. Its environmental impacts—especially CO_2 emissions and air pollution—underscore the urgency of adopting low-carbon technologies, sustainable materials, and stronger governance frameworks. Transitioning to greener practices is essential if the sector is to align with international climate goals and reduce its ecological footprint.

3. Global mercury emissions from the cement industry are a significant environmental concern, with the sector accounting for approximately 10-11% of global anthropogenic atmospheric mercury emissions, equivalent to about 230 tons of mercury per year out of a global total of 2,220 tons annually (UNEP, 2019-footnote 5). Construction activities amplify this impact through the increasing demand for cement and related materials (UNEP, 2023-footnote 6). The main sources of mercury (Hg) in cement production include raw materials, as limestone and other minerals naturally contain trace amounts of mercury; fuels, particularly coal and petroleum-based fuels that release mercury during combustion; process pathways, where the high temperatures of clinker production volatilize mercury and result in atmospheric emissions; and construction demand, as rapid urbanization and infrastructure expansion increase cement consumption and indirectly drive mercury emissions (UNEP, 2019-footnote 5; AMAP & UNEP, 2019-footnote 7). Thus, the cement industry is both a backbone of global construction and a major industrial source of mercury emissions, releasing approximately 230 tonnes of mercury annually into the atmosphere (UNEP, 2019-footnote5). As global urbanization and infrastructure development continue to increase cement demand, the sector's environmental footprint remains substantial. Tackling mercury emissions requires technological innovation, stricter governance, effective emission control technologies, and sustainable construction practices to align with global environmental and public health objectives (AMAP & UNEP, 2019-footnote).

Key system drivers of environmental pollution in the cement and construction sector

4. The environmental impacts of the cement and construction industry are shaped by a complex interplay of economic, social, technological, political, and environmental drivers. Economically, the sector is propelled by rapid urbanization, infrastructure expansion, and global demand for housing and commercial development. This constant pressure to deliver cost-effective projects often prioritizes cheap, carbon-intensive materials such as

cement and steel, reinforcing reliance on resource-heavy production methods. Socially, rising populations and shifting lifestyles fuel expectations for modern infrastructure, while limited public awareness of the industry's ecological footprint reduces demand for greener alternatives. Employment dependence on construction also makes reform socially sensitive, as millions of livelihoods are tied to the sector's growth.

5. Technological drivers further compound the challenge. Cement production remains highly energy-intensive, requiring kilns that operate at extreme temperatures and consume vast amounts of fossil fuels. While innovations such as carbon capture, alternative binders, and recycled aggregates exist, their adoption is slow and uneven, constrained by cost and scalability.

6. Politically and in terms of governance, weak enforcement of environmental regulations, fragmented institutional responsibilities, and subsidies for fossil fuels perpetuate unsustainable practices. In many regions, construction is treated as a strategic economic priority, making stricter regulation politically difficult despite its environmental costs.

7. Finally, environmental drivers highlight the sector's direct and indirect pressures on ecosystems. Quarrying for limestone, clay, and sand depletes natural resources and destroys habitats, while cement production alone contributes 7–8% of global CO_2 emissions. Mercury and particulate emissions pollute air and water systems, and construction debris fills landfills at alarming rates. Climate change feedback loops intensify these impacts, as rising temperatures and extreme weather events increase demand for resilient infrastructure, which in turn drives further cement consumption. Together, these drivers illustrate how pollution in the cement and construction sector is systemic rooted in economic imperatives, social expectations, technological limitations, governance gaps, and environmental vulnerabilities.

Country Profile

Geography and demographics

8. The Philippines' geography and demographics directly shape the trajectory of its cement and construction industry, while climate change and greenhouse gas (GHG) emissions intensify the sector's environmental and policy challenges. As an archipelagic nation with over 7,600 islands, the Philippines faces fragmented land distribution, extensive coastlines, and high exposure to natural hazards such as typhoons, earthquakes, and volcanic activity. These geographic realities drive continuous demand for resilient infrastructure—roads, bridges, ports, housing, and flood mitigation systems—placing cement at the core of national development. Urban centers such as Metro Manila, Cebu, and Davao concentrate both population and economic activity, intensifying construction pressures in hazard-prone zones and requiring land consolidation strategies to optimize spatial planning and reduce vulnerability.

9. Demographically, the Philippines' population of more than 115 million, with a youthful median age of around 25 years, creates sustained demand for housing, schools, hospitals, and transport systems. Rapid urbanization and migration toward metropolitan areas exacerbate congestion, informal settlements, and infrastructure deficits, reinforcing reliance on cement-intensive construction. At the same time, uneven population distribution across rural and island communities necessitates decentralized infrastructure development, which increases logistical challenges and material demand. This demographic dividend offers opportunities for labor force expansion in construction, but also raises policy concerns regarding sustainable resource use, occupational safety, and equitable access to infrastructure.

10. The construction industry in the Philippines contributed about 9.5% of the total workforce of the country or about 4.55M employed persons. The average participation of the female workforce in construction is 9.54% -

much below the national average value of 53.4%. With these numbers, it is crucial to ensure the presence of an empowering, enabling, and inclusive environment for both women and men in the construction industry.

11. Climate change adds a critical dimension to these pressures. The Philippines is among the most climate-vulnerable countries globally, facing rising sea levels, stronger typhoons, and more frequent flooding events. These impacts increase demand for climate-resilient infrastructure, which paradoxically drives higher cement consumption. Yet cement production is itself a major source of GHG emissions, contributing approximately 7–8% of global CO_2 emissions, alongside mercury and particulate pollution. In the Philippines, the sector's reliance on fossil fuels and clinker-based cement compounds its role in national emissions, making it a priority area for climate mitigation. Without intervention, the construction industry risks locking the country into a high-carbon development pathway that undermines its climate commitments under the Paris Agreement.

12. From a governance perspective, the intersection of geography, demographics, and climate change requires integrated land-use planning and regulatory frameworks that align construction growth with environmental sustainability. Land consolidation policies can support more efficient spatial organization of construction projects, reduce land fragmentation, and enhance community participation in development. Technical instruments such as GIS-based hazard mapping, demographic projections, and GHG inventories should be mainstreamed into planning processes to ensure that infrastructure investments are both socially inclusive and climate-resilient. At the same time, stricter emission standards, adoption of low-carbon technologies, and incentives for alternative materials are essential to reduce the sector's climate footprint.

Climate characteristics and vulnerabilities

13. In 2024 the Philippines population is estimated at 112.7 million people, with a high population growth rate (1.63% from 2015-202). The urbanization rate is 48% and has been growing since 2010. The country's GDP was 394 billion USD in 2021, with a 5.7% growth rate, with even higher growth expected in coming years, according to ADB. The country's GHG emissions have been on the rise since 1990 levels, slightly decreasing in 2020 due to the pandemic, but continuing upward trend until 2022. The dominant emission source is the energy sector, followed by agriculture and industrial processes (Figure 1).

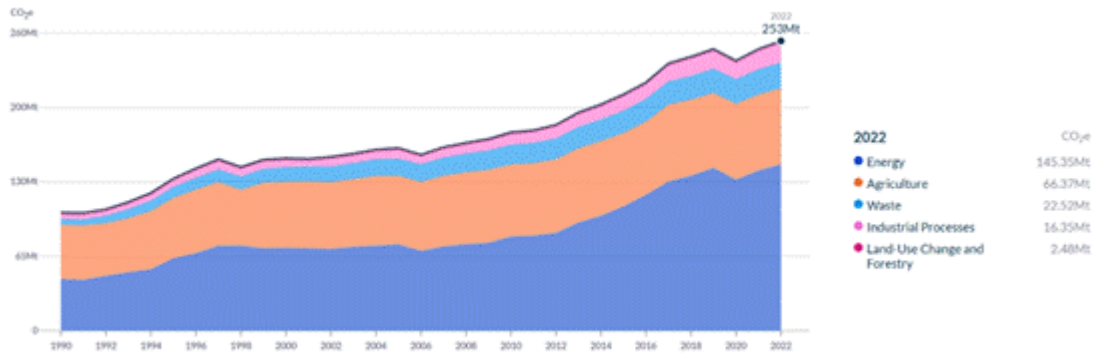


Figure 1. Philippine GHG emissions 1990 – 2022

(Source: Philippines | Total including LUCF | Greenhouse Gas (GHG) Emissions | Climate Watch)

14. In the latest Nationally Determined Contribution or NDC (2021) the Philippines committed to reduce and avoid 75% of its projected GHG emissions against the BaU scenario. This commitment is conditional and aligned with the Paris Agreement based on common but differentiated responsibilities and national circumstances. It presents a "fair share" of the 2°C target. The conditions for reaching the target set out include technology transfer, financial resources, and capacity building for action in specific sectors including industrial processes and product use. The country is looking to increase its ambition in the decarbonization of the economy.

Baseline overview

Economic overview and related estimated Hg and CO2 emissions

15. Current development policies focus on the transition to a low-carbon economy, but their implementation requires building the government's capacity to translate high ambition into concrete, measurable action. This is specifically relevant to the construction materials sector, which is rapidly developing in the country. Therefore, the government sought support through a foreign-assisted project focused on the decarbonization of the cement and construction industry and currently having the UNIDO project on the Construction Industry Roadmap.

16. According to a recent forecast the Philippines is set to be the fastest-growing construction market over the next 15 years, averaging over 6% growth per annum. This will be driven by economic growth and the working-age population growing 1.5% per annum over the next decade. The government's public-private partnership initiative and improved long-term investor confidence are set to support investment—and therefore construction activity—over the forecast period. Civil infrastructure will be the growing and fastest-growing sector, with significant government support.

17. The number of residential, non-residential, addition, alteration and repair types of construction activities in the Philippines more than doubled in 2023 compared to 2021. In 2023, an estimated amount of 47.4B USD construction project was recorded based on the building permits secured for that year.

Table 1. Construction Statistics (2021-2023)

Year	Floor Area (square meter)	Value (USD 1,000)
2023	**2,747,301.00**	**47,367.26**
2022	**1,710,053.00**	**29,483.67**
2021	**1,273,548.00**	**21,957.72**

18. In 2023, the list of Infrastructure Flagship Projects includes 197 projects worth over 8,714 billion PHP (153 billion USD) to be completed in the next years, driving demand for construction materials, and resulting in millions of tons of embodied carbon (mainly from the use of cement, steel and glass). The current Philippine Development Plan 2023-2028 prioritizes the shift of the economy towards low-carbon industry, especially sustainable production, and consumption.

19. The construction sector broadly (including mining, cement requirements and construction materials manufacturing) is a key contributor to the Philippines' energy and industrial processes emissions. The cement sector emissions in 2021 were estimated at ca. 16.46 Mt CO_2 per year, not including indirect emissions and associated land degradation and biodiversity loss. Other manufacturing and construction sector emissions are estimated at an additional 3 – 5 MT CO2 per year. The Philippine's cement industry emissions intensity was 683 kg CO2/t product in 2016, 11% higher than the world average. Currently, there is no data available on the amount of construction and demolition (C&D) waste generated in the country. It can be assumed that 10% of the weight of materials purchased for construction projects end up in waste. Detailed assessment of the

construction sector's impact on climate, material efficiency, and biodiversity is a gap, which the project aims to fulfil.

20. The projected emissions from the cement industry are estimated based on the growth of the sector in terms of cement production. The standard industry clinker ratio and the IPCC default clinker emission factor were used to come up with estimates. By 2030, cement production is estimated to emit 31.37 Mt CO2 per year, approximately twice the emissions in 2023. Table 2. Projected annual cement productions, related Hg emissions and GHG emissions:

Table 2. Annual Cement Production and Estimated Hg and GHG Emissions

	2023	2024	2025	2026	2027	2028	2029	2030
Annual Cement Production in 1000 T	40,569	44,396	48,595	53,238	58,370	64,039	70,323	77,303
Annual Hg Emission (T)	3.7	4.0	4.4	4.8	5.3	5.8	6.3	7.0
Annual GHG*Emissions (MT CO_2)	16.46	18.02	19.72	21.61	23.69	25.99	28.54	31.37

*Source: DENR model for Cement Industry Emissions (2022)

21. The MIA for the Philippines in 2019 used a 0.09 g Hg per ton of cement as input factor for the estimated Mt cement output, calculating cement sector emissions of 2,392 kg of mercury per year. With the data for 2023 at 40.6 Mt, this calculation would amount to 3,654 kg of mercury emissions. Towards the end of the project timeline, in line with the predicted construction growth, DENR estimates a cement production of 77.3 million tons in the Philippines which would correspond to 6,957 kg Hg emission per year.

22. The emission factors considered in the MIA were 40% air, 20% product, and 40% sector specific disposal. Electrostatic precipitator systems are the most common air pollution control facilities in the cement industry which incorporate collected particulates, and the particulate bound mercury, into the system. The removal rate of such systems for oxidized mercury however remains rather low (approximately 10%).

Environmental and health impacts

23. Mercury and CO_2 emissions from the cement and construction industry arise mainly from raw material processing, high-temperature kiln operations, fuel combustion, and the large volumes of materials required for infrastructure development. These emissions have distinct but interconnected environmental and health impacts, particularly for communities located near cement plants, quarries, and construction hubs.

24. Coal is still the main fuel adopted in the Philippines clinker plants, although alternative fuels are being scaled up under decarbonization roadmaps. In the country, over 67.5% of coal is imported (IEA, 2026) of which around 85% from Indonesia (CREA 2020) while the rest derives from local production. Mercury concentrations in coal used by cement plants in the Philippines are therefore expected to reflect the characteristics of the blend of imported fuels and local fuels. With this respect, while a comprehensive geochemical review reports a global average ("Clarke value") of about 0.10 ppm (Yudovich e Ketris

2005) with most coals falling within a range of approximately 0.02 to 1.0 ppm depending on geological origin and coal rank, a geochemistry survey carried out on Indonesian coal samples taken from Sumatra, Kalimantan, Sulawesi, and Papua (Belkin et al. 2009) has revealed mercury concentration ranging from 0.02 to 0.19 ppm, with an average in line with the Clarke value of 0.1 ppm. Is therefore reasonable to adopt as a baseline value a concentration of mercury in coal of around 0.1ppm. This is also in line with what has also been proposed in the Philippine Coal-Health report (CREA 2020).

25. Mercury concentrations in limestone used for clinker production are generally low but variable, typically occurring in the range of 5 to 35 µg/kg, with cement-plant measurements reporting values up to 13–51 µg/kg, depending on geological characteristics and impurity content. These findings are consistent with cement-sector studies showing that raw materials can represent a significant source of mercury input to kiln systems, in some cases comparable to or exceeding fuel-derived mercury (Kline, J, 2013; WBCSD 2016). As no publicly available data were identified for limestone used in Philippine cement plants, global ranges are used as a proxy. Project-specific measurements from Vietnam (MECIE Viet Nam 2018) indicate higher values of 55–72 µg/kg, illustrating that limestone can be a significant mercury source under certain conditions.

26. Based on the above, a mercury balance in the manufacturing of clinker in the Philippine may be calculated as follows:

- Input of mercury from coal: In a typical modern dry-process-based cement plant, 2.9–4.6 GJ of thermal energy is consumed per tonne (t) of clinker (Wolde et al. 2024). Converted in coal (6000Kcal/kg), this results in a consumption of around 130~150 kg of coal per tonne of clinker, with a mercury input in the order of 11.5 – 18.5 mg Hg / t of clinker.

- Similarly, one ton of clinker requires the consumption of 1.1~1.3 tons of limestone per ton of clinker (IPCC), with an estimated mercury input at 14.3 – 66.3 mg Hg / t of clinker.

27. These are obviously only preliminary baseline estimates that would need to be refined during project implementation. A clear consequence of the above, however, is that reducing mercury input in the cement production process cannot rely solely on controlling mercury in fuels but must also consider mercury associated with raw materials. Any intervention aimed at reducing mercury emissions from cement production therefore needs to take this into account.

28. Although the upstream prevention of mercury – such as the use of low-mercury alternative fuels and clinker replacement - is the most effective way to minimize releases, these measures alone may not fully address emissions. In parallel, downstream and process-level approaches are needed to manage mercury behavior within the system and reduce releases to the environment, complementing upstream strategies across the full production cycle.

29. In addition to the upstream and downstream approaches described above, there are also practical measures at the plant level that can help further reduce mercury emissions. For example, better control of mercury in fuels and raw materials—through improved monitoring and selection—can lower the amount of mercury entering the system, typically in the range of 10–40% (WBCSD, 2016; UNEP, 2015). Improvements in kiln operation can also make a difference by reducing mercury recirculation and limiting emission peaks, with similar potential reductions (WBCSD, 2016; European Commission, 2013). Finally, strengthening air pollution control systems—such as improving dust and filter performance, and where appropriate, applying mercury capture technologies like activated carbon injection—can further

reduce emissions, in some cases quite significantly (WBCSD, 2016; European Commission, 2013; U.S. EPA, 2011). Taken together, these measures offer practical ways to build on existing efforts and achieve additional reductions in mercury emissions across the sector.

30. Mercury emissions are released during cement manufacturing when mercury naturally present in limestone, clay, and alternative fuels is volatilized in cement kilns. Once emitted, mercury deposits onto nearby soil and water bodies, where it can be transformed into methylmercury, a highly toxic compound. In aquatic environments, methylmercury bioaccumulates fish and shellfish, entering the human food chain. This contamination threatens freshwater and coastal ecosystems and can lead to long-term ecological degradation. Mercury is also capable of long-range atmospheric transport, meaning emissions from cement plants can affect ecosystems far beyond their immediate vicinity.

30. From a human health perspective, mercury exposure is particularly harmful to populations living near cement plants and to workers within the industry. Chronic exposure can cause neurological damage, impaired cognitive development in children, and adverse effects on the cardiovascular, immune, and renal systems. Pregnant women and infants are especially vulnerable, as prenatal exposure can lead to lifelong developmental and learning disabilities.

31. CO_2 emissions from the cement and construction sector primarily result from the calcination of limestone during clinker production and the combustion of fossil fuels in kilns and heavy construction equipment. These emissions contribute directly to climate change, increasing the frequency and severity of heatwaves, floods, and storms. Climate impacts can damage infrastructure, disrupt livelihoods, and strain water and food systems.

32. Indirectly, rising temperatures and climate variability worsen air quality, increase heat-related illnesses, and elevate risks of respiratory and cardiovascular diseases. Together, mercury pollution and CO_2 emissions from cement and construction processes pose compounded risks to environmental integrity, public health, and sustainable development, underscoring the importance of cleaner production and low-carbon construction practices.

Transboundary and regional implications of mercury and CO_2 releases from cement and construction activities

33. In the Philippine, emissions of mercury and CO_2 from cement manufacturing and construction activities could have significant transboundary and regional implications due to atmospheric transport processes and the country's archipelagic and coastal setting. Elemental and oxidized mercury released from cement kilns could undergo long-range atmospheric transport facilitated by prevailing monsoon wind systems, enabling deposition far from emission sources. Subsequent deposition into terrestrial and aquatic environments, including the South China Sea, Sulu Sea, and Philippine Sea, could lead to methylation in sediments and biota, resulting in bioaccumulation and biomagnification within marine food webs. Given the Philippines' high per capita fish consumption and reliance on coastal fisheries, such transboundary mercury deposition could pose elevated regional risks to ecosystem integrity, food safety, and human health.

34. Similarly, CO_2 emissions from cement production, for example arising from fossil fuel combustion, could contribute to the global atmospheric greenhouse gas burden, with regional climate consequences. In Southeast Asia, these emissions could exacerbate ocean warming, sea-level rise, coral reef bleaching, and the increasing intensity and frequency of tropical cyclones. For the Philippines,

these climate-driven impacts could translate into heightened coastal erosion, saline intrusion, damage to infrastructure, and increased vulnerability of communities and ecosystems across national boundaries. The transboundary nature of both mercury pollution and climate forcing underscores the necessity of coordinated regional mitigation efforts and strengthens the relevance of the Philippines' obligations under the Minamata Convention on Mercury and the Paris Agreement, emphasizing emission reductions from the cement and construction sector as a regional environmental and public health priority.

Stakeholders for the cement and construction industry

35. The cement and construction sector in the Philippines is characterized by a complex network of stakeholders operating across the entire value chain, from raw material suppliers, fuel and alternative input providers, and technology and advisory services, to cement and construction product manufacturers, distributors, regulators, and end-users. These actors collectively shape production practices, material selection, and the adoption of sustainability criteria, influencing both environmental performance and resource efficiency. Industrial market dynamics, construction demand, and product pricing further affect decisions on raw material sourcing, clinker ratios, fuel use, and the incorporation of low-carbon or hazardous-chemicals-free alternatives. At the same time, regulatory frameworks, industry guidelines, and emerging green procurement standards guide investments and operational choices, creating incentives or barriers for adopting cleaner production technologies and circular economy approaches. As a result, the behavior of each stakeholder group, from policymakers to consumers, can significantly impact mercury and greenhouse gas emissions, material efficiency, and overall sustainability outcomes in the Philippine cement and construction sector. Understanding these interactions is essential for designing effective interventions to reduce emissions, enhance resource efficiency, and promote the uptake of low-carbon, environmentally sustainable construction practices nationwide.

Stakeholders and their roles in the system

36. The current institutional framework relevant to the project covers the main institutions engaged in the built environment and construction materials development, among which cement, are included in Table 3.

37. Table 3. Stakeholder Engagement

Stakeholder Type	**Contribution to accelerate reduction of mercury emissions from the cement sector and advance market transformations that support resource efficiency and net-zero carbon emission targets.**	**Name of the Ministry/institution/organization/company**

National governments	• Nationally endorse and adopt sector roadmap for reduction of mercury and carbon emissions from cement production • Promote and incentivize compliance with green construction materials policies and regulations • Develop and adopt national standards for mercury reduction in cement production • Standardize on measuring, monitoring, verifying, and reporting progress to lower mercury emissions. • Encouraging through policy and incentive measures to integrate targets for mitigating use of hazardous chemicals as well as low-carbon emissions requirements in downstream activities (urban and industrial planning) • Setting requirements and/or targets for low-carbon products without hazardous chemicals through green public procurement. • Setting guidelines on industry best practices and promotion of a safe and inclusive workplace	• Department of Trade and Industry (DTI) • National Economic and Development Authority • Department of Environment and Natural Resources (DENR) • Department of Public Works and Highways • Construction Industry Authority of the Philippines • Department of Finance • Department of Transportation (DOTr) Rail Sector
Sub-national governments	• Set requirements more ambitious than the national requirements • Demonstrate publ ic-private partnerships to develop environmentally sustaina	• Local Government Units • Public-Private Partnership Center • Department of Transportation (DOTr)

	ble, low carbon construction sectors, integrating benefits to promote the well-being and productivity of workers and inhabitants, particularly for vulnerable groups. • Promote programmes such as innovation acceleration encouraging entrepreneurs to develop alternative materials, circular practices and technologies that minimize mercury emissions, waste generation, and low carbon.	
International partners	• Provide access and favorable conditions for financing chemicals free, net zero carbon emission efforts and projects • Promote dialogues, knowledge exchange, and formation of networks on industrial decarbonization, resource efficiency, material development and circular practices, thereby building capacity across all relevant stakeholders. • Engage with international private sector technology partners for technology transfer	• International Finance Corporation (IFC) • Global Cement and Concrete Association • World Steel Association • Global ABC • The Energy Foundation • Rocky Mountain Institute • Bloomberg NEF
Private sector	• Cement and construction sector industries adopt new business models incorporating sustainability and circular economy principles and practices • Produce sustainable, free of hazardous chemicals, low-carbon, high efficiency materials and technologies • Promote renewable energy sources and energy efficient technologies	• Cement producers • MSMEs: construction materials producers, suppliers and construction industries • Cement Manufacturers Association of the Philippines, Inc. (CeMAP) • Philippine Constructors Association Inc (PhilConstruct) • Light Rail Manila Corporation

	• Support in the methodologies for embodied emissions of carbon accounting and hazardous chemical Reporting exercise.	
Investors, private banks and development banks	• Adjust strategy and investment criteria to promote the financing of environmentally friendly construction materials. • Banks shift from profit-driven investments to sustainable impact financing where both sustainability factors and profit drive the investments. • Private banks demonstrate their commitments through good ESG performance and make investments where ESG and profits are equally weighted.	• Philippine Development Bank • Landbank • Bank of the Philippine Islands • ADB
Civil society members and organizations	• Disseminating the importance of mercury abatement agenda and its relevance to- and link with-the climate change agenda. • Opportunities to bring green cement products into the built environment, especially for residences and places of work, and, for disadvantaged populations • Lead to behavioral change toward implementing environmentally responsible solutions in industries. • Participate in community actions to educate, reach out and promote the demand for	• Public-Private Partnership Center of the Philippines • AWWCI - Association of Women Workers in the Construction Industry • ACIW – Association of Construction and Informal Workers • PHILGBC - a coalition of leaders from every sector of the building industry, making it the largest green building initiative in the Philippines. Leading corporations and numerous individuals collaborate to drive the advancement of the green building movement in the country.

	environmentally sustainable products and get their commitments/willingness to support green products.	
Academia and Research Institutions	• A thorough analysis of feasibility and the inclusiveness of proposed solutions. • Involved in the design and implementation of policy and financing guidance, technical assistance, and capacity building. • Support research on alternative material with superior environmental performance. • Implement awarenes s raising initiatives	• University of the Philippines, Building Research Services Department of Science and Technology (DOST) - PCIEERD

38. Table 4. Main project stakeholders

39.

Policy development (including planning)	Financing	Implementing
• National Economic and Development Authority (NEDA) • Department of Budget and Management (DBM) • Department of Trade and Industry (DTI) - Bureau of Product Standards (BPS) and Construction Industry Authority of the Philippines (CIAP)	• Department of Finance • IFIs (ADB, IFC, World Bank) • ODA projects • Green Financing in the Philippines • Land Bank of the	• Department of Trade and Industry • Department of Public Works and Highways (DPWH) • Department of Transportation (DOTr) • Department of Science and Technology (DOST) • Local Government Units (LGUs)

• Department of Environment and Natural Resources (DENR) – Environmental Management Bureau (EMB) and Mines and Geosciences Bureau (MGB0 • Department of Energy (DOE)	Philippines' Climate S.M.A.R.T. (Synergistic, Mitigation, A daptation, Resiliency, and Transformation) Financing Program • Development Bank of the Philippines (DBP)'s Green Financing Program (GFP) • Philippine National Bank	• Private sector (industry, MSMEs) • Department of Education (DepEd) • Research and academic institutions • Civil Society Groups and Professional Organizations

40. Thus, the persistence of high mercury and CO_2 emissions in the Philippine cement and construction sector is largely driven by structural and systemic challenges. Key stakeholders, including cement manufactures, material suppliers, construction companies, and regulators, often operate within constrained systems characterized by limited regulatory enforcement, insufficient access to cleaner production technologies and low-carbon alternatives, inadequate technical capacity, and financial limitations. These barriers contribute to continued reliance on high-emission practices such as higher clinker ration, fossil fuel use, and low adaption of circular economy approaches, even as awareness of environmental and health risks grows.

41. Addressing these root constraints requires coordinated, multi-stakeholder action. Strengthening regulatory frameworks, aligning economic incentives, improving access to financing and technical knowledge, and fostering collaboration across the value-chain are critical to enable the adoption of greener, more resource-efficient, and environmentally sustainable practices. By tackling these systemic challenges, the cement and construction sector

can move toward a more resilient and low-emission pathway, supporting broader sustainability objectives, public health protection, and compliance with national and international environmental commitments.

Policy and Regulatory Framework

42. Regulatory and Policy Context for Decarbonizing the Philippine Cement Industry. The policy framework shaping environmental performance, resource efficiency, and materials management in the Philippine cement sector is defined by a mix of environmental statutes, waste and resource management regulations, energy policies, and construction material standards. These instruments set the minimum compliance obligations for industry while also presenting entry points for cleaner production, circular resource flows, and a gradual shift toward low-carbon cement. A clear understanding of this regulatory environment is critical in identifying both the drivers and barriers that influence national decarbonization pathways.

43. Air Quality Regulation. The Philippine Clean Air Act (RA 8749) provides the core legal basis for controlling emissions from cement operations. Cement kilns and clinker coolers are categorized as major stationary sources subject to limits for particulate matter, SOx, NOx, and other pollutants. Plants must obtain Permits to Operate (PTO), conduct regular stack testing, and maintain pollution-control systems—forming the minimum environmental performance baseline for any modernization effort, including the introduction of alternative fuels or production technologies. While the Act offers fundamental safeguards, its sector-specific guidance remains limited. More up-to-date emissions standards—particularly continuous emissions monitoring and benchmarks tailored to modern kiln

design and co-processing—would both strengthen regulatory oversight and give industry clearer targets for cleaner operations.

44. Co-Processing and Alternative Fuels. DENR Administrative Order 2010-06 governs the use of Alternative Fuels and Raw Materials (AFR) in cement kilns. It authorizes the use of selected waste (e.g., RDF, industrial residues, approved raw material substitutes) under strict technical and environmental safeguards. This policy has enabled cement plants to increase fuel substitution, decrease fossil fuel dependence, and contribute to waste diversion objectives. However, the policy has not kept pace with expanding waste streams, evolving waste composition, or emerging circular economic initiatives. Notably, there is still no clear mechanism for integrating processed construction and demolition (C&D) waste into AFR systems. Updating the AFR policy, including technical protocols and modern emissions-testing requirements, would assist regulators and provide industry with a more robust framework for safe and efficient co-processing.

45. Solid Waste Management and Circular Economy Potential. The Ecological Solid Waste Management Act (RA 9003) mandates waste segregation, recycling, and diversion at the local government level. LGUs operate materials recovery facilities that can serve as aggregation hubs for AFR feedstocks. Properly segregated municipal residuals, industrial by-products, biomass residues, and certain C&D materials can serve as alternative fuels or raw materials for cement production. Despite this potential, large-scale waste preparation remains a national challenge, and no detailed policy exists for the recovery and use of C&D waste in cement or concrete applications. Formulating national technical guidelines for processing C&D debris, including requirements for crushing, screening, contamination control, and quality assurance—would unlock this resource stream and support both RA 9003 objectives and industrial decarbonization.

46. Energy Efficiency Regulation. As one of the country's most energy-intensive industries, cement manufacturing is fully covered under the Energy Efficiency and Conservation Act (RA 11285). The law requires Designated Establishments to implement energy management systems, conduct periodic audits, report consumption data, and appoint certified energy managers. These obligations create enabling conditions for adopting energy-efficient equipment, waste-heat recovery systems, improved grinding technologies, and optimized kiln operations. However, the absence of sector-specific energy-performance benchmarks limits the industry's ability to quantify improvement pathways. Enabling standardized benchmarks, supported by industry data, would help identify investment priorities and allow government to craft more targeted incentive measures.

47. Construction and Building Standards. Demand-side regulations also influence the market for low-carbon cement. The Philippine Green Building Code (PGBC) promotes resource-efficient construction practices but does not yet impose explicit performance requirements for cement or concrete. Improved alignment between the PGBC and construction material specifications would accelerate the acceptance of blended cements, low-carbon concrete mixes, and products with high supplementary cementitious material (SCM) content. The DPWH Bureau of Research and Standards (BRS) set technical specifications for cement, aggregates, and concrete used in infrastructure. While these standards ensure structural integrity, they currently favor traditional formulations, leaving limited room for high-SCM cements, recycled aggregates, or performance-based specifications. Updating BRS standards in line with global low-carbon practices would suggestively expand the domestic market for greener cement products.

48. Mercury Policy and Its Implications for Fly Ash and other Supplementary Cementitious Materials (SCM). The Philippines' commitments under the Minamata Convention on Mercury require enhanced management of mercury emissions and releases, including those from coal-generated by-products. Fly ash, a widely used SCM, may contain trace mercury, requiring proper handling, testing, and quality control before the use of blended cement. While the DENR has introduced mercury-related monitoring measures, detailed national guidance specific to fly ash utilization remains underdeveloped. As demand for SCMs increases, the country will need clear protocols on fly ash characterization, allowable mercury concentrations, and testing procedures to ensure safe use and maintain industry confidence. Establishing such guidelines would support environmental protection while facilitating expanded SCM utilization for low-carbon cement.

49. Carbon Pricing and National Decarbonization Framework

House Bill No. 2055, or the proposed "Low Carbon Economy Investment Act," introduced in the 20thPhilippine Congress seeks to establish a national carbon emission pricing framework to support the Philippines' transition to a low-carbon and climate-resilient economy. The bill institutionalizes the Philippine Greenhouse Gas Inventory System (PGHGIS) under the Climate Change Commission (CCC), mandates a national Monitoring, Reporting, and Verification (MRV) system, and provides for the development of national and sectoral decarbonization pathways aligned with the country's Nationally Determined Contribution (NDC).

50. The proposed framework introduces market-based mechanisms, including emissions trading and carbon offsets, and requires covered enterprises to prepare decarbonization plans consistent with national targets. If enacted, the legislation would strengthen emissions accounting, compliance, and investment incentives across high-emitting sectors, including cement, thereby reinforcing the enabling environment for industrial decarbonization.

51. The **Philippine National Action Plan to Phase-out Mercury** as part of the country's commitment to the Minamata Convention, which includes compliance to Article 8.5 to control or reduce mercury emissions from existing sources listed in Annex D of the convention, which shall be operational at the source within 10 years. A monitoring/reporting system also needs to be devised for this purpose. Existing sources in the country cover five categories: (1) coal-fired power plants; (2) coal-fired industrial boilers; (3) smelting and roasting processes; (4) waste incineration facilities (none in the country); and (5) cement production facilities.

52. Emissions of mercury in the cement industry are regulated in many countries. Where emission limit values are in place, they range between 0.005 -10 mg/Nm^3. The limit values relate to mercury emissions from the kiln stack. The application of data (conditions, measurement techniques, and compliance criteria could differ from one country to another. The range of Emission Limit Values (ELV) is quite broad. In the Philippines, the limit is set at 0.05 mg/Nm^3 measured over a sample period of a minimum of four (4) hours and a maximum of eight (8) hours.

53. In terms of mercury control relevant for the cement sector, the MIA has outlined the need for policies and regulations that require BAT/BEP for new facilities as well as requirements for existing facilities to control/reduce mercury emissions. The main act that regulates the topic of hazardous air pollutants such as mercury is the Philippine Clean Air Act of 1999 (Republic Act No. 8749). Through this Act, DENR sets specific limits for pollutants, including mercury, to maintain air quality.

54. DENR AO 1997-08 Chemical Control Order for Hg which applies to the importation, manufacture, processing, use and distribution of mercury and mercury compounds. It also addresses the treatment, storage and disposal of mercury-bearing or mercury-contaminated wastes in the Philippines. DAO 2019-20 was issued to update the previous CCO to include materials under Mercury Added Products (MAPs) and mercury phase-out plans.

55. The P**hilippine Development Plan (PDP) 2023-2028** serves as the country's overall blueprint for development planning for the next six years. It reflects the government's policies, strategies, programs, and legislative priorities

in support of and consistent with the Socioeconomic Agenda. The Plan is geared toward the attainment of the country's long-term vision, the AmBisyon Natin 2040, where all Filipinos are envisioned to enjoy strongly rooted, comfortable, and secure lives. The PDP focuses strongly on maintaining high economic growth (between 6% – 8% p.a.), creating more, better, and more resilient jobs, and transforming the production sectors through innovation.

56. Republic Act No. 12009 – New Government Procurement Act (Philippines, 2024) which aims modernize and strengthen government procurement by embedding principles of transparency, competitiveness, efficiency, accountability, and sustainability. It seeks to professionalize procurement processes, ensure value for money, and align public spending with national development priorities**. This act is relevant to the project in terms of:**

- Embeds **sustainability** as a guiding principle in procurement, encouraging the use of eco-friendly materials and practices in infrastructure projects.
- Supports **green infrastructure standards** and circular economy approaches, reducing waste and reliance on virgin resources.

- Aligns construction procurement with **climate goals**, particularly reducing greenhouse gas emissions from sectors like cement and construction.
- Incentivizes suppliers and contractors to adopt **innovative, low-carbon solutions**, paving the way for national green certifications and market transformation.

Barriers and gaps to be addressed in the policy and regulatory framework

57. There are existing laws that address the carbon intensity of the built environment, but further work is needed to streamline their implementation and create a conducive policy environment stimulating innovation in construction materials and construction sectors, presenting an opportunity to synergize actions that lead to reduction of mercury emissions as well as lower GHG emissions. These enacted laws, which require further implementation and operationalization, supporting the creation of low carbon construction sector in the Philippines, include:

a. Green Building Code (a Referral Code of the National Building Code, Presidential Decree No. 1096) seeks to improve the efficiency of building performance through a framework of standards that will enhance sound environmental and resource management to counter harmful gases, throughout the building's life cycle, including efficient use of materials, site selection, planning, design, construction, use, occupancy, operation and maintenance, without significant increase in cost.

b. Green Jobs Act (RA 10771) The Philippine Green Jobs Act aims to promote the creation of green jobs in various sectors (defined as "employment that contributes to preserving or restoring the quality of the environment"). It provides specific financial incentives for green job creation, including tax deductions, and tax-free imports of capital equipment that would be used directly and exclusively to promote green jobs.

c. DPWH Administrative Order 2015-168 Guideline in the disposal and management of spoils and debris generated from all ongoing and completed construction and maintenance projects and the imposition of sanctions for violations thereof. The implementation covers all DPWH projects/contractors. The regulations focus on good housekeeping and practices associated with the disposal and management of the following materials: uncontaminated spoils and debris generated from on-going and completed construction and maintenance projects and activities; non-hazardous petroleum contaminated soils; and non-hazardous contaminated soils.

58. There is no existing specific framework for the management of C&D waste, and this can be considered as a gap although there are some of the laws in force, relevant to waste management in the construction sector include:

59. Philippine Environmental Code (PD 1152) requires all local government units (LGUs) to prepare and implement waste management programs. It regulates methods of proper solid waste disposal. A policy on managing and conserving natural resources includes managing mineral resources.

60. Ecological Solid Waste Management Act of 2000 (RA 9003) focuses on solid waste avoidance and waste minimization, proper waste segregation, promotion of research and development. The implementation rules and regulations include the establishment of material recovery facilities (MRFs) at local level.

61. National Solid Waste Management Strategy is a medium-term plan designed to address critical issues, gaps, and barriers encountered by SWM implementers and demonstrate the path for full implementation of RA 9003.

62. The Recycle Construction Materials Act (HB No. 7044) is a proposed legislation aimed at providing economic incentives and assistance for individuals and entities to establish facilities that recycle CDW as components for building or construction materials. It also aims to reduce C&D waste by granting the following tax and financial incentives.

63. Republic Act 11898 or the Extended Producer's Responsibility (EPR) Act of 2022 was created to regulate the production, importation, and disposal of single-use plastics. It also aims to reduce waste by extending the life cycle of products and keeping materials within the economy. Plastics, due to their high calorific value, are being co-processed in cement kilns as alternative fuels. In fact, Ecoloop, the resource recovery group of Republic Cement, has reported a diversion of 21.4 billion plastic sachets in 2023. This is equivalent to 110,000 metric tons of residual waste used as alternative fuel in the company's co-processing operations for cement manufacturing.

64. DENR Administrative Order 2010-06 entitled Guideline on the use of alternative fuels and raw materials in cement kilns, set the registration and permitting requirements, standards and procedure on co-processing of alternative fuels and raw materials (AFR) for clinker for cement production. Co-processing was defined as the reuse or recovery of mineral or energy content of waste materials while simultaneously manufacturing cement in a single combined operation. Waste materials shall meet the requirements: for alternative materials - heavy metal content, ash content >50% and mineral oxide content >76%; for alternative fuel - gross calorific content should be 2,000 kcal/kg or higher.

65. Gender related laws and convention, in consideration of the construction and cement industry, are the following:

- Republic Act No. 11313 (2019): Safe Spaces Act: covers all forms of gender based sexual harassment (GBSH) committed in public spaces, educational or training institutions, workplace, as well as online space.
- Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW): This international convention obliges the government to eliminate all forms of discrimination against women, ensuring that women and girls are protected from violence and have equal rights in all spheres.

Key transformation strategies in the cement and construction industry

66. One of the key transformation strategies is the revitalization of the industry by encouraging innovation and technology adoption. This has a special relevance for the cement and the construction materials sector, which will need to deliver materials for the growing economy. Expanding and upgrading infrastructure is one of the important areas of the PDP implementation, with a vision of "green infrastructures that are not only adaptive and resilient against shocks and natural disturbances but also contribute towards a low-carbon future". The PDP is implemented through regional development plans and various national investment programs:

67. Public Investment Program contains the priority programs and projects (PAPs) to be implemented by the national government agencies (NGAs), government-owned and controlled corporations (GOCCs), other national government offices.

68. The Build Better More program addresses infrastructure gaps that impede Philippine economic development. It includes a list of 197 approved Infrastructure Flagship Projects (above 2.5 billion PHP) to be completed by 2028, mainly focusing on transport infrastructure, urban development, agriculture, and water resources infrastructure.

69. The demand for manpower and construction materials to support the Build Better More program, led to an increased number of contractors in the Philippines. In March 2024, there are 990 contractors listed in the Philippine Contractors Accreditation Board (PCAB), 73 of these contractors are active with the Social Housing Finance Corporation (SHFC). The contractors and developers employ 19% female of its total workforce. Only 68% of these companies have gender sensitivity training.

70. As of March 2024, there are ten major cement companies in the Philippines, with a total of 19 and 4 integrated and grinding plants respectively. The top five biggest cement manufacturers in the Philippines are San Miguel Corporation (Eagle Cement), Holcim, CRH PLC (Republic Cement and Building Materials), Cemex Holdings Philippines (Solid Cement and Taiheiyo Cement). Other cement companies are Phinma Corporation (PhilCement and Petra Cement), Goodfound Cement Corp, Big Boss Cement and Century Peak Cement and Manufacturing.

71. The Philippine Green Building Council (PhilGBC) leads actions in greening the built environment in the country. It established a Green Building Procurement Hub - a platform where the products, services and public spaces can be procured. It provides a listing of suppliers with green credentials that can be easily searched and navigated. This is greatly relevant considering that The Philippines, ranked at the riskiest country for the 3rd time in 2023 according to the World Ranking Index (WRI) on climate change. There should be a framework on how to manage post-disaster waste. It is essential that buildings and infrastructure shall be free from hazardous substances so these wastes could be managed properly after a disaster.

72. The Department of Science and Technology (DOST) helps private companies and industries acquire new technologies through its Business Innovation through Science and Technology (BIST) program. It has several ongoing and completed projects related to the construction such as the following: 1) TransWood - production of transparent wood for next generation smart building materials in the Philippines; 2) Development of Eco-Cement and smart eco-blocks using locally available industrial wastes; 3) Banana textile fibers for construction applications; 4) Cement-bonded board or composite panel using bamboo for low cost housing construction; 5) Utilization of waste plastic as binder for plywood production; pilot scale production of binderless coco coir boards, performance testing of emerging prefabricated wall systems in the Philippines among others.

Financial landscape for green cement and construction sector

73. The transition to green cement and construction in the Philippines required signification technical expertise but also investment in best available techniques and best environmental practices (BAT/BEP), and potential infrastructure. While the country's financial ecosystem has begun to align with environmental and climate objectives, the availability and proven adaptability of of relevant, practical and appropriate financial tools for cement and construction stakeholders along the value-chain remains limited. This section outlines the key financial institutions and products currently available, the main limitations in financing greener, pollution-free practices, the emerging roles of green finance tools, subsidies, and insurance.

74. Key requirements of these financial institutions and stakeholders who can avail of these funding mechanisms are listed below:

Table 5

Financial Partner	Financing Mechanism	Key Requirements	Who Can Avail	Project Use (Linked to Project Components)
DBP	Green Project Finance; EE/RE Loans	Feasibility study; EMB compliance; Energy audit	Cement plants; Large material producers	Comp 3: kiln upgrades, alternative fuels,

				waste heat recovery; Comp 4: training and systems for operation and monitoring
DBP – SWEEP Fund	Sustainable & Women's Empowerment Enterprise Program	Registered SME; viable business plan; gender/social component	SMEs including women-led enterprises	Comp 2: business development for SCMs, recycled aggregates, biomass; Comp 4: SME capacity building
LandBank	Climate-Smart / Green SME Loans	Green benefit proof; credit standing; projections	SMEs in construction materials and recycling	Comp 2: supply-chain and business growth; Comp 3 (limited): pilot processing facilities
PNB	ESG-Linked Loans; Sustainability Finance	ESG framework; performance milestones	Cement firms; construction companies	Comp 2: market-ready low-carbon business models; Comp 3: scaling up low-emission technologies
Commercial Banks	Green Building / Sustainability Loans	Green certification or material-use proof	Property developers	Comp 2: market uptake of green materials; Comp 4: green procurement capacity
ADB / IFI Credit Lines (via local banks)	On-lending for green industry	Safeguards compliance; impact reporting	Large industrial borrowers via banks	Comp 3: large-scale technology demonstration; Comp 4: institutional and monitoring capacity

75. The financial mechanisms matrix presents how different development and commercial banks can support the implementation of the project by aligning their existing financing products with specific project components, particularly Components 2 (Business Development), 3 (Technology Demonstration), and 4 (Capacity Building and Knowledge Management). The matrix clarifies the type of financial products available, eligibility requirements, target beneficiaries, and how financing contributes to project outcomes.

Development Bank of the Philippines (DBP)

76. DBP plays a central role in supporting capital-intensive investments in the cement sector through its Green Project Finance and Energy Efficiency/Renewable Energy (EE/RE) loan programs. These facilities

typically require feasibility studies, environmental compliance documentation from EMB, energy audits, and proof of repayment capacity. Eligible borrowers include cement manufacturers and large construction material producers. Financing under these programs directly supports Component 3 by enabling technology demonstration activities such as kiln upgrades, alternative fuel systems, waste heat recovery, and process optimization. At the same time, these investments support Component 4 by requiring operational training and the installation of monitoring systems necessary for sustained performance and regulatory compliance.

77. DBP also administers the Sustainable Waste Management for Enhanced Environmental Protection (SWEEP), which targets small and medium enterprises, including women-led businesses. SWEEP financing supports Component 2 by enabling SMEs to develop viable business models for the processing of supplementary cementitious materials, production of recycled aggregates, and supply of biomass fuels for cement kilns. In addition, SWEEP supports Component 4 by strengthening SME capacity in compliance, quality control, and participation in green construction supply chains. Typical requirements include SME registration, viable business plans, and demonstration of social inclusion objectives.

Land Bank of the Philippines (LandBank)

78. LandBank provides climate-smart and green SME financing that supports enterprises engaged in recycling, materials recovery, logistics, and processing of alternative construction inputs. These financing instruments are particularly suited to small and medium enterprises operating within the local supply chains of the cement and construction sector. Financing under LandBank primarily supports Component 2 by strengthening business development, supply chain formation, and market readiness for recycled and alternative materials. In selected cases, financing may also support small-scale or pilot processing facilities contributing to Component 3 demonstration activities, particularly those linked to circular economy applications.

79. Philippine National Bank. In 2023, the Philippine National Bank (PNB) issued ₱3 billion in Sustainability Bonds under its Sustainability Bond Framework. This issuance is fully aligned with the ASEAN Sustainability Bond Standards and is designed to finance or refinance projects that generate demonstrable environmental and social benefits. Eligible uses of proceeds encompass investments in renewable energy, energy-efficient technologies, sustainable water and wastewater management, pollution prevention and control, and certified green buildings.

80. By directing private-sector capital toward these priority sectors, PNB actively supports the country's climate and development agenda, including the attainment of the Philippines' Nationally Determined Contribution (NDC) targets and long-term strategies for emissions reduction. The bank's sustainability financing mandate is closely aligned with the requirements of industrial transformation, positioning PNB as a strategic financial partner in efforts to advance the greening of the cement industry.

81. Through the deployment of sustainability bond proceeds and complementary green financing instruments, PNB is well placed to assist cement manufacturers in undertaking capital investments in low-emission technologies, resource-efficient operations, and pollution-mitigation systems. Such financial participation can enhance industry access to green capital, accelerate the adoption of

cleaner production practices, and reinforce alignment between sectoral initiatives and national sustainability policies.

82. These products require borrowers to establish ESG indicators, emissions or material-use benchmarks, and reporting systems. Eligible borrowers include cement companies and large construction firms. Financing under these products supports Component 2 by encouraging the adoption of business models centered on low-carbon cement and green procurement practices. Where funds are used to expand or replicate low-emission production technologies, they also contribute to Component 3 by enabling scale-up of proven technologies beyond pilot stages.

83. Commercial banks provide green building and sustainability-linked loans primarily targeted at property developers and large contractors. Typical requirements include green building certification or verifiable use of low-carbon construction materials. These financial products support Component 2 by creating market demand for blended cement and recycled construction materials, thereby reinforcing business incentives for low-carbon production. They also support Component 4 by encouraging improvements in green procurement systems, contractor compliance, and sustainability reporting practices within the construction sector.

84. International Financial Institutions (ADB and Others) through On-Lending

85. International financial institutions such as the Asian Development Bank (ADB) provide climate finance to local banks through on-lending facilities. Under this mechanism, IFIs lend to domestic banks, which then extend loans to industrial borrowers. These facilities require compliance with international environmental and social safeguards, impact monitoring, and reporting systems. Eligible borrowers are typically large industrial firms seeking financing through partner banks. IFI on-lending supports Component 3 by enabling large-scale technology demonstration and replication of low-carbon production systems across multiple facilities. It also supports Component 4 by strengthening institutional and monitoring capacities linked to safeguard compliance and emissions reporting.

Current limitations in Financing Greener and Pollution-Free Practices

86. Globally, financing greener practices in the cement and construction industries is hindered by high upfront costs, policy uncertainty, and investor risk perceptions. Decarbonization technologies such as carbon capture and low-clinker cement remain expensive and largely at pilot stage, making financiers hesitant to commit capital. Inconsistent carbon pricing and regulatory frameworks across countries further discourage long-term investment, while investors often prefer lower-risk green projects like renewable energy.

87. In Asia, rapid urbanization drives relentless demand for cement, often prioritizing affordability over sustainability. Access to green finance is limited, as many economies lack mature sustainable finance markets. Fragmented policies and weak incentives—compared to Europe or North America—create uncertainty for investors and slow adoption of advanced low-carbon technologies.

88. In the Philippines, the financing landscape is still evolving. While the Philippine Sustainable Finance Roadmap provides a framework, integration into financial systems remains incomplete. Local banks often perceive green projects as high-risk, attaching higher interest rates and limiting co-financing opportunities.

International funds provide some support, but industry inertia and cautious lending practices slow the transition toward sustainable cement and construction.

Role of Financial tools

89. Financial tools are pivotal in driving sustainability within the cement and construction industries, These sectors are often described as "hard-to-abate" due to their reliance on carbon-intensive processes. By mobilizing capital, mitigating risks, and incentivizing innovation, these instruments make it possible for companies to adopt greener practices that would otherwise be financially prohibitive.

90. Globally, mechanisms such as green bonds, blended finance, and sustainability-linked loans have emerged as key enablers. For example, the International Finance Corporation (IFC) has mobilized private capital into low-carbon cement projects by de-risking investments in emerging markets, helping bridge the gap between policy aspirations and industry realities. Similarly, the World Bank highlights that financing tools are essential to scale up low-carbon construction, particularly through concessional loans and guarantees that reduce investor risk. (sources: International Finance Corporation (IFC) – *Green Finance and Cement Sector Decarbonization*, World Bank – *Financing Low-Carbon Construction and Infrastructure)*

91. In Asia, the Asian Development Bank (ADB) has emphasized the importance of to support sustainable infrastructure. These frameworks not only provide capital but also embed sustainability conditions into financing agreements, stimulating demand for eco-friendly construction materials, and encouraging accountability in emissions reduction. (source: Asian Development Bank (ADB) – *Green Finance in Asia: Opportunities and Challenges).*

92. In the Philippines, financial tools are closely tied to regulatory frameworks. The Securities and Exchange Commission (SEC) has mandated sustainability reporting for publicly listed companies, linking access to finance with compliance to sustainability standards. This mandate pushes Pollution Control Officers (PCOs) and industry leaders to align with global best practices, while the Philippine Sustainable Finance Roadmap sets the stage for integrating sustainability into the financial system. (Philippine SEC – *Sustainability Reporting Guidelines for Publicly Listed Companies).*

93. Ultimately, financial tools are not just sources of capital—they are levers of transformation. They reduce risks, incentivize innovation, and create markets for greener practices, ensuring that the cement and construction industries can contribute meaningfully to the global target of carbon neutrality by 2050.

Barriers to Investments in the Cement and Construction Industry

94. Despite the Philippines' strong demand for infrastructure under programs like *Build, Build, Build*, the cement and

construction industries face several barriers that discourage investment. A key challenge is importing competition, particularly from Vietnam, which has led to allegations of "cement dumping." Local producers, represented by the Cement Manufacturers' Association of the Philippines (CeMAP), highlighted that there are limitations to local producsion of clinker, due to limited incentives for modernization and sustainability investments. (source: Cement Industry Faces Challenges as Imports Surge Amid Housing Demand Boom - Pinoy Builders

95. Another barrier is volatile demand, as the industry continues to recover from pandemic-related disruptions. Construction activity slowed significantly during COVID-19, creating uncertainty about long-term returns on capital-intensive projects. (source: INQUIRER.net BrandRoom / 04:35 PM January 23, 2024)

96. The sector also struggles with high energy and raw material costs, given cement's energy-intensive production process. Rising fuel prices and unstable energy policies increase operational risks, making investors hesitant to commit to greener technologies that require significant upfront capital. (source: Top challenges facing the concrete industry in the Philippines and proposed solutions in 2025 - Dainam Concrete Batching Plant Solutions

97. Finally, regulatory and financing gaps remain. While the Philippine Sustainable Finance Roadmap provides a framework, integration into financial systems is still evolving. Local banks often perceive green projects as high-risk, attaching higher interest rates and limiting co-financing opportunities. This cautious stance slows the transition toward pollution-free practices in construction and cement.

98. Identified good practices linked to alternative materials and fuels that can lead to reduced mercury and GHG emissions are presented in the table below.

Table 6. Investment Landscape in the Cement Sector

Entity	Commitments and achievements	Investments
Cemex Philippines	Cemex Philippines has achieved a 50% reduction in CO2 emissions generated by its two cement subsidiaries, Solid Cement Corp. and APO Cement Corp., from 1990 to 2022. From 2020 to 2022 alone, Cemex reduced 18 percent of its net CO2 emissions, establishing its commitment to decarbonizing its operations through its Future in Action program. Cemex goal is to achieve less than 430 kg of net CO_2 per ton of cement by 2030 and deliver net-zero CO_2 concrete by 2050. Prior to the passing of the EPR law, Solid cement plants and Apo Cement plants have been supporting several companies in their plastic neutrality and waste diversion programs through co-processing.	• increase the use of alternative fuels • increase use of decarbonated raw materials • reduce clinker factor • using clean energy in cement operations • better manage water process • Regenera Program launched in 2023 specializes in providing circularity solutions through the recovery, management, recycling and sustainable disposal and diversion of waste such as the use of municipal waste and industrial byproducts as sustainable substitutes for fossil fuels and natural raw materials in its production processes.

Holcim Philippines	In 2021, Holcim Philippines set net-zero targets for 2030 and 2050 validated by the Science Based Targets initiative (SBTi). In addition to scope 1 and 2 emissions, Holcim is reducing indirect transportation and fuel-related emissions from the value chain. Holcim is moving away from a linear "make, take, waste" approach towards a circular "reduce, reuse, recycle" economy. This involves reducing surplus material and waste, building better with less, and driving circular economy initiatives.	• drying facility in its La Union plant that would reuse hot gases from operations to dry materials instead of a separate equipment, thereby reducing fuel consumption • drying facility in Holcim's Misamis Oriental factory reduce moisture of raw materials to improve grinding operations • replacing the clinker in final cement products with alternative mineral components • raise the efficiency of converting qualified waste materials to alternative fuels of its cement plant in Norzagaray, Bulacan
San Miguel Corporation	• -4th largest cement players with 1 cement plant, 1 grinding plant, 4 distribution centers and 5 regions served in the Philippines • -7.1M metric tons cement production and • 4.2M metric tons clinker production capacity • -employs 1298 employees, 43% female	• Reduction in GhG emission by 9.2% • Clinker replacement of 896MT in 2020 • 7% Recycled input materials • Areas planted with trees: 137 hectares
Phinma	Phinma subsidiary Philcement Corp. entered into joint venture agreements with Anflocor to build a modern cement manufacturing plant in Davao del Norte which will be operational in 2026 with a production capacity of two million metric tons per year, of Union Cement	Purchased Petra Cement in Mindanao and constructing a state- of-the-art cement manufacturing facility in Davao del Norte

Baseline initiatives and baseline projects

99. The Philippines is laying important groundwork for sustainability in its cement and construction industries through both government-led and private sector initiatives. At the national level, the Philippines Cement Decarbonization Roadmap, launched by the United Nations Industrial Development Organization (UNIDO) and the Department of Trade and Industry (DTI), sets out strategies to reduce emissions and align the sector with ASEAN and global climate goals.

Cement

100. Private sector actors are actively complementing these efforts. The Cement Manufacturers Association of the Philippines (CeMAP) has committed to a sustainability roadmap, focusing on reducing carbon emissions and presenting its decarbonization plan at ASEAN forums. Leading companies such as Holcim Philippines have invested in co-processing facilities that use alternative fuels and industrial by-products, reducing reliance on coal and cutting waste sent to landfills. Similarly, Republic Cement has launched its *Ecoloop* program, which processes municipal solid waste and industrial residues as alternative fuels, directly addressing both emissions and waste management challenges. CEMEX Philippines has introduced *ReadyGREEN*, a cement product designed to lower CO_2 emissions, while Holcim Philippines markets *Holcim Excel*, a blended cement incorporating mineral components to reduce clinker use and environmental footprint.

Construction

101. The Philippine construction industry is increasingly adopting sustainable building technologies as part of its transition toward decarbonization and depollution. Developers and contractors are embracing green building certifications such as BERDE (Building for Ecologically Responsive Design Excellence) and LEED (Leadership in Energy and Environmental Design), which encourage energy efficiency, waste reduction, and sustainable design practices. These frameworks push companies to integrate technologies that minimize environmental impact across the building lifecycle.

102. On the construction side, sustainability efforts are tied to circular economy practices. Studies highlight that construction and demolition waste (CDW) remains a pressing issue, with strategies focusing on recycling and sustainable material integration. Private developers are beginning to adopt green building certifications such as BERDE (Building for Ecologically Responsive Design Excellence), which encourage energy efficiency, waste reduction, and sustainable design.

103. Construction firms are increasingly using prefabricated and modular building systems, which reduce material waste and shorten construction timelines. Smart building technologies—such as energy-efficient HVAC systems, solar integration, and water recycling systems—are also being deployed to meet sustainability targets.

104. Together, these baseline initiatives—government roadmaps, industry-wide commitments, and private sector innovations—signal a growing alignment of the Philippine cement and construction industries with global sustainability and decarbonization targets, while also addressing local waste management challenges.

Gender considerations

105. The cement and construction industries in the Philippines remain largely male-dominated, reflecting global patterns where physical labor and technical expertise have historically been associated with men. Women were often relegated to supporting roles or excluded from on-site activities. However, this landscape is gradually shifting. More women are entering engineering, project management, and even fieldwork, challenging stereotypes and contributing fresh perspectives that enhance innovation and project success.

106. Government and industry institutions are also recognizing the importance of gender inclusivity. The Construction Industry Authority of the Philippines (CIAP) has launched initiatives such as the *Women in Engineering Survey* and gender development programs, highlighting the role of women as trailblazers in construction and infrastructure development. Pioneering women leaders in construction and architecture are breaking barriers, inspiring future generations, and proving that success in the industry is not defined by gender

107. In the context of decarbonization and depollution, gender considerations become even more critical. Women, particularly in vulnerable communities, often bear disproportionate impacts of pollution and climate risks. Integrating gender perspectives into sustainability frameworks ensures that women are not only protected but also empowered to participate in decision-making, technical innovation, and policy development. This inclusivity strengthens the sector's resilience and accelerates the transition toward greener practices.

Barriers and challenges addressed by the project

108. Due to anticipated high economic growth, the Philippines is expected to have the growing and fastest growing construction market in the region, driving demand for primary construction materials (cement, steel, glass) and as result driving the growth of the industrial emissions from the cement and construction materials industry.

109. According to the DENR, one of the main barriers to addressing the challenges of using green construction materials in the built environment in the Philippines are:

- Governance and institutional capacity (weak green procurement regulations, limited low carbon development strategy);
- Financing and valuation (weak incentive system to unlock private sector investments);
- Access and application of best available technologies;
- Limited capacity for research and data generation for monitoring and basis for program and policy development.

110. Particularly on mercury emissions from the cement sector, there is lack of information and insufficient capacities related to monitoring and reporting, sidelining the issue for both the industry and the national regulators in the Philippines.

111. The project focuses on the Philippine construction materials sector to address the issue of embodied carbon in the built environment, mercury emissions from the production process and increase material efficiency. The cement industry is key in this regard, with its reliance on abundant limestone deposits in the country and its share on the construction market in the country.

112. Aiming to achieve transformation and long-term impact, the project will ensure a conducive environment for mercury monitoring and control in the Philippines. To address the current limited monitoring capacity, the project targets the enforcement capacity for mercury monitoring with continuous monitoring systems and aims to establish guidelines on mercury monitoring for industries, strengthen policies and regulatory frameworks to monitor and control mercury emissions. The Project will promote continuous learning through the integration of knowledge in decision-making processes, development of additional tools for knowledge generation, and dissemination mechanisms for successful outcome and innovation. Thus, the project will maximize the accessibility and utility of lessons learned, supporting future interventions and policy refinement. Furthermore, pilot demonstrations and feasibility studies on alternative low-carbon materials, supported by green procurement practices, represent a proactive step reinforcing the project's commitment to sustainable practices and environmental stewardship.

113. Among the identified barriers for the project are given in Table 8.

Table 7. Identified barriers addressed by the project

Barrier type	Barrier description
Political	• Weak policy framework for promoting the use of green construction materials. No requirements for the use of low mercury, low carbon, and resource efficient materials in the construction industry. • Implementation gaps on the regulations of construction and demolition waste (reuse); i.e. hazardous and non-hazardous wastes especially for Class A and Class A contractor categories. • Lack of gender mainstreaming in construction-related policies.
Financial	• High investment cost for new technologies translates into higher price of the end- product (green construction materials). • Practically non-existent market demand for green construction materials, discouraging investment and R&D in new products (e.g. cement with alternative raw materials). • High capital cost due to high investment risk for new production processes. • Insufficient financial incentives for pioneering innovations/technologies.

Technological	• Available technologies for production of green construction materials are still considered as challenging and complex compared to business-as-usual technologies (in the cement sector) due to due to factors such as the high cost of initial investment, the need for specialized equipment, the requirement for skilled personnel to operate and maintain advanced systems, and the limited availability of local suppliers and expertise to support these technologies. • Difficulties in large-scale demonstration of innovative technologies due to investment risk (in the context of low market demand, uncertain long-term policy framework). • Cement plants have low knowledge about mercury emissions in cement plants, lack understanding for the behavior of mercury transfer, and transform along the production processes.
Institutional	• Insufficient capacities to review and assess mercury control and reduction technologies for cement industry • Limited technical capacity from national stakeholders and local environmental management departments to monitor the atmospheric mercury emissions from cement kilns • Low awareness of decision-makers and industry on cement environmental impact related to the emissions from the production process.
Social and awareness	• Low interest in the greening of the construction sector in the country. • Lack of public gender sensitive outreach material and channels, on the importance of the issue. • The public has limited knowledge of the health impact of mercury emissions from cement production and consequently do not participate in the supervision of mercury pollution control of enterprises.

Project considerations against national development goals

114. As the Philippines moves through the coming decades, the cement and construction sector will remain at the heart of national development. The sector sits at the crossroads of national development and climate responsibility. Its trajectory over the next decades will be shaped not only by market demand and technology but also by the Philippines' long-term vision and international climate commitments.

115. In **2025**, the sector continues to expand under the government's "Build Better More" program, meeting the infrastructure needs of a rapidly urbanizing population. Cement production remains carbon-intensive, but incremental improvements—such as blended cement, energy-efficient kilns, and waste heat recovery—are beginning to take root. These early steps align with the country's **Nationally Determined Contributions (NDCs)**, which commit to reducing greenhouse gas emissions by 75% by 2030 (conditional on international support). At this stage, the industry is laying the groundwork for compliance, but emissions remain high and the industry is only starting to align with voluntary green building certifications such as BERDE and LEED.

116. By **2030**, the sector faces mounting pressure to deliver on the NDC targets. Climate resilience becomes central to construction, with projects focusing on disaster-ready housing and coastal protection. Cement producers begin scaling up alternative fuels, recycling construction waste, and piloting carbon capture technologies. Policy frameworks tighten, with carbon pricing and stricter environmental regulations likely introduced. These shifts reflect the Philippines' determination to meet its Paris Agreement commitments, while also preparing for the longer-term ambition of **net-zero by 2050**.

117. By **2040**, the sector's transformation is deeply tied to *Ambisyon Natin 2040*, the national vision of a "matatag, maginhawa, at panatag na buhay" (strongly rooted, comfortable, and secure life). Infrastructure development is no longer just about growth—it is about creating sustainable, livable, and resilient communities. Cement and construction projects increasingly adopt circular economy principles, digitalized planning, and green building standards. The industry contributes directly to Ambisyon 2040's goals by ensuring that economic progress is achieved without sacrificing environmental integrity.

118. By **2050**, the cement and construction sector must fully align with the Philippines' **net-zero target**. Carbon capture and storage (CCS) is widely deployed, green cement alternatives such as geopolymer and limestone calcined clay cement dominate the market, and AI-driven construction planning minimizes material waste. International financing and technology partnerships support this transformation, ensuring that the sector evolves from being a major source of emissions to becoming a cornerstone of climate resilience and sustainable urban living.

119. The project aims to integrate and align with the *Ambisyon 2040*, the NDCs, and the 2050 net-zero target into the cement and construction sector's roadmap, which is an on-going project of DTI underscores the strategic value of greening initiatives today:

- Short-term (2025): Quick wins in efficiency and blended cement adoption help the industry begin aligning with NDC commitments.
- Medium-term (2030): Scaling alternative fuels, recycling, and CCS pilots is essential to meet emission reduction targets.
- Long-term (2040–2050): Full transformation through net-zero technologies and green cement innovation ensures the sector contributes to Ambisyon 2040's vision of a sustainable, secure, and prosperous Philippines.

120. This alignment demonstrates that greening the cement and construction sector is not only about reducing emissions—it is about future-proofing national development, fulfilling international commitments, and delivering on the promise of Ambisyon 2040. The project will adopt a more comprehensive approach to the building sector by complementing its focus on large-scale infrastructure and cement production with targeted actions on low-carbon and resource-efficient housing solutions adapted to the Philippines' diverse climatic conditions and socio-economic contexts, from rural communities to dense urban areas. It will build on and align with existing policy and regulatory frameworks, including the Energy Efficiency and Conservation Act and the Philippine Green Building Code, as well as relevant voluntary certification schemes such as BERDE and

EDGE, to support the near-term uptake of passive design measures, improved cooling efficiency, and low-energy building technologies. Within the project timeframe, efforts will focus on piloting and scaling practical approaches, including the development or strengthening of energy performance certification mechanisms—drawing on international experience such as in the European Union—to help create market incentives for higher-performing buildings and deliver co-benefits such as reduced greenhouse gas and mercury emissions through lower energy and material demand. In parallel, the project will promote feasible measures to reduce reliance on virgin material extraction, including limestone quarrying, by advancing material efficiency, sustainable sourcing, and circular practices in the built environment, including increased reuse and recycling of construction materials such as steel and glass, particularly in rapidly urbanizing areas.

Future Scenarios

121. The future development of the Philippine cement and construction sector will depend on economic growth, infrastructure demand, climate risks, technological progress, and the level of environmental policy ambition. Given these uncertainties, the project has been designed to remain relevant under a range of plausible future scenarios.

Scenario 1: Business-as-usual growth with incremental environmental progress

122. Under this scenario, the Philippine economy continues to grow steadily, driven by infrastructure expansion, urban development, and housing demand. The "Build Better More" programme supports large-scale investments, and cement demand remains high. Incremental improvements such as blended cement, kiln efficiency, and waste heat recovery continue to expand.

123. The Philippine Green Building Code is implemented unevenly, with stronger uptake in large urban developments but limited enforcement in smaller municipalities and informal construction. Voluntary certification schemes (e.g. BERDE, LEED) continue to guide best practices but do not yet drive systemic change.

124. Adoption of low-carbon cement formulations aligned with emerging international standards (e.g. EN 206 evolution, GCCA frameworks) remains limited and largely pilot-based, constrained by market acceptance and regulatory inertia.

125. Furthermore, progress in mercury monitoring, green procurement, and circular construction remains uneven, constrained by limited institutional capacity, fragmented policies, and financing barriers. In this context, the project plays a critical role in strengthening enforcement capacity, and supporting early adoption of greener materials and practices.

Scenario 2: Accelerated environmental transition and stronger climate commitments

126. Under this scenario, the Philippines strengthens its environmental and climate policy ambition, supported by international cooperation, access to green finance, and increasing exposure to climate impacts. The Philippine Green Building Code is progressively enforced nationwide and integrated into public procurement and permitting systems, driving widespread adoption of energy-efficient design, passive cooling strategies, and performance-based building standards.

127. Low-carbon cement standards aligned with international developments (including EN 206 revisions and GCCA guidance) are adopted or adapted into national standards, enabling large-scale deployment of blended

cements, alternative binders, and circular materials. Market demand shifts toward lower-carbon and resource-efficient construction solutions.

128. These developments are reinforced by stronger policy instruments, potentially including carbon pricing, a better enforcement of mercury monitoring and emission limits, and incentives for circular construction.

129. In this scenario, the project acts as a catalyst by providing early policy tools, technical validation, and institutional capacity to accelerate sector-wide transformation and scale up investment.

Scenario 3: Constrained transition under economic, and climate conditions

130. Under this scenario, external factors—such as economic constraints, supply chain disruptions, energy price volatility, or shifts in global climate policy (including reduced ambition or even reversal of environmental policies in key economies)—slow down environmental investments and regulatory progress.

131. Infrastructure demand remains high, driven in part by reconstruction needs following climate-related disasters, but cost pressures limit the adoption of greener technologies and materials.

132. Implementation of the Philippine Green Building Code remains partial and inconsistent, with enforcement challenges at local level and limited incentives for compliance. The monitoring and control of mercury input and releases is not effectively enforced. Energy-efficient building design and performance standards are not systematically applied.

133. Adoption of low-carbon cement standards slows down, with continued reliance on conventional clinker-based production due to cost and availability constraints. Circular construction practices remain limited. In such a context, risks include continued dependence on carbon-intensive materials, weak mercury monitoring and enforcement, higher waste generation, and increased environmental pressures from quarrying and resource extraction.

134. Under this scenario, the project remains highly relevant as a resilience-building intervention, supporting resource efficiency, strengthening institutional capacity, and enabling cost-effective pathways to reduce emissions and environmental impacts even under constrained conditions.

Relevance of the project across scenarios

135. Across all scenarios, the project remains relevant because it addresses structural barriers in the sector, including weak policy integration, limited enforcement capacity, insufficient market incentives, and low circularity.

136. By strengthening implementation of the Philippine Green Building Code, supporting the adoption of emerging low-carbon cement standards, and promoting resource-efficient and circular construction practices, the project provides a flexible and robust framework that can:

- accelerate incremental improvements under business-as-usual conditions;
- support rapid transformation under stronger environmental ambition;
- and enhance sector resilience under adverse economic and geopolitical conditions.

137. While the scenarios above describe possible future pathways for the sector, it is also important to understand how the project interventions will perform under each of these conditions.

138. To further clarify how the project responds to different future development pathways, the link between the three scenarios and the project interventions is outlined below.

139. Under **Scenario 1: Business-as-usual growth with incremental environmental progress**, where demand continues to grow and improvements remain gradual and uneven, the project strengthens and accelerates existing efforts. Component 1 (enabling policy) and Component 4 (capacity building and monitoring) play a central role by improving regulatory frameworks, monitoring systems, and enforcement. Components 2 and 3 support the gradual uptake of improved practices such as blended cement, better kiln operation, and circular approaches, resulting in incremental reductions in mercury emissions.

140. Under **Scenario 2: Accelerated environmental transition and stronger climate commitments**, where stronger policies and market shifts enable wider adoption of low-carbon and resource-efficient practices, all components act in a complementary and reinforcing manner. Component 1 supports stronger standards and policy implementation; Component 2 mobilizes investment and business uptake, and Component 3 enables the demonstration and scaling of key technologies. Component 4 ensures effective monitoring and compliance. Together, these interventions enable more substantial reductions in mercury emissions compared to the business-as-usual pathway through reduced inputs, improved process control, and enhanced emission management.

141. Under **Scenario 3: Constrained transition under economic, climate, and geopolitical pressures**, where financial and institutional constraints limit the adoption of greener solutions, the project focuses on practical and cost-effective measures. Component 3 supports readily implementable actions such as improved kiln operation, input control, and energy efficiency, while Component 4 strengthens basic monitoring and institutional capacity. Component 1 continues to provide a policy foundation, even where implementation is partial. In this context, the project contributes to incremental emission reductions while strengthening sector resilience.

142. Overall, this scenario-based linkage demonstrates that the project is designed to remain effective under different future conditions, while progressively supporting the transition toward lower mercury emissions and more sustainable cement production.

(1) UNEP & GlobalABC (2026). *Global Status Report for Buildings and Construction 2025–2026*.

(2) US EPA (2026). *Stormwater Discharges from Construction Activities*.

(2a) 2025 peer-reviewed review. *A critical review on recycling and reuse of construction and demolition waste materials*, *Cleaner Waste Systems*.

(2b) WHO (2024) — *Compendium of WHO and other UN guidance on health and environment*.

[3] Cement Industry Pollution and Its Impact on the Environment and Population

[4] Mercury releases from the cement industry | Global Mercury Partnership (5) United Nations Environment Programme. (2019). Global Mercury Assessment 2018. UNEP Chemicals and Health Branch.

(6) United Nations Environment Programme. (2023). Mercury releases from the cement industry. UNEP Global Mercury Partnership.

(7) AMAP & United Nations Environment Programme (UNEP). (2019). Technical Background Report for the Global Mercury Assessment 2018. Arctic Monitoring and Assessment Programme (AMAP), Oslo, Norway, and United Nations Environment Programme, Chemicals and Health Branch, Geneva, Switzerland.

B. PROJECT DESCRIPTION

This section asks for a theory of change as part of a joined-up description of the project as a whole. The project description is expected to cover the key elements of good project design in an integrated way. It is also expected to meet the GEF's policy requirements on gender, stakeholders, private sector, and knowledge management and learning (see section D). This section should be a narrative that reads like a joined-up story and not independent elements that answer the guiding questions contained in the guidance document. (Approximately 3-5 pages) see guidance here

System-level change sought

121. The project seeks to catalyze a structural transition in the Philippine cement and construction sector from a high-carbon, resource-intensive, and pollution-prone development pathway toward a low-carbon, low-pollution, and resource-efficient production and construction system. This transition will be driven through an integrated package of policy reform, industrial innovation, technology demonstration, circular economy approaches, and strengthened institutional capacities.

122. The project aims to contribute to:

- reduced mercury releases and greenhouse gas emissions from cement and construction materials production;
- increased uptake of low-clinker, low-emission, and safer construction materials;
- strengthened regulatory and monitoring systems for industrial emissions and material traceability;
- improved circularity in construction materials and waste management;
- enhanced public and private sector capacity to mainstream sustainable construction practices;

- more inclusive participation of women and underrepresented groups in green construction value chains.

123. This systemic change is intended to support the Philippines' obligations under the Minamata Convention and the Paris Agreement, while improving environmental quality, public health, and industrial competitiveness.

People, processes, and systems as enablers of transformation.

124. In line with UNIDO's integrated approach to industrial transformation, the project recognizes that sustainable change in the cement and construction sector depends on the interaction between people, processes, and systems.

- People are both key beneficiaries and essential agents of change. The project will strengthen the capacities of regulators, plant operators, engineers, construction professionals, financial actors, and local stakeholders to understand, adopt, and sustain low-carbon and mercury reduction practices. It will also promote greater inclusion of women and underrepresented groups in technical training, decision-making, and green jobs, thereby supporting a more equitable transition.

- Processes refer to the scientific, technical, operational, market, and institutional practices that shape the performance of the sector. The project will support improvements in production processes, including clinker reduction, energy efficiency, fuel substitution, emissions monitoring, and the circular use of materials. It will also strengthen planning, procurement, financing, and knowledge-sharing processes that influence investment decisions and market behavior.

- Systems refer to the broader policy, regulatory, financial, and institutional framework that enables or constrains change. The project will help strengthen standards, incentives, monitoring systems, and coordination mechanisms, including cross-sectoral coordination among ministries and subnational actors—that support cleaner industrial production and sustainable construction. Furthermore, the project aims to strengthen mercury monitoring and control frameworks, green construction standards, and public procurement systems.

Transformational logic and pathways of change

125. The project's transformation pathway rests on four mutually reinforcing change levers. The project's change pathway starts from a baseline characterized by rapid growth in construction demand, continued dependence on clinker-intensive cement and fossil fuels, weak mercury monitoring and enforcement systems, limited circularity in construction materials, fragmented sector governance, and insufficient market incentives for sustainable alternatives. At the same time, awareness of environmental and health impacts remains limited, and women remain underrepresented in technical and leadership roles across the sector.

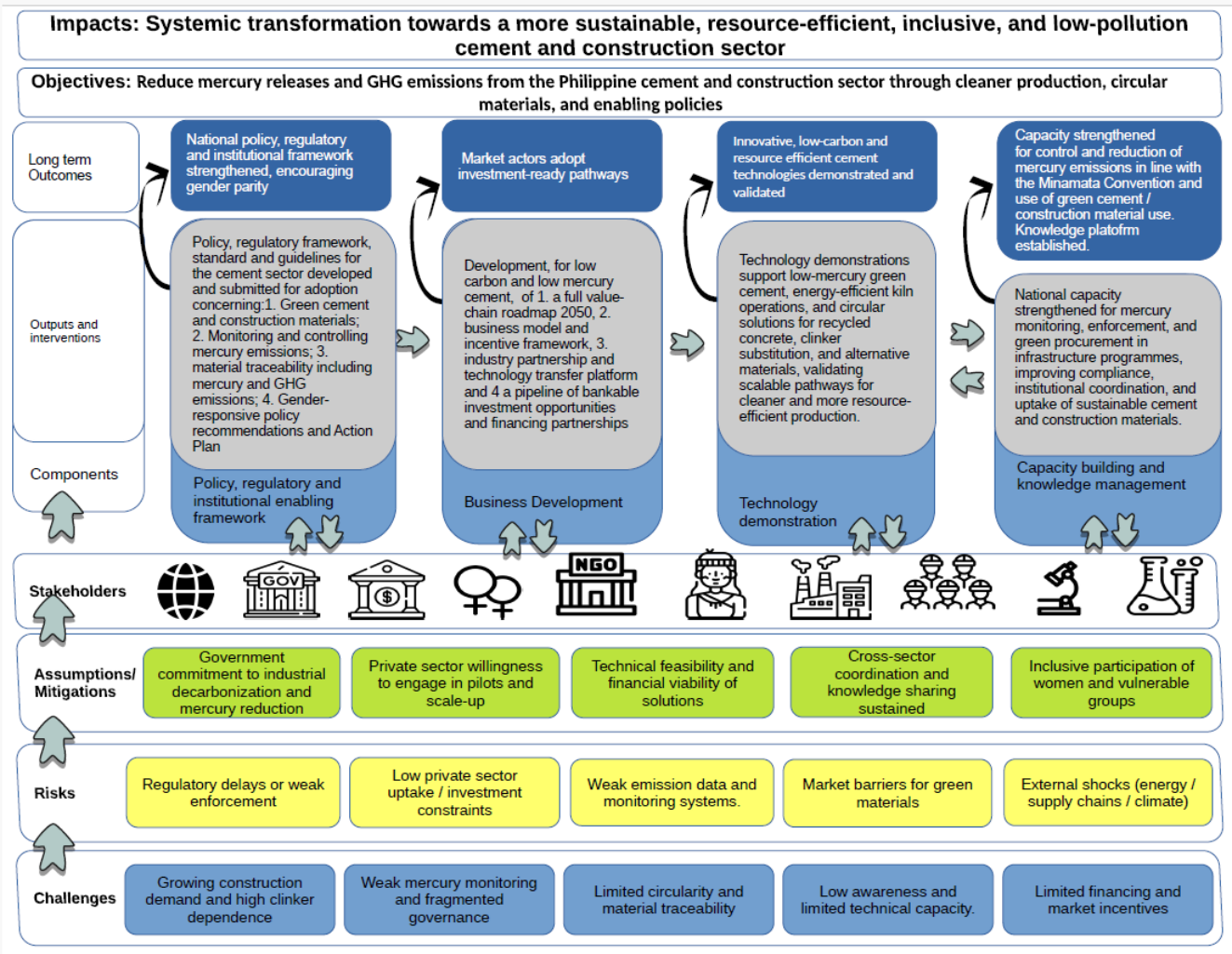
126. To address these challenges, the project will deliver an integrated package of interventions through four mutually reinforcing components. First, it will support enabling policies and regulatory reforms to strengthen standards, guidelines, and monitoring systems for green construction and industrial emissions control. Second, it will support business development and market transformation by preparing low-mercury and energy-efficient roadmaps, identifying bankable business models and investments, enhancing private capital mobilization, and facilitating dialogue between industry and financial institutions. Third, it will implement technology demonstrations to validate practical and economically viable options for cleaner cement production and circular material use. Fourth, it will strengthen institutional and technical capacities for monitoring, enforcement, procurement, knowledge sharing, and outreach, with specific initiatives related to the establishment of a digital knowledge platform, peer exchange, and B2B events.

127. These interventions are expected to generate immediate outcomes in the form of stronger institutional capacities, improved policy coherence, increased availability of technical solutions, stronger private sector confidence, and greater awareness among stakeholders. In the medium term, these outcomes are expected to support greener procurement and greater circularity in the built environment, lead to wider replication of cleaner technologies and operational practices, increase the uptake of low-carbon and low-impact construction materials, improve emissions monitoring and reporting, strengthen market demand for sustainable products, and improve access to green financing.

128. Over time, the project is expected to contribute to a structural transformation of the Philippine cement and construction sector, resulting in reduced mercury releases and greenhouse gas emissions, improved resource efficiency, increased circularity of construction materials, reduced environmental and health risks for workers and nearby communities, and enhanced resilience of the built environment. The project will therefore support the Philippines' commitments under the Minamata Convention and the Paris Agreement, while contributing to broader national goals on public health, sustainable industrialization, gender equality, and climate resilience.

129. The project's Theory of Change is based on several key assumptions. These include continued government commitment to industrial decarbonization and mercury reduction, the willingness of cement producers and market actors to engage in pilots and data sharing, the technical and financial viability of demonstrated solutions, and the existence of sufficient policy leverage and market demand to support replication. Key risks include delays in regulatory reforms, limited private sector uptake, weak emissions data, market barriers to green materials, and external shocks such as energy price volatility or climate-related disruptions. These risks will be mitigated through early stakeholder engagement, adaptive implementation, robust monitoring systems, targeted incentives, and strong coordination mechanisms.

130. This Theory of Change is based on the project's four components—policy reform, business development, technology demonstration, and capacity building—and reflects the project's intended contribution to a systemic transition in the Philippine cement and construction sector.



Detailed project description by components

143. The objective of this proposal is to enable monitoring and control of mercury emissions in the air and further reduce GHG and mercury emissions from the cement industry.

144. Component 1: Policy, regulatory and institutional enabling framework

145. This component will demonstrate the capacities to meet the requirements of the Convention and the NDC goals through integrated policy, regulatory framework, and standard implementation. The project addresses existing counteracting policies such as cost-minimization in traditional public procurement, rigid infrastructure material specifications favoring high-clinker cement, fuel/energy subsidy distortions in competing import markets, and unstructured quarrying/permitting obstacles. These are resolved through specific project mechanisms:

- Procurement Barriers: Addressed by operationalizing Republic Act No. 12009 (New Government Procurement Act of 2024) and Tatak Pinoy Act (RA 11981) under Output 2.1.2 and Output 4.1.2. The project embeds Green Public Procurement (GPP) tools, Life Cycle Costing (LCC), and Environmental Product Declarations (EPDs) so public infrastructure bids evaluate environmental performance rather than initial purchase price alone.
- Regulatory Rigidity: Addressed by updating DPWH BRS Bluebook specifications and DTI BPS requirements under Output 1.1.3 to allow higher SCM replacement ratios and recycled construction and demolition waste (CDW).
- Waste & Fuel Distortions: Addressed under Output 1.1.2 and Output 3.1.2 by updating DENR AO 2010-06 (Alternative Fuels and Raw Materials / AFR co-processing guidelines), expanding the EPR Law implementation, and introducing DOE incentive recommendations for biomass and RDF integration into kiln operations.

Component 1 will progressively establish the policy and regulatory conditions needed for sectoral transformation. During the project, the focus will move from policy and regulatory gap assessment to strengthened mercury monitoring and emission requirements, and then to national guidelines, standards, traceability and green procurement measures. By project completion, these measures are expected to provide a clearer and more predictable framework for the adoption of low-mercury, low-carbon and circular construction practices, supporting the investments and technology uptake under Components 2 and 3 and enabling wider replication beyond the project.

146. Outcome 1.1 National policy, regulatory and institutional framework strengthened, encouraging gender parity

147. Enabling a circular approach in the construction sector necessitates the creation of a conducive policy framework mindful of the challenges and synergies for achieving mercury and GHG emissions in the cement sector. This work package focuses on policy improvement to create the enabling regulatory environment for the transformation of the cement sector in the Philippines.

148. Output 1.1.1 National policy and regulatory framework for green cement and construction materials reviewed and a policy reform roadmap produced.

149. Policy needs assessment, including an analysis of gaps and challenges in the technical aspects of current policies, will be done to identify priority areas of policy support in the context of Minamata Convention and NDC implementation. Opportunities for improvements and recommendations on enhancing policy framework will be developed where necessary, to suggest revisions or updates to existing policies, regulations, and standards. This is necessary in order to streamline existing policies (the Philippine Green Building Code and Green Jobs Act), and outline new policies aimed at increasing the cement sector's ambition for mercury reduction while pursuing a decarbonization agenda. This will be done through a consultative process engaging stakeholders at different levels, based on a supply chain perspective and promotion of circularity in building materials.

150. Output 1.1.2 National regulatory framework and implementing provisions for monitoring and controlling mercury emissions in the cement sector developed and submitted for government adoption.

151. As part of the detailed analysis of the current regulatory framework, the project will review the Philippines requirements on mercury emissions. As part of the detailed analysis of the current regulatory framework, the project will review the Philippines's National Air Quality Standards (RA 8749 (Clean Air Act), DAO 2000–81 (Implementing Rules and Regulations of the Clean Air Act) and DAO 2004-26 (Amendment of Rule X1X) for strengthened requirements on mercury emissions. Additionally, the project will propose technical policies and specifications aimed at preventing and controlling mercury pollution within the cement industry. In line with the Minamata Convention, which prioritizes gender mainstreaming to safeguard human health and the environment from mercury's harmful effect, the project will advocate for integrating gender mainstreaming into technical policies where applicable.

152. Output 1.1.3 National technical guidelines and standards for low-impact buildings, low-carbon construction materials, and industrial emission reduction developed for endorsement

153. To support low impact building and infrastructure, the project will focus on developing national guidelines and standards for effective monitoring and regulation of mercury emissions, tailored to the unique characteristics of cement manufacturing processes. The project will involve extensive research and collaboration with relevant stakeholders to identify key parameters for mercury monitoring, establish standardized monitoring protocols, and define reporting requirements. Through such guidelines, the project should enhance the capacity of regulatory authorities and industry stakeholders to manage mercury emissions effectively and mitigate environmental and health risks associated with mercury emissions from the cement industry. Guidelines will include key information on the health impact of mercury on health and the environment, with specific elements on gender-specific impact.

154. Collaboration with national research institutions will support the development and refinement of standards and guidelines for alternative and low-carbon construction materials.

155. Such guidelines will be in line with the one developed by the Global Cement and Concrete Association under their Sustainability Charter aimed at enhancing the monitoring and reporting of emissions from cement manufacturing. This initiative addresses the inconsistent use of analytical standards worldwide, which leads to inadequate monitoring and enforcement of environmental regulations in some regions. The guideline is designed with three primary goals: to standardize the monitoring and reporting of cement emissions data, to deliver credible and practical information on emissions, and to encourage the effective internal management of emissions within the cement industry.

156. Output 1.1.4 National MRV and material traceability system for construction materials and associated mercury and GHG emissions established.

157. Environmental performance labelling will be promoted, integrating life-cycle assessment approaches into decision-making processes, and facilitating the establishment of a robust monitoring framework for traceability of materials in the construction industry, especially through generation of C&D waste. This takes into consideration that effective traceability and monitoring systems would require the development of reference methods, protocols, and appropriate measuring instruments, alongside the establishment of robust management systems for testing (ISO/IEC 17025) and inspection (ISO/IEC 17020), as well as relevant accreditation frameworks (e.g. ISO 14065) to ensure international recognition of results.

158. A framework for monitoring of the mercury as well as GHG emissions of the cement industry will be developed to support the country in the implementation and monitoring of the obligations under the Minamata Conventions and increase the transparency of the climate action. This will feed into the country's inventory databases for control of hazardous chemicals and GHG Inventory Management system.

159. Output 1.1.5 Gender-responsive policy recommendations and Gender Action Plan for green construction materials integrated into the national policy framework

160. The output entails conducting a comprehensive study on the social cost associated with mercury and carbon emissions. This study aims to qualify and quantify the potential greater social effects on women. By analyzing the social cost of carbon and mercury emissions and its health impact on both men and women, the project seeks to highlight the benefits of mitigating these pollutants beyond prescribed limits, thereby providing crucial insights into the economic incentives for further emission reduction measures. The research and analysis in this output aims to inform policymakers and stakeholders about the gender implications of reducing carbon and mercury emissions, facilitating informed decision-making towards more gender responsive environmentally responsible practices.

161. Among the proposed activities to achieve the expected outputs of Component 1 are the following:

162. Activity 1.1.1.1: Conduct a comprehensive assessment to identify (i) regulatory gaps and (ii) technical, financial, and capacity development needs

163. A comprehensive assessment of the cement and construction sectors will be carried out to identify gaps in existing regulations, as well as technical, financial, and institutional challenges that may limit progress toward lower emissions and more sustainable practices. The assessment will review policies, industry practices, and available technologies, and will include consultations with key stakeholders. The findings will provide an evidence-based foundation for policy development and project interventions.

164. Activity 1.1.1.2: Prepare a policy and regulatory recommendation set on the construction and cement industries value chain

165. This activity will translate the findings of the assessment into practical policy and regulatory recommendations covering different stages of the cement and construction value chain. The recommendations may address areas such as emissions control, use of alternative materials and fuels, waste utilization, and sustainable construction practices. The aim is to support government agencies in strengthening the policy framework and improving coordination across the sector.

166. Activity 1.1.1.3: Review of existing regulations and proposed policy and standard recommendations for green building design and green cement classification including certifications and eco-labeling.

167. Existing laws, regulations, and standards related to green building and cement production will be reviewed to identify gaps, overlaps, and opportunities for improvement. Based on this review, policy and standard recommendations will be developed for green building design and the classification of green or low-carbon cement, including guidance on certifications and eco-labeling systems to support market recognition of environmentally preferable materials.

168. Activity 1.1.2.1 Draft a national strategy to enhance circularity and innovation in the cement and construction sectors, including actionable measures to ensure smooth implementation of the regulation

169. This activity will develop a national strategy that promotes circular economic approaches and innovation in cement and construction. The strategy will identify priority actions to increase resource efficiency, encourage recycling and reuse of materials, and support adoption of low-impact technologies. It will also include practical measures to facilitate implementation, such as institutional arrangements, capacity-building needs, and monitoring mechanisms, ensuring that the strategy can be effectively carried out.

170. Activity 1.1.2.2: Increase capacity-building activities and conduct workshops for policymakers and technical personnel in government institutions on the implementation of the national strategy on Mercury reduction in the cement and construction sectors and regulations including gender mainstream perspective.

171. Capacity-building workshops will be conducted for policymakers and technical personnel to strengthen understanding of mercury reduction measures, relevant regulations, and implementation of the

national strategy. Gender-responsive approaches will be integrated to support inclusive participation and decision-making.

172. Activity 1.1.3.1: Conduct Hg emission monitoring and other POPs (dioxins and furans) in cement kilns registered as AFR facilities

173. This activity will provide a baseline of mercury content in coal (both local and imported), raw materials (limestone, clay), and alternative fuel/materials used in cement manufacturing. Baseline results will help ensure compliance with environmental standards, improve understanding of emission patterns, and guide the development of appropriate control measures. The data generated will also strengthen regulatory oversight and environmental reporting.

174. Activity 1.1.3.2: Increase the capacity building activities and conduct consultations, dialogues and workshops to policymakers and technical personnel in Green Procurement, Green Buildings, GHG emission calculations and emission reduction. The results will be printer-ready ordinances on green procurement and green building for LGUs.

175. This activity will conduct consultations, dialogues, and training workshops for policymakers and technical personnel on green procurement, green building practices, greenhouse gas emission calculations, and emission reduction strategies. The activity will also support the development of draft ordinances and guidance materials that local government units can adopt.

176. Activity 1.1.3.3 Draft guidelines and standards for low-impact buildings and industrial emission reduction in alignment with the NDCs

177. Guidelines and standards will be developed to promote low-impact building design and industrial emission reduction practices in alignment with the country's Nationally Determined Contributions (NDCs). These guidelines will provide practical direction for designers, builders, and industry operators on measures that can reduce environmental impacts while maintaining performance and safety standards.

178. Activity 1.1.4.1: Development of a monitoring matrix for adoption by DENR (Hg) and the Climate Change Commission (GHG)

A monitoring matrix with consideration given to AI-assisted data validation and automated reporting, will be developed to support government agencies in tracking progress in reducing mercury and greenhouse gas emissions. The matrix will include indicators, reporting formats, and suggested data collection approaches to promote consistency and transparency in monitoring and reporting across agencies.

179. Activity 1.1.5.1: Conduct national policy audits of existing green construction material regulations to identify gender gaps

180. This activity will review existing policies, regulations, and standards related to green construction materials to identify gender gaps or barriers that may limit participation, access, or benefits for women and other underrepresented groups. The audit will help ensure that future policies are more inclusive and responsive to different needs and roles within the sector.

181. Activity 1.1.5.2: Integrate gender-responsive language into environmental and construction codes (e.g., Philippine Green Building Code, DENR circulars)

182. This activity will support the integration of gender-responsive language and provisions into relevant environmental and construction codes. This may include recommendations to ensure inclusive participation in programs, equitable access to training and employment opportunities, and consideration of gender impacts in project implementation. The objective is to embed inclusivity within the regulatory framework rather than treating it as a separate activity.

183. Activity 1.1.5.3: Develop gender-inclusive guidelines for procurement of eco-friendly cement and materials

184. Procurement guidelines will be developed to encourage the purchase of eco-friendly cement and construction materials while promoting gender inclusiveness in supply chains and contracting processes. Recommendations may include supplier engagement approaches, evaluation criteria, and reporting practices that support both environmental sustainability and social inclusion.

185. The policy and regulatory measures developed under this component are expected to directly support the activities under Component 2 by creating a more enabling environment for private sector investment. Clear standards, improved compliance mechanisms, and targeted incentives will help reduce uncertainty for industry stakeholders, making it easier to develop viable business models and identify investment opportunities for low-carbon and low-mercury construction materials.

186. These policy improvements will also support the implementation of Component 3 by providing the necessary regulatory foundation for the adoption of new technologies, including alternative fuels, clinker substitution, emissions control systems, and the use of circular materials.

186a. The following table summarizes the legal or institutional status, barriers towards endorsement and the level of ambition, policy milestones and expected contributions to Hg and GHG per project output.

Outputs	Legal or institutional status	How barriers to endorsement, adoption and enforcement will be addressed	Level of ambition, policy milestones, implementation timeline and expected contributions to mercury and GHG reductions, demonstrating consistency with the NDC and net-zero ambitions
1.1.1 National policy and regulatory framework for green cement and construction materials reviewed and a policy reform roadmap produced.	**Status:** No existing national framework that is focused solely on policy/regulatory for green cement and construction materials. Existing policies and initiatives address various aspects of green buildings, low-carbon cement, sustainable procurement, climate mitigation, and circular economy, but these are not yet consolidated into a comprehensive framework specifically governing the transition toward green cement and construction materials. **Proposal for consideration:** Policy/regulatory roadmapping to produce a National Policy	Address barriers and gain enforceability through issuance of a Joint Administrative Order (JAO), or a similar instrument, by the DTI, DENR and DOST. Through the JAO, inter-agency TWG shall be established to resolve development issues such as institutional overlaps and ownership, specifications alignment, and other conflicting policies.	**Ambition**: Establish a coherent policy framework that will pave the way for the transition toward greening the cement and construction industries **Milestones:** i) completion of the policy/regulatory mapping; ii) gap analysis; iii) recommendation of reform policies **Timeline:** Start initial discussions on Year 1; For finalization by Year 2

	Framework for green cement and construction materials The proposal is a non-binding strategic national framework. It aligns directly with the ff. existing frameworks: - DTI Construction Industry Roadmap 2020–2030 - Philippine Cement and Concrete Decarbonization Roadmap - Philippine Development Plan (PDP) 2023–2028.		**Expected contributions:** to mercury and GHG reductions to directly align with NDC target (75% GHG avoidance by 2030) and Net-Zero 2050 targets.
1.1.2 National regulatory framework and implementing provisions for monitoring and controlling mercury emissions in the cement sector developed and submitted for government adoption.	**Proposal for consideration:** For merging under 1.1.1. as a general National Policy/Regulatory Framework. Implementation and monitoring provisions may instead be proposed under 1.1.2. Proposed implementing mechanism for monitoring and controlling mercury emissions in the cement and construction sectors Legally binding regulation if adopted by concerned government agencies; Potentially promulgated through a DENR-EMB Administrative Order that updates/supplements DAO 2000-81 (Implementing Rules and Regulations of the Clean Air Act - RA 8749) and DAO 2019-20 (Chemical Control Order for	Addresses enforcement and data gaps by institutionalizing mandatory stack testing, continuous mercury monitoring standards, and updating Self-Monitoring Report (SMR) online tools for DENR-EMB.	**Ambition**: Establish an enforceable implementation and monitoring mechanism at the national-level **Milestones:** i) Proposed implementing mechanism; ii) Pilot application/testing of the mechanism; iii) Adoption of the mechanism **Timeline:** Regulatory drafting by Year 2, promulgation by Year 3. Aligns with obligations under Article 8.5 of the Minamata Convention on Mercury. (avoidance of 0.4 metric tons of mercury emissions per year, amounting to 2.0

	Mercury and Mercury Compounds).		metric tons of Hg reduced over 5 years)
1.1.3 National technical guidelines and standards for low-impact buildings, low-carbon construction materials, and industrial emission reduction developed for endorsement	Philippine National Standards (PNS) and its corresponding technical regulation issued by DTI - BPS in alignment with Global Cement and Concrete Association (GCCA) sustainability guidelines.	Overcomes market resistance and structural standard rigidity by updating DPWH Bureau of Research and Standards (BRS) Bluebook specifications, allowing high-SCM blended cements, and enacting local green building ordinances. Barriers to adoption may be addressed through conduct of technical validation, cost benefit analysis, and demonstration projects, among others.	**Ambition**: Mainstream design of low-impact buildings and low-carbon construction materials **Milestones:** i) Standards assessment; ii) Technical / Regulatory gap analysis;/risk impact asssessment iii) Draft technical guidelines; iv) Laboratory or field validation; v) Recommended technical guidelines **Timeline:** Guidelines drafted by Year 2, BPS standardization by Year 3. **Contribution:** Facilitates clinker substitution and adoption of low-carbon materials across public infrastructure.
1.1.4 National MRV and material traceability system for construction materials and associated mercury and GHG emissions established.	Institutionalized national monitoring mechanism managed jointly by DENR-EMB (for Hg/POPs) and the Climate Change Commission (for GHG).	Eliminates data fragmentation through automated AI-assisted online reporting platforms, standardized testing protocols (ISO/IEC 17025/17020), and targeted training for plant Pollution Control Officers (PCOs). Barriers to adoption/enforcement may be addressed through	**Ambition**: A credible national MRV and traceability system for construction materials and associated emissions Milestones: i) Agreed indicators and methodology; ii) Baseline data; iii) System development and testing; iv) Pilot

		standardized indicators and methodologies, data-sharing agreements, and digital reporting tools, among others. Key to this is user training and a phased implementation.	rollout; v) Assessment and improvements, and User Guide; vi) Final rollout **Timeline:** Monitoring system operationalized by Year 3. **Contributions:** Enabled measurement, attribution, and monitoring of mercury and GHG emission reductions.
1.1.5 Gender-responsive policy recommendations and Gender Action Plan for green construction materials integrated into the national policy framework	**Status:** Gender & Development (GAD) plans under RA 9710 (Magna Carta of Women) and RA 11313 (Safe Spaces Act) adopted within government agencies like DTI, DENR, and DOST **Proposal for consideration:** Gender Equity, Diversity, and Inclusive policy recommendations and action plan	Mandates minimum 5% GAD budget allocations for gender activities, provides tailored health/safety standards, and addresses gender barriers in technical construction roles. Barriers may be addressed through dedicated capacity building and integration of gender indicators in project reporting and monitoring, among others.	**Ambition**: Ensure an inclusive transition to green cement and construction materials sectors. Milestones: i) Gender analysis; ii) Policy recommendations; iii) action plan; iv) Adoption / integration **Timeline:** National policy audit by Year 2, gender-inclusive action plan issued by Year 3. **Contributions:** Ensure gender equity, diversity, and inclusion across implementation and project capacity-building initiatives.

Component 2: Business development

Component 2 focuses on developing the business environment and investment pipeline needed to support the adoption and scaling of low-carbon and low-mercury technologies in the cement and construction sector.

187. Outcome 2.1 Market actors adopted investment ready pathways

188. The project aims to provide investors with more confidence in markets that are de-risked by the establishment of a technology roadmap and new business models that address net-zero carbon emissions. This will drive the creation of a chemicals-free, climate-compatible cement materials industry in the Philippines, aligned with the net-zero pathway. Component 2 is designed to address the main barriers to technology adoption by combining project preparation, financial de-risking, fiscal incentives and market creation. For capital-intensive technologies such as waste heat recovery, calcined clay systems and RDF processing, the project will provide technical assistance, engineering assessments and emissions-reduction verification to reduce pre-investment technical risks and transaction costs and develop a pipeline of bankable projects suitable for commercial financing.The project will then connect these prepared investments with a range of financing instruments. Development banks and commercial lenders will provide green and climate-smart financing for energy efficiency, kiln upgrades, waste recovery and industrial retrofits, while international financial institutions can provide concessional financing and guarantees to help address the higher perceived risks associated with new technologies. Existing fiscal incentives and tax provisions will further improve project economics and investment returns. Finally, Component 2 will address demand-side barriers by strengthening green public procurement and supporting green building requirements, creating more predictable market demand for low-carbon and low-mercury cement. By combining technical project preparation, risk-sharing mechanisms, improved investment returns and greater market certainty, the component is intended to convert identified technology opportunities into a pipeline of bankable projects and crowd in private capital at scale, rather than relying on grant financing alone.

189. Output 2.1.1 Full value-chain cement roadmap for low-mercury and net-zero sector by 2050 with climate- smart technologies developed and gender mainstreamed.

190. Existing business initiatives in the Philippines will be mapped, available resources, knowledge and ‘capacity will be identified. Based on analysis (e.g.existing UNIDO methodologies specifically designed to map and guide value chain development such as the EQuIP Tool 4 on Global Value Chains and the companion Chain Analysis Tool (CAT)) a roadmap for the development of net-zero construction sector free of hazardous chemicals in the Philippines will be developed, indicating priority areas for the government action and proposed timelines. Investment opportunities for industries in new technologies and business models will be identified. The roadmap will feed into the policy component – supporting implementation of Component 1. The document will also examine the role of women-led businesses in the road to a net-zero emission industry, as well as the necessary support for start-ups and existing companies willing to invest in environmentally responsible cement materials or construction services.

Output 2.1.1 builds directly on the enabling frameworks developed under Component 1. The policy and regulatory review, mercury monitoring and control framework, low-impact building standards, materials traceability framework, and gender assessment generated under Outputs 1.1.1- to 1.1.5 provide the evidence base and enabling conditions for the development of the policy reform cement roadmap. The roadmap consolidates these policy, regulatory, technical and market dimensions into a long-term sector transformation pathway, identifying priority technologies, financing needs, investment opportunities and implementation milestones toward a low-mercury and net-zero cement sector. In this way, Component 1 establishes the enabling environment, while Output 2.1.1 translates these frameworks into a strategic roadmap for investment and implementation.

191. Output 2.1.2 Business model incentives for private sector investment and green jobs creation in the construction industry.

192. Through a gender-responsive, consultative process and analysis of needs, enhanced incentives schemes for the production and use of cement with low mercury impact and carbon emissions will be developed.

193. Leverage for market transformation will be sought through incentives provided through green procurement and other governmental mechanisms. Green public procurement tools will be developed and operationalized that will allow the inclusion of new materials standards, low mercury levels, reduced carbon emissions, and circular economy requirements.

194. Output 2.1.3 Industry partnership and technology transfer platform established to facilitate cooperation, knowledge exchange and uptake of low-mercury and low-carbon solutions in the cement and construction sector.

195. The focus will be on organizing industry partnerships aimed at facilitating the exchange of best practices and establishing linkages in the field of technology transfer and cooperation. These events provide a platform for industry stakeholders, technology providers, and experts to come together, share insights, and forge partnerships through interactive workshops, seminars, and networking sessions. The project will encourage the participation of women-led businesses and women speakers in expert groups and business-to- business activities. Selection will be done in an open call for proposals, and MSMEs working with innovative technologies and practices will be encouraged to take part.

196. Output 2.1.4 Pipeline of bankable investment opportunities and financing partnerships for green construction practices and products developed

197. The PPG phase assessed current products offered by the financing sector to support investment benefitting environmental protection, with special attention to production with reduced toxicity, as it is commonly less recognized than climate transition. The Project will also offer technical support for the integration of gender considerations into finance initiatives. Recognizing the significance of gender criteria in the decision-making processes of multilateral investors, the Project will seek to enhance the capacities of national financing facilities, the private sector, and policymakers in this regard, thereby facilitating improved access to finance.

198. The Project will undertake various activities, including:

- Providing training on gender disparities in accessing finance and adhering to existing gender-sensitive
- incentive structures mandated by regional development banks and multilateral funds.
- Delivering training on the evaluation of gender-specific climate and environmental risks.
- Collecting sex-disaggregated and gender-specific data as required by investors and regulators.
- Developing gender-based criteria for the allocation of funds.

199. To ensure the delivery of the outputs of component 2, the following activities will be undertaken.

200. Activity 2.1.1.1: Draft a strategy for the cement value chain and recommend the cement roadmap towards low-mercury and net-zero by 2050 integrating climate-smart technologies and gender mainstreamed in the proposed goals, targets and KPIs

201. A sector strategy and roadmap will be developed to guide the cement industry toward low-mercury emissions and net-zero targets by 2050. The roadmap will examine the entire cement value chain—from raw material sourcing to production and use—and identify priority actions, technologies, and policy measures needed to achieve these goals. Climate-smart technologies and practices will be integrated into

the strategy, and gender considerations will be reflected in the proposed goals, targets, and key performance indicators to ensure that benefits and opportunities are inclusive and equitable.

Sub-activities under Activity 2.1.1.1

202. 2.1.1.1.1 Ash characterization (Fly Ash and Bottom Ash) for cement manufacturing and recommend pre-treatment study, if applicable.

203. The technical suitability of fly ash and bottom ash for use in cement manufacturing will be assessed through laboratory characterization and testing. Key parameters such as chemical composition, contaminants, and performance characteristics will be evaluated, and appropriate pre-treatment methods will be recommended where necessary. The results will support the safe and effective use of alternative materials, contributing to reduced clinker use and lower emissions.

204. 2.1.1.1.2 GHG emission estimation for cement production including Scope 1, Scope 2 and Scope 3 to determine the carbon footprint of the cement product (e.g. kg CO2/bag of cement

205. This activity will estimate greenhouse gas emissions associated with cement production, including Scope 1, Scope 2, and relevant Scope 3 emissions, in order to determine the carbon footprint of cement products (for example, kilograms of CO_2 per bag of cement). The results will provide a baseline for monitoring emission reductions, support benchmarking across facilities, and inform roadmap development and policy recommendations.

206. Activity 2.1.1.2 Prepare a set of recommendations of environmentally friendly substitute material alternatives in the cement industry for mercury emission reduction

207. Environmentally friendly substitute materials that can reduce mercury emissions and environmental impacts in cement production will be identified and evaluated. These may include supplementary cementitious materials, industrial by-products, or other low-impact alternatives to traditional inputs. Recommendations will be based on technical performance, availability, environmental benefits, and feasibility within the local context, providing practical guidance to industry and policymakers.

208. Activity 2.1.2.1 Conduct a review on the existing sustainable portfolios in the country and formulate a business model framework and incentive mechanism study to promote green investments and green jobs creation for the cement and construction industries including recommendation on the incentivization program for green procurement and adoption of low-carbon technologies.

209. This activity will review existing sustainable finance portfolios and incentive programs relevant to the cement and construction sectors. Based on this review, the project will develop a business model framework and propose incentive mechanisms to promote green investments, green jobs, green procurement, and the adoption of low-carbon technologies.

210. Activity 2.1.2.2 Conduct a technical and financial feasibility study for the use of 3D printing and other emerging technologies in the construction sector including its potential to reduce material use, clinker demand, and associated emissions

211. A technical and financial feasibility study will be conducted to assess the viability of using 3D printing and other emerging technologies in the construction sector. The study will evaluate technical requirements, costs, potential applications, and economic benefits, and will identify opportunities and constraints for adopting these technologies in local construction projects.

212.. Activity 2.1.3.1: Conduct expos and business trade fairs showcasing cement and construction-related technologies and innovations

213. This activity will organize expos and trade fairs to showcase new technologies, materials, and innovations relevant to the cement and construction sectors. These events will provide a platform for companies, researchers, and technology providers to present solutions that improve efficiency, reduce emissions, and

promote sustainability. They will also encourage networking, partnerships, and investment opportunities that can accelerate technology uptake.

214. Activity 2.1.3.2: Industrial linkage for an industrial waste exchange initiative for fly-ash producers and cement manufacturers

215. Linkages between industries will be facilitated to promote the exchange and productive use of industrial by-products, particularly fly ash, in cement manufacturing. Mapping material sources, coordination mechanisms, and support for logistics or quality assurance arrangements may be included to help reduce waste, lower raw material costs, and decrease environmental impacts.

216. Activity 2.1.3.3: Development of digital platforms for circular materials exchange

The project will support the development and operationalization of digital platforms and marketplaces for construction and demolition waste and secondary materials, in collaboration with relevant government agencies and LGUs. This will facilitate material exchange, improve traceability, and strengthen circular use of resources across the construction value chain.

217. Activity 2.1.4.1: Financial awareness on available environmental finance portfolios and technical assistance for loan applications

218. This activity will improve access to information for environmentally beneficial investments. Information sessions and workshops will be conducted to raise awareness among project partners about available green financing programs, lending windows, and incentive schemes offered by financial institutions. Technical assistance will also be provided to help partners prepare proposals, meet eligibility requirements, and navigate the loan application process.

219. Activity 2.1.4.2: Investment opportunities development for alternative and secondary raw materials

220. This activity will promote and support investments in the use of alternative or secondary raw materials, such as construction and demolition waste and other recycled materials that can be used as aggregates or inputs in construction. The activity will help demonstrate technical feasibility, identify potential supply chains, and encourage industry adoption. By increasing the use of secondary materials, the project aims to reduce reliance on virgin resources and lower environmental impacts.

221. Building on the above activities, the project will ensure that business development efforts directly translate into implementable investments under Component 3. To ensure strong alignment with Component 3, the project will support the identification and preparation of a pipeline of bankable investment projects in the cement sector, including alternative fuels, clinker substitution, mercury control, and circular material applications. This will involve technical screening, assessment of emissions reduction potential, and evaluation of financial viability, including baseline and incremental costs. The project will further facilitate partnerships across the value chain, strengthen supply chains for alternative fuels and materials, and engage financial institutions to structure co-financing for demonstration investments. In addition, monitoring, reporting, and verification (MRV) frameworks will be developed to track GHG and mercury emissions reductions, and strategies for replication and scale-up will be established to enable broader sectoral adoption.

222. As part of this pipeline development, during the PPG stage, a comprehensive inventory of potential green cement demonstration projects was developed, encompassing a wide range of interventions aimed at reducing the environmental footprint of the cement industry. From this extensive list, a limited number of projects will be carefully selected for further detailed analysis, focusing on those with the greatest potential impact and feasibility.

223. The selection criteria will consider multiple factors, including:

- Environmental impact: priority will be given to projects that can significantly reduce mercury emissions and other pollutants, contributing to cleaner production.

- Climate-smart potential: projects should demonstrate reduced carbon emissions, improved energy efficiency, or other sustainable practices that align with global climate objectives.

- Bankability: projects must be financially viable and attractive to investors, ensuring that selected interventions can realistically be implemented and scaled.

- Innovation in materials and techniques: projects introducing new construction materials or innovative construction methods will be prioritized, supporting the adoption of advanced, sustainable practices in the industry.

- For each selected project, a detailed technical and financial analysis will be conducted. This will include refining process and material designs, assessing costs and benefits, evaluating implementation risks, and ensuring compliance with environmental and safety standards. The goal is to produce demonstration projects that are not only environmentally effective but also technically feasible and economically sustainable, thereby maximizing their potential for adoption by the cement industry.

224. By focusing on high-impact, technically sound, and bankable projects, this approach ensures that resources are directed toward initiatives with the greatest potential for environmental, economic, and industry-wide benefits, while also providing clear examples of sustainable investment opportunities that can guide future industry practices.

225. The activities under this component will also contribute to Component 4 by building the capacity of financial institutions, SMEs, and government agencies in project preparation, environmental performance tracking, and sustainable financing practices.

226. Component 3: Technology demonstration

Component 3 focuses on implementing and demonstrating innovative technologies that reduce mercury emissions, lower carbon intensity, and improve resource efficiency in the cement and construction sector.

227. Outcome 3.1 Innovative, low-carbon and resource efficient cement technologies demonstrated at scale

The project will support pilot infrastructure investments enhancing their design and use of new building materials, with major focus on alternative materials with low environmental impact. This will allow the industry to develop and test cement products with low hazardous chemicals emissions and reduced carbon footprint at scale in public construction works. Demonstration projects will be selected through a transparent assessment process based on the following criteria:

- **Technical criteria:** technology readiness, technical feasibility under Philippine conditions, compatibility with existing cement production processes, and compliance with national standards and regulatory requirements.
- **Economic criteria:** financial viability, cost-effectiveness, potential for commercialization, and ability to attract follow-on public or private sector investment.
- **Environmental criteria:** potential to reduce mercury emissions, greenhouse gas emissions, hazardous pollutants, resource consumption and waste generation, while supporting circular economy objectives.
- **Replicability criteria:** potential for adoption by other cement producers, construction companies and related industries in the Philippines.

- **Scalability criteria:** potential to be integrated into sector policies, financing mechanisms, public procurement systems and future investment programmes, thereby enabling broader sector transformation.

The demonstration projects will not be implemented as stand-alone pilots. They will be directly informed by the outputs of Components 1 and 2. Component 1 provides the enabling policy, regulatory, monitoring, standards and traceability frameworks that establish the conditions for technology adoption and market transformation. Component 2 translates these enabling frameworks into a sector roadmap, investment incentives, industry partnerships and bankable investment opportunities. Then, the demonstration projects under Component 3 will generate technical, environmental and economic evidence on the performance of low-mercury, low-carbon and circular solutions. This evidence will be used to support policy implementation, strengthen investment cases, facilitate access to finance, and promote replication and scale-up across the cement and construction sector. In this way, the demonstration projects serve as the practical validation of the policy, regulatory, financing and capacity-building interventions supported by the project and provide the pathway from pilot implementation to broader sector transformation.

228. Output 3.1.1 Technology demonstration projects for low-mercury green cement.

229. The project will conduct feasibility studies on alternative low-carbon innovative materials and techniques that can effectively replace or reduce the use of clinkers, as the main source of mercury emissions in cement manufacturing. Such alternative low-carbon materials include supplementary cementitious materials (SCMs) or alternative binders and serve as a basis for viable strategies to reduce clinker content while maintaining or enhancing the quality and performance of cement products.

230. Concurrently, this Output will focus on facilitating technology demonstrations and supporting technology transfer initiatives aimed at increased utilization of supplementary cementitious materials (SCMs) in primary cement production while ensuring reduction in mercury emissions potential. This strategic approach underscores a commitment to implementing sustainable and environmentally friendly practices within the cement industry. By leveraging the findings and insights obtained from the feasibility studies, the project aims to enable cement manufacturers to effectively integrate SCMs into their primary production processes.

231. Gender will be mainstreamed in all indicators pertaining to these activities. Gender criteria will be considered when selecting private partners engaged in project activities for technology transfer. These could include the inclusion of gender equality and diversity in corporate governance, fair representation of women at all levels of the company and zero-tolerance policy for workplace gender discrimination. Feasibility studies will also look at social aspects of the materials supply chain with considerations on gender aspects of inclusion and employment.

232. Output 3.1.2 Supporting the implementation of energy-efficient processes in kiln operations

233. The output will leverage on the engagement with the cement industries for reduction of mercury emissions and support the implementation of energy-efficient processes in kiln operations through tailored audits assessing current operational practices and technology transfer initiatives for the identified areas for improvement. The objective is to use the adoption of new energy efficient technologies and combine them with targeted measures for temperature control at filters-level to prevent formation of metallic state Hg. Furthermore, the project will facilitate the transfer of knowledge and technology from experts to cement industry stakeholders, including women-led companies and experts, ensuring effective implementation and utilization of energy-efficient practices. By combining audits (with consideration to real-time monitoring tools to improve energy efficiency and emissions control in kiln operations), feasibility studies, and technology transfer, the project aims to empower cement manufacturers to optimize their kiln operations, reduce energy consumption, and enhance environmental sustainability with strict preventions of conditions enabling mercury emissions. Capacity-building activities will be conducted with a focus on women engagement to a minimum of 40% of representation. Gender will be mainstreamed in all indicators pertaining to these activities.

234. Output 3.1.3 Advancing circular approaches for recycled concrete, clinker and alternative materials.

Successful initiatives of using recycled clinkers have relied on sourcing from a wide range of secondary materials including wood ash and mineral waste. However, any input in the clinker production led to risks of introducing material with higher mercury content and result in increased emissions, so the focus of this output will be to ensure that sources of secondary material and production of recycled clinker is in line with mercury input control and categorization.

235. Through the circular approaches, the project will also aim to recover cement from Construction and Demolition Waste (CDW), reducing waste generation, and conserving natural resources. Innovative technologies and processes will be supported to minimize the environmental impact of CDW.

236. Feasibility studies will also look at social aspects in post-use and recovery of secondary materials. The informal sector is usually over-represented in waste management and women are often even more impacted by having low access to decision-making spheres of these organizational schemes.

237. To achieve the expected outputs, the following activities for Component 3 will be implemented:

238. Activity 3.1.1.1: in coordination with relevant regulatory agencies

In coordination with relevant regulatory agencies, establish Hg balance in a Pilot Cement Manufacturing Company – Hg analysis on coal/fuel, clinker, air emissions for all input (raw materials, clinker, fuel, etc) and output streams (solid, liquid and gas emissions, cement products) or all applicable (upstream and downstream) aspects of the cement manufacturing value chain. For cement partners with AFR, Dioxins and Furans will be included in the air emission.

239. This activity will establish a clear picture of how mercury moves through the cement production process in a selected pilot plant. Samples will be collected and analyzed from key inputs and outputs, such as fuels, raw materials, clinker, and air emissions. The results will help identify where mercury enters the system, how it behaves during production, and where reduction measures can be most effective. This baseline understanding is essential for designing practical emission reduction strategies.

240. Activity 3.1.1.2: Determination of Hg emission reduction based on the adopted technology – e.g., fly ash as alternative for clinker; alternative fuel materials in lieu of coal. Air emissions will be tested for Hg, conventional air parameters such as SOx, NOx, CO, and heavy metals other than Hg. For D/F, testing may be applicable for temperature-related improvements.

241. The contribution of selected technologies and practices to mercury emission reduction will be assessed. Examples include using fly ash or other materials to reduce clinker content and shifting to alternative fuels that may contain lower mercury levels. Air emissions will be tested for mercury, conventional air parameters such as SOx, NOx, and CO, and heavy metals where applicable, with dioxin and furan testing conducted when temperature-related improvements are introduced. By comparing operating data before and after implementation, the project will document emission reductions achieved and evaluate the technical and economic viability of these approaches. The findings will help guide broader adoption in the sector.

242. Activity 3.1.2.1: Conduct workshops on process optimization for cement manufacturing companies (e.g., combustion control, clinker cooling, raw mix design)

This activity will facilitate knowledge sharing and capacity building through workshops that support the effective implementation of technologies demonstrated under this component.

243. Practical training will be provided to cement plant engineers and technical staff on improving production efficiency. Workshops will focus on key areas such as combustion control, clinker cooling, and

raw mix design, all of which influence fuel use, emissions, and product quality. The sessions will also provide a platform for companies to share operational experience and lessons learned, helping build a community of practice within the industry.

244. Activity 3.1.2.2: Draft recommendation for incentivizing cement companies using alternative fuel (biomass, RDF, industrial by-products) for energy for submission to the DOE as a result of feasibility studies on integration of renewable energy into kiln operations

245. This activity will translate technical findings into practical policy recommendations. Based on feasibility studies and pilot experiences, the project will identify ways to encourage cement companies to use alternative fuels and integrate renewable energy into kiln operations. The recommendations, to be submitted to the Department of Energy, may include proposed incentives, enabling policies, or support mechanisms that can help reduce barriers to adoption and accelerate industry transition.

246. Activity 3.1.2.3: Collaborative R&D for research and academic institutions on advanced kiln technologies and AI-driven monitoring systems for real-time energy efficiency tracking

247. Collaboration between industry, universities, and research institutions will be strengthened to explore technologies that improve kiln performance and energy efficiency. Work may include testing advanced kiln systems, developing digital monitoring tools, and applying AI-based methods to track energy use and process conditions in real time. These efforts aim to support innovation while building local technical capacity for the long term.

248. Activity 3.1.3.1: Demonstration Site for a pilot structure using alternative construction materials and recycled C&D wastes.

249. This activity will develop a demonstration structure that showcases the use of alternative construction materials, including recycled construction and demolition waste. The site will serve as a practical example of how these materials can be safely and effectively used in real projects including validation of structural and performance standards under local conditions. By documenting the design, construction process, and performance, the project will help build confidence among engineers, contractors, and policymakers and encourage wider use of sustainable materials.

250. Low-cost housing will be built using green building/sustainable design, use of 3D printing during construction, alternative construction materials (i.e. pavers) will be used. Structural testing and analysis and GHG calculations (e.g. embedded carbon) will be included. Technical and financial feasibility study to be conducted in view of adoption by the National Housing Authority and inclusion in the Green Building Code. The demonstration will also assess constructability, usability, and community acceptance of the materials and technologies through engagement with local beneficiaries.

251. Activity 3.1.3.2: Construction materials hub with digital platform (in coordination with DOST, includes hosting and promotion)

252. A construction materials hub supported by a digital platform (preferably with a real-time collection and processing function) will be established to improve access to information on alternative and sustainable materials, and AI-based tools will be used to analyze collected data to support decision-making, for example by identifying lower-carbon material options and optimizing supply chains for cost, efficiency, and environmental impact In coordination with DOST, the platform will provide technical information, potential material sources, and guidance on applications, in line and compatible with national MRV and relevant government databases so that data can be automatically shared, validated, and used for compliance and policy reporting. Outreach and promotion activities will help connect suppliers, researchers, and users, strengthening the market for recycled and low-carbon construction materials.Activity 3.1.3.3: Material testing and validation of alternative cementitious materials
The project will support the testing, validation, and certification of low-carbon and alternative cementitious materials in collaboration with national research institutions. This includes strengthening laboratory and

technical capacity, where needed, to ensure compliance with national standards and support the adoption of innovative materials.

253. The demonstration activities under this component will also generate practical experience and data that will feed into Component 4. Lessons learned from implementation will support the development of monitoring and reporting systems, strengthen institutional capacity, and help inform the replication of successful approaches across the sector.

254. Component 4. Capacity building

255. Component 4 supports the overall implementation of the project by strengthening the capacity of key stakeholders, improving monitoring and reporting systems, and facilitating knowledge sharing. It builds on the results of the other components to ensure that policy measures, business development efforts, and technology demonstrations are effectively implemented and can be sustained and scaled over time.

Outcome 4.1 Capacity strengthened for control and reduction of mercury emissions in line with the Minamata Convention and use of green cement/construction material for use

256. The Outcome focuses on strengthening the national capacity to guide the industries in the cement supply chain through improved control of mercury emissions as well as through providing incentives and creation of market opportunities for products with reduced mercury emissions. Digitalization (for more interaction, and training on digital MRV and emissions forecasting, or digital platform) will be a cross-cutting enabler that can improve transparency, efficiency, and scalability of project interventions. Component 4 will support the implementation and scaling of Components 1–3 by strengthening monitoring, knowledge sharing, stakeholder engagement and replication. It will capture and share lessons, data and good practices from the policy work under Component 1, the business and financing approaches under Component 2, and the technology demonstrations under Component 3. Monitoring and reporting will provide evidence on progress and results and help identify areas where implementation needs to be adjusted. Engagement with government, industry, financial institutions, technology providers and other relevant stakeholders will support coordination, exchange of experience and uptake of successful approaches. The knowledge generated through these activities will also help identify practical conditions for replication and inform the wider application of proven technologies, business models and policy measures across the cement and construction sector.

i. National enforcement capacity strengthened for mercury monitoring and reporting, to ensure compliance with regulatory limits.

257. The project will also focus on strengthening the national enforcement capacity for mercury monitoring and reporting, with a particular emphasis on increasing the knowledge of the regulatory stakeholders and improving the knowledge exchange through the Asia Pacific Mercury 223. Monitoring Network (APMMN). It will also implement activities for continuous mercury monitoring systems to track emissions and ensure compliance with regulatory limits. This initiative thus involves enhancing the technical capabilities of regulatory authorities and industry stakeholders to effectively monitor mercury emissions in real-time. By deploying continuous monitoring systems, the project aims to provide timely and accurate data on mercury emissions, enabling proactive measures to address any deviations from regulatory limits promptly.

258. Furthermore, the project will support the development of robust reporting mechanisms to facilitate transparent communication, learning, and accountability in mercury monitoring and compliance efforts. Through these initiatives, the project seeks to enhance national enforcement capacity for mercury monitoring and reporting, contributing to improved environmental protection and public health outcomes.

259. The Air Quality Management Section at DENR is responsible for the development of Guideline Values for Additional Hazardous Air Pollutants which include mercury.

II. National institutional capacity for green procurement on infrastructure programmes built to facilitate green cement and construction materials use.

260. As mentioned in the section on systemic challenges addressed by the project, weak green procurement regulations present one of the main barriers to addressing the challenges of using green construction materials in the built environment in the Philippines. The project will build on the initiative of the government's Department for Trade and Innovation in championing greening buildings construction through green procurement, strengthening the governmental institutions capacity to use green procurement effectively as an incentive to the private sector to reduce the mercury and GHG emissions. This will entail training workshops for public institutions and guidelines creation, supported by the green public procurement tools developed and operationalized in parallel under Output 2.1.2. In addition, the Industrial Deep Decarbonisation Initiative (IDDI), convened by UNIDO, is a global initiative that drives the decarbonization of heavy-emitting sectors such as cement and steel by promoting common emissions measurement standards and stimulating demand for low-carbon materials through green public procurement. In the Philippines, engagement with IDDI can support the cement and construction sector by enabling the adoption of international carbon accounting standards, improving transparency of embodied emissions, and creating market pull for low-carbon cement and concrete, thereby accelerating industrial decarbonization and supporting national climate commitments.

261. Outcome 4.2 Knowledge management platform established to support stakeholder within the construction industry with greener transformation, promoting female leadership.

262. Output 4.2.1 Knowledge documented and shared with stakeholders

263. A set of knowledge management activities is envisaged with the objective to define a solid exit strategy, facilitate the flow of information and knowledge to national and international stakeholders and beneficiaries, as well as to recollect experiences from the Philippines during and after the project. These will be key for scaling up activities for the project. The role of knowledge management also includes documenting gender aspects of the project.

264. Throughout the project implementation phase, all relevant data, information, and lessons learned will be documented in line with a detailed knowledge management strategy defined in the project document during the PPG. Knowledge products (datasets, reports, analysis, policy guidelines, case studies, etc.) will be made available to relevant stakeholders nationally or internationally, as appropriate. Necessary links with similar initiatives, under the GEF, will be made with the aim of facilitating relevant information sharing and increasing uptake capacity.

265. Output 4.2.2 Project results communicated through relevant platforms

266. Project results will be communicated with a wide range of stakeholder groups nationally, regionally and globally through existing communication platforms, relevant social media channels and participation and organization of relevant events and forums. To facilitate effective sharing of information and experiences among agencies, reporting mechanisms will be established with standardized content forms and reporting timelines. These mechanisms will aid in

the national implementation process. Additionally, participation in relevant international forums will be organized to facilitate knowledge exchange on relevant topics and allow for learning experiences from other countries.

267. To promote gender-equality in the sector, the project will prioritize gender mainstreaming throughout all aspects, including in the selection of partners and stakeholders. This entails considering gender criteria in all its training sessions to ensure diverse representation and perspectives in decision-making processes. All content developed with specific gender aspects will be advised with particular attention on the knowledge platform.

268. Output 4.2.3. Targeted outreach for the general public, decision-makers and industry experts with gender-specific communication

269. Training sessions will be conducted focusing on various aspects of mercury emissions to control regulatory systems, monitoring methods, supervision and management capabilities, and best available techniques/best environmental practices (BAT/BEPs). These sessions aim to equip municipal-level monitoring stations with the necessary capacity to monitor atmospheric mercury emissions effectively. Furthermore, they will ensure that government officials are proficient in supervising mercury emissions from cement plants.

270. Additionally, the public will receive education on mercury emissions from cement production, the effects of mercury exposure on human health and the environment and will be encouraged to participate in supervising mercury pollution control in cement plants. Moreover, the training will provide cement plants with the knowledge required to independently select, utilize, and manage BAT/BEP technologies for controlling and reducing mercury emissions during cement clinker production. Questionnaires will be designed and distributed to gather feedback for the continuous improvement of future capacity-building activities.

271. Capacity-building activities will be conducted with a focus on women engagement to a minimum of 40% of representation. Genders will be mainstreamed in all indicators pertaining to these activities. Awareness- raising activities will include specific materials for women as a target group and focusing on (i) specific impacts of mercury with more adverse effects on women (ii) ensuring fair representation of women in the workplace and fighting gender discrimination.

272. Furthermore, the project will conduct a comprehensive analysis to identify the participation of women in the whole supply chain, analyzing working conditions, good practices, and barriers to gender equality. This analysis will inform decision-making processes and facilitate the development of targeted interventions to promote gender equality and inclusion within the industry.

273. To deliver the outputs for component 4, the following activities will be undertaken.

274. Output 4.1.1 National enforcement capacity strengthened for mercury monitoring and reporting

275. Activity 4.1.1.1 – Capacity building on Hg balance, monitoring, and compliance reporting

276. Training will be provided to cement plant personnel and regulators on establishing mercury balances in plant operations, monitoring emissions, and preparing compliance reports such as the DENR Self-Monitoring Report. The goal is to improve accuracy, consistency, and confidence in emissions reporting.

277. Activity 4.1.1.2 – Technical assistance on SMR upgrade and Hg-related online reporting tools

278. Technical support will be provided to improve reporting systems and digital tools used by DENR and regulated facilities, making mercury reporting more efficient, transparent, and easier to manage.

279. Output 4.1.2 National institutional capacity for green procurement strengthened

280. Activity 4.1.2.1 – Conduct workshops on Green Procurement for LGUs in the context of construction program implementation

281. Workshops will be conducted for local government units and infrastructure planners to strengthen understanding of how green cement and environmentally preferable construction materials can be integrated into procurement and project implementation. Output 4.2.1 Knowledge documented and shared with stakeholders

282. Activity 4.2.1.1 – Conduct IEC campaigns such as the 1) National campaigns highlighting women's role in sustainable construction 2) Showcase success stories of female professionals and entrepreneurs in green building and 3) Public-private partnerships to promote gender equity in eco-material innovation.

283. Communication materials and campaigns will be developed to raise awareness about sustainable construction, highlight the contributions of women in the sector, and promote more inclusive participation in green building initiatives, including public–private partnerships that support gender equity in eco-material innovation.

284. Activity 4.2.1.2 – Conduct Gender-sensitive safety and health training for workers for handling eco-friendly materials, cement and construction workers.

285. Training will be delivered to construction workers and personnel on safe handling of eco-friendly materials and improved occupational health practices, incorporating gender-sensitive approaches to workplace safety.

286. Activity 4.2.1.3 – Conduct upskilling on new technologies and rollout of GHG tools including participation of academic and research institutions as technical resource persons

287. Construction workers, engineers, and technical staff will be trained in emerging tools and technologies such as 3D printing, digital tools, and greenhouse gas calculators to help the workforce adapt to evolving industry practices.

288. Output 4.2.2 Project results communicated through relevant platforms

289. Activity 4.2.2.1 – Sharing and disseminating the know-how, major outputs, lessons learned and best practices from the pilot projects across the country

290. Major project outputs, lessons learned, and successful practices will be disseminated through workshops, publications, and knowledge-sharing events to support wider adoption across the sector.

291. Output 4.2.3 Targeted outreach for public, decision-makers, and experts

292. Activity 4.2.3.1 – Conducting site visits to observe best practices implemented and as inputs to Activity 4.1.1

293. Site visits will be organized to demonstration projects and partner facilities, allowing stakeholders to observe implemented technologies and practices and gain insights from real-world applications.

Component 5. Monitoring and Evaluation

294. Outcome 5.1 Project monitored and evaluated

295. Day-to-day monitoring is the responsibility of the Executing Partner, while mid-term and final project evaluations are within the responsibility of implementing agency (UNIDO).

296. Output 5.1 Ongoing project monitoring

297. The project activities will be monitored in compliance with UNIDO-GEF monitoring and evaluation policies and guidelines. PEE will be expected to provide inputs and reports for preparation of Project Implementation Reports which will be consolidated and submitted by the Implementing Agency.

298. Output 5.1.2 Mid-term project review

299. The Mid Term Review (MTR) of the project will be carried out by independent contractors (contracted by UNIDO) and will include an assessment of the project's progress up to date. It will also provide valuable feedback for potential adjustment of the project's activities, so the project remains on track to achieve its goals.

300. Output 5.1.3 Terminal evaluation

301. An independent Terminal Evaluation (TE) of the project will be undertaken by independent contractors (contracted by UNIDO) and will include an assessment of the added value of the projects. The TE will be conducted in line with UNIDO-GEF evaluation policies and guidelines. This will allow the project to evaluated also 6 months after its completion.The TE will be the responsibility of the implementing agency, and the funds will be held within the project budget. The TE of the Project will provide an independent assessment of project performance (in terms of relevance, effectiveness, efficiency) and determine the likelihood of impact and sustainability. It will have two primary purposes: (i) to provide evidence of results to meet accountability requirements, and (ii) to promote learning, feedback, and knowledge sharing through results and lessons learned among the partner agencies.

Gender dimensions

302. In the context of gender integration into development, the Philippines have enacted two main laws (Women in Development and Nation Building Act, from 1992, and the Magna Carta of Women - Republic Act 9710 - from 2009). These laws recognize gender mainstreaming in government as an implementation strategy and provide the basis for the inclusion of a gender and development (GAD) budget in the national budget law.

303. The Philippine government adopted the Philippine Plan for Gender Responsive Development (PPGD) 1995-2025, translating the Beijing Platform for Action into policies, strategies, programs, and projects for Filipino women. To implement the PPGD, the government, along with NGOs and academia, formulated the Framework Plan for Women (FPW) in 2001. The FPW prioritizes women's economic empowerment, protection and advancement of women's rights, and gender-responsive governance. The Philippines is among the few countries with a Gender and Development (GAD) Policy Budget, mandating that government agencies allocate at least 5% of their budgets to programs benefiting women.

304. UNIDO acknowledges that the empowerment of women and gender equality have significant positive impacts on key drivers of poverty alleviation and social progress, such as sustained economic growth and inclusive industrial development. UNIDO’s mandate to promote inclusive and sustainable industrial development (ISID) relies on the advancement of gender equality and the empowerment of women.

305. UNIDO addresses gender inequalities in industry and harnesses women’s full potential as economic agents of change and leaders thereby transforming economies and generating inclusive growth. UNIDO is committed to gender equality and empowerment of women, which is stipulated in the Organization’s Policy on Gender Equality and the Empowerment of Women issued in September 2019 and UNIDO’s Strategy for Gender Equality and Empowerment of Women Strategy 2020-2023. UNIDO has also developed an operational energy-gender guide and robust process to support and assure gender mainstreaming of its sustainable energy initiatives. The guiding principle of the project will be to strive to ensure that both women and men equally lead, participate in, and benefit from the project. To promote gender equality and the empowerment of women, gender-related aspects will be systematically addressed in the project and will focus on gender mainstreaming in the following areas:

306. During the PPG phase, a Gender Analysis has been carried out, and a Gender Action Plan has been developed which informs the project formulation. This includes a survey of the gender baseline situation, an identification of the differentiated needs and roles of women and men as they relate to the project's interventions, the entry points for gender mainstreaming in this project, a mapping of the relevant stakeholders at the nexus of gender equality and the cement industry, as well as a detailed action plan. In the project design, UNIDO will ensure that the relevant gender dimensions are considered, and the project log-frame developed reflects key gender dimensions of the respective outputs, activities, indicators, and targets. The gender analysis also identifies how the project can improve gender equality and empower women, as well as proposed gender specific targets to be monitored and evaluated throughout the project implementation period. To establish a baseline and develop targets, basic relevant data and qualitative information has been collected during PPG as part of the gender analysis, and gender markers is assigned in the project design. Budget allocation has also been proposed based on the gender mainstreaming action plan, to ensure project implementation will promote GEEW, including collecting additional baseline data and monitoring progress towards the targets.

307. Bringing the findings from the gender analysis above together, there are a few potential entry points for gender mainstreaming in this project, which can address systemic inequalities, mitigate gender-specific risks, and leverage women's roles as agents of change within industrial and environmental transitions:

308. First, recognize the gender-differentiated needs for health and wellbeing. The cement industry involves exposure to dust, noise, chemicals, and heavy physical work, all of which affect men and women differently. Women in particular face unique occupational health risks, such as impacts on reproductive health, higher vulnerability to respiratory issues, and the double burden of balancing workplace hazards with unpaid care responsibilities at home. Recognizing these gender-specific needs means adopting inclusive workplace health and safety standards—such as protective equipment tailored to women's bodies, gender-sensitive medical checkups, and policies addressing maternal health and childcare. Creating such an environment not only safeguards wellbeing but also increases women's retention and productivity in the sector.

309. Second, remove barriers for women's entry into a greening cement industry. Despite the noticeable achievements for gender equality in the Philippines, there may still be entrenched gender norms and stereotypes that pose hidden barriers for more women to enter into the greening cement industry that this project envisages. Relatedly, there can be a lack of wide and in-depth training opportunities, and/or recruitment biases in certain organisations. Addressing and removing these employment/entry-related barriers necessitate concerted efforts, ranging from employable skill and vocational training that is gender-responsive (e.g., training that actively tackle gender stereotypes in occupation and technical jobs), to career counselling that encourages women's entry and advancement in male-dominated fields. These efforts may also involve flexible work arrangements, and targeted recruitment practices that actively encourage women to join. Doing so helps diversify the talent pool, address labour shortages, and position the cement and concrete industries as inclusive drivers of growth.

310. Third, promote women's leadership in green buildings across different departments within the construction industry. As the Philippines pushes for sustainable infrastructure and green transition, women's perspectives and leadership are crucial in shaping innovative and socially responsive solutions. Yet women are often clustered in support roles rather than decision-making positions. Promoting women's leadership means ensuring their active participation in project design, environmental management, quality assurance, and sustainability planning within cement and construction companies. Training, mentorship, and networking opportunities should be designed to empower women engineers, architects, and managers to take leadership roles in green building initiatives. This not only advances gender equality but also leverages diverse expertise to accelerate the country's climate and sustainability goals.

311. Fourth, contribute to women's socio-economic empowerment and encourage their presence across all positions in the industries, while being alerted to the gender inequalities that build on existing division of male-skilled labour vs female-unskilled labour. Women's participation in the cement and construction

sectors is often limited to lower-paid, informal, or unskilled work, while men dominate higher-paid technical and managerial positions. This reflects and reinforces broader patterns of gender inequality in the labor market. To shift this dynamic, companies and industry associations can implement inclusive hiring practices, ensure equal pay for equal work, provide continuous upskilling opportunities, and strengthen women's access to formal employment contracts and social protections. Supporting women's socio-economic empowerment in this way not only reduces inequality but also improves industry resilience by tapping into a wider, more diverse workforce.

312. The gender action plan of this project envisages to have gender-responsive components built-in across all components of the project.. In Component 1, gender mainstreaming efforts focus on encouraging gender equity when creating the policy framework for technology innovation and green financing. Gender mainstreaming activities feature capacity building activities, as well as systematic gender assessment on policies and regulations. In Component 2, when crafting and recommending the cement roadmap towards low-mercury and net-zero by 2050, gender considerations will also be mainstreamed into the roadmap, ensuring just and inclusive transition not only for women, but also youth, minorities, the differently abled, and other marginalized communities. In Component 3, in supporting the implementation of energy-efficient processes in kiln operations, gender considerations will be devoted to leverage on the expertise of women scientists and practitioners in the research and development of advanced kiln, technologies and AI-driven monitoring systems, while also ensuring gender equality throughout the capacity workshops. In Component 4, gender equality and inclusivity will be ensured throughout the capacity building process, as well as with the content of knowledge dissemination and communication products. Moreover, dedicated efforts will be paid towards the promotion of women's leadership in science, technology, and sustainable development.

313. Private sector engagement

314. The private sector will benefit from all project components and will be directly engaged as part of the activities under Components 2, 3, and 4. The project will engage with private sector representatives to collect their input to the cement value chain roadmap and support developing new business models (Output 2.1). Private sector companies will be engaged in demonstration activities (Output 3.1). The private sector will also be represented through participation of interested relevant companies and/or associations in stakeholder meetings and knowledge exchange events.

315. Socio-economic benefits

316. The project will deliver substantial socio-economic benefits by positioning the greening of the Philippine cement industry as an inclusive engine of sustainable growth, industrial competitiveness, and social wellbeing. The initiative shifts toward the use of alternative materials and drastically reduces or eliminates the use of toxic materials. Redesigning products, services, or processes transform non-valorized resources from waste to one that may be reused in closed-loop systems. It will lead to reduced exposure to risk, increased competitiveness, business development, production continuity, and a better reputation with key stakeholders. Through capacity building, innovation support, and gender-responsive workforce strategies, the project will expand access to quality jobs for both women and men, address skills shortages, and promote upward mobility across technical, managerial, and leadership roles, in a gender and socially inclusive manner. Integrating inclusive policy frameworks and will support resilient supply chains, attract green investment, and contribute to climate mitigation and improved air quality, with positive spillovers for public health and local livelihoods. Collectively, these outcomes will reinforce the cement industry's role as a driver of equitable economic growth aligned with the Philippines' inclusive and sustainable industrial development.

Knowledge Management and Learning

317. Project's knowledge management is captured under Component 4, where specific activities are foreseen to disseminate knowledge. Knowledge capture, through technical reports, case studies, policy guidance, etc., will be an integral part of the activities under all outputs. The approach is based on UNIDO's operating modality of sharing experiences across its interventions worldwide, through many high-quality publications, organization of events, webinars, and more. The approach is described in more detail under Component

318. Support through a knowledge sharing platform is one of the key elements to secure technology transfer, strengthen national and global exchange, and building human capital and institutions. Examples are UNIDO's support for National Cleaner Production Centers, Small Hydropower Development (China), various Centers for Renewable Energy and Energy Efficiency, and others.

Global Environmental Benefits

319. The Decarbonization and Depollution of the Cement and Construction Sectors Project will enable the industry to meet CO_2 emission reduction targets, in line with the Philippines' Nationally Determined Contributions (NDC) and the Cement Decarbonization Roadmap. Through structured project outcomes, outputs, and activities, the following tangible targets will be achieved:

320. **Mercury Reduction**

321. Based on the description of project Outcome 3.1, a mercury reduction of 0.4 tonnes per year (over a period of four years) will be achieved through: · The use of secondary cementitious materials (SCMs) such as fly ash, slag, and natural pozzolans to partially replace clinker, thereby lowering thermal energy demand and reducing mercury emissions from high-temperature kiln processes; · The adoption of low-carbon cement formulations (green cement), which minimize pollutant release while providing durable, high-performance alternatives consistent with international sustainability standards; · The circular utilization of industrial by-products as construction inputs, which diverts waste streams from landfills, reduces mercury leakage into terrestrial and aquatic ecosystems, and establishes a regenerative materials cycle. 322. For mercury accounting purposes, the project interventions can be grouped into four cases: (i) fuel substitution, calculated as the difference between the mercury associated with the baseline fuel and that associated with the alternative fuel, multiplied by the quantity replaced; (ii) clinker avoidance, calculated as the difference between the mercury associated with clinker production and that associated with the clinker substitute, multiplied by the quantity of clinker avoided; (iii) cement substitution, calculated as the difference between the mercury associated with conventional cement and that associated with substitute cement, multiplied by the quantity replaced; and (iv) building waste recycling, which may be treated as a special case of clinker or raw material substitution where it directly replaces clinker-related inputs. Any claim of avoided mercury release to the environment should be supported by specific evidence demonstrating that mercury remains stably bound and would otherwise have been released under the baseline scenario. 323. For preliminary accounting purposes, the annual mercury reduction target of around 0.4 t Hg/year may be allocated across the four intervention types as follows: fuel substitution (0.10 t/year), clinker avoidance (0.20 t/year), cement substitution (0.075 t/year), and building-waste recycling (0.025 t/year). This allocation reflects the relative technical strength of the interventions, with clinker avoidance representing the most robust and scalable mechanism. The calculations are based on a mercury intensity of 0.09 g Hg/t clinker, as reported in the Philippine Mercury Initial Assessment (MIA), which provides a country-specific reference value reflecting mercury associated with cement production, including contributions from raw materials and upstream processes such as quarrying. 324. However, preliminary calculations indicate that achieving this level of

mercury reduction would require large affected production volumes, suggesting that a substantial share of the target would need to derive from sector-wide replication and policy-driven uptake rather than direct pilot-scale implementation. 325. In quantitative terms: · Fuel substitution (25% – 0.10 t Hg/year): Assuming a mercury content in coal of 100 µg/kg, this corresponds to the replacement of approximately 1.0 million tonnes of coal per year with low- or zero-mercury alternative fuels. Alternative fuels may include plastic-rich RDF fractions and municipal-waste-derived RDF. Plastic-rich fractions are expected to have high calorific value and relatively low mercury content, although this should be verified analytically. Municipal-waste-derived RDF may also be used, but its mercury content is highly variable and should be periodically measured through routine sampling and analysis before being credited toward mercury-reduction targets. Only alternative fuels with demonstrated mercury content lower than that of the displaced coal should be accounted for. · Clinker avoidance (50% – 0.20 t Hg/year): Assuming a mercury intensity of 90 mg Hg/t clinker, this corresponds to approximately 2.2 million tonnes of clinker per year avoided through the use of SCMs and low-clinker cement formulations. · Cement substitution (18.75% – 0.075 t Hg/year): Assuming a mercury intensity of 72 mg Hg/t cement, this corresponds to approximately 1.0 million tonnes of cement per year replaced by lower-mercury alternatives. · Building-waste recycling (6.25% – 0.025 t Hg/year): If treated as clinker-equivalent substitution, this corresponds to approximately 0.27 million tonnes per year of material replacing clinker inputs, subject to verification of mercury content and stability. 326. Overall, the intervention would require the replacement of approximately 1 million tonnes of coal, the avoidance or substitution of about 2.5 million tonnes of clinker, and the replacement of about 1 million tonnes of cement per year. 327. The revised mercury target is approximately half of the initial value proposed at PIF stage. However, even at this level, the target remains challenging. Based on national cement production in the range of 26–33 million tonnes per year, achieving a reduction of 0.4 t Hg/year implies intervention volumes corresponding to roughly 10–15% of national production. This suggests that, while pilot activities can demonstrate technical feasibility, achieving the target will require enabling policy measures and broader sector uptake to ensure sufficient scale. 328. CO2 Reduction. 329. Achieving the targeted mercury reduction of 0.4 t Hg/year implies substantial clinker avoidance and material substitution. Using typical emission factors (≈0.8–0.9 t CO_2/t clinker), the associated

321. Based on the description of project Outcome 3.1, a mercury reduction of 0.4 tonnes per year (over a period of four years) will be achieved through:

- The use of secondary cementitious materials (SCMs) such as fly ash, slag, and natural pozzolans to partially replace clinker, thereby lowering thermal energy demand and reducing mercury emissions from high-temperature kiln processes;
- The adoption of low-carbon cement formulations (green cement), which minimize pollutant release while providing durable, high-performance alternatives consistent with international sustainability standards;
- The circular utilization of industrial by-products as construction inputs, which diverts waste streams from landfills, reduces mercury leakage into terrestrial and aquatic ecosystems, and establishes a regenerative materials cycle.

322. For mercury accounting purposes, the project interventions can be grouped into four cases: (i) fuel substitution, calculated as the difference between the mercury associated with the baseline fuel and that associated with the alternative fuel, multiplied by the quantity replaced; (ii) clinker avoidance, calculated as the difference between the

mercury associated with clinker production and that associated with the clinker substitute, multiplied by the quantity of clinker avoided; (iii) cement substitution, calculated as the difference between the mercury associated with conventional cement and that associated with substitute cement, multiplied by the quantity replaced; and (iv) building waste recycling, which may be treated as a special case of clinker or raw material substitution where it directly replaces clinker-related inputs. Any claim of avoided mercury release to the environment should be supported by specific evidence demonstrating that mercury remains stably bound and would otherwise have been released under the baseline scenario.

323. For preliminary accounting purposes, the annual mercury reduction target of around 0.4 t Hg/year may be allocated across the four intervention types as follows: fuel substitution (0.10 t/year), clinker avoidance (0.20 t/year), cement substitution (0.075 t/year), and building-waste recycling (0.025 t/year). This allocation reflects the relative technical strength of the interventions, with clinker avoidance representing the most robust and scalable mechanism. The calculations are based on a mercury intensity of 0.09 g Hg/t clinker, as reported in the Philippine Mercury Initial Assessment (MIA), which provides a country-specific reference value reflecting mercury associated with cement production, including contributions from raw materials and upstream processes such as quarrying.

324. However, preliminary calculations indicate that achieving this level of mercury reduction would require large affected production volumes, suggesting that a substantial share of the target would need to derive from sector-wide replication and policy-driven uptake rather than direct pilot-scale implementation.

325. In quantitative terms:

- Fuel substitution (25% – 0.10 t Hg/year): Assuming a mercury content in coal of 100 µg/kg, this corresponds to the replacement of approximately 1.0 million tonnes of coal per year with low- or zero-mercury alternative fuels. Alternative fuels may include plastic-rich RDF fractions and municipal-waste-derived RDF. Plastic-rich fractions are expected to have high calorific value and relatively low mercury content, although this should be verified analytically. Municipal-waste-derived RDF may also be used, but its mercury content is highly variable and should be periodically measured through routine sampling and analysis before being credited toward mercury-reduction targets. Only alternative fuels with demonstrated mercury content lower than that of the displaced coal should be accounted for.

- Clinker avoidance (50% – 0.20 t Hg/year): Assuming a mercury intensity of 90 mg Hg/t clinker, this corresponds to approximately 2.2 million tonnes of clinker per year avoided through the use of SCMs and low-clinker cement formulations.

- Cement substitution (18.75% – 0.075 t Hg/year): Assuming a mercury intensity of 72 mg Hg/t cement, this corresponds to approximately 1.0 million tonnes of cement per year replaced by lower-mercury alternatives.

- Building-waste recycling (6.25% – 0.025 t Hg/year): If treated as clinker-equivalent substitution, this corresponds to approximately 0.27 million tonnes per year of material replacing clinker inputs, subject to verification of mercury content and stability.

326. Overall, the intervention would require the replacement of approximately 1 million tonnes of coal, the avoidance or substitution of about 2.5 million tonnes of clinker, and the replacement of about 1 million tonnes of cement per year.

327. The revised mercury target is approximately half of the initial value proposed at PIF stage. However, even at this level, the target remains challenging. Based on national cement production in the range of 26–33 million tonnes per year, achieving a reduction of 0.4 t Hg/year implies intervention volumes corresponding to roughly 10–15% of national production. This suggests that, while pilot activities can demonstrate technical feasibility, achieving the target will require enabling policy measures and broader sector uptake to ensure sufficient scale.

328. CO2 Reduction.

329. Achieving the targeted mercury reduction of 0.4 t Hg/year implies substantial clinker avoidance and material substitution. Using typical emission factors (≈0.8–0.9 t CO_2/t clinker), the associated

CO_2 reductions are expected to significantly exceed the project's committed target of 1 million tonnes over four years. The CO_2 target of 1 million tons CO2e should therefore be considered conservative and readily achievable as a co-benefit of the mercury reduction strategy.

Innovation, Sustainability and Scale up

Innovation

330. The project introduces an integrated and systems-based approach to decarbonizing the cement and construction sector by addressing key barriers across policy, finance, technology, and market demand. It brings together policymakers, industry stakeholders, financial institutions, and civil society to enable a coordinated transition toward low-carbon, resource-efficient construction materials. Key innovations include the development of harmonized standards for low-carbon cement and alternative construction materials, the establishment of frameworks for embodied carbon accounting and reporting of industrial emissions, and the introduction of green public procurement policies to stimulate demand for sustainable construction products.

331. The project also promotes financial and market-based innovation by supporting incentives that redirect investment toward low-carbon cement production, resource efficiency, and cleaner production technologies. This includes enabling private sector investment in alternative binders, clinker substitution technologies, and industrial decarbonization solutions. In addition, the project advances circular economy approaches by integrating construction and demolition (C&D) waste recovery systems, promoting the reuse of industrial by-products (such as fly ash and slag), and reducing hazardous substances within material streams.

332. Through its partnership with global platforms such as the UNIDO Industrial Deep Decarbonisation Initiative (IDDI), as well as industry initiatives linked to cement decarbonization, the project benefits from global knowledge exchange and contributes to the development of internationally aligned methodologies for embodied carbon, low-emission materials, and sustainable procurement. Together, these innovations provide scalable pathways to reduce emissions, improve resource efficiency, and transform the construction value chain toward net-zero and nature-positive outcomes.

Sustainability

333. Sustainability is embedded through strengthening institutional frameworks, market systems, and industry capacity to ensure long-term decarbonization of the cement and construction sector beyond the

project lifetime. Policy and regulatory reforms will establish durable incentives for low-carbon materials, including standards for embodied carbon, certification systems, and compliance mechanisms for green construction practices.

334. Capacity-building interventions targeting government agencies, construction firms, and financial institutions will ensure continuous technical knowledge transfer on sustainable materials, industrial energy efficiency, and circular construction practices. By aligning public procurement systems with green building standards, the project will create stable demand signals that support sustained market transformation.

335. Partnerships with cement producers, construction companies, and SMEs will embed sustainability criteria into procurement, production processes, and supply chains. The integration of financial instruments, including blended finance and green investment frameworks, will further ensure the commercial viability of low-carbon construction materials. These combined measures will institutionalize environmental and economic sustainability across the sector and support long-term emissions reductions and resource efficiency gains.

Scale Up

336. The project is designed for replication and scaling within the Philippines and across regional and global industrial decarbonization initiatives. Pilot demonstrations of low-carbon cement technologies, alternative materials, and circular construction models will serve as proof of concept for wider adoption across the construction value chain. These demonstration sites will build confidence among policymakers, industry actors, and financial institutions regarding the technical and economic viability of green construction materials.

337. At the national level, successful approaches will be scaled through integration into building codes, public procurement systems, and industrial decarbonization strategies supported by stakeholder ministries. At the regional and global levels, the project will leverage platforms such as industry decarbonization initiatives and knowledge networks under the United Nations Industrial Development Organization to share lessons learned and promote South-South cooperation. This includes engagement with IDDI-aligned efforts to scale demand-side policies for low-emission materials and strengthen global market signals for green cement and steel.

Institutional Arrangement and Coordination with Ongoing Initiatives and Project.

Please describe the Institutional Arrangements for the execution of this project, including financial management and procurement. If possible, please summarize the flow of funds (diagram), accountabilities for project management and financial reporting (organogram), including audit, and staffing plans. (max. 500 words, approximately 1 page)

Project Implementation

338. The United Nations Industrial Development Organization (UNIDO) is the GEF Implementing Agency (IA) for the project. In this role, UNIDO will provide oversight on the project's implementation, manage the overall budget, and supervise project execution. Specifically, UNIDO will be responsible for:

- Designing the execution arrangement with the Project Executing Entity (PEE), including the terms of reference and disbursement schedule;
- Releasing payment tranches upon satisfactory delivery by the PEE in accordance with the execution agreement;
- Providing technical and financial oversight to the PEE;
- Supervising the development, implementation, and evaluation of the project;
- Reporting to the GEF on annual progress, MTR, and TE;
- Participating in the Project Steering Committee.

Project Execution

339. DTI (Undersecretary level) will act as Chair of the PSC. UNIDO, DENR, and FASPS will be institutional members. Other stakeholders may be invited as members to the PSC as deemed necessary. The PSC will ensure that any proposed changes or amendments to the project and/or to the annual work plan (AWP) and budgets are done in accordance with the approved project document, the GEF policy C.39/inf 3 and UNIDO rules and regulations.

340. Clean Air Asia will act as the Project Executing Entity (PEE) and will be responsible for the complete execution of the project under a contractual arrangement with UNIDO as the IA. The selection process was based on the technical capacity and experience of the entity in project management and the cement/construction industry in the country, and as endorsed by the GEF Operational Focal Point letter. A Harmonized Approach for Cash Transfer (HACT) micro assessment has been finalized in June 2026 with an overall low risk assessment. The PEE for the project, the PEE may sub-contract qualified service providers for the execution of specific activities where specialized expertise is required, in accordance with their own institutional rules and procedures, provided these do not contradict UNIDO-GEF practices and requirements, ensuring the highest standards of quality and transparency. The PEE will also provide all necessary information to the evaluation experts for the mid-term review and terminal evaluation, ensuring that the project's progress and outcomes are thoroughly assessed and reported.

Project Management Unit

342. The PEE will designate internally, or recruit directly project management personnel to form the Project Management Unit (PMU). The PMU will be hosted by the DTI and will consist of a Project Coordinator, Technical Expert, Gender Expert, KM/Communication Expert, and an Administrative Assistant. The PMU will be responsible for the day-to-day oversight and coordination of project execution according to the agreed work plan. Additionally, the PMU will manage and coordinate all project activities carried out by external service providers. The PMU's function will conclude once the final terminal evaluation

report and all other required documentation have been completed and submitted to UNIDO, including the operational closure of the project.

The PMU's consolidated responsibilities will include:

- Execution of project activities;
- Recruiting and managing national and international consultants;
- Facilitating collaboration with stakeholders, donors, the IA, relevant national agencies, and the private sector;
- Managing project procurement, financial resources, and annual work plans;
- Organizing and leading project coordination and stakeholder meetings;
- Monitoring project progress and ensuring timely submission of reports, including progress reports, GEF Project Implementation Reports (PIRs), and annual workplans to UNIDO;
- Addressing project delays or challenges by informing UNIDO to ensure timely support or corrective actions.

343. In managing these responsibilities, the PMU will also take into consideration potential time lags that may arise from procurement processes, permitting requirements, and other necessary administrative approvals. To mitigate these risks and maintain progress toward project objectives, the PMU will integrate buffer periods into the work plan, allowing flexibility to address such procedural delays without significantly impacting the overall schedule.

344. The PMU unit be staffed by a full-time project coordinator and national administrative expert, as well as part-time experts for financial, technical, gender, ESMP and communication/knowledge management activities with at least the following tasks:

Consultant	Time Input	Tasks, Inputs and Outputs
For Project Management		
Project Coordinator	100% time 5 years	National day-to-day work of the project will be managed by a National Project Coordinator hired by the Executing Agency. The National Project Coordinator will lead the PMU and provide day-to-day management and coordination functions for project activities. The National Project Coordinator will coordinate with the national project partners and stakeholders, and the National Project Coordinator will have a liaison role with UNIDO. Duties and Responsibilities

		• Manage the overall conduct of the project and provide specific leadership and technical coordination and support to the development of all project components. • Component 1: o Lead/ensure technical coherence and policy relevance of assessments and analyses by consolidating inputs from stakeholders relevant into a unified evidence base for policy reform (without conducting specialist analyses). o Lead the technically validate the implementability of proposed policy and regulatory adjustments, ensuring alignment with existing institutional mandates, enforcement capacities, and national planning cycles. • Component 2: o Lead and technically guide the activities to ensure compliance with the project framework • Component 3: o Lead and technical oversee (with support of a technical consultant) the pilot project design, and execution, especially in terms of monitoring Global Environmental Benefits. Component 4: o Ensure alignment between awareness and capacity-building activities, especially to provide guidance from the global, other projects and vice versa. <u>Project management tasks</u> ● Manage the GEF Project Proposal Grant and GEF Project Implementation Phases in line with the GEF (Funder), UNIDO (Implementing Agency) and National Executing Agency policies and procedures within delegated authority. ● Preparation of project workplans and operational and financial planning processes ● Preparation of progress reports, as per contractual arrangements with UNIDO, and annual GEF-PIR report.

		● Assist in procurement and hiring processes, as per workplan, together with national experts. ● Build and manage strong partnerships with national and local government units, private sector and other project stakeholders and beneficiaries. ● Prepare agendas and arrange field visits, appointments, and meetings both internal and external related to the project activities ● Logistical organization of meetings, training and workshops and advertising national and international procurement related to the project with assistance from the project administrator. ● Supervise the provision and acquisition of all necessary supplies and our services including contracts of experts/consultants working on project activities. ● In collaboration with the project steering committee (PSC) and project execution team, effectively deliver agreed activities and outcomes in the multi-year implementation phase across all project components ● Advise all project counterparts on applicable administrative procedures and ensure their proper implementation ● Undertake any other activity that may be necessary for the effective management of the project. ● Be prepared to make national or international travels according to the project needs. • Manage the project risks – including social and environmental risks - initially identified and submit new risks to the Project Steering Committee • Support consultant with the implementation plans including the gender action plan, stakeholder engagement plan, and any environmental and social management plans; • Coordinate and supervise the implementation of the stakeholder engagement plan; • Visit project sites as and when required to appraise project progress on the ground and validate written progress reports.

Administrative Assistant	Project	100% time for 5 years	The administrative support person of the PMU will have the following specific duties performed under the supervision of the National Project Manager: • Provide all necessary administrative and financial reports to the National Project Manager as required by UNIDO. • Arrange the Inception meeting, stakeholder meetings, consultation meeting, training and workshops in terms of logistics, administrative items, protocol, meeting minutes. ● Maintain administrative and financial records (manual and digital records) and report according to DTI and UNIDO best practices and in compliance with International Public Sector Accounting Standards (IPSAS) and the requirement of UN agencies; ● Prepare requests for funds reporting according to UNIDO procedures. ● Collaborate in the development of terms of reference and the process of contracting services and consultants for the project. ● Designs and implements Financial Management and Audit Plan, Procurement Guidelines and disbursement Plan ● Designs and implements Annual Procurement plan as per Procurement guidelines and annual project work plan. ● Support the National project manager in the administrative and financial preparation of procurement requests, terms of reference and specifications for acquisition of goods and services and review for completeness. ● In coordination with National project manager and national procurement expert, prepares drafts of requests for quotation/requests for Call for Proposals and invitations to bid to third party suppliers, sets up invitee lists, and proposes qualification requirements and evaluation criteria. ● Where required, obtains clarifications from bidders and communicates with project team. ● Supports the National project manager in the assessment evaluation of the offers.

		● Issue reminders of report submission on existing contracts. ● Prepares inputs for progress reports, PIR, program annual report to national project manager and UNIDO Project Manager, as requested. ● Keep a record of the expenses of the project and the contributions of partners. ● Coordinate all financial and expenditure reporting (quarterly and annual), as per contractual arrangements with UNIDO and GEF annual PIR. ● Overall responsible for the monitoring and tracking of expenditures ● Perform other duties as assigned. Specifically for **component 4**, support with the logistical and technical arrangements of capacity-building activities, coordination meetings etc. including stakeholder management, and prepare pre- and post-meeting documentations.
Technical experts		
Financial expert	Deliverable based	Under the guidance and supervision of the Project Coordinator, the Expert will carry out at least the following tasks: • Develop investment analysis for the cement value chain roadmap toward low-mercury and net-zero by 2050, including CAPEX/OPEX and financing needs for priority technologies. • Design green investment and incentive mechanisms to mobilize private sector financing for low-carbon cement and circular construction materials, including green procurement-linked incentives. • Identify and structure a pipeline of bankable green cement projects, including alternative fuels, clinker substitution, mercury control, and circular economy solutions. • Conduct financial feasibility assessments of emerging technologies, such as 3D printing and other low-carbon construction innovations, including cost-benefit and scalability analysis.

		• Support development of blended finance and co-financing arrangements with development banks and private investors to de-risk green construction investments. • Design financial MRV and investment tracking frameworks, including tools to measure emissions reductions, financial performance, and alignment with ESG and investor requirements.
Knowledge Management/Communication expert	Deliverable based	Under close supervision and guidance of the Project Coordinator (PC) and in close coordination with other project experts, the expert will carry out the following tasks: • Design and implementation of the Communication and Knowledge management Strategy, ensuring communication goals support the overall objective, visibility, advocacy, and influence of the Program targeting different audiences at global, regional and national levels; and ensuring that knowledge is effectively captured, shared, adapted, and re used across diverse contexts. • Make available communication products/materials and ensure its availability within the knowledge management platform. • Develop a project communication plan, incorporate it with the annual work plans and update it annually in consultation with project stakeholders; coordinate its implementation. • Develop a project knowledge management plan, incorporate it with the annual work plans and update it annually in consultation with project stakeholders; coordinate its implementation. • Capture, share and disseminate communication materials through mass media and other channels of communication, including the different global knowledge management platform, both in printing and online forms, integrating the corresponding gender-related challenges and the specific requirements to protect the rights of the indigenous populations. • Gather the main findings, all lessons-learned, best practices and project experiences in user-friendly means to update, share and ensure availability for UNIDO Communication and Socia media Platform,

		integrating the corresponding gender-related challenges. • Facilitate learning and sharing of knowledge and experiences relevant to the project. • Ensure the development of at least ten (10) communication activities during project implementation. • Ensure the mainstreaming of gender and safeguards dimensions within the communication activities and materials.
Gender expert	Deliverable based	Under the close supervision of the Project Coordinator: • Monitor implementation of gender-related measures in pilot e-waste and recycling activities to ensure equitable participation and benefits for women and men. • Collect and analyze sex-disaggregated data on employment, entrepreneurship, and participation in project interventions. • Support project partners and pilot implementers in applying gender-sensitive approaches in training, recruitment, and operational practices. • Provide gender awareness and capacity-building sessions for project staff, partners, and stakeholders. • Track and report on gender indicators within the project M&E system, highlighting progress, gaps, and recommendations. • Facilitate women's participation in consultations, decision-making, and pilot activities, ensuring inclusive stakeholder engagement. • Identify emerging gender issues during project execution and recommend corrective actions or adjustments to ongoing activities. • Contribute to project communications and knowledge products by highlighting gender-inclusive practices and lessons learned from pilots.

Techncial expert (Hg, GHG, Cement and Construction Value Chain) for Component 3	Deliverable based	Under the close supervision of the Project Coordinator: • Guide mercury (Hg) mass balance studies in pilot cement plants, mapping Hg flows across raw materials, fuels, clinker, products, and air emissions. • Guide studies for emissions análisis (Hg, GHG Scope 1–3, SOx, NOx, CO, heavy metals, and dioxins/furans where applicable) to establish baseline and post-technology performance. • Evaluate and validate low-carbon cement technologies, including SCMs, alternative binders, clinker substitution, and alternative fuels for emission reduction effectiveness. • Provide technical oversight for kiln optimization and energy-efficiency improvements, including combustion control, clinker cooling, and raw mix design adjustments. • Assess circular economy and recycled material applications, ensuring safe use of construction and demolition waste and secondary materials with controlled mercury inputs. • Support technical validation of demonstration projects and materials, including structural performance testing, emissions verification, and compliance with national standards.
ESMP expert	Deliverable based	Under the close supervision of the Project Coordinator: • Monitor ESMP implementation for all pilot activities to ensure compliance with UNIDO Environmental and Social Safeguards and national regulations. • Conduct regular site visits to verify that identified risks and mitigation measures are effectively applied by project partners and contractors. • Collect and analyze monitoring data on environmental, social, health, and safety performance indicators. • Prepare concise ESMP monitoring reports highlighting progress, compliance status, gaps, and recommended corrective actions.

		• Provide technical support and on-site guidance to pilot implementers for effective application of mitigation measures. • Ensure the operation of the Grievance Redress Mechanism (GRM) and follow up on any issues or community concerns. • Identify new or unforeseen risks during implementation and recommend updates to the ESMP as necessary. • Contribute to stakeholder engagement and capacity-building activities to strengthen environmental and social performance of the project.
Policy expert	Deliverable based	Under the close supervision of the Project Coordinator: • Guide the comprehensive review of construction-related policies and regulations relevant to the cement sector, including alignment with the Energy Efficiency and Conservation Act and the Philippine Green Building Code, and identify gaps, inconsistencies, and opportunities for strengthening low-carbon and low-emission approaches. • Support the development and strengthening of national regulatory policies and frameworks to monitor and control mercury (Hg) emissions, including establishing reporting protocols, emission thresholds, and integration with broader air pollutant and GHG monitoring systems. • Guide the formulation of national guidelines and standards for low-impact buildings and industrial emission reduction, incorporating best practices from existing certification systems such as BERDE and EDGE. • Provide technical oversight for the development of systems to strengthen traceability and monitoring of construction materials, including tracking of raw materials, recycled inputs, and potential mercury content across the supply chain. • Support the design and implementation of tools and protocols for material flow tracking, including digital or registry-based systems to improve transparency and accountability in the construction sector. • Guide the integration of circular economy principles into policy recommendations, including provisions for safe use, reuse, and recycling of construction

		materials such as steel, glass, and alternative cementitious materials. • Conduct and oversee a gender assessment of green construction materials policies, identifying barriers, opportunities, and differentiated impacts on women and men across the value chain. • Provide recommendations to ensure gender-responsive policy design, including inclusive participation, access to green jobs, and capacity-building opportunities within the construction and cement sectors.

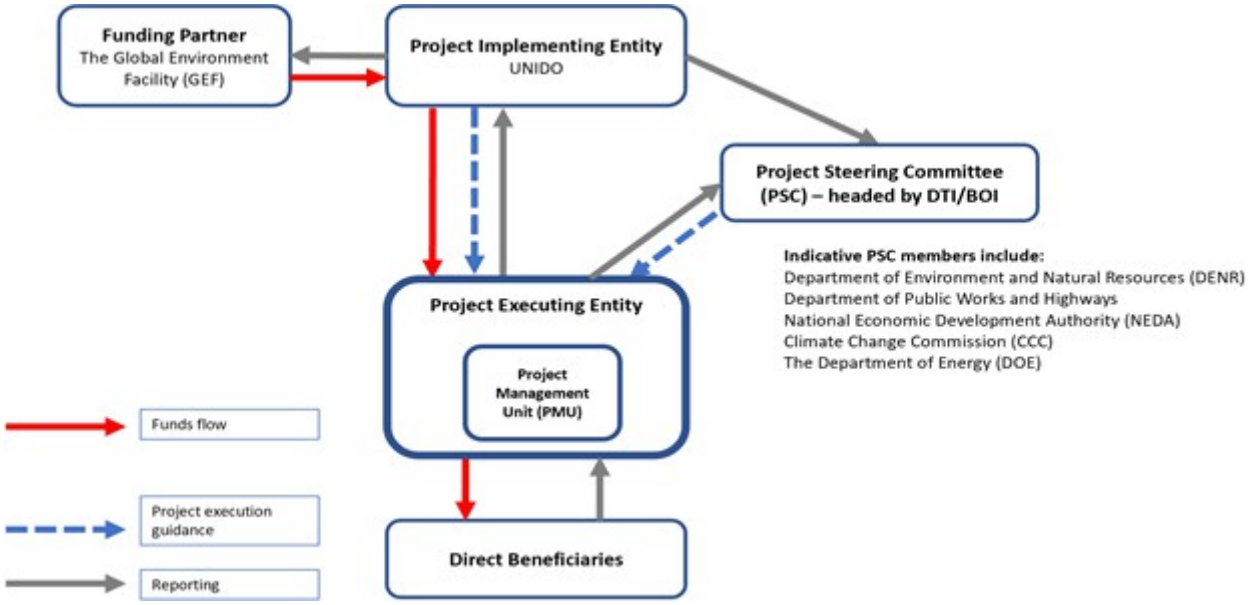
Project Steering Committee

345. A Project Steering Committee (PSC) will be established at the beginning of the project to ensure effective oversight, maintain coherence, and promote institutional ownership, while providing advisory input on key project topics ensuring alignment with GEF policy C.39/inf 3 and UNIDO rules and regulations The PSC will function as an advisory body, offering operational guidance and facilitating high-level coordination, which is essential for the project's successful implementation. Chaired by DTI, the PSC will meet annually to assess project progress and approve the workplan for the following year. Members of the PSC include DENR-EMB, DENR-FASPS and UNIDO (as member but holding no voting rights on PSC deliberations), and stakeholders to be selected during the Inception Phase of project execution. Additional stakeholders from relevant organizations and institutions may be invited to join the PSC at the project's commencement.

346. Key functions of the PSC include:

- Approving the annual workplan and budget;
- Enhancing synergies between the GEF project and other relevant initiatives;
- Authorizing significant changes to project outputs or workplans in response to evolving needs, ensuring these modifications align with the approved project document, GEF policies, and UNIDO regulations;
- Providing strategic advisory services to optimize project outcomes and ensure alignment with broader environmental and sustainability goals.

347. The PEE will be reporting on project progress and aiding in the implementation of the committee's decisions.



Project stakeholders and target groups

348. Stakeholder participation at all project levels will contribute to the cost-effectiveness of the project. The governance (PSC, Technical Coordination Groups) as well as the dialogue platforms will ensure adequate planning and implementation of activities in line with the project objectives, urban sustainability priorities, as well as complimentary with ongoing and planned programs and projects. Coordination mechanisms will be closely linked, ensuring in this manner that stakeholder concerns are up-streamed into higher project management levels, and likewise project management decisions are down-streamed to keep stakeholders duly informed. The dialogue platforms will play a key role in this process. The project will benefit from the experiences and knowledge of civil society and private sector participating in the platforms. Systematization of project experiences and lessons learned will contribute to cost-effective upscaling and replication of project results throughout the region and other cities of the country.

Technical Coordination Groups.

349. Technical Coordination Groups for each component (Component 1 and 2 led by DTI, component 3 led by DTI together with DENR, Component 4 led by DTI) will be established and shall be composed of representatives from institutions and organizations involved in the achievement of Project outcomes, as generally identified below. The working groups will represent thematic priorities of the project and ensure a formal inter-governmental and inter-institutional dialogue throughout the Project duration. Within the first six months of project start-up, it is expected that this initial listing be complemented with other institutions, organizations and private sector companies preliminarily contacted during project design.

350. **Procurement, ownership, and transfer of project assets**: Assets, including equipment procured with the project budget by the PEE, shall remain under the ownership of the PEE until they are formally transferred to designated national counterparts, project beneficiaries, or other entities. The PEE shall maintain a comprehensive inventory of all assets purchased under the project and

coordinate with UNIDO to determine the timing and conditions for the transfer of ownership, which may occur during project implementation, one year after purchase, or at another agreed-upon time, ensuring that all transfers align with project objectives. Assets under this project are envisioned to be acquired through co-financing to the extent possible. The PEE shall ensure that all project equipment is sufficiently insured and maintained while under their ownership and require any equipment recipients to maintain minimum insurance on the equipment during the lifetime of the project. The costs associated with the maintenance and insurance of the equipment have been carefully considered and incorporated into the project budget to ensure seamless implementation.

351. **Legal Context clause:** 'The present project is governed by the provisions of the Standard Basic Cooperation Agreement between the Republic of Philippines and UNIDO, signed and entered into force on 26 February 1993'.

Will the GEF Agency play an execution role on this project?

If so, please describe that role here and the justification.

No, UNIDO will not play an execution role for this project.

Also, please add a short explanation to describe cooperation with ongoing initiatives and projects, including potential for co-location and/or sharing of expertise/staffing (max. 500 words, approximately 1 page)

Coordination with on-going projects and initiatives

Ongoing projects or initiatives	**Coordination with ongoing projects or initiatives**
Global Cement and Concrete Association (GCCA)	Collaboration on embodied carbon methodologies, mercury reporting, and CCUS pipeline development.
Global Alliance for Buildings and Construction (GlobalABC)	Access to global roadmaps, carbon tracking tools, and embodied carbon methodologies for construction materials.
Control and Reduction of Mercury Emissions from Cement Industry in Brazil – GEF project	Lessons on emissions monitoring, regulatory strengthening, and alternative raw materials substitution.
Partnership for Net Zero Industry & Global Matchmaking Platform – United Nations Industrial Development Organization (Climate Club)	Technical assistance and matchmaking for finance and technology transfer in industrial decarbonization.

World Green Building Council initiatives	Promotion of green building certification systems and circular construction practices globally.
Philippine Development Plan (PDP) & NDC Implementation – Department of Environment and Natural Resources, Department of Energy, Department of Public Works and Highways	Alignment with national climate, infrastructure, and industrial decarbonization priorities.
Philippine Green Building Code – Department of Public Works and Highways	Integration of low-carbon cement standards into building regulations and compliance systems.
National Circular Economy & Waste Management Initiatives – Department of Environment and Natural Resources	Promotion of industrial by-products and construction waste reuse in cement production.
Climate Finance Programs – Green Climate Fund	Mobilization of blended finance and co-financing for low-carbon construction technologies.
Industry stakeholders – Cement Manufacturers Association of the Philippines	Engagement on voluntary standards, capacity building, and market adoption of low-carbon cement.

Core Indicators

Indicate expected results in each relevant indicator using methodologies indicated in the GEF-8 Results Measurement Framework Guidelines. There is no need to complete this table for climate adaptation projects financed solely through LDCF and SCCF.

Indicator 6 Greenhouse Gas Emissions Mitigated

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO_2e (direct)	1000000	1000000	0	0
Expected metric tons of CO_2e (indirect)	0	0	0	0

Indicator 6.1 Carbon Sequestered or Emissions Avoided in the AFOLU (Agriculture, Forestry and Other Land Use) sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO_2e (direct)				
Expected metric tons of CO_2e (indirect)	0			
Anticipated start year of accounting				
Duration of accounting				

Indicator 6.2 Emissions Avoided Outside AFOLU (Agriculture, Forestry and Other Land Use) Sector

Total Target Benefit	(At PIF)	(At CEO Endorsement)	(Achieved at MTR)	(Achieved at TE)
Expected metric tons of CO_2e (direct)	1,000,000	1,000,000		
Expected metric tons of CO_2e (indirect)				

Anticipated start year of accounting	2026	2027		
Duration of accounting	5	5		

Indicator 6.3 Energy Saved (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Total Target Benefit	Energy (MJ) (At PIF)	Energy (MJ) (At CEO Endorsement)	Energy (MJ) (Achieved at MTR)	Energy (MJ) (Achieved at TE)
Target Energy Saved (MJ)				

Indicator 6.4 Increase in Installed Renewable Energy Capacity per Technology (Use this sub-indicator in addition to the sub-indicator 6.2 if applicable)

Technology	Capacity (MW) (Expected at PIF)	Capacity (MW) (Expected at CEO Endorsement)	Capacity (MW) (Achieved at MTR)	Capacity (MW) (Achieved at TE)

Indicator 9 Chemicals of global concern and their waste reduced

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
3.50	1.60	0.00	0.00

Indicator 9.1 Solid and liquid Persistent Organic Pollutants (POPs) removed or disposed (POPs type)

POPs type	Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 9.2 Quantity of mercury reduced (metric tons)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)
3.50	1.60		

Indicator 9.3 Hydrochloroflurocarbons (HCFC) Reduced/Phased out (metric tons)

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 9.4 Number of countries with legislation and policy implemented to control chemicals and waste (Use this sub-indicator in addition to one of the sub-indicators 9.1, 9.2 and 9.3 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
	1		

Indicator 9.5 Number of low-chemical/non-chemical systems implemented, particularly in food production, manufacturing and cities (Use this sub-indicator in addition to one of the sub-indicators 9.1, 9.2 and 9.3 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)

Indicator 9.6 POPs/Mercury containing materials and products directly avoided

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 9.7 Highly Hazardous Pesticides eliminated

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 9.8 Avoided residual plastic waste

Metric Tons (Expected at PIF)	Metric Tons (Expected at CEO Endorsement)	Metric Tons (Achieved at MTR)	Metric Tons (Achieved at TE)

Indicator 11 People benefiting from GEF-financed investments

	Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (Achieved at TE)
Female	3,000,000	3,000,000		
Male	3,000,000	3,000,000		
Total	**6,000,000**	**6,000,000**	0	**0**

Explain the methodological approach and underlying logic to justify target levels for Core and Sub-Indicators (max. 250 words, approximately 1/2 page)

Mercury Reduction

Based on the description of project Outcome 3.1, a mercury reduction of 0.4 tonnes per year (over a period of five years) will be achieved through:

- The use of secondary cementitious materials (SCMs) such as fly ash, slag, and natural pozzolans to partially replace clinker, thereby lowering thermal energy demand and reducing mercury emissions from high-temperature kiln processes;
- The adoption of low-carbon cement formulations (green cement), which minimize pollutant release while providing durable, high-performance alternatives consistent with international sustainability standards;
- The circular utilization of industrial by-products as construction inputs, which diverts waste streams from landfills, reduces mercury leakage into terrestrial and aquatic ecosystems, and establishes a regenerative materials cycle.

For mercury accounting purposes, the project interventions can be grouped into four cases: (i) fuel substitution, calculated as the difference between the mercury associated with the baseline fuel and that associated with the alternative fuel, multiplied by the quantity replaced; (ii) clinker avoidance, calculated as the difference between the mercury associated with clinker production and that associated with the clinker substitute, multiplied by the quantity of clinker avoided; (iii) cement substitution, calculated as the difference between the mercury associated with conventional cement and that associated with substitute cement, multiplied by the quantity replaced; and (iv) building waste recycling, which may be treated as a special case of clinker or raw material substitution where it directly replaces clinker-related inputs. Any claim of avoided mercury release to the environment should be supported by specific evidence demonstrating that mercury remains stably bound and would otherwise have been released under the baseline scenario.

For preliminary accounting purposes, the annual mercury reduction target of around 0.4 t Hg/year may be allocated across the four intervention types as follows: fuel substitution (0.10 t/year), clinker avoidance (0.20 t/year), cement substitution (0.075 t/year), and building-waste recycling (0.025 t/year). This allocation reflects the relative technical strength of the interventions, with clinker avoidance representing the most robust and scalable mechanism. The calculations are based on a mercury intensity of 0.09 g Hg/t clinker, as reported in the Philippine Mercury Initial Assessment (MIA), which provides a country-specific reference value reflecting mercury associated with cement production, including contributions from raw materials and upstream processes such as quarrying.

However, preliminary calculations indicate that achieving this level of mercury reduction would require large affected production volumes, suggesting that a substantial share of the target would need to derive from sector-wide replication and policy-driven uptake rather than direct pilot-scale implementation.

In quantitative terms:

- Fuel substitution (25% – 0.10 t Hg/year): Assuming a mercury content in coal of 100 µg/kg, this corresponds to the replacement of approximately 1.0 million tonnes of coal per year with low- or zero-mercury alternative fuels. Alternative fuels may include plastic-rich RDF fractions and municipal-waste-derived RDF. Plastic-rich fractions are expected to have high calorific value and relatively low mercury content, although this should be verified analytically. Municipal-waste-derived RDF may also be used, but its mercury content is highly variable and should be periodically measured through routine sampling and analysis before being credited toward mercury-reduction targets. Only alternative fuels with demonstrated mercury content lower than that of the displaced coal should be accounted for.
- Clinker avoidance (50% – 0.20 t Hg/year): Assuming a mercury intensity of 90 mg Hg/t clinker, this corresponds to approximately 2.2 million tonnes of clinker per year avoided through the use of SCMs and low-clinker cement formulations.
- Cement substitution (18.75% – 0.075 t Hg/year): Assuming a mercury intensity of 72 mg Hg/t cement, this corresponds to approximately 1.0 million tonnes of cement per year replaced by lower-mercury alternatives.
- Building-waste recycling (6.25% – 0.025 t Hg/year): If treated as clinker-equivalent substitution, this corresponds to approximately 0.27 million tonnes per year of material replacing clinker inputs, subject to verification of mercury content and stability.

Overall, the intervention would require the replacement of approximately 1 million tonnes of coal, the avoidance or substitution of about 2.5 million tonnes of clinker, and the replacement of about 1 million tonnes of cement per year.

The revised mercury target is approximately half of the initial value proposed at PIF stage. However, even at this level, the target remains challenging. Based on national cement production in the range of 26–33 million tonnes per year, achieving a reduction of 0.4 t Hg/year implies intervention volumes corresponding to roughly 10–15% of national production. This suggests that, while pilot activities can demonstrate technical feasibility, achieving the target will require enabling policy measures and broader sector uptake to ensure sufficient scale.

CO2 Reduction.

Achieving the targeted mercury reduction of 0.4 t Hg/year implies substantial clinker avoidance and material substitution. Using typical emission factors (≈0.8–0.9 t CO_2/t clinker), the associated CO_2 reductions are expected to significantly exceed the project's committed target of 1 million tons over four years. The CO_2 target of 1 million tons CO2e should therefore be considered conservative and readily achievable as a co-benefit of the mercury reduction strategy.

The baseline assumes the business as usual, instead of achieving the targets committed for mercury reduction, i.e:

- 1.0 million tonnes of coal per year with low- or zero-mercury alternative fuels This is not accounted for CO2 reduction, as the amount of CO2 reduced depends on the alternative fuel selected..
- Clinker avoidance: approximately 2.2 million tonnes of clinker per year avoided through the use of SCMs and low-clinker cement formulations.
- Cement substitution approximately 1.0 million tonnes of cement per year replaced by lower-mercury alternatives (equivalent to around 0.75 million tonnes of clinker)
- Building-waste recycling (6.25% – 0.025 t Hg/year): corresponding to approximately 0.27 million tonnes per year of material replacing clinker inputs,

Totally, that would represent an amount of clinker avoided in the order of 3 million tons per year.

Direct GHG reductions are estimated as:

3 million t clinker per year avoided × 0.9 tCO_2e/t clinker = 2.7 million tCO_2e/year, or 13.5million tCO2 over the project period.

In other words, the CO2 target of one million ton over the project period will be achieved if at least 7.5% of the clinker avoidance planned under mercury reduction activities is achieved. For this reason, the one million ton CO2e is considered conservative and a co-benefit of the mercury reduction activities, as stated in the project document.

The 0.9 t CO2e/t clinker factor includes both: (i) calcination emissions, for which the IPCC default is approximately 0.52 tCO_2/t clinker; and (ii) direct kiln-fuel combustion emissions. The combined factor of 0.9 tCO_2e/t clinker represents the upper end of the typical 0.8–0.9 tCO_2/t clinker range. As a sensitivity check, application of the GCCA/GNR value of 0.821 tCO_2/t clinker would still produce an estimated reduction of 12.31 million tCO_2e over the project period.

References

1. IPCC (2006), 2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 3: Industrial Processes and Product Use, Chapter 2: Mineral Industry Emissions, Sections 2.2.1.1–2.2.1.2 and Equations 2.2 and 2.4, pp. 2.9–2.12. The IPCC clinker-based method estimates emissions as clinker production multiplied by the clinker emission factor and provides a default calcination factor of approximately 0.52 tCO_2/t clinker, including the cement-kiln-dust correction. The IPCC specifies that fuel-combustion emissions must be accounted for separately under the Energy Sector. Available at: [IPCC Guidelines, Volume 3, Chapter 2]

https://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/3_Volume3/V3_2_Ch2_Mineral_Industry.pdf

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2. Cement Sustainability Initiative/WBCSD (2011), CO_2 and Energy Accounting and Reporting Standard for the Cement Industry – The Cement CO_2 and Energy Protocol, Version 3.0, Section 3.4, pp. 16–17 and Appendix 3. The Protocol specifies a default calcination factor of 525 kg CO_2/t clinker where plant-specific clinker composition data are unavailable and separately accounts for direct kiln-fuel emissions. Available at: [Cement CO_2 and Energy Protocol]

https://www.cement-co2-protocol.org/en/Content/Resources/Downloads/WBCSD_CO2_Protocol_En.pdf

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3. Global Cement and Concrete Association (GCCA) and Global CCS Institute (2024), *CCUS in the Indian Cement Industry*, p. 40. The study applies a GNR-derived combined process and thermal emission intensity of 0.821 tCO_2/t clinker, excluding electricity-related emissions from cement grinding. Available at: [GCCA, CCUS in the Indian Cement Industry]

https://gccassociation.org/wp-content/uploads/2025/03/CCS-in-Concrete-India-Report_June-2024.pdf

Indicator 11: People benefiting from GEF-financed investments: The 6 million people should be considered as indirect beneficiaries—approximately 3 million women and 3 million men. These represent people expected to benefit from reduced mercury emissions and environmental exposure. This conservative estimate corresponds to about 5.3% of the Philippine population and recognizes that mercury transport and deposition are not restricted to communities adjacent to cement plants.

Direct beneficiaries are estimated using the approximately 130,000 direct and indirect jobs supported by the Philippine cement sector. Assuming that project-supported technical and market changes reach 5–10% of this workforce gives a range of 6,500–13,000 people. The lower value of 6,500 direct beneficiaries is adopted conservatively. These beneficiaries include cement-plant workers acquiring knowledge and skills related to low-mercury and low-carbon production and value-chain workers benefiting from green-cement products, clinker substitutes, construction-waste recycling and associated commercial activities.

Consistent with the project's estimate that women represent 9.54% of the Philippine construction workforce, the provisional target for direct beneficiaries would be 620 women and 5,880 men. The project will seek to increase women's participation beyond the existing sectoral share, including through targeted training and support for women-led enterprises participating in green-cement pilots. The disaggregation will be verified and refined using baseline data from participating companies and value-chain organizations.

References: Cement Manufacturers Association of the Philippines, 2024; Philippine Statistics Authority, 2024 Census of Population; UNEP, Global Mercury Assessment 2018: Technical Background Report.https://cemap.org.ph/newsroom/news/cement-manufacturers-association-of-the-philippines-warns-of-worker-redundancies/

Key Risks

	Rating	Explanation of risk and mitigation measures

CONTEXT		
Climate	Moderate	Risks: Climate change is considered a key driver in the project description, but climate impacts may also occur during the project implementation, either from direct events like flooding or indirectly due to responses to such events. Extreme climate events could impact project demonstration activities. The Philippines is highly exposed to extreme climate events, including tropical cyclones and their associated hazards. Government priorities may shift after a significant climate event which can lead to fewer resources for investment projects and lowering the priority of policy measures implementation. Mitigation measures: To mitigate this, the project will identify and draw on the experience gained from other ongoing initiatives in the region that address climate vulnerability and resilience in industries. Training on managing climate impacts will be part of the capacity-building aspects of the project.
Environmental and Social	Moderate	Risks: (1) Social, cultural and traditional norms may limit the integration of gender considerations into project activities and constrain women's participation in, and ability to benefit from, project interventions. (2) Women may have limited participation due to competing childcare and household responsibilities, time constraints, limited confidence in the relevance of project activities to their needs, or other social and economic barriers. Mitigation measures: Gender considerations are integrated throughout project implementation, with attention to women's needs, perspectives and interests in the implementation of activities and decision-making processes. Relevant stakeholders, including women's representatives, gender focal points, community leaders, decision-makers and industry actors, are engaged in consultations and implementation processes to identify and address social, cultural and institutional barriers to women's participation. The project engages women in identifying challenges and developing appropriate responses in the Philippines, implements a gender-responsive action plan, and promotes women's meaningful participation in relevant capacity-building, technology demonstration and investment-related activities. Practical barriers to participation, including time constraints and care responsibilities, are addressed through appropriate participation arrangements and engagement modalities. Women's participation and access to project benefits are monitored throughout implementation, with corrective measures introduced where gaps are identified to support equitable participation and benefits.
Political and Governance	Moderate	Risk: Political support is insufficient to sustain strong engagement of relevant sector actors and maintain momentum for implementation. Mitigation measures: Government stakeholders are engaged throughout project implementation to maintain political ownership, ensure continued alignment with national priorities and facilitate coordination across relevant institutions and sector actors. A project continuity and stakeholder engagement approach is applied to maintain institutional ownership and manage changes in government personnel or priorities. Strategic and periodic awareness-raising, policy dialogue and targeted communication are undertaken with key decision-makers and relevant national stakeholders to demonstrate project progress,

		highlight results and reinforce the contribution of the project to national development, climate and environmental priorities.
INNOVATION		
Institutional and Policy	Low	Risk: Policies and institutional arrangements proposed or supported by the project may not receive sufficient support from relevant government agencies at national and subnational levels, potentially resulting in delays or setbacks in implementation. Mitigation measures: Relevant government agencies and institutional stakeholders are engaged throughout project implementation in the development, review and refinement of proposed policies and institutional arrangements. Regular consultations and coordination mechanisms provide opportunities to incorporate agency mandates, operational considerations and feedback into the proposed measures, thereby strengthening institutional ownership and alignment with existing policies and priorities. Where concerns or institutional constraints arise, proposed measures are adapted, as appropriate, to address these concerns and maintain progress towards the project objectives.
Technological	Moderate	Risk: The project supports pilot deployment of new technologies in the construction sector, including hazardous-chemical-free and low-carbon materials and other innovative technologies. Some technologies may not prove technically or economically feasible at the intended scale, which could limit their successful deployment and reduce the expected environmental benefits. Mitigation measures: Proposed technologies and demonstration projects undergo technical, economic and feasibility assessments, including consideration of technology readiness, scale-up potential, market conditions and implementation requirements. Where a proposed demonstration is assessed as insufficiently feasible or suitable for implementation, the project adjusts the portfolio and considers alternative technologies or demonstration projects from the established pipeline, in accordance with the project's eligibility and selection criteria. This adaptive approach helps manage technology and scale-up risks while maintaining the project's expected environmental outcomes.
Financial and Business Model	Moderate	Risk: The project promotes innovative business models and technologies in the construction materials sector, which require access to financing and investment capital with an appropriate risk appetite. Limited availability of suitable financing could constrain project implementation, reduce private-sector participation and limit the potential for scale-up and replication. Mitigation measures: The project actively engages private-sector partners, financial institutions and development finance institutions to mobilize financing for innovative business models and technology investments. Technical assistance and project preparation support are used to strengthen the financial viability and bankability of investment opportunities and reduce perceived investment risks. Financing opportunities are linked to the project's pipeline of eligible investments, including through green and climate finance instruments, commercial lending and blended finance mechanisms where appropriate. Regular engagement with financial institutions and investors helps identify financing constraints and align project opportunities with available financing

		instruments, supporting the mobilization of private capital and the scale-up of successful solutions.
EXECUTION		
Capacity	Moderate	Risks: Lengthy government process for the project approval (Special Presidential Authority - SPA) may significantly delay project implementation. Changes in the project and country personnel could adversely impact project implementation and continuity. Mitigation measures: Effort will be made to prepare for the SPA, to reduce the time to minimum and avoid delays.
Fiduciary	Low	Risks: Mismanagement of funds by executing partners. Mitigation measures: UNIDO has a proven system for the management of executing partners. GEF fiduciary guidelines, as well as that of the agency, will be followed in fund management. This will also be part of the frequent monitoring and evaluation activities of the project.
Stakeholder	Moderate	Risks: (1) Stakeholders do not engage appropriately, leading to inadequate project design and implementation, adversely impacting project outcomes; (2) Sudden drop out of important stakeholders; (3) Low and/or short-lived participation – particularly the private sector. Mitigation measures: The project will leverage the environmental targets and agendas of the cement producers and align the industrial emissions objectives of the project with their ongoing efforts. Effective frequent communication with all identified stakeholders will be structured through a stakeholder engagement plan. Further, the project will ensure that all stakeholders have specific roles to ensure continued involvement. Private sector groups will be engaged directly from early in project design, and the project will aim to highlight the benefits of hazardous chemicals abatement and the synergies with the ongoing decarbonization efforts.
Other		
Overall Risk Rating	Moderate	The overarching risk to this project is moderate. Close monitoring of the identified risks and effective implementation of mitigation measures will ensure that the risks do not adversely impact the success and durability of the project.

C. ALIGNMENT WITH GEF-8 PROGRAMMING STRATEGIES AND COUNTRY/REGIONAL PRIORITIES

Explain how the proposed interventions are aligned with GEF- 8 programming strategies and country and regional priorities, including how these country strategies and plans relate to the multilateral environmental agreements.

For projects aiming to generate biodiversity benefits (regardless of what the source of the resources is - i.e., BD, CC or LD), please identify which of the 23 targets of the Kunming-Montreal Global Biodiversity Framework the project contributes to and explain how.

Confirm if any country policies that might contradict with intended outcomes of the project have been identified, and how the project will address this. (max. 500 words, approximately 1 page)

Alignment with GEF-8 programming strategies

352. The project is primarily aligned with the GEF-8 Climate Change Mitigation Focal Area under Pillar I: Supporting Innovation and Technology Transfer for Sustainable Energy Breakthroughs, specifically Objective 1.1: Accelerate the efficient use of energy and materials. By promoting low-carbon cement, clinker substitution, and resource-efficient construction practices, the project directly contributes to reducing greenhouse gas emissions from cement production and the broader construction value chain, which are among the most carbon-intensive industrial sectors. The project supports the decarbonization of hard-to-abate industries through innovative technologies, alternative materials, and improved industrial resource efficiency.

354. The project also aligns with the GEF-8 Chemicals and Waste Focal Area under Objective 1: Create, strengthen, and support the enabling environment and policy coherence to transform the manufacture, use, and sound management of chemicals and to eliminate waste and chemical pollution. Through the productive reuse of industrial by-products and construction and demolition waste, including fly ash, slag, and recycled materials, the project advances circular economy approaches, sustainable materials management, and industrial waste minimization. By reducing reliance on virgin raw materials and promoting resource recovery in the cement and construction sectors, the project contributes to more sustainable, low-emission, and circular industrial value chains.

355. The project embodies the GEF-8 cross-cutting principles of cost-effectiveness, sustainability, innovation, private sector engagement, and systems transformation. It promotes circular economic approaches within the construction sector by valorizing industrial by-products and construction waste, supports the development of green finance mechanisms to incentivize low-carbon materials, and introduces certification systems and digital tools to enhance transparency and market uptake. Through green public procurement and innovative business models, the project stimulates demand for sustainable construction materials while strengthening supply chains. Together, these interventions demonstrate scalable, commercially viable solutions that can be replicated nationally and across the region to accelerate the transition toward low-emission, resource-efficient, and climate-resilient construction systems.

Alignment with MEAs and SDGs

356. The project contributes to Multilateral Environmental Agreements (MEAs) and associated Global Environmental Benefits (GEBs), including the United Nations Framework Convention on Climate Change and the Paris Agreement. It supports the Philippines in increasing the ambition of its climate mitigation plans and Nationally Determined Contributions (NDCs), with a pathway toward net-zero emissions by 2050. The project will assist in implementing strategies aligned with the 1.5°C target, establishing short- and medium-term milestones supported by coherent, enforceable policies and appropriate financing mechanisms. It will also provide technical assistance to reorient policies and public investments, strengthen awareness of the value of nature in line with the Convention on Biological Diversity, and promote the integration of nature-based solutions and circular economy principles into national development strategies, while enhancing private sector participation.

357.The project is aligned with the achievement of several Sustainable Development Goals (SDGs), particularly SDG 3 (Good Health and Well-being) through reduced air pollution and improved environmental quality, and

SDG 13 (Climate Action) through mitigation of greenhouse gas emissions. It also contributes to SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 9 (Industry, Innovation and Infrastructure), SDG 11 (Sustainable Cities and Communities), and SDG 12 (Responsible Consumption and Production), reflecting its cross-sectoral and transformative nature.

358.The project focuses specifically on construction materials manufacturing, with an emphasis on green cement and low-carbon alternatives. Its overarching objective is to transform both supply and demand toward low-carbon, non-toxic construction materials. The technologies and materials supported under the project will deliver multiple environmental co-benefits, including reductions in air pollutant emissions (e.g., CO, NOx, SOx, particulate matter) and the productive use of industrial by-products and waste streams. These measures will reduce pressure on natural resources, lower impacts on biodiversity, and improve community health outcomes. The project promotes transformative low-carbon technologies that go beyond current mitigation benchmarks and foster synergies across sectors and value chains—particularly linking cement production with sustainable building and construction practices.

359. GEF support will focus on developing enabling policy frameworks, deploying innovative and scalable technological solutions, and catalyzing private sector investment. These interventions are designed for replication and scale-up and will complement financing mechanisms such as the Green Climate Fund. The project will also ensure meaningful gender mainstreaming and the integration of gender-responsive approaches and results, in line with relevant policies, strategies, and guidance.

360. The project interventions will focus on:
a) the development of low-carbon material pathways, including product redesign and the efficient sourcing and use of materials with reduced carbon footprints;
b) the establishment of certification systems and standards for green construction materials;
c) the promotion of green public procurement to stimulate market demand; and
d) the demonstration of innovative business models that support circularity and low-emission construction practices.

360a) The project addresses existing counteracting policies such as cost-minimization in traditional public procurement, rigid infrastructure material specifications favoring high-clinker cement, fuel/energy subsidy distortions in competing import markets, and unstructured quarrying/permitting obstacles. These are resolved through specific project mechanisms:

- **Procurement Barriers:** Addressed by operationalizing Republic Act No. 12009 (New Government Procurement Act of 2024) and Tatak Pinoy Act (RA 11981) under Output 2.1.2 and Output 4.1.2. The project embeds Green Public Procurement (GPP) tools, Life Cycle Costing (LCC), and Environmental Product Declarations (EPDs) so public infrastructure bids evaluate environmental performance rather than initial purchase price alone.

- **Regulatory Rigidity:** Addressed by updating DPWH BRS Bluebook specifications and DTI BPS requirements under Output 1.1.3 to allow higher SCM replacement ratios and recycled construction and demolition waste (CDW).

- **Waste & Fuel Distortions:** Addressed under Output 1.1.2 and Output 3.1.2 by updating DENR AO 2010-06 (Alternative Fuels and Raw Materials / AFR co-processing guidelines), expanding the EPR Law implementation, and introducing DOE incentive recommendations for biomass and RDF integration into kiln operations.

Alignment with Global Biodiversity Framework

361. The project directly contributes to the goals and targets of the Kunming-Montreal Global Biodiversity Framework by addressing key drivers of biodiversity loss associated with extractive industries, high-emission construction materials, and pollution from the built environment.

362. In particular, the project supports:

- **Target 7 (Reduce pollution to levels not harmful to biodiversity):** by promoting low-emission and non-toxic construction materials, reducing air pollutants (CO, NOx, SOx, particulate matter), and minimizing industrial waste leakage into terrestrial and aquatic ecosystems.
- **Target 8 (Minimize the impacts of climate change on biodiversity):** through the reduction of greenhouse gas emissions from cement and construction activities, thereby contributing to climate mitigation efforts that protect ecosystems and species
- **Target 11 (Restore, maintain, and enhance ecosystem services):** by reducing reliance on virgin raw materials such as limestone and aggregates, and promoting the use of recycled materials and industrial by-products, which lowers pressure on natural habitats and ecosystem services.
- **Target 16 (Ensure sustainable consumption choices):** by fostering market demand for green construction materials through certification systems, green public procurement, and awareness-raising across the value chain.
- **Target 18 (Reduce harmful incentives):** by supporting policy reforms and financial mechanisms that shift investments away from carbon-intensive and resource-depleting construction practices toward sustainable and circular alternatives.

D. POLICY REQUIREMENTS

Gender Equality and Women's Empowerment

We confirm that gender dimensions relevant to the project have been addressed during Project Preparation as per GEF Policy and are clearly articulated in the Project Description (Section B).

Yes

1) Does the project expect to include any gender-responsive-measures to address gender gaps or promote gender equality and women's empowerment?

Yes

If the project expects to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment, please indicate in which results area(s) the project is expected to contribute to gender equality:

Closing gender gaps in access to and control over natural resources;

Improving women's participation and decision-making; and/or

Yes

Generating socio-economic benefits or services for women.

Yes

2) Does the project's results framework or logical framework include gender-sensitive indicators?

Yes

Stakeholder Engagement

We confirm that key stakeholders were consulted during Project Preparation as required per GEF policy, their relevant roles to project outcomes has been clearly articulated in the Project Description (Section B) and that a Stakeholder Engagement Plan has been developed before CEO endorsement**.**

Yes

Select what role civil society will play in the Project

Consulted only;

Member of Advisory Body; Contractor;

Co-financier; Yes

Member of project steering committee or equivalent decision-making body ; Yes

Executor or co-executor; Yes

Other (Please explain)

Private Sector

Will there be private sector engagement in the project?

Yes

And if so, has its role been described and justified in section B project description?

Yes

Environmental and Social Safeguards

We confirm that we have provided information regarding Environmental and Social risks associated with the proposed project or program, including risk screenings/ assessments and, if applicable, management plans or other measures to address identified risks and impacts (this information should be presented in Annex E).

Yes

Please provide overall Project/Program Risk Classification

Overall Project/Program Risk Classification

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate	Medium/Moderate Medium/Moderate		

E. OTHER REQUIREMENTS

Knowledge management

We confirm that an approach to Knowledge Management and Learning has been clearly described during Project Preparation in the Project Description and that these activities have been budgeted and an anticipated timeline for delivery of relevant outputs has been provided.

Yes

Socio-economic Benefits

We confirm that the project design has considered socio-economic benefits to be delivered by the project and these have been clearly described in the Project Description and will be monitored and reported on during project implementation (at MTR and TER).

Yes, we confirm

ANNEX A: FINANCING TABLES

GEF Financing Table

Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	GEF Project Grant($)	Agency Fee($)	Total GEF Financing ($)

UNIDO	GET	Philippines	Chemicals and Waste	Mercury	Grant	4,416,210.00	419,540.00	4,835,750.00
UNIDO	GET	Philippines	Climate Change	CC STAR Allocation: CCM-1-1	Grant	1,776,484.00	168,766.00	1,945,250.00
Total GEF Resources ($)						**6,192,694.00**	**588,306.00**	**6,781,000.00**

Project Preparation Grant (PPG)

Was a Project Preparation Grant requested?

true

PPG Amount ($)

200000

PPG Agency Fee ($)

19000

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	PPG($)	Agency Fee($)	Total PPG Funding($)
UNIDO	GET	Philippines	Climate Change	CC STAR Allocation: CCM-1-1	50,000.00	4,750.00	54,750.00
UNIDO	GET	Philippines	Chemicals and Waste	Mercury	150,000.00	14,250.00	164,250.00
Total PPG Amount ($)					**200,000.00**	**19,000.00**	**219,000.00**

Please provide Justification

Sources of Funds for Country Star Allocation

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Sources of Funds	Total($)
UNIDO	GET	Philippines	Biodiversity	BD STAR Allocation	2,000,000.00
Total GEF Resources					**2,000,000.00**

Focal Area Elements

Programming Directions	Trust Fund	GEF Project Financing($)	Co-financing($)
CW-1	GET	4,416,210.00	31711796.83
CCM-1-1	GET	1,776,484.00	10000000
Total Project Cost		**6,192,694.00**	**41,711,796.83**

Confirmed Co-financing for the project, by name and type

Please include evidence for each co-financing source for this project in the tab of the portal

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
GEF Agency	UNIDO	Grant	Investment mobilized	112000
Private Sector	Alpha Architects	In-kind	Recurrent expenditures	345000
Private Sector	Republic Cement	Equity	Investment mobilized	6460000
Private Sector	Republic Cement	Grant	Investment mobilized	19140000
Civil Society Organization	UP Institute of Civil Engineering	In-kind	Recurrent expenditures	37000
Private Sector	Design Coordinates, Inc. (DCI)	In-kind	Recurrent expenditures	200000
Recipient Country Government	Department of Public Works and Highway (DPWH)- Central Office	In-kind	Recurrent expenditures	137410.52
Civil Society Organization	Gawad Kalinga	In-kind	Recurrent expenditures	48599
Civil Society Organization	Gawad Kalinga	Equity	Investment mobilized	37259
Civil Society Organization	UP Institute of Civil Engineering	Grant	Investment mobilized	40000
Recipient Country Government	Department of Trade and Industry	In-kind	Recurrent expenditures	2221514.81
Recipient Country Government	Department of Environment and Natural Resources	In-kind	Recurrent expenditures	721379.78

Recipient Country Government	Department of Environment and Natural Resources	Grant	Recurrent expenditures	13762.65
Recipient Country Government	Department of Environment and Natural Resources	Public Investment	Investment mobilized	1817983.71
Recipient Country Government	Department of Science and Technology	In-kind	Recurrent expenditures	422855.01
Recipient Country Government	Department of Science and Technology	Public Investment	Investment mobilized	3118021.41
Recipient Country Government	LGU Butuan	In-kind	Recurrent expenditures	311000
Recipient Country Government	LGU Malolos	Public Investment	Investment mobilized	617879.49
Recipient Country Government	LGU Malolos	In-kind	Recurrent expenditures	41674.95
Recipient Country Government	LGU La Union	Public Investment	Investment mobilized	289927.94
Recipient Country Government	LGU La Union	In-kind	Recurrent expenditures	157528.56
Private Sector	Taiheiyo Cement	In-kind	Recurrent expenditures	160000
Private Sector	Taiheiyo Cement	Grant	Investment mobilized	1477667
Private Sector	Taiheiyo Cement	Equity	Investment mobilized	3683333
Others	CEMAP	In-kind	Recurrent expenditures	100000
Total Co-financing				**41,711,796.83**

Please describe the investment mobilized portion of the co-financing

Stakeholder discussions with relevant government agencies, the private sector, NGOs and academia were held in-person, inline and during stakeholder meetings (e.g. inception and validation workshop) on stakeholder engagements, roles and responsibilities for project execution. Co-financing was identified based on the existing baselines for the project activities to be involved, such as the existing investments in low-carbon cement production technologies, clinker substitution systems, alternative material processing facilities, and related operational support.

The investment mobilized represents partner contributions (especially contributions related to the pilots under component 3) toward project-related investments, including infrastructure, equipment, technology, facilities, and other non-recurrent activities or assets. These investments directly support project implementation, delivery of project outputs, and achievement of the intended environmental outcomes.

ANNEX B: ENDORSEMENTS

GEF Agency(ies) Certification

GEF Agency Type	Date	Project Contact Person	Phone	Email
GEF Agency Coordinator		Ganna Onysko		g.onysko@unido.org
Project Coordinator		Maren Mellendorf	+436764100426	m.mellendorf@unido.org

Record of Endorsement of GEF Operational Focal Point (s) on Behalf of the Government(s):

Please attach the Operational Focal Point endorsement letter(s) with this template.

Name of GEF OFP	Position	Ministry	Date (MM/DD/YYYY)
Atty. Analiza Rebuelta-Teh	Undersecretary Finance, Information Systems and Climate Change , GEF OFP Focal Point	Department of Environment and Natural Resources	5/28/2026

ANNEX C: PROJECT RESULTS FRAMEWORK

Please indicate the page number in the Project Document where the project results and M&E frameworks can be found. Please also paste below the Project Results Framework from the Agency document.

Greening of the Philippines cement and Construction Industry Project Log Frame (GEF Project ID: 11707)					
Objective: Advance Philippine's efforts to reduce mercury releases to the environment, focusing on cement manufacturing, leveraging on the policies and actions for reduction of the GHG emissions					
GEBs: Core Indicator 6: Greenhouse Gas Emissions Mitigated: 1,000,000 gTEQ Core Indicator 9.2 Quantity of mercury reduced (metric tons): 2.0 ton Core Indicator 11: People benefiting from GEF-financed investments: 6,000,000 million people (female=3,000,000 million; male: 3,000,000) **UNIDO/IRPF:** B7 ENV 1: CO2eq emissions reduced (tons) B7 ENV 2: Pollutants reduced or phased out (tons) actors gaining skills on UNIDO knowledge areas				KASA 2: Number of	
Component	**KPIs/ Indicators**	**Baseline**	**Mid-term target and verification**	**TE target and verification**	**Assumptions**
Component 1. Policy, regulatory and institutional enabling framework					
Outcome 1.1 National policy, regulatory and institutional frameworkd strengthened	Number of policy and regulations framwork that supoprt better cement and construction UNIDO/IRPF: POL 1: Number of new or revised policies	o	1 draft policy framework drafted	1 draft policy framework developed	Policy commitment and willingness
Output 1.1.1 Policy review of the construction related policies relevant for the cement sector					
Output 1.1.1 National policy and regulatory framework for green cement and construction materials reviewed and a policy reform roadmap produced	# Development of 1) one regulatory gap analysis report; 2) one Technical and Financial Feasibility Report; and 3) 1 Capacity Development Needs report for the cement and construction sectors; # Development of a draft on improved policy on National Building Code, Green building and Green Procurement with emphasis on the GHG emission reduction and Hg reduction	#The relevant regulation in the Philippines (Green Building Code, Green Procurement, RA 6969, AFR, EPR on plastics, National Action Plans for Minamata Convention, Basel Convention and Stockholm Convention; #There are implementation gaps on low cost housing standards and specifications, the green procurement and green building code are not implemented nationally, some LGUs issued	# gap analysis, in alignment with the construction/cement roadmap, completed; #draft on improved policy	# Final aap analysis report, meeting minutes;	Assumptions: TWG established for this project Subject Matter Experts (SMEs) closely and effectively coordinate with GoP departments to undertake this task. Risk: difficulties to reach consensus on improved regulation or adoption of proposed standards could lead to delay in the achievement of this target.
Output 1.1.2 National regulatory framework and implementing provisions for monitoring and controlling mercury emissions in the cement sector developed and submitted for government adoption.s	#Developmen of emission monitoring report/data #Number of people trainied	#Mercury emissions are not regularly conducted, Hg in fly ash as clinker substitute is not measured; no standard methods in mercury monitoring # No specifc trainings for a wide range of stakeholders in the	#pilot inventory completed for 1 cement manufacturing facilities # Number of beneficiaries trained: 50	# Final inventory report # Number of beneficiaries trained: 100	Assumptions: Previous monitoring data by cement companies and DENR EMB are available.
Output 1.1.3 National technical guidelines and standards for low-impact buildings, low-carbon construction materials, and industrial emission reduction developed	# Number of policymakers capacitated, availability of printer ready ordinances for GPP and GB for LGUs # Developmen of guidelines and standards for low impact buildings	# LGUs do not have ordinance on GPP and GB. The main goal is for LGUs adopting or revising procurement guidelines to include environmental criteria and sustainability clauses in bidding documents and contracts # No national standards for	#Consultations and workshops conducted for policy makers #Number of beneficiaries trained 50 # Draft guidelines and standards available	#Number of beneficiaries trained 100 with evidence of workshop proceedings, meeting minutes # Final guidelines and standards available	Assumptions: Active participation of local policy makers
Output 1.1.4: National MRV and material traceability system for construction materials and associated mercury and GHG emissions established.	# Monitoring matrix document for Hg and GHG for cement industrie	# No current Hg and GHG monitoring protocol adopted by DENR	# Draft monitoring matrix for Hg and GHG available	# Final matrix for Hg and GHG available with available minutes of consultations with Cement Companies; and monitoring results conducted by DENR and Climate Change commission	Assumptions: Active participation of both the DENR and cement/construction industry as well as the availability of the equipment for monitoring. Delay in the procurement of laboratory
Output 1.1.5: Gender-responsive policy recommendations and Gender Action Plan for green construction materials integrated into the national policy framework	# Existence of a standardized audit framework that includes gender analysis criteria # Number of policies/regulations where gender gaps were identified. # Developmeny of: 1) audit report; 2) policy inventory; 3) gap analysis matrix; 4) recommendations document; and 5) stakeholder consultation records. # Availability of gender assessment report on construction related policies, regulation using gender-responsive language. # Availability of gender-inclusive procurement guidelines	# Existing national policy on Green Building but no gender assessment was conducted on this policy. #Policies were not gender assessed or a regulatory impact assessment (RIA) was conducted. #There are no gender-inclusive procurement guidlines available	# Availability of Policy Briefs - Summaries shared with government agencies highlighting gender gaps and proposed solutions. # Draft audit report, draft policy inventory, draft gap analysis matrix, draft recommendations, and draft stakeholder consultation record available using gender-responsive language # draft gender-inclusive procurement guideline is avaiable	# Audit Report- A comprehensive written report detailing the policies reviewed, methodology used, and identified gender gaps. # Policy Inventory: A compiled list of all existing green construction material regulations assessed. # Gap Analysis Matrix: Tables or charts showing where gender considerations are missing or weak in current regulations. #Stakeholder consultation records, survey/interview results and validation workshop outputs	Assumptions: All stakeholder engagement activities for gender inclusive GPP conducted.
Component 2: Business Development					
Outcome 2.1 Market actors adopt investment-ready pathways	# UNIDO/IRPF: INV 2 Number of projects or business models developed #KASA 1: Number of actors gaining awareness/knowledge on UNIDO knowledge areas				
Output 2.1.1: Full value-chain for cement roadmap or low-mercury and net-zero sector by 2050 with climate-smart technologies developed and gender mainstreamed	# Draft strategy document for the national cement sector roadmap prepared. Baseline #Developmen of Technical assessment report on fly ash and bottom ash characterization completed. #GHG emission assessment for cement production completed. #Technical recommendations report identifying environmentally friendly substitute material alternatives for reducing mercury emissions in cement production completed.	# No draft roadmap strategy exists for a low-mercury and net-zero cement sector. # No ash characterization study conducted #No project-supported GHG emission determination conducted. #No consolidated recommendations on substitute material alternatives for mercury	# 1 draft roadmap strategy document prepared. #1 ash characterization report completed. #GHG emission assessment report completed. #Recommendations report on environmentally friendly substitute materials for mercury emission reduction completed.	# Draft roadmap strategy document. # Laboratory analysis reports and technical assessment report. #GHG emission assessment report and supporting technical documentation. #Technical recommendations report; supporting technical analysis documentation.	**Assumption:** #Availability of technical data and participation of key stakeholders. #Availability of ash samples and laboratory testing faciilties # Operational data from cement plants is available. # Availability of technical data on substitute materials and participation of industry stakeholders in consultations.
Output 2.1.2 Business model and incentive framework for low-mercury and low-carbon investments developed.	# Business model framework and strategy report developed outlining approaches to catalyze green investments, green jobs, and incentive mechanisms for green cement technologies. #Technical and financial feasibility assessment of green cement technologies completed including 3D Concrete Printing	No business model framework or strategy currently exists to catalyze green investments, green jobs, and incentive mechanisms for environmentally friendly cement technologies in the Philippines. #No feasibility assessment for 3 D Concrete Printing available	# One business model framework and strategy report developed and validated with key stakeholders. #draft feasibility study and simplified manual for 3D Concrete Printing	# Final Business model framework and strategy report; stakeholder consultation and validation workshop documentation. #Final feasibility study and simplified manual for 3D Concrete Printing with m,eting minutes, and consultation reports	# Active participation of cement industry stakeholders, government agencies, and financial institutions in developing and validating the business model framework. # Reliable financial and technical data available.
Output 2.1.3 Industry partnership and technology transfer platform established to facilitate cooperation, knowledge exchange and uptake of low-mercury and low-carbon solutions in the cement and construction sector.	# Number of partnerships conducted to facilitate technology exchange and partnerships in green cement technologies. #Number of industry collaboration initiatives or partnerships established to support green cement technology development and adoption.	# 0 events conducted under the project; # 0 number of people reached	#At least 1 event conducted with evidence of event reports; attendance records; meeting documentation. #At least 1000 people reachedconducted (40% female)	# At least 3 events conducted with evidence of event reports; attendance records; meeting documentation. # At least 3 events conducted with at least 3000 people reached (40% female)	# Stakeholders actively participate in networking events. Assumption: # Stakeholders actively participate in networking events.
Output 2.1.4 Pipeline of bankable investment	# Number of financial awareness workshops	#0 financial awareness	# At least 2 workshops conducted	# At least 4 workshops conducted with	#Financial institutions and stakeholders

ANNEX D: STATUS OF UTILIZATION OF PROJECT PREPARATION GRANT (PPG)

Provide detailed funding amount of the PPG activities financing status in the table below:

Project Preparation Activities Implemented	GETF/LDCF/SCCF Amount ($)		
	Budgeted Amount	Amount Spent To date	Amount Committed
Inception meeting, validation workshop and stakeholder meetings	20,000.00	7,745.70	15,000.00
National consultant for data collection, stakeholder consultations, organization of the inception meeting and providing inputs for the CEO endorsement sections, including the stakeholder engagement plan, baseline assessment and pilot outline.	80,000.00	45,500.00	40,000.00
National consultant for financial baseline	25,000.00	15,500.00	10.00
National consultant for ESMP and technical pilots	25,000.00	25,419.34	10.00
International consultant for GEB calculation and technical review of project activities	40,000.00	12,233.41	12,000.00
HACT assessment	10,000.00	2,367.62	2,000.00
Total	**200,000.00**	**108,766.07**	**69,020.00**

ANNEX E: PROJECT MAP AND COORDINATES

Please provide geo-referenced information and map where the project interventions will take place

Location Name	Latitude	Longitude	GeoName ID
Department of T8.2082rade and Industry	14.5600	121.0300	8,646,056

Location Description:

Makati City (Metro Manila), project owner

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
Board of Investments	14.5594848	121.031652	8,646,056

Location Description:

BOI – main government counterpart of the project

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
DTI Bureau of Philippine Standards, CIAP, BPRI	14.56060385	121.030052	8,646,056

Location Description:

Makati City

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
Department of Environment and Natural Resources (Climate Change Services and Environmental Management Bureau, FASPS)	14.567829	121.0458897	8,646,056

Location Description:

Quezon City (Metro Manila)

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
Department of Public Works and Highways	14.58803749	120.9722313	8,646,056

Location Description:

Manila City, Project Partner

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
LGU Butuan City	8.94917	125.54361	17,22,186

Location Description:

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
LGU of Iloilo City	10.69285535	122.5736844	1,711,005

Location Description:

Iloilo City, Region 6

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
LGU of La Union	16.61320626	120.3184953	16,90,033

Location Description:

La Union

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
LGU of Malolos City	14.86149266	120.8103101	17,02,540

Location Description:

Bulacan

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
Taiheiyo Cement	10.31672	123.89071	1,717,512

Location Description:

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
Republic Cement	14.55317832	121.0528388	1,701,668

Location Description:

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
Gawad Kalinga	14.599512	120.984222	1,701,668

Location Description:

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
Alpha Architects	14.86417792	120.8062321	17,02,540

Location Description:

Bulacan

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
Philippine Green Building Council	14.54981182	121.0452683	1,701,668

Location Description:

Taguig City

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
UP Institute of Civil Engineering	14.64878738	121.0662	1,701,668

Location Description:

Quezon City

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
Design Coordinates, Inc	14.55027	121.03269	8,646,056

Location Description:

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
Saving the Planet Earth	14.8443	120.81039	17,02,540

Location Description:

Activity Description:

Location Name	Latitude	Longitude	GeoName ID
CeMAP	14.5857	121.0567	1,701,668

Location Description:

Activity Description:

Please provide any further geo-referenced information and map where project interventions are taking place as appropriate.

ANNEX F: ENVIRONMENTAL AND SOCIAL SAFEGUARDS SCREEN AND RATING

Attach agency safeguard datasheet/assessment report(s), including ratings of risk types and overall project/program risk classification as well as any management plans or measures to address identified risks and impacts (as applicable).

Title

Final ESMP Greening Cement and Construction Industry in the Phillippines

_ESS Screening template 230234 signed

ANNEX G: BUDGET TABLE

Please upload the budget table here.

Expenditure Category	Detailed Description	Component (USDeq.)							Total (USDeq.)	Responsible Entity
		Component 1	*Component 2*	*Component 3*	*Component 4*	*Sub-Total*	*M&E*	*PMC*		-
		Outcome 1.1	*Outcome 2.1*	*Outcome 3.1*	*Outcome 4.1*					
Goods	Equipment for the peumatic transfer of fly ash from bulk containers to clinker shed (Component 3 - pilot)			100,000		**100,000**			**100,000**	Clean Air Asia
Contractual Services – Company	Services to for the design of the pilot on CE (3D) under component 3, including calaculation of embedded carbon (Alpha)			100,000		**100,000**			**100,000**	Clean Air Asia
	Services related to support the implementation of green public procurement	200,000				**200,000**			**200,000**	Clean Air Asia
	Services to related to revise standards, and manuals under	250,000				**250,000**			**250,000**	Clean Air Asia

	componen t 1									
	Services related to the enhancem ent of existing procedures and standards for the evaluation of supplemen tary cementitio us materials (SCM) (DPWH-BRS)	100,0 00				**100,000**			**100,000**	Clean Air Asia
	Service to provide policy support for the revision of guidelines pertinent to the calculation of greenhous e gas emissions, its GHG determinat ion, and capacity-building on GHG calculation , monitoring , tracking, inventory, pilot (DENR-CCS)	50,00 0		255,00 0	50,000	**355,000**			**355,000**	Clean Air Asia
	Services related to manual for green cement and	50,00 0				**50,000**			**50,000**	Clean Air Asia

	constructio n topics									
	Services related to charcteriza tion of fly ash, and bottom ash, and undertakin g performan ce standards for the componen t 3, pilot on CE , and its related capacity-building activities (ITDI, UP ICE)	55,00 0		250,00 0	50,000	**355,000**			**355,000**	Clean Air Asia
	Services related to the policy support, including green public procureme ent, and capacity building LGU Iloilo	30,00 0			50,000	**80,000**			**80,000**	Clean Air Asia
	Services related to the support the implement ation of Green Procureme nt Plan (GPP) or new governme nt procureme nt Act NGPA and the Green Building	50,00 0	50,000	200,00 0		**300,000**			**300,000**	Clean Air Asia

	Code (GBC), and the constructio n debris hub, including the pilot of the Digital Platform for Second Constructi on materials developed at LGU Malolos, Saving Planet Earth, PCIEERD									
	Services related to the policy support, including green public procureme nt, and capacity building in LGU La Union	30,00 0			50,000	**80,000**			**80,000**	Clean Air Asia
	Services related to the policy support, including green public procureme nt, and capacity building in LGU Butuan	30,00 0			50,000	**80,000**			**80,000**	Clean Air Asia
	Services related to the use of 3D printing in the pilot site for building a low-cost housing, including the use of		100,00 0	200,00 0		**300,000**			**300,000**	Clean Air Asia

	3D printing during construction, alternative construction materials (i.e. pavers) DOST-MIRDC									
	Services related to experimental testing of alternative materials (ITDI)				250,000	**250,000**			**250,000**	Clean Air Asia
	Services related to the review of policies and adoption of policies on Hg in ambient air and management of construction debris, and Hg balance (DENR EMB Air/Lab)	50,000	100,000	200,000	50,000	**400,000**			**400,000**	Clean Air Asia
	Full value-chain cement roadmap for low-mercury and net-zero sector by 2050 with climate-smart technologies developed and gender mainstreamed.		200,000			**200,000**			**200,000**	Clean Air Asia

	Services related to the organization and execution of business to business events to exchange best practices and establish linkages for technology transfer and cooperation		200,000			**200,000**			**200,000**	Clean Air Asia
	Services related to the conduction of a technical and financial feasibility study for the use of 3D printing and other emerging technologies in the construction sector including its potential to reduce material use, clinker demand, and associated emissions		100,000			**100,000**			**100,000**	Clean Air Asia
	Services related to the pilot on green cement, including improvements to storage			600,000		**600,000**			**600,000**	Clean Air Asia

	faclities, Hg, GHG monitoring and balance (Republic Cement)									
	Services related to the policy review and gap analysis for green building, green cement and green procurement, and its SPE green design for eco blocks of the CE pilot under component 3, and its capacity for green/sustainable building design (Saving the Planet Earth)	30,000		40,000	30,000	**100,000**			**100,000**	Clean Air Asia
	Services related to manual for green cement and construction topics	50,000				**50,000**			**50,000**	Clean Air Asia
	Services related to the design and supporting the implementation of energy-efficient processes in kiln operations			241,804		**241,804**			**241,804**	Clean Air Asia

	Services related to the capacity-building activities for the dissemination of green building and sustainability principles for buildings				50,000	**50,000**			**50,000**	Clean Air Asia
	Services related to communication materials, knowledge products and conducting awareness raising campaings			50,000		**50,000**			**50,000**	Clean Air Asia
	Annual Financial Audits					**-**		54,890	**54,890**	UNIDO
Subtotal-Contractual Services-Company		975,000	750,000	2,136,804	630,000	4,491,804	-	54,890	4,546,694	
Contractual services - Individuals international	Mid-Term Evaluator					**-**	50,000		**50,000**	UNIDO
	Terminal Evaluator					**-**	80,000		**80,000**	UNIDO
Sub-total Contract		-	-	-	-	-	130,000	-	130,000	

ual services - Individuals International										
Contractual services - Individuals local	Gender Expert	15,000	15,000	15,000	15,000	**60,000**			**60,000**	Clean Air Asia
	Knowledge Management/Communication Expert				100,000	**100,000**			**100,000**	Clean Air Asia
	ESMP expert			50,000		**50,000**			**50,000**	Clean Air Asia
	Technical expert for the Cement and Construction Value Chain	50,000	50,000	50,000	50,000	**200,000**			**200,000**	Clean Air Asia
	Policy expert	100,000				**100,000**			**100,000**	Clean Air Asia
	Financial expert	10,000	60,000	20,000	10,000	**100,000**			**100,000**	Clean Air Asia
Sub-total - Contractual Services - Individual local		175,000	125,000	135,000	175,000	610,000	-	-	610,000	
Salary and benefits/staff costs	Project Coordinator	30,000	20,000	30,000	30,000	**110,000**	30,000	120,000	**260,000**	Clean Air Asia

	Administrative assistant				50,000	**50,000**		120,000	**170,000**	Clean Air Asia
Sub-total Salary and benefits/staff costs		30,000	20,000	30,000	80,000	160,000	30,000	240,000	430,000	
Trainings, Workshops, Meetings	Kick-Off Workshop					**-**	7,000		**7,000**	Clean Air Asia
	Closing Workshop					**-**	8,000		**8,000**	Clean Air Asia
	Technical Coordination and stakeholder consultations under components (Technical Working Group meetings, stakeholder meetings)	20,000	20,000	20,000	20,000	**80,000**			**80,000**	Clean Air Asia
	Learning and knowledge exchange events for the components				50,000	**50,000**			**50,000**	Clean Air Asia
	Business development events under component 2		70,000			**70,000**			**70,000**	Clean Air Asia
	PSC meetings (annually)				50,000	**50,000**			**50,000**	Clean Air Asia
Sub-total Training		20,000	90,000	20,000	120,000	250,000	15,000	-	265,000	

, workshops and Meetings										
Travel	Travels for project consultations, monitoring and knowledge sharing	15,000	15,000	15,000	15,000	**60,000**	11,000		**71,000**	Clean Air Asia
	Study tour			30,000		**30,000**			**30,000**	Clean Air Asia
Sub-total travel		15,000	15,000	45,000	15,000	90,000	11,000	-	101,000	-
Office supplies	Communications Materials and prints				10,000	**10,000**			**10,000**	Clean Air Asia
Sub-total Office supplies		-	-	-	10,000	10,000	-	-	10,000	
Grand Total		1,215,000	1,000,000	2,466,804	1,030,000	5,711,804	186,000	294,890	6,192,694	

Please explain any aspects of the budget as needed here

ANNEX I: RESPONSES TO PROJECT REVIEWS

From GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF.

STAP comment	Response
1. The pathway needs to be better developed that connects demonstration projects to durable changes in the cement industry. How can demonstration projects lead to durable change? Can demonstration projects illustrate the economic viability of technological improvements in the sector as a whole?	The CEO endorsement document addresses the pathway from demonstration projects to durable change by embedding technology pilots within a broader system of policy development, financing mechanisms, and market transformation. Demonstration activities under Component 3 are explicitly linked to sector-wide roadmaps, national standards, and green procurement

	frameworks, while Component 2 introduces business models and financial instruments that enable replication. This creates a coherent pathway in which pilot results inform policy and standards, unlock financing through institutions such as development banks, and ultimately drive wider adoption across the cement industry, thereby demonstrating not only technical feasibility but also economic viability on a scale.
2. It is unclear how collaboration can "ensure" project scale-up without addressing key barriers that exist within and between collaborators.	The concern about collaboration ensuring scale-up is addressed by explicitly recognizing and analyzing the structural barriers that exist among stakeholders, including financial risk, weak enforcement, limited technical capacity, and fragmented incentives. The CEO endorsement document pairs collaboration with concrete measures such as regulatory strengthening, clearly defined stakeholder roles, and financial de-risking instruments like green loans and sustainability financing.
3. More explanation is needed on how a robust monitoring system will be developed.	The development of a robust monitoring system is addressed through the integration of monitoring, reporting, and verification (MRV) functions at multiple levels, including project monitoring, national emissions tracking, and compliance with the Minamata Convention. The CEO endorsement document highlights strengthened institutional capacity for monitoring and reporting, introduces traceability systems for construction materials, and aligns with proposed national systems for greenhouse gas inventories and carbon pricing. In addition, financial institutions are shown to require impact monitoring as part of their lending criteria, reinforcing the role of monitoring as both a regulatory and financial accountability tool.
4. More explanation is needed to demonstrate the long-term availability of supplemental cementitious materials, especially those obtained from construction and building waste, in order to reduce clinker/cement ratios.	The issue of long-term availability of supplementary cementitious materials is addressed by framing SCMs within a broader circular economy approach and identifying both current gaps and future solutions. The document acknowledges the lack of a formal framework for construction and demolition waste and proposes the development of national guidelines, improved waste management systems, and integration of alternative materials into cement production through existing policies such as those governing alternative fuels and raw materials.
5. The construction industry in the Philippines employs approximately 4.55 million people, accounting for 9.5% of the national workforce, yet women make up less than 10% of this sector. One contributing factor to this gender disparity is the limited availability of training opportunities for women. To complement awareness and communication efforts, the project could consider partnering with institutions active in Green Building and Circular Economy initiatives, such as ESCA Engineering and the Philippine Business Coalition for Women Empowerment (PBCWE).	Gender considerations are addressed through a comprehensive mainstreaming approach that integrates gender into policy development, business models, capacity building, and communication strategies. The CEO endorsement document includes data highlighting the low participation of women in the construction sector and incorporates gender assessments in policy outputs, targeted outreach activities, and financing mechanisms that support women-led enterprises. It also references relevant national laws and international commitments on gender equality, thereby situating gender inclusion as a cross-cutting priority rather than a standalone activity.
6. Beyond environmental challenges, the cement and construction sectors also face persistent labor and	Labor and occupational safety concerns are addressed through the integration of environmental health impacts and workplace considerations within the broader project

occupational safety issues, which should be taken into account in the risk assessment.	framework. The CEO endorsement document discusses the health risks associated with mercury exposure and industrial emissions, particularly for workers and nearby communities, and includes stakeholder responsibilities related to promoting safe and inclusive workplaces. While occupational safety is not treated as a standalone component, it is incorporated within environmental management, regulatory frameworks, and capacity-building efforts, linking pollution reduction measures with improved worker safety outcomes.
7. The construction industry in the Philippines largely relies on a relatively young workforce, with youth comprising roughly one-third of the population. Despite this, the proposal appears to overlook opportunities for youth engagement, particularly relevant given the critical role young people can play in driving innovation and technology. The Philippine Green Building Council (PhilGBC), identified as a key stakeholder, could serve as a strategic partner in mobilizing youth participation. Furthermore, the Minamata Convention has launched initiatives specifically aimed at empowering youth to address mercury pollution, offering a valuable model for integrating youth into broader environmental and sustainability efforts.	Youth engagement is addressed implicitly through the document's emphasis on the Philippines' young demographic profile and the role of education, research institutions, and innovation programs in supporting sector transformation. The proposal includes academia and research organizations as key stakeholders, highlights national innovation initiatives led by institutions such as the Department of Science and Technology, and establishes knowledge-sharing platforms that can engage younger professionals. While youth is not presented as a distinct thematic focus, the structure of the project creates multiple entry points for youth participation in innovation, capacity building, and workforce development.
8. The role of SMEs in the Philippines' construction sector is estimated to be significant. For example, in a survey conducted in 2017, of the 2536 listed construction companies, more than 90% were classified as SMEs1. Although SME dominance may likely be in the downstream of the cement and construction industry, it may strengthen the proposal to assess their role in the project.	The role of SMEs is addressed by explicitly recognizing them as central actors within the construction and cement value chain and integrating them into both stakeholder mapping and project implementation strategies. The CEO endorsement document highlights their importance in supply chains, recycling activities, and material production, and provides targeted support through dedicated financing mechanisms such as SME-focused green loans and capacity-building programs. By linking SMEs to circular economy activities and green business development, the proposal strengthens their role as key drivers of adoption and scale within the broader industry transformation