STAP SCREENING TEMPLATE, May 2024

GEF ID	**11574**
Project title	**Control and reduction of mercury emissions from the cement industry in Brazil**
Date of screen	**30 May 2024**
STAP Panel Member	**Miriam Diamond**
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1. Summary of STAP's views of the project

A timely and valuable project is proposed to reduce mercury (Hg) and greenhouse gas (GHG) emissions from the cement industry. The project is designed to meet obligations under the Minamata Convention, with additional benefits of reducing GHG emissions consistent with the UNFCCC. Targeting the cement industry is very reasonable since it's Brazil's fourth largest contributor of Hg emissions, with 91 cement plants in 2019.

The proposal contains two main elements. The first is setting the regulatory stage to enable and ensure cement industry participation, including implementing a Hg monitoring program to assess whether the ultimate goal of reducing Hg emissions has been achieved. The second is implementing training, pilot projects, and information sharing to promote the uptake of best available technologies (BAT) and best environmental practices (BEP) to reduce emissions by the cement industry. Thus, the proposal includes key components of capacity building, policy development and promoting enforcement, and promoting the uptake by the cement industry of methods to reduce Hg emissions. The proposal indicates consultation with several cement industries and industry organizations while identifying a broader range of key stakeholders.

The proposal needs to better consider the financial mechanisms to promote technological changes that the cement industry must adopt to reduce Hg emissions. More attention to policy coherence would strengthen the expected outcome of the industry's uptake of necessary changes. Additional barriers to implementation should be explored, such as the limited technical expertise available to guide technology uptake.

The scientific basis needs to be strengthened about which alternative cementitious material would reduce Hg emissions and whether consideration has been given to potential unintended consequences from using such alternatives, such as biomass. The logic behind diverting construction waste to cement kilns to increase material circularity and reduce Hg emissions needs to be strengthened, e.g., who makes the connection between the construction site and cement kiln operators? The proposal should better integrate its knowledge management strategy with training activities and stakeholder inclusion.

The proposal would benefit from considering timelines for each output/outcome pathway and whether there are "mismatches" in timelines that would delay specific actions. Activities for monitoring the project's progress need to be better laid out. Women's involvement is mentioned in numerous places but is not logically connected to activities.

Note to STAP screeners: a summary of STAP's view of the project (not of the project itself), covering both strengths and weaknesses.

STAP's assessment*

□ Concur - STAP acknowledges that the concept has scientific and technical merit

X Minor - STAP has identified some scientific and technical points to be addressed in project design

□ Major - STAP has identified significant concerns to be addressed in project design

Please contact the STAP Secretariat if you would like to discuss.

2. Project rationale, and project description – are they sound?

See annex on STAP's screening guidelines.

1. **Systems thinking.** Generally, the proposal has taken a system's analytical approach. The proposal does well in threading together the need for improving the regulatory environment to enable changes to the cement industry with opportunities to use waste from infrastructure demolition, but as noted below, this pathway needs to be strengthened. Additional systems thinking is needed when considering alternative cementitious materials where their use could result in negative unintended consequences.

2. **Uncertainty futures** were not discussed but could be useful when considering economic up and downturns in the cement industry and changes that would impact the political appetite for pressing for change by the cement industry. Do some of the logic pathways in the Theory of Change depend on the timely cooperation of a stakeholder, and what would be the consequences of not having a timely response? Please consult STAP's brief on Future Narratives for guidance on how to address uncertain futures through simple future narratives.

3. **Baseline, barriers, and enablers**. The baseline was well described. Several barriers were raised, but some are questionable. Why is the lack of information and insufficient capacity for monitoring and reporting emissions significant barriers to adopting new approaches for reducing Hg emissions? Why is lack of public awareness a barrier – would you expect the public to participate in Hg pollution control enterprises? Other barriers were insufficiently described, such as policy incoherence, a lack of financial incentives for industry uptake of new technologies, and the inadequacy of technical expertise. Enabling elements require better explanation. Drivers were not well explained, but they included forecasted increased demand for cement production to meet housing and infrastructure needs.

4. **Theory of Change** (ToC):

- Includes logical connections between barriers, outputs, and direct and intermediate outcomes that lead to impact.
- Stronger logical connections need to be made between all the barriers, enablers, and related outputs, e.g., limited monitoring capacity, but outputs will be monitoring for Hg in stack emissions (?), limited expertise to support technological changes, but those changes will occur, and barriers to accessing finance, yet the cement industry will add monitoring capabilities and technological change.
- Assumptions and drivers should be included.

5. **Project Components** are discussed in detail below. In general, each component is reasonable; however, some logic needs improvement so that all components, as a whole, are feasible. For example, supply chains are mentioned early in the proposal but are not further mentioned (which supply chains? Why and how?). What will be monitored and evaluated to ensure that the project is progressing?

6. Engaging **stakeholders** is critical to the project's success. As noted above, numerous stakeholders have been identified, and some have been contacted, especially in the cement industry and government. Are stakeholders in the financial sector also critical to the project's success? Women's participation should be genuine and logical and should not be included if it doesn't make sense.

7. The calculations of GEBs appear logical, but some components need better justification (e.g., using alternative cementitious materials). Estimation of Hg emissions avoided: The assumptions behind the calculations appear reasonable, e.g., using a low and not higher Hg emission factor from cement production of 0.1 g Hg/tonne cement and replacing 2.5% of clinker with recycled material over four years.

8. The discussion of **policy coherence** needs to be strengthened since policy coherence between the Ministries of Environment and Climate Change, Industry, and Finance seems critical to ensuring positive outcomes.

9. Analysis of **risks:**

- Might climate change (e.g., extremely high temperatures) interfere with cement kiln operations? Could changes in climate influence the demand for cement or influence construction standards? A climate risk screening will be beneficial for addressing this. And these risks should be addressed as part of the future narratives. The risk table should only focus on the risks associated with project implementation.
- Risks related to technological uptake seem to be limited to the Hg monitoring activities but not uptake by cement kiln owners/operators to upgrade their processes, which would be a far greater risk
- Presumably, the most significant risk is that the financial and business models will not be sufficient to promote technological changes in the cement industry. This risk and associated mitigation measures need to be better explained. This should be addressed as part of developing the future narrative to ensure the project is robust to this plausible future. Please consult STAP's brief on Future Narratives.

Note: provide a general appraisal, asking whether relevant screening guideline questions have been addressed adequately – not all the questions will be relevant to all proposals; no need to comment on every question, only those needing more attention, noting any done very well, but ensure that all are considered. Comments should be helpful, evaluative, and qualitative, rather than yes/no.

3. Specific points to be addressed, and suggestions

The following are specific points that the STAP suggests should be addressed.

- Need to address the barrier of industry compliance with new regulations for monitoring the Hg content of inputs and outputs, which will add costs, especially since limited expertise is available regarding technologies for monitoring Hg inputs and outputs.
- Should address the gap between the current lack of regulation of Hg content of inputs and outputs and the capacity needed to establish those regulations, the required capacity for industry compliance monitoring, and a realistic timetable for the industry to comply with new regulations
- More detail and a clear rationale are needed on which types of alternative fuels might be suitable that achieve reductions in Hg emissions and that do not have unintended consequences, e.g., the use of biomass that has relatively high Hg content and that could result in competition of land for agricultural purposes or forest conservation.
- More details are needed on the infrastructure and capacity required to collect and re-use concrete from demolition sites in cement production.
- What incentive do financial institutions have to invest in upgrading cement production technologies and monitoring activities? Raising awareness is a good goal, but it alone is unlikely to promote technological change.
- Output 1.1.1—More details are needed on methods used to monetize the cost of mercury emissions, e.g., public health impacts. But of greater importance, how will monetized costs of mercury emissions feed into the regulatory system to develop "robust policies and frameworks" or provide economic incentives? Usually, those costs are externalized (e.g., costs to human health) and do not return to the emitter.
- Output 1.1.2 – We suggest that the analysis of laws, policies, etc., include an analysis of policy coherence, if there is compliance with existing laws, etc., and if not, how can compliance be encouraged. How will gender mainstreaming be achieved? Is it appropriate here?
- Output 1.1.3 – The proposal should discuss how industries will meet the additional costs associated with monitoring.
- Output 1.1.4 – The proposal is confusing as it lists a lack of guidelines and policies for monitoring, but page 19 lists 2019 Waste Incineration Best Available techniques with mercury concentration limits. Are existing limits too high and need to be revised downwards? Facilities are given four years to come to compliance. Is it realistic to aim for "prompt" installation of a Mercury Continuous Emission Monitoring System? How do women fit into this?
- Output 2.1.2. It is great to deploy cutting-edge technologies, but how can this be achieved when a barrier is a lack of expertise in this area? How will mercury in feedstocks be determined, and what is the frequency, cost, etc.? Who will bear the cost of Hg measurements during quarrying? Is this feasible? How and why will women be engaged?

- Output 2.1.3 – Concerns about alternative fuels that could have higher Hg emissions and/or unintended consequences, e.g., competition for land that produces biomass.
- Output 3.1.2—Facility-specific audits and feasibility studies are excellent ways to efficiently target process improvements. Since the lack of technical expertise was identified as a barrier, who will conduct and pay for the audits? What information will the auditors draw upon to help them and make the audits most efficient?
- Output 3.1.3—Replacing traditional cementitious materials to reduce GHGs and Hg emissions is a current field of inquiry. How will current research and testing inform this activity since some supplementary cementitious materials might actually yield higher Hg emissions, as mentioned in Output 3.1.4?
- Output 3.1.4 – It is a great idea to use recycled clinker to recover cement from construction and demolition waste, but no mention is made of the infrastructure and organization that this would require.
- Component 5 contains few details on what will actually be monitored, who will do the monitoring, and how this information will provide feedback into the project to allow for continuous improvement so that it will achieve its goals.
- Output 4.1.4 – How will the gender-based training be relevant to the cement industry, e.g., "training on the evaluation of gender-specific climate and environmental risks"?
- Output 5.1.2 – How do these gender-based evaluation actions contribute to the main goal of reducing Hg and CO2 emissions from the cement industry?

Note: number key points clearly and provide useful information or suggestions, including key literature where relevant. Completed screens should be no more than two or three pages in length.

*categories under review, subject to future revision

ANNEX: STAP'S SCREENING GUIDELINES

1. How well does the proposal explain the problem and issues to be addressed in the context of the **system** within which the problem sits and its drivers (e.g. population growth, economic development, climate change, sociocultural and political factors, and technological changes), including how the various components of the system interact?

- Context description is missing larger system explanation

2. Does the project indicate how **uncertain futures** could unfold (e.g. using simple **narratives)**, based on an understanding of the trends and interactions between the key elements of the system and its drivers?

3. Does the project describe the **baseline** problem and how it may evolve in the future in the absence of the project; and then identify the outcomes that the project seeks to achieve, how these outcomes will change the baseline, and what the key **barriers** and **enablers** are to achieving those outcomes?

4. Are the project's **objectives** well formulated and justified in relation to this system context? Is there a convincing explanation as to **why this particular project** has been selected in preference to other options, in the light of how the future may unfold?

5. How well does the **theory of change** provide an "explicit account of how and why the proposed interventions would achieve their intended outcomes and goal, based on outlining a set of key causal pathways arising from the activities and outputs of the interventions and the assumptions underlying these causal connections".

    - Does the project logic show how the project would ensure that expected outcomes are **enduring** and resilient to possible future changes identified in question 2 above, and to the effects of any conflicting policies (see question 9 below).
    - Is the theory of change grounded on a solid scientific foundation, and is it aligned with current scientific knowledge?
    - Does it explicitly consider how any necessary **institutional and behavioral** changes are to be achieved?
    - Does the theory of change diagram convincingly show the overall project logic, including causal pathways and outcomes?

Gap between lack of regulation on direct limits in mercury content of inputs and outputs and how such limits will be established and timetable of implementation, which requires considerable consultation. Isn't the cement industry likely to present a considerable barrier towards adoption of new practices that must be paid for?

6. Are the project **components** (interventions and activities) identified in the theory of change each described in sufficient detail to discern the main thrust and basis (including scientific) of the proposed solutions, how they address the problem, their justification as a robust solution, and the critical assumptions and risks to achieving them?

To increase circularity, i.e., recovery waste cement, need collection and distribution system

What is gender-speicific about cement kilns? E.g., Output 4.1.1 about outreach, monitoring and evaluation re: gender mainstreaming? (output 5.1.1) What about monitoring and evaluation of meeting goals?
Suggestion to use calcined clay to reduce CO2 emissions, but does that include energy emissions needed to produce calcined clay?
Which alternative fuels would be used?

Barriers:

Project rationale:

7. How likely is the project to generate global environmental benefits which would not have accrued without the GEF project (**additionality**)?

8. Does the project convincingly identify the relevant **stakeholders**, and their anticipated roles and responsibilities? is there an adequate explanation of how stakeholders will contribute to the development and implementation of the project, and how they will benefit from the project to ensure enduring global environmental benefits, e.g. through co-benefits?

9. Does the description adequately explain:

    - how the project will build on prior investments and complement current investments, both GEF and non-GEF,
    - how the project incorporates **lessons learned** from previous projects in the country and region, and more widely from projects addressing similar issues elsewhere; and
    - how country policies that are contradictory to the intended outcomes of the project (identified in section C) will be addressed (**policy coherence**)?

    Policy coherence needs to be addressed since proposal discusses establishing and enforcing guidelines for monitoring and for emissions reduction.

10. How adequate is the project's approach to generating, managing and exchanging **knowledge**, and how will lessons learned be captured for adaptive management and for the benefit of future projects?

11. **Innovation and transformation:**
    - If the project is intended to be **innovative:** to what degree is it innovative, how will this ambition be achieved, how will barriers and enablers be addressed, and how might scaling be achieved?

- If the project is intended to be **transformative:** how well do the project's objectives contribute to transformative change, and are they sufficient to contribute to enduring, transformational change at a sufficient scale to deliver a step improvement in one or more GEBs? Is the proposed logic to achieve the goal credible, addressing necessary changes in institutions, social or cultural norms? Are barriers and enablers to scaling be addressed? And how will enduring scaling be achieved?

12. Have **risks** to the project design and implementation been identified appropriately in the risk table in section B, and have suitable mitigation measures been incorporated? (NB: risks to the durability of project outcomes from future changes in drivers should have been reflected in the theory of change and in project design, not in this table.)

General

- Cement industry 4th largest in Hg emitter in Brazil with 91 cement plants in 2019
- "Strengthen capacity of stakeholders to monitor & manage emissions" Review national reg's, establish guidelines, demonstrate technologies for tracking emissions, study monetizing emission reduction benefits
- Pilot technologies & practices for emission reduction
- If screen input material for high Hg, where will that material go?
- Energy efficiency (HOW?), circular economy (recovery concrete from demolition sites)
- Knowledge platform for scaling up BAT/BEPs
-