STAP SCREENING TEMPLATE, June 2024

GEF ID	**11553**
Project title	**Global Electronics Management (GEM) Program**
Date of screen	**14 June 2024**
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1. Summary of STAP's views of the project

Without question, the electronics sector is in great need of improving the supply chains and life cycle management aimed at reducing resource depletion, chemical pollution, and GHG emissions. The key to this is extending the life span of ICT equipment and increasing circularity, as well as improving End-of-Life (EoL) management of wastes that can't be recovered. This ambitious proposal is developed from a broad base and years of experience and knowledge of these issues in the ICT sector. The proposal assembles agencies that have significant experience in tackling this vexing and growing problem and with connections to numerous other related initiatives. For example, it is promising that UNIDO has developed MOUs with several major global ICT brands that hold the key for moving the industry away from the planned obsolescence model and towards one that is more sustainable.

The proposal takes a systems approach by identifying key drivers and barriers in the system, and then working with enabling elements to design a range of targeted components and interventions. An example here is naming the problem of shorter product life cycles, planned obsolescences and limiting repair options as key barriers to reducing the impacts from the sector. The proposal then includes aspects to address these critical and difficult barriers through its four components. Gender considerations are grounded in an understanding of the issues, although the measures taken to redress gender imbalances could be more ambitious by targeting involvement at the upper (well-paid) as well as lower part of the value chain.

Although the proposal is comprehensive and justifiably broad in its considerations, one element that was not addressed is compliance monitoring of existing or newly developed policies and legislation. This is of particular importance because of the illegal trade and handling of e-waste. Several other issues that could be better addressed are the role of non-governmental standards and standard-setting agencies since such standards can be an enabler or barrier to circularity, e.g., flammability standards for exterior ICT device casings that now limit plastics recycling. Another element that could be better addressed is the identification and separation of hazardous materials with logistical and financial provisions for environmentally sound disposal.

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
- ◻ 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.** The proposal takes a systems-thinking approach by examining the upstream drivers of the problem and connecting them with an array of interventions. It discusses the environmental and socioeconomic dimensions of the issues and their interconnections. It also highlights the connections to the MEAs served by the GEF. The discussion on e-waste generation was based on the 2020 Global E-waste Monitor report. We

encourage the proponent to update this information when further developing the report using the latest version of the report: Global E-waste Monitor 2024.

2. **Uncertainty futures** were not discussed but could be useful when considering economic ups and downturns that could affect the ICT industry and changes that would impact the political imperative for pressing forward with policy changes. Consideration should be given to logic pathways in the Theory of Change that depend on the timely cooperation of one element to facilitate another, e.g., unlocking Intellectual Property Rights (IP) to allow for device repair with setting up a repair network. 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 proposal clearly lays out the current baseline status of the ICT industry, including the major industrial actors. Innovation is fast-paced. Consumers of new products have limited choices and often incomplete understanding of the programmed obsolescence features. It is not clear that the design of products is driven by consumer demand or rather, by demand generated by the industry for products which turn out to have a short life span (page 12). Consumer choice is acknowledged as an enabling element rather than a barrier, when working with the major tech companies. For example, consumer choice away from IoT and highly digitized devices can be an enabler where older analogue technologies are suitable (which can be more easily repaired). The proposal notes that whereas the ICT industry has been shaping consumer behaviour towards greater and faster consumption, the aim of industry's influence on consumer behaviour could be moved towards influencing consumers purchasing towards a sustainability agenda.

A lack of policies and legislation aimed at e-waste management is a barrier, but even with legislation, technical and system-level barriers can limit circularity and effective e-waste management. Some of these points could be included in the summary of barriers, notably the promotion of short-lived devices and limited options for repair and reuse. Another fast-moving driver is miniaturization which, on the one hand, reduces material use and GHGs per device, but in aggregate over all devices, can increase material use and GHGs. Will the proposal address such trade-offs? Another barrier not noted is the low price of some primary materials that is undercutting recycling, e.g., low cost due to artisanal and illegal mining practices in countries fraught with political instability.

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

- All major components are listed and linked through logical pathways. The ToC starts with identifying the key driver of "unabated consumerism" (although the origin of this consumerism might be better placed on the "big tech" business model), and then takes a systems analytical approach by considering regulations through to technical and market-based considerations.
- The ToC might more clearly identify the dynamic nature of the problem – increasing volumes of e-waste over time for which "static" improvements in recycling capacity cannot keep pace. This is an important point emphasized in the 2024 Global E-waste Monitor report, which noted that the rate of e-waste generation significantly outpaces the rate of collection and recycling in all parts of the world.
- Overall, STAP thinks the assumptions in the ToC need to be made clearer and connected to the project activities. Some are presented as needs rather than as a belief that is accepted as true or taken for granted in defining the causal links in the causal pathway (e.g., there is a need for upgraded business models, information on electronics needs strategic dissemination, etc.). Instead, the assumption should say what is assumed as true that will lead to desired change if business models are upgraded, for example.
- Further, one assumption (although not explicitly stated in the ToC) is that "big tech" and other lead companies can shift their practices towards "design-for-repair," and "design-for-longevity." The justification for this assumption should be offered. Similarly, an implicit assumption is that big tech companies will cooperate in opening up IP rights to allow for repair and updating algorithms. This is addressed under the "technological risk assessment" but could be better linked to legislative initiatives that could help push this behavior change.

- The proposal lists many barriers. A barrier not listed is that it is often uneconomic to recover elements that are used in trace amounts but are essential to the functioning of ICT devices, e.g., tantalum and rare earth elements. Elements like copper and sometimes gold and cobalt are recovered. Here, the solution would appear to be increasing longevity, which is one of the proposed interventions. A related point is that given the need for using hazardous elements for functionality, is it realistic to have an outcome that "hazardous waste streams … will be removed from the value chain"? It is suggested that the program qualifies what hazardous material can realistically be removed from the value chain, what interventions will be used to minimize the use of those that are essential in products, and how environmental impacts will be minimized/prevented at product end-of-life.

5. **Project Components**: All project components are reasonable and logically connected through the ToC. STAP comments are presented in the next Section of this screen.

6. Engaging **stakeholders.** One set of players not mentioned is that of international standards-setting organizations where standards compliance is usually voluntary but widespread by manufacturers in the global marketplace. These non-regulatory standards can present a significant barrier or could be a potent enabler. For example, analyses of flammability standards for exterior computer casings drove the use of PBDEs and now other hazardous halogenated and non-halogenated flame retardants. These standards are based on limited evidence and considerations, and yet lead to downstream barriers to recycling (e.g., thinking beyond PBDEs and now UV-328 POPs to other hazardous and/or persistent flame retardants used in exterior plastic cases).

7. The **calculations of GEBs** appear logical and necessarily contain large uncertainties given the ambitious scope of the project. The provision of granular program-specific indicators is also commended.

8. Gender considerations are grounded in an understanding of the issues and well-discussed in the proposal. However, the measures taken to redress gender imbalances could be more ambitious by targeting involvement at the upper (well-paid) as well as lower part of the value chain.

9. The discussion of **policy coherence** considers public and private sector policies, with the incoherence between the current business model of the "big tech" companies driving short life spans and the need for public investment to deal with the mounting volumes of e-waste. Component 1 of the proposal can be further developed by carrying out a policy coherence analysis in countries to identify gaps and contradictions. This analysis can help identify leakage that could undermine the effectiveness of the project interventions. STAP's policy coherence advisory document includes activities and steps that a project could implement to do this.

10. Analysis of **risks:**

- Risks related to the financing of hazardous waste disposal should be considered under the "financial and business model" risk assessment.
- Risks related to economic up- and downturns should be considered, including the major cyclical price fluctuations of some elements used in ICT devices such as copper.

3. Specific points to be addressed, and suggestions

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

- Use updated data, e.g., from the 2024 Global E-waste Monitor report.
- Make the assumptions clearer and more connected to the project activities. Reconsider some of the assumptions and barriers (e.g., standard setting by third-party organizations, "big tech" opening up IP rights to enable repair) and how these would influence activities. What could be done if these assumptions do not hold?
- Consider the element of time in the sequencing of activities.

- Component 1: Enabling Policies on Circular Electronics. Do outcomes under this component require capacity building and a "road-map" for avoiding policy incoherence? Recommend undertaking a policy coherence analysis as discussed in Section 2.9 above.
- Component 2: Cleaner production and sustainable consumption and use.
  Outcome 2.1. How will sustainable, low-toxicity raw materials and "ethically sourced sustainable materials" be identified, and who will make this identification? This would seem to be challenging and requires thorough consideration of options to avoid unintended consequences, e.g., difficulties in reducing the flow of "conflict minerals" with the unintended consequence of increasing illegal flows.
  Outcome 2.2. It is reasonable to partner with educational institutions to better integrate sustainability concerns, which are usually trumped in research and development by technological innovation focusing on processing speeds, miniaturization, etc. Here, buy-in from "big tech" will be important in legitimizing and prioritizing sustainability concerns given their influence in educational institutions (e.g., funding R&D).
  Will this component include a longer list of hazardous materials beyond MCCPs? If so, who will develop that list, and how will screening be conducted?
- Component 3: Resource-efficient value chain across the electronics sector. Who will develop standards? Urban mining requires sound and well-managed recovery technologies, such as high-temperature smelters, to separate and purify metals. Whereas dismantling can be a local activity (that requires occupational health protection measures), smelters are large regional facilities. Who will oversee the recommendations and implementation of such technologies?
  Outcome 3.1. Would promoting the reuse of components be aided by standardization, which was discussed earlier in the proposal?
  Regarding recycling, although it makes complete sense to recover elements, and certainly, many valuable elements are contained in ICT devices, such recovery can be uneconomic because of the technical difficulties of separating trace amounts of many elements coupled with the low cost of primary materials. For example, the industry has reduced its use of gold in each printed circuit board, making it more difficult and expensive to recover the gold (e.g., Ciacci et al. 2016 and Helbig et al. 2020).
  Outcome 3.2. Is screening required to identify ICT device components containing hazardous materials like MCCPs, etc? It is good that the project will provide information on BAT/BEP for the "proper disposal" of hazardous materials.
  Will efforts be made to increase women's participation in technology development and other "high-end" and more lucrative aspects of the project, not just participation in recycling and remanufacturing?
- Component 4: Knowledge management, communication, and program-level coordination. Comprehensive plan of activities and outputs.
  Will the activities include developing and disseminating methods to track program indicators, e.g., how to estimate the number of units/yr avoided or recovered?
  How will the "number of health or epidemiological cases related to electronics manufacture or e-waste collection…' be quantified?

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?

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?

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?

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**)?

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.)