GEF-8 PROJECT IDENTIFICATION FORM (PIF)

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General Project Information

Project Title	
Accelerating Transition to a Circular Economy in India's Electrical and Electronic Sector through Sustainable Integrated Approaches	
Region	GEF Project ID
India	11405
Country(ies)	Type of Project
India	FSP
GEF Agency(ies):	GEF Agency ID
UNDP	9664
Executing Partner	Executing Partner Type
Ministry of Environment, Forest and Climate Change, India	Government
GEF Focal Area (s)	Submission Date
Chemicals and Waste	10/18/2023
Project Sector (CCM Only)	
Taxonomy	
Knowledge Generation, Capacity, Knowledge and Research, Capacity Development, Stakeholders, Focal Areas, Chemicals and Waste, Open Burning, Plastics, Best Available Technology / Best Environmental Practices, Waste Management, Persistent Organic Pollutants, Uninentional Persistent Organic Pollutants, Influencing models, Strengthen institutional capacity and decision-making, Demonstrate innovative approache, Beneficiaries, Private Sector, Individuals/Entrepreneurs, Communications, Awareness Raising, Gender Equality, Gender results areas, Participation and leadership, Gender Mainstreaming, Sex-disaggregated indicators, Targeted Research, Knowledge Exchange, Learning	
Type of Trust Fund	Project Duration (Months)
GET	60
GEF Project Grant: (a)	GEF Project Non-Grant: (b)
15,000,000.00	0.00
Agency Fee(s) Grant: (c)	Agency Fee(s) Non-Grant (d)
1,350,000.00	0.00
Total GEF Financing: (a+b+c+d)	Total Co-financing
16,350,000.00	105,000,000.00
PPG Amount: (e)	PPG Agency Fee(s): (f)
300,000.00	27,000.00
PPG total amount: (e+f)	Total GEF Resources: (a+b+c+d+e+f)

327,000.00	16,677,000.00

Project Tags

CBIT: No NGI: No SGP: No Innovation: No

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. The explanation and justification of the project should be in section B "project description".(max. 250 words, approximately 1/2 page)

The electric and electronics equipment (EEE) manufacturing is an important part of the global economy. Their production and consumption patterns also have led to generation of large quantities wastes (e-waste), which can be a source of hazardous wastes that pose risks to humans, the environment and to sustainable economic growth of nations, as variety of metals and heavy metals, plastics and (hazardous) chemicals are used by the electronics industry for different purposes.

In India, e-waste is mostly processed by informal sector using precarious and manual - and even open burning - processes which lead to high emissions of toxic chemicals and heavy metals. Therefore, the objective of this project is to reduce (and/or eliminate) the adverse impacts of POPs, UPOPs and heavy metals (such as mercury and lead) on human health and environment by making strategic interventions across the life cycle and the value chain of electrical and electronic equipment and strengthening India's capacity for the environmentally sound management e-waste through integrated approaches.

The project is intended to be transformative in nature as it will integrate circular economy principles in the electrical and electronic (manufacturing) sector by implementing measures throughout the entire value chain of products till their end-of-life (including recycling and disposal) through the proposed interventions:

1. Strengthen the institutional mechanisms and develop knowledge-based interventions including design of innovative economic models
2. Improve practices, systems and technologies for the EEE Manufacturing and its Supply Chain through prevention methods and socio-technical ESM models/pilots aimed for future replication.
3. Improve the e-waste management ecosystem by deploying investments, prevention measures, infrastructures and technologies for POPs and u-POPs and heavy metals emissions/releases reduction in e-waste processing.
4. Make information and knowledge accessible, raise awareness and build networks and partnerships facilitate knowledge sharing among the EEE sector stakeholders, national and subnational Governments, and link national action to international/global programmes on e-waste

The project will achieve the reduction of use and emissions of 10,500 metric tonnes and 232.74 g.TEQ of Persistent Organic Pollutants (POPs and U-POPs), 8,000 metric tonnes of heavy metals, 2.62 metric tonnes of mercury and other toxic chemicals in the production of future EEE; collect and dispose of 94,500 metric tonnes of plastics and recover 365 metric tonnes of previous metals (Au, Pt, Rh, Pd, Li, Co, Ni) . At the same time it will reduce the emissions of 508,200 tons of CO_2-eq during its lifecycle.

Indicative Project Overview

Project Objective

The objective of this proposed project is to reduce (and/or eliminate) the adverse impacts of POPs, UPOPs and heavy metal (such as mercury) on human health and environment by making strategic interventions across the life cycle of electrical and electronic equipment and strengthening India's capacity for the environmentally sound management of electrical and electronic wastes (e-waste) through integrated approaches.

Project Components

1. Strengthen institutional mechanisms and develop knowledge-based interventions including design of innovative economic models.

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
2,500,000.00	12,000,000.00

Outcome:

1.1) Enabling environment enhanced for sustainable EEE production and e-waste management

Output:

1.1) Circular Economy baseline for EEE eco-design and cleaner production established

1.2) Inventories of e-waste generation and assessment on externalities established, cost of e-waste management mapped, and value chain of key materials identified taking into consideration specific gender-related aspects.

1.3) E-waste rules' enforcement, including EPR monitoring, harmonized among national and subnational level and coordination mechanism and guidelines for management e-waste established.

1.4) Frameworks for audit of e-waste recycling facilities developed.

1.5) India's RoHS for imported and manufactured EEE assessed and gender-sensitive recommendations proposed to strengthen its implementation and aligned for the national/subnational action.

1.6) Gender-sensitive Eco-design and eco-labelling standards and guidelines proposed at targeted industries.

1.7) Economically sustainable management model for e-waste designed and piloted

2. EEE Manufacturing, Supply Chain and EOL Ecosystem improvement through prevention measures and socio-technical ESM models/pilots for replication.

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
6,100,000.00	48,000,000.00

Outcome:

2.2) POPs and other highly hazardous releases and emissions from EEE's unsound production and e-waste's management reduced with support from financial models and BAT/BEP piloted.

Output:

2.1) Initiate the transformation of the EEE production and assembly in at least two (2) Original Equipment Manufacturers (OEMs) through eco-design and other inputs/materials/chemicals reduction measures piloted.

2.2) At least two (2) Feasibility Studies for replacement/rebate models of used EEE developed with manufacturers (OEMs) and/or large retailers to support strengthening of EPR schemes.

2.3) At least one (1) gender-responsive economically sustainable model with OEMs for education and public engagement on e-waste collection (offsetting) and supply chains piloted.

2.4) At least three (3) gender-responsive schemes for e-waste collection and BEP for transforming or upgrading informal processing facilities developed and piloted.

2.5) Lithium-ion scrap batteries management pilot (1), developed and tested, linked to upstream electric car production to manage their off-spec batteries, with ESM model and guidelines prepared.

3. Improvement of baseline systems and infrastructures for POPs and uPOPs reduction in e-waste processing.

Component Type	Trust Fund
Investment	GET
GEF Project Financing ($)	Co-financing ($)
4,750,000.00	36,051,000.00

Outcome:

3.1) Systems changed and Infrastructures for reduction of POPs and uPOPs & recovery of key materials improved.

Output:

3.1) Circularity gender-responsive infrastructure for eco-design in OEM facilities (3) assessed and improvements' feasibility determined.

3.2) Review of baselines and BAT/BEP in process for metal and valuable material extraction from e-waste tested in one (1) pilot site

3.3) Gender-responsive Feasibility study(ies) and strategic roadmap developed for replication of 3.2.

3.4) Process for PBDEs removal from e-waste' plastics designed, assessed and pilot scale tested in one (1) site.

4. Knowledge management, Global coordination & cooperation, and monitoring & evaluation (M&E).

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
600,000.00	3,000,000.00

Outcome:

4.1) Global, regional cooperation improved, and capacities enhanced.

Output:

4.1) Coordination established with Global Programmes and Initiatives for knowledge management and information exchange and gender equality action.

4.3) Gender-sensitive Awareness and training Programme(s) for stakeholders, consumers, recyclers and dismantlers launched. Women are empowered to lead and participate in awareness and training activities.

4.4) Gender-sensitive Guidelines on incorporating EPR/CE principles and results, metrics and impacts into ESG Reports launched and Champions on ESG reporting identified through an manufacturer's driven awareness programme.

M&E

Component Type	Trust Fund
Technical Assistance	GET
GEF Project Financing ($)	Co-financing ($)
350,000.00	1,000,000.00

Outcome:

4.2) Awareness training and robust mechanism for monitoring and evaluation developed.

Output:

4.2) Gender-responsive Cross collaboration, including web-based MIS system and communication platform established and aligned with global programmes or initiatives on EEE Sector.

4.5) Gender-sensitive Project Monitoring & Evaluation established and ongoing throughout project cycle.

Component Balances

Project Components	GEF Project Financing ($)	Co-financing ($)
1. Strengthen institutional mechanisms and develop knowledge-based interventions including design of innovative economic models.	2,500,000.00	12,000,000.00
2. EEE Manufacturing, Supply Chain and EOL Ecosystem improvement through prevention measures and socio-technical ESM models/pilots for replication.	6,100,000.00	48,000,000.00
3. Improvement of baseline systems and infrastructures for POPs and uPOPs reduction in e-waste processing.	4,750,000.00	36,051,000.00
4. Knowledge management, Global coordination & cooperation, and monitoring & evaluation (M&E).	600,000.00	3,000,000.00
M&E	350,000.00	1,000,000.00
Subtotal	**14,300,000.00**	**100,051,000.00**
Project Management Cost	700,000.00	4,949,000.00
Total Project Cost ($)	**15,000,000.00**	**105,000,000.00**

Please provide justification

PROJECT OUTLINE

A. PROJECT RATIONALE

Briefly 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, Root Causes and Barriers that need to be addressed.

Generation of e-waste in India

1. E-waste is one of the fastest growing waste streams in India and the country's Consumer Electronics and Appliance Industry is expected to become the fifth largest in the world by 2025.[1][1] The Indian electronics market is one of the world's largest in the world, and the industry saw a Compound Annual Growth Rate (CAGR) of 17.9% from 243,263 crore (USD 37 billion) in 2015-16 to 554,461 crore (USD 74.7 billion) in 2020-21.[2][2] And the Centre for Science and Environment (CSE) found that 5.8 kg/capita EEE was put on the market and 2.4 kg/capita e-waste was generated in 2019.[3][3] According to the Ministry of Electronics and Information Technology (MeitY), the key drivers of this growth are: a large domestic market, availability of skilled talents and low-cost labour.

2. India, after China and the United States, is the third largest generator[4][4] of e-waste. As per the Global E-waste Monitor 2020, the country generated a total of 3.23 million tonnes of e-waste in 2019. It is only known that approximately 70% of the total e-waste in India is generated in nine states. The following are the nine states in descending order of e-waste generation: Maharashtra, Tamil Nadu, Andhra Pradesh, Uttar Pradesh, West Bengal, Delhi, Karnataka, Gujarat, Madhya Pradesh. Main sources of electronic waste in India are government and industrial sectors (public and private), which account for almost 70 % of total e-waste generation. The contribution of individual households is relatively small at about 15%; the rest being contributed by manufacturers.

3. As of June 2023, the Central Pollution Control Board (CPCB) has authorized a total of 569 recycling facilities with a cumulative capacity of 1.79 million tonnes of e-waste. Half of the recycling facilities are clustered in the western and south-western part of the country. Consequently, more than half of the states rely on interstate e-waste management.

4. According to research from the Associated Chambers of Commerce and Industry of India (ASSOCHAM), e-waste consists of three components: glass (37%), metals (33%) and plastics (30%). The same research found the following metallic constituents of e-waste: iron (52%), zinc (3%), copper (18%), aluminium (12%), lead (3%), other (12%). Due to fact that e-waste contains precious metals such as silver, gold, platinum, palladium, and scarce metals such as lithium, nickel, and cobalt, it is attractive for the formal and informal sector[5][5] to collect

and process this type of waste. The composition of EEE renders e-waste a unique and profitable waste stream making it unlikely to be littered on the streets or in common waste bins in the cities and villages.

5. Formal e-waste collection in India is 1%, indicating that only 0.03 Mt of the 3.23 Mt e-waste generated in 2019 became part of the formal recycling value chain (Source: CSE and E-waste Monitor). The Ministry of Environment, Forest, and Climate Change (MoEF&CC) stated that approximately 1.6 Mt e-waste was generated in 2021-2022 (and about 1 Mt in 2019-2020), of which 0.35 Mt was processed. However, this figure pertains to only 21 Nos. of items as categorised in previous e-waste rules of 2016.

6. The new e-waste rules of 2022 identify a total of 106 Nos. of items of which generation data is yet to be ascertained. Therefore, it should be noted that there are discrepancies on e-waste data, further confirming a lack of transparency through its value chain.

7. It is also known that the largest fraction of the e-waste managed in India, which may be up to 95%, is through the informal sector and the rest in formal units. Women tend to be the main economic contributors within the informal sector. The informal sector in India is diversified and typically characterised by poverty and unsafe conditions due to the lack of regulations and institutional recognition leading to high exposure of hazardous chemicals and negative health effects on workers.

8. In and around metropolitan cities all over India, there are over 3,000 informal units engaged in some form of e-waste management. A large cluster of units are in Delhi, Tamil Nadu, U.P., Karnataka, Maharashtra, Gujarat, Kerala, Andhra Pradesh, West Bengal and Rajasthan. The e-waste is usually processed through crude and unscientific methods of material extraction. Informal units generally practice cannibalizing, polluting processing technologies such as de-soldering of cable and crude leaching of printed circuit boards to extract high value metals, while burning and randomly disposing of residual plastics.

9. More critically, extraction of precious metals is usually done through uncontrolled and open burning processes that causes emission of toxic chemicals, including U-POPs (PCDD/Fs and PBDD/Fs), and heavy metals including lead, cadmium, mercury in particular. Additionally, the discharges from e-waste processing leads to the release of POPs such as Polychlorinated Biphenyl (PCB) and Polybrominated Diphenyl Ethers (PBDE) which are used as flame retardants resulting in soil and water contamination. This leads to considerable occupational health and safety concerns as well as environmental pollution.

10. Electrical and Electronical Equipment contain different hazardous substances with environmental and health risks. [6][6] For instance, CRTs (Cathode Ray Tubes) used in TVs, monitors, ATMs, video cameras, batteries, PVC cables and paints consist of lead, barium and other heavy metals that can leach into ground water and release toxic emissions. Other examples are batteries, housing and medical equipment that contain mercury, and plastic from printers, keyboards, monitors etc. containing BPA, DEHP and DBP and PVC; and polymer paints, printing inks, electrical transformers and capacitors that contain polychlorinated Biphenyls (PCBs). These components release harmful chemicals into the soil and the air, and other toxic chemical exposure during use. Some effects on human health include risk of developing heart problems, suppression of the immune system and muscle tumours.

11. An indicative estimation of actual POPs and toxic chemicals emission, when it is estimated that India generated and disposed of ~4,000,000 MT of e-waste in 2020 (plus a conservative 5% of import), is as follows. Assuming that 50 % of the cables and metal/plastic mixtures are burned in an uncontrolled manner for thermal wire reclamation, that would lead to: 4,200,000 *0.035 (2% weight fraction cables plus 5% metal/plastic

mixtures)*12,000 µg TEQ/t = 1,764 g-TEQ/yr in PCDD/F emissions (emission factor for open burning of cables: 12,000 µg TEQ/t, UNEP Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs 2013, Cat. 2, Class m), while the uncontrolled burning of circuit boards could be responsible for: 4,200,000 MT*0.017 (1.7 % weight fraction circuit boards) *100 µg TEQ/t = 7.1 g-TEQ/yr in PCDD/F (emission factor for open burning of circuit boards: 100 µg TEQ/t, Hedlund et al. 2005). Total of estimated emissions then is 1,771.1 g-TEQ/yr.

12. As for Polybrominated Diphenyl Ethers PBDEs (commonly referred to as Brominated Flame Retardants, BFR), if it is conservatively assumed that in total ~ 2 percent of e-waste weight is made up of plastics containing PBDEs in a concentration of ~1600 mg/kg, therefore the mass flow of PBDEs contained in e-waste in India is ~ 134.4 MT/year. PBDE can be released during the high temperature stages of recycling processes. This amount needs to be verified, but there is, however, no doubt that the PBDEs may be released to a very high degree from e-waste in India. Regarding mercury contained in EEE such as LCD backlights, lamp components, display panels etc, if it is assumed that its concentration in e-waste is of 5 g/T, an amount of about 21 tonnes will be present.

13. Metallic contents of key metals, form calculations from other countries, reveal that a potential of recovery of 1,000 t of lithium, 1,800 t of cobalt and 1,200 t of nickel exists from e-waste processing.

14. Regarding electromobility and their waste, until September 2023, a total of 759,182 electric vehicles have been registered in India with a growth in sales of 133% from FY15 to FY20. A total of 380 Electric Vehicle (EV) manufacturers operates in the country and 1.32% of all vehicle sales in FY21-22 were electric[7][7]. In 2022, the EV market reached 772 million USD. The transition to e-mobility is a priority for the Government of India and is being implemented through the flagship scheme: Faster Adoption and Manufacturing of (Hybrid) and Electric vehicles (FAME). Throughout the country 1,800 EV Charging Stations have been installed and further expansion is underway. So far reduction of 2,656 kilotons of carbon dioxide emissions have been achieved. The Accelerated e-Mobility Revolution for India's Transportation (e-AMRIT) is a web-portal by the government of India, which provides extensive information pertaining to electric vehicles, such as the earlier mentioned data, tools with calculations, a charging station map and other resources. It is critical that the lifecycle management of batteries in EV sector could be piloted in India.

15. It is finally noted the substantial leakage of the collected waste to the informal recycling facilities take place, leaving significant quantities of waste to be processed by the private sector. Besides, formal operations are at a disadvantage with respect to informal since they pay taxes and other levies. Additionally, there is low willingness of public to pay for e-waste management. Accordingly, the rationalisation of pricing of e-waste needs to be addressed to support formal recycling facilities. This can be done by stakeholders, especially recyclers and PROs – who are responsible for the financial and/or operational organisation of Extended Producers Responsibility (EPR).

16. As another major source is auction of e-waste by bulk consumers, the EPR provision could be specifically effective. Yet the informal sector in India is the backbone of recycling and resource recovery. Both PROs and recyclers may formally engage with informal waste pickers (also known as *kabadiwala*) through a mutually accepted financial model. Besides recycling, it is essential to also focus on extending the life of EEE, as part of the transition to a circular and inclusive economy in the electrical and electronics sector, but financial mechanisms to support this transition are still not clear in India.

17. Finally, the second-hand electronic market in India is estimated to be worth $11 billion (by value) by FY26 and it is growing at a rate of 16% compounded annually. Since some years, major retailers such as Amazon and Flipkart are selling refurbished electronics on their platforms. This indicates interest and demand for reuse and repair, which used to be part of India's repair economy. For the transition to a circular economy in the electronics sector, it is essential to adopt the principles of eco-design including Design for Environment (DfE, taking into account reuse and recycling) in business models. There is an ongoing initiative on plastic waste management in 50 cities of India, supported by UNDP and financed by private partners, which may have synergies with this proposed projects, particularly in the collection of e-waste related plastics.

Baseline Regulations and Policies and the Role of subnational Governments

18. The Ministry of Environment, Forest, and Climate Change (MoEF&CC) is the nodal agency for policy and planning, to ensure the environmentally sound management of e-waste in India. Until 2008, e-waste was addressed in accordance with the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008. The first regulation exclusively on e-waste was the E-Waste (Management & Handling) Rules, 2011, which came into effect in May 2012. The 2011 rules were superseded by the E-Waste (Management) Rules 2016 and subsequently by E-waste (Management) Rules, 2022, which were amended most recently in July 2023.

19. Considering the size of the country and the substantial amount of waste generated, the implementation of Extended Producer Responsibility (EPR) remains a challenge. It is critical to establish strong data management systems and efficient tracking mechanisms to facilitate EPR compliance and policymaking. Integrating EPR with the principles of a circular economy, keeping pace with technological advancements, bridging the gap between the informal and formal recycling sectors, and fostering consumer awareness all pose significant challenges in the successful implementation of EPR.

20. The current Rules lay a strong emphasis on Extended Producer Responsibility (EPR). Two (2) categories are covered under the Rules of EEE namely (i) IT and Telecommunication Equipment and (ii) Consumer Electricals and Electronics. Moreover, annual e-waste recycling targets are set on 60% of the EEE put on the market between 2023-2024 and rise to 80% from 2027-2028 and onwards. For EPR, the target for 2023-2024 is 15% of the sale figure of financial year 2021-2022. This increases to 20% of the sale figure of the financial year two years back from 2024-2025 onwards. However, importers of used EEE have a 100% EPR obligation, if the products are not re-exported. The current rules also promote refurbishing by incentivizing; only 75% of the deferred quantity is added to the EPR of the producer for recycling upon expiry of the extended life of the refurbished product.

21. The E-Waste (Management) Rules 2022 define the responsibilities for each stakeholder in the e-waste ecosystem including manufacturers, producers, refurbishes, bulk consumers, dismantlers, recyclers and the subnational Governments (State Pollution Control Boards, which are responsible for implementation); Producers are required to fulfil their EPR obligations and may take help of third party organisations such as Producer Responsibility Organisation (PRO), collection centres, dealers. A scheme of an overall e-waste management is presented in Figure 1 below. Activities in the boxes are those according to the E-Waste 2016, and this still applies for the latest 2023 amendment.

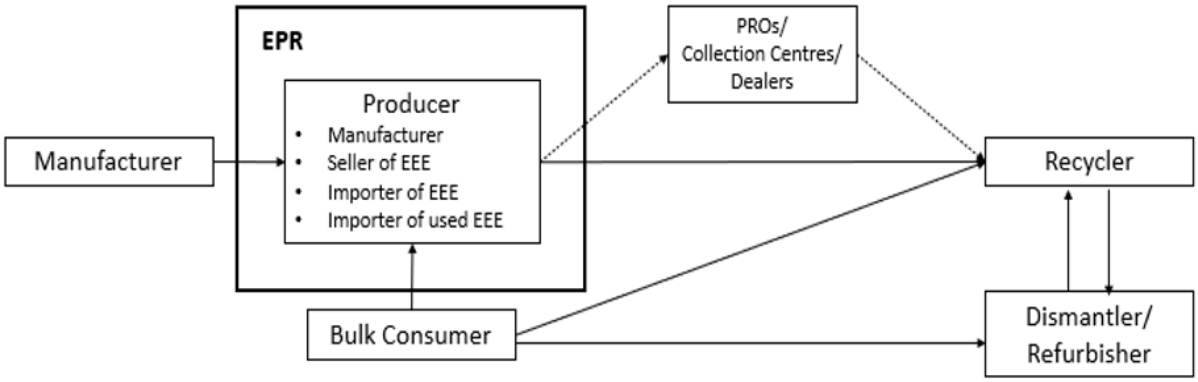

Figure 1. Flow of materials and responsibilities in India

22. The disposal of municipal solid waste is mainly done through landfilling, waste to energy plants, and thermal treatment such as incineration and resource derived fuels (RDFs). The E-Waste (Management) Rules, 2022 assigns the urban local bodies (Municipal Commissions) the responsibilities to ensure that e-waste, if found to be mixed with municipal solid waste is properly segregated, collected and is channelised to an authorised dismantler or recycler. It is also the responsibility of the urban local bodies to ensure that e-waste pertaining to orphan products is collected and channelised to an authorised dismantler or recycler. However, it is suspected that a part of this may be getting leaked to informal collectors who often are women. Therefore, enforcement of the E-waste Rules, 2022 is required to be more stringent.

23. Labour conditions in the e-waste industry is regulated by Rule 10 of the E-waste (Management) Rules, 2022, and also refer to additional regulations that prohibit child labour, whereby the Department of Labour in a State or any other government agency authorised in this regard by the State Government has to ensure recognition and registration of workers involved in dismantling and recycling; assist formation of groups of such workers to facilitate setting up dismantling facilities; undertake industrial skill development activities for the workers involved in dismantling and recycling; and undertake annual monitoring to ensure safety & health of workers involved in dismantling and recycling. Further, the rules mandate the Central Pollution Control Board to prepare an integrated plan for effective implementation of these provisions, and to submit an annual report to the Ministry of Environment, Forest, and Climate Change regarding the status of implementation of the e-waste management rules with quantitative and qualitative analysis along with its recommendations.

24. From 2015, MeitY has implemented the “Awareness Programme on Environmental Hazards of Electronic Waste”. The objective was to create awareness among the public about the hazards of informal recycling across India. On their website (http://greene.gov.in/), information such as manuals for Training of Trainers, relevant documents, reports, videos, audios, and flyers is freely available. According to their dashboard, there were 1,315,402 participants under the e-waste Awareness Activity, 1,247 participants in the Training of Trainers, 5,789 participants in Capacity Development of Government Officials and 201,162,090 participants on the Mass Awareness Campaign through Cinema. Over 97% of the participants are from schools (30.41%), colleges (16.99%), bulk consumers (30.99%) and resident welfare associations, also known as RWA (18.78%). As for the achieved stakeholders, 1,516 belong to the informal sector, 1,535 were refurbishers and 2,170 were retailers.

Upstream Responsibilities and EEE Manufacturing and their Rules

25. Rule 16 of the E-waste management Rules, 2022, targets the Reduction in The Use of Hazardous Substances In The Manufacture Of Electrical And Electronic Equipment And Their Components Or Consumables Or Parts Or Spares (RoHS). It states that new EEE and their components/consumables/parts/spares may not contain lead,

mercury, cadmium, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers beyond a maximum concentration value of 0.1% by weight in homogenous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers and of 0.01% by weight in homogenous materials for cadmium.'

26. Out of the total consumption of EEE in India, 54% (in monetary value terms) comes from domestic production.[8][8] In order to expedite the focus on Circular Economy (CE) and ensure the transition of India from a linear to a circular economy, NITI Aayog (policy think-tank of GoI) constituted committee proposed [9][9]. This plan focuses action on:

(a) Design, Component Manufacturing, Product Assembly stage- Design requirements of ICT/ CE devices to evaluate scope for Indian eco-design programme, design for recyclability.

(b) Consumption Stage- Product obsolescence / Extension of product-life, eco-labelling on the products, resource efficiency. This policy paper emphasises the need of a global framework which would be more effective than standalone domestic pieces of legislation for promoting eco-design.

27. The Central Pollution Control Board (CPCB) has been given the responsibility of ensuring ROHS compliance through mandatory checks. The Board has to conduct random sampling of EEE put on the market to monitor and verify compliance and testing costs has to be borne by the producer. If the product does not comply, producers have to take corrective measures and withdraw or recall the product from the market.

28. The Battery Waste Management Rules. 2022 are separate from the e-waste management rules and set EPR targets for all type of batteries viz. electric vehicle batteries, portable batteries, automotive batteries, and industrial batteries. In 2027-2028, the minimum use out of total dry weight of the battery for portable and EV batteries is 5% and for automotive and industrial batteries is 35%. From 2030-2031 onwards this will be respectively 20% and 40%. In contrary to the e-waste management rules, the functions of the consumer are emphasized, giving them the responsibility to discard the waste battery separately from other waste streams and deliver this to a special entity for collection, recycling or refurbishing of e-waste. The recovery targets for 2024-2025 for portable and EV batteries is 70% and for automotive and industrial batteries 55%, which will increase to respectively 90% and 60% from 2026-2027 and onwards. And producers have Extended Producer Responsibility obligations. The CPCB provides EPR certificates for recyclers and refurbishes based on the weight of the battery processed, percentage fulfilment of material recovery targets for specified year and geographical (i.e., domestic or imported) source of the battery. Furthermore, there are prohibitions on heavy meal contents (mercury and cadmium specifically) in the battery and labelling requirements.

Country's Responsibilities in front of the Stockholm and Minamata Conventions

29. One of the major goals of the Stockholm Convention on Persistent Organic Pollutants is the continuing minimization and, where feasible, ultimate elimination of POPs and unintentionally produced POPs (Article 5). Article 6 of the Stockholm Convention requires each Party to develop and implement strategies to identify existing POPs stockpiles, and to develop strategies for identifying products in use that contain or are contaminated with POPs and POPs-containing wastes. Similar goals are sought by the Minamata Convention

on Mercury, and this is especially relevant to India as products that contain mercury end up in the same e-waste stream for processing and recycling.

30. E-waste is an issue of concern with reference to unintentional release of POPs and toxic chemicals. Research from ASSOCHAM showed that 76% of the e-waste workers in India suffer from respiratory ailments such as breathing difficulties, irritation, coughing and choking, which is a direct result of improper safeguards. Workers and children are among the most exposed to toxic emissions on a daily basis as work is done with bare hands and without protective masks.[10][10] This is highly concerning since air pollution in India is already severe.

Barriers to be removed

31. At the EEE production stage, barriers are more strongly structural. OEMs are well established and high technology companies and therefore:

a) They will be resilient to adopt changes, such as some that will be proposed in this project.

b) Difficulty to adopt EPR from Ewaste rules, in such a way that it can be reflected at the design and production stages.

c) Financial access for modifications of their processes

32. With regards to the end-of-life stage, it is known that substantial leakage of the collected waste to the informal recycling facilities take place, leaving significant quantities of waste to be processed by the private sector. Besides, formal operations are at a disadvantage with respect to informal since they pay taxes and other levies. Additionally, there is low willingness of public to pay for e-waste management. Accordingly, the rationalisation of pricing of e-waste needs to be addressed to support formal recycling facilities. Yet the informal sector in India is the backbone of recycling and resource recovery. Both PROs and recyclers may formally engage with informal waste pickers, also known as *kabadiwala*) through a mutually accepted financial model. Besides recycling, it is essential to also focus on extending the life of EEE, as part of the transition to a circular and inclusive economy in the electrical and electronics sector.

33. Barriers that need to be addressed to incorporate and mainstream a sound management of e-waste and thus minimize its environmental and health impacts, can be summarized as follows:

a) Lack of data and knowledge about the dimension of the streams of the different e-waste categories as well as their routes of processing;

b) Unknown amount of illegal e-waste imports.

c) Need of stronger implementation of the E-Waste Rules 2022, specially with respect to EPR Schemes (and their sustainable financial mechanisms);

d) Need to take into consideration and address the liabilities around the well-established informal processing/trading sector;

e) Lack of know-how and skill set among formal and informal small and medium enterprises (SMEs) on sustainable technologies that could be adopted to avoid release of POPs and other harmful substances from e-waste processing and increase SRM and CRM recovery efficiency;

f) Lack of economically appealing conditions for the informal sector such as an *ad-hoc* business models;

g) Lack of economic/social incentives, such as "take back systems'' for individuals to return the e-waste collected to original manufacturer and not to the informal chain.

h) Lack of innovative schemes of collaboration along the value chain actors, particularly between producers and recyclers through PROs to share the benefits ;

i) Lack of awareness among individual consumers on how safely dispose the e-waste generated by them.

j) Capacity constraints of relevant agencies at national, state and local level

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[1] Ministry of Electronics and Information Technology 2022. Annual Report 2021-2022

[2] MeitY, initiative: Make in India

[3] Atin Biswas and Siddharth Ghanshyam Singh 2020. E-waste Management in India: Challenges and Agenda, Centre for Science and Environment

[4] B Forti V., Baldé C.P., Kuehr R., Bel G. 2020. The Global E-waste Monitor 2020: Quantities, flows and the circular economy potential. United Nations University (UNU)/United Nations Institute for Training and Research (UNITAR) – co-hosted SCYCLE Programme, International Telecommunication Union (ITU) & International Solid Waste Association (ISWA), Bonn/Geneva/Rotterdam.

[5] Situation of informal e-waste processing in India is important to be described. This is a well-established activity that goes across most parts of the country. They work organized in a form of "inverse supply chain". As a case example, the initial, home-to-home- or from landfill collection of e-waste in its different kinds is performed by waste pickers, who take them and sell to an "aggregator" in small storage centres, who then sells the collected e-waste to either PROs or directly to recyclers. PROs then convey the consolidated collected and pre-selected materials to the final recycler.

[6] MeitY 2018. E-waste Awareness for Informal Sector: Manual for Training of Trainers.

[7] Data reported on the e-amrit portal by NITI Aayog as on 14th Sep 2023. https://e-amrit.niti.gov.in/home

[8] Press information Bureau release on Production of Electronic Goods. https://pib.gov.in/PressReleasePage.aspx?PRID=1881410

[9] https://www.meity.gov.in/writereaddata/files/Circular_Economy_EEE-MeitY-May2021-ver7.pdf

[10] Garg, Neha (2019). E-Waste Management in India: A Study of Current Scenario. [S.l.]: SSRN. https://ssrn.com/abstract=3356877.

B. PROJECT DESCRIPTION

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 PIF guidance document. (Approximately 3-5 pages) see guidance here

Project Objective

34. The objective of this proposed project is to reduce (and/or eliminate) the adverse impacts of POPs, UPOPs and heavy metal (such as mercury) on human health and environment by making strategic interventions across the life cycle of electrical and electronic equipment and strengthening India's capacity

for the environmentally sound management of electrical and electronic wastes (e-waste) through integrated approaches.

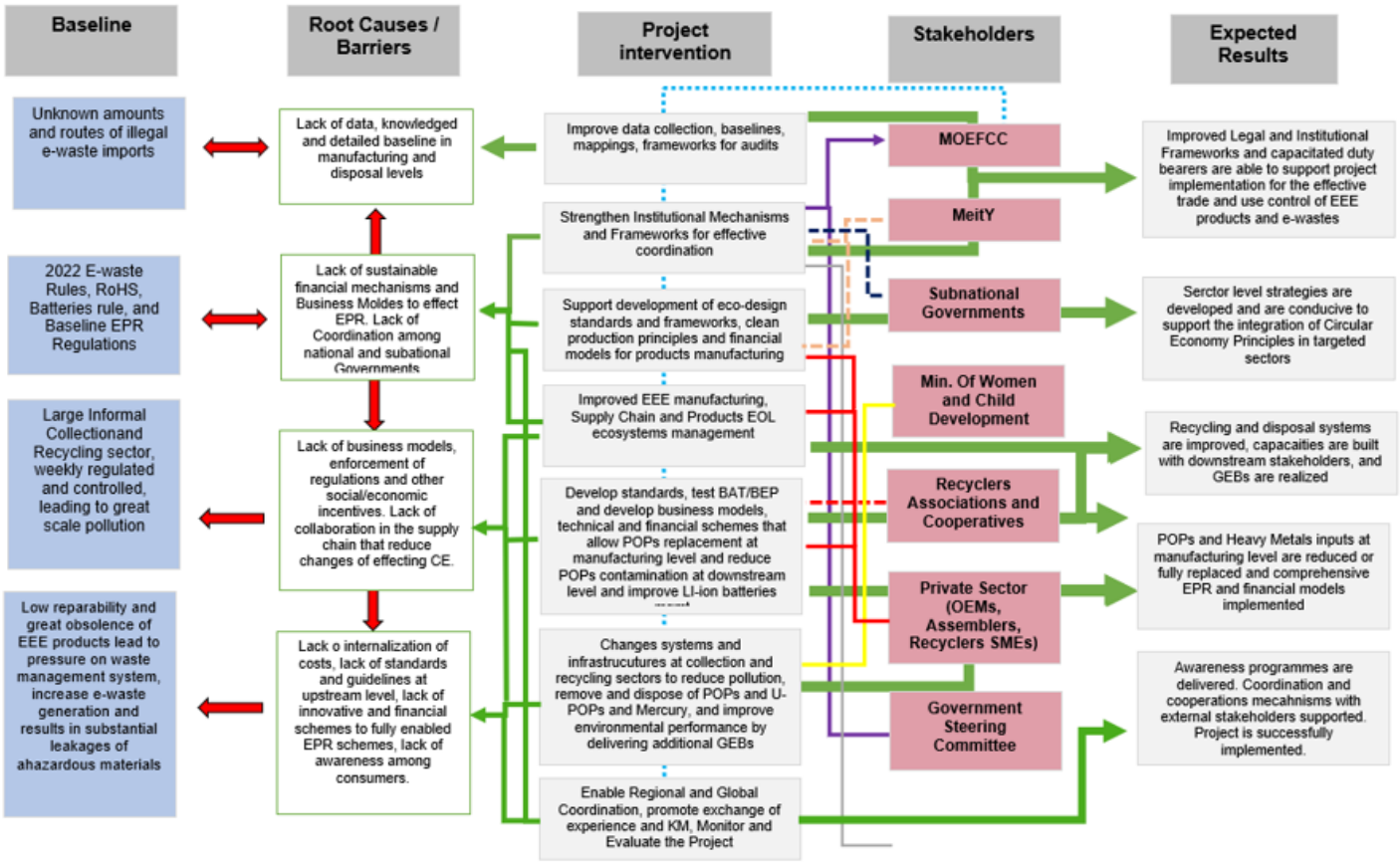

Figure 2. Intended Theory of Change

Component 1. Strengthen institutional mechanisms and develop knowledge-based interventions including design of innovative economic models.

Outcome 1. Enabling environment enhanced for sustainable EEE production and e-waste management

35. The baseline for a Circular Economy on EEE considering eco-design and cleaner production assessments will be established and the inventorization of e-waste on environmental externalities (socio-health), cost of management options including POPs & toxics, mapping of existing capacities & technologies and value of key materials determined.

36. To initiate the baseline, a comprehensive national e-waste inventory is needed and will be developed based on the methodology developed by the United Nations University (UNU) to calculate the e-waste generated and undertake a Material Flow Analysis (MFA) of EEE production through to end of life. A mapping of POPs (PBDEs) and other highly hazardous (HH) constituents (Cadmium, Lead, Chromium and Mercury) flow along the electronic waste life cycle will then also be realized. This will include selected sampling and chemical analyses and the determination of potential release of PBDEs, PBDD/F and PCDD/F.

37. At the same time, key value metals (Lithium, Cobalt, Nickel, Rare earths, precious and platinum group metals) will be identified and estimated. In addition, material specific technical standards will be developed for POPs and other toxic chemicals.

38. Environmental externalities and solutions' processing costs will be assessed. Sources, generators, types, management bottlenecks, critical points of accumulation in public health and the environment of e-waste will be identified and assessed, taking into consideration gender-sensitive approaches and impacts. Precious and key metals contained in e-waste will be quantified, besides other value containing materials. This will be presented in the development of guideline for e-waste inventories in Indian cities and states; and further application in model 4 metro-cities for demonstration and dissemination to rest of the country.

39. A comprehensive socio-environmental gender assessment of the impact of informal recycling, its nature of operation, collection networks, modus operandi of recycling and informal recycling hubs in various states will be developed. This will be complemented with determination of potential environmental effects as well as its health effects on informal male and female collectors and recyclers, and other workers along the value chain: i.e., from discarding by public down to final end-of-life, with the aim of improving health and livelihoods of general population and workers through a gender-responsive approach.

40. Nationwide e-waste value chain of the recycling industry will be assessed, including listing and characteristics of industries. Formal units will be determined from authorizations and informal units estimated by surveys and visits and with the support of Bulk Consumers help. This industrial sub-sector will be assessed in number of facilities, size, process type, processing capacity and personnel involved. A certification system to ensure the adoption of environmentally sound e-waste management practices will be developed based on internationally known practices.

41. A comprehensive assessment (including identification of gaps and problem areas) of the national EPR system, (including review of other countries' successful models regarding enforcement of extended producer responsibility and likely model appropriate for Indian context) contained in the country will be developed, since the success of the implementation of the regulatory system hinges on a well-financed, competitive, and effective EPR system, especially important is the function of PROs. From that, amendments referring particularly to enforcement mechanisms will be developed and proposed. Audit framework for E-waste value chain will be developed, based on experience from ISO 18000 and other voluntary hazardous waste audits from other countries, such as R2 and E stewardships. Draft guidelines will be prepared and discussed. An electronic monitoring mechanism will be developed, tested and established, supported by results of outcome B on EPR.

42. A gender-sensitive coordination mechanism, supported by guidelines specifically designed for the purpose, will be developed to harmonize the local/state administrative permits for transportation, collection, and management of e-waste. A gender-sensitive working interstate group will be established for discussion and supported by the platform to be developed above.

43. Policy recommendations for restriction on the toxic contents of imported and nationally manufactured electronics goods, which is referred to as the "E-waste Management Rules, 2022", will be implemented and enforced (subject to development of gender-sensitive Strategic Environmental and Social Assessment – SESA, that will include consultation with gender groups potentially impacted by these measures). Results of the implementation will be first assessed through a Pilot with a specific imported product and/or waste. After pilot is finalized, assessment of overall implementation will be developed, including its economic cost.

44. Eco-design and eco-labelling standards for EEE production, will be prepared based on BAT/BEP from other countries and in the experience in India. Standards will be socialized and guidelines for their implementation prepared. Eco-design practices will be tested in conjunction with Component 2, and further refined.

45. A study will be undertaken to explore the product subscription model with the aim of diminishing the generation of electronic waste and extending the lifespan of electronic products in response to technological obsolescence, taking into consideration gender aspects to be identified as part of the Gender Action Plan (GAP).

46. A reference, gender-responsive, economically Sustainable Model (ESM) for India will be designed and developed for integration into the entire value chain. The concept creation of the model will be based on the learnings obtained during baseline development, in the present and evolving ecosystem assessment, in world trends in E-waste management and EEE production and supported by recent E-waste Rules and other regulations, keeping in mind the social wellbeing of the workers and people.47. Departing from the feasibility study of E-waste recycling and processing of India, the economic dimension will be determined, and development of financial instruments/ mechanism will be realised, to be adapted for supporting the path for the full establishment of the integrated in the reference model, allowing regulations' compliance. This Mechanism will include Extended Producer Responsibility. Financing sources for the establishing of successful business models (start-ups) and implementation projects for EEE eco-design and for e-waste sound processing, will be identified and fostered, from the background information developed by the UNDP Asia Regional Office for plastics and circular economy.

Component 2. EEE Manufacturing, Supply Chain and EOL Ecosystem improvement through prevention measures and socio-technical ESM models/pilots for replication.

48. Deployment of improved Extended Producer Responsibilities (EPR) of the manufacturers (OEM) and assemblers will be tested through application of Eco-design measures[1][11] covering different aspects of product design but strongly enforcing the reduction of POPs and other chemicals in processes. Pilots will be developed in conjunction with 2 different OEMs, which are to be selected at the beginning of the Project's implementation, since design modifications take long time. Definition of the modification in design to be addressed and the OEMs to work with will be further defined along PPG phase in direct discussion between the stakeholders.

(a) Gender equality perspective will be taken into consideration in the mapping and identification of OEMs, retailers, assemblers and other stakeholders by conducting inclusive stakeholder analysis and participatory consultations.

49. A pilot will be designed and implemented to integrate interest of two different OEM and/or large retailer into a model for either used equipment replacement of equipment of the same brand or model, by a newer version, paying a differential. Or else, upgrading the used equipment into larger capacities. Alternative to this, can be to apply a rebate in the buying of a new one.

50. A gender-responsive ESM will be designed and tested for the establishment of a direct relationship between an OEM and educational institutions, taking advantage of the interest of youth into the preservation of environment. In the basic format, OEM will pay for specific awareness lessons to school (from secondary up) and develop and pay for collection and processing of the E-waste from- and around the school. This will be accounted for in the ESG reports of the OEM as well as for EPR.

51. Pilot (1) on Lithium-ion batteries management, including from collection, sorting and neutralization as preparation for export for recycling, will be tested mainly in two senses: for risks prevention from explosions and as a materials (lithium, cobalt and nickel) source. Work will be linked to car main automobile's' manufacture which produces electric cars to also manage their off-spec Lithium batteries. A business model

will be developed in order to foster a likely start up. A practical guideline for will be elaborated and disseminated.

Component 3. Improvement of baseline systems and infrastructures for POPs and uPOPs reduction in e-waste processing.

52. Circularity infrastructure (such as production machinery) and gender-sensitive knowledge capacities will be assessed in at least 3 OEM facilities. As a result, from the assessment, type and dimension of the required infrastructure adaptations for a more circularized operation of the facilities will be determined. (*More circular meaning e.g., adaptations to produce easier to disassemble EEE, easier to repair, easier to upgrade, etc*). Feasibility study and cost-benefit analysis of the facility will then be realised. This pilot can also be combined with the following stage of the value chain, that is, large retailers of the brand OEM. In this way, the extension of circularity can be expanded to logistics measures.

53. A gender-responsive Pilot with a group of "informal recyclers' facilities" will be developed sustained in the E-waste (Management) Rules, 2022, whereby Department of Labour in the State or any other government agency authorised in this regard, "shall assist formation of groups of such workers to facilitate setting up dismantling facilities; shall undertake industrial skill development activities for the workers involved in dismantling and recycling; and undertake annual monitoring and to ensure safety & health of workers involved in dismantling and recycling". The Pilot will consist in organizing a group of informal recyclers into a gender-sensitive "cluster" to train them on "low-tech", or what is named as "appropriate technology" in order for them to lower their health damage and to the environment. Once established, model will be tested and evaluated for their feasibility of replication.

54. Gender-sensitive technical assistance in (4) Pilot Projects for informal recyclers/Assemblers/Refurbishes will be designed and developed in order to obtain optimized operations as to BAT/BEP. Aspects sough will also be improved mechanical pre-treatment processes to minimize losses of valuable fractions and diffusion of POPs/PTS and support facilities that remove components from PCBs to upgrade them to an integrated process. A gender-sensitive best practice Guideline will be produced in order to serve as the basis for a standard at later stages. New/up-gradation of processing facilities with minimum benchmarks and standard operating procedures to bring in professionalism in the process of e-waste processing and recycling will be obtained.

55. An E-waste pilot processing unit focused on the informal sector capabilities and for micro and small enterprises of the sector will be designed and built for metals extraction from the final products of the E-waste recyclers. Capacity would be of a 500 kg/day and can be developed in partnership with a private sector company. Process can be either Pyrometallurgical or Hydrometallurgical. This pilot project will be deployed to recover not only gold, silver and platinum group metals, but also strategically valuable metals such as Lithium, Cobalt and Nickel from E-waste batteries. In this extraction process, standard commodity metals such as copper and other will be recovered too. An important aspect to be evaluated is that the feasibility of the sustainable model, so recovered metals can generate the value and compensate the cost of removal of all PBDEs from plastics containing these chemicals. Feasibility study for a plant of 800 t/day (about 20,000 t/year) will be developed.

56. An E-waste pilot processing unit will be designed, needs based, and built for POPs and other toxic chemicals (mainly PBDEs) removed from the end-of-life materials from the recyclers. This can be set in a location where many recyclers or disassemblers are located, to minimize the risk in transport. Approximate capacity would be of 500 kg and can be developed in partnership with a Producer (OEM), in order to best fulfil EPR from E-waste Rules 2022. In the design, stages of separation will be assessed. Two alternate routes will be assessed during PPG phase, to define whether it will be physical segregation of plastics containing flame retardants at the dismantling stage or else chemical recycling/neutralization of the plastics.

(a) The Above pilot projects will also adopt an inclusive approach to avoid any gender discrimination and ensure the participation of women, youth groups, and vulnerable groups while mainstreaming the gender aspect through the empowerment and participation of diverse groups of women and men in e-waste management.

Component 4. Knowledge management, Global coordination & cooperation, and monitoring & evaluation (M&E)

57. An interactive information and knowledge platform will be established, firstly through known means such as internet, but also making use of social networks. Platform will include a board of experts from universities and CSOs, who will manage it and implement other activities to disseminate their topics among others: most importantly, as a tracking system, peer reviewed and grey literature, policy, accountability, experiences in all life cycle, knowledge on best practices, tool kit, institutional and legal framework, management decisions, etc. This will entail preparation and implementation of a gender-sensitive communication strategy and plan that would focus on sharing knowledge.

58. This component will support the collection of findings and experiences from Components 1 and 2 on the work with Manufacturers and develop guidelines on how reporting on EPR schemes, CE interventions and systems change can be incorporated in ESG Reports and track the reporting of stakeholders to identify Champions by campaigning (awareness) with these upstream actors. In particular, efforts will be made to identify best practices (that promote gender equality so as to provide specific guidance and examples for mainstreaming gender perspectives across the lifecycle of the project) – to achieve greater effectiveness, better outcomes and stronger co-benefits.

59. Coordination with other present or future initiatives, at regional or global scales will be implemented through collaboration for knowledge and lessons learnt exchange, participation in regional or global platforms, participation in other countries projects, sharing of project's results, financing aspects, and other.

60. At global level the project will seek collaboration for knowledge and lessons learnt exchange through knowledge management component, including the global Gender Action Plan, and harmonize gender-sensitive approaches between components. At national level the project intents to coordinate with the most relevant ongoing initiatives of the government and private sector. Through this coordination, the project will be able to identify gaps in the current interventions and possible paths for joint interventions, as well as build on the past executed work.

61. More specific coordination and cooperation modalities will be further investigated during the PPG. During the PPG, the specific existing knowledge sharing mechanisms and flows between these initiatives and projects will be identified and mapped to ensure and establish an efficient knowledge sharing system that allows all to coordinate and cooperate where relevant.

62. M&E and adaptive management in response to necessities and results from the intermediate evaluation and final findings with lessons learned applied.

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[1] Taking Eco-design as per EU Directives scopes for EEE, as:

- product durability, reusability, upgradability, and repairability
- presence of substances that inhibit circularity
- energy and resource efficiency
- recycled content

- remanufacturing and recycling
- information requirements, including a Digital Product Passport
- carbon and environmental footprints

Coordination and Cooperation with Ongoing Initiatives and Project.

Does the GEF Agency expect to play an execution role on this project?

No

If so, please describe that role here. 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

1. The Implementing Partner (GEF Executing Agency) for the project will be the Ministry of Environment, Forestry and Climate Change (MOEFCC) and the project will be implemented over a period of six (6) years with UNDP as the GEF Implementing Agency.

2. The project is expected to be implemented through the National Implementation Modality (NIM), and potentially, execution support may be provided by UNDP Country Office in order to allow the MOEFCC and the PMU (Project) Staff to use Financial, Procurement and ERP systems to execute parts of the Project that Governmental institutional and legal framework find limitations.

3. During PPG Phase, the MOEFCC and UNDP will consider all specific execution options to present the proposed Implementation Modality to the GEF, if applicable, by the CEO Endorsement Request submission.

4. Independently of the Implementation Modality sought, relevant execution guidance will be obtained through the National Steering Committee set up with the Secretary of the MOEFCC as the chairperson and in conjunction with the Project Board to be formed under the Project Framework. It is expected that a Project Manager will head the PMU, reporting technically directly to the Project Board (to be co-chaired by the MOEFCC) and who will be responsible for coordination with the Hazardous Waste Management Division (HSMD), Ministry of Electronics and Information Technology (MeitY), other line ministries and departments and overseeing the implementation of the project.

5. This GEF project will cooperate and coordinate closely with ongoing initiatives to ensure sharing of information and lessons and collaboration in related activities as described in the Table below:

Table: Complementarity with existing Projects and Programs

Ongoing Initiatives	Complementarity with GEF 8 project
GEF/UNDP Accelerating adoption of super-efficient technologies for sustainable thermal comfort in buildings in India (2023-2029) $4,534,357	The project aims to support Government of India and key stakeholders in policy, institutional & technical readiness to curb GHG emissions through accelerating the provision of energy efficient thermal comfort in buildings in India and enable market transformation of energy efficient building technologies. The GEF-8 project may learn from the star-labelling model on energy efficiency and cooling technologies and designing the guidelines for national rollout with EEE products.
Plastic Waste Management program with private sector (2018-2024) $4,534,357	This project aims to create a socio-technical model for taking plastic waste management from informal to formal economy and establish material recovery centres for sustained practices in waste management. In addition to these alignments, the other interventions on institutionalizing Swachhta Kendras within governance framework structures and improving socio-economic conditions of waste pickers, developing technology-supported knowledge management would align well with the GEF project.
Phase II of Japan Supplementary Budget-Leveraging NDCs for Low Carbon Development Pathways' (2023-2024) $5,174,839	This project will examine the ESG baseline for the entire life cycle of solar PV systems, ranging from raw material extraction through manufacturing, deployment, and end-of-life management at the disposal stage, etc. The GEF-8 project can learn from the project's Just Transition plans, supporting the deployment of low-emission technologies and facilitating the implementation of climate-positive adaptation in the waste management sector and the life cycle of EEE sector.

Core Indicators

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)	508200	0	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)				
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)	508,200			
Expected metric tons of CO_2e (indirect)				
Anticipated start year of accounting	2026			
Duration of accounting	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)
19.43	0.00	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)
Decabromodiphenyl ether (commercial mixture, c-decaBDE)	16.80			

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)
2.63			

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)

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)
10,500.00			

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)
94,500.00			

Indicator 10 Persistent organic pollutants to air reduced

Grams of toxic equivalent gTEQ (Expected at PIF)	Grams of toxic equivalent gTEQ (Expected at CEO Endorsement)	Grams of toxic equivalent gTEQ (Achieved at MTR)	Grams of toxic equivalent gTEQ (Achieved at TE)
232.74			

Indicator 10.1 Number of countries with legislation and policy implemented to control emissions of POPs to air (Use this sub-indicator in addition to Core Indicator 10 if applicable)

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

Indicator 10.2 Number of emission control technologies/practices implemented (Use this sub-indicator in addition to Core Indicator 10 if applicable)

Number (Expected at PIF)	Number (Expected at CEO Endorsement)	Number (Achieved at MTR)	Number (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	3,200			
Male	3,200			
Total	**6,400**	**0**	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)

Calculations are direct result of the achievement of the project's objective (at the end of implementation) and is calculate against the project lifecycle (6 years).

The reduction / elimination of 5% of the releases or emissions in 2022 is the baseline withing the total of 4,200,000 t/yr of e-waste generated in India. Hence, the project's resources will be used to achieve this target at the end of the 5th year of implementation (an average of 2.5% each year reduction will translate into a 12.5% elimination of the baseline amount of each pollutant), more specifically:

· For PBDEs, it is conservatively assumed that ~ 2% of e-waste weight is made up of plastics containing PBDEs in a concentration of ~1600 mg/kg (0.0016 conversion factor), (see reference by Hedlund).

· For PBDD/F: 4,200,000 *0.035 (2% weight fraction cables plus 5% metal/plastic mixtures)*12,000 µg TEQ/t = 1,764 g-TEQ/yr in PCDD/F emissions (emission factor for open burning of cables: 12,000 µg TEQ/t, UNEP Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other Unintentional POPs 2013, Cat. 2, Class m), while the uncontrolled burning of circuit boards could be responsible for: 4,200,000 MT*0.017 (1.7 % weight fraction circuit boards) *100 µg TEQ/t = 7.1 g-TEQ/yr in PCDD/F (emission factor for open burning of circuit boards: 100 µg TEQ/t, Hedlund et al. 2005). Total of estimated emissions then is 1,771.1 g-TEQ/yr.

· For PCDD/F, e-waste is considered to contain 20% plastic and it is assumed that each 1 t of plastic emits 0.00012 g-TEQ when inadequately burnt.

· For Hg, assuming a base concentration of 5g/T is contained in e-waste.

· For CO2 eq. emissions avoided, the four main materials contained in e-waste are steel, aluminium, copper and plastic (which account for about two thirds of the total mass), from own calculations with data from different reference sources the following arises: (from virgin minerals) 1.52 t of CO2e emissions per t of e-waste ; (through recycling of metals) 0.64 t of CO2e emissions per t of e-waste; therefore, net t 0.88 t of CO2e emissions are avoided through e-waste recycle. And assuming that the remaining third of the mass includes low energy demands materials, except for the precious and energy transition metals, a conservative 10% extra increase is considered, to give a 0.968 t of CO2e avoided per t of e-waste treated.

· Finally, assuming 80% collection efficiency of e-waste, from the project's goal, the processing average would be 320 t/day (from 84,000 t/yr average) @ an average 50 kg/day per worker day, of which 50% would be male and 50% female.

Risks to Project Preparation and Implementation

Summarize risks that might affect the project preparation and implementation phases and what are the mitigation strategies the project preparation process will undertake to address these (e.g. what alternatives may be considered during project preparation- such as in terms of consultations, role and choice of counterparts, delivery mechanisms, locations in country, flexible design elements, etc.). Identify any of the risks listed below that would call in question the viability of the project during its implementation. Please describe any possible mitigation measures needed. (The risks associated with project design and Theory of Change should be described in the "Project description" section above). The risk rating should reflect the overall risk to project outcomes considering the country setting and ambition of the project. The rating scale is: High, Substantial, Moderate, Low.

Risk Categories	Rating	Comments
Climate	Low	There could be increased consumption of resources (and GHG emission) and other emissions due to migration from informal to formal recycling activities. Also, as result of climate adverse issues driven by climate change, there could be the potential risk of flooding or structure damage to recycling / temporary e-

		waste (and its materials') storage facilities.
Environment and Social	Moderate	The Pre-Screening has identified 8 risks related to this project: three (3) categorized as LOW and five (5) categorized as MODERATE; The risks pre-identified are largely of impacts of medium magnitude, limited in scale (site-specific) and duration (temporary), can be avoided, managed and/or mitigated with relatively uncomplicated measures. Hence, at this stage, it is considered that Project has activities with potential adverse social and environmental risks and impacts that are few in number, limited in scale, largely reversible and can be identified with a reasonable degree of certainty and readily addressed through application of recognized good international practice, mitigation measures and a stakeholder engagement plan during project implementation, in which can be either addressed by the project itself, while others could be addressed through specific scoped assessments and plans, also to be developed and integrated in the project design. In addition, as good practice, it would be recommended the PPG to also develop an ESMF to strengthen the risk mitigation or avoidance framework in a more integrated manner. However, during PPG phase, full SESP will be conducted to assess whether risks stand, particularly at the same levels of Impact and Likelihood, as well as to identify any other risks. In this sense, the overall risk categorization for this project could change.
Political and Governance	Low	In terms of Political stability, India was reported index at --0.61504 in

		2021, according to the World Bank collection of development indicators, compiled from officially recognized sources as per World Bank (2023). Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism. Estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from approximately -2.5 to 2.5. Hence, this risk is categorized as “Low'
Macro-economic	Low	As per the World Bank Outlook (2023), India is one of the fastest growing economies of the world and is poised to continue on this path, with aspirations to reach high middle income status by 2047. It is also committed to ensuring that its continued growth path is equipped to deal with the challenges of climate change, and in line with its goal of achieving net-zero emissions by 2070. Both the general government fiscal deficit and public debt to GDP ratio increased sharply in FY20/21 and have been declining gradually since then, with the fiscal deficit falling from over 13 percent in FY20/21 to an estimated 9.4 percent in FY22/23.
Strategies and Policies	Moderate	Duty-bearers (e.g. sub-national government Officers) may not be equipped/capacitated to fulfill their roles within the project outcomes. PPG phase will consider the targeted states and the capacities of current Duty-bearers and is expected to include in its design targeted capacity-building and awareness activities to support the full deployment of guidelines designed

		by project so these can be used, and enforced, by the Duty-bearers.
Technical design of project or program	Low	
Institutional capacity for implementation and sustainability	Low	The responsibility for project implementation is proposed to rest with the Hazardous Waste Management Division, Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India. The HACT will be conducted for the proposed Implementing Partner during the PPG Phase of the project. Elements of sustainability, scale up and replicability will be embedded in Project design during PPG phase.
Fiduciary: Financial Management and Procurement	Low	The responsibility for project implementation is proposed to rest with the Hazardous Waste Management Division, Ministry of Environment, Forest and Climate Change (MoEF&CC), Government of India. The HACT will be conducted for the proposed Implementing Partner during the PPG Phase of the project.
Stakeholder Engagement	Moderate	Private stakeholders may present resistance to implement policies' measures. PPG phase will consider the targeted states and the capacities of stakeholders and a Stakeholders Engagement Plan will be developed to assure their buy-in and cooperation under the project.
Other		n/a
Financial Risks for NGI projects		n/a
Overall Risk Rating	Moderate	

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

Describe 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.

Confirm if any country policies that might contradict with intended outcomes of the project have been identified, and how the project will address this.

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. (max. 500 words, approximately 1 page)

1. India is Party to both Stockholm and Minamata Conventions, so their nationals' policies, in particular the most recent ones, are aligned with those MEAs.

2. The project is aligned with GEF 8 programming and objectives 1, 2, and 3 under the Chemicals and Waste Focal Area. Through promoting circular economy approaches, implementing upstream measures, and tackling the chemicals and waste at end of life, the project will prevent highly hazardous chemicals and waste containing POPs from entering uncontrolled dumps and/or material recovery supply chains.

3. The project integrates circularity principles across the value chain of EEE in terms of product design, enhancing product sustainability, improving recycling/ refurbishment/ repair and finally the material recovery and sound management of end-of-life EEE products. It will support the three Chemicals and Wastes Objectives by:

   (a) adopting and implementing policy and economic instruments that aim to enable environment for sustainable EEE production under Component 1;

   (b) by improving design and manufacture of EEE products with prevention measures and socio-technic models and pilots under Component 2 ;

   (c) by managing e-wastes containing POPs in an environmentally sound manner under Component 3, and by;

   (d) enhancing capacity in applying circular economy practices to reduce pollution from e-waste containing POPs and valuable and key materials extraction under Components 3 and 4.

4. The proposed actions address to reduce and eliminate the adverse impacts of POPs, UPOPs and heavy metal such as mercury and other highly hazardous chemicals towards achieving the GEF-8 target of eliminating these and preventing their entry into the global environment. Promoting a circular economy transition in India's electrical and electronics sector will improve production, consumption, and environmentally sound disposal patterns, and eventually reduce POPs and the release of chemicals of concern to the environment. It will also contribute to achieving GEF-8 targets on Green House Gas emissions and other benefits of recovery of key metals.

5. No national policy contradicts any of the proposed outcomes of this Project, on the contrary, the most recent one's E-waste management rules 2022 and Battery Rules 2022, are very favourable to project's outcomes. For a large and rapidly developing country like India, which lacks domestic reserves of rare earth elements required for manufacturing EEE, transitioning to a circular economy provides an opportunity to improve resource availability for the electronics sector and ensure the environmentally sound management of e-waste.

6. However, there might be differentiated Legal, Policy and Institutional responsibilities spread over stakeholders at national and subnational government levels, particularly in relation to downstream activities (waste management, recycling and waste movement for disposal). The project design will recognize any differentiated and conflicting responsibilities, identify the core of the issue and proposed coordination mechanisms and harmonization practices and framework that could hinder any project output.

D. POLICY REQUIREMENTS

Gender Equality and Women's Empowerment:

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

Yes

Stakeholder Engagement

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

Yes

Were the following stakeholders consulted during project identification phase:

Indigenous Peoples and Local Communities:

Civil Society Organizations: Yes

Private Sector: Yes

Provide a brief summary and list of names and dates of consultations

Gender

1. Efforts to ensure the Sound Management Persistent Organic Pollutants (POPs) and their emissions have important gender dimensions. In daily life, men, women, and children are exposed to different kinds of chemicals in varying concentrations and receive the impacts from them. Limited Gender Stakeholders were initially consulted during PIF development (India's Ministry of Gender and Child Development focal points; UNDP Country Office and Regional Gender Specialists and Academia). Further consultations will be expanded and carried out during PPG phase when recycling partners and pilot site locations are identified and screened.

2. This gender assessment will be conducted during the PPG phase and will lead to the design of a Gender Action Plan (GAP) to be implemented with the Project to increase the effectiveness of its outcomes. The GAP will include the collection of sex-disaggregated data and provide gender training for involved staff and project participants, authorities and other stakeholders in collaboration with organizations and institutions that have expertise on gender issues. This will consider aspects such as female workers exposed to POPs and other toxic chemicals, pregnant and fertile populations and vulnerable groups and to develop strategies to address this matter on order to prevent the adverse effects of POPs on their health.

Stakeholders Engagement (including CSOs and Private Sector)

3. The project has conducted high level consultations with Ministry of Industry and Ministry of Environment and Forestry and Climate Change and their relevant stakeholder's consultation bodies. Also, key Industrial and Recycling associations in New Delhi were consulted to support shaping the overarching PIF design. Further consultations will be expanded and carried out during PPG phase when EEE equipment OEMs, assemblers and traders, as well as recycling partners and pilot site locations are identified and screened.

Indigenous Peoples and Local Communities

4. In principle, the sought project locations are to be within cities limits and industrial zones, as well as legally and licensed established recycling facilities and waste disposal sites which are zoned as commercial/industrial sites.

5. At the PIF stage, is not foreseen that cultural heritage sites and indigenous sites will be the scope areas of the project (influence areas). It is also not foreseen engagement with indigenous communities and the project won't make use of indigenous communities' knowledge and resources. However, further consultations with CSOs will be expanded and carried out during PPG phase when pilot site locations are identified and screened.

(Please upload to the portal documents tab any stakeholder engagement plan or assessments that have been done during the PIF development phase.)

Private Sector

Will there be private sector engagement in the project?

Yes

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

Yes

Environmental and Social Safeguard (ESS) Risks

We confirm that we have provided indicative information regarding Environmental and Social risks associated with the proposed project or program and any measures to address such risks and impacts (this information should be presented in Annex D).

Yes

Overall Project/Program Risk Classification

PIF	CEO Endorsement/Approval	MTR	TE
Medium/Moderate			

E. OTHER REQUIREMENTS

Knowledge management

We confirm that an approach to Knowledge Management and Learning has been clearly described in the Project Description (Section B)

Yes

ANNEX A: FINANCING TABLES

GEF Financing Table

Indicative 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 ($)
UNDP	GET	India	Chemicals and Waste	POPs	Grant	15,000,000.00	1,350,000.00	16,350,000.00

Total GEF Resources ($)		**15,000,000.00**	**1,350,000.00**	**16,350,000.00**

Project Preparation Grant (PPG)

Is Project Preparation Grant requested?

true

PPG Amount ($)

300000

PPG Agency Fee ($)

27000

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	Grant / Non-Grant	PPG($)	Agency Fee($)	Total PPG Funding($)
UNDP	GET	India	Chemicals and Waste	POPs	Grant	300,000.00	27,000.00	327,000.00
Total PPG Amount ($)						**300,000.00**	**27,000.00**	**327,000.00**

Please provide justification

Sources of Funds for Country Star Allocation

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Sources of Funds	Total($)
Total GEF Resources					**0.00**

Indicative Focal Area Elements

Programming Directions	Trust Fund	GEF Project Financing($)	Co-financing($)
CW-1	GET	4,600,000.00	27000000
CW-2	GET	5,100,000.00	40000000
CW-3	GET	5,300,000.00	38000000
Total Project Cost		**15,000,000.00**	**105,000,000.00**

Indicative Co-financing

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount($)
Recipient Country Government	Ministry of Environment, Forest and Climate Change	In-kind	Recurrent expenditures	10000000
Recipient Country Government	Ministry of Electronics and Information Technology	In-kind	Recurrent expenditures	10000000
Private Sector	Original Equipment Manufacturers, Producers, Recyclers, Electronics Companies	Grant	Investment mobilized	60000000
Private Sector	Product manufacturers, resellers/ refurbishers/ dismantlers/ recyclers of e-waste	In-kind	Recurrent expenditures	20000000
GEF Agency	UNDP	In-kind	Recurrent expenditures	5000000
Total Co-financing				**105,000,000.00**

Describe how any "Investment Mobilized" was identified

Private Sector: Investment of USD 60 million is expected to be mobilized through on-going and planned initiatives related to e-waste recycling, processing, management, material recovery and by manufacturers that invest in upstream circularity design approaches in manufacturing and product assembly. Other private sector entities will be tapped (based on the financial assessment) for promoting the circularity in EEE sector. The private sector partners will be finalized during the PPG.

Note: Co-financing activities are tentative and will be formally agreed to at PPG stage.

ANNEX B: ENDORSEMENTS

GEF Agency(ies) Certification

GEF Agency Type	Name	Date	Project Contact Person	Phone	Email
GEF Agency Coordinator	Pradeep Kurukulasuriya	10/17/2023	Anderson Alves		pradeep.kurukulasuriya@undp.org
Project Coordinator	Anderson Alves	10/17/2023	Anderson Alves		anderson.alves@undp.org

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

Name	Position	Ministry	Date (MM/DD/YYYY)
Mr. Neelesh Kumar Sah	Joint Secretary and GEF OFP India	Ministry of Environment, Forest and Climate Change (MoEFCC)	10/17/2023

ANNEX C: PROJECT LOCATION

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

Specific project sites, and their locations, will be determined during PPG Phae.

ANNEX D: ENVIRONMENTAL AND SOCIAL SAFEGUARDS SCREEN AND RATING

(PIF level) Attach agency safeguard screen form including rating of risk types and overall risk rating.

Title
PRE SESP Ewaste_India_for clearance _CLEAN-4Oct2023

ANNEX E: RIO MARKERS

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

ANNEX F: TAXONOMY WORKSHEET

<<Table below for now taken from GEF-7 PIF>>

Level 1	Level 2	Level 3	Level 4
Influencing Models	Strengthen institutional capacity/ decision-making		
Influencing Models	Demonstrate innovative approaches		
Stakeholders	Private sector	Entrepreneurs	
Stakeholders	Beneficiaries		
Stakeholders	Communications	Awareness Raising	
Capacity, Knowledge and Research	Knowledge Generation and Exchange		
Capacity, Knowledge and Research	Capacity Development		
Capacity, Knowledge and Research	Targeted Research		
Capacity, Knowledge and Research	Learning		
Gender Equality	Gender mainstreaming	Sex-disaggregated indicators	
Gender Equality	Gender results areas	Awareness Raising	
Gender Equality	Gender results areas	Participation and Leadership	
Focal Area/Theme	Chemicals and wastes	Persistent Organic Pollutants	
Focal Area/Theme	Chemicals and wastes	Persistent Organic Pollutants	
Focal Area/Theme	Chemicals and wastes	Unintentional Persistent Organic Pollutants	
Focal Area/Theme	Chemicals and wastes	Waste Management	
Focal Area/Theme	Chemicals and wastes	Plastics	
Focal Area/Theme	Chemicals and wastes	Open Burning	
Focal Area/Theme	Chemicals and wastes	Best Available Technology / Best Environmental Practices	