

# **Financing Mitigation and Adaptation Projects (FMAP) in Indian MSMEs Programme**

## **Environmental & Social Impact Assessment [ESIA] and Environmental & Social Management Plan [ESMP]**

### **Direct Financing Plastic Sector**

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**In consultation with Green Climate Fund (GCF)**



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## Section 1:

### 1. ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

#### 1.1 Executive Summary

##### 1.1.1 Overview of the sector related to project activities and its objective

India's plastic industry is a key contributor to the country's manufacturing and export ecosystem. The sector has evolved from being a raw material supplier to a manufacturer of value-added products, serving industries such as packaging, automotive, healthcare, agriculture, and consumer goods. India is among the top global players in plastic production and exports, supported by a strong domestic market and growing international demand. Micro, Small, and Medium Enterprises (MSMEs) form the backbone of India's plastic industry. These enterprises are engaged in activities like injection moulding, extrusion, blow moulding, and recycling. MSMEs contribute significantly to employment generation and innovation, offering cost-effective solutions for diverse industrial applications. With over 30,000 processing units, of which 85–90% belong to small and medium enterprises, the sector ensures flexibility and adaptability to meet customized product requirements.

India's plastic industry exports a wide range of products, including raw materials, moulded goods, packaging materials, and specialty plastics. In FY25, India's plastic exports stood at US\$12.5 billion, rising from US\$11.5 billion in FY24, with major markets in the USA, China, UAE, Germany, and Italy<sup>1</sup>. MSMEs play a crucial role in this growth by maintaining competitive pricing and quality standards, positioning India as a reliable supplier globally. The growth of MSMEs in the plastic sector is driven by rising domestic consumption, urbanization, and expanding industrial applications. Government initiatives such as Make in India, and export promotion programs support MSMEs through financial incentives, technology upgrades, and market access. Additionally, India's focus on sustainability and recycling is creating new opportunities for innovation, with increasing demand for eco-friendly and recyclable plastic products.

MSME in India stands for Micro, Small, and Medium Enterprises. These are businesses categorized based on their investment in plant and machinery/equipment and annual turnover. The MSME classification applies to both manufacturing and service industries. The classification is based on:

- **Investment in Plant & Machinery** (not land/building)
- **Annual Turnover**

**All amount in Indian Rupee (₹)**

| Category | Investment Limit | Turnover Limit   |
|----------|------------------|------------------|
| Micro    | Up to ₹2.5 crore | Up to ₹10 crore  |
| Small    | Up to ₹25 crore  | Up to ₹100 crore |
| Medium   | Up to ₹125 crore | Up to ₹500 crore |

This helps industries access priority lending, government schemes, and subsidies.

<sup>1</sup> Reference: <https://www.ibef.org/exports/plastic-industry-india> (India Brand Equity Foundation, Department of Commerce, Ministry of Commerce and Industry, Government of India)

## Environmental & Social Impacts of the Plastic Sector

The Indian plastic sector faces persistent environmental and social challenges due to intensive use of water, energy, petrochemicals, and fossil fuels across the value chain. Inefficient processes lead to pollution, waste generation, and adverse social outcomes.

### Key Environmental Issues

- 🚧 **Marine and Ecosystem Pollution:** Roughly 2,000 garbage trucks' worth of plastic leak into oceans, rivers, and lakes daily, devastating wildlife and habitats.
- 🚧 **Climate Change and Carbon Footprint:** The plastics industry is a significant driver of the climate crisis, contributing 3.4% of global greenhouse gases. Without intervention, it could consume 20% of total oil production by 2050.
- 🚧 **Low Recycling Rates and Waste Management:** Less than 10% of all plastic produced is recycled, according to the UNEP. Most plastic ends up in landfills, incinerators, or as environmental pollution.
- 🚧 **Microplastics and Toxic Pollution:** Plastics do not biodegrade, breaking down instead into microplastics that enter the food chain, soil, and air. Production and incineration release toxic substances like phthalates and carcinogens.

### Key Social Issues

- 🚧 **Toxicity Throughout the Lifecycle:** Plastic production involves harmful additives, and 99% of plastic is derived from fossil fuels. Workers in manufacturing, refining, and waste management are exposed to these toxins, facing risks of cancer, respiratory diseases, and reproductive issues.
- 🚧 **Waste Burning Fumes:** Improper disposal, such as burning plastic, releases toxic dioxins and furans, causing severe respiratory and chronic health issues in nearby communities.
- 🚧 **Working Conditions:** Long hours, low wages, weak safety standards, and lack of grievance systems, especially in the informal/unorganized sector plastic sector.
- 🚧 **Child Labour Risks:** Mostly eliminated but still observed in informal sub-sectors due to weak oversight.
- 🚧 **Health & Safety Hazards:** Microplastics are found in food, water, and air, leading to ingestion. Workers face risks from toxic chemical exposure, and PPE usage remains low.

Addressing these challenges requires coordinated action by the statutory bodies, industry, civil society, and consumers. A combined focus on environmental sustainability and social responsibility is essential for a resilient and equitable plastic sector in India.

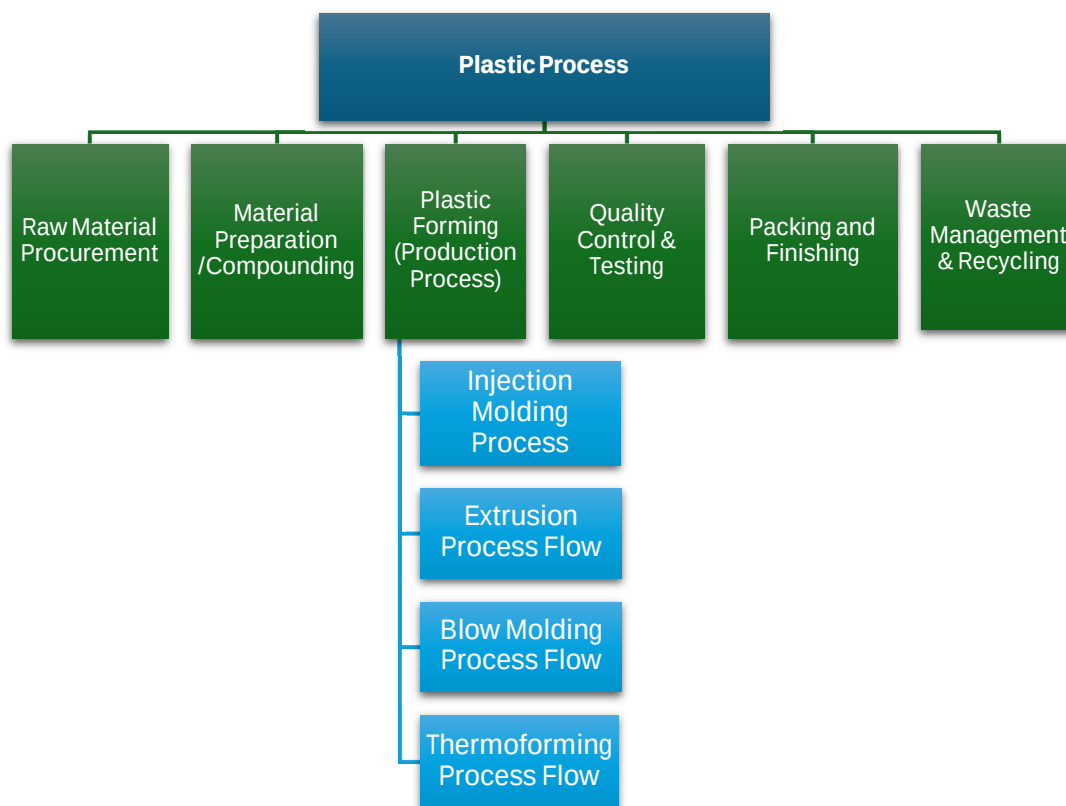
### Plastic Clusters in India

Few of the major plastic clusters in India are spread across different states, forming specialized hubs for manufacturing and processing plastic products. These clusters play a vital role in supporting the plastic industry, particularly MSMEs, by providing shared infrastructure, skilled manpower, and access to raw materials. They focus on activities such as injection moulding, extrusion, blow moulding, and packaging, catering to diverse sectors like automotive, consumer goods, and industrial applications.

Some of the prominent plastic clusters include Surendra Nagar in Gujarat, Karnal in Haryana, Ernakulam in Kerala, Ujjain in Madhya Pradesh, Aurangabad in Maharashtra, Kancheepuram in Tamil Nadu, and Jalpaiguri in West Bengal. These clusters are recognized under the MSME Cluster Development Programme and contribute significantly to production, innovation, and exports in the plastic sector.

**Note:** The above cluster list is indicative and not exhaustive; additional clusters could be added by the Accredited Entity (AE) for funding under FMAP Programme.

### 1.1.2 Process in Plastic Industry in Indian Setup



### 1.1.3 Purpose of the ESIA and its scope

The Environmental and Social Impact Assessment (ESIA) has been developed as a programme - level assessment to evaluate and disclose potential environmental and social risks associated with MSME sub-projects financed under the **Financing Mitigation and Adaptation Projects (FMAP) in Indian MSMEs Programme**. It complements SIDBI's screening and due diligence process under its Environmental and Social Management System (ESMS) [approved by GCF Board] and ensures consistency with the Green Climate Fund (GCF) Environmental and Social Standards (ESS).

In line with ESMS procedures, all proposed sub-projects are first screened against the Exclusion List (Annexure 1) to confirm eligibility. Eligible projects are then assessed for compliance with SIDBI's Environmental and Social Management Policy which is in alignment with IFC Performance Standards. Applicants are required to submit the Environmental and Social Due Diligence form (Annexure 2), followed by project appraisal. During project appraisal, financial ratings of the MSME borrowers are carried out using the respective credit rating model / tool adopted by the organization alongside the Environmental Social and Governance (ESG) rating/ ESDD format. The project appraisal is carried out after carrying out project site assessments to confirm risk categorization and safeguard requirements under FMAP Programme. ESIA/ESMP shall only be applicable for **Category B projects**. The definitions of **Category B** and **Category C** projects are mentioned below.

- **Category B projects** involve technology or process changes that may result in moderate, site-specific, and reversible impacts, such as water discharge, air emissions, chemical and waste handling, energy use, and occupational health and safety concerns. These impacts must be carefully assessed and managed through structured mitigation planning or through use of technology or process where impacts and risks are considered limited, and the magnitude is expected to be low to moderate. The risks and impacts are few, contained within the footprint of the activities, largely reversible, and readily mitigated through generally accepted mitigation measures and good international industry practices.
- **Category C projects** involve low-risk efficiency improvements or equipment upgrades that do not alter manufacturing chemistry or increase pollution loads and therefore present minimal potential for adverse environmental or social effects or Category C activities are typically those that have no physical elements or defined footprints. However, in certain contexts, activities that have physical elements or a footprint may also be considered as low risk, particularly where the activities are small-scale, undertaken within an already built environment, do not involve physical and economic displacement of people or have minimal or no adverse impacts on indigenous peoples.

By providing a structured assessment framework, this ESIA enables the FMAP Programme to evaluate Category B interventions - identifying, analyzing, and mitigating potential environmental and social impacts - while also validating the low-risk nature of Category C projects. This ensures full alignment with SIDBI's ESMS (aligned with IFC Performance Standards), and the GCF Environmental and Social standards.

This ESIA and ESMP are applicable across diverse industrial activities and processes within the **plastic sector, covering various MSME clusters in India**. These frameworks define pathways for classifying risks, evaluating the implications of mitigation technologies and adaptation investments, and establishing a transparent, standardized basis for environmental and social risk management under the FMAP Programme.

### Linkage with GCF

The **FMAP Programme** supports projects that reduce greenhouse gas emissions and enhance climate resilience. MSMEs in the plastic industry can avail assistance under GCF-FMAP Programme for any of the following project types:

#### A. Mitigation

- **Energy Efficiency Projects:** Example- Retrofitting / replacing / upgrading EE machinery / interventions / process optimization, and waste heat recovery to reduce energy consumption.
- **Renewable Energy Integration:** Example- Installation of solar panels / solar water heater in manufacturing units for captive use / Renewable Energy Service sector enterprises that sell solar / wind power to the manufacturing enterprises.
- **Green Mobility & Logistics:** Example- 2 Wheelers, 3 Wheelers, 4 Wheelers, E-buses, E-trucks, charging infrastructure and battery swap.

- **Waste to Energy:** Example- Setting up Waste to Energy projects for generation of Biogas/ Bio CNG/ Power/ producer or syngas from urban, industrial and agricultural wastes/residues.

#### **B. Adaptation:**

- **Water-efficient technologies:** Example- Wastewater / Effluent treatment / ZLD/ Rainwater harvesting systems, surface water storage units, stormwater management equipment and aquifer recharge solutions for drought-prone areas.
- **Climate-resilient materials:** Example-Green Buildings using locally suited, durable materials for housing and infrastructure to withstand extreme weather.
- **Manufacturing Climate innovation related products:** Example- Innovative and locally suited technologies aimed at increasing climate adaptation.
- **Supplying alternative raw materials for those that are at risk from climate change:** Example- Aiding MSMEs who are the suppliers to bigger industries manufacturing technologies to enhance adaptive capacity of end beneficiaries.

### **1.1.4 Objectives of the ESIA**

The key objectives of this ESIA are to:

- Provide a programme-level framework for environmental and social risk assessment of MSME sub-projects under FMAP Programme.
- Ensure compliance with SIDBI's ESMS, IFC Performance Standards, and GCF Environmental and Social Standards.
- Identify and categorize potential risks associated with Category B and Category C projects.
- Establish mitigation measures and safeguard requirements for Category B interventions.
- Validate the low-risk nature of Category C projects to streamline approval and implementation.
- Promote transparency and accountability in environmental and social risk management across MSME sectors.

### **1.1.5 Scope of the ESIA**

The scope of this ESIA covers:

- MSME sub-projects financed under the FMAP Programme in India viz., (i) Brownfield projects set up by an existing enterprise within its existing industrial premises, (ii) Brownfield enterprises going for expansion and modernization of their existing operations in a new location / premises; and (iii) Greenfield projects i.e., setting up of new enterprises.
- Environmental risks such as emissions, effluents, waste management, energy use, and resource efficiency.
- Social risks including occupational health and safety, community impacts, and labor practices.
- Screening, categorization, and appraisal processes consistent with SIDBI's ESMS and GCF ESS requirements.
- Programme-level analysis to guide project-specific assessments and safeguard planning.



### 1.1.6 Summary of key Environmental and Social Risks

The plastic sector has revolutionized the modern world, offering convenience and durability to consumers across a variety of industries, at the same time plastic pollution has become ubiquitous in natural and built environments, raising concerns about potential harm to humans and nature alike. Plastic production involves using non-renewable resources such as oil and natural gas, which are often extracted using environmentally destructive methods. The production process also releases harmful greenhouse gases such as carbon dioxide and methane, contributing to climate change. Therefore, plastic industry poses significant risks, including 3.4% of global greenhouse gas emissions, massive marine pollution, and the release of toxic, carcinogenic chemicals throughout its life cycle. Socially, it causes severe health issues for communities and workers, particularly through air pollution and chemical exposure.

### 1.1.7 Key mitigation measures and recommendations

To address these challenges, the plastic sector can adopt a more balanced and forward-looking approach that safeguards both the environment and people:

- **Increase energy efficiency:** Plastic production requires significant energy, which can contribute to greenhouse gas emissions. Increasing energy efficiency in the production process makes it possible to reduce the amount of energy required to produce each unit of plastic, thus reducing greenhouse gas emissions.
- **Renewables:** Integrate renewable energy solutions such as Solar PV / Wind to reduce emissions and operating costs.
- **Reduce water usage:** Plastic production also requires a significant amount of water, which can put a strain on water resources. By reducing water usage in the production process, it is possible to conserve water resources and reduce the environmental impact.
- **Implement waste reduction strategies:** In addition to recycling plastic waste, it is crucial to implement waste reduction strategies in the production process itself. This can include educating consumers about the importance of recycling and waste reduction and promoting sustainable alternatives to traditional plastic products.
- **Worker Health & Safety:** Provide personal protective equipment (PPE), ergonomic workstations, toxic fume control systems, and regular training on safe handling of chemicals and machinery.
- **Community Safeguards:** Monitor and control noise, dust, and emissions, while maintaining strong fire and emergency preparedness systems to protect surrounding populations.
- **Technology Upgradation:** Encourage adoption of automation, PLC-based controls, and modern waste management and treatment technologies to improve compliance and reduce risks.

*Note: (Process wise detailed list is described in section 1.3)*

## 1.2 Risk Categorization Methodology

The methodology adopted for the ESIA is based on a systematic and participatory approach, ensuring the involvement of all relevant stakeholders and partners associated with the FMAP Programme. With the support of administrative bodies, local authorities, industry associations, and MSME representatives, the study was conducted in a consultative manner to promote

transparency and broad dissemination of information regarding the programme's objectives and potential impacts.

Risk categorization methodology tailored for SIDBI–GCF ESIA/ESMP screening of plastic sector MSMEs in India:

- **Low:** Limited, site-specific impacts; easily mitigated; compliant is categorized as C.
- **Moderate:** Manageable with standard measures; no significant legacy issues are categorized as B.
- **High:** Significant, diverse, or irreversible impacts; cumulative cluster impacts; resettlement/ land acquisition affecting biodiversity-sensitive areas, indigenous communities, or cultural heritage without regulatory compliance; major legal non-compliance; sensitive receptors affected is categorized as A. **Under the FMAP programme, Category A projects are not covered.**

Key steps in the methodology include:

- **Stakeholder Consultations:** Structured discussions were held with MSME owners, workers, local communities, and sectoral experts to capture diverse perspectives on environmental and social risks, benefits, and concerns.
- **Document Review:** Existing policies, regulatory frameworks, sectoral studies, and SIDBI's ESMS procedures were reviewed to ensure alignment with national standards, IFC Performance Standards, and GCF Environmental and Social Standards.
- **Portfolio Data Review:** Technical, financial, and environmental data from SIDBI's previous portfolio assets (earlier loan cases) were analyzed to identify patterns of risk, performance outcomes, and mitigation effectiveness. This evidence base provided valuable insights into sector-specific challenges, compliance trends, and the practical feasibility of proposed interventions.
- **Site Assessments:** Field visits and site-level assessments were conducted to validate information provided in the Environmental and Social Due Diligence (ESDD) forms and the ESG Screening Sheets, ensuring accurate categorization and safeguard planning.
- **Risk Analysis and Mitigation Planning:** Environmental and social risks were analyzed for Category B interventions, focusing on emissions, effluents, waste management, energy use, and occupational health and safety. Mitigation measures were identified to ensure impacts remain moderate, site-specific, and reversible.
- **Screening and Categorization:** Sub-projects were systematically screened against the ESMS Exclusion List, followed by categorization into Category B or Category C based on potential risk pathways. Screening of sub-projects follows a joint interpretation framework, where SIDBI applies its internal ESMS processes while ensuring full alignment with GCF's safeguards
- **Validation of Low-Risk Projects:** Category C projects were reviewed to confirm their low-risk nature, particularly efficiency improvements and equipment upgrade that do not alter manufacturing chemistry or increase pollution loads.

This participatory and evidence-based methodology ensures a common understanding of the issues, benefits, and concerns associated with MSME sub-projects under FMAP Programme. By integrating historical portfolio data with forward-looking risk analysis, the ESIA provides a

transparent and standardized framework for environmental and social risk management, strengthening compliance with SIDBI's ESMS and the GCF Environmental and Social Policy.

## 1.3 Environmental and Social Due Diligence and Assessment

As the Accredited Entity (AE), SIDBI is responsible for ensuring that all subprojects under the Program adhere to the Green Climate Fund (GCF) Environmental and Social Safeguards (ESS) and follow a proportionate, risk-based due diligence process.

**Fit-for-Purpose ESIA (Environmental and Social Impact Assessment):** For subprojects categorized as Moderate risk (B), the review a sector-specific ESIA that:

- Identifies environmental impacts such as high-water and energy demand, high-COD effluent generation, plastic waste management, air emissions, and hazardous chemical handling—critical in plastic manufacturing.
- Assesses social risks such as labor conditions, OHS (chemical exposure, boilers, confined-space risks), migrant worker conditions, and community-level impacts, especially in plastic clusters.
- Evaluates contextual sensitivities (e.g., proximity to drainage channels, rivers, or groundwater sources).
- GCF guidelines state that the ESIA must be proportional to the risk category and designed to address the specific impacts of the activity.
- For sub-projects where Brownfield enterprises going for expansion and modernization of their existing operations in a new location / premises; and (ii) Greenfield projects i.e., setting up of new enterprises, the scope of land is limited to industrial area, industrial estate, notified industrial zone, special economic zones, Land parcels already designated by the Government for non-agricultural use, solar / wind farms etc. where all the necessary statutory permission / infrastructure are available.
- Such projects are eligible under this ESIA only where Environmental and Social Due Diligence (ESDD) and legal/site screening confirm that there is no compulsory land acquisition with physical or economic displacement, no Indigenous Peoples impacts, no critical habitat/protected ecosystem impacts, no cultural heritage impacts, and no other material PS5–PS8 consequence in line with SIDBI's ESMS and GCF Environmental and Social Standards.
- Any sub-project for which screening identifies impacts falling under exclusion criteria or PS5–PS8 requirements shall be deemed ineligible and excluded from financing under the GCF-FMAP Programme.

Following are the detailed E&S Risk Assessment associated with Plastic Process & Technologies:

### 1.3.1 Raw Material Procurement

In plastic industry raw material procurement involves sourcing polymers (PE, PP, PVC, PET) and additives (colorants, fillers) derived from petrochemicals (oil, gas).

#### (a) Key Environmental Risks

##### Transportation & Storage of Raw Materials

**Risks:**

- Spills during transportation (pipeline ruptures, tanker spills).
- Fire and explosion hazards due to flammable materials.
- GHG footprint from marine and road logistics.

### **Plastic Resin Production (Polymerization)**

Production of polymers like **PE, PP, PVC, PET** involves energy-intensive chemical reactions.

#### **Risks:**

- High GHG emissions due to energy consumption.
- Release of hazardous chemicals (e.g., vinyl chloride monomer for PVC).
- Effluent discharge containing chemical residues.
- Microplastic release during pellet handling

### **Recycled Raw Materials (Secondary Plastic)**

#### **Risks:**

- Contaminated waste streams may lead to improper handling.
- Emission of toxic fumes during low-quality recycling.
- Wastewater generation during washing of plastic scrap material.

## **(b) Key Social Risks**

**Worker Health & Safety:** In extraction and polymerization, workers face:

- Exposure to toxic chemicals (e.g., benzene, styrene, phthalates).
- Risk of fires, explosions, and inhalation of hazardous fumes.
- Ergonomic risks in manual handling of raw materials.

#### **Labor Conditions**

- Informal labor without PPE.
- Exposure to burning or melting plastic fumes.
- Child labor risks in manual waste picking.

#### **Impact on Local Communities**

Communities near oil wells, refineries, or polymer plants may face:

- Air and water pollution - respiratory diseases, contaminated drinking water.
- Noise and traffic pollution due to industrial activity.

**Note:** It may be noted that the Extraction of Fossil Fuels is not being done by MSMEs. Therefore, the Environment and Social Risk won't be applicable for the MSME sub-projects w.r.t raw material procurement. Generally, the MSME's procure raw materials from cracking units located in different parts of India or recycled plastic procured from Plastic Recycling units.

## **1.3.2 Material Preparation/Compounding**

Material preparation and compounding in the plastic industry is the foundational process of blending raw base polymers (resins) with additives, fillers, colorants, and reinforcements to create a customized plastic material with specific, enhanced properties. This process transforms

raw, resin into high-performance plastic compounds (usually in pellet form) designed to meet precise functional requirements—such as strength, flexibility, color, UV resistance, or flame retardancy, before final manufacturing techniques like injection molding or extrusion are used.

This process generally includes Raw material drying (removing moisture from polymer granules), Mixing (adding stabilizers, fillers, pigments, flame retardants, plasticizers, etc.), Extrusion & compounding (melting, homogenizing, pelletizing).

#### **(a) Key Environmental Risks**

##### **Air Emissions from Extrusion & Additives**

Compounding involves heating polymers, which may release:

- Volatile organic compounds (VOCs)
- Styrene, formaldehyde, benzene traces (depending on material)
- Fumes from stabilizers, pigments, plasticizers, flame retardants

##### **Risks:**

- ✓ Poor indoor air quality
- ✓ Contribution to ambient air pollution
- ✓ Occupational exposure to hazardous chemicals

##### **Dust Generation (Fillers & Pigments)**

Materials like talc, calcium carbonate, carbon black, glass fibers generate harmful dust.

- Airborne particulate matter (PM10, PM2.5)
- Contamination of surrounding areas
- Deposition on equipment and stormwater systems

##### **Solid Waste Generation**

- Reject granules, off-spec pellets
- Additive packaging waste
- Dust, scrap, filter residues

##### **Risks:**

- ✓ Non-hazardous waste increases landfill load
- ✓ Certain additives may be **hazardous** (e.g., heavy-metal pigments, brominated flame retardants)

##### **Microplastic/Pellet Loss**

##### **Impacts:**

- Plastic pellet leakage to drains then rivers then marine ecosystem
- Long-term ecological harm

##### **Energy Consumption**

Dryers, extruders, heaters, and cooling systems consume significant electricity/heat.

##### **Risks:**

- ✓ High carbon footprint

##### **Water Use & Effluent (Cooling Water)**

Compounding itself uses limited water, but some processes use:

- Cooling water
- Washing water (in re-compounding of recycled materials)

##### **Risks:**

- ✓ Thermal water discharge
- ✓ Contaminated wastewater containing microplastics

**(b) Key Social Risks**

**Worker Exposure to Hazardous Dust & Fumes**

- Respiratory issues
- Skin and eye irritation
- Long-term chronic health effects (depending on additives and monomers). High-risk materials include Carbon Black, titanium dioxide, Talc, Brominated flame retardants, PVC additives (e.g. phthalates)

**Accidents & Safety Risks**

Compounding involves:

- High-temperature extruders
- Rotating screws
- Pelletizers and rotating knives
- Hot molten plastic

**Risks:**

- ✓ Burns
- ✓ Amputation hazards
- ✓ Entanglement injuries
- ✓ Slips from spilled pellets

**Manual Handling & Ergonomic Risks**

Material preparation often involves:

- Bag lifting
- Barrel loading
- Handling 25–50 kg sacks of additives

**Risks:**

- ✓ Musculoskeletal injuries
- ✓ Back strain

**Noise Exposure**

Extruders, mixers, blowers may exceed safe noise levels.

**Risks:**

- ✓ Hearing damage
- ✓ Fatigue and long-term cognitive impacts

**Use of Contract/Informal Labour:** Common in MSME plastic units

**Risks:**

- ✓ Lack of adequate PPE
- ✓ No formal training
- ✓ Wage & working-hour violations

**Fire & Explosion Hazards**

Triggered by:

- Dust cloud ignition (carbon black, fine powders)
- Overheated extruders
- Flammable chemicals in additives

**Risks:**

- ✓ Worker injury
- ✓ Major accidents affecting nearby community

### **Categorization of activities in Compounding- Category: B (Moderate Risk)**

Risks are significant but manageable with proper interventions like plastic waste segregation and management, effluent treatment, and worker safety measures.

### **Rationale for categorization of activities in Compounding:**

Plastic compounding operations are typically categorized as B because the environmental and social impacts are localized, predictable, and reversible, and can be effectively managed using standard mitigation measures such as ventilation, dust control, pellet containment, and OHS protocols.

### **Applicable IFC Performance Standards:**

- **PS 1- Assessment and Management of Environmental and Social Risks and Impacts:** Applicable due to significant environmental and social risks requiring structured management systems for environment and social impacts.
- **PS2 – Labor & Working Conditions:** Applicable due to worker exposure to dust, fumes, heat, machines.
- **PS3 – Resource Efficiency & Pollution Prevention:** Applicable for pollution prevention, air emissions, waste, energy use.
- **PS4 – Community Health & Safety:** Applicable; Fire hazards, community concerns, emergency management.
- **PS 5 to PS 8** are conditional because they apply only if projects involve land acquisition affecting biodiversity-sensitive areas, indigenous communities, or cultural heritage without regulatory compliance.

**Note:** SIDBI's ESMS and GCF ESS require these checks during screening and due diligence.

### **1.3.3 Plastic Forming (production process)**

**It is divided into four types of processes:**

- 1) Injection Molding Process:** Injection molding is a manufacturing process in which thermoplastic or thermoset materials are heated until they become molten and then injected under high pressure into a carefully engineered mold cavity. Once the material cools and solidifies, it takes the exact shape of the mold. This highly repeatable and efficient process supports the production of parts with complex geometries, precise dimensions, and tight tolerances, making it well-suited for high-volume manufacturing of intricate components.

**Application:** Automotive parts, Toys, Household items, Electrical components

### **Environmental Risks**

- Air emissions & fumes from melting polymers (ABS, PC, PVC, Nylon)
- VOCs and odors especially from additives and colorants
- High electricity consumption (hydraulic machines)
- Solid waste: sprues, runners, rejected molded parts
- Noise from hydraulic pumps and material loaders
- Cooling water consumption and thermal discharge
- Pellet loss/microplastic contamination during material handling

### **Social Risks**

- Worker exposure to fumes, dust, high temperatures
- Machine injuries: clamping hazards, molten plastic burns, screw rotation accidents
- Ergonomic stress: mold changes, heavy lifting, trimming/finishing tasks
- Contract labor risks: inadequate PPE, low awareness
- Fire hazards: overheated barrel, electrical faults

- 2) Extrusion Process Flow:** It is a manufacturing method that transforms raw thermoplastic resin into specific shapes such as pipes, films, or window frames. The process follows a consistent flow of material from a solid state to a molten liquid, then back to a solid form.

**Application:** Pipes and tubes, Sheets and films, Profiles (frames, channels, cables)

### **Environmental Risk**

- Continuous process resulting in continuous emissions of fumes/VOCs
- High thermal load leads to high energy consumption
- Noise from extruders, blowers, compressors
- Solid waste: start-up scrap, off spec extrudate, trim waste
- Water pollution if cooling bath/closed-loop water becomes contaminated
- Plastic pellet leakage around feeding/transport systems
- Film extrusion risk: micro-plastic flakes and edge-trim waste

### **Social Risk**

- Burn injuries from hot extrudate and heaters
- Noise exposure to operators
- Accidents with rotating screws, haul-off/cutting units
- Chemical exposure to additives (stabilizers, plasticizers)
- Heat stress in poorly ventilated extrusion halls

- 3) Blow Molding Process Flow:** It is a manufacturing sequence used to create hollow thermoplastic products, such as bottles and containers. The core principle involves melting plastic, forming it into a tube-like starting shape, and then using compressed air to inflate that shape against the walls of a mold

**Application:** Bottles, containers, jugs etc.



**Environmental Risk:**

- High energy demand for preform heating (stretch blow molding)
- Air emissions from PET/HDPE melting
- Solid waste: flash, trimming, rejected bottles
- Noise from air compressors and blowing cycles
- Compressed-air leaks
- Pellet spillage and microplastic contamination
- Odor emissions where recycled plastics are used

**Social Risk:**

- High-pressure air risks: hose failures, blow-outs.
- Hot preforms and molds causing burn injuries.
- Handling heavy molds in larger machines → ergonomic strain.
- Exposure to fumes from PET and HDPE melting.
- Slip hazards from spilled pellets.
- Fire hazards with heating systems and compressors.

- 4) Thermoforming Process Flow:** It is a manufacturing process that converts thermoplastic sheets into 3D shapes by heating them to a pliable state, molding them using vacuum, pressure, or mechanical force, cooling to solidify the shape, and trimming the excess material. This method is highly scalable, serving industries ranging from food packaging to heavy duty industrial sectors like automotive and construction (HVAC components, panels).

**Application:** Dashboards, door panels, HVAC components, panels

**Environmental Risk:**

- Heating sheets releases fumes (especially PS, PET, PVC).
- Trim waste is significant if not recycled.
- Energy consumption for heating ovens and vacuum pumps.
- Noise from vacuum/pressure pumps.
- Plastic dust/flakes from trimming and grinding.
- Water usage in some cooling systems.
- Waste management risks when producing food-grade products.

**Social Risk:**

- Thermal burns from hot sheets and molded parts.
- Knife/cutter-related injuries during trimming.
- Exposure to dust from grinding regrind material.
- Ergonomic risks: repetitive stacking, packing.
- Contract labor safety issues (common in packaging units).

**GCF Categorization of activities in Plastic Forming/Production Process - Category: B (Moderate Risk) :**

Risks are significant but manageable with proper interventions like plastic waste recycling, effluent treatment, wastewater management, and worker safety measures.

### Rationale for categorization of activities in Plastic Forming/Production Process

Processes like extrusion and injection molding are energy-intensive, relying on significant electricity for heating and hydraulic clamping. The use of additives (e.g., phthalates, flame retardants) and the release of Volatile Organic Compounds (VOC's) during heating pose health risks to workers and local communities, triggering Occupational Health safeguards.

### Applicable IFC Performance Standards

- **PS 1- Assessment and Management of Environmental and Social Risks and Impacts:** Applicable due to E&S risks involved in Plastic forming process.
- **PS2 – Labor & Working Conditions:** Applicable due to OHS risks to labor; like machine safety, thermal hazard.
- **PS3 – Resource Efficiency & Pollution Prevention:** Applicable. Managing fugitive emissions / production scrap
- **PS4 – Community Health & Safety:** Applicable due to high noise and mechanical hazards. OHS risks.
- **PS 5 to PS 8** are conditional because they apply only if projects involve land acquisition affecting biodiversity-sensitive areas, indigenous communities, or cultural heritage without regulatory compliance.

**Note:** SIDBI's ESMS and GCF ESS require these checks during screening and due diligence.

#### 1.3.4 Quality Control & Testing

Quality control (QC) and testing are the systematic processes used to ensure that materials and finished parts meet rigorous performance, safety, and dimensional standards

### Environmental Risks

The environmental footprint of testing and QC stems from both the energy-intensive nature of lab operations and the physical waste generated during inspections.

- **Laboratory Waste Generation:** Research and QC laboratories contribute to global plastic waste. Testing often requires single-use consumables like pipette tips, petri dishes, and centrifuge tubes to maintain sterility and prevent cross-contamination.
- **Toxic Chemical Runoff:** Testing procedures often utilize hazardous chemicals and solvents for sample preparation (e.g., acetone for cleaning or reagents for chemical resistance tests). Direct release of these chemicals without proper treatment can contaminate groundwater and local wastewater systems.
- **Hazardous Air Emissions:** The operation of fume hoods and sterilization technologies in labs can release volatile organic compounds (VOCs). In-process QC, which involves heating plastics for molding or extrusion, releases toxic fumes containing styrene, formaldehyde, and dioxins.
- **High Energy Consumption:** Laboratories are among the most energy-intensive institutional spaces, consuming more energy per square meter than standard offices due to specialized ventilation (HVAC) and high-power equipment like ultra-low temperature (ULT) freezers.

## Social Risks

- **Respiratory Issues:** Workers and QC inspectors near heated plastics are at high risk of inhaling toxic fumes and microplastic dust, which can lead to chronic bronchitis, asthma, and reduced lung capacity.
- **Chemical Exposure:** Chronic exposure to monomers (like vinyl chloride in PVC) and additives (like phthalates or BPA) are linked to severe health outcomes, including cancer, endocrine disruption, and decreased fertility.
- **Physical Safety:** The reliance on heavy machinery for mechanical testing (e.g., tensile or impact testers) poses risks of crushing, entanglement, and thermal burns from molten plastic

## Categorization of activities in Quality control and Testing - Category: B (Medium Risk)

Risks are significant but manageable with proper interventions like toxic chemical and flue gas management, effluent treatment, and worker safety measures.

## Rationale for categorization of activities in Quality control and Testing process:

Plastic testing facilities and mid-sized industrial QC operations are classified as Category B. Risks include laboratory chemical runoff and the management of hazardous testing waste

## Applicable IFC Performance Standards

- **PS 1- Assessment and Management of Environmental and Social Risks and Impacts:** Applicable. Managed through proper management
- **PS2 – Labor & Working Conditions:** Applicable. PPE required by QC staff from inhaling microplastics/toxic fumes.
- **PS3 – Resource Efficiency & Pollution Prevention:** Applicable. Waste Management/ Hazardous Material.
- **PS4 – Community Health & Safety:** Applicable. Occupational health and safety aspects.
- **PS 5 to PS 8** are conditional because they apply only if projects involve land acquisition affecting biodiversity-sensitive areas, indigenous communities, or cultural heritage without regulatory compliance.

**Note:** SIDBI's ESMS and GCF ESS require these checks during screening and due diligence.

### 1.3.5 Packing and Finishing

Packing ensures the finished goods reach the customer without damage while maintaining the required cleanliness and organization. Finishing refers to the post-molding operations used to improve the functionality or aesthetics of a plastic part.

## Environmental Risks

- **Microplastic Emission:** Processes like grinding, sanding, and trimming create fine plastic dust. Without high-efficiency particulate air (HEPA) filtration, these microplastics enter factory drainage or are vented into the atmosphere, eventually reaching waterways.
- **Volatile Organic Compounds (VOCs):** Decorative finishing, such as painting, silk-screening, and solvent bonding, uses inks and adhesives that release VOCs.

- **Secondary Packaging Waste:** Plastic products are often wrapped in excessive single-use films, straps, and protective foams for shipping, generating a massive waste stream before the product even reaches the consumer.

### Social Risks

- **Respiratory Hazards:** Fine dust from trimming and fumes from ultrasonic welding or laser marking can cause chronic obstructive pulmonary disease (COPD) in workers.
- **Ergonomic and Repetitive Stress:** Packing involves high-frequency repetitive motions (bending, lifting, reaching). Workers are at high risk for Musculoskeletal Disorders (MSDs), which are among the most common industrial injuries in the plastic sector.
- **Physical Safety (Mechanical Risks):** Finishing equipment like CNC routers, hydraulic trimmers, and automated palletizers pose risks of lacerations, pinch-point injuries, or amputations if machine is not handled properly.
- **Noise Pollution:** High-speed finishing machinery and pneumatic packing tools often exceed 85 decibels.

### Categorization for Packing and Finishing - Category: C (Low Risk)

Risks are minimal and can be manageable with proper interventions like waste collection and recycling and worker safety measures.

### Rationale for categorization of Packing and Finishing

The impacts are usually site-specific, limited in number, and largely reversible through standard mitigation measures. Finishing processes like sanding, trimming, and printing create physical waste (plastic scraps/dust) and chemical waste (inks, solvents).

### Applicable IFC Performance Standards

- **PS 1- Assessment and Management of Environmental and Social Risks and Impacts:** Applicable. Managed through management plan.
- **PS2 – Labor & Working Conditions:** Applicable. Packing and finishing are labor-intensive.
- **PS3 – Resource Efficiency & Pollution Prevention:** Applicable. Managed through pollution prevention equipment
- **PS4 – Community Health & Safety:** Applicable. Occupational health and safety.
- **PS 5 to PS 8** are conditional because they apply only if projects involve land acquisition affecting biodiversity-sensitive areas, indigenous communities, or cultural heritage without regulatory compliance.

Note: SIDBI's ESMS and GCF ESS require these checks during screening and due diligence.

### 1.3.6 Waste Management & Recycling

Waste Management refers to the systematic handling, segregation, processing, treatment, and recovery of all forms of plastic waste generated during manufacturing, quality control, finishing, and packaging operations. It ensures that plastic waste is managed in a manner that prevents environmental pollution, protects human health, conserves resources, and complies with regulatory requirements.

## **Environmental Risks**

### **Improper Segregation of Plastic Waste**

- Mixing clean, recyclable plastic scrap with contaminated, oily, or mixed-material waste reduces recyclability.
- Leads to more waste being diverted to landfills or incineration.

### **Air Pollution and Microplastics**

- Grinding, shredding, and reprocessing generate plastic dust and microplastic particles.
- Airborne microplastics may travel beyond facility boundaries, affecting community health.

### **Soil and Water Contamination**

- Leakage of plastic flakes, pellets, regrind, and powders during handling.
- Uncovered storage areas allow stormwater runoff carrying microplastics into drains, soil, and surface water.
- Contaminated wash water (inks, oils, cleaning agents, additives) may pollute groundwater if not treated.

### **Hazardous Waste Mismanagement**

Some plastic industries generate hazardous waste, such as:

- Ink/solvent residues
- Contaminated rags
- Oily plastics
- Waste lubricants/hydraulic oils

### **Improper storage can cause:**

- Fire risk
- Soil contamination
- Regulatory non-compliance under Hazardous Waste Rules

### **Fire Risk in Waste Storage Areas**

- Plastic scrap piles, especially thin films, are highly flammable.
- Dust accumulation may ignite due to heat, sparks, or poor housekeeping.
- Fires release toxic smoke affecting workers and nearby communities.

### **Leakage of Pellets into the Environment**

- Polymer pellets used for reprocessing can spill, enter storm drains, and cause major biodiversity harm.
- Difficult to clean once released.

### **Noise Pollution**

- Grinding, shredding, agglomeration, and reprocessing machines can create high noise levels that affect workers and nearby communities.

### **Energy and GHG Emissions**

- Recycling machinery (grinders, extruders) consumes large amounts of electricity.

- If powered by fossil-based grid electricity, it contributes to GHG emissions.

## **Social Risks**

### **Worker Health & Safety Risks**

- Exposure to microplastics, plastic dust, off-gassing vapors.
- Injuries from grinders, shredders, and material handling equipment.
- Fire accidents in scrap yards.
- Handling sharp plastic offcuts and rejected parts.

### **Informal Labor Risk**

- Informal workers, sometimes without PPE or training
- Potential issues of:
  - o Unsafe working conditions
  - o Lack of social protection
  - o Child/forced labor in downstream recycling facilities

### **Community Health & Nuisance Risks**

- Noise from grinders/shredders.
- Odor from contaminated waste or burning.
- Microplastic escape impacting surrounding areas.
- Fire incidents causing community exposure to toxic smoke.

### **Occupational Exposure to Hazardous Substances**

- In certain recycling streams, inks, adhesives, solvents, oils, or chemical additives may be present.
- Workers may be exposed during sorting, washing, shredding, or reprocessing.

### **Poor Housekeeping Leading to Slips, Trips, and Falls**

- Scatter of pellets increases risk of slip accidents.
- Poorly organized waste yards lead to ergonomic strain and accidents.

### **Transport and Logistics Risks**

- Waste movement by trucks can cause:
  - o Spillage of pellets or scrap on roads
  - o Traffic accidents
  - o Exposure of helpers/laborers sitting on trucks (common in MSMEs)

## **Compliance Risks**

### **Non-Compliance with Plastic Waste Management Rules**

Risks include:

- Failure to maintain waste records
- Lack of tie-ups with authorized recyclers
- Sending waste to informal/unregistered vendors
- Lack of EPR compliance documentation (for packaging plastic users)
- Fines, legal proceedings, or plant shutdown risk

### **Hazardous Waste Rule Violations**

- Mixing hazardous and non-hazardous plastic waste
- Illegal disposal leading to CPCB/SPCB action
- Fines, legal proceedings, or plant shutdown risk

### **Categorization of activities in Waste Management and Recycling process: Category B (Medium risk)**

Risks are significant but manageable with proper interventions like waste management, effluent treatment, and worker safety measures.

**Rationale for categorization of Waste Management and Recycling process:** Waste management & recycling in plastic industries involves moderate, site-specific, and manageable risks, such as dust/microplastics, hazardous residues, fire hazards, and worker safety issues. Impacts are not irreversible, not large-scale, and can be mitigated with standard controls.

#### **Applicable IFC Performance Standards**

- **PS 1- Assessment and Management of Environmental and Social Risks and Impacts:** Applicable. Required for overall E&S screening, waste audits, emergency planning, supplier/recycler screening.
- **PS2 – Labor & Working Conditions:** Applicable. Worker safety related to dust, noise, machine guarding, PPE, and informal labor issues in recycling.
- **PS3 – Resource Efficiency & Pollution Prevention:** Applicable. Air emissions, microplastic control, waste segregation, recycling, energy use in grinding/extrusion. Pollution prevention equipment.
- **PS4 – Community Health & Safety :** Applicable. Fire hazards in scrap yards; dust migration; pellet leakage; truck movement risks. Proper occupational health and safety management.
- **PS 5 to PS 8** are conditional because they apply only if projects involve land acquisition affecting biodiversity-sensitive areas, indigenous communities, or cultural heritage without regulatory compliance.

Note: SIDBI's ESMS and GCF ESS require these checks during screening and due diligence.

Currently, 49 technologies/machines are documented under plastic processes, along with an additional indicative **351 cross-functional technologies listed** which are not exhaustive and can be used by MSMEs in the plastic segment is considered under **Annexure 3**.

| <b>Sr. No.</b> | <b>Technology Name</b>                                           | <b>Process category</b> | <b>Project Category</b> |
|----------------|------------------------------------------------------------------|-------------------------|-------------------------|
| 1              | PLC Controlled Hydraulic Press                                   | Auxiliary & Finishing   | Category - B            |
| 2              | Pultrosen Machine                                                | Auxiliary & Finishing   | Category - B            |
| 3              | Infra-Red Heaters / Oven                                         | Auxiliary & Finishing   | Category - B            |
| 4              | Fully Automatic - HM/ LDPE (using Variable Frequency Drive)      | Auxiliary & Finishing   | Category - B            |
| 5              | Slitting Machine (Using AC Frequency Drive)                      | Auxiliary & Finishing   | Category - B            |
| 6              | Pneumo Hydraulic Edge Guide System                               | Auxiliary & Finishing   | Category - B            |
| 7              | Three Layer Brown Film Plant (using Variable Frequency Drive)    | Auxiliary & Finishing   | Category - B            |
| 8              | Standby Zipper Pouch Making Machines (using AC Frequency Drives) | Auxiliary & Finishing   | Category - B            |
| 9              | Rotary Cap Compression Moulding Machine                          | Auxiliary & Finishing   | Category - B            |

|    |                                                                                      |                                          |              |
|----|--------------------------------------------------------------------------------------|------------------------------------------|--------------|
| 10 | Laminated Tube Body Maker Machine                                                    | Auxiliary & Finishing                    | Category - B |
| 11 | Screwing Cap Machine                                                                 | Auxiliary & Finishing                    | Category - B |
| 12 | Scrap Grinder                                                                        | Auxiliary & Finishing                    | Category - B |
| 13 | Automatic Strap Bend Making Machine                                                  | Auxiliary & Finishing                    | Category - B |
| 14 | Automatic High Speed Bag Making Machine                                              | Auxiliary & Finishing                    | Category - B |
| 15 | Bottom Seal Bag Packing Machine (with Micro Processor Controlled)                    | Auxiliary & Finishing                    | Category - B |
| 16 | Plastic Injection Machine (with Variable Pump)                                       | Auxiliary & Finishing                    | Category - B |
| 17 | Slow Speed Granulator                                                                | Auxiliary & Finishing                    | Category - B |
| 18 | Fully automatic strap band making machine                                            | Auxiliary & Finishing                    | Category - B |
| 19 | Automatic Splicer Machine with PLC controls                                          | Auxiliary & Finishing                    | Category - B |
| 20 | PLC based tape stretching line                                                       | Auxiliary & Finishing                    | Category - B |
| 21 | High Frequency Plasting Welding Machine/ Embossing Machine                           | Auxiliary & Finishing                    | Category - B |
| 22 | High Speed Heater Mixer (with VFD and Screw Conveyor)                                | Auxiliary & Finishing                    | Category - B |
| 23 | Water Pelletizing System                                                             | Auxiliary & Finishing                    | Category - B |
| 24 | Bitumen Membrane Forming                                                             | Auxiliary & Finishing                    | Category - B |
| 25 | Auto Woven Bag Cutting & Sewing (with inverter control)                              | Auxiliary & Finishing                    | Category - B |
| 26 | Microprocessor Controlled Fully Automatic Extrusion/ Injection Blow Moulding Machine | Blow Molding / Hollow Forming            | Category - B |
| 27 | 3D Blow Moulding Machine with PLC control system                                     | Blow Molding / Hollow Forming            | Category - B |
| 28 | Multi-Layer Film Extruder                                                            | Extrusion / Processing                   | Category - B |
| 29 | Thermoforming Sheet Extrusion Machine (using Variable Frequency Drive)               | Extrusion / Processing                   | Category - B |
| 30 | Plate Extruder Line                                                                  | Extrusion / Processing                   | Category - B |
| 31 | Rotating Twin Screw Extruder                                                         | Extrusion / Processing                   | Category - B |
| 32 | Conical Twin Screw Extruder with Variable Frequency Drive                            | Extrusion / Processing                   | Category - B |
| 33 | Extrusion Lamination Plant with VFD                                                  | Extrusion / Processing                   | Category - B |
| 34 | Blown Film Plant with VFD                                                            | Extrusion / Processing                   | Category - B |
| 35 | Servo Motor Plastic Injection Machine                                                | Injection Molding / Forming              | Category - B |
| 36 | PET Moulding Machine                                                                 | Injection Molding / Forming              | Category - B |
| 37 | Fully Automatic Micro Processor Controlled Plastic Injection Moulding Machines       | Injection Molding / Forming              | Category - B |
| 38 | Plastic Injection Molding Machine with Variable Pump                                 | Injection Molding / Forming              | Category - B |
| 39 | Solvent Less Lamination Machine                                                      | Lamination & Coating / Surface Treatment | Category - B |



|    |                                                                                                                                                                                  |                                          |              |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------------|
| 40 | Corona Treater (using Advanced IGBT Technology)                                                                                                                                  | Lamination & Coating / Surface Treatment | Category - B |
| 41 | Flex Lamination Machine                                                                                                                                                          | Lamination & Coating / Surface Treatment | Category - B |
| 42 | Production line for manufacturing of laminated panels                                                                                                                            | Lamination & Coating / Surface Treatment | Category - B |
| 43 | Thermoforming Machine with Infra-red Heaters (using Variable Frequency Drive)                                                                                                    | Thermoforming/ Heating                   | Category - B |
| 44 | Solar Photo Voltaic power projects for captive use within the existing operating / manufacturing premises                                                                        |                                          | Category - C |
| 45 | Electric mobility - 2 Wheelers, 3 Wheelers, 4 Wheelers, E-buses, E-trucks etc. for transit of passengers / industry staff / transport of consumer goods & finished products etc. |                                          | Category - C |
| 46 | Charging infrastructure and Battery swap set up within the existing operating / manufacturing premises                                                                           |                                          | Category - C |
| 47 | Wastewater / Effluent treatment / ZLD/                                                                                                                                           |                                          | Category - C |
| 48 | Rainwater harvesting systems, surface water storage units, stormwater management equipment and aquifer recharge solutions                                                        |                                          | Category - C |
| 49 | Green Buildings use locally suited, durable materials for housing and infrastructure to withstand extreme weather                                                                |                                          | Category - C |

**Note-**

(i) The above list is indicative and not exhaustive; additional technologies/machines may be considered by the AE for funding only where they fall within the approved scope and eligibility criteria of FMAP, are screened and categorized in accordance with the ESMS, and comply with applicable E&S standards.

(ii) The category indicated in the table reflects the typical risk profile of the technology/process itself. Where the same technology is proposed as part of (a) a brownfield enterprise expanding/modernizing in a new location, (b) a greenfield enterprise, or (c) an off-site RE/EE project, the final categorization of the overall subproject shall be determined through ESDD and site/legal screening. In such cases, the sub-project may be classified as Category B where land-related, siting, community health and safety, or other site-specific risks are assessed as moderate, site-specific, and manageable.

In addition to it, SIDBI highlights that MSME is required to prepare and maintain the minimum mandatory documentation. These documents collectively demonstrate compliance with GCF ESS, IFC PS, and SIDBI's ESMS. Each MSME must prepare the ESDD Checklist (Annexure 2) as part of screening and categorization under FMAP Programme.

Cumulative cluster-level Effluent risks, including CETP capacity, performance, and compliance with regulatory norms, will be explicitly assessed as part of the Environmental & Social Due

Diligence (ESDD) for all Category B subprojects. During ESDD (Annexure 2), and through the ESG Rating Tool (Annexure 7 of ESMS), SIDBI's loan officer/relationship manager and E&S expert will:

- Verify the operational status, performance, and regulatory compliance of the ETP/ CETP to which the MSME is connected, as appropriate.
- Examine whether the additional hydraulic/organic/color load from the proposed subproject may exceed CETP capacity or receiving-environment limits.
- Require that MSMEs implement effluent minimization, in-house pre-treatment, and source-level pollution reduction measures as part of the site-specific ESMP.

During inspection, assessment identifies whether the effluent wastewater is non-compliant, or projected incremental loads would exceed treatment or disposal capacity, or environmental compliance cannot be assured even after mitigation, then the subproject will be:

- (a) excluded from FMAP financing, or
- (b) phased/deferred until adequate treatment capacity and regulatory compliance are demonstrably ensured.

This approach is fully consistent with SIDBI's ESMS and ESIA framework, which already screens out non-compliant proposals, excludes higher-risk activities, and requires risk-based appraisal and verification before approval. For all Category B projects MSMEs need to have prescribed Wastewater within the limit, site-specific ESMP conditions will include effluent minimization, pre-treatment, monitoring, and compliance reporting of Environmental parameters.

## 1.4 Regulatory compliance analysis (Indian environmental laws + GCF standards)

### 1.4.1 Central Pollution Control Board (CPCB) of India: Classification of Sectors into Red, Orange, Green, White and Blue Categories, 2025<sup>2</sup>

**Based on Pollution Index (PI)** derived from water emissions, air emissions, hazardous waste generation, and resource consumption, CPCB categorizes 419 industrial sectors into four color-coded groups. CPCB has classified total 419 sectors and sub-sectors under Red (125), Orange (137), Green (94), White (54) and Blue (9) categories.

**Table 1: List of Industrial Sectors Classified Under Red, Orange, Green, And White Category**

| Sl. No | CPCB Sl. No. | Plastic Industry                                                                    | Industry Category (Based Upon the Pollution Index – PI) |
|--------|--------------|-------------------------------------------------------------------------------------|---------------------------------------------------------|
| 1      | 132          | Polythene and Plastic processed products manufacturing (virgin/compostable plastic) | GREEN                                                   |
| 2      | 147          | Manufacturing plastic or cotton rope                                                | WHITE                                                   |

<sup>2</sup> CPCB, 2025, "Report on Classification of Sectors into Red, Orange, Green, White and Blue Categories (A tool for progressive environmental management)" - 2025  
<https://cpcb.nic.in/openpdf.php?id=TGF0ZXN0RmlsZS9fMTczNzYxMzk2OV9tZWVpYXBob3RvMTEzODMucGRm>

|    |       |                                                                                                                                                                                                                                                                                                                                                                                                   |        |
|----|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 3  | 152.1 | Manufacturing of flakes/staple fibre / strip from the recycling of PET bottles [Recycling]                                                                                                                                                                                                                                                                                                        | ORANGE |
| 4  | 152.2 | Plastic waste processing (manufacturing of flakes/granules) [Recycling]                                                                                                                                                                                                                                                                                                                           | ORANGE |
| 5  | 52.1  | Fibre Reinforced plastic production; Fibre glass (containing lead) production and processing (excluding moulding)                                                                                                                                                                                                                                                                                 | ORANGE |
| 6  | 52.2  | Fibre Reinforced plastic production; Fibre glass (without lead) production and processing (excluding moulding)                                                                                                                                                                                                                                                                                    | ORANGE |
| 7  | 128   | Manufacturing of bi-axially oriented Polypropylene (PP) film along with metalizing operations (Mainly extrusion process involving)                                                                                                                                                                                                                                                                | GREEN  |
| 8  | 61    | Foam Manufacturing (Raw materials are polyurethane, latex etc.)                                                                                                                                                                                                                                                                                                                                   | GREEN  |
| 9  | 150.1 | Industry engaged in recycling of e-waste generated from the electrical and electronic Equipment (EEE) listed in the E-Waste (Management) Rules 2022 using pyro/ hydro/ electrometallurgical processing and recycling of plastic separated from Waste EEE                                                                                                                                          | RED    |
| 10 | 150.2 | Industry engaged in recycling of e-waste generated from the electrical and electronic equipment (EEE) listed in the E-Waste (Management) Rules 2022 (PCB processing limited to only mechanical processing and separation without pyro/ hydro/ electro-metallurgical processing), production of Al, Cu, and other metals from non-PCB sources and/or recycling of plastic separated from Waste EEE | ORANGE |

Whereas,

- 1) Red Category industries are High pollution requires frequent monitoring.
- 2) Orange Category industries are Moderate pollution is less frequent, but regulated control.
- 3) Green Category industries are Low pollution—minimal regulatory oversight.
- 4) White Category industries are Practically non-polluting—often exempt from routine consent procedure
- 5) Blue Category industries are essential Environmental Services e.g. Waste Management.

**Pollution Index (PI) Ranges & Categories:** methodology with equal weighting of **Air pollutant Score** ( $PI_A$ ), **Water pollutant Score** ( $PI_W$ ), **Waste Pollutant Score** ( $PI_H$ ). Each pollutant group is scored out of 100, and the Cumulative Pollution Index is calculated.

- **$PI \geq 80$ :** Red
- **$55 \leq PI < 80$ :** Orange
- **$25 \leq PI < 55$ :** Green
- **$PI < 25$ :** White.

Additionally, State Pollution Control Boards (SPCBs) and Pollution Control Committees (PCCs) were authorized to categorize any new or leftover sectors according to the CPCB's 2016 methodology.

### 1.4.2 IFC Performance Standard (PS) will be checked by Third-party and SIDBI

For Environmental & Social Risk, assessment by Third Party and SIDBI need to be considered the IFC Principles Standard for throughout the process which has been stated above in each process of the plastic segment (Section 2.2).

**PS1- Assessment and Management of Environmental and Social Risks and Impacts:**

Verified through ESDD, ESG Screening Sheets, and ESMP documentation.

The programme-level ESMS is classified as Category I-2, and the sector-level ESIA/ESMP is designed to support Category B and C MSMEs within the plastic sector. The programme will primarily support climate change mitigation activities for MSMEs, including the adoption of energy-efficient machinery, renewable energy technologies, electric mobility solutions, and other eligible mitigation measures as outlined in the approved funding proposals. These interventions are envisaged as MSME sub-projects within the plastic sector, with indicative activities detailed in this ESMP document.

In addition to operational improvements, the programme may also finance brownfield MSME sub-projects involving the expansion and modernization of existing enterprises, including relocation to new sites or premises. Such sub-projects may involve a combination of operational enhancements and limited construction activities, such as the development of industrial sheds, buildings, or minor civil works required for the installation of machinery and equipment.

As mentioned in Section 1.3 (Fit-for-Purpose ESIA), all financed sub-projects will be designed and implemented to ensure that environmental and social risks and impacts remain site-specific, manageable, and fully aligned with applicable regulatory standards and safeguard requirements.

**PS2 - Labor & Working Conditions:** Checked via OHS audits, PPE, gender safeguards in ESMP.

**PS3 - Resource Efficiency & Pollution Prevention:** Confirmed through energy/water efficiency measures, Environmental performance reports.

**PS4 - Community Health & Safety:** Linked to GRM, community disclosure, and effluent/air emission compliance. Further, the following health & safety measures are to be ensured wherever the construction workers are engaged during the project implementation:

- Disease Risk Management with inclusion of risks related to spread of communicable diseases (especially during construction/expansion works) with mitigation measures such as worker awareness, hygiene practices, and access to basic health facilities.
- Asbestos Risk Management where refurbishment or rooftop works may involve asbestos-containing materials, MSMEs will undertake general asbestos surveys, and consult with Environmental experts internally and upon confirmation with experts will follow in line with national regulations and World Bank EHS Guidelines.
- In cases where third-party contractors handle hazardous materials, MSMEs will ensure basic due diligence of contractor capacity, including adherence to safety procedures, regulatory compliance, and use of trained personnel.

- Where security personnel are engaged, MSMEs will ensure compliance with applicable laws and good international practices, including code of conduct, training, and monitoring, while managing associated risks related to worker/community interaction.

SIDBI will also ensure that any material incidents or complaints are reported and addressed through the GRM, and communicated to GCF through regular engagement and APRs, ensuring timely corrective actions.

**PS 5 to PS 8:** The details for applicability and requirements are given as under:

#### **IFC Performance Standard 5 – Land Acquisition and Involuntary Resettlement**

- **Applicability:**
  - o Not applicable where Greenfield or expansion projects are undertaken within industrial area, industrial estate, notified industrial zone, special economic zones, Land parcels already designated by the Government for non-agricultural use, or privately purchased land through willing buyer–willing seller transactions with clear title or solar / wind farms etc. where all the necessary statutory permission / infrastructure are available.
  - o May be triggered if land acquisition results in economic displacement (loss of livelihoods, access restrictions) or physical displacement, even in the absence of formal resettlement.
- **Requirements:**
  - o Screening to confirm no involuntary land acquisition; projects involving resettlement or displacement of households are excluded.

#### **IFC Performance Standard 6 – Biodiversity Conservation and Sustainable Management of Living Natural Resources**

- **Applicability:**
  - o Not applicable where Greenfield or expansion projects are undertaken within industrial area, industrial estate, notified industrial zone, special economic zones, Land parcels already designated by the Government for non-agricultural use, or privately purchased land through willing buyer–willing seller transactions with clear title or solar / wind farms etc. where all the necessary statutory permission / infrastructure are available.
  - o Screening is required to ensure no conversion or degradation of natural habitats, wetlands, forests, or protected areas.
- **Requirements:**
  - o Any project with potential impacts on critical habitats is ineligible under the programme.

#### **IFC Performance Standard 7 – Indigenous People**

- **Applicability:**
  - o Not applicable where Greenfield or expansion projects are undertaken within industrial area, industrial estate, notified industrial zone, special economic zones, Land parcels already designated by the Government for non-agricultural use, or privately purchased land through willing buyer–willing seller transactions with clear title or solar / wind farms etc. where all the necessary statutory permission / infrastructure are available.
  - o Screening is required to confirm absence of Indigenous People / communities are not affected by the project.
- **Requirements:**

- o Any project with potential impacts on Indigenous People / communities are ineligible under the programme.

#### **IFC Performance Standard 8 – Cultural Heritage**

- **Applicability:**

- o Not applicable where Greenfield or expansion projects are undertaken within industrial area, industrial estate, notified industrial zone, special economic zones, Land parcels already designated by the Government for non-agricultural use, or privately purchased land through willing buyer–willing seller transactions with clear title or solar / wind farms etc. where all the necessary statutory permission / infrastructure are available.
- o Screening is required to ensure that there is no known impact on sites of cultural, archaeological, or religious significance.

- **Requirements:**

- o No financing of projects involving significant impacts on cultural heritage.

For Brownfield projects set up by an existing enterprise within its existing industrial premises, the Environmental and Social Impact Assessment (ESIA) confirms that IFC Performance Standards PS 5 to PS 8 that is relating to land acquisition and involuntary resettlement; Indigenous Peoples; biodiversity and critical habitats; and cultural heritage are not applicable, as these activities do not involve land acquisition, displacement, impacts on sensitive ecosystems, or disturbance of cultural assets.

However, in case of brownfield enterprises going in for expansion or modernization in a new location and for setting up of a Greenfield enterprise, land is generally acquired. SIDBI ensures that in the above scenario, the E&S risks are adequately identified, assessed, and mitigated within the scope of this ESIA & ESMP, ensuring no adverse environmental or social impacts i.e., land acquisition for the project does not affect biodiversity-sensitive areas, indigenous communities, or cultural heritage. If the land acquisition affects any of the PS 5-8 triggers, SIDBI will not cover such project(s) under GCF-FMAP Programme.

Accredited Entity (SIDBI) clarifies that any subproject that triggers PS5–PS8 requirements will be automatically deemed ineligible under the FMAP programme as currently structured. This aligns with SIDBI's existing ESMS, which already: screens out high-risk proposals and all Category A / I-1 activities during initial screening and due diligence.

Detailed ESDD, ESG risk rating, and site verification to confirm safeguard compliance prior to sanction of project. Rejects any project that fails to meet E&S compliance or falls under the exclusion list.

Under FMAP Programme, SIDBI will not finance any MSME subproject that involves land acquisition with physical/economic displacement of people, impacts on Indigenous Peoples, activities located within or adversely affecting critical habitats or legally protected ecosystems, any kind of risks to cultural heritage or archaeological resources.

#### **Social Risks & Safeguards**

Social risks include chemical exposure, inadequate sanitation, potential forced labour, and community impacts from wastewater discharge. Vulnerable groups comprise contract and migrant labor, women workers, and nearby households. Safeguards will include substituting safer chemicals, enforcing PPE usage and sanitation standards, conducting supplier due diligence to prevent labor exploitation, and providing gender-sensitive facilities to ensure inclusivity and worker welfare.

## 1.5 Stakeholder Engagement & Monitoring

Stakeholder engagement begins at the appraisal stage for all the sub-projects. Engagement activities include:

- Consultations with MSME owners, workers, machinery suppliers and other stakeholders (if necessary) about the project
- Awareness sessions on Energy conservation, Emission reduction, OHS, chemical safety, E&S risk assessment & mitigation, and social, labour & Gender rights etc.;
- Disclosure of applicable safeguard requirements, ESMP obligations, and mitigation responsibilities.
- SIDBI shall ensure continuous stakeholder engagement throughout implementation, including periodic site visits, safety meetings, and environmental monitoring interactions.

Stakeholder engagement will focus on transparency and inclusivity throughout project implementation. Key actions include community disclosure on environmental management practices, establishment of a worker grievance redressal mechanism, and regular safety briefings for all operational staff and workers.

Monitoring will be guided by measurable indicators such as effluent discharge norms, Personal Protective Equipment (PPE) compliance, percentage of workers trained on chemical exposure and handling, and average grievance resolution time (Refer section 6). These indicators will ensure accountability and continuous improvement in environmental and social performance.

The FMAP programme integrates stakeholder engagement, public disclosure, and grievance redressal as core elements of its Environmental & Social Management System. MSME subprojects are embedded within densely populated industrial clusters. Therefore, meaningful engagement with workers, nearby communities, and institutional stakeholders is critical to ensure transparency, risk communication, and participatory monitoring.

## 1.6 Impact Category & GCF Linkages

The overall impact is assessed as moderate, site-specific, and reversible with appropriate controls. Based on GCF categorization, Material Preparation/Compounding, Plastic Forming Production Process, Quality Control & Testing, Waste Management & recycling processes / operations fall under **Category B** due to potential chemical and pollutant-related risks, while low-risk interventions such as raw material procurement, packing and finishing are classified as **Category C**.

## 1.7 Community Health and Safety

In line with Community Health & Safety, the ESIA acknowledges that MSME operations require structured systems for emergency preparedness, fire and explosion prevention, and safe handling of hazardous materials. This report tries to highlight key risks associated with chemical exposure, heat stress, emissions, boiler operations and hazardous effluent handling. To make these requirements explicit, every Category B subproject will be required to maintain and implement a Site Specific Emergency Preparedness & Response Plan (EPRP) for plastic scrap and finished-goods fire, toxic smoke exposure, solvent/additive spill, pellet or flake

release to drains, grinder/shredder/extruder fire, compressed-air failure, electrical or charging-related fire where applicable, emergency access, evacuation, firewater runoff containment and coordination with local fire services.

Where relevant, MSMEs must also address traffic and road safety risks linked to transport of raw materials (petrochemicals, dyes, fossil fuels) and outward movement of finished products. Although most MSMEs operate inside established industrial parks and clusters, which already include controlled internal transport infrastructure, MSMEs implement measures to minimize off-site impacts, including safe loading and unloading, vehicle movement scheduling, and spill/accident response.

MSME units ought to ensure that external stakeholders including nearby residents, worker housing, local authorities, or downstream users are informed of community health and safety measures relevant to them. This includes disclosure of emergency procedures, contact details of grievance focal points, and communication of associated risks, consistent with the stakeholder engagement and disclosure practices already defined in the ESIA, which include community disclosure, periodic meetings, and dissemination of safeguard responsibilities

## 1.8 Disclosure Requirements & GCF linkages

- **Category B:** Requires ESIA & ESMP and 30-day advance disclosure before GCF Board consideration.
- **GCF Linkages**
  - Applies to Material Preparation/Compounding, Plastic Forming Production Process, Quality Control & Testing, Waste Management & recycling processes due to E&S risks.
  - Requires ESIA & ESMP and 30-day advance disclosure under GCF Information Disclosure Policy.
- **Category C:** No advance disclosure required under GCF Information Disclosure Policy.
- **GCF Linkages**
  - Applies to raw material procurement, packing and finishing (minimal/no adverse impacts).
  - For this, no advanced disclosure is required.

## 1.9 Plastic Sector: Environmental Risks, Mitigation, and GCF Classification

**Table 2: E&S Risk Assessment with Mitigation Measures Across Plastic Manufacturing Processes**

| Process                         | Key Environmental & Social Risks                                            | Mitigation Measures                                       | Indicative risk level | Rationale                                              | Applicable IFC PS     |
|---------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------|-----------------------|--------------------------------------------------------|-----------------------|
| <b>Raw Material Procurement</b> | VOCs, NOx, SOx from extraction and processing; Spills during transportation | Spill preparedness in logistics; preference for certified | C                     | Impacts are largely occupational and readily mitigated | PS 1, PS2, PS3 & PS 4 |



|                                           |                                                                                                                                                                    |                                                                                                                                                                                                     |   |                                                                                                                                                                                  |                      |
|-------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
|                                           | (pipeline ruptures, tanker spills); Fire and explosion hazards due to flammable materials. Labor Exposure to toxic chemicals (e.g., benzene, styrene, phthalates). | suppliers (ISO 14001/45001); encourage recycled polymer procurement, PPE mandatory                                                                                                                  |   |                                                                                                                                                                                  |                      |
| <b>Material Preparation / Compounding</b> | Dust, fumes, VOCs; worker exposure to plasticizers/heavy-metal stabilizers; heat burns; noise; accidental mixing of incompatible chemicals; fire from polymer dust | Dust extraction/LEV; substitution with non-toxic additives; PPE; controlled feeding systems; explosion-proof electricals; segregation of chemicals; temperature controls; noise dampening; training | B | Risks are moderate, site-specific, and reversible with robust treatment and substitution; Direct handling of chemicals, heat, and dust; moderate worker/environmental risks      | PS 1, PS2, PS3 & PS4 |
| <b>Plastic Forming Production Process</b> | High heat and burn injury; fumes and VOCs; noise; energy consumption; hydraulic oil leaks; machine accidents; fire risk; manual material handling strain           | Local Exhaust Ventilation/fume extraction; heat guards; machine guarding; preventive maintenance; fire detection & suppression; low-VOC mould release agents; noise control;                        | B | Impacts are site-specific and reversible; managed through efficiency and recovery systems. Core emission & energy-intensive process; moderate worker exposure and accident risks | PS1, PS2, PS3 & PS4  |

|                                         |                                                                                                                                     |                                                                                                                                                                                                                  |   |                                                                                                          |                      |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------------------------------------------------|----------------------|
|                                         |                                                                                                                                     | ergonomic lifts;<br>energy-efficient motors/heaters; spill kits                                                                                                                                                  |   |                                                                                                          |                      |
| <b>Quality Control &amp; Testing</b>    | Noise, dust, sharp edges, minor chemical exposure; small test waste                                                                 | PPE, dust extraction, guarding of machines, solvent fume hoods, SOPs, calibration, proper disposal of samples                                                                                                    | B | Risks are site-specific and reversible; limited and easily managed through standard lab safety practices | PS1, PS2 , PS3 & PS4 |
| <b>Packaging and Finishing</b>          | Dust, noise, manual handling, fire load in finished goods warehouse; packaging waste                                                | Dust control, PPE, ergonomic aids, fire-rated storage, housekeeping; recycling of packaging; forklift safety                                                                                                     | C | Environmental impacts are minor and controllable; primarily occupational.                                | PS 1, PS2, PS3 & PS4 |
| <b>Waste Management &amp; Recycling</b> | Plastic dust; microplastic release; improper disposal; stormwater contamination; fire hazard in waste area; emissions from grinders | Segregation of scrap; regrinding for reuse; approved recyclers; covered & banded waste storage; dust control; spill containment; fire safety; compliance with waste rules; wastewater treatment where applicable | B | Risks are site-specific and reversible; mitigable through proper treatment.                              | PS1, PS2, PS3 & PS4  |

Through the Exclusion list (attached as annexure 1) screening, Environmental and Social Due Diligence (ESDD) process, supported by SIDBI's ESG risk rating tools, and site-level verification visits, the Environmental and Social Impact Assessment (ESIA) has been done for the plastic sector. Risks have been considered and aligned with GCF standards.

Notwithstanding the indicative classification of individual technologies or processes as Category B, the final environmental and social risk categorization of each sub-project shall be determined on a case-by-case basis through Environmental and Social Due Diligence (ESDD), site verification, and application of the FMAP Exclusion List under SIDBI's ESMS.

Any sub-project that, based on ESDD and site-specific conditions, exhibits characteristics consistent with Category A/I-1 activities under the GCF Environmental and Social Policy including impacts that are diverse, irreversible, unprecedented, or otherwise non-mitigable shall be deemed ineligible and excluded from financing under the FMAP Program.”

Further, Category B classification shall also apply in the following scenarios:

- (a) Brownfield enterprises undertaking expansion, modernization, or capacity augmentation within existing or appropriately designated sites; and
- (b) Greenfield enterprises or new locations where land is procured through willing buyer-seller arrangements, located in non-sensitive areas, and where screening confirms absence of impacts related to involuntary resettlement, biodiversity, Indigenous Peoples, or cultural heritage.

Any subproject where screening identifies material impacts under PS5–PS8 shall be deemed ineligible and excluded from financing under the FMAP Programme.

Such classification is based on the nature and scale of impacts, which are generally site-specific, reversible, and readily mitigable through standard environmental and social management measures. Accordingly, these projects are subject to proportionate Environmental and Social Due Diligence (ESDD) in line with SIDBI's ESMS.

In addition to the EE projects set up / to be established in a new location or any RE Projects (solar, wind, hybrid, etc.) established by MSME units for captive or own consumption and located outside the borrower's operating premises may trigger IFC Performance Standards (PS) 5–8, primarily due to land-related considerations. These projects are typically developed on land classified as barren or dry land under applicable national land-use regulations, with no existing residential or commercial usage. The project site is generally selected based on technical considerations viz., systematic process balancing high resource availability (wind/solar) with proximity to grid infrastructure for power evacuation, no adverse environmental impact, and favorable topography.

Similarly, a Greenfield or brownfield enterprise setting up a standalone offsite RE project (solar, wind, hybrid, etc.) for non-captive purpose under GCF-FMAP Programme, shall be classified as “Category-B” as these projects involves land acquisition. In such cases, the PS 5–8 may be triggered due to land acquisition, SIDBI ensures that these risks are adequately identified,

assessed, and mitigated within the scope of this ESIA & ESMP, ensuring no adverse environmental or social impacts i.e. land acquisition for the project does not affect biodiversity-sensitive areas, indigenous communities, or cultural heritage. If land acquisition affects any of the PS 5-8 triggers, SIDBI will not cover such project(s) under GCF-FMAP Programme.

Prior to sanction and disbursement, SIDBI ensures that all statutory approvals and clearances related to land and project development are in place, including valid land registration or lease documentation and approvals from relevant authorities such as State Electricity Boards and local Distribution Companies (DISCOMs).

Land acquisition for such projects is undertaken strictly on a willing buyer–willing seller basis in compliance with applicable Indian laws. SIDBI verifies the reasonableness of land costs through third-party valuation by bank-empaneled valuers and validates title and ownership through legal due diligence conducted by empaneled advocates to identify any encumbrances, disputes, or litigation risks. Review of land records and plot maps forms part of the appraisal process stage.

Accordingly, while PS 5–8 may be triggered in these cases due to land acquisition and land-use aspects, SIDBI ensures that these risks are adequately identified, assessed, and mitigated within the scope of this ESIA& ESMP, ensuring no adverse environmental or social impacts i.e. land acquisition for the project does not affect biodiversity-sensitive areas, indigenous communities, or cultural heritage. If the land acquisition affects any of the PS 5-8 triggers, SIDBI will not assist the project under GCF-FMAP Programme.

Moving forward, the focus shifts to the documentation and implementation of the Environmental and Social Management Plan (ESMP). ESMP will operationalize the ESIA findings by translating them into actionable safeguards, including specific mitigation measures, monitoring indicators, and clear responsibilities for each Category B subproject under the sector.

Below are the tailored ESMPs for all Category B subprojects based on the outcomes of ESDD and site inspections. This ESMP plan will then be formally shared with the borrowers, accompanied by structured training sessions to build their capacity in implementing the safeguards. MSMEs will be required to provide a formal undertaking, committing to applicable compliance with the ESMP, including adherence to pollution control measures, occupational health and safety standards, gender and inclusion safeguards, and grievance redressal mechanisms.

This integrated approach ensures that risks remain site-specific, reversible, and effectively mitigated, while embedding ESG principles and inclusive practices into every financed project by the Accredited Entity.

## Section 2:

### 2. Environmental and Social Management Plan (ESMP): Implementation Framework for Category B Sub- projects of plastic sector

Under direct financing, SIDBI is responsible for ensuring that all subprojects under the Program adhere to the Green Climate Fund (GCF) Environmental and Social Safeguards (ESS) and follow a proportionate, risk-based due diligence process. This responsibility is rooted in the GCF revised Environmental and Social Policy.

SIDBI shall ensure that every financed subproject; regardless of scale or sector, meets the GCF Environmental & Social Policy requirements. This includes:

- Applying GCF's risk screening and categorization system (A/B/C) to each subproject.
- Ensuring that the GCF ESS (aligned with IFC Performance Standards) are triggered, assessed, and managed based on the potential environmental and social impacts.
- Ensuring alignment with national regulatory requirements and ongoing compliance monitoring.

GCF explicitly requires accredited entities to integrate the GCF ESP and safeguards into their due-diligence and project-approval processes.

SIDBI's own ESMS further strengthens this responsibility by requiring systematic identification, appraisal, risk classification, and monitoring of E&S risks across all financed MSME subprojects. SIDBI ensures that E&S assessments are proportionate to the level of risk and appropriately tailored to the specific attributes, scale, and sensitivities of the plastic sector. This includes Fit-for-Purpose ESIA for the sub-projects mentioned in the Section 1.2.

#### 2.1 Objective of the ESMP

- Identify potential Environmental and Social issues or threats associated with the proposed project activities and suggest procedures and measures to avoid, prevent, mitigate or compensate for them in line with the standard mitigation hierarchy.
- Integrate environmental and social safeguards into MSME financing as a mandatory standard for all Category B subprojects.
- Ensure that after ESDD, this tailored ESMP is shared with MSME borrowers.
- Create awareness and encourage MSMEs to adopt E&S framework and to build capacity to implement the same.
- Align MSME's operations with National Environmental legislation and GCF Environmental and Social Policy, ensuring risks remain site-specific, reversible, and mitigated.

#### 2.2 Screening and Categorization of Activities

- **Initial Screening:** All MSME proposals are screened against SIDBI's Exclusion List; Category A projects are rejected outright.
- **ESDD Process:** Category B projects undergo detailed due diligence using SIDBI's checklist, ESG risk rating tool, and site verification.

- **ESMP Preparation:** Based on ESDD findings, this project-specific ESMPs outlining mitigation measures, monitoring indicators, responsibilities, and timelines.
- **Sharing with MSMEs:** ESMPs are formally shared with borrowers, ensuring clarity on obligations.

## 2.3 Risk Identification and Assessment

- Risks identified during ESDD (wastewater discharge, hazardous waste, air emissions, OHS concerns, gender risks) are mapped into the ESMP.
- Each ESMP specifies:
  - o **Mitigation measures** (ETP, Pollution control, PPE, safer chemicals).
  - o **Monitoring indicators** (BOD/COD levels, emission compliance, PPE usage rates).
  - o **Responsible people** within the MSME.
  - o **Timelines** for implementation.
- MSMEs are trained to understand risk categories and mitigation pathways, ensuring ownership of safeguards.
- SIDBI stipulates that MSMEs must ensure standard working conditions and requisite worker amenities, consistent with the availability and operational requirements of all Category B MSMEs. These expectations are aligned with India's National Labour Code, which consolidates 29 existing labour laws into four comprehensive codes (1) Wages, (2) Social Security, (3) Industrial Relations, and (4) Occupational Safety—effective from 21 November 2025.
- These obligations are already embedded within several Environmental & Social (E&S) risk sections under Performance Standard 2 (PS 2), which mandates compliance with national regulations on fair wages, working hours, employee benefits, non-discrimination, and occupational health and safety.

## 2.4 ESMP Implementation

- **Training Workshops:** SIDBI organizes training sessions for MSMEs covering Environmental & Social Risk like pollution control, OHS, gender equality, SEAH prevention, stakeholder engagement, and grievance redressal.
- **Undertaking from MSMEs:** Borrowers sign a formal undertaking committing to implement ESMP measures, comply with national laws and GCF safeguards, and submit monitoring reports.
- **Suitable covenants:** Undertakings for ESMP implementation become part of loan sanction conditions, making compliance enforceable.

## 2.5 Mitigation Plan for Category B Subprojects for stakeholders understanding to adopt process specific mitigation plan

### 1. Material Preparation/Compounding

- **Risks:** Dust and fumes from powders/pigments; VOCs from plasticizers/solvents; Heat/burns from hot mixers and melt equipment; Fire/explosion (fine dust,

incompatibles); Ergonomic strain (bag lifting, hopper charging); Chemical exposure (phthalates, amines, stabilizers); Noise from mixers/granulators

- **Mitigation:** Enclosed feeders & closed transfer; local exhaust ventilation (LEV) at mixers and hoppers; Dust collection with HEPA; noise enclosures. Low-VOC/safer additives; dust-free masterbatch instead of loose pigments. Chemical compatibility matrix & segregation; ergonomic aids (tilt-tables, hoists); Personal Protective Equipment - Respirators, cut/heat-resistant gloves, goggles.
- **Validation:** measures on pollutant load and comply with discharge norms, Noise monitoring where applicable, near-miss reports/month; ergonomic injury rate.

## 2. Plastic Forming Production Process

- **Risks:** Heat/burns from barrels, moulds; Fumes/VOCs and decomposition products (e.g., from overheated polymer); Machine hazards; Hydraulic oil leaks leading to slip/soil contamination; High energy consumption (electric drives, heaters); Noise from compressors, granulators; Fire risk around hot zones and polymer dust
- **Mitigation:** Fire detection/suppression near machines; energy-efficient heaters, VFDs, high-efficiency motors; noise control; LEV on vents/de-gassing and purging stations; Heat-resistant gloves, face shields for purging, safety shoes
- **Validation:** Measurement of VOCs near vents, noise; spill/incident logs; fire drill records.

## 3. Quality Control & Testing

- **Risks:** Minor solvent/VOC exposure at cleaning/inking; Dust/shards from specimen cutting/grinding; Noise from bench grinders; Small hazardous sample waste (inks/solvents)
- **Mitigation:** LEV/fume hoods for solvents; guards & interlocks on tensile/impact testers; on-tool extraction for grinding; low-VOC cleaners/inks. sample disposal protocol; calibration schedules; chemical labeling. PPE- Safety glasses/face shields; cut-resistant gloves; hearing protection as needed.
- **Validation:** Measure VOC readings at solvent points; noise near grinders; Equipment calibration certificates; test method SOPs; chemical log; small hazardous waste register & manifests; LEV inspection.

## 4. Waste Management & Recycling

- **Risks:** Microplastics/plastic dust emissions during grinding & handling; Pellet/nurdle leakage to drains and soil; Fire load & ignition in scrap/waste areas; Improper mixing of hazardous residues (inks/solvents/oily rags) with non-hazardous plastic; Stormwater contamination from uncovered storage; Community nuisance (smoke if waste is burnt; noise)
- **Mitigation:** Enclosed grinders with extraction & dust collection; covered, bunded waste yards with impervious flooring; pellet containment (screens, berms, drain guards); spark detection/suppression where applicable; fire-rated storage; dedicated bins for hazardous residues; signage & secondary containment. Strict segregation (resin type, clean vs contaminated, hazardous vs non-hazardous); approved recycler tie-ups; no open burning; stormwater inspections; emergency response plan (spill/fire). PPE- Dust masks/respirators, gloves, goggles for grinding/handling

- **Validation:** Measure Dust (area & personal); stormwater TSS/microplastics (where feasible); housekeeping audits; fire drill performance. Documentary Evidence of Waste inventory & monthly balance; recycler authorization; photos of covered storage & bunds; spill logs; training records. Percentage of scrap recycled (internal/external); pellet loss incidents/month; fire/near-miss count.

In addition to the subprojects assisted under the above-mentioned activities which are already classified as “Category-B”, the subprojects which falls under activities such as Raw Material Procurement and Packaging and Finishing would also be classified as Category B when an MSME undertakes a Greenfield project / expansion project by a brownfield enterprise in a new location. Accordingly, the following process shall be followed w.r.t risks mitigation and validation.

### 1. Raw Material Procurement

- Risks: VOCs, NOx, SOx from extraction and processing; Spills during transportation (pipeline ruptures, tanker spills); Fire and explosion hazards due to flammable materials. Labor Exposure to toxic chemicals (e.g., benzene, styrene, phthalates).
- Mitigation: Spill preparedness in logistics; preference for certified suppliers (ISO 14001/45001); encourage recycled polymer procurement, PPE mandatory
- Validation: Impacts are largely occupational and readily mitigated

### 2. Packaging and Finishing

- Risks: Ergonomic strain, minor noise, dust, noise, manual handling, fire load in finished goods warehouse; packaging waste
- Mitigation: Dust control, PPE, ergonomic aids, fire-rated storage, housekeeping; recycling of packaging; forklift safety
- Validation: Environmental impacts are minor and controllable; primarily occupational.

#### 2.5.1 Asset-based Environmental & Social Mitigation measures

SIDBI has adopted an asset-anchored, risk-cluster approach, which aligns with FMAP’s asset-specific financing model and SIDBI’s experience under previous green-lending programme(s). This approach ensures consistent, practical and uniform application of mitigation requirements across all Category B MSMEs, regardless of location.

To operationalize this approach, risk clusters aligned with international plastic E&S standards like IFC Performance Standards for pollution control, Occupational Health and Safety (OHS), Community Health and Safety (CHS), labour & GRM, gender & (Prevention, Prohibition and Redressal) POSH Act / Sexual Exploitation, Abuse, and Harassment (SEAH).

Detailed asset-based mitigation tables, summarizing:

- (I) key E&S risk drivers linked to FMAP-financed assets, and
- (II) mandatory mitigation and O&M measures to be included in sub-project ESMPs.



This structure reflects good international practice, ensures compliance feasibility for MSMEs, and provides a clear and scalable framework that can be uniformly implemented across India's diverse plastic sector.

Indicative outline of the key sub-management plans that may be required for MSMEs, based on the nature and scale of operations may include the following:

- Occupational Health and Safety (OHS) Plan
- Waste and Sludge Management Plan (including disposal of plastic waste)
- Chemical and Solvent Management Plan
- Water and Effluent Management Plan
- Air Emissions and Pollution Control Plan
- Emergency Preparedness and Response Plan

The applicability of these plans will be determined through ESDD screening, risk categorization, project appraisal and incorporated into site-specific ESMPs with implementation and monitoring requirements for each MSME. Though, SIDBI EE team along with credit officers monitors the implementation of the necessary sub-management plans / mitigation measures, the MSME units are solely responsible for execution.

To ensure asset-specific environmental and social risk management across plastic sub-projects, a consolidated asset-anchored mitigation has been added in table 3 below. The table summarizes, for each key asset or technology, the associated process step, principal E&S risk pathways identified in the ESIA, and the minimum mitigation and O&M requirements to be included in sub-project ESMPs. This format aligns with internationally recognized good practice. The credit officers during sub-project appraisal and evaluation shall customize and expand the listed measures based on the actual technologies, scale, and site conditions.

**Table 3: Asset Based Environmental & Social Mitigation measures**

| Assets / Technology             | Process Step | Key E&S Risk                                                                                                                                                           | Mitigation Measures (to include in ESMPs)                                                                                                                                                                   | O&M Requirements                                                                                                                                                                                                                  | Responsible Parties #                                         |
|---------------------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
| <b>Raw Material Procurement</b> | Procurement  | VOCs, NOx, SOx from extraction and processing; Spills during transportation (pipeline ruptures, tanker spills); Fire and explosion hazards due to flammable materials. | <ul style="list-style-type: none"> <li>• Spill preparedness in logistics; preference for certified suppliers (ISO 14001/45001); encourage recycled polymer procurement, PPE mandatory</li> <li>•</li> </ul> | <ul style="list-style-type: none"> <li>• Routine inspection of transportation pipelines, tankers</li> <li>• Housekeeping for spills</li> <li>• Chemical inventory management</li> <li>• Regular training for operators</li> </ul> | MSME Owners / Promoters / Technician or Operation supervisor. |

| Assets / Technology                                     | Process Step                             | Key E&S Risk                                                                                                                                                                                                                                   | Mitigation Measures (to include in ESMPs)                                                                                                                                                                                         | O&M Requirements                                                                                                                                                                           | Responsible Parties #                                                                               |
|---------------------------------------------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
|                                                         |                                          |                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                   | <ul style="list-style-type: none"> <li>• Fire management</li> </ul>                                                                                                                        |                                                                                                     |
| <b>Boilers &amp; Pressure Vessels</b>                   | Heat setting, finishing, process heating | <ul style="list-style-type: none"> <li>• Explosion risk</li> <li>• Steam burns</li> <li>• Air emissions</li> <li>• Noise</li> <li>• Safety gear</li> <li>• Such as Safety Shoes, Hamlet, Goggles, gloves and reflective jacket etc.</li> </ul> | <ul style="list-style-type: none"> <li>• Certified boiler installation</li> <li>• Pressure relief valves</li> <li>• Interlocks &amp; emergency shutdown</li> <li>• Stack emission controls</li> <li>• Noise enclosures</li> </ul> | <ul style="list-style-type: none"> <li>• Annual pressure certification</li> <li>• Daily boiler logs</li> <li>• Stack monitoring as per SPCB norms</li> <li>• Operator licensing</li> </ul> | MSME Owners / Promoters / Technician or Operation supervisor.                                       |
| <b>Effluent Treatment Plant (ETP) / CETP Connection</b> | Wastewater treatment                     | <ul style="list-style-type: none"> <li>• Discharge of untreated wastewater</li> <li>• Sludge mismanagement and Odour</li> <li>• Safety gear such as Safety Shoes, Hamlet, Goggles, gloves and reflective jacket etc.</li> </ul>                | <ul style="list-style-type: none"> <li>• Correct chemical dosing</li> <li>• Online pH/flow monitoring</li> <li>• Proper sludge storage</li> <li>• ETP operator training</li> </ul>                                                | <ul style="list-style-type: none"> <li>• Daily pH, COD/BOD checks</li> <li>• Monthly effluent testing</li> <li>• Sludge disposal to authorised vendors</li> </ul>                          | MSME Owners / Promoters / Technician or Operation supervisor / ETP Operator                         |
| <b>Stenter / Heat Setting Machines</b>                  | Finishing, heat setting                  | <ul style="list-style-type: none"> <li>• Fire hazards</li> <li>• Heat stress</li> <li>• Air emissions (VOCs)</li> </ul>                                                                                                                        | <ul style="list-style-type: none"> <li>• Fire suppression system</li> <li>• Thermal insulation</li> <li>• Stack monitoring</li> <li>• Exhaust ventilation</li> </ul>                                                              | <ul style="list-style-type: none"> <li>• Quarterly stack emission tests</li> <li>• Thermal insulation verification</li> <li>• Preventive maintenance</li> </ul>                            | MSME Owners / Promoters / Technician or Operation supervisor / EHS Officer                          |
| <b>Plastic Forming Production Process</b>               | Production Process                       | High heat and burn injury; fumes and VOCs; noise; energy consumption; hydraulic oil leaks; machine accidents; fire risk; manual material handling strain                                                                                       | <ul style="list-style-type: none"> <li>• Machine guarding</li> <li>• Lockout-Tag Out (LOTO)</li> <li>• Hearing protection</li> <li>• Fire Management</li> </ul>                                                                   | <ul style="list-style-type: none"> <li>• Belt/roller checks</li> <li>• Noise monitoring</li> <li>• Fire safety equipments</li> <li>• Fire safety equipment</li> </ul>                      | MSME Owners / Promoters / Technician or Operation supervisor / Production Manager/ Maintenance Team |

| Assets / Technology                                                    | Process Step                  | Key E&S Risk                                                                                                                                                                                                         | Mitigation Measures (to include in ESMPs)                                                                                                                             | O&M Requirements                                                                                                         | Responsible Parties #                                                                |
|------------------------------------------------------------------------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Chemical Storage Rooms</b>                                          | All pre-processing and dyeing | <ul style="list-style-type: none"> <li>• Chemical spills</li> <li>• Worker exposure</li> <li>• Fire risk</li> <li>• Safety gears such as Safety Shoes, Hamlet, Goggles, gloves and reflective jacket etc.</li> </ul> | <ul style="list-style-type: none"> <li>• Segregated storage (acids, alkalis)</li> <li>• Ventilation</li> <li>• Spill kits</li> <li>• Fire-specific storage</li> </ul> | <ul style="list-style-type: none"> <li>• Monthly inventory reconciliation</li> <li>• Storage condition checks</li> </ul> | MSME Owners / Promoters / Technician or Operation supervisor / Chemical Storekeeper; |
| <b>Air Compressors</b>                                                 | Utilities                     | <ul style="list-style-type: none"> <li>• Noise</li> <li>• Pressure hazards</li> </ul>                                                                                                                                | <ul style="list-style-type: none"> <li>• Noise enclosures</li> <li>• Pressure relief valves</li> </ul>                                                                | <ul style="list-style-type: none"> <li>• Pressure checks</li> </ul>                                                      | MSME Owners / Promoters / Technician or Operation supervisor /                       |
| <b>Generators (DG Sets)</b>                                            | Utilities / Backup power      | <ul style="list-style-type: none"> <li>• Air emissions</li> <li>• Noise</li> </ul>                                                                                                                                   | <ul style="list-style-type: none"> <li>• Acoustic noise enclosure</li> <li>• Stack height compliance</li> <li>• Fuel spill control</li> </ul>                         | <ul style="list-style-type: none"> <li>• Emission testing</li> <li>• Oil spill logs</li> </ul>                           | MSME Owners / Promoters / Technician or Operation supervisor /                       |
| <b>Warehousing &amp; Material Handling Equipment</b>                   | Raw material staging          | <ul style="list-style-type: none"> <li>• Fire risk (cotton)</li> <li>• Ergonomic strain</li> <li>• Forklift collision</li> </ul>                                                                                     | <ul style="list-style-type: none"> <li>• Fire extinguishers</li> <li>• Aisle marking</li> <li>• Forklift SOPs</li> </ul>                                              | <ul style="list-style-type: none"> <li>• Equipment inspection</li> <li>• Fire drills</li> </ul>                          | MSME Owners / Promoters / Technician or Operation supervisor / Warehouse Manager     |
| <b>Solar PV Panels (if applicable)</b>                                 | Renewable energy              | <ul style="list-style-type: none"> <li>• Electrical shock</li> <li>• Fall hazards</li> <li>• Safety gear such as Safety Shoes, Hamlet, Goggles, gloves and reflective jacket etc.</li> </ul>                         | <ul style="list-style-type: none"> <li>• Electrical isolation</li> <li>• Use of PPE for maintenance</li> </ul>                                                        | <ul style="list-style-type: none"> <li>• Annual electrical audit</li> </ul>                                              | MSME Owners / Promoters / Technician or Operation supervisor / Maintenance Team      |
| <b>Worker Facilities (Toilets, Crèches, Women-Friendly Facilities)</b> | All operations                | <ul style="list-style-type: none"> <li>• Gender safety risks</li> <li>• Hygiene risks</li> <li>• Safety gears such as Safety Shoes, Hamlet, Goggles, gloves and reflective jacket etc.</li> </ul>                    | <ul style="list-style-type: none"> <li>• Adequate, segregated toilets</li> <li>• Antiharassment committee</li> <li>• Grievance redressal system (GRS)</li> </ul>      | <ul style="list-style-type: none"> <li>• Daily hygiene maintenance</li> </ul>                                            | MSME Owners / Promoters / Technician or Operation supervisor / HR; Welfare Officer   |
| <b>Fire Safety Systems</b>                                             | Entire unit                   | <ul style="list-style-type: none"> <li>• Fire outbreaks</li> <li>• Worker injury</li> <li>• Safety gear</li> </ul>                                                                                                   | <ul style="list-style-type: none"> <li>• Smoke detectors</li> <li>• Sprinklers</li> </ul>                                                                             | <ul style="list-style-type: none"> <li>• Monthly fire equipment checks</li> </ul>                                        | MSME Owners / Promoters /                                                            |

| Assets / Technology | Process Step | Key E&S Risk                                                             | Mitigation Measures (to include in ESMPs)                                      | O&M Requirements                                                   | Responsible Parties #                                  |
|---------------------|--------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------|--------------------------------------------------------|
|                     |              | such as Safety Shoes, Hamlet, Goggles, gloves and reflective jacket etc. | <ul style="list-style-type: none"> <li>Hydrants</li> <li>Fire exits</li> </ul> | <ul style="list-style-type: none"> <li>Fire mock drills</li> </ul> | Technician or Operation supervisor /EHS Team; Security |

# Responsible parties might not have Technical Environmental expert at Micro and Small -MSME. In such case, they may consider the unit head, and capable individual may be assigned as the person responsible.

MSMEs in India are generally small and EHS personnel / service provider would be required appropriate to the scale and risk profile of operations to perform ESS-related tasks. MSMEs may assign staff with defined EHS responsibilities and train them through capacity-building and training initiatives facilitated by SIDBI under the programme or can train the staff on their own.

Compliance will be ensured through ESDD screening and periodic monitoring, including site visits to verify that staffing arrangements remain proportionate to risk levels and effective in implementing ESS requirements.

Residual risks that remain after technology adoption include chemical exposure, heat stress, noise, emergency preparedness gaps, labour welfare considerations, women-friendly facilities, and SEAH/harassment risks. These are addressed through unit-specific ESMP measures described in Section 2.5.2 below.

## 2.5.2 SIDBI's Activity-Wise Environmental & Social Management Plan (ESMP)

Section 2.5.1 outlines SIDBI's internal environmental and social management procedures for FMAP direct-lending operations. These steps form part of SIDBI's institutional ESMS and run parallel to the MSME-level ESMP requirements presented in Section 2.5.3.

**Table 4: SIDBI's Activity Wise ESMP**

| Sl. No. | Activity                                               | Description                                                                                                                                                                                                      | Responsibility  | Frequency                                        |
|---------|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------------------------------|
| 1       | <b>Project Screening / E&amp;S Risk Categorization</b> | Ensure projects listed in the FMAP Exclusion List are not taken up. Initial risk categorization is applied to screen out high-risk (Category A/I-1) proposals.                                                   | SIDBI           | At project evaluation and loan application stage |
| 2a      | <b>Environmental and Social Due Diligence (ESDD)</b>   | Evaluation of E&S risks, compliance gaps and identification of applicable mitigation measures. Projects not meeting E&S requirements will either be rejected or asked to strengthen compliance before appraisal. | Borrower (MSME) | With each loan application                       |
| 2b      | <b>Review of ESDD Report</b>                           | Examination and verification of ESDD documents and evidence for completeness, adequacy, and alignment with FMAP requirements.                                                                                    | SIDBI           | At loan application review                       |

| Sl. No.   | Activity                                                        | Description                                                                                                                                                                                                                                                                                  | Responsibility                            | Frequency                                                         |
|-----------|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-------------------------------------------------------------------|
| <b>3</b>  | <b>Technical Assessment</b>                                     | Assessment of energy/resource savings, pollution reduction, OHS improvements, and other E&S benefits of the proposed assets.                                                                                                                                                                 | SIDBI                                     | During loan appraisal                                             |
| <b>4</b>  | <b>E&amp;S Rating</b>                                           | Scoring of environmental and social performance using SIDBI's ESG/Green Rating Tool to support decision-making.                                                                                                                                                                              | SIDBI                                     | During loan appraisal                                             |
| <b>5a</b> | <b>Environmental &amp; Social Management Plan (ESMP) Review</b> | Based on ESDD findings, SIDBI reviews the MSME's ESMP or ESHS strengthening plan, ensuring inclusion of: (i) mitigation measures, (ii) monitoring indicators, (iii) responsibilities, (iv) timelines, and (v) residual-risk actions. ESMPs are shared with MSMEs during the lending process. | SIDBI + MSME                              | During loan appraisal                                             |
| <b>5b</b> | <b>Training &amp; Awareness</b>                                 | MSMEs receive guidance/training on ESMP implementation                                                                                                                                                                                                                                       | SIDBI / MSME                              | Need based                                                        |
| <b>6a</b> | <b>E&amp;S Supervision</b>                                      | Site visits, document reviews and verification of ESMP implementation using M&V protocols, ESDD formats and the ESG Rating Tool.                                                                                                                                                             | SIDBI                                     | Periodical visit during tenure of loan [generally once in a year] |
| <b>6b</b> | <b>Monitoring &amp; Reporting</b>                               | Independent third-party monitoring (sample-based) may be undertaken to assess ESMP implementation, including checks on SEAH safeguards, labour and gender measures, and asset-specific mitigation. Findings will be integrated into FMAP programme-level reporting.                          | SIDBI / Third-Party Agency (if appointed) | As per program requirement                                        |

### 2.5.3 MSME Stage-wise for Assets based monitoring under Environmental & Social Management Plan (ESMP)

This MSME stage-wise ESMP sets minimum E&S actions and responsibilities for each stage of the sub-project cycle screening/appraisal, installation, commissioning, routine operation, monitoring & reporting, and decommissioning.

Actions are explicitly linked to the risk clusters in Section 2.5 (Pollution & Resource Efficiency; OHS & Workplace Safety; Community Health & Safety; Labour & GRM; Gender, SEAH/ POSH & Inclusion) and anchored to FMAP-financed asset types (e.g., ETPs, washing ranges, stenters, boilers, rooftop PV, mobility).

SIDBI will apply its standard procedures for internal review, including onsite verification by Relationship Manager (RM), and use of structured tools (ESG Rating Tool, ESDD formats, and M&V protocols). Technical Assistance (TA) will support MSMEs to implement unit-level ESMPs, and sample-based third-party verification will provide independent checks at portfolio level.

Table 5: E&amp;S Actions and Responsibilities by Project Stage

| A. Screening / Appraisal Stage                                                                                |                                                                                                                                        |                                  |                                                                      |                                                                     |
|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------|
| E&S Actions<br>(Asset-anchored)                                                                               | Asset-Specific Conditions                                                                                                              | Responsibilities                 | Evidence Records / Maintain                                          | Verification & Frequency                                            |
| Apply exclusion list; map applicable risk clusters; preliminary ESDD                                          | Confirm the project is not on the exclusion list and all the Environmental & Social compliances are in place as per ESDD document.     | MSME & RM                        | ESDD checklist; legal permits status; site layout; utility list      | Pre-Sanction visit to the project site and during project appraisal |
| Legal and regulatory screening (SPCB consents, factory license);                                              | Confirm Consent to Establish timelines;                                                                                                | MSME & RM                        | Copies of consents/ applications                                     | Pre-Sanction visit to the project site and during project appraisal |
| Baseline OHS & HR due diligence: PPE, fire & emergency, labour contracts, women facilities & GRM              | Verify (POSH), toilets/lighting, workers sanitation; contractor controls                                                               | MSME & RM                        | HR policies, GRM notes, POSH constitution, floorplans                | Pre-Sanction visit to the project site and during project appraisal |
| Residual-risk planning requirement listed in term sheet, as appropriate                                       | Require unit-specific actions in ESMP for OHS, emergency, labour, women's safety/SEAH                                                  | MSME, RM and E&S Expert          | Draft unit-specific ESMP outline                                     | Project Appraisal stage                                             |
| B. Installation Stage                                                                                         |                                                                                                                                        |                                  |                                                                      |                                                                     |
| E&S Actions                                                                                                   | Asset-Specific Conditions                                                                                                              | Responsibilities                 | Evidence Records /                                                   | Verification & Frequency                                            |
| Contractor OHS plan (LOTO, work at height, hot work, confined space, electrical safety); site induction & PPE | Green Technologies, Boiler placement & foundations; stenter ventilation; ETP bunding; Electric arc and hot work protection & isolators | Vendor/Installer; MSME oversight | Method statements: toolbox talk registers; Permit To Work (PTW) logs | Check at MSME end                                                   |
| Nuisance control dust, noise, traffic; safe chemical receipt/storage                                          | Temporary storage for chemicals, spill kits; forklift movement plan                                                                    | Vendor; MSME                     | Housekeeping & traffic plan; spill logs                              | Check at MSME end                                                   |
| Compliance with layout and clearances (fire lanes, exits, extinguishers, hydrants)                            | Fire detection & suppression compatibility                                                                                             | MSME; Vendor                     | Layout as-built; fire system handover                                | Check at MSME end                                                   |
| C. Commissioning Stage                                                                                        |                                                                                                                                        |                                  |                                                                      |                                                                     |
| E&S Actions                                                                                                   | Asset-Specific Conditions                                                                                                              | Responsibilities                 | Evidence Records /                                                   | Verification & Frequency                                            |



|                                                                                                                       |                                                                                          |                                |                                                  |                                                     |
|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------|--------------------------------------------------|-----------------------------------------------------|
| <b>Functional testing: ETP (flow, pH, COD), stenter/boiler stacks, DG/compressors acoustics, PV protection relays</b> | Calibrate flow meters, pH probes; verify stack height                                    | Vendor (tests); MSME (witness) | Commissioning reports; calibration certificates  | Technical Official spot-check                       |
| <b>Emergency preparedness drill; verify routes, alarms,</b>                                                           | Simulate small spill; evacuation timing; assembly area                                   | MSME; E&S Expert support       | Drill records; emergency plan                    | Post commissioning                                  |
| <b>Operator training &amp; SOPs (ETP dosing, boiler operations, stenter settings)</b>                                 | Vendor manuals translated; shift-wise SOPs                                               | Vendor; MSME                   | Training attendance; SOPs; shift handover sheets | Post-commissioning at MSME end                      |
| <b>D. Routine Operation Stage</b>                                                                                     |                                                                                          |                                |                                                  |                                                     |
| <b>E&amp;S Actions</b>                                                                                                | <b>Asset-Specific Conditions</b>                                                         | <b>Responsibilities</b>        | <b>Evidence Records</b>                          | <b>Verification &amp; Frequency</b>                 |
| <b>Effluent &amp; emissions compliance; sludge to authorised vendor; plastic waste manifests</b>                      | ETP daily pH, periodic COD/BOD; stack/ambient checks as per SPCB, total plastic produced | MSME (Ops)                     | Lab reports; manifests; calibration logs         | By the concerned Regulators.                        |
| <b>OHS controls: PPE, machine guarding, LOTO, hot-surface insulation; periodic fire checks</b>                        | Stenter guarding; boiler operator certification; confined space permits                  | MSME                           | PPE logs; PTW; incident/NMIS reports             | Need based periodical review                        |
| <b>Community safeguards: traffic management; noise timing; stack dispersion, plastic burning</b>                      | Vehicle routing; acoustic enclosures maintained, plastic disposed and collection         | MSME                           | Traffic plan; noise checks                       | Need based periodical review                        |
| <b>Labour &amp; GRM: contracts, wages, hours, GRM functionality; POSH functioning; facilities for women</b>           | GRM register; POSH training; toilets/lighting                                            | MSME; HR/Welfare               | GRM logs; POSH minutes                           | Need based periodical review                        |
| <b>Residual-risk actions: unit-specific SOPs and corrective actions</b>                                               | Upset conditions; legacy drains; battery handling                                        | MSME                           | CAR (Corrective Action Register)                 | Need based periodical review                        |
| <b>E. Monitoring &amp; Reporting Stage</b>                                                                            |                                                                                          |                                |                                                  |                                                     |
| <b>E&amp;S Actions</b>                                                                                                | <b>Asset-Specific Conditions</b>                                                         | <b>Responsibilities</b>        | <b>Evidence Records</b>                          | <b>Verification &amp; Frequency</b>                 |
| <b>Maintain M&amp;V logs (effluent, emissions, energy, water), OHS</b>                                                | Metered ETP flows, boiler fuel data, PV generation, EV charging                          | MSME                           | M&V sheets; training registers; drills           | MSME shall maintain data which may be available for |

|                                                                        |                                                                         |                                                     |                                                         |                                                                                                 |
|------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <b>incidents, drills, training</b>                                     |                                                                         |                                                     |                                                         | verification to regulatory bodies                                                               |
| <b>Internal audits against cluster measures &amp; asset conditions</b> | Short, MSME-friendly checklists                                         | MSME; RM support                                    | Audit checklists; photos                                | MSME to keep audit data and make available for verification                                     |
| <b>Third-party verification (sample-based) across</b>                  | Evidence reviews; site checks; Corrective Action Plan                   | Independent agency; SIDBI PMU                       | Verification reports; CAPs                              | Verification on sample basis as per requirement                                                 |
| <b>Reporting to SIDBI/PMU; update MIS; track CAP closure</b>           | Aligning with FMAP reporting cadence                                    | MSME; RM/ PMU                                       | Periodic reports                                        | As per loan conditions                                                                          |
| <b>F. Decommissioning Stage (recognising loan-tenure constraint)</b>   |                                                                         |                                                     |                                                         |                                                                                                 |
| <b>E&amp;S Actions</b>                                                 | <b>Asset-Specific Conditions</b>                                        | <b>Responsibilities</b>                             | <b>Evidence Records</b>                                 | <b>Verification &amp; Frequency</b>                                                             |
| <b>Plan for end-of-life pathways at</b>                                | PV module/battery recycling; boiler dismantling; chemical tank disposal | MSME (when End of Life arises); Vendor/EPR channels | Disposal certificates; handover to authorised recyclers | Verification feasible only if within loan tenure; otherwise, documented commitment at appraisal |
| <b>Residual risks during dismantling: OHS, spills, traffic control</b> | Dismantling method statements; PTW/LOTO                                 | MSME; Contractor                                    | PTW; spill & incident lo                                | At time of dismantling                                                                          |

This section outlines the minimum, stage-wise environmental and social (E&S) actions and responsibilities that MSME sub-projects are required to follow under FMAP. These actions are designed to be practical, asset-anchored, and implementation-oriented, helping MSME units translate FMAP safeguards into day-to-day operational practices.

This whole section, which describes SIDBI's internal ESMS procedures for appraisal, supervision, and portfolio-level reporting under FMAP's direct-lending modality.

### Structure and Linkages:

The stage-wise ESMP covers the full cycle of MSME sub-projects, including: screening/appraisal, installation, commissioning, routine operation, monitoring & reporting, and decommissioning.

Each action item is explicitly linked to the risk clusters identified in Section 2.5:

- Pollution & Resource Efficiency
- Occupational Health & Safety
- Community Health & Safety
- Labour & GRM
- Gender, SEAH/POSH & Inclusion

These requirements are aligned with the specific asset types financed under FMAP, such as ETPs, washing ranges, furnaces for plastic melting, stenters, boilers, rooftop solar PV systems and



mobility solutions. This ensures that MSMEs can clearly understand the E&S expectations related to the technologies they adopt.

### **Implementation and Verification**

To support consistent and reliable implementation, SIDBI will apply its standard internal review processes, including onsite verification by the Relationship Manager and Technical Officials. SIDBI will also use structured assessment tools such as the ESG/Green Rating Tool, ESDD formats, and Measurement & Verification (M&V) protocols to ensure transparency and uniformity in evaluations.

MSMEs will receive Technical Training and Capacity Building (as TA workshop) to prepare and implement unit-level ESMPs or E&S strengthening plans. In addition, sample-based third-party verification will provide independent oversight across the programme, helping validate ESMP implementation and strengthen portfolio-level monitoring.

The responsibilities and actions described in this section apply to MSMEs, SIDBI, technology vendors/contractors, third-party verifiers, and Technical Assistance providers only.

## **2.6 Management and Monitoring Requirements**

Effective E&S management requires the SIDBI to implement continuous monitoring, reporting, supervision, and corrective-action mechanisms. These obligations are established under the GCF Environmental and Social Policy, the GCF Screening & Categorization Guidance, and SIDBI's own ESMS.

### **Environmental & Social (E&S) performance and compliance with the ESMP:**

- Monitoring the implementation of ESMP measures for each subproject throughout the project lifecycle.
- Ensuring compliance with GCF Environmental and Social Safeguards (ESS), host-country regulations, and approved subproject-specific ESMPs.
- Maintaining systematic E&S performance records, including effluent monitoring, waste management, occupational health and safety (OHS) indicators, grievance redress data, and stakeholder engagement logs.
- Reporting to the GCF on the project's E&S performance through periodic progress reports.

The GCF Environmental & Social Policy explicitly requires accredited entities to ensure implementation, monitoring, and compliance with mitigation measures identified in ESIA/ESMP. SIDBI's ESMS additionally requires ongoing E&S risk management, including monitoring and reporting across subprojects through the entire project cycle.

### **Conduct periodic site audits, inspections, and impact assessments:**

Regular site visits/audits at a frequency proportionate to risk category are conducted and the details are as under:

- High-risk and Moderate-risk - semi-annual or annual monitoring
- Low-risk - annual or desk-based compliance checks.
- Track actual impacts versus predicted impacts identified in ESIA, adjusting mitigation measures as needed (adaptive management).
- Document non-compliances and ensure corrective action plans (CAPs) are implemented within agreed timelines.

SIDBI's ESMF and project cycle framework specify monitoring frequency, site audits, incident reviews, and corrective-action tracking as core components of E&S supervision.

The World Bank/IFC ESF and GCF guidance emphasize adaptive monitoring, disclosure, and ongoing reassessment of risks throughout implementation, requiring borrowers/accredited entities to adjust measures whenever impacts deviate from predictions.

At the varying levels of E&S capacity across MSMEs, technical assistance (TA), capacity-building and independent verification mechanisms form an integral part of FMAP's implementation strategy. SIDBI already applies similar models across its green financing lines, including external technical partners, third-party auditors, and structured reporting formats.

Technical Assistance (TA) providers will help MSMEs prepare site-specific ESMPs strengthening plans, aligned with the risk clusters and asset-specific mitigation requirements in Section 2.5.

Under the Technical Assistance (TA) plan, dedicated workshops will be organized to build the capacity of MSMEs, PFIs, and NBFCs on the application of environmental and social safeguards (the number of workshops can be increased as per requirement and size of participants). These workshops will provide structured knowledge on how E&S aspects are integrated during project screening, implementation, and monitoring & verification (M&V). A specialized agency will be engaged (as per the TA plan submitted during proposal) to design and deliver the workshops, preparing training materials and guidance aligned with GCF's E&S standards and the FMAP programme. The costs associated with ESMP implementation, including environmental training, OHS measures, and monitoring, will be borne under the TA component of the overall project/operational expenditure. Additionally, SIDBI EE team will support these requirements through ESDD processes, loan covenants, and capacity-building support, ensuring that adequate financial provisions are available for effective implementation of environmental and social safeguards. SIDBI EE team will be actively involved in the preparation, review, and finalization of these materials to ensure their relevance and quality. This initiative will strengthen institutional understanding and practice of E&S compliance, thereby supporting the effective adoption of low-carbon technologies within the MSME sector.

- MSMEs will receive guidance on documentation and residual-risk management, emergency preparedness, and labour/women-safety safeguards.
- ESG Rating Tool, ESDD checklists and M&V protocols will be used to standardise assessment and strengthen implementation.

Regarding Third-Party Monitoring and Sample Based Verification, SIDBI will engage independent agencies for sample-based verification across the MSME portfolio. Third party verifiers will review implementation of ESMP actions, conduct site visits, and check evidence records like pollutant load, effluent logs, OHS training, emergency systems, GRM functioning, POSH/SEAH. Verification findings will serve into portfolio level reporting, corrective actions, and capacity-building needs.

SIDBI's Technical Officials (E&S and Climate Expert) and Relationship Managers will monitor progress at key applicable ESMP stages. TA workshop and third-party findings will be integrated into SIDBI's internal supervision, tracking, and periodic reporting to GCF as per FAA. This will strengthen alignment between implementation and program-level accountability. This combined approach ensures that MSMEs receive hands-on support to meet ESMP requirements, while

SIDBI maintains a robust oversight framework consistent with FMAP safeguards and SIDBI's green lending standards.

## 3. Loan Processing Framework for direct lending operations<sup>3</sup>

### 3.1 Loan Screening and Approval Process

The Loan Approval Process is a comprehensive three-stage procedure designed to rigorously evaluate loan applications and ensure adherence to the stringent criteria.

The first stage, Application and Initial Screening, is conducted at the branch level by the Relationship Manager of SIDBI. During this phase, applications are meticulously screened for completeness, including the submission of mandatory documentation such as climate-related, environmental, and social safeguards documents. Incomplete applications are promptly rejected/ hand hold to be completed, as the case may be, while only those deemed complete undergo initial screening against the exclusion list criteria. Further, at this stage, the individual proposals would be assessed for the following to ensure that they do not fall under the Cat. A/ I-1 activities of GCF:

1. Project outlay (if more than USD 60 million per project)
2. Whether the potential impact (environmental and/or social risks) are diverse, irreversible, or unprecedented
3. Whether the impact of the project be addressed through adequate policy implementation and workplace standards and suitable norms?

Based on the above assessment, if the project is found to be in the category Cat. A/ I-1 of, then the project will be screened out and will not be considered for financing.

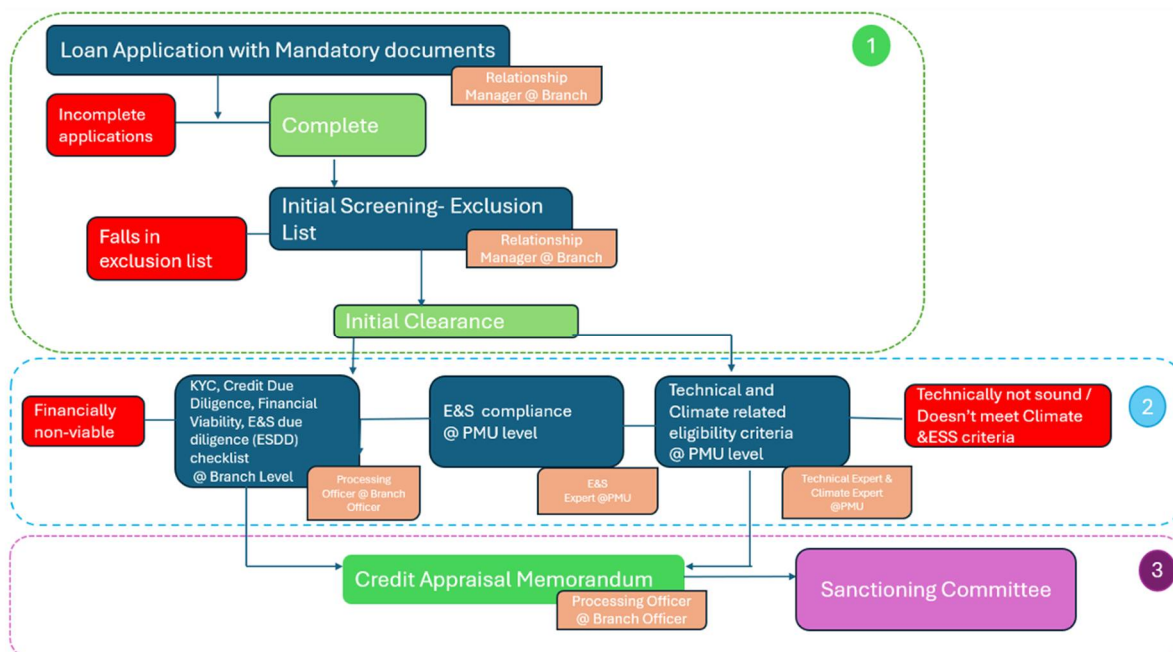
Applications that meet the criteria are forwarded to the second stage, Due Diligence, while those that fall under the exclusion list (which includes the Category A/I1 projects) are rejected. The Due Diligence stage is executed in parallel at the branch level and involves several crucial assessments. The second level of screening will be done by means of the ESG rating tool as mentioned in ESMS of FMAP. The Processing Officer conducts evaluations related to Know Your Customer (KYC) requirements, financial viability, credit due diligence and checking of ESDD checklist information. Concurrently, the Climate Expert, Technical Expert and E&S expert at the Project Management Unit (PMU) will perform climate-related, technical due diligence and will check the projects for ESS compliance (using the ESG rating tool) to ensure the soundness of the proposed project from a technical, E&S and climate perspective.

In the third stage, technically sound and financially viable applications proceed to the Credit Appraisal Memorandum preparation phase. The Processing team comprising Maker and Checker compiles a comprehensive Credit Appraisal Memorandum, which is then presented to the Loan Sanctioning Committee for final evaluation and decision-making. To maintain

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<sup>3</sup> SIDBI, "Environment and Social Management System (ESMS) 'Financing Mitigation & Adaptation Projects (FMAP) in Indian MSMEs", Page 27-29, <https://www.sidbi.in/assets/front/pdf/ESMS-FMAP-E.pdf>

transparency and impartiality, no member involved in the Initial Application Screening and Due Diligence processes is permitted to be part of the Loan Sanctioning Committee.



**Figure 1: Loan Application Process**

For direct loans, risk screening is carried out by SIDBI at the individual project level before financial approval. Each MSME proposal undergoes detailed checks against the exclusion list and Category A/I-1 criteria. Environmental and Social Due Diligence (ESDD) is performed, supported by the ESG rating tool, and project-specific ESMPs are prepared to ensure compliance with environmental and social, safeguards. This ensures that only technically sound and compliant projects are financed directly by SIDBI.

Risk management for the direct loans is focused on the individual project level. Each MSME borrower must demonstrate compliance with the sectoral ESIA/ESMP and ESMS, which outlines impact/mitigation measures, monitoring indicators, and responsibilities. SIDBI, as the Accredited Entity (AE), directly screens proposals, by ensuring that MSME's submit a holistic Environment Social Due Diligence (ESDD) and ESG rating tool which encompasses environment and social risks like (Pollution control, Labour issues, Occupational health and safety, SEAH, Grievance Redressal, Gender), and ensures that every project meets environmental and social safeguards before financial approval.

## 3.2 Risk Identification & Mitigation Strategy

Table 6: Identification risk and its mitigation strategy

| Type          | Risks Identified                                               | Mitigation Measures                                                                                                                                                                                                                                                                                 |
|---------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Environmental | Toxic discharges, hazardous emissions, noise fury, waste chaos | Advanced pollution control (air, water & noise whatever applicable), Waste management, wherever applicable, clean tech retrofits, real-time monitoring, Statutory and regulatory clearances, climate-smart innovation, proper hands-on training be given to the operators before operation, regular |

|                      |                                                               |                                                                                                                                                                                                                                             |
|----------------------|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      |                                                               | inspections, Operation & Maintenance of machineries / equipment, Fire safety guidelines /manuals, Do's & Don'ts in the facility etc.                                                                                                        |
| <b>Social</b>        | Unsafe labour conditions, gender inequity, SEAH, underpayment | Institutional safeguards, Personal protective Equipment (PPE) like Masks, Goggles, Gloves, Harness must be provided, Display boards with danger signs placed at electrical and hazardous areas, Wage enforcement, GRMs, Gender Action Plans |
| <b>Community</b>     | Health deterioration, land stress, exclusion                  | Community consultations, inclusive benefits, shared infrastructure                                                                                                                                                                          |
| <b>Technological</b> | Digital illiteracy, surveillance misuse, e-waste from sensors | Literacy drives, ethical tech use, green IoT design, traceable recycling chains                                                                                                                                                             |

## 4. Grievance Redress Mechanism

The sectoral ESMP clearly outlines MSME-level expectations for grievance redressal. At the MSME/site level, each unit must prominently display the internal grievance focal point's details (name/phone/email) at entrances, shop floors, canteens, and dormitories. Worker induction and refresher toolbox talks will include a short briefing on internal grievance channels, escalation options to the Grievance Redressal Committee/Body, and access to the SIDBI GRM as described in SIDBI's ESMS-FMAP (Section 9.5 Awareness and Capacity Building) and GCF IRM.

Each MSME must maintain simple, accessible grievance channels such as a name of grievance officer as point of contact, complaint register/box and ensure basic logging, tracking, and timely resolution of labour / gender based, OHS, SEAH/POSH, and Environmental & Social grievances. SIDBI will verify MSME-level GRM performance during annual ESS Monitoring & Verification (ESS M&V) visits and through any third-party verification done under the Programme. MSMEs will also submit periodic reports to SIDBI summarizing grievance categories, acknowledgements, resolutions, open cases, and corrective actions taken.

In 2013, the Government of India notified the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act (POSH Act). The Act aspires to ensure women's right to workplace equality, free from sexual harassment through compliance with the above mentioned three elements. It is important to note that the Act provides a civil remedy to women and is in addition to other laws that are currently in force. Consequently, any woman who wishes to report instances of sexual harassment at the workplace has the right to take recourse of both civil and criminal proceedings. As a public financial institution, SIDBI has adopted the POSH policy of the Government of India (Refer Attachment 2 of ESMS in page no 125 -135).

Grievance Redressal Policy (Refer Attachment 3 of ESMS) is based on the principles of customer service and customer satisfaction which would in turn broaden its customer base. SIDBI's policy on grievance redressal follows broadly the following principles:

- Customers are always treated fairly
- Grievances raised by customers are dealt with courtesy and on time
- SIDBI will treat all grievances efficiently and fairly as they can damage the Bank's reputation and business if handled otherwise
- SIDBI's employees must work in good faith and without prejudice to the interests of the customer
- Customers are fully informed of avenues to escalate their complaints/ grievances within the organization and their rights to alternative remedy if they are not fully satisfied with the response of the Bank to their complaints in keeping with the above policy, the GRM has the following provisions:

(a) Registration of complaint: Customer can lodge / register his grievance through any of the following channels:

- Complaint in Person
- Complaints through post / mail / email
- Online Registration of Complaints and
- Grievances lodged through the Public Grievance Portal such as Centralized Public Grievances Redress and Monitoring System (CPGRAMS) ([www.pgportal.gov.in](http://www.pgportal.gov.in))

(b) Mandatory display/ disclosure requirements at SIDBI Offices: The following are displayed/ disclosed at the SIDBI offices for easy filing of grievances.

- Complaint Book/Register
- Complaints/Suggestion Box
- Complaint form at SIDBI website homepage
- Notice Board displaying contact details of Nodal Officers for grievances, escalation of unresolved grievances within 8 working days, and details of Chief Grievance Officer to be approached when not satisfied with the redress.

(c) Resolution of grievances / complaints: The process includes

- acknowledgement after receipt of complaint
- escalation matrix
- referring unsatisfied complaints to higher levels, etc.

Anonymous complaints are not entertained. All efforts are made to resolve each complaint received by the Bank generally within stipulated time as per the following escalation matrix:

Table 7: Escalation matrix at SIDBI

| Level         | SIDBI Office    | Official In-charge              |
|---------------|-----------------|---------------------------------|
| <b>First</b>  | Branch Office   | Nodal Officer at Branch level   |
| <b>Second</b> | Regional Office | Nodal Officer at Regional level |
| <b>Third</b>  | Head Office     | Chief Grievance Officer         |

There may be some complaints which require deeper analyses from all possible angles. In such cases, the Bank will try to resolve the grievance within one month from the receipt of complaint. In case of unsatisfactory resolution, the resolution can be escalated to the higher level.

## 4.1 SIDBI's 3-Tier GRM

SIDBI has a three-tier grievance/ complaint redressal system which can be accessed @ <https://www.sidbi.in/complaints> The details are given below:

### **Level 1 – Branch Office Level**

At the Branch Office, a complaint can be filed in person, post/ email to SIDBI and register online. When a complaint is registered, a unique Complaint ID will be generated/issued. The following complete details are to be furnished while registering the complaints, enabling them to address the concern(s) in a holistic and timely manner:

- Full name of Complainant
- Customer ID if an existing Customer
- Complainant's Contact details (address, telephone number and e-mail)
- Reference number of Transaction/Complaint ID, depending on purpose

In case of non-receipt of reply within 8 working days of registering the complaint or unsatisfactory reply, it can be escalated to Level 2, using Complaint ID.



**Level 2 – Regional Office Level**

In case of non-receipt of reply within 8 working days of registering the complaint or unsatisfactory reply, the complainant can escalate it to Level 2 (Regional In-charge), using Complaint ID.

**Level 3 – Head Office Level**

If registered complaint is not resolved satisfactorily within 5 working days from date of escalation at regional level (Level 2), the complainant can contact Chief Grievance Officer/ Alternate Chief Grievance Officer.

SIDBI has a functional and well-structured three-tier GRM in place. The existing GRM will be utilized for the bilateral / multilateral supported programs /project. SIDBI will ensure that its GRM is adequately advertised at the levels of all stakeholders.

Additionally, a focal point for the programme will be appointed or nominated who can be contacted to obtain any project-related information or for registering suggestions/grievances. Details of the focal point for each case shall be made available on the SIDBI/project website.

To assess the overall effectiveness and efficiency of the project GRM, an evaluation will be conducted on an annual basis. Results will be shared with all concerned stakeholders to facilitate improvement in the performance of the GRM and provide necessary feedback. The following points may be assessed during such evaluations:

- Number of complaints/ queries received,
- Category of complainants (Type of stakeholder),
- Status of the complaints (rejected, closed, reopened, ongoing),
- Response time involved in the resolution of complaints,
- Feedback from the aggrieved/ complainants, if any

Further, GCF Independent Redressal Mechanism (IRM) can be accessed on the following link (<https://irm.greenclimate.fund/>), wherein affected parties/person can directly file a complaint if they are negatively affected by the projects/programmes funded by Green Climate Fund (GCF).

## **4.2 Grievance Redressal for Customers & Stakeholders**

SIDBI ensures grievance redressal through continuous stakeholder engagement. For non-customers, awareness of mechanisms under Govt. of India/SIDBI/GCF is created via consultations. Citizens may lodge grievances 24x7 through the Centralised Public Grievance Redress and Monitoring System (CPGRAMS)<sup>4</sup>, accessible via web and mobile (UMANG/Google Play). Complaints can be tracked with a unique ID, and appeals filed if resolution is unsatisfactory.

## **4.3 Gender-Based Violence & SEAH risk identification and management**

While section 4 covers about the labour vulnerabilities including gender safeguards and compliance with India's Sexual Harassment of Women at Workplace (Prevention, Prohibition & Redressal) Act, 2013 commonly known as the POSH Act and provides for SEAH/gender

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<sup>4</sup> <https://pgportal.gov.in/>



assessment under independent monitoring. Accordingly, SIDBI follows the POSH Act, ensuring zero tolerance for GBV/SEAH<sup>5</sup>. The Act mandates:

- Broad definition of workplace (including organized/unorganized sectors).
- Internal & Local Complaints Committees.
- Defined complaint filing and inquiry process.
- Employer duties: safe environment, awareness programs, support to complainants, treating harassment as misconduct, and timely reporting.

MSMEs must comply with institutional arrangements and report under programme mechanisms. As a Grievance/SEAH/POSH risk screening step, SIDBI ensures MSMEs undertake that Grievance/SEAH/POSH related information i.e., whether the unit has Internal Complaint Committee with respect to Grievance/SEAH/POSH and any cases registered / resolved. Further, Survivor-Centered Handling i.e., (confidentiality, non-retaliation, referral pathways) are followed as per POSH Act.

It is essential for MSMEs to institutionalize grievance redressal processes to enhance their accountability and stakeholder's trust. Accordingly, MSMEs shall maintain register/records covering the following details: -

- i. Total number of grievances received
- ii. Summary of grievances received
- iii. Details of grievances resolved, pending, reasons for delay in addressing the pending grievances, etc.
- iv. Details of number of sexual harassment complaints received and action undertaken to address such complaints.

In addition, Gender Assessment and Gender Action Plan under FMAP in GCF FMAP 241 has been captured in accordance with GCF requirement on Gender and Grievance. Reference Link: [fp241-gender-assessment-cover.pdf](#) and [fp241-gender-action-plan-cover.pdf](#)

SIDBI explicitly stipulates that all Category B MSMEs must adhere to minimum labour and working-condition standards aligned with IFC Performance Standard 2, the GCF Environmental and Social Safeguards (ESS), and India's National Labour Code. The Labour Code—effective from 21 November 2025—consolidates 29 existing labour laws into four integrated codes covering:

1. **Wages,**
2. **Social Security,**
3. **Industrial Relations,** and
4. **Occupational Safety, Health and Working Conditions.**

These requirements are designed to identify and manage worker-related risks while ensuring that enterprises maintain safe, fair, and legally compliant workplaces.

In addition, SIDBI mandates that all MSMEs comply with India's statutory prohibitions on child labour and forced or bonded labour. Enterprises must also ensure the protection and fair treatment of vulnerable worker groups, including contract workers, migrant workers, and women

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<sup>5</sup> SIDBI, "Environment and Social Management System (ESMS) 'Financing Mitigation & Adaptation Projects (FMAP) in Indian MSMEs", Page 71, <https://www.sidbi.in/assets/front/pdf/ESMS-FMAP-E.pdf>

workers, along with providing all necessary workplace amenities and welfare facilities in line with national regulations and international good practice.

At MSME site, Workers can access to Nodal officer (name/phone/email) regarding the POSH/SEAH through Prominent display board at entrances, shopfloors, canteens and dormitories/restroom for their Grievance Redressal Issues. Subsequently, worker induction & refresher toolbox talks are included with a short briefing on Internal Grievance Mechanism options, escalation to Grievance Redressal Management Committee/Body and under SIDBI's report on ESMS- FMAP in Indian MSMEs - section 9.5 Awareness and Capacity building ESMP training already committed which covers ESMP implementation.

Verification will be carried out during follow-up visits by SIDBI officers or by third party verification done under the programme, which the ESMP already prescribes. Periodic MSME submission to SIDBI covers various categories like Labour/Gender/OHS/SEAH/environment and resolved within the given timeline with corrective actions taken etc.

#### 4.4 Conflict Sensitivity Assessment<sup>6</sup>

- **Community Health & Safety:** OHS safeguards are checked via ESDD/ESG tools before lending. Annual audits ensure compliance. Borrowers (MSME) must provide medical care, redress, and compensation in case of incidents.
- **Land Acquisition:** Projects involving displacement of indigenous people / /resettlement shall be screened and not covered under the project. However, the new projects complying with this ESIA / ESMP would be covered under the project.
- **Indigenous Peoples:** Loans will not finance projects affecting peoples in voluntary isolation. Legal screening ensures compliance and financial capacity.

### 5. Monitoring, Evaluation & Reporting Requirements

The FMAP programme adopts a **comprehensive, multilayered Monitoring and Evaluation (M&E) system** that integrates subproject-level ESMP implementation, programme-level oversight, and reporting to the Green Climate Fund (GCF). Monitoring responsibilities are shared across the AE, MSME borrowers, third-party agencies, and SIDBI's Programme Management Unit (PMU). The approach ensures continuous oversight of environmental and social performance, GHG emission reductions, and compliance throughout the project lifecycle.

#### 5.1 Continuous Monitoring and Reporting Obligations

##### 1. Monitoring Level (SIDBI)

SIDBI conducts **end-to-end monitoring** from project appraisal through implementation and closure. This includes:

- **Pre-Sanction visits** before loan sanction, where SIDBI verifies actual site conditions through:
  - o On-site walkthrough inspections
  - o Stakeholder interviews (workers, supervisors, management)
  - o Photographic verification and geo-tagged evidence
  - o Cross-checking compliance with the exclusion list
  - o ESDD and ESG scoring

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<sup>6</sup> SIDBI, "Environment and Social Management System (ESMS) 'Financing Mitigation & Adaptation Projects (FMAP) in Indian MSMEs", Page 73- & 74, <https://www.sidbi.in/assets/front/pdf/ESMS-FMAP-E.pdf>

- **Verification of mitigation measures** listed in the project-specific ESMPs, including:
  - o Pollution control infrastructure (ETP, APCD, caustic recovery, sludge handling)
  - o PPE availability and OHS practices
  - o Chemical management and hazardous waste disposal
  - o Gender, SEAH, and labor compliance (aligned with new National Labor Codes, effective 21 Nov 2025)
- **Annual supervision missions**, including site audits, documentation checks, and follow-ups on corrective actions. **Ensuring submission** by MSMEs, tied to undertakings signed during ESMP rollout (Section 3.4).

## 2. Third-Party Monitoring

During the initial six years of the programme:

- A **third-party M&E agency** develops monitoring tools, reporting formats, and conducts verification audits.
- From years **7–13**, SIDBI's PMU technical/M&E officer conducts field-level monitoring using the validated tools.
- Independent sample-based evaluations assess:
  - o ESMP implementation on the ground
  - o Gender and SEAH Action Plan compliance
  - o E&S risk mitigation effectiveness
  - o Climate benefits (GHG reductions, energy savings, water efficiency)

## 3. Programme-Level Monitoring by SIDBI

SIDBI monitors:

- Sub-loan performance and disbursements
- Co-financing mobilization
- Climate results (GHG reductions, energy savings)
- Progress towards outputs (beneficiaries, women-led MSMEs, EVs financed, solar projects, etc.)
- Institutional strengthening indicators

All findings feed into Performance Reports and the Annual Performance Report (APR).

## 5.2 Integration with GCF's Annual Performance Report (APR)

The APR consolidates monitoring results from all financing channels and fulfils SIDBI's obligations. Key elements include:

### 1. Subproject Disclosure & Reporting

- All directly financed subprojects are disclosed and included in APR submissions.
- APR includes:
  - o Summaries of ESIA/ESDD/ESMP implementation
  - o Significant changes or material variances post-disclosure
  - o Portfolio-level corrective actions
  - o Updates on safeguards, gender, SEAH, OHS, climate resilience, and pollution control compliance.

### 2. Climate & Results Reporting

SIDBI submits:

- **Traceable Excel-based GHG reduction calculations** annually, using:
  - o Energy savings data from MSMEs
  - o Internationally recognized methodologies (CDM, ISO standards)
- **Programme-level indicators**, including:

- o Core indicator 1 (GHG emission reductions)
- o Core indicator 2 (beneficiaries)
- o Core indicator 3 (value of climate-resilient assets)
- o Core indicators 5–8 (institutional strengthening, innovation, knowledge creation)

### **3. Compliance Confirmation**

Every APR confirms that:

- Sub-loans comply with eligibility criteria
- Sectoral ESMP guidelines are met
- Co-financing ratios are maintained
- All monitoring data meets Evaluation Policy requirements
- Programme-level progress aligns with climate impacts, results framework, and ESMS commitments.

## **6. Conclusion**

The ESIA and ESMP under FMAP is a commitment to responsible industrial transformation for Category B subprojects under direct lending component. These measures would safeguard our environment, uphold workers' dignity and safety, protect community health, and anchor our path toward a sustainable future.

## Annexure 1- Negative / Exclusion List

### **SIDBI does not finance the following (Negative/Exclusionary List of projects) out of the GCF Proceeds:**

- i. Production or trade in any product or activity deemed illegal under Indian laws or regulations or international conventions and agreements.
- ii. Production or trade in weapons and munitions.
- iii. Production or trade in alcoholic beverages (excluding beer and wine).
- iv. Production or trade in tobacco.
- v. Gambling, casinos, and equivalent enterprises.
- vi. Trade in wildlife or wildlife products regulated under CITES.
- vii. Production or trade in radioactive materials.
- viii. Production or trade in or use of unbounded asbestos fibers.
- ix. Commercial logging operations or the purchase of logging equipment for use in primary tropical moist forest (prohibited by the Forestry policy).
- x. Production or trade in products containing PCBs.
- xi. Production or trade in pharmaceuticals subject to international phase outs or bans.
- xii. Drift net fishing in the marine environment using nets in excess of 2.5 km. in length.
- xiii. Production or trade in ozone depleting substances (ODS) subject to international phase out.
- xiv. Production or trade in pesticides/herbicides subject to international phase outs or bans as agreed by GOI based on Stockholm convention.
- xv. Production or activities involving harmful or exploitative forms of child labour or forced labour.
- xvi. Projects/ activities requiring land acquisition and/ or causing Loss of Land / loss of source of income / loss of livelihoods, impacts on community/ displacement of people or communities from private or public lands or any negative impacts on livelihoods.
- xvii. Projects located in areas of significant settlement or impacting the natural and cultural resources of tribal people and adversely affecting the land, culture, livelihood, and way of life of tribal and indigenous people.
- xviii. Projects located in sensitive ecological areas and natural/ cultural heritage locations. If any activities are proposed in these areas, then the beneficiaries must obtain the requisite permissions. These permissions are required if the activities are taken up within one km from the sensitive ecological areas or heritage locations.
- xix. Category A Projects with potentially significant adverse environmental and/or social risks and impacts that, individually or cumulatively, are diverse, irreversible, or unprecedented and I1 i.e. when an intermediary's existing or proposed portfolio includes or is expected to include financial exposure to activities with potentially significant adverse environmental and social.
- xx. Projects that affect in any way Indigenous Peoples with limited external contact, also known as peoples "in voluntary isolation", "isolated peoples" or "remote groups".
- xxi. Production and distribution of racist, anti-democratic and/or neo-Nazi media.
- xxii. Projects that involve the conversion or degradation of Critical Natural Habitats
- xxiii. Large agricultural or forestry enterprises (>5,000 ha) produce palm oil or wood that do not comply with recognised international certification systems (e.g. RSPO or FSC) or equivalent regulations.
- xxiv. Practices which prevent employees from lawfully exercising their rights of association and collective bargaining
- xxv. Nuclear power plants (apart from measures that reduce environmental hazards of existing assets) and mines with uranium as an essential source of extraction.
- xxvi. Prospection, exploration and mining of coal; land-based means of transport and related infrastructure essentially used for coal; power plants, heating stations and cogeneration facilities essentially fired with coal, as well as associated stub lines.
- xxvii. Non-conventional prospection, exploration and extraction of oil from bituminous shale, tar sands or oil sands.
- xxviii. Cross-border trade in waste products unless compliant with the Basel Convention and the underlying regulations.
- xxix. Production or trade of persistent organic pollutants (POPs)
- xxx. Prohibited transboundary trade in waste (under the Basel Convention)
- xxxi. Investments which could be associated with the destruction or significant impairment of areas particularly worthy of protection (without adequate compensation in accordance with international standards).
- xxxii. Production or trade in wood or other forestry products other than from sustainably managed forests.
- xxxiii. Production, trade, storage, or transport of significant volumes of hazardous chemicals, or commercial scale usage of hazardous chemicals. Hazardous chemicals include gasoline, kerosene, and other petroleum products.
- xxxiv. Production or activities that impinge on the lands owned, or claimed under adjudication, by Indigenous Peoples, without full documented consent of such peoples.



## Annexure 2 - Environmental & Social Due Diligence (ESDD) Checklist

Name of the MSME enterprise:

Project Location with address:

| S.No.                                  | Particulars                                                                                                                                                                               | Response                                | Remarks                                                                                                                                                                                                                                                                                            |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><u>A. Environmental Aspects</u></b> |                                                                                                                                                                                           |                                         |                                                                                                                                                                                                                                                                                                    |
| 1                                      | Environmental Clearance from MoEFCC* / SEIAA**                                                                                                                                            | Yes / No / Not Applicable / Applied For | <ul style="list-style-type: none"> <li>If 'Yes', attach copy of the same.</li> <li>If 'Applied For', attach copy of the application submitted by the MSME unit to the concerned SPCB or the receipt copy of the fee paid to the SPCB.</li> </ul>                                                   |
| 2                                      | Valid Consent(s) / Clearances from SPCB/CPCB                                                                                                                                              | Yes / No / Not Applicable / Applied For | <ul style="list-style-type: none"> <li>If 'Yes', attach copy of Consent to Establish (CTE) / Consent to Operate (CTO).</li> <li>If 'Applied For', then attach copy of the application submitted by the MSME unit to the concerned SPCB or the receipt copy of the fee paid to the SPCB.</li> </ul> |
| 3                                      | Whether the unit has received any notice for regulatory non-compliance or violation of norms or consent conditions or faced any litigation or material settlement of convictions in court | Yes/No                                  | If 'Yes', state reasons, which led to industry being notified as 'non-compliant' and actions undertaken to become compliant. State clearly whether the issue has been resolved or not. If not, state reasons clearly.                                                                              |
| 4                                      | Compliance of consent - for eg. Installation of pollution control measure suggested as per consent                                                                                        | Yes / No / Not Applicable               | list out deviations if any                                                                                                                                                                                                                                                                         |
| <b><u>B. Social Aspects</u></b>        |                                                                                                                                                                                           |                                         |                                                                                                                                                                                                                                                                                                    |
| 5                                      | Does the unit employ child and / or forced labor for its operations                                                                                                                       | Yes/No                                  |                                                                                                                                                                                                                                                                                                    |
| 6                                      | Does the unit follow minimum wages act / No discrimination on the grounds of                                                                                                              | Yes/No                                  |                                                                                                                                                                                                                                                                                                    |

| S.No. | Particulars                                                                                                                                                                                                                                                                                                                                        | Response                  | Remarks |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------|
|       | religion/ethnicity/colour/<br>race/ gender and caste.                                                                                                                                                                                                                                                                                              |                           |         |
| 7     | Does the unit employ Occupational, Health and Safety related measures for its operations<br><i>[For example: Workers wearing Gloves, helmet, mask during operations (especially during welding operations), installation of fire safety measures (e.g. workable / usable fire extinguishers having pressure gauge needle in green zone), etc.]</i> | Yes/No                    |         |
| 8     | Does the unit comply with labour welfare requirements like ESI /EPF etc                                                                                                                                                                                                                                                                            | Yes / No                  |         |
| 9     | Does the unit have occupational facilities such as canteen / restroom / toilet for the worker                                                                                                                                                                                                                                                      | Yes/ No                   |         |
| 10    | Does the unit employ women? If yes, whether separate facilities such as toilet / rest room provided to them                                                                                                                                                                                                                                        | Yes / No                  |         |
| 11    | Does the unit have a Grievance Redressal Mechanism (GRM) and Grievance Register to lodge complaints.                                                                                                                                                                                                                                               | Yes / No / Not Applicable |         |
| 12    | Does the unit have Internal Complaint Committee with respect to The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) POSH Act / Sexual Exploitation, Abuse, and Harassment (SEAH)                                                                                                                                   | Yes / No / Not Applicable |         |
| 13    | Do the unit received any complaint or any cases registered under POSH Act / SEAH till date                                                                                                                                                                                                                                                         | Yes / No                  |         |



| S.No.                                                                     | Particulars                                                                                                                                                                       | Response                  | Remarks                                                                                 |
|---------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------|
| 14                                                                        | Is there any provision for Physically handicapped/ Challenged person in the workforce despite of gender.                                                                          | Yes / No / Not Applicable |                                                                                         |
| 15                                                                        | Does the unit have prominent display boards indicating GRM(MSME) contact person details / SIDBI Grievance redressal contact details/ GCF independent redressal mechanism details. | Yes / No / Not Applicable |                                                                                         |
| 16                                                                        | Does the unit have Emergency Preparedness Response Plan (EPRP).                                                                                                                   | Yes / No / Not Applicable |                                                                                         |
| 17                                                                        | Is there availability of First Aid at the site and tie up with the local hospital in case of emergency?                                                                           | Yes / No / Not Applicable |                                                                                         |
| <b>C. General Land Related Aspects – Common for all types of projects</b> |                                                                                                                                                                                   |                           |                                                                                         |
| 18                                                                        | Does the project / unit is located in the notified industrial area & park / cluster / Special Economic Zone etc                                                                   | Yes / No                  | <i>If no, the following questions are to be answered (Question 19, 20, 21 &amp; 22)</i> |
| 19                                                                        | Does the project require compulsory land acquisition causing displacement of the resident / Involuntary resettlement                                                              | Yes / No / Not Applicable |                                                                                         |
| 20                                                                        | Does the unit / project is located in, areas of significant settlement and / or collective attachment of tribal people / Indigenous People.                                       | Yes / No / Not Applicable |                                                                                         |
| 21                                                                        | Does the project involves signification alteration / damage / removal of any critical cultural heritage                                                                           | Yes / No / Not Applicable |                                                                                         |
| 22                                                                        | Is the project / unit located closer (within 10 KM) to any eco sensitive zone such as national parks / reserved forests                                                           | Yes / No / Not Applicable |                                                                                         |

| S.No.                                                                                                                                                                                                                                     | Particulars                                            | Response                                                                                                                                                                                                                                                                                                                                                 | Remarks |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| <b><u>D. Land-related Aspects</u></b> (Only for Brownfield enterprises going for expansion and modernization of their existing operations in a new location / premises; and (ii) Greenfield projects i.e., setting up of new enterprises) |                                                        |                                                                                                                                                                                                                                                                                                                                                          |         |
| 23                                                                                                                                                                                                                                        | Land Status / use classification                       | <ul style="list-style-type: none"> <li>• industrial area, industrial estate notified industrial zone,</li> <li>• special economic zones,</li> <li>• Land parcels already designated by the Government for non-agricultural use,</li> <li>• solar / wind farms etc where all the necessary statutory permission / infrastructure are available</li> </ul> |         |
| 24                                                                                                                                                                                                                                        | Transaction Status - Mode of Land Access / Acquisition | <ul style="list-style-type: none"> <li>• Purchased from Govt (outright / lease)</li> <li>• Privately purchased land through willing buyer–willing seller transactions with clear title</li> <li>• Private Lease</li> <li>• Owned / inherited Others (please specify)</li> </ul>                                                                          |         |

\* Ministry of Environment, Forest and Climate Change

\*\* State Environment Impact Assessment Authority

**(Promoters Signature)**

It is hereby certified that the information provided in the above ESDD report by the project proponent has been duly checked/ verified by the undersigned and is found to have sufficient environment and social safeguard measures in place and therefore may be considered for providing loan.

Signature :  
Name of Person :  
Designation :  
Name of the SIDBI Branch :

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**For the use of SIDBI Branch**

- ☐ Approved
- ☐ Conditional Approval (Specify the conditions)
- ☐ Not Approved, Reason(s) thereof

## Annexure 3- List of Cross Functional Technology

The technologies mentioned below are used across all the industrial sectors which improves Energy Efficiency, results in cleaner production, enhances resource efficiency and would also result in reduction of GHG emissions which are aligned with the FMAP Programme objective. The E&S Risk Categorization of these technologies would depend on the industrial process as mentioned in this document.

Further, it is to be mentioned that these technologies are also used for projects with backward and forward integration within the eligible industrial sectors identified under the FMAP Programme.

In addition to the above, if the project includes both mitigation and adaptation measures, suitable bifurcation and tagging would be done for the purpose of inclusion in the project and reporting to GCF under the FMAP Programme.

The following cross-sectoral technologies would be funded under the FMAP Programme including the sector under reference.

| <b>Sr. No.</b> | <b>Technology Name</b>                                   |
|----------------|----------------------------------------------------------|
| 1              | Variable Frequency Drives                                |
| 2              | Energy Efficient Transformers                            |
| 3              | Energy Efficient Fluorescent Lamps                       |
| 4              | Compact Fluorescent Lamps                                |
| 5              | Metal Halides Lamps                                      |
| 6              | High Pressure Sodium Vapor Lamps                         |
| 7              | Light Emitting Diode                                     |
| 8              | Microprocessor Based Intelligent Control                 |
| 9              | Exclusive Transformer for Lighting                       |
| 10             | Servo Stabilizer                                         |
| 11             | Electronic Ballast                                       |
| 12             | Energy Efficient Air Compressors & Blowers               |
| 13             | Energy Efficient Fans & Pumps                            |
| 14             | Capacitors                                               |
| 15             | Automatic Power factor Controller                        |
| 16             | Soft Starter for Motors                                  |
| 17             | Maximum Demand Controller                                |
| 18             | Automatic Temperature Controller                         |
| 19             | High-frequency Induction Irradiation                     |
| 20             | High-frequency Melting Furnace                           |
| 21             | Highly Sensitive and Responsive Arc Furnace              |
| 22             | High-performance Electrolytic Furnace                    |
| 23             | Electromagnetic Irradiation                              |
| 24             | Common Incinerator Alongwith Power Generation Facilities |

|    |                                                                                                    |
|----|----------------------------------------------------------------------------------------------------|
| 25 | Screw Compressor                                                                                   |
| 26 | Computer Desktop Virtual Machine                                                                   |
| 27 | Cooling Towers (Fills with PVC Honey Comb)                                                         |
| 28 | Wide Belt Sander                                                                                   |
| 29 | Spindle Moulder                                                                                    |
| 30 | Multi-boring machine                                                                               |
| 31 | Visi cooler                                                                                        |
| 32 | Robot Arms                                                                                         |
| 33 | Enginator based on Natural Gas                                                                     |
| 34 | CNC Router                                                                                         |
| 35 | Vacuum forming machine with thermostat control                                                     |
| 36 | Edge Bander Sprint with Power- PC Control                                                          |
| 37 | Enterprise Resource Planning (ERP) (with PPG module)                                               |
| 38 | Automatic Book Sewing Machine                                                                      |
| 39 | Tunnel Dryer for mosquito coil industry                                                            |
| 40 | Induction Lighting                                                                                 |
| 41 | SCADA system                                                                                       |
| 42 | Energy Management System                                                                           |
| 43 | Water-tube Boiler (by replacing conventional Smoke-tube Boiler)                                    |
| 44 | Condensate Recovery & Recycle System                                                               |
| 45 | Energy Efficient Boilers                                                                           |
| 46 | Recuperators                                                                                       |
| 47 | Cogeneration                                                                                       |
| 48 | Heat Pumps                                                                                         |
| 49 | Energy Efficient Refrigeration System                                                              |
| 50 | Automatic Combustion Control for Boilers / Furnaces                                                |
| 51 | Regenerative Burners for Furnace                                                                   |
| 52 | Heat Recovery Systems for Boilers (Economizer, Air Pre- heater)                                    |
| 53 | Outdoor Intake Control / Variable Air Volume / Heat exchanger                                      |
| 54 | High Efficiency DG Set for Power Generation (Low Fuel Consumption with Pollution Control & Canopy) |
| 55 | Waste Heat Recovery Boiler                                                                         |
| 56 | Thermal Insulation for Hot & Cold Systems                                                          |
| 57 | Dehumidification Dryer                                                                             |
| 58 | Building Energy Management System                                                                  |
| 59 | Municipal Solid Waste Based Power Generation                                                       |
| 60 | Building Energy Management System (BEMS) & Concentrated Solar Thermal Power (CSP)                  |
| 61 | Bioreactor with PLC                                                                                |
| 62 | Batching Plant with Microprocessor Control                                                         |
| 63 | Wire Condensor Welding Machine equipped with PLC                                                   |
| 64 | 2 Stations Auto Balancing Machine equipped with PLC                                                |
| 65 | Standing Seam Roofing and Curving                                                                  |
| 66 | Energy Efficient Air Compressors                                                                   |
| 67 | Variable Frequency Drive for Screw Compressors                                                     |

|     |                                                                                           |
|-----|-------------------------------------------------------------------------------------------|
| 68  | Heat of Compression Air Dryers (Replacing Desiccant Air Dryer)                            |
| 69  | Variable Frequency Drive for Oil Pump in Hydraulic Power Packs                            |
| 70  | Energy Efficient Exhaust Fans                                                             |
| 71  | Variable Frequency Drive for Hot Air Circulation Fan for Preheating Furnace               |
| 72  | Air Preheater (for Furnace Flue Gas Waste Heat Recovery)                                  |
| 73  | CNC Cutting Machine with End Former                                                       |
| 74  | Fully Automatic CNC Return Bender                                                         |
| 75  | Automatic Ring Sizing and Loading Machine                                                 |
| 76  | CNC Vertical Machining Centre                                                             |
| 77  | Vacuum Holding for Non-Ferrous Components for High-Speed Milling                          |
| 78  | CNC Co-ordinate Measuring Machine                                                         |
| 79  | CNC Sharpening and Profile Grinding, Automatic Broach Sharpening Machine                  |
| 80  | Turning Machine with Variable Frequency Drive with Regenerative Braking System            |
| 81  | Servo Electric Turret Punch Machine                                                       |
| 82  | Abrasive Assisted High Pressure Water Jet Cutting                                         |
| 83  | Inverter Based Welding Machine                                                            |
| 84  | CNC Plasma Cutting Machine                                                                |
| 85  | Double Polishing Machine (with Inverter Control)                                          |
| 86  | Pressure Die Casting Machine                                                              |
| 87  | Semi-Automatic Pillar Type Hydraulic Hot Moulding Press (with PLC Control)                |
| 88  | CNC Electronic Spring Control Machine                                                     |
| 89  | Fully Automatic Hydraulic Hot Chamber with Diesel Burner                                  |
| 90  | Rotary Table Machine for Surface Finishing and Polishing (with Inverter Speed Regulation) |
| 91  | CNC Punching Forming Machine                                                              |
| 92  | Open Back Double Point Press - PLC Controlled                                             |
| 93  | Automatic Transfer Unit                                                                   |
| 94  | CNC Garter Spring Former                                                                  |
| 95  | Electro-Hydraulic CNC Punching Machine                                                    |
| 96  | Automatic NC Control Bending Machine                                                      |
| 97  | Sensor Oxy- Height Control (OHC) and Sensor Plasma Height Control (PHC)                   |
| 98  | Gasifier Based Heat Treatment Furnace                                                     |
| 99  | Insulated Gate Bipolar Transistor Based Inverter                                          |
| 100 | Cylinder Block Boring and Milling Machine (with Variable Speed and Cycle Control)         |
| 101 | Duplex Roller Polishing Machine                                                           |
| 102 | Nut Former Machine                                                                        |
| 103 | Double End Chamfering Machine for Pipes                                                   |
| 104 | Heavy Duty Plano Milling Machine (using AC Variable Drive)                                |
| 105 | Heavy Duty Multi- Coil Electromagnetic Rectangular Chuck (with Variable Control Unit)     |
| 106 | NC Hydraulic Shearing Machine                                                             |
| 107 | NC Flame Cutting Machine                                                                  |
| 108 | CNC Spring Making Machine                                                                 |
| 109 | CNC Wire Bending Machine                                                                  |
| 110 | Plano Miller with 3 Cutting Head                                                          |

|     |                                                                                            |
|-----|--------------------------------------------------------------------------------------------|
| 111 | Electro Permanent Magnetic - Plate Handling System                                         |
| 112 | Electro Permanent Magnetic - Telescopic Spreader Beam                                      |
| 113 | Electro Permanent Magnetic - Tilting Plate Handling                                        |
| 114 | Electro Permanent Magnetic - Billet Handling Machine                                       |
| 115 | Modular Electro Permanent Magnets                                                          |
| 116 | Battery Operated Electro Permanent Magnetic Lifter                                         |
| 117 | Heavy Duty EPM Systems for Rail Machining                                                  |
| 118 | EPM Modules for Fast Mould Clamping                                                        |
| 119 | Electro Permanent Magnetic Chucks (MAGNASLOT)                                              |
| 120 | CMM Machine (Coordinate Measuring Machine)                                                 |
| 121 | High Speed Circular Sawing Machine 2, 3 & 4 Hole drilling SPM                              |
| 122 | 15 Hole drilling SPM                                                                       |
| 123 | 4 Way U drilling & fine boring SPM                                                         |
| 124 | Multi spindle drilling head SPM                                                            |
| 125 | Three pillar types drilling SPM                                                            |
| 126 | 2Way fine boring SPM                                                                       |
| 127 | CNC Rotary Draw tube bender                                                                |
| 128 | Electronic Servo                                                                           |
| 129 | CNC Straightening and cutting machine                                                      |
| 130 | Single Axis NC Tube bender with linear and rotary indexing arrangement                     |
| 131 | Marine engine                                                                              |
| 132 | Corner cleaning machine equipped with PLC control                                          |
| 133 | Automatic end milling machine                                                              |
| 134 | Two Glazing Bead Saw with automatic control                                                |
| 135 | High Alumina Brick Refractories                                                            |
| 136 | Servo driven Spring Coiling Lathe Machine                                                  |
| 137 | Cold Heading Machine                                                                       |
| 138 | CNC Engraving Machine                                                                      |
| 139 | Pick and Place Machine                                                                     |
| 140 | NC Cutter and Rotary                                                                       |
| 141 | Radial CNC Multi Spindle Drilling Machine                                                  |
| 142 | Electrically heated Nitriding Furnace                                                      |
| 143 | CAM Machine                                                                                |
| 144 | Travelling head clicking machine                                                           |
| 145 | Aluminum Profiling Extrusion Machines (Hydraulic using Variable Pumps with PLC Controlled) |
| 146 | Single Spindle Vertical Honing Machine with VFD control                                    |
| 147 | Slant Bed CNC Lathe                                                                        |
| 148 | Panel Cutter machine (PLC controlled)                                                      |
| 149 | CNC machining centre with Inverter controlled                                              |
| 150 | Laser Cutting machine                                                                      |
| 151 | Cylindrical Grinding Machine (with Inverter control)                                       |
| 152 | CNC Tool and Cutter Grinder                                                                |
| 153 | CNC Column Moving Horizontal Machining Centre                                              |
| 154 | Automatic end cutter                                                                       |

|     |                                                                                                 |
|-----|-------------------------------------------------------------------------------------------------|
| 155 | Intermix (with water cooled rotors)                                                             |
| 156 | Hydraulic Cone Crusher                                                                          |
| 157 | 5 axis CNC Tool and Cutter Grinding Machine                                                     |
| 158 | Flat Bed CNC Chucker                                                                            |
| 159 | Vertical Sliding Head Machine                                                                   |
| 160 | Turn Auto Loading and Unloading CNC Machine                                                     |
| 161 | Impregnating Plant with VFD controls                                                            |
| 162 | Automatic Vacuum Press                                                                          |
| 163 | Fully Automatic Polishing Machine (with Frequency Converter)                                    |
| 164 | Pilger Machine                                                                                  |
| 165 | Hydraulic Puller (with electronically controlled and brake hydraulic dynamometer)               |
| 166 | Conveyor System                                                                                 |
| 167 | Polishing Machine                                                                               |
| 168 | Hydraulic Deep Draw Press with Die Cusion complete with Hydraulic power pack (With PLC control) |
| 169 | Seam Welding Machine (with Microprocessor based weld control)                                   |
| 170 | 5 Axes Universal Milling Machine                                                                |
| 171 | Multi-wire Cutting Machine with Automatic control using PC                                      |
| 172 | Fiber Laser Marking System                                                                      |
| 173 | Gapframe Mechanical Press with PLC Control                                                      |
| 174 | Continuous Hardening and Tempering Line Furnace                                                 |
| 175 | Tube Straightening & Cutting Machine equipped with PLC                                          |
| 176 | Serpentine Bending Machine equipped with PLC                                                    |
| 177 | Wire Flattering Mill                                                                            |
| 178 | CNC/PLC based Sheet Metal Rolling and Forming Machine with VFD                                  |
| 179 | Spooling Machines (with Variable Frequency Drive Control)                                       |
| 180 | High Speed Metal cutting band saw with PLC and VFD control                                      |
| 181 | AI&ML based IoT platform for Energy and Asset management                                        |
| 182 | Air Pre Heater & Drying Bed in furnace                                                          |
| 183 | Automation and Control System                                                                   |
| 184 | Automation of Withering Troughs                                                                 |
| 185 | Back Pressure Turbine                                                                           |
| 186 | BEE 5 Star Rated AC                                                                             |
| 187 | Combustion Control System for Boiler                                                            |
| 188 | Condensate recovery system in boiler/jet dying machine                                          |
| 189 | Desiccant-based cooling systems / DeVAP (Desiccant Enhanced Evaporative) HVAC                   |
| 190 | DeSuperheater for Chiller Compressors                                                           |
| 191 | Economiser in boiler/Thermic Fluid Heater                                                       |
| 192 | Electric annealing furnace                                                                      |
| 193 | Electric Dry Vacuum Pumps                                                                       |
| 194 | Electric Extrusion Melting                                                                      |
| 195 | Electric Melting Furnace                                                                        |
| 196 | Electrical Servo Drives                                                                         |
| 197 | Energy Efficient Brushless Direct Current (BLDC) Fan                                            |



|     |                                                                                       |
|-----|---------------------------------------------------------------------------------------|
| 198 | Energy Efficient Pumps - 5 Star Rating Pumps                                          |
| 199 | Energy efficient Refrigeration Compressor                                             |
| 200 | Energy Efficient Screw Compressor                                                     |
| 201 | Energy Efficient Turbo Blower                                                         |
| 202 | Energy recovery ventilation (ERV)                                                     |
| 203 | ETEKINA (Heat pipe technology for thermal energy recovery in industrial applications) |
| 204 | Gas Engine based co-generation technology                                             |
| 205 | Gas fired Annealing furnace                                                           |
| 206 | Gas-fired Reheating Furnace with WHR System                                           |
| 207 | Gasifier for Electrical Application                                                   |
| 208 | Ground & Water source Heat Pumps (GSHP)                                               |
| 209 | Hanger Shot Blast Machine                                                             |
| 210 | Heat Exchanger                                                                        |
| 211 | Heat Pump                                                                             |
| 212 | Hot Air Generator from Briquette                                                      |
| 213 | Hydrogen fired Vapour absorption machine                                              |
| 214 | IGBT based Induction furnace                                                          |
| 215 | IGBT based temperature control                                                        |
| 216 | Infrared (IR) Heaters                                                                 |
| 217 | Light emitting diode (LED) Lighting                                                   |
| 218 | Light Pipe                                                                            |
| 219 | Low-Grade Waste Heat Recovery System (LGWHRs)                                         |
| 220 | Magnetocaloric Refrigerator                                                           |
| 221 | Mechanical Vapor Recompression (MVR) Evaporator                                       |
| 222 | Micro Turbine                                                                         |
| 223 | Motors (IE3 or IE4 or IE5)                                                            |
| 224 | Oxy-fuel combustion in reheat furnace                                                 |
| 225 | PUF insulation                                                                        |
| 226 | Recuperative burner for heat recovery for high medium temperature furnaces            |
| 227 | Regenerative burners for high temperature furnaces                                    |
| 228 | Screw Compressor with Permanent Magnet (PM) motor                                     |
| 229 | Static Reactive Power Generator with Harmonics Filter                                 |
| 230 | Steam operated pumping traps                                                          |
| 231 | Temperature controller for cooling tower fan                                          |
| 232 | Thermo Compression                                                                    |
| 233 | Tri-generation                                                                        |
| 234 | Variable Frequency Drives (VFD)                                                       |
| 235 | Variable Refrigerant flow (VRF) in HVAC                                               |
| 236 | Waste Heat Recovery for power generation                                              |
| 237 | Compact Scan Digitizing System                                                        |
| 238 | Mechanical Press with PLC and VFD control                                             |
| 239 | Electric Overhead Travelling Crane with VFD                                           |
| 240 | PLC based Fully Automatic Sawing Machine                                              |
| 241 | PLC based Vertical Boring Mill                                                        |

|     |                                                                   |
|-----|-------------------------------------------------------------------|
| 242 | CNC Surface Grinder Machine                                       |
| 243 | Harmonic filter                                                   |
| 244 | Ceramic Fiber Insulation for Batch Furnaces                       |
| 245 | TIG welding machine (using thyristorised control)                 |
| 246 | Infrared Irradiation                                              |
| 247 | Hot Water Generator                                               |
| 248 | Turbulators (for gas fired boilers)                               |
| 249 | Vertical Roller Mill (VRM)                                        |
| 250 | Alternative Fuels & Raw Material (AFR) Utilization                |
| 251 | Energy efficient impeller                                         |
| 252 | Methane Capture technology                                        |
| 253 | Replacement of steam turbine drive with high-speed motor drive    |
| 254 | Electric Vehicles and Charging Infrastructure                     |
| 255 | Nano composite surface treatment for condenser in power plant     |
| 256 | Torrefaction Technology                                           |
| 257 | CNC Bending Machine                                               |
| 258 | CNC Gear Hobbing Machine                                          |
| 259 | CNC Grinding Machine                                              |
| 260 | CNC Horizontal M/c Centre                                         |
| 261 | CNC Machine (Special Purpose Machine)                             |
| 262 | CNC Milling M/C                                                   |
| 263 | CNC Turn –Mill Centre                                             |
| 264 | CNC Turret Punch Machine                                          |
| 265 | CNC Wire Cut Machine                                              |
| 266 | Falling Film Evaporator (Re-refining of Lubricating Oil)          |
| 267 | Wiped Film Evaporator (Re-refining of Lubricating Oil)            |
| 268 | Fine Grinding (CBN Surface Grinding Machine)                      |
| 269 | Gas Fired / Oil Crucible Melting Furnace                          |
| 270 | CNC Wire Cut                                                      |
| 271 | CNC Milling                                                       |
| 272 | CNC Lathe                                                         |
| 273 | Gas Based Generator set                                           |
| 274 | Computerized Automatic Electroplating / Zinc Plants               |
| 275 | Heavy Duty Horizontal Machining Center                            |
| 276 | CNC Hydraulic Press Brake                                         |
| 277 | Automatic Electrostatic Powder Coating Machine                    |
| 278 | CNC Milling Machine - Vertical Machining Centre                   |
| 279 | PVD (Multi-arc Ion) Coating Machine                               |
| 280 | CNC 3 Axes Hobbing Machine                                        |
| 281 | Sealed Quench Furnace (use of Thyristor Power Controller and PLC) |
| 282 | Paint Shop with Waste Heat Recovery System                        |
| 283 | CNC Hydraulic Guillotine Shearing Press                           |
| 284 | CNC Turret Punch Press                                            |

|     |                                                                                                                                                               |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 285 | Continuous Gas Carburising Furnace with Endogas Generator                                                                                                     |
| 286 | Electronic Spring Coiling Machines                                                                                                                            |
| 287 | CNC Gear shaving machine                                                                                                                                      |
| 288 | Medium Frequency End- bar Heater                                                                                                                              |
| 289 | Electrical Annealing Bogie Furnaces                                                                                                                           |
| 290 | Gasifier for Melting and Reheating Process                                                                                                                    |
| 291 | Rotoboratory Furnace                                                                                                                                          |
| 292 | Aeroseal duct sealing technology                                                                                                                              |
| 293 | Energy Efficient technology for ECBC/Eco-niwas Samhita                                                                                                        |
| 294 | Radiant Cooling                                                                                                                                               |
| 295 | VAM Chillers                                                                                                                                                  |
| 296 | High Efficiency Automatic Door                                                                                                                                |
| 297 | High Efficiency Automatic Revolving Door                                                                                                                      |
| 298 | Woody Textile Insulator                                                                                                                                       |
| 299 | Other Building Material Contributing to Increased Heat Insulation Performance of Building Equipment                                                           |
| 300 | Hollow Heading Machine                                                                                                                                        |
| 301 | Heading Machine with Semi Cover                                                                                                                               |
| 302 | Carbon Fiber Fan                                                                                                                                              |
| 303 | Hydraulic Coupling                                                                                                                                            |
| 304 | CNC Based Gear Tester                                                                                                                                         |
| 305 | Conveyorised Powder Coating Curing Oven                                                                                                                       |
| 306 | Energy Efficient Air Conditioner                                                                                                                              |
| 307 | Energy Efficient Refrigerators (High Efficiency Compressors, Improved Insulation and Precise Temperature and Defrost Mechanisms to Improve Energy Efficiency) |
| 308 | Vapour Absorption Refrigeration                                                                                                                               |
| 309 | Fuel Cell Cogeneration System                                                                                                                                 |
| 310 | Energy Efficient Elevators                                                                                                                                    |
| 311 | Equipment, Machinery and Construction Material Contributing to Increased Energy Savings                                                                       |
| 312 | Heat Reclaim Ventilation / Air Conditioning System                                                                                                            |
| 313 | High Efficiency Escalator                                                                                                                                     |
| 314 | Inorganic Textile Insulator                                                                                                                                   |
| 315 | Forming Plastic Insulator                                                                                                                                     |
| 316 | Heat insulating opening material                                                                                                                              |
| 317 | Air Sealing Support Material                                                                                                                                  |
| 318 | Heat Absorbing Glass / Low Emissivity Glass (Window Panel)                                                                                                    |
| 319 | Common Effluent Treatment Plant                                                                                                                               |
| 320 | Machine Fixed-film Bio Reactor ETP                                                                                                                            |
| 321 | Membrane Bio Reactor ETP                                                                                                                                      |
| 322 | Automatic Coil Winding Machine                                                                                                                                |
| 323 | Vacuum Impregnation plant                                                                                                                                     |
| 324 | Semi-Automatic Press                                                                                                                                          |
| 325 | Automatic CNC Core Cutting Machine                                                                                                                            |
| 326 | Hi Speed Precision Power Press with Computerized Control                                                                                                      |

|     |                                                                                              |
|-----|----------------------------------------------------------------------------------------------|
| 327 | Vacuum Impregnated Plant                                                                     |
| 328 | Automatic/CNC Coil Winding Machine                                                           |
| 329 | Temperature Control Drying Oven                                                              |
| 330 | Amorphous Metal Core Transformers                                                            |
| 331 | CNC Core Cutting Machine                                                                     |
| 332 | Natural Gas Based Oven                                                                       |
| 333 | Microprocessor Based Electric Furnace                                                        |
| 334 | Plasma Cutting Inverter                                                                      |
| 335 | Catalytic Enameling Machine                                                                  |
| 336 | Extruder with Temperature Control, Pre- heating, Speed Control                               |
| 337 | XPLATE on FD Fan to improve boiler combustion efficiency                                     |
| 338 | Solar PV Modules and Semi/Automatic Solar PV Module manufacturing Line                       |
| 339 | IGBT based welding machine                                                                   |
| 340 | Windmills                                                                                    |
| 341 | Solar Photovoltaic                                                                           |
| 342 | Micro Hydro                                                                                  |
| 343 | Biomass / Bagasse (Gasifier or Cogeneration)                                                 |
| 344 | Solar Water Heater                                                                           |
| 345 | Wind Ventilator (Wind Powered Exhaust Fan)                                                   |
| 346 | Solar Power Inverters                                                                        |
| 347 | Renewable Energy based Steam Boiler                                                          |
| 348 | Residual Derived Fuel (RDF) based Power Generation Plant                                     |
| 349 | Powerless Ventilators                                                                        |
| 350 | Renewable Energy Projects (Solar, Wind, biomass etc.) for both captive & non-captive purpose |
| 351 | Waste to Energy projects including Compressed Biogas Projects                                |

**Note** (i) *The above list is indicative and not exhaustive; additional technologies/machines may be considered by the AE for funding only where they fall within the approved scope and eligibility criteria of FMAP, are screened and categorized in accordance with the ESMS, and comply with applicable E&S standards.*

(ii) *The category indicated in the table reflects the typical risk profile of the technology/process itself. Where the same technology is proposed as part of (a) a brownfield enterprise expanding/modernizing in a new location, (b) a greenfield enterprise, or (c) an off-site RE/EE project, the final categorization of the overall subproject shall be determined through ESDD and site/legal screening. In such cases, the sub-project may be classified as Category B where land-related, siting, community health and safety, or other site-specific risks are assessed as moderate, site-specific, and manageable.*

**End of document**

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